



VALUE AT THE SPINDLE®

Micro Tool Catalog



New Expanded Offering

www.sgsmicrotools.com

ISO 9001:2015 Certified



KYOCERA SGS Precision Tools (KSPT) is an ISO-certified manufacturer of industry leading round solid carbide cutting tools. State of the art manufacturing and warehouse facilities have the capacity and processes to meet the quality and delivery demands of customers in all markets around the world. Complete inspections performed within its metallurgical lab and manufacturing quality departments ensure the use of high quality carbide and reliable manufacturing consistency regardless of when a cutting tool is produced.

KSPT is proud to have pioneered some of the world's most advanced cutting technologies due to rigorous testing of tools, coatings, and materials within its Global Innovation Center. It is this commitment to innovation that has launched patented products and technologies like the Z-Carb with its variable geometry and cutting edge preparation, Series 43 APR® and APF® ultra high performance aluminum cutting tools, and the JetStream coolant technology.

SGS has become an important part of the KYOCERA Precision Tools family, and while the name has changed, one thing has not. Its dedicated people and their relentless commitment to the customer. KSPT Technical Sales Engineers, Application Specialists, and Distribution Partners blanket the globe, delivering reliable service and support to all market segments. It is these people and products that drive innovative application strategies and cutting tool technologies into the end user, continually exceeding expectations and providing the most Value at the Spindle®



Table of Contents

| | |
|-----------------------------|---|
| KYOCERA SGS Precision Tools | 2 |
| KSPT Micro End Mills | 4 |
| KSPT Micro Drills | 6 |
| Coatings | 8 |
| Common Legend | 9 |

MILLING

FRACTIONAL

| SERIES | DESCRIPTION | PAGE |
|-----------------|---|------|
| M2, M2CR | 2 Flute Square & Corner Radius 1.5xD | 10 |
| | 2 Flute Square & Corner Radius 3xD | 14 |
| | 2 Flute Square 3xD, 8xD Overall Reach | 18 |
| | 2 Flute Square 3xD, 12xD Overall Reach | 19 |
| M2B | 2 Flute Ball 1.5xD | 20 |
| | 2 Flute Ball 3xD | 22 |
| | 2 Flute Ball 3xD, 8xD Overall Reach | 24 |
| | 2 Flute Ball 3xD, 12xD Overall Reach | 25 |
| M3, M3CR | 3 Flute Square 1.5xD, 3xD Overall Reach | 26 |
| | 3 Flute Square & Corner Radius 1.5xD, 5xD Overall Reach | 27 |
| | 3 Flute Square & Corner Radius 1.5xD, 8xD Overall Reach | 29 |
| | 3 Flute Square & Corner Radius 1.5xD, 12xD Overall Reach | 31 |
| | 3 Flute Square 1.5xD, 15xD Overall Reach | 33 |
| | 3 Flute Square 1.5xD, 20xD Overall Reach | 34 |
| M3B | 3 Flute Square 1.5xD, 25xD Overall Reach | 35 |
| | 3 Flute Ball 1.5xD, 3xD Overall Reach | 36 |
| | 3 Flute Ball 1.5xD, 5xD Overall Reach | 37 |
| | 3 Flute Ball 1.5xD, 8xD Overall Reach | 38 |
| | 3 Flute Ball 1.5xD, 12xD Overall Reach | 39 |
| | 3 Flute Ball 1.5xD, 15xD Overall Reach | 40 |
| M4, M4CR | 3 Flute Ball 1.5xD, 20xD Overall Reach | 41 |
| | 3 Flute Ball 1.5xD, 25xD Overall Reach | 42 |
| | 4 Flute Square & Corner Radius 1.5xD | 43 |
| | 4 Flute Square & Corner Radius 3xD | 48 |
| M4L | 4 Flute Square 3xD, 8xD Overall Reach | 52 |
| | 4 Flute Square 3xD, 12xD Overall Reach | 53 |
| | 4 Flute Square 5xD | 54 |
| | 4 Flute Square 8xD | 55 |
| M4E | 4 Flute Square 12xD | 56 |
| | 4 Flute Ball 1.5xD | 57 |
| M4B | 4 Flute Ball 3xD | 59 |
| | 4 Flute Ball 3xD, 8xD Overall Reach | 61 |
| | 4 Flute Ball 3xD, 12xD Overall Reach | 62 |
| | 4 Flute Ball 5xD | 63 |
| M4EB | 4 Flute Ball 8xD | 64 |
| M4XB | 4 Flute Ball 12xD | 65 |

METRIC

| SERIES | DESCRIPTION | PAGE |
|-------------|----------------------|------|
| M2M | 2 Flute Square 1.5xD | 66 |
| | 2 Flute Square 3xD | 67 |
| M2MB | 2 Flute Ball 1.5xD | 69 |
| | 2 Flute Ball 3xD | 70 |
| M4M | 4 Flute Square 1.5xD | 72 |
| | 4 Flute Square 3xD | 73 |
| M4MB | 4 Flute Ball 1.5xD | 74 |
| | 4 Flute Ball 3xD | 75 |

Speed & Feed Recommendations

| | | |
|-------------|----------------------------------|----|
| M032 | 3 Flute Square and Corner Radius | 82 |
|-------------|----------------------------------|----|

Speed & Feed Recommendations

HOLE MAKING

| | | |
|-------------|---|----|
| M080 | 2 Flute Spotting Drill External Coolant | 89 |
| M081 | 2 Flute Spotting Drill External Coolant | 90 |

Speed & Feed Recommendations

| | | |
|-------------|--|----|
| M105 | 2 Flute External Coolant Standard and Extended length | 93 |
|-------------|--|----|

Speed & Feed Recommendations

| | | |
|-------------|--|-----|
| M226 | 2 Flute External Coolant | 99 |
| L226 | 2 Flute Left Hand Cut External Coolant | 108 |

Speed & Feed Recommendations

| | | |
|-------------|--------------------------|-----|
| M814 | 2 Flute Internal Coolant | 114 |
|-------------|--------------------------|-----|

Speed & Feed Recommendations

TECHNICAL INFORMATION

| | |
|---------------------------|-----|
| EDP Index | 118 |
| Decimal Equivalent Chart | 130 |
| Hardness Conversion Chart | 131 |

KSPT MICRO END MILLS

SMALL TOOLS. EPIC PROPORTIONS.

KYOCERA SGS Precision Tools (KSPT) commitment to providing superior quality round solid carbide cutting tools is unwavering, and these efforts are being taken one step further by introducing an impressive micro tool expansion. With a staggering expansion of over 2,500 tools in various lengths of cut, reach variations, end configurations and coating options, the portfolio can satisfy a variety of machining applications tailored for small diameter milling environments. Explore the portfolio below and discover how these small tools can deliver epic VALUE AT THE SPINDLE®!

EXPANSION HIGHLIGHTS:

- 2, 3, and 4 flutes in square, corner radii, and ball nose end configurations options standard
- Lengths of cut ranging from 1.5 times diameter through 12 times diameter
- Expansive reach options ranging from 3 times diameter through 25 times diameter overall reach
- Fractional tools on 1/8" common shank and metric tools on 3MM and 4MM shanks to suit global application demands
- Uncoated options for tools in expanded and legacy portfolio
- Offered in Ti-NAMITE®-A coating for superior chip flow at low spindle speeds in a variety of applications
- All micro tools are manufactured in accordance with KSPT ISO 9001: 2015 quality standards



CASE STUDY M4 8XD MICRO END MILL

INDUSTRY

AEROSPACE

MATERIAL

347 Stainless Steel (28 HRc Hardness)

PRODUCT

M4 8XD Micro End Mills

APPLICATION

Plunging

COMPETITOR

3 Flute Extended Reach Micro End Mill

COOLANT

Soluble Flood

TOOL INFORMATION

0.07" Dia / 0.21" LOC / 2" OAL

GOALS

The goals of this study were to significantly reduce job cost through the implementation of superior tooling and increased manufacturing efficiencies.

STRATEGY

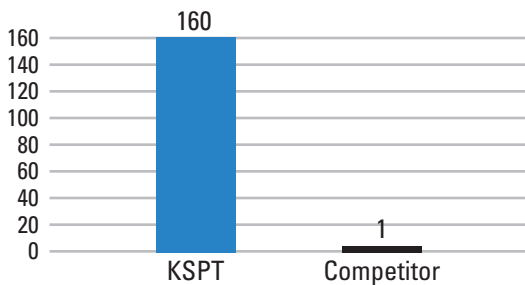
KSPT approached the job with a 4 flute 8XD Micro End Mill. The four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.

| | KSPT | COMPETITOR |
|-----------------|-----------|--------------|
| TOOL DIAMETER | .07" | .07 |
| SPEED | 6600 RPM | 3400 RPM |
| FEED | 4 IPM | 2 IPM |
| RADIAL CUT (AE) | N/A | N/A |
| AXIAL CUT (AP) | 0.38 | 0.38 |
| CYCLE TIME | 6 SECONDS | 11.4 SECONDS |

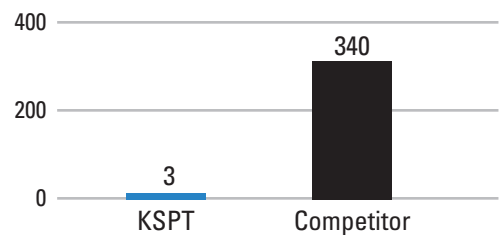
RESULTS

The overall findings of this study indicate **KSPT's 4 flute micro end mill blew away the competitor's 3 flute tool** in efficiency and effectiveness. **KSPT's tool was able to capacitate a 48% higher speed and a 50% greater feed rate.** Those combined efficiencies were able to **cut the cycle time in half!** Because of the higher quality tool, the customer was able to **produce 160 parts per KSPT tool.** The competitor's 3 flute end mill was only able to produce 1 part per tool. Thus, the **tool change cost was reduced by over 99%!** Additionally, since KSPT only used 3 total tools to complete the job, the customer benefited from a **new tool cost reduction by over 99%.** The **M4 8XD 4 flute micro end mill ultimately saved the customer a grand total of \$12,030.34, resulting in a 98.88% cost reduction!** These tools, albeit small, are an epic step forward for micro machining.

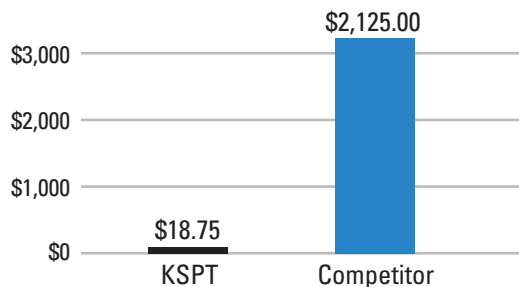
TOTAL PARTS AVAILABLE PER TOOL



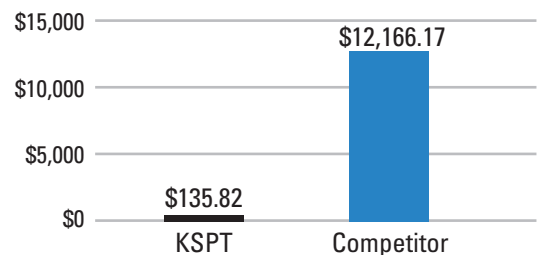
NEW TOOLS REQUIRED TO COMPLETE THE JOB



TOOL CHANGE COST



TOTAL COST



KSPT MICRO DRILLS

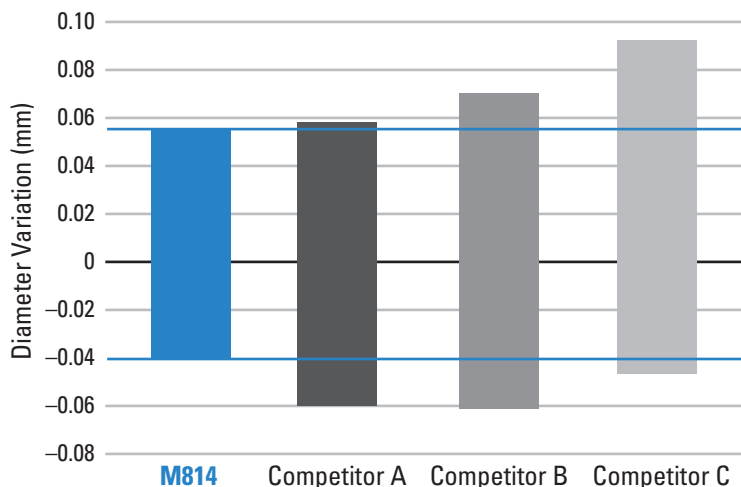
SMALL TOOLS. EPIC PROPORTIONS.

KYOCERA SGS Precision Tools (KSPT) commitment to providing superior quality round solid carbide cutting tools is unwavering, and these efforts are being taken one step further by introducing an impressive micro tool expansion. Within the expansion, KSPT introduces a new lineup of micro drills totaling more than 1,400 tools with a variety of coolant and length options to meet the demands of global hole making applications. Explore the portfolio below and discover how these small tools can deliver epic VALUE AT THE SPINDLE®!

DRILL PORTFOLIO HIGHLIGHTS:

- 2 flutes for optimal chip evacuation and cutting edge strength
- Internal coolant options on select series promotes controlled and consistent operating temperatures
- Lengths of cut ranging from 3 times diameter through 15 times diameter
- Fractional tools on 1/8" common shank and metric tools on 3MM and 4MM shanks to suit global market demands
- Uncoated options standard in select series
- Offered with Ti-NAMITE®-A coating for superior tool life and all-around value across a variety of applications
- Select series offered in new Ti-NAMITE®-Cr (AlCrN) coating for exceptional wear resistance in wet and dry drilling of cast iron and steel materials up to 52 HRC
- All micro tools are manufactured in accordance with KSPT ISO 9001: 2015 quality standards

**HOLE DIAMETER VARIATION
SERIES M814**



| | No. of Holes | Dia. Variation (mm) |
|--------------|--------------|---------------------|
| M814 | 600 | 0.0937 |
| Competitor A | 600 | 0.1141 |
| Competitor B | 269 (Broken) | 0.1281 |
| Competitor C | 600 | 0.1347 |

Cutting Conditions:

N = 6468 rpm, Vf = 575 mm/min
Drill Diameter 0,3 mm
Drilling Depth 25,4 mm, 17-4PH-900

M814

- Split point and double margin design provide superior hole finish and size control
- Coolant hole feature allows straight through drilling without a peck cycle
- High-performance Ti-NAMITE®-Cr coating and mirror polished fluting increase tool life and productivity in moderate-to-difficult workpiece materials
- Available from stock in a selection of popular lengths and diameters
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures



M105

- 4-facet point design stabilizes on entry for superior hole size control and tool life
- Mirror surface finishes improve chip flow as hole depth increases
- Ti-NAMITE®-A coating and uncoated options for the ultimate performance in a variety of ferrous and non-ferrous workpiece materials
- Available from stock in a selection of popular lengths and diameters
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures



M080 & M081

- 4-facet point design, stub length, and mirror finish provide the highest quality spot
- Ti-NAMITE®-A coating and uncoated options for the ultimate performance and tool life in a variety of ferrous and non-ferrous workpiece materials
- Available from stock in all popular diameters and point configurations
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures



M226 & L226

- 4-facet point design stabilizes on entry for superior hole size control and tool life (>.08mm)
- Mirror surface finishes improve chip flow as hole depth increases
- Ti-NAMITE®-A coating and uncoated options for the ultimate performance in a variety of ferrous and non-ferrous workpiece materials
- Right and left hand cut available from stock in a wide selection of popular lengths and diameters
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures



KSPT COATINGS

Ti-NAMITE-A

With excellent thermal and chemical resistance, Ti-NAMITE®-A (AlTiN) allows for dry cutting and improvements in performance of carbide. The coating has a high hardness giving ultimate protection against abrasive wear and erosion. Ideal for cast iron, high temperature alloys, steels, and stainless steel applications.

Hardness (HV): 3700
Oxidation Temperature: 1100°C / 2010°F
Coefficient of Friction: 0.30
Thickness: 1 – 4 Microns (based on tool diameter)

KYOCERA SGS PRECISION TOOLS AlTiN COATING PERFORMANCE (LAB RESULTS)

SEM photography shows the KSPT proprietary coating method provides a significant reduction in macro particle deposition on the tool surface, which contributes to increased performance due to smoother chip flow. Another benefit of the KSPT micro-tool coating is a significant reduction in edge rounding due to excessive thickness, typical of most normal coatings.



Ti-NAMITE-CR

With very high wear resistance and excellent hot hardness, Ti-NAMITE®-Cr (AlCrN) allows for wet and dry machining versatility at the highest of cutting speeds for increased machine utilization and productivity. The coating provides optimal thermal shock stability and is ideal for cast iron and steel applications up to 52 HRC.

Hardness (HV): 3200
Oxidation Temperature: 1100°C / 2010°F
Coefficient of Friction: 0.35
Thickness: 1 – 4 Microns (based on tool diameter)

Common Legend

TO ORDER: Please specify quantity and EDP number.

RETURN POLICY: An RMA number must accompany all product returns. Contact your Customer Service Representative for an RMA number.

REGULATION SAFETY GLASSES SHOULD ALWAYS BE WORN WHEN USING HIGH-SPEED CUTTING EQUIPMENT



WARNING: This product can expose you to chemicals including Cobalt, which is known to the State of California to cause cancer. For more information go to www.p65warnings.ca.gov

MATERIALS



Steels



Stainless Steels



Cast Iron



High Temp Alloys



Titanium



Non-Ferrous



Plastics/Composites



Hardened Steels

END MILLS

TOOL LENGTH



Stub



Regular



Long



Long Reach



Extra Long

FLUTES



2 Flutes



3 Flutes



4 Flutes

END CONFIGURATIONS



Ball



Corner



Square

SHANK TYPE



Common

HELIX ANGLE



Right Spiral

PROFILE ANGLE



Profile Angle

RAKE ANGLE



Positive

All tools are in Right Cut Direction unless noted

DRILLS

SHANK TYPE



Common



Straight

HELIX ANGLES



Right Spiral



Left Spiral



None

COOLANT OPTIONS



Internal Coolant



External Coolant

POINT ANGLE



Drill Point

REACH

1.5xD

1.5xD Reach

3xD

3xD Reach

5xD

5xD Reach

8xD

8xD Reach

12xD

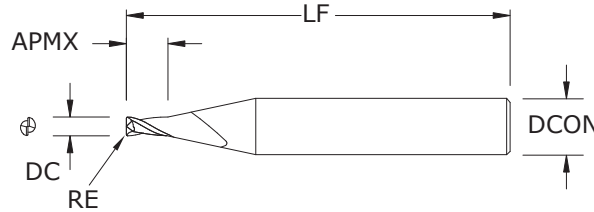
12xD Reach

15xD

15xD Reach



M2 • M2CR
1.5xD
FRACTIONAL SERIES



 New Expanded Tools

TOLERANCES (inch)

.004-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

RE = +0.0000/-0.0005

- Two flute design is ideal for softer alloyed, non-ferrous material applications that require slotting or involve heavy chip loads.
- Enhanced corner geometry with tight tolerance corner radii
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|------------------|----------|---------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.004 | 1/8 | 0.006 | 1-1/2 | — | 04004 | 04000 |
| 0.005 | 1/8 | 0.008 | 1-1/2 | — | 00301 | 02201 |
| 0.006 | 1/8 | 0.009 | 1-1/2 | — | 00302 | 02202 |
| 0.007 | 1/8 | 0.011 | 1-1/2 | — | 00303 | 02203 |
| 0.008 | 1/8 | 0.012 | 1-1/2 | — | 00304 | 02204 |
| 0.009 | 1/8 | 0.014 | 1-1/2 | — | 00305 | 02205 |
| 0.010 | 1/8 | 0.015 | 1-1/2 | — | 00306 | 02206 |
| 0.011 | 1/8 | 0.017 | 1-1/2 | — | 00307 | 02207 |
| 0.012 | 1/8 | 0.018 | 1-1/2 | — | 00308 | 02208 |
| 0.013 | 1/8 | 0.020 | 1-1/2 | — | 00309 | 02209 |
| 0.014 | 1/8 | 0.021 | 1-1/2 | — | 00310 | 02210 |
| 0.015 | 1/8 | 0.023 | 1-1/2 | — | 00311 | 02211 |
| 0.015 | 1/8 | 0.023 | 1-1/2 | 0.003 | 08500 | 08641 |
| 0.016 | 1/8 | 0.024 | 1-1/2 | — | 00312 | 02212 |
| 0.017 | 1/8 | 0.026 | 1-1/2 | — | 00313 | 02213 |
| 0.018 | 1/8 | 0.027 | 1-1/2 | — | 00314 | 02214 |
| 0.019 | 1/8 | 0.029 | 1-1/2 | — | 00315 | 02215 |
| 0.020 | 1/8 | 0.030 | 1-1/2 | — | 00316 | 02216 |
| 0.020 | 1/8 | 0.030 | 1-1/2 | 0.003 | 08502 | 08643 |
| 0.020 | 1/8 | 0.030 | 1-1/2 | 0.005 | 08504 | 08645 |
| 0.021 | 1/8 | 0.032 | 1-1/2 | — | 00317 | 02217 |
| 0.022 | 1/8 | 0.033 | 1-1/2 | — | 00318 | 02218 |
| 0.023 | 1/8 | 0.035 | 1-1/2 | — | 00319 | 02219 |
| 0.024 | 1/8 | 0.036 | 1-1/2 | — | 00320 | 02220 |
| 0.025 | 1/8 | 0.038 | 1-1/2 | — | 00321 | 02221 |
| 0.025 | 1/8 | 0.038 | 1-1/2 | 0.010 | 08505 | 08646 |
| 0.026 | 1/8 | 0.039 | 1-1/2 | — | 00322 | 02222 |
| 0.027 | 1/8 | 0.041 | 1-1/2 | — | 00323 | 02223 |
| 0.028 | 1/8 | 0.042 | 1-1/2 | — | 00324 | 02224 |
| 0.029 | 1/8 | 0.044 | 1-1/2 | — | 00325 | 02225 |
| 0.030 | 1/8 | 0.045 | 1-1/2 | — | 00326 | 02226 |
| 0.030 | 1/8 | 0.045 | 1-1/2 | 0.010 | 08507 | 08648 |
| 0.031 | 1/8 | 0.047 | 1-1/2 | — | 00327 | 02227 |
| 0.032 | 1/8 | 0.048 | 1-1/2 | — | 00328 | 02228 |
| 0.033 | 1/8 | 0.050 | 1-1/2 | — | 00329 | 02229 |
| 0.034 | 1/8 | 0.051 | 1-1/2 | — | 00330 | 02230 |

 STEELS

 STAINLESS STEELS

 CAST IRON

 HIGH TEMP ALLOYS

 TITANIUM

 HARDENED STEELS

 NON-FERROUS

 PLASTICS/COMPOSITES

continued on next page

New Expanded Tools

M2 • M2CR
1.5xD
FRACTIONAL SERIES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|------------------|----------|---------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.035 | 1/8 | 0.053 | 1-1/2 | — | 00331 | 02231 |
| 0.035 | 1/8 | 0.053 | 1-1/2 | 0.005 | 08509 | 08650 |
| 0.035 | 1/8 | 0.053 | 1-1/2 | 0.010 | 08511 | 08652 |
| 0.036 | 1/8 | 0.054 | 1-1/2 | — | 00332 | 02232 |
| 0.037 | 1/8 | 0.056 | 1-1/2 | — | 00333 | 02233 |
| 0.038 | 1/8 | 0.057 | 1-1/2 | — | 00334 | 02234 |
| 0.039 | 1/8 | 0.059 | 1-1/2 | — | 00335 | 02235 |
| 0.040 | 1/8 | 0.060 | 1-1/2 | — | 00336 | 02236 |
| 0.040 | 1/8 | 0.060 | 1-1/2 | 0.005 | 08513 | 08654 |
| 0.040 | 1/8 | 0.060 | 1-1/2 | 0.010 | 08515 | 08656 |
| 0.041 | 1/8 | 0.062 | 1-1/2 | — | 00337 | 02368 |
| 0.042 | 1/8 | 0.063 | 1-1/2 | — | 00338 | 02369 |
| 0.043 | 1/8 | 0.065 | 1-1/2 | — | 00339 | 02370 |
| 0.044 | 1/8 | 0.066 | 1-1/2 | — | 00340 | 02371 |
| 0.045 | 1/8 | 0.068 | 1-1/2 | — | 00341 | 02372 |
| 0.045 | 1/8 | 0.068 | 1-1/2 | 0.005 | 08517 | 08658 |
| 0.045 | 1/8 | 0.068 | 1-1/2 | 0.010 | 08519 | 08660 |
| 0.046 | 1/8 | 0.069 | 1-1/2 | — | 00342 | 02373 |
| 0.047 | 1/8 | 0.071 | 1-1/2 | — | 00343 | 02374 |
| 0.048 | 1/8 | 0.072 | 1-1/2 | — | 00344 | 02375 |
| 0.049 | 1/8 | 0.074 | 1-1/2 | — | 00345 | 02376 |
| 0.050 | 1/8 | 0.075 | 1-1/2 | — | 00346 | 02377 |
| 0.050 | 1/8 | 0.075 | 1-1/2 | 0.005 | 08521 | 08662 |
| 0.050 | 1/8 | 0.075 | 1-1/2 | 0.010 | 08523 | 08664 |
| 0.050 | 1/8 | 0.075 | 1-1/2 | 0.015 | 08525 | 08666 |
| 0.051 | 1/8 | 0.077 | 1-1/2 | — | 00347 | 02378 |
| 0.052 | 1/8 | 0.078 | 1-1/2 | — | 00348 | 02379 |
| 0.053 | 1/8 | 0.080 | 1-1/2 | — | 00349 | 02380 |
| 0.054 | 1/8 | 0.081 | 1-1/2 | — | 00350 | 02381 |
| 0.055 | 1/8 | 0.083 | 1-1/2 | — | 00351 | 02382 |
| 0.055 | 1/8 | 0.083 | 1-1/2 | 0.005 | 08527 | 08668 |
| 0.055 | 1/8 | 0.083 | 1-1/2 | 0.010 | 08529 | 08670 |
| 0.055 | 1/8 | 0.083 | 1-1/2 | 0.015 | 08531 | 08672 |
| 0.056 | 1/8 | 0.084 | 1-1/2 | — | 00352 | 02383 |
| 0.057 | 1/8 | 0.086 | 1-1/2 | — | 00353 | 02384 |
| 0.058 | 1/8 | 0.087 | 1-1/2 | — | 00354 | 02385 |

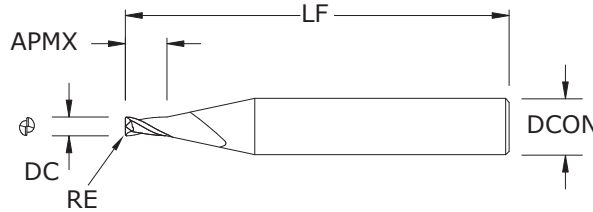
continued

continued on next page

M2 • M2CR • 1.5xD



M2 • M2CR 1.5xD FRACTIONAL SERIES



 New Expanded Tools

TOLERANCES (inch)

.004-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

RE = +0.0000/-0.0005

continued

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|------------------|----------|---------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.059 | 1/8 | 0.089 | 1-1/2 | - | 00355 | 02386 |
| 0.060 | 1/8 | 0.090 | 1-1/2 | - | 00356 | 02387 |
| 0.060 | 1/8 | 0.090 | 1-1/2 | 0.005 | 08533 | 08674 |
| 0.060 | 1/8 | 0.090 | 1-1/2 | 0.010 | 08535 | 08676 |
| 0.060 | 1/8 | 0.090 | 1-1/2 | 0.015 | 08537 | 08678 |
| 0.062 | 1/8 | 0.093 | 1-1/2 | - | 00357 | 02388 |
| 0.065 | 1/8 | 0.098 | 1-1/2 | - | 00358 | 02389 |
| 0.065 | 1/8 | 0.098 | 1-1/2 | 0.005 | 08539 | 08680 |
| 0.065 | 1/8 | 0.098 | 1-1/2 | 0.010 | 08541 | 08682 |
| 0.065 | 1/8 | 0.098 | 1-1/2 | 0.015 | 08543 | 08684 |
| 0.070 | 1/8 | 0.105 | 1-1/2 | - | 00359 | 02390 |
| 0.070 | 1/8 | 0.105 | 1-1/2 | 0.005 | 08545 | 08686 |
| 0.070 | 1/8 | 0.105 | 1-1/2 | 0.010 | 08547 | 08688 |
| 0.070 | 1/8 | 0.105 | 1-1/2 | 0.015 | 08549 | 08690 |
| 0.075 | 1/8 | 0.112 | 1-1/2 | - | 04006 | 04002 |
| 0.075 | 1/8 | 0.113 | 1-1/2 | 0.005 | 08551 | 08692 |
| 0.075 | 1/8 | 0.113 | 1-1/2 | 0.010 | 08553 | 08694 |
| 0.075 | 1/8 | 0.113 | 1-1/2 | 0.015 | 08555 | 08696 |
| 0.075 | 1/8 | 0.113 | 1-1/2 | 0.020 | 08557 | 08698 |
| 0.078 | 1/8 | 0.117 | 1-1/2 | - | 00360 | 02391 |
| 0.080 | 1/8 | 0.120 | 1-1/2 | - | 00361 | 02392 |
| 0.080 | 1/8 | 0.120 | 1-1/2 | 0.005 | 08559 | 08700 |
| 0.080 | 1/8 | 0.120 | 1-1/2 | 0.010 | 08561 | 08702 |
| 0.080 | 1/8 | 0.120 | 1-1/2 | 0.015 | 08563 | 08704 |
| 0.080 | 1/8 | 0.120 | 1-1/2 | 0.020 | 08565 | 08706 |
| 0.085 | 1/8 | 0.128 | 1-1/2 | - | 00362 | 02393 |
| 0.085 | 1/8 | 0.128 | 1-1/2 | 0.005 | 08567 | 08708 |
| 0.085 | 1/8 | 0.128 | 1-1/2 | 0.010 | 08569 | 08710 |
| 0.085 | 1/8 | 0.128 | 1-1/2 | 0.015 | 08571 | 08712 |
| 0.085 | 1/8 | 0.128 | 1-1/2 | 0.020 | 08573 | 08714 |
| 0.090 | 1/8 | 0.135 | 1-1/2 | - | 00363 | 02394 |
| 0.090 | 1/8 | 0.135 | 1-1/2 | 0.005 | 08575 | 08716 |
| 0.090 | 1/8 | 0.135 | 1-1/2 | 0.010 | 08577 | 08718 |
| 0.090 | 1/8 | 0.135 | 1-1/2 | 0.015 | 08579 | 08720 |
| 0.090 | 1/8 | 0.135 | 1-1/2 | 0.020 | 08581 | 08722 |
| 0.093 | 1/8 | 0.140 | 1-1/2 | - | 00364 | 02395 |

continued on next page

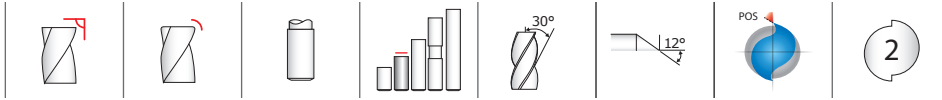
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

New Expanded Tools

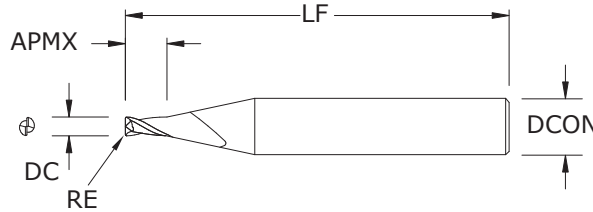
**M2 • M2CR
1.5xD**
FRACTIONAL SERIES

continued

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|---------------------------|---------------------------|--------------------------|-------------------------|------------------------|----------|------------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.095 | 1/8 | 0.143 | 1-1/2 | — | 00365 | 02396 |
| 0.095 | 1/8 | 0.143 | 1-1/2 | 0.005 | 08583 | 08724 |
| 0.095 | 1/8 | 0.143 | 1-1/2 | 0.010 | 08585 | 08726 |
| 0.095 | 1/8 | 0.143 | 1-1/2 | 0.015 | 08587 | 08728 |
| 0.095 | 1/8 | 0.143 | 1-1/2 | 0.020 | 08589 | 08730 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | — | 00366 | 02397 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | 0.005 | 08591 | 08732 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | 0.010 | 08593 | 08734 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | 0.015 | 08595 | 08736 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | 0.020 | 08597 | 08738 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | 0.030 | 08599 | 08740 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | — | 00367 | 02398 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | 0.005 | 08601 | 08742 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | 0.010 | 08603 | 08744 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | 0.015 | 08605 | 08746 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | 0.020 | 08607 | 08748 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | 0.030 | 08609 | 08750 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | — | 00368 | 02399 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | 0.005 | 08611 | 08752 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | 0.010 | 08613 | 08754 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | 0.015 | 08615 | 08756 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | 0.020 | 08617 | 08758 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | 0.030 | 08619 | 08760 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | — | 00369 | 02400 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | 0.005 | 08621 | 08762 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | 0.010 | 08623 | 08764 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | 0.015 | 08625 | 08766 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | 0.020 | 08627 | 08768 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | 0.030 | 08629 | 08770 |
| 0.120 | 1/8 | 0.180 | 1-1/2 | — | 00370 | 02401 |
| 0.120 | 1/8 | 0.180 | 1-1/2 | 0.005 | 08631 | 08772 |
| 0.120 | 1/8 | 0.180 | 1-1/2 | 0.010 | 08633 | 08774 |
| 0.120 | 1/8 | 0.180 | 1-1/2 | 0.015 | 08635 | 08776 |
| 0.120 | 1/8 | 0.180 | 1-1/2 | 0.020 | 08637 | 08778 |
| 0.120 | 1/8 | 0.180 | 1-1/2 | 0.030 | 08639 | 08780 |



M2 • M2CR
3xD
FRACTIONAL SERIES



 New Expanded Tools

TOLERANCES (inch)

.004-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

RE = +0.0000/-0.0005

 STEELS

 STAINLESS STEELS

 CAST IRON

 HIGH TEMP ALLOYS

 TITANIUM

 HARDENED STEELS

 NON-FERROUS

 PLASTICS/COMPOSITES

- Two flute design is ideal for softer alloyed, non-ferrous material applications that require slotting or involve heavy chip loads.
- Enhanced corner geometry with tight tolerance corner radii
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|------------------------|------------------------|-----------------------|----------------------|---------------------|----------|------------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.004 | 1/8 | 0.012 | 1-1/2 | — | 04005 | 04001 |
| 0.005 | 1/8 | 0.015 | 1-1/2 | — | 00811 | 02275 |
| 0.006 | 1/8 | 0.018 | 1-1/2 | — | 00812 | 02276 |
| 0.007 | 1/8 | 0.021 | 1-1/2 | — | 00813 | 02277 |
| 0.008 | 1/8 | 0.024 | 1-1/2 | — | 00814 | 02278 |
| 0.009 | 1/8 | 0.027 | 1-1/2 | — | 00815 | 02279 |
| 0.010 | 1/8 | 0.030 | 1-1/2 | — | 00816 | 02280 |
| 0.011 | 1/8 | 0.033 | 1-1/2 | — | 00817 | 02281 |
| 0.012 | 1/8 | 0.036 | 1-1/2 | — | 00818 | 02282 |
| 0.013 | 1/8 | 0.039 | 1-1/2 | — | 00819 | 02283 |
| 0.014 | 1/8 | 0.042 | 1-1/2 | — | 00820 | 02284 |
| 0.015 | 1/8 | 0.045 | 1-1/2 | — | 00821 | 02285 |
| 0.015 | 1/8 | 0.045 | 1-1/2 | 0.003 | 08501 | 08642 |
| 0.016 | 1/8 | 0.048 | 1-1/2 | — | 00822 | 02286 |
| 0.017 | 1/8 | 0.051 | 1-1/2 | — | 00823 | 02287 |
| 0.018 | 1/8 | 0.054 | 1-1/2 | — | 00824 | 02288 |
| 0.019 | 1/8 | 0.057 | 1-1/2 | — | 00825 | 02289 |
| 0.020 | 1/8 | 0.060 | 1-1/2 | — | 00826 | 02290 |
| 0.020 | 1/8 | 0.060 | 1-1/2 | 0.003 | 08503 | 08644 |
| 0.020 | 1/8 | 0.060 | 1-1/2 | 0.005 | 04020 | 04021 |
| 0.021 | 1/8 | 0.063 | 1-1/2 | — | 00827 | 02291 |
| 0.022 | 1/8 | 0.066 | 1-1/2 | — | 00828 | 02292 |
| 0.023 | 1/8 | 0.069 | 1-1/2 | — | 00829 | 02293 |
| 0.024 | 1/8 | 0.072 | 1-1/2 | — | 00830 | 02294 |
| 0.025 | 1/8 | 0.075 | 1-1/2 | — | 00831 | 02295 |
| 0.025 | 1/8 | 0.075 | 1-1/2 | 0.005 | 04022 | 04023 |
| 0.025 | 1/8 | 0.075 | 1-1/2 | 0.010 | 08506 | 08647 |
| 0.026 | 1/8 | 0.078 | 1-1/2 | — | 00832 | 02296 |
| 0.027 | 1/8 | 0.081 | 1-1/2 | — | 00833 | 02297 |
| 0.028 | 1/8 | 0.084 | 1-1/2 | — | 00834 | 02298 |
| 0.029 | 1/8 | 0.087 | 1-1/2 | — | 00835 | 02299 |
| 0.030 | 1/8 | 0.090 | 1-1/2 | — | 00836 | 02300 |
| 0.030 | 1/8 | 0.090 | 1-1/2 | 0.010 | 08508 | 08649 |
| 0.031 | 1/8 | 0.093 | 1-1/2 | — | 00837 | 02301 |
| 0.032 | 1/8 | 0.096 | 1-1/2 | — | 00838 | 02302 |
| 0.033 | 1/8 | 0.099 | 1-1/2 | — | 00839 | 02303 |

continued on next page

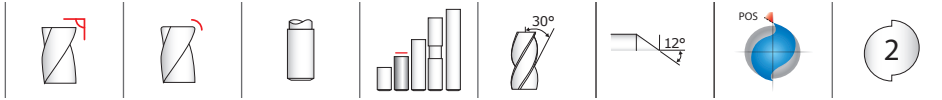
New Expanded Tools

**M2 • M2CR
3xD**
FRACTIONAL SERIES

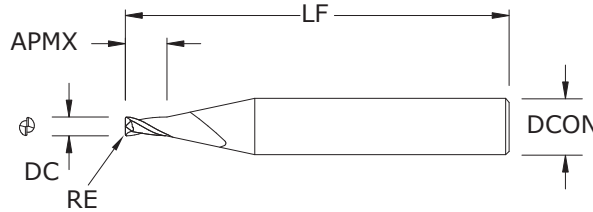
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|---------------------------|---------------------------|--------------------------|-------------------------|------------------------|----------|------------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.034 | 1/8 | 0.102 | 1-1/2 | — | 00840 | 02304 |
| 0.035 | 1/8 | 0.105 | 1-1/2 | — | 00841 | 02305 |
| 0.035 | 1/8 | 0.105 | 1-1/2 | 0.005 | 08510 | 08651 |
| 0.035 | 1/8 | 0.105 | 1-1/2 | 0.010 | 08512 | 08653 |
| 0.036 | 1/8 | 0.108 | 1-1/2 | — | 00842 | 02306 |
| 0.037 | 1/8 | 0.111 | 1-1/2 | — | 00843 | 02307 |
| 0.038 | 1/8 | 0.114 | 1-1/2 | — | 00844 | 02308 |
| 0.039 | 1/8 | 0.117 | 1-1/2 | — | 00845 | 02309 |
| 0.040 | 1/8 | 0.120 | 1-1/2 | — | 00846 | 02310 |
| 0.040 | 1/8 | 0.120 | 1-1/2 | 0.005 | 08514 | 08655 |
| 0.040 | 1/8 | 0.120 | 1-1/2 | 0.010 | 08516 | 08657 |
| 0.041 | 1/8 | 0.123 | 1-1/2 | — | 00479 | 02436 |
| 0.042 | 1/8 | 0.126 | 1-1/2 | — | 00480 | 02437 |
| 0.043 | 1/8 | 0.129 | 1-1/2 | — | 00481 | 02438 |
| 0.044 | 1/8 | 0.132 | 1-1/2 | — | 00482 | 02439 |
| 0.045 | 1/8 | 0.135 | 1-1/2 | — | 00483 | 02440 |
| 0.045 | 1/8 | 0.135 | 1-1/2 | 0.005 | 08518 | 08659 |
| 0.045 | 1/8 | 0.135 | 1-1/2 | 0.010 | 08520 | 08661 |
| 0.046 | 1/8 | 0.138 | 1-1/2 | — | 00484 | 02441 |
| 0.047 | 1/8 | 0.141 | 1-1/2 | — | 00485 | 02442 |
| 0.048 | 1/8 | 0.144 | 1-1/2 | — | 00486 | 02443 |
| 0.049 | 1/8 | 0.147 | 1-1/2 | — | 00487 | 02444 |
| 0.050 | 1/8 | 0.150 | 1-1/2 | — | 00488 | 02445 |
| 0.050 | 1/8 | 0.150 | 1-1/2 | 0.005 | 08522 | 08663 |
| 0.050 | 1/8 | 0.150 | 1-1/2 | 0.010 | 08524 | 08665 |
| 0.050 | 1/8 | 0.150 | 1-1/2 | 0.015 | 08526 | 08667 |
| 0.051 | 1/8 | 0.153 | 1-1/2 | — | 00489 | 02446 |
| 0.052 | 1/8 | 0.156 | 1-1/2 | — | 00490 | 02447 |
| 0.053 | 1/8 | 0.159 | 1-1/2 | — | 00491 | 02448 |
| 0.054 | 1/8 | 0.162 | 1-1/2 | — | 00492 | 02449 |
| 0.055 | 1/8 | 0.165 | 1-1/2 | — | 00493 | 02450 |
| 0.055 | 1/8 | 0.165 | 1-1/2 | 0.005 | 08528 | 08669 |
| 0.055 | 1/8 | 0.165 | 1-1/2 | 0.010 | 08530 | 08671 |
| 0.055 | 1/8 | 0.165 | 1-1/2 | 0.015 | 08532 | 08673 |
| 0.056 | 1/8 | 0.168 | 1-1/2 | — | 00494 | 02451 |
| 0.057 | 1/8 | 0.171 | 1-1/2 | — | 00495 | 02452 |

continued

continued on next page



M2 • M2CR
3xD
FRACTIONAL SERIES



 New Expanded Tools

TOLERANCES (inch)

.004-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

RE = +0.0000/-0.0005

continued

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|------------------|----------|---------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.058 | 1/8 | 0.174 | 1-1/2 | - | 00496 | 02453 |
| 0.059 | 1/8 | 0.177 | 1-1/2 | - | 00865 | 02454 |
| 0.060 | 1/8 | 0.180 | 1-1/2 | - | 00498 | 02455 |
| 0.060 | 1/8 | 0.180 | 1-1/2 | 0.005 | 08534 | 08675 |
| 0.060 | 1/8 | 0.180 | 1-1/2 | 0.010 | 08536 | 08677 |
| 0.060 | 1/8 | 0.180 | 1-1/2 | 0.015 | 08538 | 08679 |
| 0.062 | 1/8 | 0.186 | 1-1/2 | - | 00499 | 02456 |
| 0.065 | 1/8 | 0.195 | 1-1/2 | - | 00500 | 02457 |
| 0.065 | 1/8 | 0.195 | 1-1/2 | 0.005 | 08540 | 08681 |
| 0.065 | 1/8 | 0.195 | 1-1/2 | 0.010 | 08542 | 08683 |
| 0.065 | 1/8 | 0.195 | 1-1/2 | 0.015 | 08544 | 08685 |
| 0.070 | 1/8 | 0.210 | 1-1/2 | - | 00501 | 02458 |
| 0.070 | 1/8 | 0.210 | 1-1/2 | 0.005 | 08546 | 08687 |
| 0.070 | 1/8 | 0.210 | 1-1/2 | 0.010 | 08548 | 08689 |
| 0.070 | 1/8 | 0.210 | 1-1/2 | 0.015 | 08550 | 08691 |
| 0.075 | 1/8 | 0.225 | 1-1/2 | - | 04007 | 04003 |
| 0.075 | 1/8 | 0.225 | 1-1/2 | 0.005 | 08552 | 08693 |
| 0.075 | 1/8 | 0.225 | 1-1/2 | 0.010 | 08554 | 08695 |
| 0.075 | 1/8 | 0.225 | 1-1/2 | 0.015 | 08556 | 08697 |
| 0.075 | 1/8 | 0.225 | 1-1/2 | 0.020 | 08558 | 08699 |
| 0.078 | 1/8 | 0.234 | 1-1/2 | - | 00870 | 02459 |
| 0.080 | 1/8 | 0.240 | 1-1/2 | - | 00503 | 02460 |
| 0.080 | 1/8 | 0.240 | 1-1/2 | 0.005 | 08560 | 08701 |
| 0.080 | 1/8 | 0.240 | 1-1/2 | 0.010 | 08562 | 08703 |
| 0.080 | 1/8 | 0.240 | 1-1/2 | 0.015 | 08564 | 08705 |
| 0.080 | 1/8 | 0.240 | 1-1/2 | 0.020 | 08566 | 08707 |
| 0.085 | 1/8 | 0.255 | 1-1/2 | - | 00504 | 02461 |
| 0.085 | 1/8 | 0.255 | 1-1/2 | 0.005 | 08568 | 08709 |
| 0.085 | 1/8 | 0.255 | 1-1/2 | 0.010 | 08570 | 08711 |
| 0.085 | 1/8 | 0.255 | 1-1/2 | 0.015 | 08572 | 08713 |
| 0.085 | 1/8 | 0.255 | 1-1/2 | 0.020 | 08574 | 08715 |
| 0.090 | 1/8 | 0.270 | 1-1/2 | - | 00505 | 02462 |
| 0.090 | 1/8 | 0.270 | 1-1/2 | 0.005 | 08576 | 08717 |
| 0.090 | 1/8 | 0.270 | 1-1/2 | 0.010 | 08578 | 08719 |
| 0.090 | 1/8 | 0.270 | 1-1/2 | 0.015 | 08580 | 08721 |
| 0.090 | 1/8 | 0.270 | 1-1/2 | 0.020 | 08582 | 08723 |

continued on next page

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

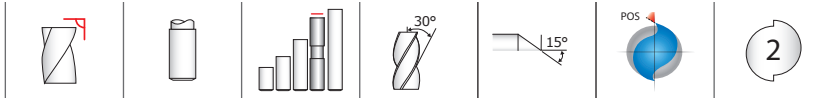
New Expanded Tools

**M2 • M2CR
3xD**
FRACTIONAL SERIES

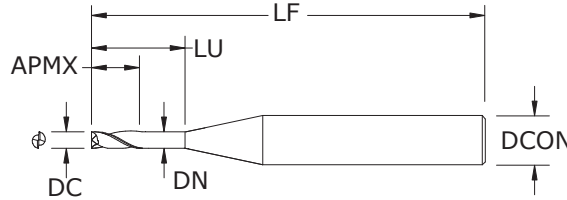
continued

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|---------------------------|---------------------------|--------------------------|-------------------------|------------------------|----------|------------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.093 | 1/8 | 0.279 | 1-1/2 | — | 00506 | 02463 |
| 0.095 | 1/8 | 0.285 | 1-1/2 | — | 00507 | 02464 |
| 0.095 | 1/8 | 0.285 | 1-1/2 | 0.005 | 08584 | 08725 |
| 0.095 | 1/8 | 0.285 | 1-1/2 | 0.010 | 08586 | 08727 |
| 0.095 | 1/8 | 0.285 | 1-1/2 | 0.015 | 08588 | 08729 |
| 0.095 | 1/8 | 0.285 | 1-1/2 | 0.020 | 08590 | 08731 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | — | 00508 | 02465 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | 0.005 | 08592 | 08733 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | 0.010 | 08594 | 08735 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | 0.015 | 08596 | 08737 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | 0.020 | 08598 | 08739 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | 0.030 | 08600 | 08741 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | — | 00509 | 02466 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | 0.005 | 08602 | 08743 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | 0.010 | 08604 | 08745 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | 0.015 | 08606 | 08747 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | 0.020 | 08608 | 08749 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | 0.030 | 08610 | 08751 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | — | 00878 | 02467 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | 0.005 | 08612 | 08753 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | 0.010 | 08614 | 08755 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | 0.015 | 08616 | 08757 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | 0.020 | 08618 | 08759 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | 0.030 | 08620 | 08761 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | — | 00511 | 02468 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | 0.005 | 08622 | 08763 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | 0.010 | 08624 | 08765 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | 0.015 | 08626 | 08767 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | 0.020 | 08628 | 08769 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | 0.030 | 08630 | 08771 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | — | 00512 | 02469 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | 0.005 | 08632 | 08773 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | 0.010 | 08634 | 08775 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | 0.015 | 08636 | 08777 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | 0.020 | 08638 | 08779 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | 0.030 | 08640 | 08781 |

M2 • 3xD • 8xD Overall Reach



M2 • 3xD 8xD FRACTIONAL SERIES



 New Expanded Tools

- Two flute design is ideal for softer alloyed, non-ferrous material applications that require slotting or involve heavy chip loads.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | OVERALL LENGTH LF | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------|----------------------|------------------------|--|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | UNCOATED | | TI-NAMITE-A (AITiN) | |
| 0.010 | 1/8 | 0.030 | 0.080 | 0.009 | 1-1/2 | 09353 | 03400 | |
| 0.015 | 1/8 | 0.045 | 0.120 | 0.014 | 1-1/2 | 09355 | 03401 | |
| 0.020 | 1/8 | 0.060 | 0.160 | 0.018 | 1-1/2 | 09357 | 03402 | |
| 0.025 | 1/8 | 0.075 | 0.200 | 0.023 | 1-1/2 | 09359 | 03403 | |
| 0.030 | 1/8 | 0.090 | 0.240 | 0.028 | 1-1/2 | 09361 | 03404 | |
| 0.031 | 1/8 | 0.093 | 0.248 | 0.029 | 1-1/2 | 09363 | 03405 | |
| 0.035 | 1/8 | 0.105 | 0.280 | 0.032 | 1-1/2 | 09365 | 03406 | |
| 0.040 | 1/8 | 0.120 | 0.320 | 0.037 | 1-1/2 | 09367 | 03407 | |
| 0.045 | 1/8 | 0.135 | 0.360 | 0.042 | 2 | 09369 | 03408 | |
| 0.047 | 1/8 | 0.141 | 0.376 | 0.044 | 2 | 09371 | 03409 | |
| 0.050 | 1/8 | 0.150 | 0.400 | 0.047 | 2 | 09373 | 03410 | |
| 0.055 | 1/8 | 0.165 | 0.440 | 0.051 | 2 | 09375 | 03411 | |
| 0.060 | 1/8 | 0.180 | 0.480 | 0.056 | 2 | 09377 | 03412 | |
| 0.062 | 1/8 | 0.186 | 0.496 | 0.058 | 2 | 09379 | 03413 | |
| 0.065 | 1/8 | 0.195 | 0.520 | 0.061 | 2 | 09381 | 03414 | |
| 0.070 | 1/8 | 0.210 | 0.560 | 0.065 | 2 | 09383 | 03415 | |
| 0.075 | 1/8 | 0.225 | 0.600 | 0.070 | 2 | 09385 | 03416 | |
| 0.078 | 1/8 | 0.234 | 0.624 | 0.073 | 2 | 09387 | 03417 | |
| 0.080 | 1/8 | 0.240 | 0.640 | 0.075 | 2 | 09389 | 03418 | |
| 0.085 | 1/8 | 0.255 | 0.680 | 0.079 | 2 | 09391 | 03419 | |
| 0.090 | 1/8 | 0.270 | 0.720 | 0.084 | 2 | 09393 | 03420 | |
| 0.093 | 1/8 | 0.279 | 0.744 | 0.087 | 2 | 09395 | 03421 | |
| 0.095 | 1/8 | 0.285 | 0.760 | 0.089 | 2 | 09397 | 03422 | |
| 0.100 | 1/8 | 0.300 | 0.800 | 0.094 | 2 | 09399 | 03423 | |
| 0.110 | 1/8 | 0.330 | 0.880 | 0.103 | 2 | 09401 | 03424 | |
| 0.115 | 1/8 | 0.345 | 0.920 | 0.108 | 2 | 09403 | 03425 | |
| 0.120 | 1/8 | 0.360 | 0.960 | 0.112 | 2 | 09405 | 03426 | |

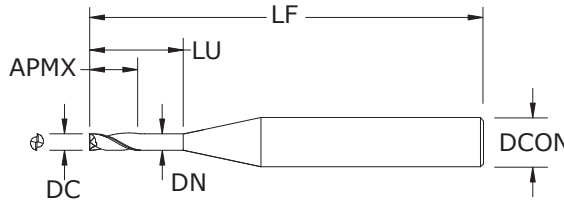
TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h6

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M2 • 3xD
12xD
FRACTIONAL SERIES

New Expanded Tools

TOLERANCES (inch)

.010-.120 DIAMETER

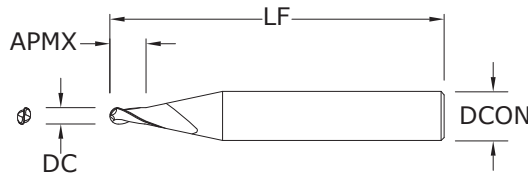
DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

| inch | | | | | | EDP NO. | |
|---------------------|---------------------|--------------------|----------|------------------|-------------------|----------|---------------------|
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.010 | 1/8 | 0.030 | 0.120 | 0.009 | 1-1/2 | 09352 | 03427 |
| 0.015 | 1/8 | 0.045 | 0.180 | 0.014 | 1-1/2 | 09354 | 03428 |
| 0.020 | 1/8 | 0.060 | 0.240 | 0.018 | 1-1/2 | 09356 | 03429 |
| 0.025 | 1/8 | 0.075 | 0.300 | 0.023 | 1-1/2 | 09358 | 03430 |
| 0.030 | 1/8 | 0.090 | 0.360 | 0.028 | 2 | 09360 | 03431 |
| 0.031 | 1/8 | 0.093 | 0.372 | 0.029 | 2 | 09362 | 03432 |
| 0.035 | 1/8 | 0.105 | 0.420 | 0.032 | 2 | 09364 | 03433 |
| 0.040 | 1/8 | 0.120 | 0.480 | 0.037 | 2 | 09366 | 03434 |
| 0.045 | 1/8 | 0.135 | 0.540 | 0.042 | 2 | 09368 | 03435 |
| 0.047 | 1/8 | 0.141 | 0.564 | 0.044 | 2 | 09370 | 03436 |
| 0.050 | 1/8 | 0.150 | 0.600 | 0.047 | 2 | 09372 | 03437 |
| 0.055 | 1/8 | 0.165 | 0.660 | 0.051 | 2 | 09374 | 03438 |
| 0.060 | 1/8 | 0.180 | 0.720 | 0.056 | 2 | 09376 | 03439 |
| 0.062 | 1/8 | 0.186 | 0.744 | 0.058 | 2 | 09378 | 03440 |
| 0.065 | 1/8 | 0.195 | 0.780 | 0.061 | 2 | 09380 | 03441 |
| 0.070 | 1/8 | 0.210 | 0.840 | 0.065 | 2 | 09382 | 03442 |
| 0.075 | 1/8 | 0.225 | 0.900 | 0.070 | 2 | 09384 | 03443 |
| 0.078 | 1/8 | 0.234 | 0.936 | 0.073 | 2-1/2 | 09386 | 03444 |
| 0.080 | 1/8 | 0.240 | 0.960 | 0.075 | 2-1/2 | 09388 | 03445 |
| 0.085 | 1/8 | 0.255 | 1.020 | 0.079 | 2-1/2 | 09390 | 03446 |
| 0.090 | 1/8 | 0.270 | 1.080 | 0.084 | 2-1/2 | 09392 | 03447 |
| 0.093 | 1/8 | 0.279 | 1.116 | 0.087 | 2-1/2 | 09394 | 03448 |
| 0.095 | 1/8 | 0.285 | 1.140 | 0.089 | 2-1/2 | 09396 | 03449 |
| 0.100 | 1/8 | 0.300 | 1.200 | 0.094 | 2-1/2 | 09398 | 03450 |
| 0.110 | 1/8 | 0.330 | 1.320 | 0.103 | 2-1/2 | 09400 | 03451 |
| 0.115 | 1/8 | 0.345 | 1.380 | 0.108 | 2-1/2 | 09402 | 03452 |
| 0.120 | 1/8 | 0.360 | 1.440 | 0.112 | 2-1/2 | 09404 | 03453 |

- Two flute design is ideal for softer alloyed, non-ferrous material applications that require slotting or involve heavy chip loads.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.



 New Expanded Tools

M2B • 1.5xD

FRACTIONAL SERIES

- Two flute design is ideal for softer alloyed, non-ferrous material applications that require slotting or involve heavy chip loads.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| inch | | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|----------|---------------------|
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.005 | 1/8 | 0.008 | 1-1/2 | 00669 | 03029 |
| 0.006 | 1/8 | 0.009 | 1-1/2 | 00670 | 03030 |
| 0.007 | 1/8 | 0.011 | 1-1/2 | 00671 | 03031 |
| 0.008 | 1/8 | 0.012 | 1-1/2 | 00672 | 03032 |
| 0.009 | 1/8 | 0.014 | 1-1/2 | 00673 | 03033 |
| 0.010 | 1/8 | 0.015 | 1-1/2 | 00674 | 03034 |
| 0.011 | 1/8 | 0.017 | 1-1/2 | 00675 | 03035 |
| 0.012 | 1/8 | 0.018 | 1-1/2 | 00676 | 03036 |
| 0.013 | 1/8 | 0.020 | 1-1/2 | 00677 | 03037 |
| 0.014 | 1/8 | 0.021 | 1-1/2 | 00678 | 03038 |
| 0.015 | 1/8 | 0.023 | 1-1/2 | 00679 | 03039 |
| 0.016 | 1/8 | 0.024 | 1-1/2 | 00680 | 03040 |
| 0.017 | 1/8 | 0.026 | 1-1/2 | 00681 | 03041 |
| 0.018 | 1/8 | 0.027 | 1-1/2 | 00682 | 03042 |
| 0.019 | 1/8 | 0.029 | 1-1/2 | 00683 | 03043 |
| 0.020 | 1/8 | 0.030 | 1-1/2 | 00684 | 03044 |
| 0.021 | 1/8 | 0.032 | 1-1/2 | 00685 | 03045 |
| 0.022 | 1/8 | 0.033 | 1-1/2 | 00686 | 03046 |
| 0.023 | 1/8 | 0.035 | 1-1/2 | 00687 | 03047 |
| 0.024 | 1/8 | 0.036 | 1-1/2 | 00688 | 03048 |
| 0.025 | 1/8 | 0.038 | 1-1/2 | 00689 | 03049 |
| 0.026 | 1/8 | 0.039 | 1-1/2 | 00690 | 03050 |
| 0.027 | 1/8 | 0.041 | 1-1/2 | 00691 | 03051 |
| 0.028 | 1/8 | 0.042 | 1-1/2 | 00692 | 03052 |
| 0.029 | 1/8 | 0.044 | 1-1/2 | 00693 | 03053 |
| 0.030 | 1/8 | 0.045 | 1-1/2 | 00694 | 03054 |
| 0.031 | 1/8 | 0.047 | 1-1/2 | 00695 | 03055 |
| 0.032 | 1/8 | 0.048 | 1-1/2 | 00696 | 03056 |
| 0.033 | 1/8 | 0.050 | 1-1/2 | 00697 | 03057 |
| 0.034 | 1/8 | 0.051 | 1-1/2 | 00698 | 03058 |
| 0.035 | 1/8 | 0.053 | 1-1/2 | 00699 | 03059 |
| 0.036 | 1/8 | 0.054 | 1-1/2 | 00700 | 03060 |
| 0.037 | 1/8 | 0.056 | 1-1/2 | 00701 | 03061 |
| 0.038 | 1/8 | 0.057 | 1-1/2 | 00702 | 03062 |
| 0.039 | 1/8 | 0.059 | 1-1/2 | 00703 | 03063 |
| 0.040 | 1/8 | 0.060 | 1-1/2 | 00704 | 03064 |

TOLERANCES (inch)

.005-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

RE = 1/2 Cutting Diameter (DC)

continued on next page

New Expanded Tools

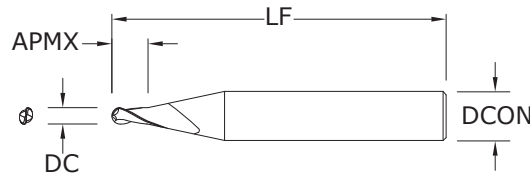
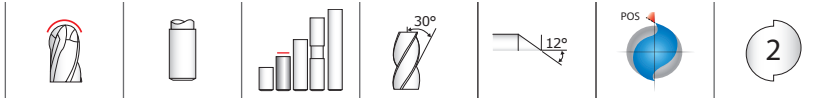
M2B • 1.5xD
FRACTIONAL SERIES

| CUTTING DIAMETER DC | inch | | | EDP NO. | |
|---------------------------|---------------------------|--------------------------|-------------------------|----------|------------------------|
| | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.041 | 1/8 | 0.062 | 1-1/2 | 00705 | 02504 |
| 0.042 | 1/8 | 0.063 | 1-1/2 | 00706 | 02505 |
| 0.043 | 1/8 | 0.065 | 1-1/2 | 00707 | 02506 |
| 0.044 | 1/8 | 0.066 | 1-1/2 | 00708 | 02507 |
| 0.045 | 1/8 | 0.068 | 1-1/2 | 00709 | 02508 |
| 0.046 | 1/8 | 0.069 | 1-1/2 | 00710 | 02509 |
| 0.047 | 1/8 | 0.071 | 1-1/2 | 00711 | 02510 |
| 0.048 | 1/8 | 0.072 | 1-1/2 | 00712 | 02511 |
| 0.049 | 1/8 | 0.074 | 1-1/2 | 00713 | 02512 |
| 0.050 | 1/8 | 0.075 | 1-1/2 | 00714 | 02513 |
| 0.051 | 1/8 | 0.077 | 1-1/2 | 00715 | 02514 |
| 0.052 | 1/8 | 0.078 | 1-1/2 | 00716 | 02515 |
| 0.053 | 1/8 | 0.080 | 1-1/2 | 00717 | 02516 |
| 0.054 | 1/8 | 0.081 | 1-1/2 | 00718 | 02517 |
| 0.055 | 1/8 | 0.083 | 1-1/2 | 00719 | 02518 |
| 0.056 | 1/8 | 0.084 | 1-1/2 | 00720 | 02519 |
| 0.057 | 1/8 | 0.086 | 1-1/2 | 00721 | 02520 |
| 0.058 | 1/8 | 0.087 | 1-1/2 | 00722 | 02521 |
| 0.059 | 1/8 | 0.089 | 1-1/2 | 00723 | 02522 |
| 0.060 | 1/8 | 0.090 | 1-1/2 | 00724 | 02523 |
| 0.062 | 1/8 | 0.093 | 1-1/2 | 00725 | 02524 |
| 0.065 | 1/8 | 0.098 | 1-1/2 | 00726 | 02525 |
| 0.070 | 1/8 | 0.105 | 1-1/2 | 00727 | 02526 |
| 0.075 | 1/8 | 0.112 | 1-1/2 | 04010 | 04008 |
| 0.078 | 1/8 | 0.117 | 1-1/2 | 00728 | 02527 |
| 0.080 | 1/8 | 0.120 | 1-1/2 | 00729 | 02528 |
| 0.085 | 1/8 | 0.128 | 1-1/2 | 00730 | 02529 |
| 0.090 | 1/8 | 0.135 | 1-1/2 | 00731 | 02530 |
| 0.093 | 1/8 | 0.140 | 1-1/2 | 00732 | 02531 |
| 0.095 | 1/8 | 0.143 | 1-1/2 | 00733 | 02532 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | 00734 | 02533 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | 00735 | 02534 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | 00736 | 02535 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | 00737 | 02536 |
| 0.120 | 1/8 | 0.180 | 1-1/2 | 00738 | 02537 |

RE = 1/2 Cutting Diameter (DC)

continued

FRACTIONAL M2B • 3xD



 New Expanded Tools

M2B • 3xD FRACTIONAL SERIES

- Two flute design is ideal for softer alloyed, non-ferrous material applications that require slotting or involve heavy chip loads.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|----------|---------------------|
| | | | | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.005 | 1/8 | 0.015 | 1-1/2 | 00443 | 03103 |
| 0.006 | 1/8 | 0.018 | 1-1/2 | 00444 | 03104 |
| 0.007 | 1/8 | 0.021 | 1-1/2 | 00445 | 03105 |
| 0.008 | 1/8 | 0.024 | 1-1/2 | 00446 | 03106 |
| 0.009 | 1/8 | 0.027 | 1-1/2 | 00447 | 03107 |
| 0.010 | 1/8 | 0.030 | 1-1/2 | 00448 | 03108 |
| 0.011 | 1/8 | 0.033 | 1-1/2 | 00449 | 03109 |
| 0.012 | 1/8 | 0.036 | 1-1/2 | 00450 | 03110 |
| 0.013 | 1/8 | 0.039 | 1-1/2 | 00451 | 03111 |
| 0.014 | 1/8 | 0.042 | 1-1/2 | 00452 | 03112 |
| 0.015 | 1/8 | 0.045 | 1-1/2 | 00453 | 03113 |
| 0.016 | 1/8 | 0.048 | 1-1/2 | 00454 | 03114 |
| 0.017 | 1/8 | 0.051 | 1-1/2 | 00455 | 03115 |
| 0.018 | 1/8 | 0.054 | 1-1/2 | 00456 | 03116 |
| 0.019 | 1/8 | 0.057 | 1-1/2 | 00457 | 03117 |
| 0.020 | 1/8 | 0.060 | 1-1/2 | 00458 | 03118 |
| 0.021 | 1/8 | 0.063 | 1-1/2 | 00459 | 03119 |
| 0.022 | 1/8 | 0.066 | 1-1/2 | 00460 | 03120 |
| 0.023 | 1/8 | 0.069 | 1-1/2 | 00461 | 03121 |
| 0.024 | 1/8 | 0.072 | 1-1/2 | 00462 | 03122 |
| 0.025 | 1/8 | 0.075 | 1-1/2 | 00463 | 03123 |
| 0.026 | 1/8 | 0.078 | 1-1/2 | 00464 | 03124 |
| 0.027 | 1/8 | 0.081 | 1-1/2 | 00465 | 03125 |
| 0.028 | 1/8 | 0.084 | 1-1/2 | 00466 | 03126 |
| 0.029 | 1/8 | 0.087 | 1-1/2 | 00467 | 03127 |
| 0.030 | 1/8 | 0.090 | 1-1/2 | 00468 | 03128 |
| 0.031 | 1/8 | 0.093 | 1-1/2 | 00469 | 03129 |
| 0.032 | 1/8 | 0.096 | 1-1/2 | 00470 | 03130 |
| 0.033 | 1/8 | 0.099 | 1-1/2 | 00471 | 03131 |
| 0.034 | 1/8 | 0.102 | 1-1/2 | 00472 | 03132 |
| 0.035 | 1/8 | 0.105 | 1-1/2 | 00473 | 03133 |
| 0.036 | 1/8 | 0.108 | 1-1/2 | 00474 | 03134 |
| 0.037 | 1/8 | 0.111 | 1-1/2 | 00475 | 03135 |
| 0.038 | 1/8 | 0.114 | 1-1/2 | 00476 | 03136 |
| 0.039 | 1/8 | 0.117 | 1-1/2 | 00477 | 03137 |
| 0.040 | 1/8 | 0.120 | 1-1/2 | 00478 | 03138 |

TOLERANCES (inch)

.005-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

continued on next page

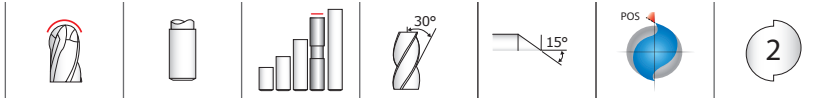
New Expanded Tools

M2B • 3xD
FRACTIONAL SERIES

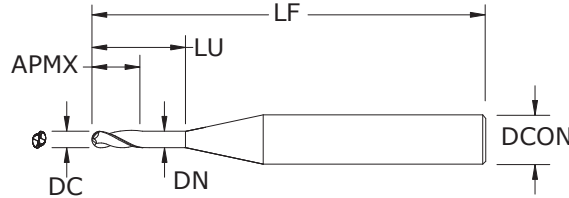
| CUTTING DIAMETER DC | inch | | | EDP NO. | |
|---------------------------|---------------------------|--------------------------|-------------------------|----------|------------------------|
| | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.041 | 1/8 | 0.123 | 1-1/2 | 00847 | 02572 |
| 0.042 | 1/8 | 0.126 | 1-1/2 | 00848 | 02573 |
| 0.043 | 1/8 | 0.129 | 1-1/2 | 00849 | 02574 |
| 0.044 | 1/8 | 0.132 | 1-1/2 | 00850 | 02575 |
| 0.045 | 1/8 | 0.135 | 1-1/2 | 00851 | 02576 |
| 0.046 | 1/8 | 0.138 | 1-1/2 | 00852 | 02577 |
| 0.047 | 1/8 | 0.141 | 1-1/2 | 00853 | 02578 |
| 0.048 | 1/8 | 0.144 | 1-1/2 | 00854 | 02579 |
| 0.049 | 1/8 | 0.147 | 1-1/2 | 00855 | 02580 |
| 0.050 | 1/8 | 0.150 | 1-1/2 | 00856 | 02581 |
| 0.051 | 1/8 | 0.153 | 1-1/2 | 00857 | 02582 |
| 0.052 | 1/8 | 0.156 | 1-1/2 | 00858 | 02583 |
| 0.053 | 1/8 | 0.159 | 1-1/2 | 00859 | 02584 |
| 0.054 | 1/8 | 0.162 | 1-1/2 | 00860 | 02585 |
| 0.055 | 1/8 | 0.165 | 1-1/2 | 00861 | 02586 |
| 0.056 | 1/8 | 0.168 | 1-1/2 | 00862 | 02587 |
| 0.057 | 1/8 | 0.171 | 1-1/2 | 00863 | 02588 |
| 0.058 | 1/8 | 0.174 | 1-1/2 | 00864 | 02589 |
| 0.059 | 1/8 | 0.177 | 1-1/2 | 00497 | 02590 |
| 0.060 | 1/8 | 0.180 | 1-1/2 | 00866 | 02591 |
| 0.062 | 1/8 | 0.186 | 1-1/2 | 00867 | 02592 |
| 0.065 | 1/8 | 0.195 | 1-1/2 | 00868 | 02593 |
| 0.070 | 1/8 | 0.210 | 1-1/2 | 00869 | 02594 |
| 0.075 | 1/8 | 0.225 | 1-1/2 | 04011 | 04009 |
| 0.078 | 1/8 | 0.234 | 1-1/2 | 00502 | 02595 |
| 0.080 | 1/8 | 0.240 | 1-1/2 | 00871 | 02596 |
| 0.085 | 1/8 | 0.255 | 1-1/2 | 00872 | 02597 |
| 0.090 | 1/8 | 0.270 | 1-1/2 | 00873 | 02598 |
| 0.093 | 1/8 | 0.279 | 1-1/2 | 00874 | 02599 |
| 0.095 | 1/8 | 0.285 | 1-1/2 | 00875 | 02600 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | 00876 | 02601 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | 00877 | 02602 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | 00510 | 02603 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | 00879 | 02604 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | 00880 | 02605 |

continued

M2B • 3xD • 8xD Overall Reach



M2B • 3xD 8xD FRACTIONAL SERIES



New Expanded Tools

TOLERANCES (inch)

.010-.120 DIAMETER
DC = +0.000/-0.001
DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- Two flute design is ideal for softer alloyed, non-ferrous material applications that require slotting or involve heavy chip loads.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | OVERALL LENGTH LF | EDP NO. | |
|---------------------|---------------------|--------------------|----------|------------------|----------|-------------------|---------------------|--|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | UNCOATED | | TI-NAMITE-A (AITiN) | |
| 0.010 | 1/8 | 0.030 | 0.080 | 0.009 | 1-1/2 | 09299 | 03697 | |
| 0.015 | 1/8 | 0.045 | 0.120 | 0.014 | 1-1/2 | 09301 | 03698 | |
| 0.020 | 1/8 | 0.060 | 0.160 | 0.018 | 1-1/2 | 09303 | 03699 | |
| 0.025 | 1/8 | 0.075 | 0.200 | 0.023 | 1-1/2 | 09305 | 03700 | |
| 0.030 | 1/8 | 0.090 | 0.240 | 0.028 | 1-1/2 | 09307 | 03701 | |
| 0.031 | 1/8 | 0.093 | 0.248 | 0.029 | 1-1/2 | 09309 | 03702 | |
| 0.035 | 1/8 | 0.105 | 0.280 | 0.032 | 1-1/2 | 09311 | 03703 | |
| 0.040 | 1/8 | 0.120 | 0.320 | 0.037 | 1-1/2 | 09313 | 03704 | |
| 0.045 | 1/8 | 0.135 | 0.360 | 0.042 | 2 | 09315 | 03705 | |
| 0.047 | 1/8 | 0.141 | 0.376 | 0.044 | 2 | 09317 | 03706 | |
| 0.050 | 1/8 | 0.150 | 0.400 | 0.047 | 2 | 09319 | 03707 | |
| 0.055 | 1/8 | 0.165 | 0.440 | 0.051 | 2 | 09321 | 03708 | |
| 0.060 | 1/8 | 0.180 | 0.480 | 0.056 | 2 | 09323 | 03709 | |
| 0.062 | 1/8 | 0.186 | 0.496 | 0.058 | 2 | 09325 | 03710 | |
| 0.065 | 1/8 | 0.195 | 0.520 | 0.061 | 2 | 09327 | 03711 | |
| 0.070 | 1/8 | 0.210 | 0.560 | 0.065 | 2 | 09329 | 03712 | |
| 0.075 | 1/8 | 0.225 | 0.600 | 0.070 | 2 | 09331 | 03713 | |
| 0.078 | 1/8 | 0.234 | 0.624 | 0.073 | 2 | 09333 | 03714 | |
| 0.080 | 1/8 | 0.240 | 0.640 | 0.075 | 2 | 09335 | 03715 | |
| 0.085 | 1/8 | 0.255 | 0.680 | 0.079 | 2 | 09337 | 03716 | |
| 0.090 | 1/8 | 0.270 | 0.720 | 0.084 | 2 | 09339 | 03717 | |
| 0.093 | 1/8 | 0.279 | 0.744 | 0.087 | 2 | 09341 | 03718 | |
| 0.095 | 1/8 | 0.285 | 0.760 | 0.089 | 2 | 09343 | 03719 | |
| 0.100 | 1/8 | 0.300 | 0.800 | 0.094 | 2 | 09345 | 03720 | |
| 0.110 | 1/8 | 0.330 | 0.880 | 0.103 | 2 | 09347 | 03721 | |
| 0.115 | 1/8 | 0.345 | 0.920 | 0.108 | 2 | 09349 | 03722 | |
| 0.120 | 1/8 | 0.360 | 0.960 | 0.112 | 2 | 09351 | 03723 | |

RE = 1/2 Cutting Diameter (DC)



New Expanded Tools

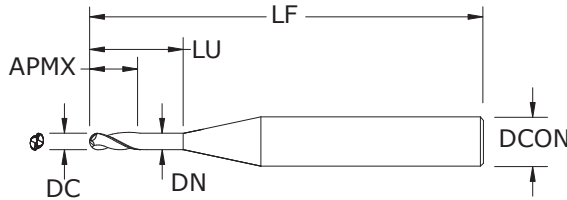
TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M2B • 3xD
12xD
FRACTIONAL SERIES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------------------|----------|------------------------|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.010 | 1/8 | 0.030 | 0.120 | 0.009 | 1-1/2 | 09298 | 03724 |
| 0.015 | 1/8 | 0.045 | 0.180 | 0.014 | 1-1/2 | 09300 | 03725 |
| 0.020 | 1/8 | 0.060 | 0.240 | 0.018 | 1-1/2 | 09302 | 03726 |
| 0.025 | 1/8 | 0.075 | 0.300 | 0.023 | 1-1/2 | 09304 | 03727 |
| 0.030 | 1/8 | 0.090 | 0.360 | 0.028 | 2 | 09306 | 03728 |
| 0.031 | 1/8 | 0.093 | 0.372 | 0.029 | 2 | 09308 | 03729 |
| 0.035 | 1/8 | 0.105 | 0.420 | 0.032 | 2 | 09310 | 03730 |
| 0.040 | 1/8 | 0.120 | 0.480 | 0.037 | 2 | 09312 | 03731 |
| 0.045 | 1/8 | 0.135 | 0.540 | 0.042 | 2 | 09314 | 03732 |
| 0.047 | 1/8 | 0.141 | 0.564 | 0.044 | 2 | 09316 | 03733 |
| 0.050 | 1/8 | 0.150 | 0.600 | 0.047 | 2 | 09318 | 03734 |
| 0.055 | 1/8 | 0.165 | 0.660 | 0.051 | 2 | 09320 | 03735 |
| 0.060 | 1/8 | 0.180 | 0.720 | 0.056 | 2 | 09322 | 03736 |
| 0.062 | 1/8 | 0.186 | 0.744 | 0.058 | 2 | 09324 | 03737 |
| 0.065 | 1/8 | 0.195 | 0.780 | 0.061 | 2 | 09326 | 03738 |
| 0.070 | 1/8 | 0.210 | 0.840 | 0.065 | 2 | 09328 | 03739 |
| 0.075 | 1/8 | 0.225 | 0.900 | 0.070 | 2 | 09330 | 03740 |
| 0.078 | 1/8 | 0.234 | 0.936 | 0.073 | 2-1/2 | 09332 | 03741 |
| 0.080 | 1/8 | 0.240 | 0.960 | 0.075 | 2-1/2 | 09334 | 03742 |
| 0.085 | 1/8 | 0.255 | 1.020 | 0.079 | 2-1/2 | 09336 | 03743 |
| 0.090 | 1/8 | 0.270 | 1.080 | 0.084 | 2-1/2 | 09338 | 03744 |
| 0.093 | 1/8 | 0.279 | 1.116 | 0.087 | 2-1/2 | 09340 | 03745 |
| 0.095 | 1/8 | 0.285 | 1.140 | 0.089 | 2-1/2 | 09342 | 03746 |
| 0.100 | 1/8 | 0.300 | 1.200 | 0.094 | 2-1/2 | 09344 | 03747 |
| 0.110 | 1/8 | 0.330 | 1.320 | 0.103 | 2-1/2 | 09346 | 03748 |
| 0.115 | 1/8 | 0.345 | 1.380 | 0.108 | 2-1/2 | 09348 | 03749 |
| 0.120 | 1/8 | 0.360 | 1.440 | 0.112 | 2-1/2 | 09350 | 03750 |

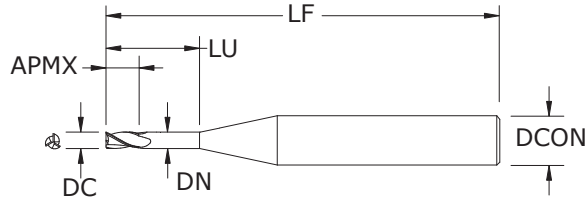
RE = 1/2 Cutting Diameter (DC)

- Two flute design is ideal for softer alloyed, non-ferrous material applications that require slotting or involve heavy chip loads.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

M3 • 1.5xD • 3xD Overall Reach



M3 • 1.5xD 3xD FRACTIONAL SERIES



 New Expanded Tools

- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

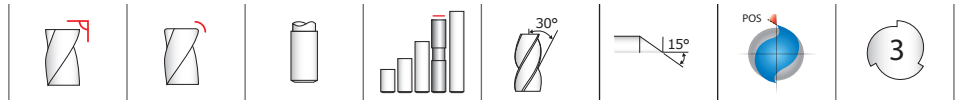
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | OVERALL LENGTH LF | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------|----------------------|------------------------|--|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| 0.010 | 1/8 | 0.015 | 0.030 | 0.009 | 2-1/2 | 09599 | 03508 | |
| 0.015 | 1/8 | 0.023 | 0.045 | 0.014 | 2-1/2 | 09606 | 03509 | |
| 0.020 | 1/8 | 0.030 | 0.060 | 0.018 | 2-1/2 | 09613 | 03510 | |
| 0.025 | 1/8 | 0.038 | 0.075 | 0.023 | 2-1/2 | 09620 | 03511 | |
| 0.030 | 1/8 | 0.045 | 0.090 | 0.028 | 2-1/2 | 09627 | 03512 | |
| 0.031 | 1/8 | 0.047 | 0.093 | 0.029 | 2-1/2 | 09634 | 03513 | |
| 0.035 | 1/8 | 0.053 | 0.105 | 0.032 | 2-1/2 | 09641 | 03514 | |
| 0.040 | 1/8 | 0.060 | 0.120 | 0.037 | 2-1/2 | 09648 | 03515 | |
| 0.045 | 1/8 | 0.068 | 0.135 | 0.042 | 2-1/2 | 09655 | 03516 | |
| 0.047 | 1/8 | 0.071 | 0.141 | 0.044 | 2-1/2 | 09662 | 03517 | |
| 0.050 | 1/8 | 0.075 | 0.150 | 0.047 | 2-1/2 | 09669 | 03518 | |
| 0.055 | 1/8 | 0.083 | 0.165 | 0.051 | 2-1/2 | 09676 | 03519 | |
| 0.060 | 1/8 | 0.090 | 0.180 | 0.056 | 2-1/2 | 09683 | 03520 | |
| 0.062 | 1/8 | 0.093 | 0.186 | 0.058 | 2-1/2 | 09690 | 03521 | |
| 0.065 | 1/8 | 0.098 | 0.195 | 0.061 | 2-1/2 | 09697 | 03522 | |
| 0.070 | 1/8 | 0.105 | 0.210 | 0.065 | 2-1/2 | 09704 | 03523 | |
| 0.075 | 1/8 | 0.113 | 0.225 | 0.070 | 2-1/2 | 09711 | 03524 | |
| 0.078 | 1/8 | 0.117 | 0.234 | 0.073 | 2-1/2 | 09718 | 03525 | |
| 0.080 | 1/8 | 0.120 | 0.240 | 0.075 | 2-1/2 | 09725 | 03526 | |
| 0.085 | 1/8 | 0.128 | 0.255 | 0.079 | 2-1/2 | 09732 | 03527 | |
| 0.090 | 1/8 | 0.135 | 0.270 | 0.084 | 2-1/2 | 09739 | 03528 | |
| 0.093 | 1/8 | 0.140 | 0.279 | 0.087 | 2-1/2 | 09746 | 03529 | |
| 0.095 | 1/8 | 0.143 | 0.285 | 0.089 | 2-1/2 | 09753 | 03530 | |
| 0.100 | 1/8 | 0.150 | 0.300 | 0.094 | 2-1/2 | 09760 | 03531 | |
| 0.110 | 1/8 | 0.165 | 0.330 | 0.103 | 2-1/2 | 09767 | 03532 | |
| 0.115 | 1/8 | 0.173 | 0.345 | 0.108 | 2-1/2 | 09774 | 03533 | |
| 0.120 | 1/8 | 0.180 | 0.360 | 0.112 | 2-1/2 | 09781 | 03534 | |

TOLERANCES (inch)

.010-.120 DIAMETER
 DC = +0.000/-0.001
 DCON = h6

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

M3 • M3CR • 1.5xD • 5xD Overall Reach



New Expanded Tools

TOLERANCES (inch)

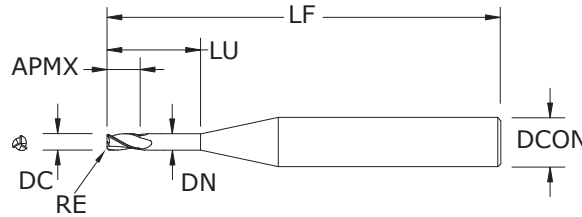
.010–.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

RE = +0.0000/-0.0005

- STEELS**
- STAINLESS STEELS**
- CAST IRON**
- HIGH TEMP ALLOYS**
- TITANIUM**
- HARDENED STEELS**
- NON-FERROUS**
- PLASTICS/COMPOSITES**



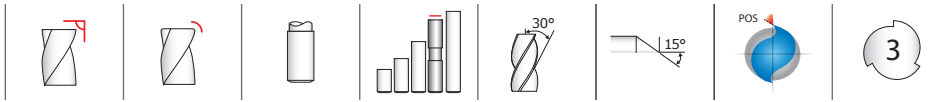
M3 • M3CR • 1.5xD 5xD FRACTIONAL SERIES

| inch | | | | | | | EDP NO. | |
|---------------------|---------------------|--------------------|----------|------------------|-------------------|------------------|----------|---------------------|
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.010 | 1/8 | 0.015 | 0.050 | 0.009 | 2-1/2 | — | 09600 | 03535 |
| 0.015 | 1/8 | 0.023 | 0.075 | 0.014 | 2-1/2 | — | 09607 | 03536 |
| 0.015 | 1/8 | 0.023 | 0.075 | 0.014 | 2-1/2 | 0.003 | 08782 | 08884 |
| 0.020 | 1/8 | 0.030 | 0.100 | 0.018 | 2-1/2 | — | 09614 | 03537 |
| 0.020 | 1/8 | 0.030 | 0.100 | 0.018 | 2-1/2 | 0.005 | 08785 | 08887 |
| 0.025 | 1/8 | 0.038 | 0.125 | 0.023 | 2-1/2 | — | 09621 | 03538 |
| 0.025 | 1/8 | 0.038 | 0.125 | 0.023 | 2-1/2 | 0.005 | 08788 | 08890 |
| 0.030 | 1/8 | 0.045 | 0.150 | 0.028 | 2-1/2 | — | 09628 | 03539 |
| 0.030 | 1/8 | 0.045 | 0.150 | 0.028 | 2-1/2 | 0.005 | 08791 | 08893 |
| 0.031 | 1/8 | 0.047 | 0.155 | 0.029 | 2-1/2 | — | 09635 | 03540 |
| 0.035 | 1/8 | 0.053 | 0.175 | 0.032 | 2-1/2 | — | 09642 | 03541 |
| 0.035 | 1/8 | 0.053 | 0.175 | 0.032 | 2-1/2 | 0.005 | 08794 | 08896 |
| 0.035 | 1/8 | 0.053 | 0.175 | 0.032 | 2-1/2 | 0.010 | 08797 | 08899 |
| 0.040 | 1/8 | 0.060 | 0.200 | 0.037 | 2-1/2 | — | 09649 | 03542 |
| 0.040 | 1/8 | 0.060 | 0.200 | 0.037 | 2-1/2 | 0.005 | 08800 | 08902 |
| 0.040 | 1/8 | 0.060 | 0.200 | 0.037 | 2-1/2 | 0.010 | 08803 | 08905 |
| 0.045 | 1/8 | 0.068 | 0.225 | 0.042 | 2-1/2 | — | 09656 | 03543 |
| 0.045 | 1/8 | 0.068 | 0.225 | 0.042 | 2-1/2 | 0.005 | 08806 | 08908 |
| 0.045 | 1/8 | 0.068 | 0.225 | 0.042 | 2-1/2 | 0.010 | 08809 | 08911 |
| 0.047 | 1/8 | 0.071 | 0.235 | 0.044 | 2-1/2 | — | 09663 | 03544 |
| 0.050 | 1/8 | 0.075 | 0.250 | 0.047 | 2-1/2 | — | 09670 | 03545 |
| 0.050 | 1/8 | 0.075 | 0.250 | 0.047 | 2-1/2 | 0.005 | 08812 | 08914 |
| 0.050 | 1/8 | 0.075 | 0.250 | 0.047 | 2-1/2 | 0.010 | 08815 | 08917 |
| 0.050 | 1/8 | 0.075 | 0.250 | 0.047 | 2-1/2 | 0.015 | 08818 | 08920 |
| 0.055 | 1/8 | 0.083 | 0.275 | 0.051 | 2-1/2 | — | 09677 | 03546 |
| 0.060 | 1/8 | 0.090 | 0.300 | 0.056 | 2-1/2 | — | 09684 | 03547 |
| 0.060 | 1/8 | 0.090 | 0.300 | 0.056 | 2-1/2 | 0.005 | 08821 | 08923 |
| 0.060 | 1/8 | 0.090 | 0.300 | 0.056 | 2-1/2 | 0.010 | 08824 | 08926 |
| 0.060 | 1/8 | 0.090 | 0.300 | 0.056 | 2-1/2 | 0.015 | 08827 | 08929 |
| 0.062 | 1/8 | 0.093 | 0.310 | 0.058 | 2-1/2 | — | 09691 | 03548 |
| 0.065 | 1/8 | 0.098 | 0.325 | 0.061 | 2-1/2 | — | 09698 | 03549 |
| 0.070 | 1/8 | 0.105 | 0.350 | 0.065 | 2-1/2 | — | 09705 | 03550 |
| 0.070 | 1/8 | 0.105 | 0.350 | 0.065 | 2-1/2 | 0.005 | 08830 | 08932 |
| 0.070 | 1/8 | 0.105 | 0.350 | 0.065 | 2-1/2 | 0.010 | 08833 | 08935 |

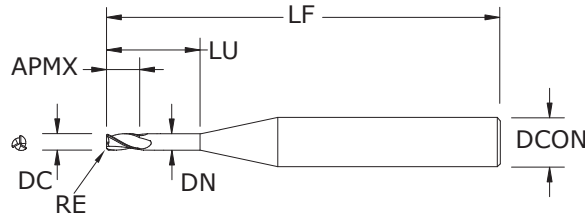
continued on next page

- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Enhanced corner geometry with tight tolerance corner radii
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

M3 • M3CR • 1.5xD • 5xD Overall Reach



M3 • M3CR • 1.5xD 5xD FRACTIONAL SERIES



 New Expanded Tools

TOLERANCES (inch)

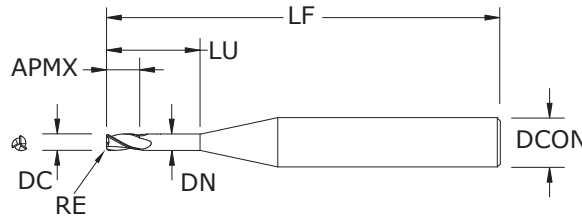
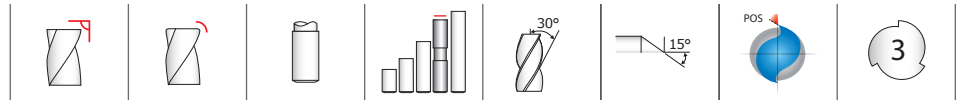
.010-.120 DIAMETER
 DC = +0.000/-0.001
 DCON = h₆
 RE = +0.0000/-0.0005

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

continued

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | inch | | | | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------------------|---------------------|----------|------------------------|
| | | | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.070 | 1/8 | 0.105 | 0.350 | 0.065 | 2-1/2 | 0.015 | 08836 | 08938 |
| 0.075 | 1/8 | 0.113 | 0.375 | 0.070 | 2-1/2 | - | 09712 | 03551 |
| 0.078 | 1/8 | 0.117 | 0.390 | 0.073 | 2-1/2 | - | 09719 | 03552 |
| 0.080 | 1/8 | 0.120 | 0.400 | 0.075 | 2-1/2 | - | 09726 | 03553 |
| 0.080 | 1/8 | 0.120 | 0.400 | 0.075 | 2-1/2 | 0.005 | 08839 | 08941 |
| 0.080 | 1/8 | 0.120 | 0.400 | 0.075 | 2-1/2 | 0.010 | 08842 | 08944 |
| 0.080 | 1/8 | 0.120 | 0.400 | 0.075 | 2-1/2 | 0.015 | 08845 | 08947 |
| 0.085 | 1/8 | 0.128 | 0.425 | 0.079 | 2-1/2 | - | 09733 | 03554 |
| 0.090 | 1/8 | 0.135 | 0.450 | 0.084 | 2-1/2 | - | 09740 | 03555 |
| 0.090 | 1/8 | 0.135 | 0.450 | 0.084 | 2-1/2 | 0.005 | 08848 | 08950 |
| 0.090 | 1/8 | 0.135 | 0.450 | 0.084 | 2-1/2 | 0.010 | 08851 | 08953 |
| 0.090 | 1/8 | 0.135 | 0.450 | 0.084 | 2-1/2 | 0.015 | 08854 | 08956 |
| 0.093 | 1/8 | 0.140 | 0.465 | 0.087 | 2-1/2 | - | 09747 | 03556 |
| 0.095 | 1/8 | 0.143 | 0.475 | 0.089 | 2-1/2 | - | 09754 | 03557 |
| 0.100 | 1/8 | 0.150 | 0.500 | 0.094 | 2-1/2 | - | 09761 | 03558 |
| 0.100 | 1/8 | 0.150 | 0.500 | 0.094 | 2-1/2 | 0.005 | 08857 | 08959 |
| 0.100 | 1/8 | 0.150 | 0.500 | 0.094 | 2-1/2 | 0.010 | 08860 | 08962 |
| 0.100 | 1/8 | 0.150 | 0.500 | 0.094 | 2-1/2 | 0.015 | 08863 | 08965 |
| 0.110 | 1/8 | 0.165 | 0.550 | 0.103 | 2-1/2 | - | 09768 | 03559 |
| 0.110 | 1/8 | 0.165 | 0.550 | 0.103 | 2-1/2 | 0.005 | 08866 | 08968 |
| 0.110 | 1/8 | 0.165 | 0.550 | 0.103 | 2-1/2 | 0.010 | 08869 | 08971 |
| 0.110 | 1/8 | 0.165 | 0.550 | 0.103 | 2-1/2 | 0.015 | 08872 | 08974 |
| 0.115 | 1/8 | 0.173 | 0.575 | 0.108 | 2-1/2 | - | 09775 | 03560 |
| 0.120 | 1/8 | 0.180 | 0.600 | 0.112 | 2-1/2 | - | 09782 | 03561 |
| 0.120 | 1/8 | 0.180 | 0.600 | 0.112 | 2-1/2 | 0.005 | 08875 | 08977 |
| 0.120 | 1/8 | 0.180 | 0.600 | 0.112 | 2-1/2 | 0.010 | 08878 | 08980 |
| 0.120 | 1/8 | 0.180 | 0.600 | 0.112 | 2-1/2 | 0.015 | 08881 | 08983 |

M3 • M3CR • 1.5xD • 8xD Overall Reach



New Expanded Tools

TOLERANCES (inch)

.010–.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

RE = +0.0000/-0.0005

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

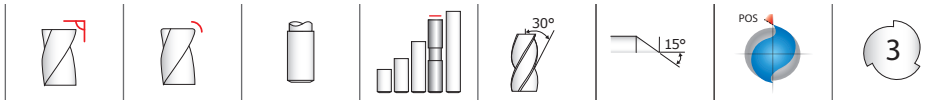
M3 • M3CR • 1.5xD 8xD FRACTIONAL SERIES

| inch | | | | | | | EDP NO. | |
|---------------------|---------------------|--------------------|----------|------------------|-------------------|------------------|----------|---------------------|
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.010 | 1/8 | 0.015 | 0.080 | 0.009 | 2-1/2 | — | 09601 | 03562 |
| 0.015 | 1/8 | 0.023 | 0.120 | 0.014 | 2-1/2 | — | 09608 | 03563 |
| 0.015 | 1/8 | 0.023 | 0.120 | 0.014 | 2-1/2 | 0.003 | 08783 | 08885 |
| 0.020 | 1/8 | 0.030 | 0.160 | 0.018 | 2-1/2 | — | 09615 | 03564 |
| 0.020 | 1/8 | 0.030 | 0.160 | 0.018 | 2-1/2 | 0.005 | 08786 | 08888 |
| 0.025 | 1/8 | 0.038 | 0.200 | 0.023 | 2-1/2 | — | 09622 | 03565 |
| 0.025 | 1/8 | 0.038 | 0.200 | 0.023 | 2-1/2 | 0.005 | 08789 | 08891 |
| 0.030 | 1/8 | 0.045 | 0.240 | 0.028 | 2-1/2 | — | 09629 | 03566 |
| 0.030 | 1/8 | 0.045 | 0.240 | 0.028 | 2-1/2 | 0.005 | 08792 | 08894 |
| 0.031 | 1/8 | 0.047 | 0.248 | 0.029 | 2-1/2 | — | 09636 | 03567 |
| 0.035 | 1/8 | 0.053 | 0.280 | 0.032 | 2-1/2 | — | 09643 | 03568 |
| 0.035 | 1/8 | 0.053 | 0.280 | 0.032 | 2-1/2 | 0.005 | 08795 | 08897 |
| 0.035 | 1/8 | 0.053 | 0.280 | 0.032 | 2-1/2 | 0.010 | 08798 | 08900 |
| 0.040 | 1/8 | 0.060 | 0.320 | 0.037 | 2-1/2 | — | 09650 | 03569 |
| 0.040 | 1/8 | 0.060 | 0.320 | 0.037 | 2-1/2 | 0.005 | 08801 | 08903 |
| 0.040 | 1/8 | 0.060 | 0.320 | 0.037 | 2-1/2 | 0.010 | 08804 | 08906 |
| 0.045 | 1/8 | 0.068 | 0.360 | 0.042 | 2-1/2 | — | 09657 | 03570 |
| 0.045 | 1/8 | 0.068 | 0.360 | 0.042 | 2-1/2 | 0.005 | 08807 | 08909 |
| 0.045 | 1/8 | 0.068 | 0.360 | 0.042 | 2-1/2 | 0.010 | 08810 | 08912 |
| 0.047 | 1/8 | 0.071 | 0.376 | 0.044 | 2-1/2 | — | 09664 | 03571 |
| 0.050 | 1/8 | 0.075 | 0.400 | 0.047 | 2-1/2 | — | 09671 | 03572 |
| 0.050 | 1/8 | 0.075 | 0.400 | 0.047 | 2-1/2 | 0.005 | 08813 | 08915 |
| 0.050 | 1/8 | 0.075 | 0.400 | 0.047 | 2-1/2 | 0.010 | 08816 | 08918 |
| 0.050 | 1/8 | 0.075 | 0.400 | 0.047 | 2-1/2 | 0.015 | 08819 | 08921 |
| 0.055 | 1/8 | 0.083 | 0.440 | 0.051 | 2-1/2 | — | 09678 | 03573 |
| 0.060 | 1/8 | 0.090 | 0.480 | 0.056 | 2-1/2 | — | 09685 | 03574 |
| 0.060 | 1/8 | 0.090 | 0.480 | 0.056 | 2-1/2 | 0.005 | 08822 | 08924 |
| 0.060 | 1/8 | 0.090 | 0.480 | 0.056 | 2-1/2 | 0.010 | 08825 | 08927 |
| 0.060 | 1/8 | 0.090 | 0.480 | 0.056 | 2-1/2 | 0.015 | 08828 | 08930 |
| 0.062 | 1/8 | 0.093 | 0.496 | 0.058 | 2-1/2 | — | 09692 | 03575 |
| 0.065 | 1/8 | 0.098 | 0.520 | 0.061 | 2-1/2 | — | 09699 | 03576 |
| 0.070 | 1/8 | 0.105 | 0.560 | 0.065 | 2-1/2 | — | 09706 | 03577 |
| 0.070 | 1/8 | 0.105 | 0.560 | 0.065 | 2-1/2 | 0.005 | 08831 | 08933 |
| 0.070 | 1/8 | 0.105 | 0.560 | 0.065 | 2-1/2 | 0.010 | 08834 | 08936 |
| 0.070 | 1/8 | 0.105 | 0.560 | 0.065 | 2-1/2 | 0.015 | 08837 | 08939 |
| 0.075 | 1/8 | 0.113 | 0.600 | 0.070 | 2-1/2 | — | 09713 | 03578 |

- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

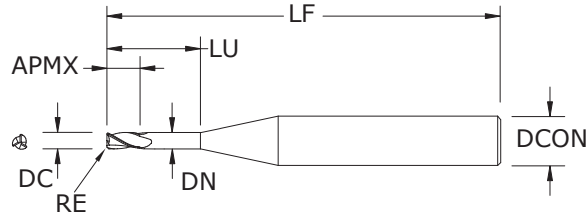
continued on next page

M3 • M3CR • 1.5xD • 8xD Overall Reach



M3 • M3CR • 1.5xD 8xD

FRACTIONAL SERIES



 New Expanded Tools

TOLERANCES (inch)

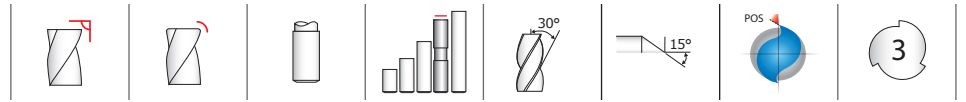
.010–.120 DIAMETER
 DC = +0.000/–0.001
 DCON = h₆
 RE = +0.0000/–0.0005

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

continued

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | inch | | | | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------------------|---------------------|----------|------------------------|
| | | | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.078 | 1/8 | 0.117 | 0.624 | 0.073 | 2-1/2 | – | 09720 | 03579 |
| 0.080 | 1/8 | 0.120 | 0.640 | 0.075 | 2-1/2 | – | 09727 | 03580 |
| 0.080 | 1/8 | 0.120 | 0.640 | 0.075 | 2-1/2 | 0.005 | 08840 | 08942 |
| 0.080 | 1/8 | 0.120 | 0.640 | 0.075 | 2-1/2 | 0.010 | 08843 | 08945 |
| 0.080 | 1/8 | 0.120 | 0.640 | 0.075 | 2-1/2 | 0.015 | 08846 | 08948 |
| 0.085 | 1/8 | 0.128 | 0.680 | 0.079 | 2-1/2 | – | 09734 | 03581 |
| 0.090 | 1/8 | 0.135 | 0.720 | 0.084 | 2-1/2 | – | 09741 | 03582 |
| 0.090 | 1/8 | 0.135 | 0.720 | 0.084 | 2-1/2 | 0.005 | 08849 | 08951 |
| 0.090 | 1/8 | 0.135 | 0.720 | 0.084 | 2-1/2 | 0.010 | 08852 | 08954 |
| 0.090 | 1/8 | 0.135 | 0.720 | 0.084 | 2-1/2 | 0.015 | 08855 | 08957 |
| 0.093 | 1/8 | 0.140 | 0.744 | 0.087 | 2-1/2 | – | 09748 | 03583 |
| 0.095 | 1/8 | 0.143 | 0.760 | 0.089 | 2-1/2 | – | 09755 | 03584 |
| 0.100 | 1/8 | 0.150 | 0.800 | 0.094 | 2-1/2 | – | 09762 | 03585 |
| 0.100 | 1/8 | 0.150 | 0.800 | 0.094 | 2-1/2 | 0.005 | 08858 | 08960 |
| 0.100 | 1/8 | 0.150 | 0.800 | 0.094 | 2-1/2 | 0.010 | 08861 | 08963 |
| 0.100 | 1/8 | 0.150 | 0.800 | 0.094 | 2-1/2 | 0.015 | 08864 | 08966 |
| 0.110 | 1/8 | 0.165 | 0.880 | 0.103 | 2-1/2 | – | 09769 | 03586 |
| 0.110 | 1/8 | 0.165 | 0.880 | 0.103 | 2-1/2 | 0.005 | 08867 | 08969 |
| 0.110 | 1/8 | 0.165 | 0.880 | 0.103 | 2-1/2 | 0.010 | 08870 | 08972 |
| 0.110 | 1/8 | 0.165 | 0.880 | 0.103 | 2-1/2 | 0.015 | 08873 | 08975 |
| 0.115 | 1/8 | 0.173 | 0.920 | 0.108 | 2-1/2 | – | 09776 | 03587 |
| 0.120 | 1/8 | 0.180 | 0.960 | 0.112 | 2-1/2 | – | 09783 | 03588 |
| 0.120 | 1/8 | 0.180 | 0.960 | 0.112 | 2-1/2 | 0.005 | 08876 | 08978 |
| 0.120 | 1/8 | 0.180 | 0.960 | 0.112 | 2-1/2 | 0.010 | 08879 | 08981 |
| 0.120 | 1/8 | 0.180 | 0.960 | 0.112 | 2-1/2 | 0.015 | 08882 | 08984 |

M3 • M3CR • 1.5xD • 12xD Overall Reach



New Expanded Tools

TOLERANCES (inch)

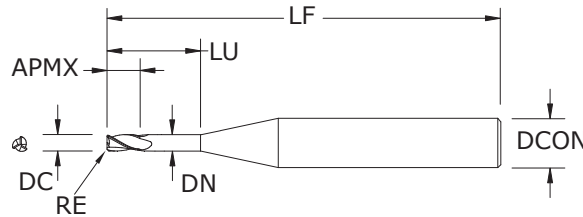
.010–.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

RE = +0.0000/-0.0005

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



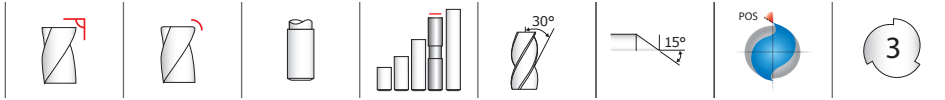
M3 • M3CR • 1.5xD 12xD FRACTIONAL SERIES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | inch | | | | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------------------|---------------------|----------|---------------------|
| | | | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.010 | 1/8 | 0.015 | 0.120 | 0.009 | 2-1/2 | — | 09595 | 03589 |
| 0.015 | 1/8 | 0.023 | 0.180 | 0.014 | 2-1/2 | — | 09602 | 03590 |
| 0.015 | 1/8 | 0.023 | 0.180 | 0.014 | 2-1/2 | 0.003 | 08784 | 08886 |
| 0.020 | 1/8 | 0.030 | 0.240 | 0.018 | 2-1/2 | — | 09609 | 03591 |
| 0.020 | 1/8 | 0.030 | 0.240 | 0.018 | 2-1/2 | 0.005 | 08787 | 08889 |
| 0.025 | 1/8 | 0.038 | 0.300 | 0.023 | 2-1/2 | — | 09616 | 03592 |
| 0.025 | 1/8 | 0.038 | 0.300 | 0.023 | 2-1/2 | 0.005 | 08790 | 08892 |
| 0.030 | 1/8 | 0.045 | 0.360 | 0.028 | 2-1/2 | — | 09623 | 03593 |
| 0.030 | 1/8 | 0.045 | 0.360 | 0.028 | 2-1/2 | 0.005 | 08793 | 08895 |
| 0.031 | 1/8 | 0.047 | 0.372 | 0.029 | 2-1/2 | — | 09630 | 03594 |
| 0.035 | 1/8 | 0.053 | 0.420 | 0.032 | 2-1/2 | — | 09637 | 03595 |
| 0.035 | 1/8 | 0.053 | 0.420 | 0.032 | 2-1/2 | 0.005 | 08796 | 08898 |
| 0.035 | 1/8 | 0.053 | 0.420 | 0.032 | 2-1/2 | 0.010 | 08799 | 08901 |
| 0.040 | 1/8 | 0.060 | 0.480 | 0.037 | 2-1/2 | — | 09644 | 03596 |
| 0.040 | 1/8 | 0.060 | 0.480 | 0.037 | 2-1/2 | 0.005 | 08802 | 08904 |
| 0.040 | 1/8 | 0.060 | 0.480 | 0.037 | 2-1/2 | 0.010 | 08805 | 08907 |
| 0.045 | 1/8 | 0.068 | 0.540 | 0.042 | 2-1/2 | — | 09651 | 03597 |
| 0.045 | 1/8 | 0.068 | 0.540 | 0.042 | 2-1/2 | 0.005 | 08808 | 08910 |
| 0.045 | 1/8 | 0.068 | 0.540 | 0.042 | 2-1/2 | 0.010 | 08811 | 08913 |
| 0.047 | 1/8 | 0.071 | 0.564 | 0.044 | 2-1/2 | — | 09658 | 03598 |
| 0.050 | 1/8 | 0.075 | 0.600 | 0.047 | 2-1/2 | — | 09665 | 03599 |
| 0.050 | 1/8 | 0.075 | 0.600 | 0.047 | 2-1/2 | 0.005 | 08814 | 08916 |
| 0.050 | 1/8 | 0.075 | 0.600 | 0.047 | 2-1/2 | 0.010 | 08817 | 08919 |
| 0.050 | 1/8 | 0.075 | 0.600 | 0.047 | 2-1/2 | 0.015 | 08820 | 08922 |
| 0.055 | 1/8 | 0.083 | 0.660 | 0.051 | 2-1/2 | — | 09672 | 03600 |
| 0.060 | 1/8 | 0.090 | 0.720 | 0.056 | 2-1/2 | — | 09679 | 03601 |
| 0.060 | 1/8 | 0.090 | 0.720 | 0.056 | 2-1/2 | 0.005 | 08823 | 08925 |
| 0.060 | 1/8 | 0.090 | 0.720 | 0.056 | 2-1/2 | 0.010 | 08826 | 08928 |
| 0.060 | 1/8 | 0.090 | 0.720 | 0.056 | 2-1/2 | 0.015 | 08829 | 08931 |
| 0.062 | 1/8 | 0.093 | 0.744 | 0.058 | 2-1/2 | — | 09686 | 03602 |
| 0.065 | 1/8 | 0.098 | 0.780 | 0.061 | 2-1/2 | — | 09693 | 03603 |
| 0.070 | 1/8 | 0.105 | 0.840 | 0.065 | 2-1/2 | — | 09700 | 03604 |
| 0.070 | 1/8 | 0.105 | 0.840 | 0.065 | 2-1/2 | 0.005 | 08832 | 08934 |
| 0.070 | 1/8 | 0.105 | 0.840 | 0.065 | 2-1/2 | 0.010 | 08835 | 08937 |
| 0.070 | 1/8 | 0.105 | 0.840 | 0.065 | 2-1/2 | 0.015 | 08838 | 08940 |
| 0.075 | 1/8 | 0.113 | 0.900 | 0.070 | 2-1/2 | — | 09707 | 03605 |

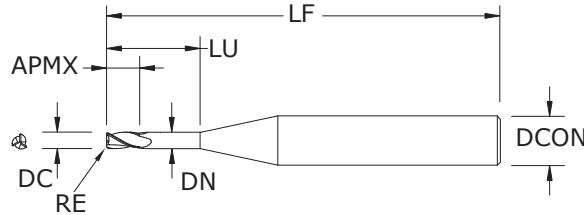
- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Enhanced corner geometry with tight tolerance corner radii
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

continued on next page

M3 • M3CR • 1.5xD • 12xD Overall Reach



M3 • M3CR • 1.5xD 12xD FRACTIONAL SERIES



 New Expanded Tools

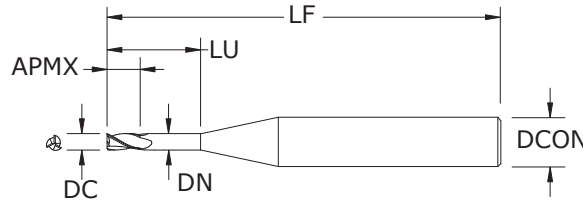
TOLERANCES (inch)

.010–.120 DIAMETER
 DC = +0.000/-0.001
 DCON = h₆
 RE = +0.0000/-0.0005

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

continued

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | inch | | | | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------------------|---------------------|----------|---------------------|
| | | | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.078 | 1/8 | 0.117 | 0.936 | 0.073 | 2-1/2 | — | 09714 | 03606 |
| 0.080 | 1/8 | 0.120 | 0.960 | 0.075 | 2-1/2 | — | 09721 | 03607 |
| 0.080 | 1/8 | 0.120 | 0.960 | 0.075 | 2-1/2 | 0.005 | 08841 | 08943 |
| 0.080 | 1/8 | 0.120 | 0.960 | 0.075 | 2-1/2 | 0.010 | 08844 | 08946 |
| 0.080 | 1/8 | 0.120 | 0.960 | 0.075 | 2-1/2 | 0.015 | 08847 | 08949 |
| 0.085 | 1/8 | 0.128 | 1.020 | 0.079 | 2-1/2 | — | 09728 | 03608 |
| 0.090 | 1/8 | 0.135 | 1.080 | 0.084 | 2-1/2 | — | 09735 | 03609 |
| 0.090 | 1/8 | 0.135 | 1.080 | 0.084 | 2-1/2 | 0.005 | 08850 | 08952 |
| 0.090 | 1/8 | 0.135 | 1.080 | 0.084 | 2-1/2 | 0.010 | 08853 | 08955 |
| 0.090 | 1/8 | 0.135 | 1.080 | 0.084 | 2-1/2 | 0.015 | 08856 | 08958 |
| 0.093 | 1/8 | 0.140 | 1.116 | 0.087 | 2-1/2 | — | 09742 | 03610 |
| 0.095 | 1/8 | 0.143 | 1.140 | 0.089 | 2-1/2 | — | 09749 | 03611 |
| 0.100 | 1/8 | 0.150 | 1.200 | 0.094 | 2-1/2 | — | 09756 | 03612 |
| 0.100 | 1/8 | 0.150 | 1.200 | 0.094 | 2-1/2 | 0.005 | 08859 | 08961 |
| 0.100 | 1/8 | 0.150 | 1.200 | 0.094 | 2-1/2 | 0.010 | 08862 | 08964 |
| 0.100 | 1/8 | 0.150 | 1.200 | 0.094 | 2-1/2 | 0.015 | 08865 | 08967 |
| 0.110 | 1/8 | 0.165 | 1.320 | 0.103 | 2-1/2 | — | 09763 | 03613 |
| 0.110 | 1/8 | 0.165 | 1.320 | 0.103 | 2-1/2 | 0.005 | 08868 | 08970 |
| 0.110 | 1/8 | 0.165 | 1.320 | 0.103 | 2-1/2 | 0.010 | 08871 | 08973 |
| 0.110 | 1/8 | 0.165 | 1.320 | 0.103 | 2-1/2 | 0.015 | 08874 | 08976 |
| 0.115 | 1/8 | 0.173 | 1.380 | 0.108 | 2-1/2 | — | 09770 | 03614 |
| 0.120 | 1/8 | 0.180 | 1.440 | 0.112 | 2-1/2 | — | 09777 | 03615 |
| 0.120 | 1/8 | 0.180 | 1.440 | 0.112 | 2-1/2 | 0.005 | 08877 | 08979 |
| 0.120 | 1/8 | 0.180 | 1.440 | 0.112 | 2-1/2 | 0.010 | 08880 | 08982 |
| 0.120 | 1/8 | 0.180 | 1.440 | 0.112 | 2-1/2 | 0.015 | 08883 | 08985 |



New Expanded Tools

TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

M3 • 1.5xD
15xD
FRACTIONAL SERIES

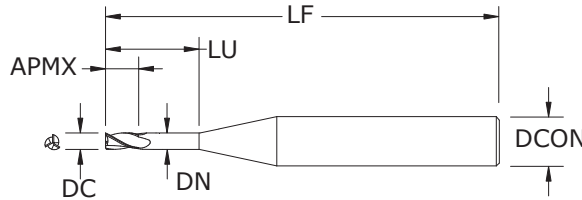
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | EDP NO. | |
|---------------------|---------------------|--------------------|----------|------------------|-------------------|----------|---------------------|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.010 | 1/8 | 0.015 | 0.150 | 0.009 | 2-1/2 | 09596 | 03616 |
| 0.015 | 1/8 | 0.023 | 0.225 | 0.014 | 2-1/2 | 09603 | 03617 |
| 0.020 | 1/8 | 0.030 | 0.300 | 0.018 | 2-1/2 | 09610 | 03618 |
| 0.025 | 1/8 | 0.038 | 0.375 | 0.023 | 2-1/2 | 09617 | 03619 |
| 0.030 | 1/8 | 0.045 | 0.450 | 0.028 | 2-1/2 | 09624 | 03620 |
| 0.031 | 1/8 | 0.047 | 0.465 | 0.029 | 2-1/2 | 09631 | 03621 |
| 0.035 | 1/8 | 0.053 | 0.525 | 0.032 | 2-1/2 | 09638 | 03622 |
| 0.040 | 1/8 | 0.060 | 0.600 | 0.037 | 2-1/2 | 09645 | 03623 |
| 0.045 | 1/8 | 0.068 | 0.675 | 0.042 | 2-1/2 | 09652 | 03624 |
| 0.047 | 1/8 | 0.071 | 0.705 | 0.044 | 2-1/2 | 09659 | 03625 |
| 0.050 | 1/8 | 0.075 | 0.750 | 0.047 | 2-1/2 | 09666 | 03626 |
| 0.055 | 1/8 | 0.083 | 0.825 | 0.051 | 2-1/2 | 09673 | 03627 |
| 0.060 | 1/8 | 0.090 | 0.900 | 0.056 | 2-1/2 | 09680 | 03628 |
| 0.062 | 1/8 | 0.093 | 0.930 | 0.058 | 2-1/2 | 09687 | 03629 |
| 0.065 | 1/8 | 0.098 | 0.975 | 0.061 | 2-1/2 | 09694 | 03630 |
| 0.070 | 1/8 | 0.105 | 1.050 | 0.065 | 2-1/2 | 09701 | 03631 |
| 0.075 | 1/8 | 0.113 | 1.125 | 0.070 | 2-1/2 | 09708 | 03632 |
| 0.078 | 1/8 | 0.117 | 1.170 | 0.073 | 2-1/2 | 09715 | 03633 |
| 0.080 | 1/8 | 0.120 | 1.200 | 0.075 | 2-1/2 | 09722 | 03634 |
| 0.085 | 1/8 | 0.128 | 1.275 | 0.079 | 2-1/2 | 09729 | 03635 |
| 0.090 | 1/8 | 0.135 | 1.350 | 0.084 | 2-1/2 | 09736 | 03636 |
| 0.093 | 1/8 | 0.140 | 1.395 | 0.087 | 3 | 09743 | 03637 |
| 0.095 | 1/8 | 0.143 | 1.425 | 0.089 | 3 | 09750 | 03638 |
| 0.100 | 1/8 | 0.150 | 1.500 | 0.094 | 3 | 09757 | 03639 |
| 0.110 | 1/8 | 0.165 | 1.650 | 0.103 | 3 | 09764 | 03640 |
| 0.115 | 1/8 | 0.173 | 1.725 | 0.108 | 3 | 09771 | 03641 |
| 0.120 | 1/8 | 0.180 | 1.800 | 0.112 | 3 | 09778 | 03642 |

- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

M3 • 1.5xD • 20xD Overall Reach



M3 • 1.5xD 20xD FRACTIONAL SERIES



 New Expanded Tools

- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | OVERALL LENGTH LF | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------|----------------------|------------------------|--|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | UNCOATED | | TI-NAMITE-A (AITiN) | |
| 0.010 | 1/8 | 0.015 | 0.200 | 0.009 | 2-1/2 | 09597 | 03643 | |
| 0.015 | 1/8 | 0.023 | 0.300 | 0.014 | 2-1/2 | 09604 | 03644 | |
| 0.020 | 1/8 | 0.030 | 0.400 | 0.018 | 2-1/2 | 09611 | 03645 | |
| 0.025 | 1/8 | 0.038 | 0.500 | 0.023 | 2-1/2 | 09618 | 03646 | |
| 0.030 | 1/8 | 0.045 | 0.600 | 0.028 | 2-1/2 | 09625 | 03647 | |
| 0.031 | 1/8 | 0.047 | 0.620 | 0.029 | 2-1/2 | 09632 | 03648 | |
| 0.035 | 1/8 | 0.053 | 0.700 | 0.032 | 2-1/2 | 09639 | 03649 | |
| 0.040 | 1/8 | 0.060 | 0.800 | 0.037 | 2-1/2 | 09646 | 03650 | |
| 0.045 | 1/8 | 0.068 | 0.900 | 0.042 | 2-1/2 | 09653 | 03651 | |
| 0.047 | 1/8 | 0.071 | 0.940 | 0.044 | 2-1/2 | 09660 | 03652 | |
| 0.050 | 1/8 | 0.075 | 1.000 | 0.047 | 2-1/2 | 09667 | 03653 | |
| 0.055 | 1/8 | 0.083 | 1.100 | 0.051 | 2-1/2 | 09674 | 03654 | |
| 0.060 | 1/8 | 0.090 | 1.200 | 0.056 | 2-1/2 | 09681 | 03655 | |
| 0.062 | 1/8 | 0.093 | 1.240 | 0.058 | 2-1/2 | 09688 | 03656 | |
| 0.065 | 1/8 | 0.098 | 1.300 | 0.061 | 3 | 09695 | 03657 | |
| 0.070 | 1/8 | 0.105 | 1.400 | 0.065 | 3 | 09702 | 03658 | |
| 0.075 | 1/8 | 0.113 | 1.500 | 0.070 | 3 | 09709 | 03659 | |
| 0.078 | 1/8 | 0.117 | 1.560 | 0.073 | 3 | 09716 | 03660 | |
| 0.080 | 1/8 | 0.120 | 1.600 | 0.075 | 3 | 09723 | 03661 | |
| 0.085 | 1/8 | 0.128 | 1.700 | 0.079 | 3 | 09730 | 03662 | |
| 0.090 | 1/8 | 0.135 | 1.800 | 0.084 | 3 | 09737 | 03663 | |
| 0.093 | 1/8 | 0.140 | 1.860 | 0.087 | 3 | 09744 | 03664 | |
| 0.095 | 1/8 | 0.143 | 1.900 | 0.089 | 3 | 09751 | 03665 | |
| 0.100 | 1/8 | 0.150 | 2.000 | 0.094 | 4 | 09758 | 03666 | |
| 0.110 | 1/8 | 0.165 | 2.200 | 0.103 | 4 | 09765 | 03667 | |
| 0.115 | 1/8 | 0.173 | 2.300 | 0.108 | 4 | 09772 | 03668 | |
| 0.120 | 1/8 | 0.180 | 2.400 | 0.112 | 4 | 09779 | 03669 | |

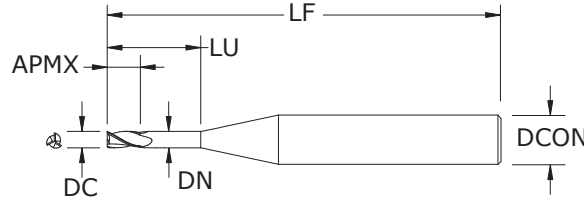
TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M3 • 1.5xD
25xD
FRACTIONAL SERIES

New Expanded Tools

TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

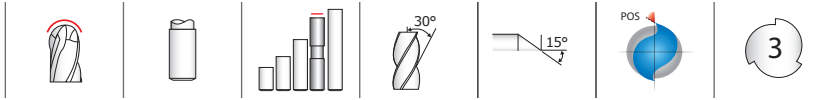
DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

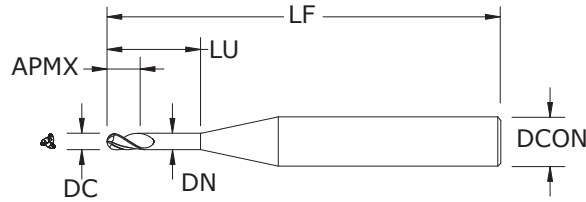
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | inch | | | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------------------|----------|------------------------|
| | | | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.010 | 1/8 | 0.015 | 0.250 | 0.009 | 2-1/2 | 09598 | 03670 |
| 0.015 | 1/8 | 0.023 | 0.375 | 0.014 | 2-1/2 | 09605 | 03671 |
| 0.020 | 1/8 | 0.030 | 0.500 | 0.018 | 2-1/2 | 09612 | 03672 |
| 0.025 | 1/8 | 0.038 | 0.625 | 0.023 | 2-1/2 | 09619 | 03673 |
| 0.030 | 1/8 | 0.045 | 0.750 | 0.028 | 2-1/2 | 09626 | 03674 |
| 0.031 | 1/8 | 0.047 | 0.775 | 0.029 | 2-1/2 | 09633 | 03675 |
| 0.035 | 1/8 | 0.053 | 0.875 | 0.032 | 2-1/2 | 09640 | 03676 |
| 0.040 | 1/8 | 0.060 | 1.000 | 0.037 | 2-1/2 | 09647 | 03677 |
| 0.045 | 1/8 | 0.068 | 1.125 | 0.042 | 2-1/2 | 09654 | 03678 |
| 0.047 | 1/8 | 0.071 | 1.175 | 0.044 | 2-1/2 | 09661 | 03679 |
| 0.050 | 1/8 | 0.075 | 1.250 | 0.047 | 2-1/2 | 09668 | 03680 |
| 0.055 | 1/8 | 0.083 | 1.375 | 0.051 | 3 | 09675 | 03681 |
| 0.060 | 1/8 | 0.090 | 1.500 | 0.056 | 3 | 09682 | 03682 |
| 0.062 | 1/8 | 0.093 | 1.550 | 0.058 | 3 | 09689 | 03683 |
| 0.065 | 1/8 | 0.098 | 1.625 | 0.061 | 3 | 09696 | 03684 |
| 0.070 | 1/8 | 0.105 | 1.750 | 0.065 | 3 | 09703 | 03685 |
| 0.075 | 1/8 | 0.113 | 1.875 | 0.070 | 3 | 09710 | 03686 |
| 0.078 | 1/8 | 0.117 | 1.950 | 0.073 | 4 | 09717 | 03687 |
| 0.080 | 1/8 | 0.120 | 2.000 | 0.075 | 4 | 09724 | 03688 |
| 0.085 | 1/8 | 0.128 | 2.125 | 0.079 | 4 | 09731 | 03689 |
| 0.090 | 1/8 | 0.135 | 2.250 | 0.084 | 4 | 09738 | 03690 |
| 0.093 | 1/8 | 0.140 | 2.325 | 0.087 | 4 | 09745 | 03691 |
| 0.095 | 1/8 | 0.143 | 2.375 | 0.089 | 4 | 09752 | 03692 |
| 0.100 | 1/8 | 0.150 | 2.500 | 0.094 | 4 | 09759 | 03693 |
| 0.110 | 1/8 | 0.165 | 2.750 | 0.103 | 4 | 09766 | 03694 |
| 0.115 | 1/8 | 0.173 | 2.875 | 0.108 | 4 | 09773 | 03695 |
| 0.120 | 1/8 | 0.180 | 3.000 | 0.112 | 4 | 09780 | 03696 |

- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

M3B • 1.5xD • 3xD Overall Reach



M3B • 1.5xD 3xD FRACTIONAL SERIES



 New Expanded Tools

- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | OVERALL LENGTH LF | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------|----------------------|------------------------|--|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | UNCOATED | | TI-NAMITE-A (AITiN) | |
| 0.010 | 1/8 | 0.015 | 0.030 | 0.009 | 2-1/2 | 09410 | 03805 | |
| 0.015 | 1/8 | 0.023 | 0.045 | 0.014 | 2-1/2 | 09417 | 03806 | |
| 0.020 | 1/8 | 0.030 | 0.060 | 0.018 | 2-1/2 | 09424 | 03807 | |
| 0.025 | 1/8 | 0.038 | 0.075 | 0.023 | 2-1/2 | 09431 | 03808 | |
| 0.030 | 1/8 | 0.045 | 0.090 | 0.028 | 2-1/2 | 09438 | 03809 | |
| 0.031 | 1/8 | 0.047 | 0.093 | 0.029 | 2-1/2 | 09445 | 03810 | |
| 0.035 | 1/8 | 0.053 | 0.105 | 0.032 | 2-1/2 | 09452 | 03811 | |
| 0.040 | 1/8 | 0.060 | 0.120 | 0.037 | 2-1/2 | 09459 | 03812 | |
| 0.045 | 1/8 | 0.068 | 0.135 | 0.042 | 2-1/2 | 09466 | 03813 | |
| 0.047 | 1/8 | 0.071 | 0.141 | 0.044 | 2-1/2 | 09473 | 03814 | |
| 0.050 | 1/8 | 0.075 | 0.150 | 0.047 | 2-1/2 | 09480 | 03815 | |
| 0.055 | 1/8 | 0.083 | 0.165 | 0.051 | 2-1/2 | 09487 | 03816 | |
| 0.060 | 1/8 | 0.090 | 0.180 | 0.056 | 2-1/2 | 09494 | 03817 | |
| 0.062 | 1/8 | 0.093 | 0.186 | 0.058 | 2-1/2 | 09501 | 03818 | |
| 0.065 | 1/8 | 0.098 | 0.195 | 0.061 | 2-1/2 | 09508 | 03819 | |
| 0.070 | 1/8 | 0.105 | 0.210 | 0.065 | 2-1/2 | 09515 | 03820 | |
| 0.075 | 1/8 | 0.113 | 0.225 | 0.070 | 2-1/2 | 09522 | 03821 | |
| 0.078 | 1/8 | 0.117 | 0.234 | 0.073 | 2-1/2 | 09529 | 03822 | |
| 0.080 | 1/8 | 0.120 | 0.240 | 0.075 | 2-1/2 | 09536 | 03823 | |
| 0.085 | 1/8 | 0.128 | 0.255 | 0.079 | 2-1/2 | 09543 | 03824 | |
| 0.090 | 1/8 | 0.135 | 0.270 | 0.084 | 2-1/2 | 09550 | 03825 | |
| 0.093 | 1/8 | 0.140 | 0.279 | 0.087 | 2-1/2 | 09557 | 03826 | |
| 0.095 | 1/8 | 0.143 | 0.285 | 0.089 | 2-1/2 | 09564 | 03827 | |
| 0.100 | 1/8 | 0.150 | 0.300 | 0.094 | 2-1/2 | 09571 | 03828 | |
| 0.110 | 1/8 | 0.165 | 0.330 | 0.103 | 2-1/2 | 09578 | 03829 | |
| 0.115 | 1/8 | 0.173 | 0.345 | 0.108 | 2-1/2 | 09585 | 03830 | |
| 0.120 | 1/8 | 0.180 | 0.360 | 0.112 | 2-1/2 | 09592 | 03831 | |

RE = 1/2 Cutting Diameter (DC)

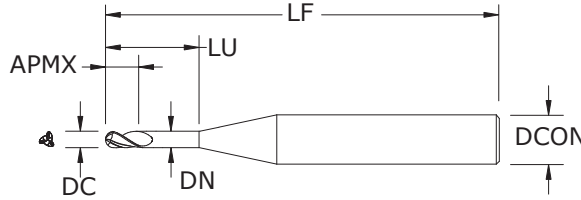
TOLERANCES (inch)

.010–.120 DIAMETER

DC = +0.000/–0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M3B • 1.5xD
5xD
FRACTIONAL SERIES

New Expanded Tools

TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | OVERALL LENGTH LF | EDP NO. | |
|---------------------|---------------------|--------------------|----------|------------------|----------|-------------------|---------------------|--|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| 0.010 | 1/8 | 0.015 | 0.050 | 0.009 | 2-1/2 | 09411 | 03832 | |
| 0.015 | 1/8 | 0.023 | 0.075 | 0.014 | 2-1/2 | 09418 | 03833 | |
| 0.020 | 1/8 | 0.030 | 0.100 | 0.018 | 2-1/2 | 09425 | 03834 | |
| 0.025 | 1/8 | 0.038 | 0.125 | 0.023 | 2-1/2 | 09432 | 03835 | |
| 0.030 | 1/8 | 0.045 | 0.150 | 0.028 | 2-1/2 | 09439 | 03836 | |
| 0.031 | 1/8 | 0.047 | 0.155 | 0.029 | 2-1/2 | 09446 | 03837 | |
| 0.035 | 1/8 | 0.053 | 0.175 | 0.032 | 2-1/2 | 09453 | 03838 | |
| 0.040 | 1/8 | 0.060 | 0.200 | 0.037 | 2-1/2 | 09460 | 03839 | |
| 0.045 | 1/8 | 0.068 | 0.225 | 0.042 | 2-1/2 | 09467 | 03840 | |
| 0.047 | 1/8 | 0.071 | 0.235 | 0.044 | 2-1/2 | 09474 | 03841 | |
| 0.050 | 1/8 | 0.075 | 0.250 | 0.047 | 2-1/2 | 09481 | 03842 | |
| 0.055 | 1/8 | 0.083 | 0.275 | 0.051 | 2-1/2 | 09488 | 03843 | |
| 0.060 | 1/8 | 0.090 | 0.300 | 0.056 | 2-1/2 | 09495 | 03844 | |
| 0.062 | 1/8 | 0.093 | 0.310 | 0.058 | 2-1/2 | 09502 | 03845 | |
| 0.065 | 1/8 | 0.098 | 0.325 | 0.061 | 2-1/2 | 09509 | 03846 | |
| 0.070 | 1/8 | 0.105 | 0.350 | 0.065 | 2-1/2 | 09516 | 03847 | |
| 0.075 | 1/8 | 0.113 | 0.375 | 0.070 | 2-1/2 | 09523 | 03848 | |
| 0.078 | 1/8 | 0.117 | 0.390 | 0.073 | 2-1/2 | 09530 | 03849 | |
| 0.080 | 1/8 | 0.120 | 0.400 | 0.075 | 2-1/2 | 09537 | 03850 | |
| 0.085 | 1/8 | 0.128 | 0.425 | 0.079 | 2-1/2 | 09544 | 03851 | |
| 0.090 | 1/8 | 0.135 | 0.450 | 0.084 | 2-1/2 | 09551 | 03852 | |
| 0.093 | 1/8 | 0.140 | 0.465 | 0.087 | 2-1/2 | 09558 | 03853 | |
| 0.095 | 1/8 | 0.143 | 0.475 | 0.089 | 2-1/2 | 09565 | 03854 | |
| 0.100 | 1/8 | 0.150 | 0.500 | 0.094 | 2-1/2 | 09572 | 03855 | |
| 0.110 | 1/8 | 0.165 | 0.550 | 0.103 | 2-1/2 | 09579 | 03856 | |
| 0.115 | 1/8 | 0.173 | 0.575 | 0.108 | 2-1/2 | 09586 | 03857 | |
| 0.120 | 1/8 | 0.180 | 0.600 | 0.112 | 2-1/2 | 09593 | 03858 | |

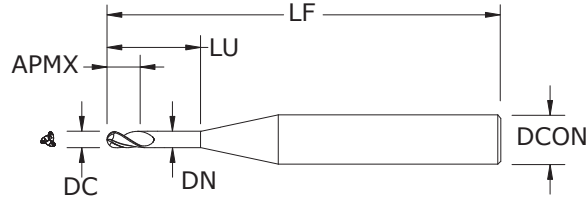
RE = 1/2 Cutting Diameter (DC)

- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

M3B • 1.5xD • 8xD Overall Reach



M3B • 1.5xD 8xD FRACTIONAL SERIES



 New Expanded Tools

- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | OVERALL LENGTH LF | EDP NO. | |
|---------------------|---------------------|--------------------|----------|------------------|----------|-------------------|---------------------|--|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | UNCOATED | | TI-NAMITE-A (AITIN) | |
| 0.010 | 1/8 | 0.015 | 0.080 | 0.009 | 2-1/2 | 09412 | 03859 | |
| 0.015 | 1/8 | 0.023 | 0.120 | 0.014 | 2-1/2 | 09419 | 03860 | |
| 0.020 | 1/8 | 0.030 | 0.160 | 0.018 | 2-1/2 | 09426 | 03861 | |
| 0.025 | 1/8 | 0.038 | 0.200 | 0.023 | 2-1/2 | 09433 | 03862 | |
| 0.030 | 1/8 | 0.045 | 0.240 | 0.028 | 2-1/2 | 09440 | 03863 | |
| 0.031 | 1/8 | 0.047 | 0.248 | 0.029 | 2-1/2 | 09447 | 03864 | |
| 0.035 | 1/8 | 0.053 | 0.280 | 0.032 | 2-1/2 | 09454 | 03865 | |
| 0.040 | 1/8 | 0.060 | 0.320 | 0.037 | 2-1/2 | 09461 | 03866 | |
| 0.045 | 1/8 | 0.068 | 0.360 | 0.042 | 2-1/2 | 09468 | 03867 | |
| 0.047 | 1/8 | 0.071 | 0.376 | 0.044 | 2-1/2 | 09475 | 03868 | |
| 0.050 | 1/8 | 0.075 | 0.400 | 0.047 | 2-1/2 | 09482 | 03869 | |
| 0.055 | 1/8 | 0.083 | 0.440 | 0.051 | 2-1/2 | 09489 | 03870 | |
| 0.060 | 1/8 | 0.090 | 0.480 | 0.056 | 2-1/2 | 09496 | 03871 | |
| 0.062 | 1/8 | 0.093 | 0.496 | 0.058 | 2-1/2 | 09503 | 03872 | |
| 0.065 | 1/8 | 0.098 | 0.520 | 0.061 | 2-1/2 | 09510 | 03873 | |
| 0.070 | 1/8 | 0.105 | 0.560 | 0.065 | 2-1/2 | 09517 | 03874 | |
| 0.075 | 1/8 | 0.113 | 0.600 | 0.070 | 2-1/2 | 09524 | 03875 | |
| 0.078 | 1/8 | 0.117 | 0.624 | 0.073 | 2-1/2 | 09531 | 03876 | |
| 0.080 | 1/8 | 0.120 | 0.640 | 0.075 | 2-1/2 | 09538 | 03877 | |
| 0.085 | 1/8 | 0.128 | 0.680 | 0.079 | 2-1/2 | 09545 | 03878 | |
| 0.090 | 1/8 | 0.135 | 0.720 | 0.084 | 2-1/2 | 09552 | 03879 | |
| 0.093 | 1/8 | 0.140 | 0.744 | 0.087 | 2-1/2 | 09559 | 03880 | |
| 0.095 | 1/8 | 0.143 | 0.760 | 0.089 | 2-1/2 | 09566 | 03881 | |
| 0.100 | 1/8 | 0.150 | 0.800 | 0.094 | 2-1/2 | 09573 | 03882 | |
| 0.110 | 1/8 | 0.165 | 0.880 | 0.103 | 2-1/2 | 09580 | 03883 | |
| 0.115 | 1/8 | 0.173 | 0.920 | 0.108 | 2-1/2 | 09587 | 03884 | |
| 0.120 | 1/8 | 0.180 | 0.960 | 0.112 | 2-1/2 | 09594 | 03885 | |

RE = 1/2 Cutting Diameter (DC)

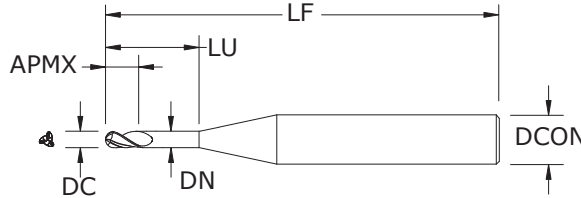
TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h6

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M3B • 1.5xD
12xD
FRACTIONAL SERIES

New Expanded Tools

TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

| inch | | | | | | EDP NO. | |
|---------------------|---------------------|--------------------|----------|------------------|-------------------|----------|---------------------|
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.010 | 1/8 | 0.015 | 0.120 | 0.009 | 2-1/2 | 09406 | 03886 |
| 0.015 | 1/8 | 0.023 | 0.180 | 0.014 | 2-1/2 | 09413 | 03887 |
| 0.020 | 1/8 | 0.030 | 0.240 | 0.018 | 2-1/2 | 09420 | 03888 |
| 0.025 | 1/8 | 0.038 | 0.300 | 0.023 | 2-1/2 | 09427 | 03889 |
| 0.030 | 1/8 | 0.045 | 0.360 | 0.028 | 2-1/2 | 09434 | 03890 |
| 0.031 | 1/8 | 0.047 | 0.372 | 0.029 | 2-1/2 | 09441 | 03891 |
| 0.035 | 1/8 | 0.053 | 0.420 | 0.032 | 2-1/2 | 09448 | 03892 |
| 0.040 | 1/8 | 0.060 | 0.480 | 0.037 | 2-1/2 | 09455 | 03893 |
| 0.045 | 1/8 | 0.068 | 0.540 | 0.042 | 2-1/2 | 09462 | 03894 |
| 0.047 | 1/8 | 0.071 | 0.564 | 0.044 | 2-1/2 | 09469 | 03895 |
| 0.050 | 1/8 | 0.075 | 0.600 | 0.047 | 2-1/2 | 09476 | 03896 |
| 0.055 | 1/8 | 0.083 | 0.660 | 0.051 | 2-1/2 | 09483 | 03897 |
| 0.060 | 1/8 | 0.090 | 0.720 | 0.056 | 2-1/2 | 09490 | 03898 |
| 0.062 | 1/8 | 0.093 | 0.744 | 0.058 | 2-1/2 | 09497 | 03899 |
| 0.065 | 1/8 | 0.098 | 0.780 | 0.061 | 2-1/2 | 09504 | 03900 |
| 0.070 | 1/8 | 0.105 | 0.840 | 0.065 | 2-1/2 | 09511 | 03901 |
| 0.075 | 1/8 | 0.113 | 0.900 | 0.070 | 2-1/2 | 09518 | 03902 |
| 0.078 | 1/8 | 0.117 | 0.936 | 0.073 | 2-1/2 | 09525 | 03903 |
| 0.080 | 1/8 | 0.120 | 0.960 | 0.075 | 2-1/2 | 09532 | 03904 |
| 0.085 | 1/8 | 0.128 | 1.020 | 0.079 | 2-1/2 | 09539 | 03905 |
| 0.090 | 1/8 | 0.135 | 1.080 | 0.084 | 2-1/2 | 09546 | 03906 |
| 0.093 | 1/8 | 0.140 | 1.116 | 0.087 | 2-1/2 | 09553 | 03907 |
| 0.095 | 1/8 | 0.143 | 1.140 | 0.089 | 2-1/2 | 09560 | 03908 |
| 0.100 | 1/8 | 0.150 | 1.200 | 0.094 | 2-1/2 | 09567 | 03909 |
| 0.110 | 1/8 | 0.165 | 1.320 | 0.103 | 2-1/2 | 09574 | 03910 |
| 0.115 | 1/8 | 0.173 | 1.380 | 0.108 | 2-1/2 | 09581 | 03911 |
| 0.120 | 1/8 | 0.180 | 1.440 | 0.112 | 2-1/2 | 09588 | 03912 |

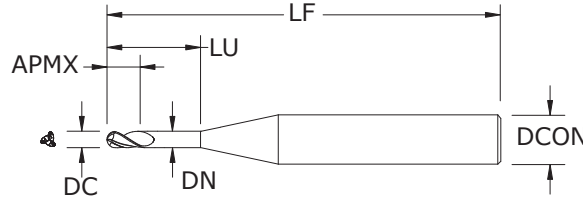
RE = 1/2 Cutting Diameter (DC)

- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

M3B • 1.5xD • 15xD Overall Reach



M3B • 1.5xD 15xD FRACTIONAL SERIES



 New Expanded Tools

- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | OVERALL LENGTH LF | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------|----------------------|------------------------|--|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | UNCOATED | | TI-NAMITE-A (AITIN) | |
| 0.010 | 1/8 | 0.015 | 0.150 | 0.009 | 2-1/2 | 09407 | 03913 | |
| 0.015 | 1/8 | 0.023 | 0.225 | 0.014 | 2-1/2 | 09414 | 03914 | |
| 0.020 | 1/8 | 0.030 | 0.300 | 0.018 | 2-1/2 | 09421 | 03915 | |
| 0.025 | 1/8 | 0.038 | 0.375 | 0.023 | 2-1/2 | 09428 | 03916 | |
| 0.030 | 1/8 | 0.045 | 0.450 | 0.028 | 2-1/2 | 09435 | 03917 | |
| 0.031 | 1/8 | 0.047 | 0.465 | 0.029 | 2-1/2 | 09442 | 03918 | |
| 0.035 | 1/8 | 0.053 | 0.525 | 0.032 | 2-1/2 | 09449 | 03919 | |
| 0.040 | 1/8 | 0.060 | 0.600 | 0.037 | 2-1/2 | 09456 | 03920 | |
| 0.045 | 1/8 | 0.068 | 0.675 | 0.042 | 2-1/2 | 09463 | 03921 | |
| 0.047 | 1/8 | 0.071 | 0.705 | 0.044 | 2-1/2 | 09470 | 03922 | |
| 0.050 | 1/8 | 0.075 | 0.750 | 0.047 | 2-1/2 | 09477 | 03923 | |
| 0.055 | 1/8 | 0.083 | 0.825 | 0.051 | 2-1/2 | 09484 | 03924 | |
| 0.060 | 1/8 | 0.090 | 0.900 | 0.056 | 2-1/2 | 09491 | 03925 | |
| 0.062 | 1/8 | 0.093 | 0.930 | 0.058 | 2-1/2 | 09498 | 03926 | |
| 0.065 | 1/8 | 0.098 | 0.975 | 0.061 | 2-1/2 | 09505 | 03927 | |
| 0.070 | 1/8 | 0.105 | 1.050 | 0.065 | 2-1/2 | 09512 | 03928 | |
| 0.075 | 1/8 | 0.113 | 1.125 | 0.070 | 2-1/2 | 09519 | 03929 | |
| 0.078 | 1/8 | 0.117 | 1.170 | 0.073 | 2-1/2 | 09526 | 03930 | |
| 0.080 | 1/8 | 0.120 | 1.200 | 0.075 | 2-1/2 | 09533 | 03931 | |
| 0.085 | 1/8 | 0.128 | 1.275 | 0.079 | 2-1/2 | 09540 | 03932 | |
| 0.090 | 1/8 | 0.135 | 1.350 | 0.084 | 2-1/2 | 09547 | 03933 | |
| 0.093 | 1/8 | 0.140 | 1.395 | 0.087 | 3 | 09554 | 03934 | |
| 0.095 | 1/8 | 0.143 | 1.425 | 0.089 | 3 | 09561 | 03935 | |
| 0.100 | 1/8 | 0.150 | 1.500 | 0.094 | 3 | 09568 | 03936 | |
| 0.110 | 1/8 | 0.165 | 1.650 | 0.103 | 3 | 09575 | 03937 | |
| 0.115 | 1/8 | 0.173 | 1.725 | 0.108 | 3 | 09582 | 03938 | |
| 0.120 | 1/8 | 0.180 | 1.800 | 0.112 | 3 | 09589 | 03939 | |

RE = 1/2 Cutting Diameter (DC)

TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



New Expanded Tools

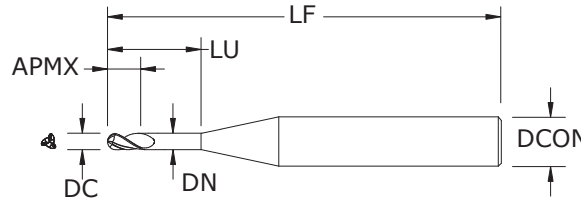
TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



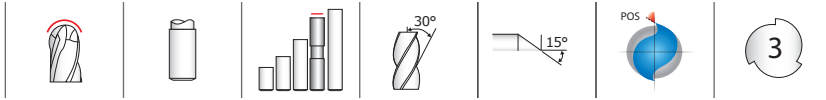
M3B • 1.5xD
20xD
FRACTIONAL SERIES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------------------|----------|---------------------|
| | | | | | | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.010 | 1/8 | 0.015 | 0.200 | 0.009 | 2-1/2 | 09408 | 03940 |
| 0.015 | 1/8 | 0.023 | 0.300 | 0.014 | 2-1/2 | 09415 | 03941 |
| 0.020 | 1/8 | 0.030 | 0.400 | 0.018 | 2-1/2 | 09422 | 03942 |
| 0.025 | 1/8 | 0.038 | 0.500 | 0.023 | 2-1/2 | 09429 | 03943 |
| 0.030 | 1/8 | 0.045 | 0.600 | 0.028 | 2-1/2 | 09436 | 03944 |
| 0.031 | 1/8 | 0.047 | 0.620 | 0.029 | 2-1/2 | 09443 | 03945 |
| 0.035 | 1/8 | 0.053 | 0.700 | 0.032 | 2-1/2 | 09450 | 03946 |
| 0.040 | 1/8 | 0.060 | 0.800 | 0.037 | 2-1/2 | 09457 | 03947 |
| 0.045 | 1/8 | 0.068 | 0.900 | 0.042 | 2-1/2 | 09464 | 03948 |
| 0.047 | 1/8 | 0.071 | 0.940 | 0.044 | 2-1/2 | 09471 | 03949 |
| 0.050 | 1/8 | 0.075 | 1.000 | 0.047 | 2-1/2 | 09478 | 03950 |
| 0.055 | 1/8 | 0.083 | 1.100 | 0.051 | 2-1/2 | 09485 | 03951 |
| 0.060 | 1/8 | 0.090 | 1.200 | 0.056 | 2-1/2 | 09492 | 03952 |
| 0.062 | 1/8 | 0.093 | 1.240 | 0.058 | 2-1/2 | 09499 | 03953 |
| 0.065 | 1/8 | 0.098 | 1.300 | 0.061 | 3 | 09506 | 03954 |
| 0.070 | 1/8 | 0.105 | 1.400 | 0.065 | 3 | 09513 | 03955 |
| 0.075 | 1/8 | 0.113 | 1.500 | 0.070 | 3 | 09520 | 03956 |
| 0.078 | 1/8 | 0.117 | 1.560 | 0.073 | 3 | 09527 | 03957 |
| 0.080 | 1/8 | 0.120 | 1.600 | 0.075 | 3 | 09534 | 03958 |
| 0.085 | 1/8 | 0.128 | 1.700 | 0.079 | 3 | 09541 | 03959 |
| 0.090 | 1/8 | 0.135 | 1.800 | 0.084 | 3 | 09548 | 03960 |
| 0.093 | 1/8 | 0.140 | 1.860 | 0.087 | 3 | 09555 | 03961 |
| 0.095 | 1/8 | 0.143 | 1.900 | 0.089 | 3 | 09562 | 03962 |
| 0.100 | 1/8 | 0.150 | 2.000 | 0.094 | 4 | 09569 | 03963 |
| 0.110 | 1/8 | 0.165 | 2.200 | 0.103 | 4 | 09576 | 03964 |
| 0.115 | 1/8 | 0.173 | 2.300 | 0.108 | 4 | 09583 | 03965 |
| 0.120 | 1/8 | 0.180 | 2.400 | 0.112 | 4 | 09590 | 03966 |

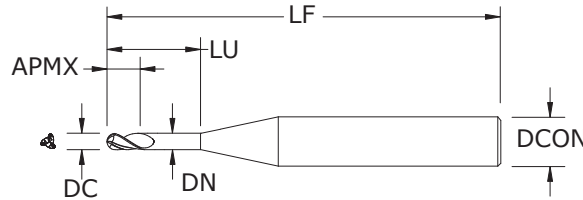
RE = 1/2 Cutting Diameter (DC)

- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

M3B • 1.5xD • 25xD Overall Reach



M3B • 1.5xD 25xD FRACTIONAL SERIES



 New Expanded Tools

- Three flute design features improved chip space over four flutes and increased strength and feed capability over two flutes.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | OVERALL LENGTH LF | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------|----------------------|------------------------|--|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | UNCOATED | | TI-NAMITE-A (AITiN) | |
| 0.010 | 1/8 | 0.015 | 0.250 | 0.009 | 2-1/2 | 09409 | 03967 | |
| 0.015 | 1/8 | 0.023 | 0.375 | 0.014 | 2-1/2 | 09416 | 03968 | |
| 0.020 | 1/8 | 0.030 | 0.500 | 0.018 | 2-1/2 | 09423 | 03969 | |
| 0.025 | 1/8 | 0.038 | 0.625 | 0.023 | 2-1/2 | 09430 | 03970 | |
| 0.030 | 1/8 | 0.045 | 0.750 | 0.028 | 2-1/2 | 09437 | 03971 | |
| 0.031 | 1/8 | 0.047 | 0.775 | 0.029 | 2-1/2 | 09444 | 03972 | |
| 0.035 | 1/8 | 0.053 | 0.875 | 0.032 | 2-1/2 | 09451 | 03973 | |
| 0.040 | 1/8 | 0.060 | 1.000 | 0.037 | 2-1/2 | 09458 | 03974 | |
| 0.045 | 1/8 | 0.068 | 1.125 | 0.042 | 2-1/2 | 09465 | 03975 | |
| 0.047 | 1/8 | 0.071 | 1.175 | 0.044 | 2-1/2 | 09472 | 03976 | |
| 0.050 | 1/8 | 0.075 | 1.250 | 0.047 | 2-1/2 | 09479 | 03977 | |
| 0.055 | 1/8 | 0.083 | 1.375 | 0.051 | 3 | 09486 | 03978 | |
| 0.060 | 1/8 | 0.090 | 1.500 | 0.056 | 3 | 09493 | 03979 | |
| 0.062 | 1/8 | 0.093 | 1.550 | 0.058 | 3 | 09500 | 03980 | |
| 0.065 | 1/8 | 0.098 | 1.625 | 0.061 | 3 | 09507 | 03981 | |
| 0.070 | 1/8 | 0.105 | 1.750 | 0.065 | 3 | 09514 | 03982 | |
| 0.075 | 1/8 | 0.113 | 1.875 | 0.070 | 3 | 09521 | 03983 | |
| 0.078 | 1/8 | 0.117 | 1.950 | 0.073 | 4 | 09528 | 03984 | |
| 0.080 | 1/8 | 0.120 | 2.000 | 0.075 | 4 | 09535 | 03985 | |
| 0.085 | 1/8 | 0.128 | 2.125 | 0.079 | 4 | 09542 | 03986 | |
| 0.090 | 1/8 | 0.135 | 2.250 | 0.084 | 4 | 09549 | 03987 | |
| 0.093 | 1/8 | 0.140 | 2.325 | 0.087 | 4 | 09556 | 03988 | |
| 0.095 | 1/8 | 0.143 | 2.375 | 0.089 | 4 | 09563 | 03989 | |
| 0.100 | 1/8 | 0.150 | 2.500 | 0.094 | 4 | 09570 | 03990 | |
| 0.110 | 1/8 | 0.165 | 2.750 | 0.103 | 4 | 09577 | 03991 | |
| 0.115 | 1/8 | 0.173 | 2.875 | 0.108 | 4 | 09584 | 03992 | |
| 0.120 | 1/8 | 0.180 | 3.000 | 0.112 | 4 | 09591 | 03993 | |

RE = 1/2 Cutting Diameter (DC)

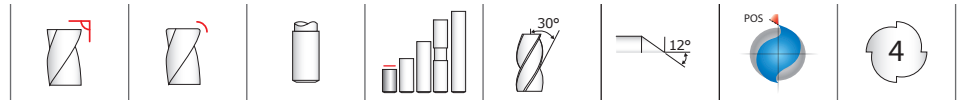
TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



New Expanded Tools

TOLERANCES (inch)

.005–.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

RE = +0.0000/-0.0005

STEELS

STAINLESS STEELS

CAST IRON

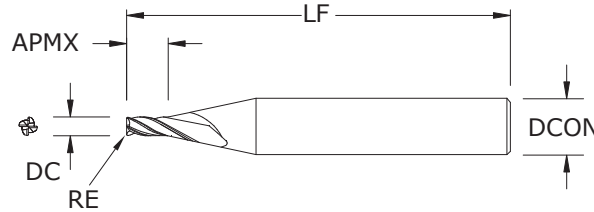
HIGH TEMP ALLOYS

TITANIUM

HARDENED STEELS

NON-FERROUS

PLASTICS/COMPOSITES



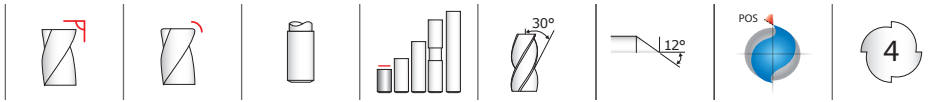
**M4 • M4CR
1.5xD**
FRACTIONAL SERIES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|------------------|----------|---------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.005 | 1/8 | 0.008 | 1-1/2 | — | 00372 | 02238 |
| 0.006 | 1/8 | 0.009 | 1-1/2 | — | 00373 | 02239 |
| 0.007 | 1/8 | 0.011 | 1-1/2 | — | 00374 | 02240 |
| 0.008 | 1/8 | 0.012 | 1-1/2 | — | 00375 | 02241 |
| 0.009 | 1/8 | 0.014 | 1-1/2 | — | 00376 | 02242 |
| 0.010 | 1/8 | 0.015 | 1-1/2 | — | 00377 | 02243 |
| 0.011 | 1/8 | 0.017 | 1-1/2 | — | 00378 | 02244 |
| 0.012 | 1/8 | 0.018 | 1-1/2 | — | 00379 | 02245 |
| 0.013 | 1/8 | 0.020 | 1-1/2 | — | 00380 | 02246 |
| 0.014 | 1/8 | 0.021 | 1-1/2 | — | 00381 | 02247 |
| 0.015 | 1/8 | 0.023 | 1-1/2 | — | 00382 | 02248 |
| 0.015 | 1/8 | 0.023 | 1-1/2 | 0.003 | 08986 | 09126 |
| 0.016 | 1/8 | 0.024 | 1-1/2 | — | 00383 | 02249 |
| 0.017 | 1/8 | 0.026 | 1-1/2 | — | 00384 | 02250 |
| 0.018 | 1/8 | 0.027 | 1-1/2 | — | 00385 | 02251 |
| 0.019 | 1/8 | 0.029 | 1-1/2 | — | 00386 | 02252 |
| 0.020 | 1/8 | 0.030 | 1-1/2 | — | 00387 | 02253 |
| 0.020 | 1/8 | 0.030 | 1-1/2 | 0.003 | 08988 | 09128 |
| 0.020 | 1/8 | 0.030 | 1-1/2 | 0.005 | 04024 | 04025 |
| 0.021 | 1/8 | 0.032 | 1-1/2 | — | 00388 | 02254 |
| 0.022 | 1/8 | 0.033 | 1-1/2 | — | 00389 | 02255 |
| 0.023 | 1/8 | 0.035 | 1-1/2 | — | 00390 | 02256 |
| 0.024 | 1/8 | 0.036 | 1-1/2 | — | 00391 | 02257 |
| 0.025 | 1/8 | 0.038 | 1-1/2 | — | 00392 | 02258 |
| 0.025 | 1/8 | 0.038 | 1-1/2 | 0.005 | 04026 | 04027 |
| 0.025 | 1/8 | 0.038 | 1-1/2 | 0.010 | 08990 | 09130 |
| 0.026 | 1/8 | 0.039 | 1-1/2 | — | 00393 | 02259 |
| 0.027 | 1/8 | 0.041 | 1-1/2 | — | 00394 | 02260 |
| 0.028 | 1/8 | 0.042 | 1-1/2 | — | 00395 | 02261 |
| 0.029 | 1/8 | 0.044 | 1-1/2 | — | 00396 | 02262 |
| 0.030 | 1/8 | 0.045 | 1-1/2 | — | 00397 | 02263 |
| 0.030 | 1/8 | 0.045 | 1-1/2 | 0.010 | 08992 | 09132 |
| 0.031 | 1/8 | 0.047 | 1-1/2 | — | 00398 | 02264 |
| 0.032 | 1/8 | 0.048 | 1-1/2 | — | 00399 | 02265 |
| 0.033 | 1/8 | 0.050 | 1-1/2 | — | 00400 | 02266 |
| 0.034 | 1/8 | 0.051 | 1-1/2 | — | 00401 | 02267 |

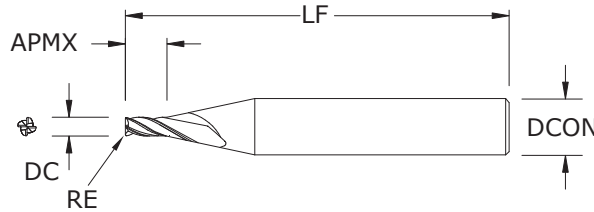
- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Enhanced corner geometry with tight tolerance corner radii
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

continued on next page

M4 • M4CR • 1.5xD



M4 • M4CR 1.5xD FRACTIONAL SERIES



 New Expanded Tools

TOLERANCES (inch)

.005–.120 DIAMETER
 DC = +0.000/-0.001
 DCON = h₆
 RE = +0.0000/-0.0005

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

continued

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|------------------------|------------------------|-----------------------|----------------------|---------------------|----------|------------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.035 | 1/8 | 0.053 | 1-1/2 | — | 00402 | 02268 |
| 0.035 | 1/8 | 0.053 | 1-1/2 | 0.005 | 08994 | 09134 |
| 0.035 | 1/8 | 0.053 | 1-1/2 | 0.010 | 08996 | 09136 |
| 0.036 | 1/8 | 0.054 | 1-1/2 | — | 00403 | 02269 |
| 0.037 | 1/8 | 0.056 | 1-1/2 | — | 00404 | 02270 |
| 0.038 | 1/8 | 0.057 | 1-1/2 | — | 00405 | 02271 |
| 0.039 | 1/8 | 0.059 | 1-1/2 | — | 00406 | 02272 |
| 0.040 | 1/8 | 0.060 | 1-1/2 | — | 00407 | 02273 |
| 0.040 | 1/8 | 0.060 | 1-1/2 | 0.005 | 08998 | 09138 |
| 0.040 | 1/8 | 0.060 | 1-1/2 | 0.010 | 09000 | 09140 |
| 0.041 | 1/8 | 0.062 | 1-1/2 | — | 00408 | 02402 |
| 0.042 | 1/8 | 0.063 | 1-1/2 | — | 00409 | 02403 |
| 0.043 | 1/8 | 0.065 | 1-1/2 | — | 00410 | 02404 |
| 0.044 | 1/8 | 0.066 | 1-1/2 | — | 00411 | 02405 |
| 0.045 | 1/8 | 0.068 | 1-1/2 | — | 00412 | 02406 |
| 0.045 | 1/8 | 0.068 | 1-1/2 | 0.005 | 09002 | 09142 |
| 0.045 | 1/8 | 0.068 | 1-1/2 | 0.010 | 09004 | 09144 |
| 0.046 | 1/8 | 0.069 | 1-1/2 | — | 00413 | 02407 |
| 0.047 | 1/8 | 0.071 | 1-1/2 | — | 00414 | 02408 |
| 0.048 | 1/8 | 0.072 | 1-1/2 | — | 00415 | 02409 |
| 0.049 | 1/8 | 0.074 | 1-1/2 | — | 00416 | 02410 |
| 0.050 | 1/8 | 0.075 | 1-1/2 | — | 00417 | 02411 |
| 0.050 | 1/8 | 0.075 | 1-1/2 | 0.005 | 09006 | 09146 |
| 0.050 | 1/8 | 0.075 | 1-1/2 | 0.010 | 09008 | 09148 |
| 0.050 | 1/8 | 0.075 | 1-1/2 | 0.015 | 09010 | 09150 |
| 0.051 | 1/8 | 0.077 | 1-1/2 | — | 00418 | 02412 |
| 0.052 | 1/8 | 0.078 | 1-1/2 | — | 00419 | 02413 |
| 0.053 | 1/8 | 0.080 | 1-1/2 | — | 00420 | 02414 |
| 0.054 | 1/8 | 0.081 | 1-1/2 | — | 00421 | 02415 |
| 0.055 | 1/8 | 0.083 | 1-1/2 | — | 00422 | 02416 |
| 0.055 | 1/8 | 0.083 | 1-1/2 | 0.005 | 09012 | 09152 |
| 0.055 | 1/8 | 0.083 | 1-1/2 | 0.010 | 09014 | 09154 |
| 0.055 | 1/8 | 0.083 | 1-1/2 | 0.015 | 09016 | 09156 |
| 0.056 | 1/8 | 0.084 | 1-1/2 | — | 00423 | 02417 |

continued on next page

New Expanded Tools

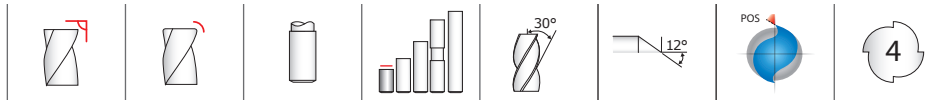
**M4 • M4CR
1.5xD**
FRACTIONAL SERIES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|---------------------------|---------------------------|--------------------------|-------------------------|------------------------|----------|------------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.057 | 1/8 | 0.086 | 1-1/2 | — | 00424 | 02418 |
| 0.058 | 1/8 | 0.087 | 1-1/2 | — | 00425 | 02419 |
| 0.059 | 1/8 | 0.089 | 1-1/2 | — | 00426 | 02420 |
| 0.060 | 1/8 | 0.090 | 1-1/2 | — | 00427 | 02421 |
| 0.060 | 1/8 | 0.090 | 1-1/2 | 0.005 | 09018 | 09158 |
| 0.060 | 1/8 | 0.090 | 1-1/2 | 0.010 | 09020 | 09160 |
| 0.060 | 1/8 | 0.090 | 1-1/2 | 0.015 | 09022 | 09162 |
| 0.062 | 1/8 | 0.093 | 1-1/2 | — | 00428 | 02422 |
| 0.065 | 1/8 | 0.098 | 1-1/2 | — | 00429 | 02423 |
| 0.065 | 1/8 | 0.098 | 1-1/2 | 0.005 | 09024 | 09164 |
| 0.065 | 1/8 | 0.098 | 1-1/2 | 0.010 | 09026 | 09166 |
| 0.065 | 1/8 | 0.098 | 1-1/2 | 0.015 | 09028 | 09168 |
| 0.070 | 1/8 | 0.105 | 1-1/2 | — | 00430 | 02424 |
| 0.070 | 1/8 | 0.105 | 1-1/2 | 0.005 | 09030 | 09170 |
| 0.070 | 1/8 | 0.105 | 1-1/2 | 0.010 | 09032 | 09172 |
| 0.070 | 1/8 | 0.105 | 1-1/2 | 0.015 | 09034 | 09174 |
| 0.075 | 1/8 | 0.1125 | 1-1/2 | — | 04014 | 04012 |
| 0.075 | 1/8 | 0.113 | 1-1/2 | 0.005 | 09036 | 09176 |
| 0.075 | 1/8 | 0.113 | 1-1/2 | 0.010 | 09038 | 09178 |
| 0.075 | 1/8 | 0.113 | 1-1/2 | 0.015 | 09040 | 09180 |
| 0.075 | 1/8 | 0.113 | 1-1/2 | 0.020 | 09042 | 09182 |
| 0.078 | 1/8 | 0.117 | 1-1/2 | — | 00431 | 02425 |
| 0.080 | 1/8 | 0.120 | 1-1/2 | — | 00432 | 02426 |
| 0.080 | 1/8 | 0.120 | 1-1/2 | 0.005 | 09044 | 09184 |
| 0.080 | 1/8 | 0.120 | 1-1/2 | 0.010 | 09046 | 09186 |
| 0.080 | 1/8 | 0.120 | 1-1/2 | 0.015 | 09048 | 09188 |
| 0.080 | 1/8 | 0.120 | 1-1/2 | 0.020 | 09050 | 09190 |
| 0.085 | 1/8 | 0.128 | 1-1/2 | — | 00433 | 02427 |
| 0.085 | 1/8 | 0.128 | 1-1/2 | 0.005 | 09052 | 09192 |
| 0.085 | 1/8 | 0.128 | 1-1/2 | 0.010 | 09054 | 09194 |
| 0.085 | 1/8 | 0.128 | 1-1/2 | 0.015 | 09056 | 09196 |
| 0.085 | 1/8 | 0.128 | 1-1/2 | 0.020 | 09058 | 09198 |
| 0.090 | 1/8 | 0.135 | 1-1/2 | — | 00434 | 02428 |
| 0.090 | 1/8 | 0.135 | 1-1/2 | 0.005 | 09060 | 09200 |

continued

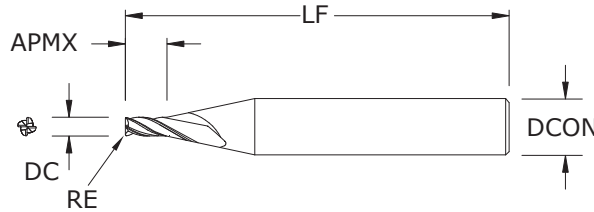
continued on next page

M4 • M4CR • 1.5xD



M4 • M4CR 1.5xD FRACTIONAL SERIES

continued



 New Expanded Tools

TOLERANCES (inch)

.005–.120 DIAMETER
 DC = +0.000/-0.001
 DCON = h₆
 RE = +0.0000/-0.0005

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|------------------------|------------------------|-----------------------|----------------------|---------------------|----------|------------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.090 | 1/8 | 0.135 | 1-1/2 | 0.010 | 09062 | 09202 |
| 0.090 | 1/8 | 0.135 | 1-1/2 | 0.015 | 09064 | 09204 |
| 0.090 | 1/8 | 0.135 | 1-1/2 | 0.020 | 09066 | 09206 |
| 0.093 | 1/8 | 0.140 | 1-1/2 | — | 00435 | 02429 |
| 0.095 | 1/8 | 0.143 | 1-1/2 | — | 00436 | 02430 |
| 0.095 | 1/8 | 0.143 | 1-1/2 | 0.005 | 09068 | 09208 |
| 0.095 | 1/8 | 0.143 | 1-1/2 | 0.010 | 09070 | 09210 |
| 0.095 | 1/8 | 0.143 | 1-1/2 | 0.015 | 09072 | 09212 |
| 0.095 | 1/8 | 0.143 | 1-1/2 | 0.020 | 09074 | 09214 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | — | 00437 | 02431 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | 0.005 | 09076 | 09216 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | 0.010 | 09078 | 09218 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | 0.015 | 09080 | 09220 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | 0.020 | 09082 | 09222 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | 0.030 | 09084 | 09224 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | — | 00438 | 02432 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | 0.005 | 09086 | 09226 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | 0.010 | 09088 | 09228 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | 0.015 | 09090 | 09230 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | 0.020 | 09092 | 09232 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | 0.030 | 09094 | 09234 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | — | 00439 | 02433 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | 0.005 | 09096 | 09236 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | 0.010 | 09098 | 09238 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | 0.015 | 09100 | 09240 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | 0.020 | 09102 | 09242 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | 0.030 | 09104 | 09244 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | — | 00440 | 02434 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | 0.005 | 09106 | 09246 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | 0.010 | 09108 | 09248 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | 0.015 | 09110 | 09250 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | 0.020 | 09112 | 09252 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | 0.030 | 09114 | 09254 |
| 0.120 | 1/8 | 0.180 | 1-1/2 | — | 00441 | 02435 |

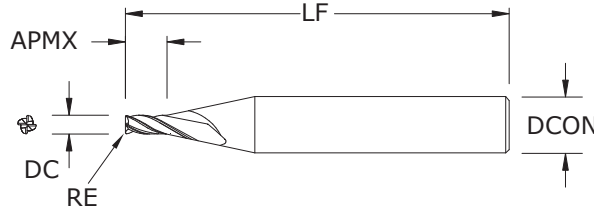
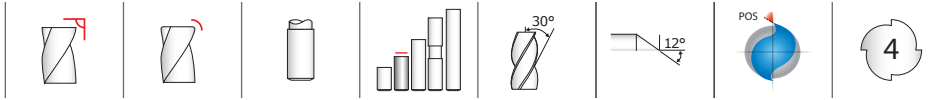
continued on next page

New Expanded Tools

**M4 • M4CR
1.5xD**
FRACTIONAL SERIES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|---------------------------|---------------------------|--------------------------|-------------------------|------------------------|----------|------------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.120 | 1/8 | 0.180 | 1-1/2 | 0.005 | 09116 | 09256 |
| 0.120 | 1/8 | 0.180 | 1-1/2 | 0.010 | 09118 | 09258 |
| 0.120 | 1/8 | 0.180 | 1-1/2 | 0.015 | 09120 | 09260 |
| 0.120 | 1/8 | 0.180 | 1-1/2 | 0.020 | 09122 | 09262 |
| 0.120 | 1/8 | 0.180 | 1-1/2 | 0.030 | 09124 | 09264 |

continued



M4 • M4CR • 3xD

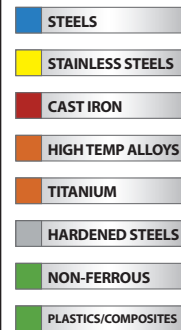
FRACTIONAL SERIES

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Enhanced corner geometry with tight tolerance corner radii
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|------------------------|------------------------|-----------------------|----------------------|---------------------|----------|------------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.005 | 1/8 | 0.015 | 1-1/2 | — | 00514 | 02312 |
| 0.006 | 1/8 | 0.018 | 1-1/2 | — | 00515 | 02313 |
| 0.007 | 1/8 | 0.021 | 1-1/2 | — | 00516 | 02314 |
| 0.008 | 1/8 | 0.024 | 1-1/2 | — | 00517 | 02315 |
| 0.009 | 1/8 | 0.027 | 1-1/2 | — | 00518 | 02316 |
| 0.010 | 1/8 | 0.030 | 1-1/2 | — | 00519 | 02317 |
| 0.011 | 1/8 | 0.033 | 1-1/2 | — | 00520 | 02318 |
| 0.012 | 1/8 | 0.036 | 1-1/2 | — | 00521 | 02319 |
| 0.013 | 1/8 | 0.039 | 1-1/2 | — | 00522 | 02320 |
| 0.014 | 1/8 | 0.042 | 1-1/2 | — | 00523 | 02321 |
| 0.015 | 1/8 | 0.045 | 1-1/2 | — | 00524 | 02322 |
| 0.015 | 1/8 | 0.045 | 1-1/2 | 0.003 | 08987 | 09127 |
| 0.016 | 1/8 | 0.048 | 1-1/2 | — | 00525 | 02323 |
| 0.017 | 1/8 | 0.051 | 1-1/2 | — | 00526 | 02324 |
| 0.018 | 1/8 | 0.054 | 1-1/2 | — | 00527 | 02325 |
| 0.019 | 1/8 | 0.057 | 1-1/2 | — | 00528 | 02326 |
| 0.020 | 1/8 | 0.060 | 1-1/2 | — | 00529 | 02327 |
| 0.020 | 1/8 | 0.060 | 1-1/2 | 0.003 | 08989 | 09129 |
| 0.020 | 1/8 | 0.060 | 1-1/2 | 0.005 | 04028 | 04029 |
| 0.021 | 1/8 | 0.063 | 1-1/2 | — | 00530 | 02328 |
| 0.022 | 1/8 | 0.066 | 1-1/2 | — | 00531 | 02329 |
| 0.023 | 1/8 | 0.069 | 1-1/2 | — | 00532 | 02330 |
| 0.024 | 1/8 | 0.072 | 1-1/2 | — | 00533 | 02331 |
| 0.025 | 1/8 | 0.075 | 1-1/2 | — | 00534 | 02332 |
| 0.025 | 1/8 | 0.075 | 1-1/2 | 0.005 | 04030 | 04031 |
| 0.025 | 1/8 | 0.075 | 1-1/2 | 0.010 | 08991 | 09131 |
| 0.026 | 1/8 | 0.078 | 1-1/2 | — | 00535 | 02333 |
| 0.027 | 1/8 | 0.081 | 1-1/2 | — | 00536 | 02334 |
| 0.028 | 1/8 | 0.084 | 1-1/2 | — | 00537 | 02335 |
| 0.029 | 1/8 | 0.087 | 1-1/2 | — | 00538 | 02336 |
| 0.030 | 1/8 | 0.090 | 1-1/2 | — | 00539 | 02337 |
| 0.030 | 1/8 | 0.090 | 1-1/2 | 0.010 | 08993 | 09133 |
| 0.031 | 1/8 | 0.093 | 1-1/2 | — | 00540 | 02338 |
| 0.032 | 1/8 | 0.096 | 1-1/2 | — | 00541 | 02339 |
| 0.033 | 1/8 | 0.099 | 1-1/2 | — | 00542 | 02340 |
| 0.034 | 1/8 | 0.102 | 1-1/2 | — | 00543 | 02341 |

TOLERANCES (inch)

.004–.120 DIAMETER
 DC = +0.000/–0.001
 DCON = h₆
 RE = +0.0000/–0.0005



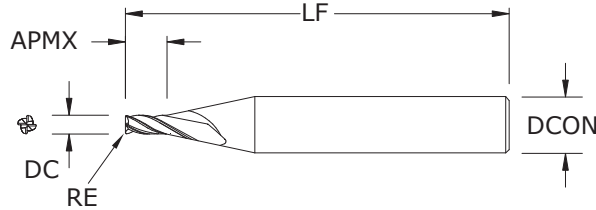
continued on next page

M4 • M4CR • 3xD
FRACTIONAL SERIES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|------------------|----------|---------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.035 | 1/8 | 0.105 | 1-1/2 | — | 00544 | 02342 |
| 0.035 | 1/8 | 0.105 | 1-1/2 | 0.005 | 08995 | 09135 |
| 0.035 | 1/8 | 0.105 | 1-1/2 | 0.010 | 08997 | 09137 |
| 0.036 | 1/8 | 0.108 | 1-1/2 | — | 00545 | 02343 |
| 0.037 | 1/8 | 0.111 | 1-1/2 | — | 00546 | 02344 |
| 0.038 | 1/8 | 0.114 | 1-1/2 | — | 00547 | 02345 |
| 0.039 | 1/8 | 0.117 | 1-1/2 | — | 00548 | 02346 |
| 0.040 | 1/8 | 0.120 | 1-1/2 | — | 00549 | 02347 |
| 0.040 | 1/8 | 0.120 | 1-1/2 | 0.005 | 08999 | 09139 |
| 0.040 | 1/8 | 0.120 | 1-1/2 | 0.010 | 09001 | 09141 |
| 0.041 | 1/8 | 0.123 | 1-1/2 | — | 00550 | 02470 |
| 0.042 | 1/8 | 0.126 | 1-1/2 | — | 00551 | 02471 |
| 0.043 | 1/8 | 0.129 | 1-1/2 | — | 00552 | 02472 |
| 0.044 | 1/8 | 0.132 | 1-1/2 | — | 00553 | 02473 |
| 0.045 | 1/8 | 0.135 | 1-1/2 | — | 00554 | 02474 |
| 0.045 | 1/8 | 0.135 | 1-1/2 | 0.005 | 09003 | 09143 |
| 0.045 | 1/8 | 0.135 | 1-1/2 | 0.010 | 09005 | 09145 |
| 0.046 | 1/8 | 0.138 | 1-1/2 | — | 00555 | 02475 |
| 0.047 | 1/8 | 0.141 | 1-1/2 | — | 00556 | 02476 |
| 0.048 | 1/8 | 0.144 | 1-1/2 | — | 00557 | 02477 |
| 0.049 | 1/8 | 0.147 | 1-1/2 | — | 00558 | 02478 |
| 0.050 | 1/8 | 0.150 | 1-1/2 | — | 00559 | 02479 |
| 0.050 | 1/8 | 0.150 | 1-1/2 | 0.005 | 09007 | 09147 |
| 0.050 | 1/8 | 0.150 | 1-1/2 | 0.010 | 09009 | 09149 |
| 0.050 | 1/8 | 0.150 | 1-1/2 | 0.015 | 09011 | 09151 |
| 0.051 | 1/8 | 0.153 | 1-1/2 | — | 00560 | 02480 |
| 0.052 | 1/8 | 0.156 | 1-1/2 | — | 00561 | 02481 |
| 0.053 | 1/8 | 0.159 | 1-1/2 | — | 00562 | 02482 |
| 0.054 | 1/8 | 0.162 | 1-1/2 | — | 00563 | 02483 |
| 0.055 | 1/8 | 0.165 | 1-1/2 | — | 00564 | 02484 |
| 0.055 | 1/8 | 0.165 | 1-1/2 | 0.005 | 09013 | 09153 |
| 0.055 | 1/8 | 0.165 | 1-1/2 | 0.010 | 09015 | 09155 |
| 0.055 | 1/8 | 0.165 | 1-1/2 | 0.015 | 09017 | 09157 |
| 0.056 | 1/8 | 0.168 | 1-1/2 | — | 00565 | 02485 |
| 0.057 | 1/8 | 0.171 | 1-1/2 | — | 00566 | 02486 |
| 0.058 | 1/8 | 0.174 | 1-1/2 | — | 00567 | 02487 |

continued

continued on next page



 New Expanded Tools

M4 • M4CR • 3xD
FRACTIONAL SERIES

continued

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|------------------------|------------------------|-----------------------|----------------------|---------------------|----------|------------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.059 | 1/8 | 0.177 | 1-1/2 | — | 00568 | 02488 |
| 0.060 | 1/8 | 0.180 | 1-1/2 | — | 00569 | 02489 |
| 0.060 | 1/8 | 0.180 | 1-1/2 | 0.005 | 09019 | 09159 |
| 0.060 | 1/8 | 0.180 | 1-1/2 | 0.010 | 09021 | 09161 |
| 0.060 | 1/8 | 0.180 | 1-1/2 | 0.015 | 09023 | 09163 |
| 0.062 | 1/8 | 0.186 | 1-1/2 | — | 00570 | 02490 |
| 0.065 | 1/8 | 0.195 | 1-1/2 | — | 00571 | 02491 |
| 0.065 | 1/8 | 0.195 | 1-1/2 | 0.005 | 09025 | 09165 |
| 0.065 | 1/8 | 0.195 | 1-1/2 | 0.010 | 09027 | 09167 |
| 0.065 | 1/8 | 0.195 | 1-1/2 | 0.015 | 09029 | 09169 |
| 0.070 | 1/8 | 0.210 | 1-1/2 | — | 00572 | 02492 |
| 0.070 | 1/8 | 0.210 | 1-1/2 | 0.005 | 09031 | 09171 |
| 0.070 | 1/8 | 0.210 | 1-1/2 | 0.010 | 09033 | 09173 |
| 0.070 | 1/8 | 0.210 | 1-1/2 | 0.015 | 09035 | 09175 |
| 0.075 | 1/8 | 0.225 | 1-1/2 | — | 04015 | 04013 |
| 0.075 | 1/8 | 0.225 | 1-1/2 | 0.005 | 09037 | 09177 |
| 0.075 | 1/8 | 0.225 | 1-1/2 | 0.010 | 09039 | 09179 |
| 0.075 | 1/8 | 0.225 | 1-1/2 | 0.015 | 09041 | 09181 |
| 0.075 | 1/8 | 0.225 | 1-1/2 | 0.020 | 09043 | 09183 |
| 0.078 | 1/8 | 0.234 | 1-1/2 | — | 00573 | 02493 |
| 0.080 | 1/8 | 0.240 | 1-1/2 | — | 00574 | 02494 |
| 0.080 | 1/8 | 0.240 | 1-1/2 | 0.005 | 09045 | 09185 |
| 0.080 | 1/8 | 0.240 | 1-1/2 | 0.010 | 09047 | 09187 |
| 0.080 | 1/8 | 0.240 | 1-1/2 | 0.015 | 09049 | 09189 |
| 0.080 | 1/8 | 0.240 | 1-1/2 | 0.020 | 09051 | 09191 |
| 0.085 | 1/8 | 0.255 | 1-1/2 | — | 00575 | 02495 |
| 0.085 | 1/8 | 0.255 | 1-1/2 | 0.005 | 09053 | 09193 |
| 0.085 | 1/8 | 0.255 | 1-1/2 | 0.010 | 09055 | 09195 |
| 0.085 | 1/8 | 0.255 | 1-1/2 | 0.015 | 09057 | 09197 |
| 0.085 | 1/8 | 0.255 | 1-1/2 | 0.020 | 09059 | 09199 |
| 0.090 | 1/8 | 0.270 | 1-1/2 | — | 00576 | 02496 |
| 0.090 | 1/8 | 0.270 | 1-1/2 | 0.005 | 09061 | 09201 |
| 0.090 | 1/8 | 0.270 | 1-1/2 | 0.010 | 09063 | 09203 |
| 0.090 | 1/8 | 0.270 | 1-1/2 | 0.015 | 09065 | 09205 |
| 0.090 | 1/8 | 0.270 | 1-1/2 | 0.020 | 09067 | 09207 |
| 0.093 | 1/8 | 0.279 | 1-1/2 | — | 00577 | 02497 |

TOLERANCES (inch)

.004–.120 DIAMETER

DC = +0.000/–0.001

DCON = h₆

RE = +0.0000/–0.0005

STEELS

STAINLESS STEELS

CAST IRON

HIGH TEMP ALLOYS


TITANIUM

HARDENED STEELS

NON-FERROUS

PLASTICS/COMPOSITES

continued on next page

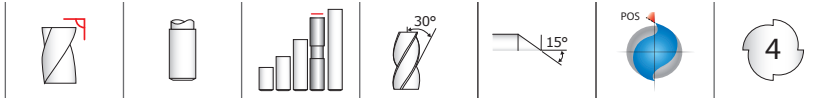
 New Expanded Tools

M4 • M4CR • 3xD
FRACTIONAL SERIES

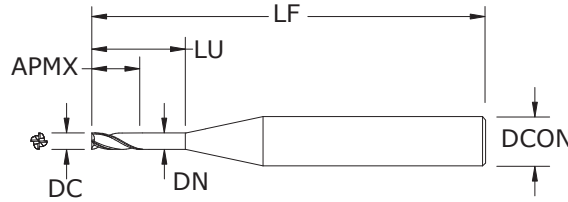
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|------------------|----------|---------------------|
| | | LENGTH OF CUT APMX | OVERALL LENGTH LF | CORNER RADIUS RE | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.095 | 1/8 | 0.285 | 1-1/2 | — | 00578 | 02498 |
| 0.095 | 1/8 | 0.285 | 1-1/2 | 0.005 | 09069 | 09209 |
| 0.095 | 1/8 | 0.285 | 1-1/2 | 0.010 | 09071 | 09211 |
| 0.095 | 1/8 | 0.285 | 1-1/2 | 0.015 | 09073 | 09213 |
| 0.095 | 1/8 | 0.285 | 1-1/2 | 0.020 | 09075 | 09215 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | — | 00579 | 02499 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | 0.005 | 09077 | 09217 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | 0.010 | 09079 | 09219 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | 0.015 | 09081 | 09221 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | 0.020 | 09083 | 09223 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | 0.030 | 09085 | 09225 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | — | 00580 | 02500 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | 0.005 | 09087 | 09227 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | 0.010 | 09089 | 09229 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | 0.015 | 09091 | 09231 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | 0.020 | 09093 | 09233 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | 0.030 | 09095 | 09235 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | — | 00581 | 02501 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | 0.005 | 09097 | 09237 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | 0.010 | 09099 | 09239 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | 0.015 | 09101 | 09241 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | 0.020 | 09103 | 09243 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | 0.030 | 09105 | 09245 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | — | 00582 | 02502 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | 0.005 | 09107 | 09247 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | 0.010 | 09109 | 09249 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | 0.015 | 09111 | 09251 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | 0.020 | 09113 | 09253 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | 0.030 | 09115 | 09255 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | — | 00583 | 02503 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | 0.005 | 09117 | 09257 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | 0.010 | 09119 | 09259 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | 0.015 | 09121 | 09261 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | 0.020 | 09123 | 09263 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | 0.030 | 09125 | 09265 |

continued

M4 • 3xD • 8xD Overall Reach



M4 • 3xD 8xD FRACTIONAL SERIES



 New Expanded Tools

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | OVERALL LENGTH LF | EDP NO. | |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------|----------------------|------------------------|--|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | UNCOATED | | TI-NAMITE-A (AITiN) | |
| 0.010 | 1/8 | 0.030 | 0.080 | 0.009 | 1-1/2 | 09839 | 03454 | |
| 0.015 | 1/8 | 0.045 | 0.120 | 0.014 | 1-1/2 | 09841 | 03455 | |
| 0.020 | 1/8 | 0.060 | 0.160 | 0.018 | 1-1/2 | 09843 | 03456 | |
| 0.025 | 1/8 | 0.075 | 0.200 | 0.023 | 1-1/2 | 09845 | 03457 | |
| 0.030 | 1/8 | 0.090 | 0.240 | 0.028 | 1-1/2 | 09847 | 03458 | |
| 0.031 | 1/8 | 0.093 | 0.248 | 0.029 | 1-1/2 | 09849 | 03459 | |
| 0.035 | 1/8 | 0.105 | 0.280 | 0.032 | 1-1/2 | 09851 | 03460 | |
| 0.040 | 1/8 | 0.120 | 0.320 | 0.037 | 1-1/2 | 09853 | 03461 | |
| 0.045 | 1/8 | 0.135 | 0.360 | 0.042 | 2 | 09855 | 03462 | |
| 0.047 | 1/8 | 0.141 | 0.376 | 0.044 | 2 | 09857 | 03463 | |
| 0.050 | 1/8 | 0.150 | 0.400 | 0.047 | 2 | 09859 | 03464 | |
| 0.055 | 1/8 | 0.165 | 0.440 | 0.051 | 2 | 09861 | 03465 | |
| 0.060 | 1/8 | 0.180 | 0.480 | 0.056 | 2 | 09863 | 03466 | |
| 0.062 | 1/8 | 0.186 | 0.496 | 0.058 | 2 | 09865 | 03467 | |
| 0.065 | 1/8 | 0.195 | 0.520 | 0.061 | 2 | 09867 | 03468 | |
| 0.070 | 1/8 | 0.210 | 0.560 | 0.065 | 2 | 09869 | 03469 | |
| 0.075 | 1/8 | 0.225 | 0.600 | 0.070 | 2 | 09871 | 03470 | |
| 0.078 | 1/8 | 0.234 | 0.624 | 0.073 | 2 | 09873 | 03471 | |
| 0.080 | 1/8 | 0.240 | 0.640 | 0.075 | 2 | 09875 | 03472 | |
| 0.085 | 1/8 | 0.255 | 0.680 | 0.079 | 2 | 09877 | 03473 | |
| 0.090 | 1/8 | 0.270 | 0.720 | 0.084 | 2 | 09879 | 03474 | |
| 0.093 | 1/8 | 0.279 | 0.744 | 0.087 | 2 | 09881 | 03475 | |
| 0.095 | 1/8 | 0.285 | 0.760 | 0.089 | 2 | 09883 | 03476 | |
| 0.100 | 1/8 | 0.300 | 0.800 | 0.094 | 2 | 09885 | 03477 | |
| 0.110 | 1/8 | 0.330 | 0.880 | 0.103 | 2 | 09887 | 03478 | |
| 0.115 | 1/8 | 0.345 | 0.920 | 0.108 | 2 | 09889 | 03479 | |
| 0.120 | 1/8 | 0.360 | 0.960 | 0.112 | 2 | 09891 | 03480 | |

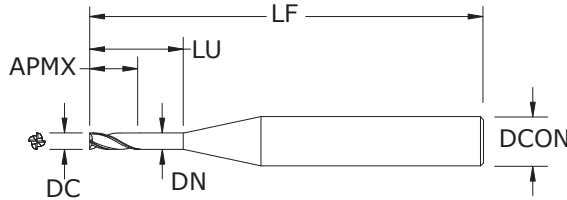
TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M4 • 3xD
12xD
FRACTIONAL SERIES

New Expanded Tools

TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

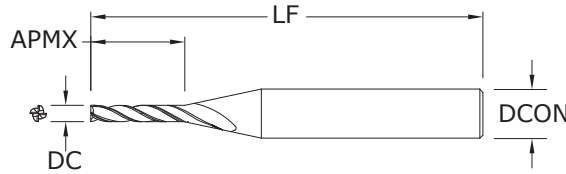
DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | EDP NO. | |
|---------------------|---------------------|--------------------|----------|------------------|-------------------|----------|---------------------|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.010 | 1/8 | 0.030 | 0.120 | 0.009 | 1-1/2 | 09838 | 03481 |
| 0.015 | 1/8 | 0.045 | 0.180 | 0.014 | 1-1/2 | 09840 | 03482 |
| 0.020 | 1/8 | 0.060 | 0.240 | 0.018 | 1-1/2 | 09842 | 03483 |
| 0.025 | 1/8 | 0.075 | 0.300 | 0.023 | 1-1/2 | 09844 | 03484 |
| 0.030 | 1/8 | 0.090 | 0.360 | 0.028 | 2 | 09846 | 03485 |
| 0.031 | 1/8 | 0.093 | 0.372 | 0.029 | 2 | 09848 | 03486 |
| 0.035 | 1/8 | 0.105 | 0.420 | 0.032 | 2 | 09850 | 03487 |
| 0.040 | 1/8 | 0.120 | 0.480 | 0.037 | 2 | 09852 | 03488 |
| 0.045 | 1/8 | 0.135 | 0.540 | 0.042 | 2 | 09854 | 03489 |
| 0.047 | 1/8 | 0.141 | 0.564 | 0.044 | 2 | 09856 | 03490 |
| 0.050 | 1/8 | 0.150 | 0.600 | 0.047 | 2 | 09858 | 03491 |
| 0.055 | 1/8 | 0.165 | 0.660 | 0.051 | 2 | 09860 | 03492 |
| 0.060 | 1/8 | 0.180 | 0.720 | 0.056 | 2 | 09862 | 03493 |
| 0.062 | 1/8 | 0.186 | 0.744 | 0.058 | 2 | 09864 | 03494 |
| 0.065 | 1/8 | 0.195 | 0.780 | 0.061 | 2 | 09866 | 03495 |
| 0.070 | 1/8 | 0.210 | 0.840 | 0.065 | 2 | 09868 | 03496 |
| 0.075 | 1/8 | 0.225 | 0.900 | 0.070 | 2 | 09870 | 03497 |
| 0.078 | 1/8 | 0.234 | 0.936 | 0.073 | 2-1/2 | 09872 | 03498 |
| 0.080 | 1/8 | 0.240 | 0.960 | 0.075 | 2-1/2 | 09874 | 03499 |
| 0.085 | 1/8 | 0.255 | 1.020 | 0.079 | 2-1/2 | 09876 | 03500 |
| 0.090 | 1/8 | 0.270 | 1.080 | 0.084 | 2-1/2 | 09878 | 03501 |
| 0.093 | 1/8 | 0.279 | 1.116 | 0.087 | 2-1/2 | 09880 | 03502 |
| 0.095 | 1/8 | 0.285 | 1.140 | 0.089 | 2-1/2 | 09882 | 03503 |
| 0.100 | 1/8 | 0.300 | 1.200 | 0.094 | 2-1/2 | 09884 | 03504 |
| 0.110 | 1/8 | 0.330 | 1.320 | 0.103 | 2-1/2 | 09886 | 03505 |
| 0.115 | 1/8 | 0.345 | 1.380 | 0.108 | 2-1/2 | 09888 | 03506 |
| 0.120 | 1/8 | 0.360 | 1.440 | 0.112 | 2-1/2 | 09890 | 03507 |

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

FRACTIONAL M4L • 5xD



New Expanded Tools

M4L • 5xD FRACTIONAL SERIES

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| inch | | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|----------|---------------------|
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.010 | 1/8 | 0.050 | 2-1/2 | 00584 | 02640 |
| 0.015 | 1/8 | 0.075 | 2-1/2 | 00585 | 02641 |
| 0.020 | 1/8 | 0.100 | 2-1/2 | 00586 | 02642 |
| 0.025 | 1/8 | 0.125 | 2-1/2 | 00587 | 02643 |
| 0.030 | 1/8 | 0.150 | 2-1/2 | 00588 | 02644 |
| 0.031 | 1/8 | 0.155 | 2-1/2 | 00589 | 02645 |
| 0.035 | 1/8 | 0.175 | 2-1/2 | 00590 | 02646 |
| 0.040 | 1/8 | 0.200 | 2-1/2 | 00591 | 02647 |
| 0.045 | 1/8 | 0.225 | 2-1/2 | 00592 | 02648 |
| 0.047 | 1/8 | 0.235 | 2-1/2 | 00593 | 02649 |
| 0.050 | 1/8 | 0.250 | 2-1/2 | 00594 | 02650 |
| 0.055 | 1/8 | 0.275 | 2-1/2 | 00595 | 02651 |
| 0.060 | 1/8 | 0.300 | 2-1/2 | 00596 | 02652 |
| 0.062 | 1/8 | 0.310 | 2-1/2 | 00597 | 02653 |
| 0.065 | 1/8 | 0.325 | 2-1/2 | 00598 | 02654 |
| 0.070 | 1/8 | 0.350 | 2-1/2 | 00599 | 02655 |
| 0.075 | 1/8 | 0.375 | 2-1/2 | 00600 | 02656 |
| 0.078 | 1/8 | 0.390 | 2-1/2 | 00601 | 02657 |
| 0.080 | 1/8 | 0.400 | 2-1/2 | 00602 | 02658 |
| 0.085 | 1/8 | 0.425 | 2-1/2 | 00603 | 02659 |
| 0.090 | 1/8 | 0.450 | 2-1/2 | 00604 | 02660 |
| 0.093 | 1/8 | 0.465 | 2-1/2 | 00605 | 02661 |
| 0.095 | 1/8 | 0.475 | 2-1/2 | 00606 | 02662 |
| 0.100 | 1/8 | 0.500 | 2-1/2 | 00607 | 02663 |
| 0.110 | 1/8 | 0.550 | 2-1/2 | 00608 | 02664 |
| 0.115 | 1/8 | 0.575 | 2-1/2 | 00609 | 02665 |
| 0.120 | 1/8 | 0.600 | 2-1/2 | 00610 | 02666 |

TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



New Expanded Tools

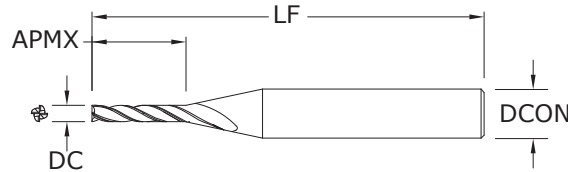
TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

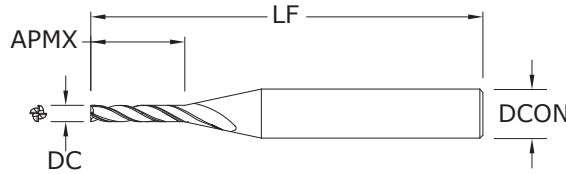


M4E • 8xD
FRACTIONAL SERIES

| inch | | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|----------|---------------------|
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.010 | 1/8 | 0.080 | 2-1/2 | 00611 | 02667 |
| 0.015 | 1/8 | 0.120 | 2-1/2 | 00612 | 02668 |
| 0.020 | 1/8 | 0.160 | 2-1/2 | 00613 | 02669 |
| 0.025 | 1/8 | 0.200 | 2-1/2 | 00614 | 02670 |
| 0.030 | 1/8 | 0.240 | 2-1/2 | 00615 | 02671 |
| 0.031 | 1/8 | 0.248 | 2-1/2 | 00616 | 02672 |
| 0.035 | 1/8 | 0.280 | 2-1/2 | 00617 | 02673 |
| 0.040 | 1/8 | 0.320 | 2-1/2 | 00618 | 02674 |
| 0.045 | 1/8 | 0.360 | 2-1/2 | 00619 | 02675 |
| 0.047 | 1/8 | 0.376 | 2-1/2 | 00620 | 02676 |
| 0.050 | 1/8 | 0.400 | 2-1/2 | 00621 | 02677 |
| 0.055 | 1/8 | 0.440 | 2-1/2 | 00622 | 02678 |
| 0.060 | 1/8 | 0.480 | 2-1/2 | 00623 | 02679 |
| 0.062 | 1/8 | 0.496 | 2-1/2 | 00624 | 02680 |
| 0.065 | 1/8 | 0.520 | 2-1/2 | 00625 | 02681 |
| 0.070 | 1/8 | 0.560 | 2-1/2 | 00626 | 02682 |
| 0.075 | 1/8 | 0.600 | 2-1/2 | 00627 | 02683 |
| 0.078 | 1/8 | 0.624 | 2-1/2 | 00628 | 02684 |
| 0.080 | 1/8 | 0.640 | 2-1/2 | 00629 | 02685 |
| 0.085 | 1/8 | 0.680 | 2-1/2 | 00630 | 02686 |
| 0.090 | 1/8 | 0.720 | 2-1/2 | 00631 | 02687 |
| 0.093 | 1/8 | 0.744 | 2-1/2 | 00632 | 02688 |
| 0.095 | 1/8 | 0.760 | 2-1/2 | 00633 | 02689 |
| 0.100 | 1/8 | 0.800 | 2-1/2 | 00634 | 02690 |
| 0.110 | 1/8 | 0.880 | 2-1/2 | 00635 | 02691 |
| 0.115 | 1/8 | 0.920 | 2-1/2 | 00636 | 02692 |
| 0.120 | 1/8 | 0.960 | 2-1/2 | 00637 | 02693 |

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

FRACTIONAL M4X • 12xD



New Expanded Tools

M4X • 12xD FRACTIONAL SERIES

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | EDP NO. | |
|------------------------|------------------------|-----------------------|----------------------|----------|------------------------|
| | | | | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.015 | 1/8 | 0.180 | 2-1/2 | 00639 | 02694 |
| 0.020 | 1/8 | 0.240 | 2-1/2 | 00640 | 02695 |
| 0.025 | 1/8 | 0.300 | 2-1/2 | 00641 | 02696 |
| 0.030 | 1/8 | 0.360 | 2-1/2 | 00642 | 02697 |
| 0.031 | 1/8 | 0.372 | 2-1/2 | 00643 | 02698 |
| 0.035 | 1/8 | 0.420 | 2-1/2 | 00644 | 02699 |
| 0.040 | 1/8 | 0.480 | 2-1/2 | 00645 | 02700 |
| 0.045 | 1/8 | 0.540 | 2-1/2 | 00646 | 02701 |
| 0.047 | 1/8 | 0.564 | 2-1/2 | 00647 | 02702 |
| 0.050 | 1/8 | 0.600 | 2-1/2 | 00648 | 02703 |
| 0.055 | 1/8 | 0.660 | 2-1/2 | 00649 | 02704 |
| 0.060 | 1/8 | 0.720 | 2-1/2 | 00650 | 02705 |
| 0.062 | 1/8 | 0.744 | 2-1/2 | 00651 | 02706 |
| 0.065 | 1/8 | 0.780 | 2-1/2 | 00652 | 02707 |
| 0.070 | 1/8 | 0.840 | 2-1/2 | 00653 | 02708 |
| 0.075 | 1/8 | 0.900 | 2-1/2 | 00654 | 02709 |
| 0.078 | 1/8 | 0.936 | 2-1/2 | 00655 | 02710 |
| 0.080 | 1/8 | 0.960 | 2-1/2 | 00656 | 02711 |
| 0.085 | 1/8 | 1.020 | 2-1/2 | 00657 | 02712 |
| 0.090 | 1/8 | 1.080 | 2-1/2 | 00658 | 02713 |
| 0.093 | 1/8 | 1.116 | 2-1/2 | 00659 | 02714 |
| 0.095 | 1/8 | 1.140 | 2-1/2 | 00660 | 02715 |
| 0.100 | 1/8 | 1.200 | 2-1/2 | 00661 | 02716 |
| 0.110 | 1/8 | 1.320 | 2-1/2 | 00662 | 02717 |
| 0.115 | 1/8 | 1.380 | 2-1/2 | 00663 | 02718 |
| 0.120 | 1/8 | 1.440 | 2-1/2 | 00664 | 02719 |

TOLERANCES (inch)

.015-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



New Expanded Tools

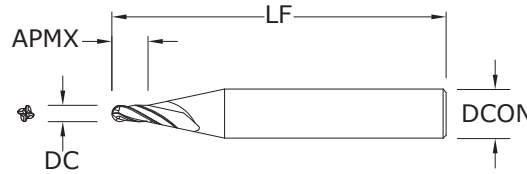
TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M4B • 1.5xD
FRACTIONAL SERIES

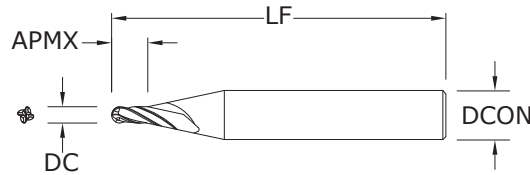
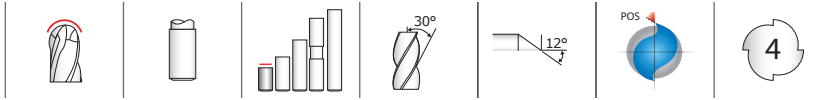
| inch | | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|----------|---------------------|
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AITIN) |
| 0.010 | 1/8 | 0.015 | 1-1/2 | 00745 | 03071 |
| 0.011 | 1/8 | 0.017 | 1-1/2 | 00746 | 03072 |
| 0.012 | 1/8 | 0.018 | 1-1/2 | 00747 | 03073 |
| 0.013 | 1/8 | 0.020 | 1-1/2 | 00748 | 03074 |
| 0.014 | 1/8 | 0.021 | 1-1/2 | 00749 | 03075 |
| 0.015 | 1/8 | 0.023 | 1-1/2 | 00750 | 03076 |
| 0.016 | 1/8 | 0.024 | 1-1/2 | 00751 | 03077 |
| 0.017 | 1/8 | 0.026 | 1-1/2 | 00752 | 03078 |
| 0.018 | 1/8 | 0.027 | 1-1/2 | 00753 | 03079 |
| 0.019 | 1/8 | 0.029 | 1-1/2 | 00754 | 03080 |
| 0.020 | 1/8 | 0.030 | 1-1/2 | 00755 | 03081 |
| 0.021 | 1/8 | 0.032 | 1-1/2 | 00756 | 03082 |
| 0.022 | 1/8 | 0.033 | 1-1/2 | 00757 | 03083 |
| 0.023 | 1/8 | 0.035 | 1-1/2 | 00758 | 03084 |
| 0.024 | 1/8 | 0.036 | 1-1/2 | 00759 | 03085 |
| 0.025 | 1/8 | 0.038 | 1-1/2 | 00760 | 03086 |
| 0.026 | 1/8 | 0.039 | 1-1/2 | 00761 | 03087 |
| 0.027 | 1/8 | 0.041 | 1-1/2 | 00762 | 03088 |
| 0.028 | 1/8 | 0.042 | 1-1/2 | 00763 | 03089 |
| 0.029 | 1/8 | 0.044 | 1-1/2 | 00764 | 03090 |
| 0.030 | 1/8 | 0.045 | 1-1/2 | 00765 | 03091 |
| 0.031 | 1/8 | 0.047 | 1-1/2 | 00766 | 03092 |
| 0.032 | 1/8 | 0.048 | 1-1/2 | 00767 | 03093 |
| 0.033 | 1/8 | 0.050 | 1-1/2 | 00768 | 03094 |
| 0.034 | 1/8 | 0.051 | 1-1/2 | 00769 | 03095 |
| 0.035 | 1/8 | 0.053 | 1-1/2 | 00770 | 03096 |
| 0.036 | 1/8 | 0.054 | 1-1/2 | 00771 | 03097 |
| 0.037 | 1/8 | 0.056 | 1-1/2 | 00772 | 03098 |
| 0.038 | 1/8 | 0.057 | 1-1/2 | 00773 | 03099 |
| 0.039 | 1/8 | 0.059 | 1-1/2 | 00774 | 03100 |
| 0.040 | 1/8 | 0.060 | 1-1/2 | 00775 | 03101 |
| 0.041 | 1/8 | 0.062 | 1-1/2 | 00776 | 02538 |
| 0.042 | 1/8 | 0.063 | 1-1/2 | 00777 | 02539 |
| 0.043 | 1/8 | 0.065 | 1-1/2 | 00778 | 02540 |

RE = 1/2 Cutting Diameter (DC)

continued on next page

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

M4B • 1.5xD



 New Expanded Tools

M4B • 1.5xD

FRACTIONAL SERIES

continued

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | EDP NO. | |
|------------------------|------------------------|-----------------------|----------------------|----------|------------------------|
| | | | | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.044 | 1/8 | 0.066 | 1-1/2 | 00779 | 02541 |
| 0.045 | 1/8 | 0.068 | 1-1/2 | 00780 | 02542 |
| 0.046 | 1/8 | 0.069 | 1-1/2 | 00781 | 02543 |
| 0.047 | 1/8 | 0.071 | 1-1/2 | 00782 | 02544 |
| 0.048 | 1/8 | 0.072 | 1-1/2 | 00783 | 02545 |
| 0.049 | 1/8 | 0.074 | 1-1/2 | 00784 | 02546 |
| 0.050 | 1/8 | 0.075 | 1-1/2 | 00785 | 02547 |
| 0.051 | 1/8 | 0.077 | 1-1/2 | 00786 | 02548 |
| 0.052 | 1/8 | 0.078 | 1-1/2 | 00787 | 02549 |
| 0.053 | 1/8 | 0.080 | 1-1/2 | 00788 | 02550 |
| 0.054 | 1/8 | 0.081 | 1-1/2 | 00789 | 02551 |
| 0.055 | 1/8 | 0.083 | 1-1/2 | 00790 | 02552 |
| 0.056 | 1/8 | 0.084 | 1-1/2 | 00791 | 02553 |
| 0.057 | 1/8 | 0.086 | 1-1/2 | 00792 | 02554 |
| 0.058 | 1/8 | 0.087 | 1-1/2 | 00793 | 02555 |
| 0.059 | 1/8 | 0.089 | 1-1/2 | 00794 | 02556 |
| 0.060 | 1/8 | 0.090 | 1-1/2 | 00795 | 02557 |
| 0.062 | 1/8 | 0.093 | 1-1/2 | 00796 | 02558 |
| 0.065 | 1/8 | 0.098 | 1-1/2 | 00797 | 02559 |
| 0.070 | 1/8 | 0.105 | 1-1/2 | 00798 | 02560 |
| 0.075 | 1/8 | 0.112 | 1-1/2 | 04018 | 04016 |
| 0.078 | 1/8 | 0.117 | 1-1/2 | 00799 | 02561 |
| 0.080 | 1/8 | 0.120 | 1-1/2 | 00800 | 02562 |
| 0.085 | 1/8 | 0.128 | 1-1/2 | 00801 | 02563 |
| 0.090 | 1/8 | 0.135 | 1-1/2 | 00802 | 02564 |
| 0.093 | 1/8 | 0.140 | 1-1/2 | 00803 | 02565 |
| 0.095 | 1/8 | 0.143 | 1-1/2 | 00804 | 02566 |
| 0.100 | 1/8 | 0.150 | 1-1/2 | 00805 | 02567 |
| 0.105 | 1/8 | 0.158 | 1-1/2 | 00806 | 02568 |
| 0.110 | 1/8 | 0.165 | 1-1/2 | 00807 | 02569 |
| 0.115 | 1/8 | 0.173 | 1-1/2 | 00808 | 02570 |
| 0.120 | 1/8 | 0.180 | 1-1/2 | 00809 | 02571 |

RE = 1/2 Cutting Diameter (DC)

TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



New Expanded Tools

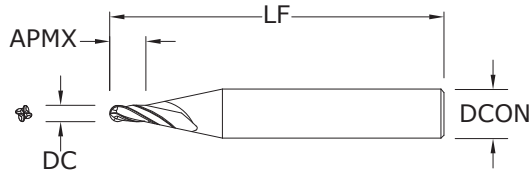
TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M4B • 3xD
FRACTIONAL SERIES

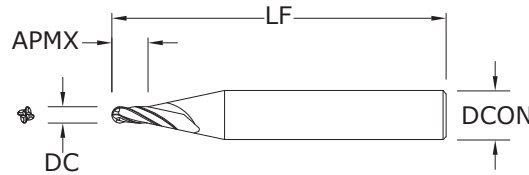
| inch | | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|----------|---------------------|
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.010 | 1/8 | 0.030 | 1-1/2 | 00887 | 03145 |
| 0.011 | 1/8 | 0.033 | 1-1/2 | 00888 | 03146 |
| 0.012 | 1/8 | 0.036 | 1-1/2 | 00889 | 03147 |
| 0.013 | 1/8 | 0.039 | 1-1/2 | 00890 | 03148 |
| 0.014 | 1/8 | 0.042 | 1-1/2 | 00891 | 03149 |
| 0.015 | 1/8 | 0.045 | 1-1/2 | 00892 | 03150 |
| 0.016 | 1/8 | 0.048 | 1-1/2 | 00893 | 03151 |
| 0.017 | 1/8 | 0.051 | 1-1/2 | 00894 | 03152 |
| 0.018 | 1/8 | 0.054 | 1-1/2 | 00895 | 03153 |
| 0.019 | 1/8 | 0.057 | 1-1/2 | 00896 | 03154 |
| 0.020 | 1/8 | 0.060 | 1-1/2 | 00897 | 03155 |
| 0.021 | 1/8 | 0.063 | 1-1/2 | 00898 | 03156 |
| 0.022 | 1/8 | 0.066 | 1-1/2 | 00899 | 03157 |
| 0.023 | 1/8 | 0.069 | 1-1/2 | 00900 | 03158 |
| 0.024 | 1/8 | 0.072 | 1-1/2 | 00901 | 03159 |
| 0.025 | 1/8 | 0.075 | 1-1/2 | 00902 | 03160 |
| 0.026 | 1/8 | 0.078 | 1-1/2 | 00903 | 03161 |
| 0.027 | 1/8 | 0.081 | 1-1/2 | 00904 | 03162 |
| 0.028 | 1/8 | 0.084 | 1-1/2 | 00905 | 03163 |
| 0.029 | 1/8 | 0.087 | 1-1/2 | 00906 | 03164 |
| 0.030 | 1/8 | 0.090 | 1-1/2 | 00907 | 03165 |
| 0.031 | 1/8 | 0.093 | 1-1/2 | 00908 | 03166 |
| 0.032 | 1/8 | 0.096 | 1-1/2 | 00909 | 03167 |
| 0.033 | 1/8 | 0.099 | 1-1/2 | 00910 | 03168 |
| 0.034 | 1/8 | 0.102 | 1-1/2 | 00911 | 03169 |
| 0.035 | 1/8 | 0.105 | 1-1/2 | 00912 | 03170 |
| 0.036 | 1/8 | 0.108 | 1-1/2 | 00913 | 03171 |
| 0.037 | 1/8 | 0.111 | 1-1/2 | 00914 | 03172 |
| 0.038 | 1/8 | 0.114 | 1-1/2 | 00915 | 03173 |
| 0.039 | 1/8 | 0.117 | 1-1/2 | 00916 | 03174 |
| 0.040 | 1/8 | 0.120 | 1-1/2 | 00917 | 03175 |
| 0.041 | 1/8 | 0.123 | 1-1/2 | 00918 | 02606 |
| 0.042 | 1/8 | 0.126 | 1-1/2 | 00919 | 02607 |
| 0.043 | 1/8 | 0.129 | 1-1/2 | 00920 | 02608 |

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

RE = 1/2 Cutting Diameter (DC)

continued on next page

M4B • 3xD



 New Expanded Tools

M4B • 3xD

FRACTIONAL SERIES

TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

continued

| inch | | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|----------|---------------------|
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.044 | 1/8 | 0.132 | 1-1/2 | 00921 | 02609 |
| 0.045 | 1/8 | 0.135 | 1-1/2 | 00922 | 02610 |
| 0.046 | 1/8 | 0.138 | 1-1/2 | 00923 | 02611 |
| 0.047 | 1/8 | 0.141 | 1-1/2 | 00924 | 02612 |
| 0.048 | 1/8 | 0.144 | 1-1/2 | 00925 | 02613 |
| 0.049 | 1/8 | 0.147 | 1-1/2 | 00926 | 02614 |
| 0.050 | 1/8 | 0.150 | 1-1/2 | 00927 | 02615 |
| 0.051 | 1/8 | 0.153 | 1-1/2 | 00928 | 02616 |
| 0.052 | 1/8 | 0.156 | 1-1/2 | 00929 | 02617 |
| 0.053 | 1/8 | 0.159 | 1-1/2 | 00930 | 02618 |
| 0.054 | 1/8 | 0.162 | 1-1/2 | 00931 | 02619 |
| 0.055 | 1/8 | 0.165 | 1-1/2 | 00932 | 02620 |
| 0.056 | 1/8 | 0.168 | 1-1/2 | 00933 | 02621 |
| 0.057 | 1/8 | 0.171 | 1-1/2 | 00934 | 02622 |
| 0.058 | 1/8 | 0.174 | 1-1/2 | 00935 | 02623 |
| 0.059 | 1/8 | 0.177 | 1-1/2 | 00936 | 02624 |
| 0.060 | 1/8 | 0.180 | 1-1/2 | 00937 | 02625 |
| 0.062 | 1/8 | 0.186 | 1-1/2 | 00938 | 02626 |
| 0.065 | 1/8 | 0.195 | 1-1/2 | 00939 | 02627 |
| 0.070 | 1/8 | 0.210 | 1-1/2 | 00940 | 02628 |
| 0.075 | 1/8 | 0.225 | 1-1/2 | 04019 | 04017 |
| 0.078 | 1/8 | 0.234 | 1-1/2 | 00941 | 02629 |
| 0.080 | 1/8 | 0.240 | 1-1/2 | 00942 | 02630 |
| 0.085 | 1/8 | 0.255 | 1-1/2 | 00943 | 02631 |
| 0.090 | 1/8 | 0.270 | 1-1/2 | 00944 | 02632 |
| 0.093 | 1/8 | 0.279 | 1-1/2 | 00945 | 02633 |
| 0.095 | 1/8 | 0.285 | 1-1/2 | 00946 | 02634 |
| 0.100 | 1/8 | 0.300 | 1-1/2 | 00947 | 02635 |
| 0.105 | 1/8 | 0.315 | 1-1/2 | 00948 | 02636 |
| 0.110 | 1/8 | 0.330 | 1-1/2 | 00949 | 02637 |
| 0.115 | 1/8 | 0.345 | 1-1/2 | 00950 | 02638 |
| 0.120 | 1/8 | 0.360 | 1-1/2 | 00951 | 02639 |

RE = 1/2 Cutting Diameter (DC)



New Expanded Tools

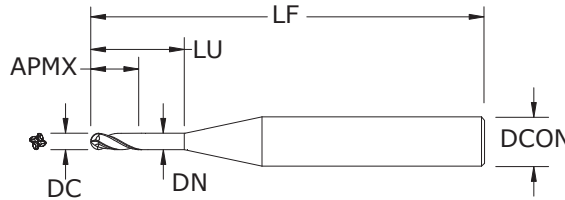
TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



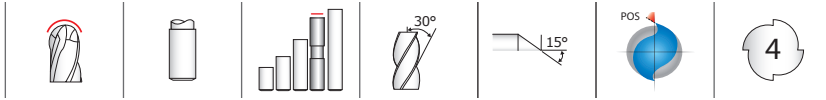
M4B • 3xD
8xD
FRACTIONAL SERIES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | | OVERALL LENGTH LF | EDP NO. | |
|---------------------|---------------------|--------------------|----------|------------------|----------|-------------------|---------------------|--|
| | | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| 0.010 | 1/8 | 0.030 | 0.080 | 0.009 | 1-1/2 | 09785 | 03751 | |
| 0.015 | 1/8 | 0.045 | 0.120 | 0.014 | 1-1/2 | 09787 | 03752 | |
| 0.020 | 1/8 | 0.060 | 0.160 | 0.018 | 1-1/2 | 09789 | 03753 | |
| 0.025 | 1/8 | 0.075 | 0.200 | 0.023 | 1-1/2 | 09791 | 03754 | |
| 0.030 | 1/8 | 0.090 | 0.240 | 0.028 | 1-1/2 | 09793 | 03755 | |
| 0.031 | 1/8 | 0.093 | 0.248 | 0.029 | 1-1/2 | 09795 | 03756 | |
| 0.035 | 1/8 | 0.105 | 0.280 | 0.032 | 1-1/2 | 09797 | 03757 | |
| 0.040 | 1/8 | 0.120 | 0.320 | 0.037 | 1-1/2 | 09799 | 03758 | |
| 0.045 | 1/8 | 0.135 | 0.360 | 0.042 | 2 | 09801 | 03759 | |
| 0.047 | 1/8 | 0.141 | 0.376 | 0.044 | 2 | 09803 | 03760 | |
| 0.050 | 1/8 | 0.150 | 0.400 | 0.047 | 2 | 09805 | 03761 | |
| 0.055 | 1/8 | 0.165 | 0.440 | 0.051 | 2 | 09807 | 03762 | |
| 0.060 | 1/8 | 0.180 | 0.480 | 0.056 | 2 | 09809 | 03763 | |
| 0.062 | 1/8 | 0.186 | 0.496 | 0.058 | 2 | 09811 | 03764 | |
| 0.065 | 1/8 | 0.195 | 0.520 | 0.061 | 2 | 09813 | 03765 | |
| 0.070 | 1/8 | 0.210 | 0.560 | 0.065 | 2 | 09815 | 03766 | |
| 0.075 | 1/8 | 0.225 | 0.600 | 0.070 | 2 | 09817 | 03767 | |
| 0.078 | 1/8 | 0.234 | 0.624 | 0.073 | 2 | 09819 | 03768 | |
| 0.080 | 1/8 | 0.240 | 0.640 | 0.075 | 2 | 09821 | 03769 | |
| 0.085 | 1/8 | 0.255 | 0.680 | 0.079 | 2 | 09823 | 03770 | |
| 0.090 | 1/8 | 0.270 | 0.720 | 0.084 | 2 | 09825 | 03771 | |
| 0.093 | 1/8 | 0.279 | 0.744 | 0.087 | 2 | 09827 | 03772 | |
| 0.095 | 1/8 | 0.285 | 0.760 | 0.089 | 2 | 09829 | 03773 | |
| 0.100 | 1/8 | 0.300 | 0.800 | 0.094 | 2 | 09831 | 03774 | |
| 0.110 | 1/8 | 0.330 | 0.880 | 0.103 | 2 | 09833 | 03775 | |
| 0.115 | 1/8 | 0.345 | 0.920 | 0.108 | 2 | 09835 | 03776 | |
| 0.120 | 1/8 | 0.360 | 0.960 | 0.112 | 2 | 09837 | 03777 | |

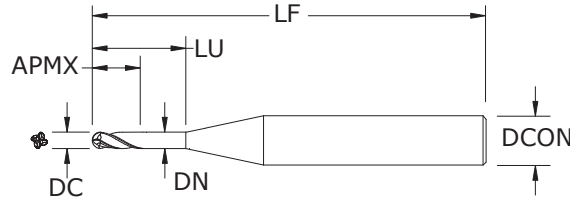
RE = 1/2 Cutting Diameter (DC)

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

M4B • 3xD • 12xD Overall Reach



M4B • 3xD 12xD FRACTIONAL SERIES



 New Expanded Tools

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| inch | | | | | | EDP NO. | |
|---------------------|---------------------|--------------------|----------|------------------|-------------------|----------|---------------------|
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AITIN) |
| 0.010 | 1/8 | 0.030 | 0.120 | 0.009 | 1-1/2 | 09784 | 03778 |
| 0.015 | 1/8 | 0.045 | 0.180 | 0.014 | 1-1/2 | 09786 | 03779 |
| 0.020 | 1/8 | 0.060 | 0.240 | 0.018 | 1-1/2 | 09788 | 03780 |
| 0.025 | 1/8 | 0.075 | 0.300 | 0.023 | 1-1/2 | 09790 | 03781 |
| 0.030 | 1/8 | 0.090 | 0.360 | 0.028 | 2 | 09792 | 03782 |
| 0.031 | 1/8 | 0.093 | 0.372 | 0.029 | 2 | 09794 | 03783 |
| 0.035 | 1/8 | 0.105 | 0.420 | 0.032 | 2 | 09796 | 03784 |
| 0.040 | 1/8 | 0.120 | 0.480 | 0.037 | 2 | 09798 | 03785 |
| 0.045 | 1/8 | 0.135 | 0.540 | 0.042 | 2 | 09800 | 03786 |
| 0.047 | 1/8 | 0.141 | 0.564 | 0.044 | 2 | 09802 | 03787 |
| 0.050 | 1/8 | 0.150 | 0.600 | 0.047 | 2 | 09804 | 03788 |
| 0.055 | 1/8 | 0.165 | 0.660 | 0.051 | 2 | 09806 | 03789 |
| 0.060 | 1/8 | 0.180 | 0.720 | 0.056 | 2 | 09808 | 03790 |
| 0.062 | 1/8 | 0.186 | 0.744 | 0.058 | 2 | 09810 | 03791 |
| 0.065 | 1/8 | 0.195 | 0.780 | 0.061 | 2 | 09812 | 03792 |
| 0.070 | 1/8 | 0.210 | 0.840 | 0.065 | 2 | 09814 | 03793 |
| 0.075 | 1/8 | 0.225 | 0.900 | 0.070 | 2 | 09816 | 03794 |
| 0.078 | 1/8 | 0.234 | 0.936 | 0.073 | 2-1/2 | 09818 | 03795 |
| 0.080 | 1/8 | 0.240 | 0.960 | 0.075 | 2-1/2 | 09820 | 03796 |
| 0.085 | 1/8 | 0.255 | 1.020 | 0.079 | 2-1/2 | 09822 | 03797 |
| 0.090 | 1/8 | 0.270 | 1.080 | 0.084 | 2-1/2 | 09824 | 03798 |
| 0.093 | 1/8 | 0.279 | 1.116 | 0.087 | 2-1/2 | 09826 | 03799 |
| 0.095 | 1/8 | 0.285 | 1.140 | 0.089 | 2-1/2 | 09828 | 03800 |
| 0.100 | 1/8 | 0.300 | 1.200 | 0.094 | 2-1/2 | 09830 | 03801 |
| 0.110 | 1/8 | 0.330 | 1.320 | 0.103 | 2-1/2 | 09832 | 03802 |
| 0.115 | 1/8 | 0.345 | 1.380 | 0.108 | 2-1/2 | 09834 | 03803 |
| 0.120 | 1/8 | 0.360 | 1.440 | 0.112 | 2-1/2 | 09836 | 03804 |

RE = 1/2 Cutting Diameter (DC)

TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



New Expanded Tools

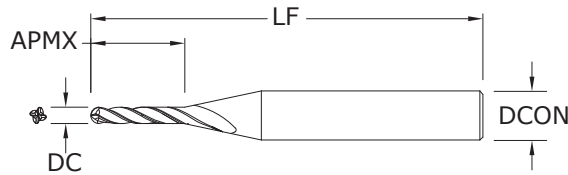
TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M4LB • 5xD
FRACTIONAL SERIES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|----------|---------------------|
| | | | | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.010 | 1/8 | 0.050 | 2-1/2 | 00952 | 02720 |
| 0.015 | 1/8 | 0.075 | 2-1/2 | 00953 | 02721 |
| 0.020 | 1/8 | 0.100 | 2-1/2 | 00954 | 02722 |
| 0.025 | 1/8 | 0.125 | 2-1/2 | 00955 | 02723 |
| 0.030 | 1/8 | 0.150 | 2-1/2 | 00956 | 02724 |
| 0.031 | 1/8 | 0.155 | 2-1/2 | 00957 | 02725 |
| 0.035 | 1/8 | 0.175 | 2-1/2 | 00958 | 02726 |
| 0.040 | 1/8 | 0.200 | 2-1/2 | 00959 | 02727 |
| 0.045 | 1/8 | 0.225 | 2-1/2 | 00960 | 02728 |
| 0.047 | 1/8 | 0.235 | 2-1/2 | 00961 | 02729 |
| 0.050 | 1/8 | 0.250 | 2-1/2 | 00962 | 02730 |
| 0.055 | 1/8 | 0.275 | 2-1/2 | 00963 | 02731 |
| 0.060 | 1/8 | 0.300 | 2-1/2 | 00964 | 02732 |
| 0.062 | 1/8 | 0.310 | 2-1/2 | 00965 | 02733 |
| 0.065 | 1/8 | 0.325 | 2-1/2 | 00966 | 02734 |
| 0.070 | 1/8 | 0.350 | 2-1/2 | 00967 | 02735 |
| 0.075 | 1/8 | 0.375 | 2-1/2 | 00968 | 02736 |
| 0.078 | 1/8 | 0.390 | 2-1/2 | 00969 | 02737 |
| 0.080 | 1/8 | 0.400 | 2-1/2 | 00970 | 02738 |
| 0.085 | 1/8 | 0.425 | 2-1/2 | 00971 | 02739 |
| 0.090 | 1/8 | 0.450 | 2-1/2 | 00972 | 02740 |
| 0.093 | 1/8 | 0.465 | 2-1/2 | 00973 | 02741 |
| 0.095 | 1/8 | 0.475 | 2-1/2 | 00974 | 02742 |
| 0.100 | 1/8 | 0.500 | 2-1/2 | 00975 | 02743 |
| 0.110 | 1/8 | 0.550 | 2-1/2 | 00976 | 02744 |
| 0.115 | 1/8 | 0.575 | 2-1/2 | 00977 | 02745 |
| 0.120 | 1/8 | 0.600 | 2-1/2 | 00978 | 02746 |

RE = 1/2 Cutting Diameter (DC)

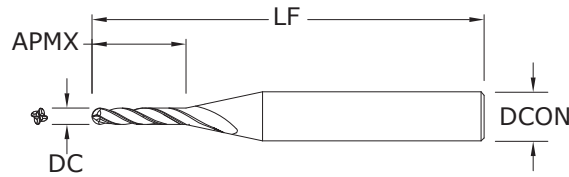
- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

M4EB • 8xD



M4EB • 8xD

FRACTIONAL SERIES



 New Expanded Tools

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | EDP NO. | |
|------------------------|------------------------|-----------------------|----------------------|----------|---------------------|
| | | | | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0.010 | 1/8 | 0.080 | 2-1/2 | 00979 | 02747 |
| 0.015 | 1/8 | 0.120 | 2-1/2 | 00980 | 02748 |
| 0.020 | 1/8 | 0.160 | 2-1/2 | 00981 | 02749 |
| 0.025 | 1/8 | 0.200 | 2-1/2 | 00982 | 02750 |
| 0.030 | 1/8 | 0.240 | 2-1/2 | 00983 | 02751 |
| 0.031 | 1/8 | 0.248 | 2-1/2 | 00984 | 02752 |
| 0.035 | 1/8 | 0.280 | 2-1/2 | 00985 | 02753 |
| 0.040 | 1/8 | 0.320 | 2-1/2 | 00986 | 02754 |
| 0.045 | 1/8 | 0.360 | 2-1/2 | 00987 | 02755 |
| 0.047 | 1/8 | 0.376 | 2-1/2 | 00988 | 02756 |
| 0.050 | 1/8 | 0.400 | 2-1/2 | 00989 | 02757 |
| 0.055 | 1/8 | 0.440 | 2-1/2 | 00990 | 02758 |
| 0.060 | 1/8 | 0.480 | 2-1/2 | 00991 | 02759 |
| 0.062 | 1/8 | 0.496 | 2-1/2 | 00992 | 02760 |
| 0.065 | 1/8 | 0.520 | 2-1/2 | 00993 | 02761 |
| 0.070 | 1/8 | 0.560 | 2-1/2 | 00994 | 02762 |
| 0.075 | 1/8 | 0.600 | 2-1/2 | 00995 | 02763 |
| 0.078 | 1/8 | 0.624 | 2-1/2 | 00996 | 02764 |
| 0.080 | 1/8 | 0.640 | 2-1/2 | 00997 | 02765 |
| 0.085 | 1/8 | 0.680 | 2-1/2 | 00998 | 02766 |
| 0.090 | 1/8 | 0.720 | 2-1/2 | 00999 | 02767 |
| 0.093 | 1/8 | 0.744 | 2-1/2 | 01000 | 02768 |
| 0.095 | 1/8 | 0.760 | 2-1/2 | 01001 | 02769 |
| 0.100 | 1/8 | 0.800 | 2-1/2 | 01002 | 02770 |
| 0.110 | 1/8 | 0.880 | 2-1/2 | 01003 | 02771 |
| 0.115 | 1/8 | 0.920 | 2-1/2 | 01004 | 02772 |
| 0.120 | 1/8 | 0.960 | 2-1/2 | 01005 | 02773 |

RE = 1/2 Cutting Diameter (DC)

TOLERANCES (inch)

.010-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



New Expanded Tools

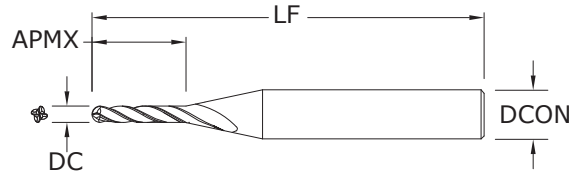
TOLERANCES (inch)

.015-.120 DIAMETER

DC = +0.000/-0.001

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M4XB • 12xD
FRACTIONAL SERIES

| inch | | | | EDP NO. | |
|---------------------|---------------------|--------------------|-------------------|----------|---------------------|
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.015 | 1/8 | 0.180 | 2-1/2 | 01007 | 02774 |
| 0.020 | 1/8 | 0.240 | 2-1/2 | 01008 | 02775 |
| 0.025 | 1/8 | 0.300 | 2-1/2 | 01009 | 02776 |
| 0.030 | 1/8 | 0.360 | 2-1/2 | 01010 | 02777 |
| 0.031 | 1/8 | 0.372 | 2-1/2 | 01011 | 02778 |
| 0.035 | 1/8 | 0.420 | 2-1/2 | 01012 | 02779 |
| 0.040 | 1/8 | 0.480 | 2-1/2 | 01013 | 02780 |
| 0.045 | 1/8 | 0.540 | 2-1/2 | 01014 | 02781 |
| 0.047 | 1/8 | 0.564 | 2-1/2 | 01015 | 02782 |
| 0.050 | 1/8 | 0.600 | 2-1/2 | 01016 | 02783 |
| 0.055 | 1/8 | 0.660 | 2-1/2 | 01017 | 02784 |
| 0.060 | 1/8 | 0.720 | 2-1/2 | 01018 | 02785 |
| 0.062 | 1/8 | 0.744 | 2-1/2 | 01019 | 02786 |
| 0.065 | 1/8 | 0.780 | 2-1/2 | 01020 | 02787 |
| 0.070 | 1/8 | 0.840 | 2-1/2 | 01021 | 02788 |
| 0.075 | 1/8 | 0.900 | 2-1/2 | 01022 | 02789 |
| 0.078 | 1/8 | 0.936 | 2-1/2 | 01023 | 02790 |
| 0.080 | 1/8 | 0.960 | 2-1/2 | 01024 | 02791 |
| 0.085 | 1/8 | 1.020 | 2-1/2 | 01025 | 02792 |
| 0.090 | 1/8 | 1.080 | 2-1/2 | 01026 | 02793 |
| 0.093 | 1/8 | 1.116 | 2-1/2 | 01027 | 02794 |
| 0.095 | 1/8 | 1.140 | 2-1/2 | 01028 | 02795 |
| 0.100 | 1/8 | 1.200 | 2-1/2 | 01029 | 02796 |
| 0.110 | 1/8 | 1.320 | 2-1/2 | 01030 | 02797 |
| 0.115 | 1/8 | 1.380 | 2-1/2 | 01031 | 02798 |
| 0.120 | 1/8 | 1.440 | 2-1/2 | 01032 | 02799 |

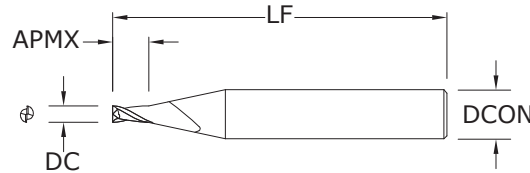
RE = 1/2 Cutting Diameter (DC)

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

M2M • 1.5xD



M2M • 1.5xD METRIC SERIES



 New Expanded Tools

- Two flute design is ideal for softer alloyed, non-ferrous material applications that require slotting or involve heavy chip loads.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | DECIMAL EQUIVALENT | mm | | | EDP NO. | |
|------------------------|--------------------|------------------------|-----------------------|----------------------|----------|------------------------|
| | | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0,1 | 0.0039 | 3,0 | 0,1 | 38,0 | 05002 | 05000 |
| 0,2 | 0.0079 | 3,0 | 0,3 | 38,0 | 01801 | 02801 |
| 0,3 | 0.0118 | 3,0 | 0,4 | 38,0 | 01802 | 02802 |
| 0,4 | 0.0157 | 3,0 | 0,6 | 38,0 | 01803 | 02803 |
| 0,5 | 0.0197 | 3,0 | 0,7 | 38,0 | 01804 | 02804 |
| 0,6 | 0.0236 | 3,0 | 0,9 | 38,0 | 01805 | 02805 |
| 0,7 | 0.0276 | 3,0 | 1,0 | 38,0 | 01806 | 02806 |
| 0,8 | 0.0315 | 3,0 | 1,2 | 38,0 | 01807 | 02807 |
| 0,9 | 0.0354 | 3,0 | 1,3 | 38,0 | 01808 | 02808 |
| 1,0 | 0.0394 | 3,0 | 1,5 | 38,0 | 01809 | 02809 |
| 1,0 | 0.0394 | 4,0 | 1,5 | 50,0 | 01861 | 02819 |
| 1,1 | 0.0433 | 3,0 | 1,6 | 38,0 | 01810 | 02860 |
| 1,1 | 0.0433 | 4,0 | 1,6 | 50,0 | 01862 | 02892 |
| 1,2 | 0.0472 | 3,0 | 1,8 | 38,0 | 01811 | 02861 |
| 1,2 | 0.0472 | 4,0 | 1,8 | 50,0 | 01863 | 02893 |
| 1,3 | 0.0512 | 3,0 | 1,9 | 38,0 | 01812 | 02862 |
| 1,3 | 0.0512 | 4,0 | 1,9 | 50,0 | 01864 | 02894 |
| 1,4 | 0.0551 | 3,0 | 2,1 | 38,0 | 01813 | 02863 |
| 1,4 | 0.0551 | 4,0 | 2,1 | 50,0 | 01865 | 02895 |
| 1,5 | 0.0591 | 3,0 | 2,2 | 38,0 | 01814 | 02864 |
| 1,5 | 0.0591 | 4,0 | 2,2 | 50,0 | 01866 | 02896 |
| 1,6 | 0.0630 | 3,0 | 2,4 | 38,0 | 01815 | 02865 |
| 1,6 | 0.0630 | 4,0 | 2,4 | 50,0 | 01867 | 02897 |
| 1,7 | 0.0669 | 3,0 | 2,5 | 38,0 | 01816 | 02866 |
| 1,7 | 0.0669 | 4,0 | 2,5 | 50,0 | 01868 | 02898 |
| 1,8 | 0.0709 | 3,0 | 2,7 | 38,0 | 01817 | 02867 |
| 1,8 | 0.0709 | 4,0 | 2,7 | 50,0 | 01869 | 02899 |
| 1,9 | 0.0748 | 3,0 | 2,8 | 38,0 | 01818 | 02868 |
| 1,9 | 0.0748 | 4,0 | 2,8 | 50,0 | 01870 | 02900 |
| 2,0 | 0.0787 | 3,0 | 3,0 | 38,0 | 01819 | 02869 |
| 2,0 | 0.0787 | 4,0 | 3,0 | 50,0 | 01871 | 02901 |
| 2,5 | 0.0984 | 3,0 | 3,7 | 38,0 | 01820 | 02870 |
| 2,5 | 0.0984 | 4,0 | 3,7 | 50,0 | 01872 | 02902 |
| 3,0 | 0.1181 | 3,0 | 4,5 | 38,0 | 01821 | 02871 |
| 3,0 | 0.1181 | 4,0 | 4,5 | 50,0 | 01873 | 02903 |

TOLERANCES (mm)

0,1–3,0 DIAMETER
 DC = +0,0000/–0,0254
 DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



New Expanded Tools

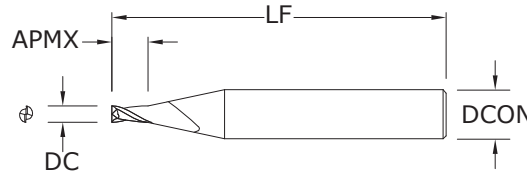
TOLERANCES (mm)

0,1–3,0 DIAMETER

DC = +0,0000/–0,0254

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M2M • 3xD
METRIC SERIES

| CUTTING DIAMETER DC | DECIMAL EQUIVALENT | mm | | | EDP NO. | |
|---------------------|--------------------|---------------------|--------------------|-------------------|----------|---------------------|
| | | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AITIN) |
| 0,1 | 0.0039 | 3,0 | 0,3 | 38,0 | 05003 | 05001 |
| 0,2 | 0.0079 | 3,0 | 0,6 | 38,0 | 01823 | 02811 |
| 0,2 | 0.0079 | 4,0 | 0,6 | 50,0 | 01875 | 02349 |
| 0,3 | 0.0118 | 3,0 | 0,9 | 38,0 | 01824 | 02350 |
| 0,3 | 0.0118 | 4,0 | 0,9 | 50,0 | 01876 | 02360 |
| 0,4 | 0.0157 | 3,0 | 1,2 | 38,0 | 01825 | 02351 |
| 0,4 | 0.0157 | 4,0 | 1,2 | 50,0 | 01877 | 02361 |
| 0,5 | 0.0197 | 3,0 | 1,5 | 38,0 | 01826 | 02352 |
| 0,5 | 0.0197 | 4,0 | 1,5 | 50,0 | 01878 | 02362 |
| 0,6 | 0.0236 | 3,0 | 1,8 | 38,0 | 01827 | 02353 |
| 0,6 | 0.0236 | 4,0 | 1,8 | 50,0 | 01879 | 02363 |
| 0,7 | 0.0276 | 3,0 | 2,1 | 38,0 | 01828 | 02354 |
| 0,7 | 0.0276 | 4,0 | 2,1 | 50,0 | 01880 | 02364 |
| 0,8 | 0.0315 | 3,0 | 2,4 | 38,0 | 01829 | 02355 |
| 0,8 | 0.0315 | 4,0 | 2,4 | 50,0 | 01881 | 02365 |
| 0,9 | 0.0354 | 3,0 | 2,7 | 38,0 | 01830 | 02356 |
| 0,9 | 0.0354 | 4,0 | 2,7 | 50,0 | 01882 | 02366 |
| 1,0 | 0.0394 | 3,0 | 3,0 | 38,0 | 01831 | 02357 |
| 1,0 | 0.0394 | 4,0 | 3,0 | 50,0 | 01883 | 02367 |
| 1,1 | 0.0433 | 3,0 | 3,3 | 38,0 | 01832 | 02872 |
| 1,1 | 0.0433 | 4,0 | 3,3 | 50,0 | 01884 | 02904 |
| 1,2 | 0.0472 | 3,0 | 3,6 | 38,0 | 01833 | 02873 |
| 1,2 | 0.0472 | 4,0 | 3,6 | 50,0 | 01885 | 02905 |
| 1,3 | 0.0512 | 3,0 | 3,9 | 38,0 | 01834 | 02874 |
| 1,3 | 0.0512 | 4,0 | 3,9 | 50,0 | 01886 | 02906 |
| 1,4 | 0.0551 | 3,0 | 4,2 | 38,0 | 01835 | 02875 |
| 1,4 | 0.0551 | 4,0 | 4,2 | 50,0 | 01887 | 02907 |
| 1,5 | 0.0591 | 3,0 | 4,5 | 38,0 | 01836 | 02876 |
| 1,5 | 0.0591 | 4,0 | 4,5 | 50,0 | 01888 | 02908 |
| 1,6 | 0.0630 | 3,0 | 4,8 | 38,0 | 01837 | 02877 |
| 1,6 | 0.0630 | 4,0 | 4,8 | 50,0 | 01889 | 02909 |
| 1,7 | 0.0669 | 3,0 | 5,1 | 38,0 | 01838 | 02878 |
| 1,7 | 0.0669 | 4,0 | 5,1 | 50,0 | 01890 | 02910 |
| 1,8 | 0.0709 | 3,0 | 5,4 | 38,0 | 01839 | 02879 |

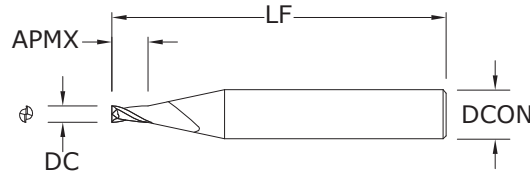
continued on next page

- Two flute design is ideal for softer alloyed, non-ferrous material applications that require slotting or involve heavy chip loads.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.



M2M • 3xD
METRIC SERIES

continued



 New Expanded Tools

TOLERANCES (mm)

0,1–3,0 DIAMETER

DC = +0,0000/–0,0254

DCON = h₆

| CUTTING DIAMETER DC | DECIMAL EQUIVALENT | mm | | | EDP NO. | |
|------------------------|--------------------|------------------------|-----------------------|----------------------|----------|------------------------|
| | | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 1,8 | 0.0709 | 4,0 | 5,4 | 50,0 | 01891 | 02911 |
| 1,9 | 0.0748 | 3,0 | 5,7 | 38,0 | 01840 | 02880 |
| 1,9 | 0.0748 | 4,0 | 5,7 | 50,0 | 01892 | 02912 |
| 2,0 | 0.0787 | 3,0 | 6,0 | 38,0 | 01841 | 02881 |
| 2,0 | 0.0787 | 4,0 | 6,0 | 50,0 | 01893 | 02913 |
| 2,1 | 0.0827 | 3,0 | 6,3 | 38,0 | 01842 | 02882 |
| 2,2 | 0.0866 | 3,0 | 6,6 | 38,0 | 01843 | 02883 |
| 2,3 | 0.0906 | 3,0 | 6,9 | 38,0 | 01844 | 02884 |
| 2,4 | 0.0945 | 3,0 | 7,2 | 38,0 | 01845 | 02885 |
| 2,5 | 0.0984 | 3,0 | 7,5 | 38,0 | 01846 | 02886 |
| 2,5 | 0.0984 | 4,0 | 7,5 | 50,0 | 01894 | 02914 |
| 2,6 | 0.1024 | 3,0 | 7,8 | 38,0 | 01847 | 02887 |
| 2,7 | 0.1063 | 3,0 | 8,1 | 38,0 | 01848 | 02888 |
| 2,8 | 0.1102 | 3,0 | 8,4 | 38,0 | 01849 | 02889 |
| 2,9 | 0.1142 | 3,0 | 8,7 | 38,0 | 01850 | 02890 |
| 3,0 | 0.1181 | 3,0 | 9,0 | 38,0 | 01851 | 02891 |
| 3,0 | 0.1181 | 4,0 | 9,0 | 50,0 | 01895 | 02915 |

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



New Expanded Tools

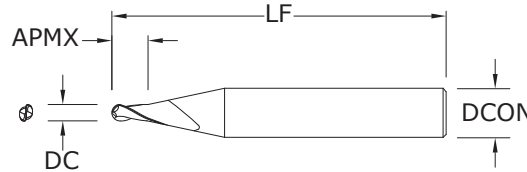
TOLERANCES (mm)

0,1–3,0 DIAMETER

DC = +0,0000/–0,0254

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M2MB • 1.5xD
METRIC SERIES

| CUTTING DIAMETER DC | DECIMAL EQUIVALENT | mm | | | EDP NO. | |
|---------------------|--------------------|---------------------|--------------------|-------------------|----------|---------------------|
| | | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0,1 | 0.0039 | 3,0 | 0,1 | 38,0 | 05017 | 05004 |
| 0,2 | 0.0079 | 3,0 | 0,3 | 38,0 | 05019 | 05006 |
| 0,3 | 0.0118 | 3,0 | 0,3 | 38,0 | 05021 | 05008 |
| 0,4 | 0.0157 | 3,0 | 0,6 | 38,0 | 05023 | 05010 |
| 0,5 | 0.0197 | 3,0 | 0,7 | 38,0 | 01900 | 03180 |
| 0,6 | 0.0236 | 3,0 | 0,9 | 38,0 | 01901 | 03181 |
| 0,7 | 0.0276 | 3,0 | 1,0 | 38,0 | 01902 | 03182 |
| 0,8 | 0.0315 | 3,0 | 1,2 | 38,0 | 01903 | 03183 |
| 0,9 | 0.0354 | 3,0 | 1,3 | 38,0 | 01904 | 03184 |
| 1,0 | 0.0394 | 3,0 | 1,5 | 38,0 | 01905 | 03185 |
| 1,0 | 0.0394 | 4,0 | 1,5 | 50,0 | 02009 | 02849 |
| 1,1 | 0.0433 | 3,0 | 1,6 | 38,0 | 01906 | 02916 |
| 1,1 | 0.0433 | 4,0 | 1,6 | 50,0 | 02010 | 02980 |
| 1,2 | 0.0472 | 3,0 | 1,8 | 38,0 | 01907 | 02917 |
| 1,2 | 0.0472 | 4,0 | 1,8 | 50,0 | 02011 | 02981 |
| 1,3 | 0.0512 | 3,0 | 1,9 | 38,0 | 01908 | 02918 |
| 1,3 | 0.0512 | 4,0 | 1,9 | 50,0 | 02012 | 02982 |
| 1,4 | 0.0551 | 3,0 | 2,1 | 38,0 | 01909 | 02919 |
| 1,4 | 0.0551 | 4,0 | 2,1 | 50,0 | 02013 | 02983 |
| 1,5 | 0.0591 | 3,0 | 2,2 | 38,0 | 01910 | 02920 |
| 1,5 | 0.0591 | 4,0 | 2,2 | 50,0 | 02014 | 02984 |
| 1,6 | 0.0630 | 3,0 | 2,4 | 38,0 | 01911 | 02921 |
| 1,6 | 0.0630 | 4,0 | 2,4 | 50,0 | 02015 | 02985 |
| 1,7 | 0.0669 | 3,0 | 2,5 | 38,0 | 01912 | 02922 |
| 1,7 | 0.0669 | 4,0 | 2,5 | 50,0 | 02016 | 02986 |
| 1,8 | 0.0709 | 3,0 | 2,7 | 38,0 | 01913 | 02923 |
| 1,8 | 0.0709 | 4,0 | 2,7 | 50,0 | 02017 | 02987 |
| 1,9 | 0.0748 | 3,0 | 2,8 | 38,0 | 01914 | 02924 |
| 1,9 | 0.0748 | 4,0 | 2,8 | 50,0 | 02018 | 02988 |
| 2,0 | 0.0787 | 3,0 | 3,0 | 38,0 | 01915 | 02925 |
| 2,0 | 0.0787 | 4,0 | 3,0 | 50,0 | 02019 | 02989 |
| 2,5 | 0.0984 | 3,0 | 3,7 | 38,0 | 01916 | 02926 |
| 2,5 | 0.0984 | 4,0 | 3,7 | 50,0 | 02020 | 02990 |
| 3,0 | 0.1181 | 3,0 | 4,5 | 38,0 | 01917 | 02927 |
| 3,0 | 0.1181 | 4,0 | 4,5 | 50,0 | 02021 | 02991 |

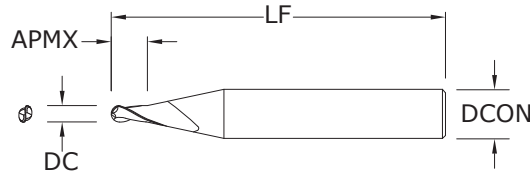
RE = 1/2 Cutting Diameter (DC)

- Two flute design is ideal for softer alloyed, non-ferrous material applications that require slotting or involve heavy chip loads.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

M2MB • 3xD



M2MB • 3xD METRIC SERIES



 New Expanded Tools

- Two flute design is ideal for softer alloyed, non-ferrous material applications that require slotting or involve heavy chip loads.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | DECIMAL EQUIVALENT | mm | | | EDP NO. | |
|---------------------|--------------------|---------------------|--------------------|-------------------|----------|---------------------|
| | | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0,1 | 0.0039 | 3,0 | 0,3 | 38,0 | 05018 | 05005 |
| 0,2 | 0.0079 | 3,0 | 0,6 | 38,0 | 05020 | 05007 |
| 0,3 | 0.0118 | 3,0 | 0,9 | 38,0 | 05022 | 05009 |
| 0,4 | 0.0157 | 3,0 | 1,2 | 38,0 | 05024 | 05011 |
| 0,5 | 0.0197 | 3,0 | 1,5 | 38,0 | 05025 | 05012 |
| 0,5 | 0.0197 | 4,0 | 1,5 | 50,0 | 02048 | 03200 |
| 0,6 | 0.0236 | 3,0 | 1,8 | 38,0 | 05026 | 05013 |
| 0,6 | 0.0236 | 4,0 | 1,8 | 50,0 | 02049 | 03201 |
| 0,7 | 0.0276 | 3,0 | 2,1 | 38,0 | 05027 | 05014 |
| 0,7 | 0.0276 | 4,0 | 2,1 | 50,0 | 02050 | 03202 |
| 0,8 | 0.0315 | 3,0 | 2,4 | 38,0 | 05028 | 05015 |
| 0,8 | 0.0315 | 4,0 | 2,4 | 50,0 | 02051 | 03203 |
| 0,9 | 0.0354 | 3,0 | 2,7 | 38,0 | 05029 | 05016 |
| 0,9 | 0.0354 | 4,0 | 2,7 | 50,0 | 02052 | 03204 |
| 1,0 | 0.0394 | 3,0 | 3,0 | 38,0 | 01949 | 02829 |
| 1,0 | 0.0394 | 4,0 | 3,0 | 50,0 | 02053 | 03205 |
| 1,1 | 0.0433 | 3,0 | 3,3 | 38,0 | 01950 | 02940 |
| 1,1 | 0.0433 | 4,0 | 3,3 | 50,0 | 02054 | 03004 |
| 1,2 | 0.0472 | 3,0 | 3,6 | 38,0 | 01951 | 02941 |
| 1,2 | 0.0472 | 4,0 | 3,6 | 50,0 | 02055 | 03005 |
| 1,3 | 0.0512 | 3,0 | 3,9 | 38,0 | 01952 | 02942 |
| 1,3 | 0.0512 | 4,0 | 3,9 | 50,0 | 02056 | 03006 |
| 1,4 | 0.0551 | 3,0 | 4,2 | 38,0 | 01953 | 02943 |
| 1,4 | 0.0551 | 4,0 | 4,2 | 50,0 | 02057 | 03007 |
| 1,5 | 0.0591 | 3,0 | 4,5 | 38,0 | 01954 | 02944 |
| 1,5 | 0.0591 | 4,0 | 4,5 | 50,0 | 02058 | 03008 |
| 1,6 | 0.0630 | 3,0 | 4,8 | 38,0 | 01955 | 02945 |
| 1,6 | 0.0630 | 4,0 | 4,8 | 50,0 | 02059 | 03009 |
| 1,7 | 0.0669 | 3,0 | 5,1 | 38,0 | 01956 | 02946 |
| 1,7 | 0.0669 | 4,0 | 5,1 | 50,0 | 02060 | 03010 |
| 1,8 | 0.0709 | 3,0 | 5,4 | 38,0 | 01957 | 02947 |
| 1,8 | 0.0709 | 4,0 | 5,4 | 50,0 | 02061 | 03011 |
| 1,9 | 0.0748 | 3,0 | 5,7 | 38,0 | 01958 | 02948 |
| 1,9 | 0.0748 | 4,0 | 5,7 | 50,0 | 02062 | 03012 |

RE = 1/2 Cutting Diameter (DC)

continued on next page

TOLERANCES (mm)

0,1–3,0 DIAMETER
 DC = +0,0000/–0,0254
 DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

New Expanded Tools

TOLERANCES (mm)

0,1–3,0 DIAMETER

DC = +0,0000/–0,0254

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

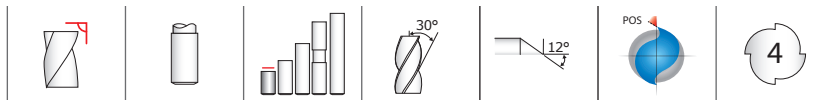
M2MB • 3xD
METRIC SERIES

continued

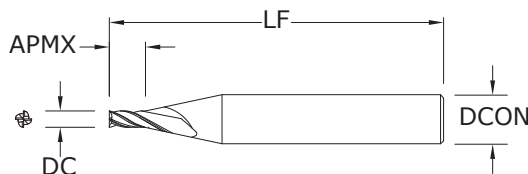
| CUTTING DIAMETER DC | DECIMAL EQUIVALENT | mm | | | EDP NO. | |
|---------------------|--------------------|---------------------|--------------------|-------------------|----------|---------------------|
| | | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 2,0 | 0.0787 | 3,0 | 6,0 | 38,0 | 01959 | 02949 |
| 2,0 | 0.0787 | 4,0 | 6,0 | 50,0 | 02063 | 03013 |
| 2,1 | 0.0827 | 3,0 | 6,3 | 38,0 | 01960 | 02950 |
| 2,2 | 0.0866 | 3,0 | 6,6 | 38,0 | 01961 | 02951 |
| 2,3 | 0.0906 | 3,0 | 6,9 | 38,0 | 01962 | 02952 |
| 2,4 | 0.0945 | 3,0 | 7,2 | 38,0 | 01963 | 02953 |
| 2,5 | 0.0984 | 3,0 | 7,5 | 38,0 | 01964 | 02954 |
| 2,5 | 0.0984 | 4,0 | 7,5 | 50,0 | 02064 | 03014 |
| 2,6 | 0.1024 | 3,0 | 7,8 | 38,0 | 01965 | 02955 |
| 2,7 | 0.1063 | 3,0 | 8,1 | 38,0 | 01966 | 02956 |
| 2,8 | 0.1102 | 3,0 | 8,4 | 38,0 | 01967 | 02957 |
| 2,9 | 0.1142 | 3,0 | 8,7 | 38,0 | 01968 | 02958 |
| 3,0 | 0.1181 | 3,0 | 9,0 | 38,0 | 01969 | 02959 |
| 3,0 | 0.1181 | 4,0 | 9,0 | 50,0 | 02065 | 03015 |

RE = 1/2 Cutting Diameter (DC)

M4M • 1.5xD



M4M • 1.5xD METRIC SERIES



 New Expanded Tools

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | DECIMAL EQUIVALENT | mm | | | EDP NO. | |
|---------------------|--------------------|---------------------|--------------------|-------------------|----------|---------------------|
| | | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0,1 | 0.0039 | 3,0 | 0,15 | 38,0 | 05112 | 05076 |
| 0,2 | 0.0079 | 3,0 | 0,30 | 38,0 | 05113 | 05077 |
| 0,3 | 0.0118 | 3,0 | 0,45 | 38,0 | 05114 | 05078 |
| 0,4 | 0.0157 | 3,0 | 0,60 | 38,0 | 05115 | 05079 |
| 0,5 | 0.0197 | 3,0 | 0,75 | 38,0 | 05116 | 05080 |
| 0,6 | 0.0236 | 3,0 | 0,90 | 38,0 | 05117 | 05081 |
| 0,7 | 0.0276 | 3,0 | 1,05 | 38,0 | 05118 | 05082 |
| 0,8 | 0.0315 | 3,0 | 1,20 | 38,0 | 05119 | 05083 |
| 0,9 | 0.0354 | 3,0 | 1,35 | 38,0 | 05120 | 05084 |
| 1,0 | 0.0394 | 3,0 | 1,50 | 38,0 | 05121 | 05085 |
| 1,1 | 0.0433 | 3,0 | 1,65 | 38,0 | 09282 | 09290 |
| 1,2 | 0.0472 | 3,0 | 1,80 | 38,0 | 09283 | 09291 |
| 1,3 | 0.0512 | 3,0 | 1,95 | 38,0 | 09284 | 09292 |
| 1,4 | 0.0551 | 3,0 | 2,10 | 38,0 | 09285 | 09293 |
| 1,5 | 0.0591 | 3,0 | 2,25 | 38,0 | 05122 | 05086 |
| 1,6 | 0.0630 | 3,0 | 2,40 | 38,0 | 09286 | 09294 |
| 1,7 | 0.0669 | 3,0 | 2,55 | 38,0 | 09287 | 09295 |
| 1,8 | 0.0709 | 3,0 | 2,70 | 38,0 | 09288 | 09296 |
| 1,9 | 0.0748 | 3,0 | 2,85 | 38,0 | 09289 | 09297 |
| 2,0 | 0.0787 | 3,0 | 3,00 | 38,0 | 05123 | 05087 |
| 2,1 | 0.0827 | 3,0 | 3,15 | 38,0 | 09270 | 09278 |
| 2,2 | 0.0866 | 3,0 | 3,30 | 38,0 | 09271 | 09279 |
| 2,3 | 0.0906 | 3,0 | 3,45 | 38,0 | 09272 | 09280 |
| 2,4 | 0.0945 | 3,0 | 3,60 | 38,0 | 09273 | 09281 |
| 2,5 | 0.0984 | 3,0 | 3,75 | 38,0 | 05124 | 05088 |
| 3,0 | 0.1181 | 3,0 | 4,50 | 38,0 | 05125 | 05089 |

TOLERANCES (mm)

0,1–3,0 DIAMETER

DC = +0,0000/–0,0254

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



New Expanded Tools

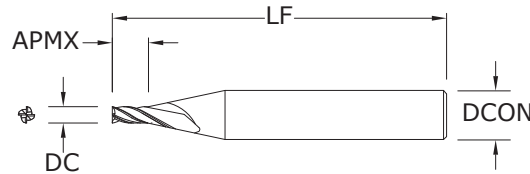
TOLERANCES (mm)

0,1–3,0 DIAMETER

DC = +0,0000/–0,0254

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

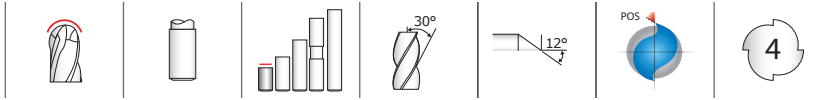


M4M • 3xD
METRIC SERIES

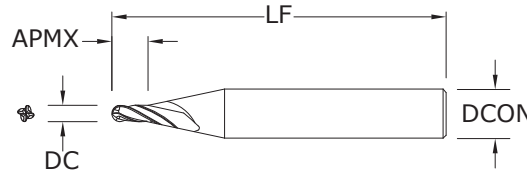
| CUTTING DIAMETER DC | DECIMAL EQUIVALENT | mm | | | EDP NO. | |
|---------------------|--------------------|---------------------|--------------------|-------------------|----------|---------------------|
| | | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0,1 | 0.0039 | 3,0 | 0,3 | 38,0 | 05090 | 05054 |
| 0,2 | 0.0079 | 3,0 | 0,6 | 38,0 | 05091 | 05055 |
| 0,3 | 0.0118 | 3,0 | 0,9 | 38,0 | 05092 | 05056 |
| 0,4 | 0.0157 | 3,0 | 1,2 | 38,0 | 05093 | 05057 |
| 0,5 | 0.0197 | 3,0 | 1,5 | 38,0 | 05094 | 05058 |
| 0,6 | 0.0236 | 3,0 | 1,8 | 38,0 | 05095 | 05059 |
| 0,7 | 0.0276 | 3,0 | 2,1 | 38,0 | 05096 | 05060 |
| 0,8 | 0.0315 | 3,0 | 2,4 | 38,0 | 05097 | 05061 |
| 0,9 | 0.0354 | 3,0 | 2,7 | 38,0 | 05098 | 05062 |
| 1,0 | 0.0394 | 3,0 | 3,0 | 38,0 | 05099 | 05063 |
| 1,1 | 0.0433 | 3,0 | 3,3 | 38,0 | 05100 | 05064 |
| 1,2 | 0.0472 | 3,0 | 3,6 | 38,0 | 05101 | 05065 |
| 1,3 | 0.0512 | 3,0 | 3,9 | 38,0 | 05102 | 05066 |
| 1,4 | 0.0551 | 3,0 | 4,2 | 38,0 | 05103 | 05067 |
| 1,5 | 0.0591 | 3,0 | 4,5 | 38,0 | 05104 | 05068 |
| 1,6 | 0.0630 | 3,0 | 4,8 | 38,0 | 05105 | 05069 |
| 1,7 | 0.0669 | 3,0 | 5,1 | 38,0 | 05106 | 05070 |
| 1,8 | 0.0709 | 3,0 | 5,4 | 38,0 | 05107 | 05071 |
| 1,9 | 0.0748 | 3,0 | 5,7 | 38,0 | 05108 | 05072 |
| 2,0 | 0.0787 | 3,0 | 6,0 | 38,0 | 05109 | 05073 |
| 2,1 | 0.0827 | 3,0 | 6,3 | 38,0 | 09266 | 09274 |
| 2,2 | 0.0866 | 3,0 | 6,6 | 38,0 | 09267 | 09275 |
| 2,3 | 0.0906 | 3,0 | 6,9 | 38,0 | 09268 | 09276 |
| 2,4 | 0.0945 | 3,0 | 7,2 | 38,0 | 09269 | 09277 |
| 2,5 | 0.0984 | 3,0 | 7,5 | 38,0 | 05110 | 05074 |
| 3,0 | 0.1181 | 3,0 | 9,0 | 38,0 | 05111 | 05075 |

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

M4MB • 1.5xD



M4MB • 1.5xD METRIC SERIES



 New Expanded Tools

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

| CUTTING DIAMETER DC | DECIMAL EQUIVALENT | mm | | | EDP NO. | |
|---------------------|--------------------|---------------------|--------------------|-------------------|----------|---------------------|
| | | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0,4 | 0.0157 | 3,0 | 0,6 | 38,0 | 05042 | 05030 |
| 0,5 | 0.0197 | 3,0 | 0,7 | 38,0 | 05044 | 05032 |
| 0,6 | 0.0236 | 3,0 | 0,9 | 38,0 | 05046 | 05034 |
| 0,7 | 0.0276 | 3,0 | 1,0 | 38,0 | 05048 | 05036 |
| 0,8 | 0.0315 | 3,0 | 1,2 | 38,0 | 05050 | 05038 |
| 0,9 | 0.0354 | 3,0 | 1,3 | 38,0 | 05052 | 05040 |
| 1,0 | 0.0394 | 3,0 | 1,5 | 38,0 | 01927 | 03195 |
| 1,0 | 0.0394 | 4,0 | 1,5 | 50,0 | 02031 | 02859 |
| 1,1 | 0.0433 | 3,0 | 1,6 | 38,0 | 01928 | 02928 |
| 1,1 | 0.0433 | 4,0 | 1,6 | 50,0 | 02032 | 02992 |
| 1,2 | 0.0472 | 3,0 | 1,8 | 38,0 | 01929 | 02929 |
| 1,2 | 0.0472 | 4,0 | 1,8 | 50,0 | 02033 | 02993 |
| 1,3 | 0.0512 | 3,0 | 1,9 | 38,0 | 01930 | 02930 |
| 1,3 | 0.0512 | 4,0 | 1,9 | 50,0 | 02034 | 02994 |
| 1,4 | 0.0551 | 3,0 | 2,1 | 38,0 | 01931 | 02931 |
| 1,4 | 0.0551 | 4,0 | 2,1 | 50,0 | 02035 | 02995 |
| 1,5 | 0.0591 | 3,0 | 2,2 | 38,0 | 01932 | 02932 |
| 1,5 | 0.0591 | 4,0 | 2,2 | 50,0 | 02036 | 02996 |
| 1,6 | 0.0630 | 3,0 | 2,4 | 38,0 | 01933 | 02933 |
| 1,6 | 0.0630 | 4,0 | 2,4 | 50,0 | 02037 | 02997 |
| 1,7 | 0.0669 | 3,0 | 2,5 | 38,0 | 01934 | 02934 |
| 1,7 | 0.0669 | 4,0 | 2,5 | 50,0 | 02038 | 02998 |
| 1,8 | 0.0709 | 3,0 | 2,7 | 38,0 | 01935 | 02935 |
| 1,8 | 0.0709 | 4,0 | 2,7 | 50,0 | 02039 | 02999 |
| 1,9 | 0.0748 | 3,0 | 2,8 | 38,0 | 01936 | 02936 |
| 1,9 | 0.0748 | 4,0 | 2,8 | 50,0 | 02040 | 03000 |
| 2,0 | 0.0787 | 3,0 | 3,0 | 38,0 | 01937 | 02937 |
| 2,0 | 0.0787 | 4,0 | 3,0 | 50,0 | 02041 | 03001 |
| 2,5 | 0.0984 | 3,0 | 3,7 | 38,0 | 01938 | 02938 |
| 2,5 | 0.0984 | 4,0 | 3,7 | 50,0 | 02042 | 03002 |
| 3,0 | 0.1181 | 3,0 | 4,5 | 38,0 | 01939 | 02939 |
| 3,0 | 0.1181 | 4,0 | 4,5 | 50,0 | 02043 | 03003 |

RE = 1/2 Cutting Diameter (DC)

TOLERANCES (mm)

0,4–3,0 DIAMETER
 DC = +0,0000/–0,0254
 DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



New Expanded Tools

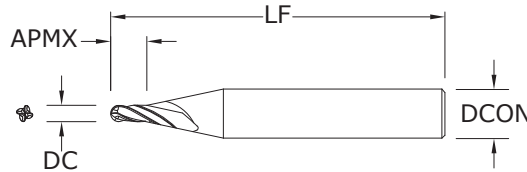
TOLERANCES (mm)

0,4–3,0 DIAMETER

DC = +0,0000/–0,0254

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M4MB • 3xD
METRIC SERIES

| CUTTING DIAMETER DC | DECIMAL EQUIVALENT | mm | | | EDP NO. | |
|---------------------|--------------------|---------------------|--------------------|-------------------|----------|---------------------|
| | | SHANK DIAMETER DCON | LENGTH OF CUT APMX | OVERALL LENGTH LF | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0,4 | 0.0157 | 3,0 | 1,2 | 38,0 | 05043 | 05031 |
| 0,5 | 0.0197 | 3,0 | 1,5 | 38,0 | 05045 | 05033 |
| 0,6 | 0.0236 | 3,0 | 1,8 | 38,0 | 05047 | 05035 |
| 0,7 | 0.0276 | 3,0 | 2,1 | 38,0 | 05049 | 05037 |
| 0,8 | 0.0315 | 3,0 | 2,4 | 38,0 | 05051 | 05039 |
| 0,9 | 0.0354 | 3,0 | 2,7 | 38,0 | 05053 | 05041 |
| 1,0 | 0.0394 | 3,0 | 3,0 | 38,0 | 01979 | 02839 |
| 1,0 | 0.0394 | 4,0 | 3,0 | 50,0 | 02075 | 03215 |
| 1,1 | 0.0433 | 3,0 | 3,3 | 38,0 | 01980 | 02960 |
| 1,1 | 0.0433 | 4,0 | 3,3 | 50,0 | 02076 | 03016 |
| 1,2 | 0.0472 | 3,0 | 3,6 | 38,0 | 01981 | 02961 |
| 1,2 | 0.0472 | 4,0 | 3,6 | 50,0 | 02077 | 03017 |
| 1,3 | 0.0512 | 3,0 | 3,9 | 38,0 | 01982 | 02962 |
| 1,3 | 0.0512 | 4,0 | 3,9 | 50,0 | 02078 | 03018 |
| 1,4 | 0.0551 | 3,0 | 4,2 | 38,0 | 01983 | 02963 |
| 1,4 | 0.0551 | 4,0 | 4,2 | 50,0 | 02079 | 03019 |
| 1,5 | 0.0591 | 3,0 | 4,5 | 38,0 | 01984 | 02964 |
| 1,5 | 0.0591 | 4,0 | 4,5 | 50,0 | 02080 | 03020 |
| 1,6 | 0.0630 | 3,0 | 4,8 | 38,0 | 01985 | 02965 |
| 1,6 | 0.0630 | 4,0 | 4,8 | 50,0 | 02081 | 03021 |
| 1,7 | 0.0669 | 3,0 | 5,1 | 38,0 | 01986 | 02966 |
| 1,7 | 0.0669 | 4,0 | 5,1 | 50,0 | 02082 | 03022 |
| 1,8 | 0.0709 | 3,0 | 5,4 | 38,0 | 01987 | 02967 |
| 1,8 | 0.0709 | 4,0 | 5,4 | 50,0 | 02083 | 03023 |
| 1,9 | 0.0748 | 3,0 | 5,7 | 38,0 | 01988 | 02968 |
| 1,9 | 0.0748 | 4,0 | 5,7 | 50,0 | 02084 | 03024 |
| 2,0 | 0.0787 | 3,0 | 6,0 | 38,0 | 01989 | 02969 |
| 2,0 | 0.0787 | 4,0 | 6,0 | 50,0 | 02085 | 03025 |
| 2,1 | 0.0827 | 3,0 | 6,3 | 38,0 | 01990 | 02970 |
| 2,2 | 0.0866 | 3,0 | 6,6 | 38,0 | 01991 | 02971 |
| 2,3 | 0.0906 | 3,0 | 6,9 | 38,0 | 01992 | 02972 |
| 2,4 | 0.0945 | 3,0 | 7,2 | 38,0 | 01993 | 02973 |
| 2,5 | 0.0984 | 3,0 | 7,5 | 38,0 | 01994 | 02974 |
| 2,5 | 0.0984 | 4,0 | 7,5 | 50,0 | 02086 | 03026 |
| 2,6 | 0.1024 | 3,0 | 7,8 | 38,0 | 01995 | 02975 |
| 2,7 | 0.1063 | 3,0 | 8,1 | 38,0 | 01996 | 02976 |
| 2,8 | 0.1102 | 3,0 | 8,4 | 38,0 | 01997 | 02977 |
| 2,9 | 0.1142 | 3,0 | 8,7 | 38,0 | 01998 | 02978 |
| 3,0 | 0.1181 | 3,0 | 9,0 | 38,0 | 01999 | 02979 |
| 3,0 | 0.1181 | 4,0 | 9,0 | 50,0 | 02087 | 03027 |

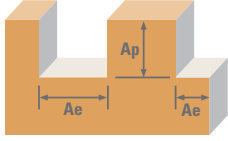
RE = 1/2 Cutting Diameter (DC)

- Four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- High performance carbide substrate designed specifically for Micro Tool applications.
- Broad portfolio, offering consistent lengths of cut, to ensure application demands are met.
- Advanced geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality.
- All tools in stock to meet customer order requirements.
- All micro tools are manufactured in accordance with the KSPT ISO certified quality procedures.

Speeds and Feeds

Instructions:

- rpm = use speed from INCH or METRIC Baseline chart
- ipm = INCH Baseline Feed (ipm) x Feed Multiplier [from selected chart below]
- mm/min = METRIC Baseline Feed (mm/min) x Feed Multiplier [from selected chart below]
- Reduce speed and feed 30 percent when using uncoated tools
- Find Width of Cut (Ae) and Depth of Cut (Ap) recommendations on chart below
- refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for detailed technical charts by series



| INCH 2-Flute, Square, Corner Radius & Ball Without Reach | Flute Length | 1.5 x DC | | 3 x DC | | | |
|--|-----------------|----------|---------|---------|---------|------|------|
| | Feed Multiplier | 1 | | 0.9 | | | |
| | Width/Depth | Ae x DC | Ap x DC | Ae x DC | Ap x DC | | |
| | Diameter (DC) | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | | |
| P H K M S N ALL | Profile | ≤.30 | ≤.50 | ≤1 | ≤.10 | ≤.25 | ≤2 |
| | Slot | 1 | ≤.20 | ≤.50 | 1 | ≤.15 | ≤.35 |

| INCH 4-Flute, Square, Corner Radius & Ball Without Reach | Flute Length | 1.5 x DC | | 3 x DC | | 5 x DC | | 8 x DC | | 12 x DC | | | | | | |
|--|-----------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|----|------|------|----|
| | Feed Multiplier | 1.57 | | 1.41 | | 0.59 | | 0.59 | | 0.36 | | | | | | |
| | Width/Depth | Ae x DC | Ap x DC | Ae x DC | Ap x DC | Ae x DC | Ap x DC | Ae x DC | Ap x DC | Ae x DC | Ap x DC | | | | | |
| | Diameter (DC) | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | | | | | |
| P H K M S N ALL | Profile | ≤.30 | ≤.50 | ≤1 | ≤.10 | ≤.25 | ≤2 | ≤.10 | ≤.25 | ≤3 | ≤.05 | ≤.10 | ≤4 | ≤.03 | ≤.06 | ≤6 |
| | Slot | 1 | ≤.20 | ≤.50 | 1 | ≤.15 | ≤.35 | 1 | ≤.10 | ≤.20 | | | | | | |

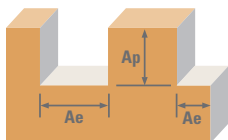
| METRIC 2-Flute Square & Ball Without Reach | Flute Length | 1.5 x DC | | 3 x DC | | | |
|---|-----------------|----------|---------|---------|---------|------|------|
| | Feed Multiplier | 1 | | 0.9 | | | |
| | Width/Depth | Ae x DC | Ap x DC | Ae x DC | Ap x DC | | |
| | Diameter (DC) | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | | |
| P H K M S N ALL | Profile | ≤.30 | ≤.50 | ≤1 | ≤.10 | ≤.25 | ≤2 |
| | Slot | 1 | ≤.20 | ≤.50 | 1 | ≤.15 | ≤.35 |

| METRIC 4-Flute Square & Ball Without Reach | Flute Length | 1.5 x DC | | 3 x DC | | | |
|---|-----------------|----------|---------|---------|---------|------|------|
| | Feed Multiplier | 1.57 | | 1.41 | | | |
| | Width/Depth | Ae x DC | Ap x DC | Ae x DC | Ap x DC | | |
| | Diameter (DC) | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | | |
| P H K M S N ALL | Profile | ≤.30 | ≤.50 | ≤1 | ≤.10 | ≤.25 | ≤2 |
| | Slot | 1 | ≤.20 | ≤.50 | 1 | ≤.15 | ≤.35 |

Speeds and Feeds

Instructions:

- rpm = use speed from INCH or METRIC Baseline chart
- ipm = INCH Baseline Feed (ipm) x Feed Multiplier [from selected chart below]
- mm/min = METRIC Baseline Feed (mm/min) x Feed Multiplier [from selected chart below]
- Reduce speed and feed 30 percent when using uncoated tools
- Find Width of Cut (Ae) and Depth of Cut (Ap) recommendations on chart below
- refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for detailed technical charts by series



| INCH 2-Flute Square & Ball With Reach | Flute Length | 8 x DC | | 12 x DC | | | |
|--|-----------------|---------|---------|---------|---------|------|------|
| | Feed Multiplier | 0.6 | | 0.5 | | | |
| | Width/Depth | Ae x DC | Ap x DC | Ae x DC | Ap x DC | | |
| | Diameter (DC) | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | | |
| P H K M S N | Profile | ≤.25 | ≤.50 | ≤.30 | ≤.22 | ≤.45 | ≤.25 |
| ALL | Slot | 1 | ≤.07 | ≤.17 | 1 | ≤.06 | ≤.15 |

| INCH 3-Flute Square, Corner Radius & Ball With Reach | Flute Length | 3 x DC | | 5 x DC | | 8 x DC | | 12 x DC | | 15 x DC | | 20 x DC | | 25 x DC | | | | | | | | |
|--|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|------|------|------|------|------|------|
| | Feed Multiplier | 1.4 | | 1.15 | | 0.9 | | 0.7 | | 0.6 | | 0.45 | | 0.35 | | | | | | | | |
| | Width/Depth | Ae x DC | Ap x DC | Ae x DC | Ap x DC | Ae x DC | Ap x DC | Ae x DC | Ap x DC | Ae x DC | Ap x DC | Ae x DC | Ap x DC | Ae x DC | Ap x DC | | | | | | | |
| | Diameter (DC) | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | | | | | | | |
| P H K M S N | Profile | ≤.30 | ≤.60 | ≤.5 | ≤.30 | ≤.60 | ≤.35 | ≤.25 | ≤.50 | ≤.30 | ≤.22 | ≤.45 | ≤.25 | ≤.15 | ≤.30 | ≤.25 | ≤.12 | ≤.25 | ≤.20 | ≤.12 | ≤.25 | ≤.20 |
| ALL | Slot | 1 | ≤.15 | ≤.30 | 1 | ≤.08 | ≤.20 | 1 | ≤.07 | ≤.17 | 1 | ≤.06 | ≤.15 | 1 | ≤.06 | ≤.15 | 1 | ≤.04 | ≤.10 | 1 | ≤.04 | ≤.10 |

















| INCH 4-Flute Square & Ball With Reach | Flute Length | 8 x DC | | 12 x DC | | | |
|--|-----------------|---------|---------|---------|---------|------|------|
| | Feed Multiplier | 0.95 | | 0.75 | | | |
| | Width/Depth | Ae x DC | Ap x DC | Ae x DC | Ap x DC | | |
| | Diameter (DC) | ≤0.0312 | >0.0312 | ≤0.0312 | >0.0312 | | |
| P H K M S N | Profile | ≤.25 | ≤.50 | ≤.30 | ≤.22 | ≤.45 | ≤.25 |
| ALL | Slot | 1 | ≤.07 | ≤.17 | 1 | ≤.06 | ≤.15 |

Note:













- Bhn (Brinell) HRC (Rockwell C)
- reduce speed and feed 30 percent when using uncoated tools
- Fz x No. of Flutes x max available rpm when recommendation exceeds machine limit
- helical ramp at 1 degrees or less, using slotting speed and feed rates (plunging is not recommended)
- reduce speed and feed for materials harder than listed
- reduce feed and Ae when finish milling (.02 x DC maximum)
- refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for detailed technical charts by series

FRACTIONAL Baseline

INCH Baseline
Speed and Feed
Square, Corner Radius
& Ball End
With and Without Reach

| Material | Hardness | Vc (sfm) | DC • in | DC • in | | | | | |
|--|-----------------------------|--|---------------|----------|---------|---------|---------|---------|---------|
| | | | | 0.0050 | 0.0156 | 0.0312 | 0.0625 | 0.0938 | 0.1200 |
| P CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536 | ≤ 275 Bhn or ≤ 28 HRc | Profile  | 365 RPM | 278860 | 89378 | 44689 | 22309 | 14865 | 11619 |
| | | | (292-438) Fz | 0.000022 | 0.00007 | 0.00013 | 0.00027 | 0.00041 | 0.00052 |
| | | | Feed (ipm) | 12.05 | 12.05 | 12.05 | 12.05 | 12.05 | 12.05 |
| | | Slot  | 290 RPM | 221560 | 71013 | 35506 | 17725 | 11810 | 9232 |
| | | | (232-348) Fz | 0.000022 | 0.00007 | 0.00013 | 0.00027 | 0.00041 | 0.00052 |
| | | | Feed (ipm) | 9.57 | 9.57 | 9.57 | 9.57 | 9.57 | 9.57 |
| P ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100 | ≤ 375 Bhn or ≤ 40 HRc | Profile  | 210 RPM | 160440 | 51423 | 25712 | 12835 | 8552 | 6685 |
| | | | (168-252) Fz | 0.000019 | 0.00006 | 0.00012 | 0.00024 | 0.00036 | 0.00046 |
| | | | Feed (ipm) | 6.16 | 6.16 | 6.16 | 6.16 | 6.16 | 6.16 |
| | | Slot  | 165 RPM | 126060 | 40404 | 20202 | 10085 | 6720 | 5253 |
| | | | (132-198) Fz | 0.000019 | 0.00006 | 0.00012 | 0.00024 | 0.00036 | 0.00046 |
| | | | Feed (ipm) | 4.84 | 4.84 | 4.84 | 4.84 | 4.84 | 4.84 |
| M STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F | ≤ 275 Bhn or ≤ 28 HRc | Profile  | 340 RPM | 259760 | 83256 | 41628 | 20781 | 13846 | 10823 |
| | | | (272-408) Fz | 0.000022 | 0.00007 | 0.00013 | 0.00027 | 0.00041 | 0.00052 |
| | | | Feed (ipm) | 11.22 | 11.22 | 11.22 | 11.22 | 11.22 | 11.22 |
| | | Slot  | 270 RPM | 206280 | 66115 | 33058 | 16502 | 10996 | 8595 |
| | | | (216-324) Fz | 0.000022 | 0.00007 | 0.00013 | 0.00027 | 0.00041 | 0.00052 |
| | | | Feed (ipm) | 8.91 | 8.91 | 8.91 | 8.91 | 8.91 | 8.91 |
| M STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L | ≤ 275 Bhn or ≤ 28 HRc | Profile  | 235 RPM | 179540 | 57545 | 28772 | 14363 | 9570 | 7481 |
| | | | (188-282) Fz | 0.000019 | 0.00006 | 0.00012 | 0.00024 | 0.00036 | 0.00046 |
| | | | Feed (ipm) | 6.90 | 6.90 | 6.90 | 6.90 | 6.90 | 6.90 |
| | | Slot  | 185 RPM | 141340 | 45301 | 22651 | 11307 | 7534 | 5889 |
| | | | (148-222) Fz | 0.000019 | 0.00006 | 0.00012 | 0.00024 | 0.00036 | 0.00046 |
| | | | Feed (ipm) | 5.43 | 5.43 | 5.43 | 5.43 | 5.43 | 5.43 |
| M STAINLESS STEELS (PH) 13-8 PH, 15-5PH, 17-4 PH, CUSTOM 450 | ≤ 325 Bhn or ≤ 35 HRc | Profile  | 215 RPM | 164260 | 52647 | 26324 | 13141 | 8756 | 6844 |
| | | | (172-258) Fz | 0.000014 | 0.00004 | 0.00008 | 0.00017 | 0.00025 | 0.00033 |
| | | | Feed (ipm) | 4.46 | 4.46 | 4.46 | 4.46 | 4.46 | 4.46 |
| | | Slot  | 170 RPM | 129880 | 41628 | 20814 | 10390 | 6923 | 5412 |
| | | | (136-204) Fz | 0.000014 | 0.00004 | 0.00008 | 0.00017 | 0.00025 | 0.00033 |
| | | | Feed (ipm) | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 | 3.53 |
| K CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile | ≤ 220 Bhn or ≤ 19 HRc | Profile  | 305 RPM | 233020 | 74686 | 37343 | 18642 | 12421 | 9709 |
| | | | (244-366) Fz | 0.000022 | 0.00007 | 0.00014 | 0.00027 | 0.00041 | 0.00052 |
| | | | Feed (ipm) | 10.08 | 10.08 | 10.08 | 10.08 | 10.08 | 10.08 |
| | | Slot  | 245 RPM | 187180 | 59994 | 29997 | 14974 | 9978 | 7799 |
| | | | (196-294) Fz | 0.000022 | 0.00007 | 0.00014 | 0.00027 | 0.00041 | 0.00052 |
| | | | Feed (ipm) | 8.10 | 8.10 | 8.10 | 8.10 | 8.10 | 8.10 |
| N ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075 | ≤ 150 Bhn or ≤ 7 HRc | Profile  | 1000 RPM | 764000 | 244872 | 122436 | 61120 | 40725 | 31833 |
| | | | (800-1200) Fz | 0.000064 | 0.00020 | 0.00040 | 0.00080 | 0.00120 | 0.00153 |
| | | | Feed (ipm) | 97.50 | 97.50 | 97.50 | 97.50 | 97.50 | 97.50 |
| | | Slot  | 800 RPM | 611200 | 195897 | 97949 | 48996 | 32580 | 25467 |
| | | | (640-960) Fz | 0.000064 | 0.00020 | 0.00040 | 0.00080 | 0.00120 | 0.00153 |
| | | | Feed (ipm) | 78.00 | 78.00 | 78.00 | 78.00 | 78.00 | 78.00 |
| N COPPER ALLOYS Alum Bronze, C110, Muntz Brass | ≤ 140 Bhn or ≤ 3 HRc | Profile  | 515 RPM | 393460 | 126109 | 63054 | 31477 | 20973 | 16394 |
| | | | (412-618) Fz | 0.000048 | 0.00015 | 0.00030 | 0.00060 | 0.00090 | 0.00115 |
| | | | Feed (ipm) | 37.68 | 37.68 | 37.68 | 37.68 | 37.68 | 37.68 |
| | | Slot  | 410 RPM | 313240 | 100397 | 50199 | 25059 | 16697 | 13052 |
| | | | (328-492) Fz | 0.000048 | 0.00015 | 0.00030 | 0.00060 | 0.00090 | 0.00115 |
| | | | Feed (ipm) | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 |

















continued on next page

| INCH Baseline Speed and Feed Square, Corner Radius & Ball End With and Without Reach | | | Hardness | Vc (sfm) | DC • in | | | | | | |
|--|---|--|--------------------|-----------------------------|----------|---------|---------|---------|---------|---------|------|
| | | | | | 0.0050 | 0.0156 | 0.0312 | 0.0625 | 0.0938 | 0.1200 | |
| N | PLASTICS Polycarbonate, PVC, Polypropylene | Profile  | 1000 (800-1200) | RPM | 764000 | 244872 | 122436 | 61120 | 40725 | 31833 | |
| | | | | Fz | 0.000064 | 0.00020 | 0.00040 | 0.00080 | 0.00120 | 0.00153 | |
| | | | | Feed (ipm) | 97.50 | 97.50 | 97.50 | 97.50 | 97.50 | 97.50 | |
| | | Slot  | 800 (640-960) | RPM | 611200 | 195897 | 97949 | 48896 | 32580 | 25467 | |
| | | | | Fz | 0.000064 | 0.00020 | 0.00040 | 0.00080 | 0.00120 | 0.00153 | |
| | | | | Feed (ipm) | 78.00 | 78.00 | 78.00 | 78.00 | 78.00 | 78.00 | |
| S | SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400 | Profile  | 60 (48-72) | ≤ 300 Bhn or ≤ 32 HRc | RPM | 45840 | 14692 | 7346 | 3667 | 2443 | 1910 |
| | | | | Fz | 0.000012 | 0.00004 | 0.00008 | 0.00015 | 0.00023 | 0.00029 | |
| | | | | Feed (ipm) | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | |
| | | Slot  | 45 (36-54) | RPM | 34380 | 11019 | 5510 | 2750 | 1833 | 1433 | |
| | | | | Fz | 0.000012 | 0.00004 | 0.00008 | 0.00015 | 0.00023 | 0.00029 | |
| | | | | Feed (ipm) | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | |
| S | SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene | Profile  | 45 (36-54) | ≤ 400 Bhn or ≤ 43 HRc | RPM | 34380 | 11019 | 5510 | 2750 | 1833 | 1433 |
| | | | | Fz | 0.000008 | 0.00003 | 0.00005 | 0.00010 | 0.00015 | 0.00019 | |
| | | | | Feed (ipm) | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | |
| | | Slot  | 35 (28-42) | RPM | 26740 | 8571 | 4285 | 2139 | 1425 | 1114 | |
| | | | | Fz | 0.000008 | 0.00003 | 0.00005 | 0.00010 | 0.00015 | 0.00019 | |
| | | | | Feed (ipm) | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | |
| S | TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si | Profile  | 160 (128-192) | ≤ 350 Bhn or ≤ 38 HRc | RPM | 122240 | 39179 | 19590 | 9779 | 6516 | 5093 |
| | | | | Fz | 0.000014 | 0.00004 | 0.00008 | 0.00017 | 0.00025 | 0.00033 | |
| | | | | Feed (ipm) | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | 3.32 | |
| | | Slot  | 130 (104-156) | RPM | 99320 | 31833 | 15917 | 7946 | 5294 | 4138 | |
| | | | | Fz | 0.000014 | 0.00004 | 0.00008 | 0.00017 | 0.00025 | 0.00033 | |
| | | | | Feed (ipm) | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 | |
| S | TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al | Profile  | 60 (48-72) | ≤ 440 Bhn or ≤ 47 HRc | RPM | 45840 | 14692 | 7346 | 3667 | 2443 | 1910 |
| | | | | Fz | 0.000010 | 0.00003 | 0.00006 | 0.00012 | 0.00018 | 0.00023 | |
| | | | | Feed (ipm) | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | |
| | | Slot  | 45 (36-54) | RPM | 34380 | 11019 | 5510 | 2750 | 1833 | 1433 | |
| | | | | Fz | 0.000010 | 0.00003 | 0.00006 | 0.00012 | 0.00018 | 0.00023 | |
| | | | | Feed (ipm) | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | |
| H | TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2 | Profile  | 175 (140-210) | ≤ 375 Bhn or ≤ 40 HRc | RPM | 133700 | 42853 | 21426 | 10696 | 7127 | 5571 |
| | | | | Fz | 0.000016 | 0.00005 | 0.00010 | 0.00020 | 0.00030 | 0.00038 | |
| | | | | Feed (ipm) | 4.28 | 4.28 | 4.28 | 4.28 | 4.28 | 4.28 | |
| | | Slot  | 140 (112-168) | RPM | 106960 | 34282 | 17141 | 8557 | 5701 | 4457 | |
| | | | | Fz | 0.000016 | 0.00005 | 0.00010 | 0.00020 | 0.00030 | 0.00038 | |
| | | | | Feed (ipm) | 3.42 | 3.42 | 3.42 | 3.42 | 3.42 | 3.42 | |













Note:

- Bhn (Brinell) HRc (Rockwell C)
- when recommended speed exceeds your capability, use maximum available and recalculate ipm
- rpm = Vc x 3.82 / DC
- ipm = Fz x No. of flutes x rpm
- reduce speed and feed for materials harder than listed
- reduce feed and Ae when finish milling (.02 x D₁ maximum)
- refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for detailed technical charts by series

Baseline

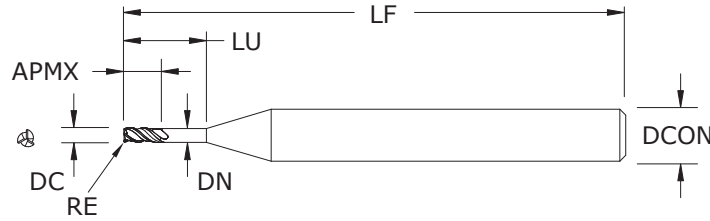
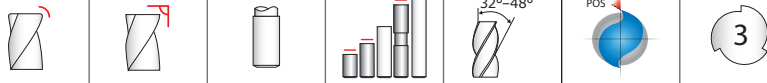
| METRIC Baseline Speed and Feed Square & Ball End With and Without Reach | | | | | DC • (mm) | | | | | | | | |
|--|---|-----------------------------|--|-----------|-----------|---------------|---------|---------|---------|---------|---------|---------|---------|
| | Hardness | Vc (m/min) | | | | | | | | | | | |
| | | | 0.1 | 0.5 | 1 | 1.5 | 2 | 2.5 | 3 | | | | |
| P | CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536 | ≤ 275 Bhn or ≤ 28 HRc | Profile  | 111 | RPM | 353837 | 70767 | 35384 | 23589 | 17692 | 14153 | 11795 | |
| | | | | (89-134) | | Fz | 0.00043 | 0.00216 | 0.00432 | 0.00648 | 0.00865 | 0.01081 | 0.01297 |
| | | | | | | Feed (mm/min) | 306 | 306 | 306 | 306 | 306 | 306 | 306 |
| | | | Slot  | 88 | RPM | 281131 | 56226 | 28113 | 18742 | 14057 | 11245 | 9371 | |
| | | | | (71-106) | | Fz | 0.00043 | 0.00216 | 0.00432 | 0.00648 | 0.00865 | 0.01081 | 0.01297 |
| | | | | | | Feed (mm/min) | 243 | 243 | 243 | 243 | 243 | 243 | 243 |
| P | ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100 | ≤ 375 Bhn or ≤ 40 HRc | Profile  | 64 | RPM | 203577 | 40715 | 20358 | 13572 | 10179 | 8143 | 6786 | |
| | | | | (51-77) | | Fz | 0.00038 | 0.00192 | 0.00384 | 0.00576 | 0.00769 | 0.00961 | 0.01153 |
| | | | | | | Feed (mm/min) | 156 | 156 | 156 | 156 | 156 | 156 | 156 |
| | | | Slot  | 50 | RPM | 159954 | 31991 | 15995 | 10664 | 7998 | 6398 | 5332 | |
| | | | | (40-60) | | Fz | 0.00038 | 0.00192 | 0.00384 | 0.00576 | 0.00769 | 0.00961 | 0.01153 |
| | | | | | | Feed (mm/min) | 123 | 123 | 123 | 123 | 123 | 123 | 123 |
| M | STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F | ≤ 275 Bhn or ≤ 28 HRc | Profile  | 104 | RPM | 329602 | 65920 | 32960 | 21973 | 16480 | 13184 | 10987 | |
| | | | | (83-124) | | Fz | 0.00043 | 0.00216 | 0.00432 | 0.00648 | 0.00865 | 0.01081 | 0.01295 |
| | | | | | | Feed (mm/min) | 285 | 285 | 285 | 285 | 285 | 285 | 285 |
| | | | Slot  | 82 | RPM | 261742 | 52348 | 26174 | 17449 | 13087 | 10470 | 8725 | |
| | | | | (66-99) | | Fz | 0.00043 | 0.00216 | 0.00432 | 0.00648 | 0.00865 | 0.01081 | 0.01295 |
| | | | | | | Feed (mm/min) | 226 | 226 | 226 | 226 | 226 | 226 | 226 |
| M | STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L | ≤ 275 Bhn or ≤ 28 HRc | Profile  | 72 | RPM | 227813 | 45563 | 22781 | 15188 | 11391 | 9113 | 7594 | |
| | | | | (57-86) | | Fz | 0.00038 | 0.00192 | 0.00385 | 0.00577 | 0.00769 | 0.00961 | 0.01154 |
| | | | | | | Feed (mm/min) | 175 | 175 | 175 | 175 | 175 | 175 | 175 |
| | | | Slot  | 56 | RPM | 179342 | 35868 | 17934 | 11956 | 8967 | 7174 | 5978 | |
| | | | | (45-68) | | Fz | 0.00038 | 0.00192 | 0.00385 | 0.00577 | 0.00769 | 0.00961 | 0.01154 |
| | | | | | | Feed (mm/min) | 138 | 138 | 138 | 138 | 138 | 138 | 138 |
| M | STAINLESS STEELS (PH) 13-8 PH, 15-5PH, 17-4 PH, CUSTOM 450 | ≤ 325 Bhn or ≤ 35 HRc | Profile  | 66 | RPM | 208425 | 41685 | 20842 | 13895 | 10421 | 8337 | 6947 | |
| | | | | (52-79) | | Fz | 0.00027 | 0.00136 | 0.00272 | 0.00408 | 0.00544 | 0.00680 | 0.00819 |
| | | | | | | Feed (mm/min) | 113 | 113 | 113 | 113 | 113 | 113 | 113 |
| | | | Slot  | 52 | RPM | 164801 | 32960 | 16480 | 10987 | 8240 | 6592 | 5493 | |
| | | | | (41-62) | | Fz | 0.00027 | 0.00136 | 0.00272 | 0.00408 | 0.00544 | 0.00680 | 0.00819 |
| | | | | | | Feed (mm/min) | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| K | CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile | ≤ 220 Bhn or ≤ 19 HRc | Profile  | 93 | RPM | 295672 | 59134 | 29567 | 19711 | 14784 | 11827 | 9856 | |
| | | | | (74-112) | | Fz | 0.00043 | 0.00217 | 0.00433 | 0.00650 | 0.00866 | 0.01083 | 0.01301 |
| | | | | | | Feed (mm/min) | 256 | 256 | 256 | 256 | 256 | 256 | 256 |
| | | | Slot  | 75 | RPM | 237507 | 47501 | 23751 | 15834 | 11875 | 9500 | 7917 | |
| | | | | (60-90) | | Fz | 0.00043 | 0.00217 | 0.00433 | 0.00650 | 0.00866 | 0.01083 | 0.01301 |
| | | | | | | Feed (mm/min) | 206 | 206 | 206 | 206 | 206 | 206 | 206 |
| N | ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075 | ≤ 150 Bhn or ≤ 7 HRc | Profile  | 305 | RPM | 969416 | 193883 | 96942 | 64628 | 48471 | 38777 | 32314 | |
| | | | | (244-366) | | Fz | 0.00128 | 0.00639 | 0.01277 | 0.01916 | 0.02555 | 0.03193 | 0.03832 |
| | | | | | | Feed (mm/min) | 2477 | 2477 | 2477 | 2477 | 2477 | 2477 | 2477 |
| | | | Slot  | 244 | RPM | 775533 | 155107 | 77553 | 51702 | 38777 | 31021 | 25851 | |
| | | | | (195-293) | | Fz | 0.00128 | 0.00639 | 0.01277 | 0.01916 | 0.02555 | 0.03193 | 0.03832 |
| | | | | | | Feed (mm/min) | 1981 | 1981 | 1981 | 1981 | 1981 | 1981 | 1981 |
| N | COPPER ALLOYS Alum Bronze, C110, Muntz Brass | ≤ 140 Bhn or ≤ 3 HRc | Profile  | 157 | RPM | 499249 | 99850 | 49925 | 33283 | 24962 | 19970 | 16642 | |
| | | | | (126-188) | | Fz | 0.00096 | 0.00479 | 0.00959 | 0.01438 | 0.01917 | 0.02396 | 0.02876 |
| | | | | | | Feed (mm/min) | 957 | 957 | 957 | 957 | 957 | 957 | 957 |
| | | | Slot  | 125 | RPM | 397461 | 79492 | 39746 | 26497 | 19873 | 15898 | 13249 | |
| | | | | (100-150) | | Fz | 0.00096 | 0.00479 | 0.00959 | 0.01438 | 0.01917 | 0.02396 | 0.02876 |
| | | | | | | Feed (mm/min) | 762 | 762 | 762 | 762 | 762 | 762 | 762 |

continued on next page

| METRIC Baseline Speed and Feed Square & Ball End With and Without Reach | | | Hardness | Vc (m/min) | DC • (mm) | | | | | | | | |
|--|---|--|----------|---|---------------|-----------|---------|---------|---------|---------|---------|---------|---------|
| | | | | | 0.1 | 0.5 | 1 | 1.5 | 2 | 2.5 | 3 | | |
| N | PLASTICS Polycarbonate, PVC, Polypropylene | Profile  | 305 | RPM | 969416 | 193883 | 96942 | 64628 | 48471 | 38777 | 32314 | | |
| | | | | (244-366) | Fz | 0.00128 | 0.00639 | 0.01277 | 0.01916 | 0.02555 | 0.03193 | 0.03832 | |
| | | | | | Feed (mm/min) | 2477 | 2477 | 2477 | 2477 | 2477 | 2477 | 2477 | |
| | | | | Slot  | 244 | RPM | 775533 | 155107 | 77553 | 51702 | 38777 | 31021 | 25851 |
| | | | | | | (195-293) | Fz | 0.00128 | 0.00639 | 0.01277 | 0.01916 | 0.02555 | 0.03193 |
| | | | | Feed (mm/min) | 1981 | | 1981 | 1981 | 1981 | 1981 | 1981 | 1981 | |
| S | SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400 | Profile  | 18 | RPM | 58165 | 11633 | 5816 | 3878 | 2908 | 2327 | 1939 | | |
| | | | | (15-22) | Fz | 0.00024 | 0.00121 | 0.00242 | 0.00362 | 0.00483 | 0.00604 | 0.00722 | |
| | | | | | Feed (mm/min) | 28 | 28 | 28 | 28 | 28 | 28 | 28 | |
| | | | | Slot  | 14 | RPM | 43624 | 8725 | 4362 | 2908 | 2181 | 1745 | 1454 |
| | | | | | | (11-16) | Fz | 0.00024 | 0.00121 | 0.00242 | 0.00362 | 0.00483 | 0.00604 |
| | | | | Feed (mm/min) | 21 | | 21 | 21 | 21 | 21 | 21 | 21 | |
| S | SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene | Profile  | 14 | RPM | 43624 | 8725 | 4362 | 2908 | 2181 | 1745 | 1454 | | |
| | | | | (11-16) | Fz | 0.00016 | 0.00080 | 0.00161 | 0.00241 | 0.00322 | 0.00402 | 0.00486 | |
| | | | | | Feed (mm/min) | 14 | 14 | 14 | 14 | 14 | 14 | 14 | |
| | | | | Slot  | 11 | RPM | 33930 | 6786 | 3393 | 2262 | 1696 | 1357 | 1131 |
| | | | | | | (9-13) | Fz | 0.00016 | 0.00080 | 0.00161 | 0.00241 | 0.00322 | 0.00402 |
| | | | | Feed (mm/min) | 11 | | 11 | 11 | 11 | 11 | 11 | 11 | |
| S | TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si | Profile  | 49 | RPM | 155107 | 31021 | 15511 | 10340 | 7755 | 6204 | 5170 | | |
| | | | | (39-59) | Fz | 0.00027 | 0.00136 | 0.00272 | 0.00408 | 0.00544 | 0.00680 | 0.00821 | |
| | | | | | Feed (mm/min) | 84 | 84 | 84 | 84 | 84 | 84 | 84 | |
| | | | | Slot  | 40 | RPM | 126024 | 25205 | 12602 | 8402 | 6301 | 5041 | 4201 |
| | | | | | | (32-48) | Fz | 0.00027 | 0.00136 | 0.00272 | 0.00408 | 0.00544 | 0.00680 |
| | | | | Feed (mm/min) | 69 | | 69 | 69 | 69 | 69 | 69 | 69 | |
| S | TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al | Profile  | 18 | RPM | 58165 | 11633 | 5816 | 3878 | 2908 | 2327 | 1939 | | |
| | | | | (15-22) | Fz | 0.00019 | 0.00096 | 0.00192 | 0.00288 | 0.00384 | 0.00480 | 0.00585 | |
| | | | | | Feed (mm/min) | 22 | 22 | 22 | 22 | 22 | 22 | 22 | |
| | | | | Slot  | 14 | RPM | 43624 | 8725 | 4362 | 2908 | 2181 | 1745 | 1454 |
| | | | | | | (11-16) | Fz | 0.00019 | 0.00096 | 0.00192 | 0.00288 | 0.00384 | 0.00480 |
| | | | | Feed (mm/min) | 17 | | 17 | 17 | 17 | 17 | 17 | 17 | |
| H | TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2 | Profile  | 53 | RPM | 169648 | 33930 | 16965 | 11310 | 8482 | 6786 | 5655 | | |
| | | | | (43-64) | Fz | 0.00032 | 0.00160 | 0.00320 | 0.00480 | 0.00640 | 0.00800 | 0.00962 | |
| | | | | | Feed (mm/min) | 109 | 109 | 109 | 109 | 109 | 109 | 109 | |
| | | | | Slot  | 43 | RPM | 135718 | 27144 | 13572 | 9048 | 6786 | 5429 | 4524 |
| | | | | | | (34-51) | Fz | 0.00032 | 0.00160 | 0.00320 | 0.00480 | 0.00640 | 0.00800 |
| | | | | Feed (mm/min) | 87 | | 87 | 87 | 87 | 87 | 87 | 87 | |

- Note:**
- Bhn (Brinell) HRc (Rockwell C)
 - when recommended speed exceeds your capability, use maximum available and recalculate mm/min
 - rpm = (Vc x 1000) / (DC x 3.14)
 - mm/min = Fz x No. of flutes x rpm
 - reduce speed and feed for materials harder than listed
 - reduce feed and Ae when finish milling (.02 x D₁ maximum)
 - refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for detailed technical charts by series

FRACTIONAL M032



New Expanded Tools

M032 FRACTIONAL SERIES

- Variable helix design improves stability, extends tool life, and improves part quality in challenging applications
- Reinforced shank maximizes rigidity, especially in applications requiring additional tool extension
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- Available from stock in a selection of popular diameters, flute lengths, and end configurations
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | inch | | | | CORNER RADIUS RE | EDP NO. |
|------------------------|------------------------|-----------------------|-------------|---------------------|----------------------|------------------------|---------------------|---------|
| | | | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | TI-NAMITE-A (AITIN) | | |
| 0.0312 | 1/4 | 0.063 | — | — | 2-1/2 | — | 05271 | |
| 0.0312 | 1/4 | 0.063 | 0.155 | 0.029 | 2-1/2 | — | 05272 | |
| 0.0312 | 1/4 | 0.063 | — | — | 2-1/2 | 0.006 | 05270 | |
| 0.0312 | 1/4 | 0.094 | — | — | 2-1/2 | — | 05274 | |
| 0.0312 | 1/4 | 0.094 | — | — | 2-1/2 | 0.006 | 05273 | |
| 0.0312 | 1/4 | 0.094 | 0.155 | 0.029 | 2-1/2 | 0.006 | 05275 | |
| 0.0469 | 1/4 | 0.094 | — | — | 2-1/2 | — | 05277 | |
| 0.0469 | 1/4 | 0.094 | 0.230 | 0.043 | 2-1/2 | — | 05278 | |
| 0.0469 | 1/4 | 0.094 | — | — | 2-1/2 | 0.010 | 05276 | |
| 0.0469 | 1/4 | 0.141 | — | — | 2-1/2 | — | 05280 | |
| 0.0469 | 1/4 | 0.141 | — | — | 2-1/2 | 0.010 | 05279 | |
| 0.0469 | 1/4 | 0.141 | 0.230 | 0.043 | 2-1/2 | 0.010 | 05281 | |
| 0.0625 | 1/4 | 0.140 | — | — | 2-1/2 | — | 05283 | |
| 0.0625 | 1/4 | 0.140 | 0.312 | 0.058 | 2-1/2 | — | 05284 | |
| 0.0625 | 1/4 | 0.140 | — | — | 2-1/2 | 0.010 | 05282 | |
| 0.0625 | 1/4 | 0.188 | — | — | 2-1/2 | — | 05286 | |
| 0.0625 | 1/4 | 0.188 | — | — | 2-1/2 | 0.010 | 05285 | |
| 0.0625 | 1/4 | 0.188 | 0.312 | 0.058 | 2-1/2 | 0.010 | 05287 | |
| 0.0781 | 1/4 | 0.140 | — | — | 2-1/2 | — | 05289 | |
| 0.0781 | 1/4 | 0.140 | 0.390 | 0.072 | 2-1/2 | — | 05290 | |
| 0.0781 | 1/4 | 0.140 | — | — | 2-1/2 | 0.010 | 05288 | |
| 0.0781 | 1/4 | 0.234 | — | — | 2-1/2 | — | 05292 | |
| 0.0781 | 1/4 | 0.234 | — | — | 2-1/2 | 0.010 | 05291 | |
| 0.0781 | 1/4 | 0.234 | 0.390 | 0.072 | 2-1/2 | 0.010 | 05293 | |
| 0.0938 | 1/4 | 0.188 | — | — | 2-1/2 | — | 05295 | |
| 0.0938 | 1/4 | 0.188 | 0.465 | 0.086 | 2-1/2 | — | 05296 | |
| 0.0938 | 1/4 | 0.188 | — | — | 2-1/2 | 0.010 | 05294 | |
| 0.0938 | 1/4 | 0.375 | — | — | 2-1/2 | — | 05298 | |
| 0.0938 | 1/4 | 0.375 | — | — | 2-1/2 | 0.010 | 05297 | |
| 0.0938 | 1/4 | 0.375 | 0.465 | 0.086 | 2-1/2 | 0.010 | 05299 | |
| 0.1094 | 1/4 | 0.188 | — | — | 2-1/2 | — | 05301 | |
| 0.1094 | 1/4 | 0.188 | 0.545 | 0.101 | 2-1/2 | — | 05302 | |
| 0.1094 | 1/4 | 0.188 | — | — | 2-1/2 | 0.010 | 05300 | |
| 0.1094 | 1/4 | 0.438 | — | — | 2-1/2 | — | 05304 | |
| 0.1094 | 1/4 | 0.438 | — | — | 2-1/2 | 0.010 | 05303 | |
| 0.1094 | 1/4 | 0.438 | 0.545 | 0.101 | 2-1/2 | 0.010 | 05305 | |

TOLERANCES (inch)

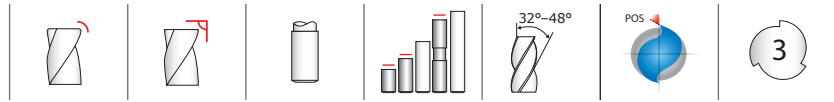
.031–.109 DIAMETER

DC = +0.000/–0.001

DCON = h₆

RE = +0.002/–0.002

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



New Expanded Tools

TOLERANCES (mm)

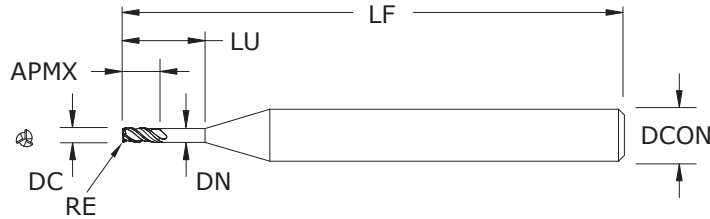
1,0–3,0 DIAMETER

DC = +0,0000/–0,0254

DCON = h₆

RE = +0,050/–0,050

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

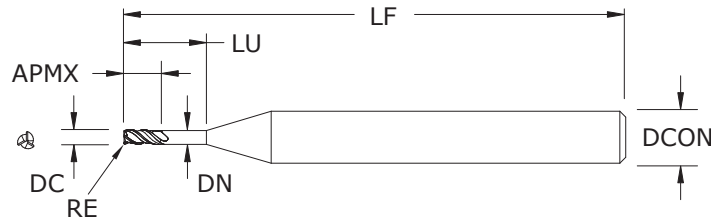
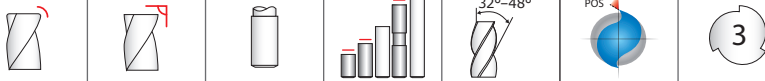


M032
METRIC SERIES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | mm | | | | CORNER RADIUS RE | EDP NO. |
|---------------------|---------------------|--------------------|----------|------------------|-------------------|---------------------|------------------|---------|
| | | | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | TI-NAMITE-A (AITiN) | | |
| 1,0 | 6,0 | 1,5 | – | – | 63,5 | – | 05324 | |
| 1,0 | 6,0 | 1,5 | – | – | 63,5 | 0,1 | 05321 | |
| 1,0 | 6,0 | 1,5 | – | – | 63,5 | 0,2 | 05322 | |
| 1,0 | 6,0 | 1,5 | – | – | 63,5 | 0,3 | 05323 | |
| 1,0 | 6,0 | 3,0 | – | – | 63,5 | – | 05328 | |
| 1,0 | 6,0 | 3,0 | – | – | 63,5 | 0,1 | 05325 | |
| 1,0 | 6,0 | 3,0 | – | – | 63,5 | 0,2 | 05326 | |
| 1,0 | 6,0 | 3,0 | – | – | 63,5 | 0,3 | 05327 | |
| 1,0 | 6,0 | 3,0 | 10,0 | 0,92 | 75,0 | – | 05332 | |
| 1,0 | 6,0 | 3,0 | 10,0 | 0,92 | 63,5 | 0,1 | 05329 | |
| 1,0 | 6,0 | 3,0 | 10,0 | 0,92 | 63,5 | 0,2 | 05330 | |
| 1,0 | 6,0 | 3,0 | 10,0 | 0,92 | 63,5 | 0,3 | 05331 | |
| 1,5 | 6,0 | 2,5 | – | – | 63,5 | – | 05310 | |
| 1,5 | 6,0 | 2,5 | – | – | 63,5 | 0,1 | 05306 | |
| 1,5 | 6,0 | 2,5 | – | – | 63,5 | 0,2 | 05307 | |
| 1,5 | 6,0 | 2,5 | – | – | 63,5 | 0,3 | 05308 | |
| 1,5 | 6,0 | 2,5 | – | – | 63,5 | 0,5 | 05309 | |
| 1,5 | 6,0 | 4,5 | – | – | 63,5 | – | 05315 | |
| 1,5 | 6,0 | 4,5 | – | – | 63,5 | 0,1 | 05311 | |
| 1,5 | 6,0 | 4,5 | – | – | 63,5 | 0,2 | 05312 | |
| 1,5 | 6,0 | 4,5 | – | – | 63,5 | 0,3 | 05313 | |
| 1,5 | 6,0 | 4,5 | – | – | 63,5 | 0,5 | 05314 | |
| 1,5 | 6,0 | 4,5 | 15,0 | 1,38 | 75,0 | – | 05320 | |
| 1,5 | 6,0 | 4,5 | 15,0 | 1,38 | 63,5 | 0,1 | 05316 | |
| 1,5 | 6,0 | 4,5 | 15,0 | 1,38 | 63,5 | 0,2 | 05317 | |
| 1,5 | 6,0 | 4,5 | 15,0 | 1,38 | 63,5 | 0,3 | 05318 | |
| 1,5 | 6,0 | 4,5 | 15,0 | 1,38 | 63,5 | 0,5 | 05319 | |
| 2,0 | 6,0 | 3,0 | – | – | 63,5 | – | 05348 | |
| 2,0 | 6,0 | 3,0 | – | – | 63,5 | 0,2 | 05345 | |
| 2,0 | 6,0 | 3,0 | – | – | 63,5 | 0,3 | 05346 | |
| 2,0 | 6,0 | 3,0 | – | – | 63,5 | 0,5 | 05347 | |
| 2,0 | 6,0 | 6,0 | – | – | 63,5 | – | 05352 | |
| 2,0 | 6,0 | 6,0 | – | – | 63,5 | 0,2 | 05349 | |
| 2,0 | 6,0 | 6,0 | – | – | 63,5 | 0,3 | 05350 | |

- Variable helix design improves stability, extends tool life, and improves part quality in challenging applications
- Reinforced shank maximizes rigidity, especially in applications requiring additional tool extension
- Proprietary coating allows for superior chip flow, driving industry leading productivity and value, even at low spindle speeds.
- Available from stock in a selection of popular diameters, flute lengths, and end configurations
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures

continued on next page



 New Expanded Tools

M032
METRIC SERIES

continued

| mm | | | | | | | EDP NO, |
|---------------------|---------------------|--------------------|----------|------------------|-------------------|------------------|---------------------|
| CUTTING DIAMETER DC | SHANK DIAMETER DCON | LENGTH OF CUT APMX | REACH LU | NECK DIAMETER DN | OVERALL LENGTH LF | CORNER RADIUS RE | TI-NAMITE-A (AITiN) |
| 2,0 | 6,0 | 6,0 | – | – | 63,5 | 0,5 | 05351 |
| 2,0 | 6,0 | 6,0 | 20,0 | 1,84 | 75,0 | – | 05356 |
| 2,0 | 6,0 | 6,0 | 20,0 | 1,84 | 63,5 | 0,2 | 05353 |
| 2,0 | 6,0 | 6,0 | 20,0 | 1,84 | 63,5 | 0,3 | 05354 |
| 2,0 | 6,0 | 6,0 | 20,0 | 1,84 | 63,5 | 0,5 | 05355 |
| 2,5 | 6,0 | 4,0 | – | – | 63,5 | – | 05336 |
| 2,5 | 6,0 | 4,0 | – | – | 63,5 | 0,2 | 05333 |
| 2,5 | 6,0 | 4,0 | – | – | 63,5 | 0,3 | 05334 |
| 2,5 | 6,0 | 4,0 | – | – | 63,5 | 0,5 | 05335 |
| 2,5 | 6,0 | 7,5 | – | – | 63,5 | – | 05340 |
| 2,5 | 6,0 | 7,5 | – | – | 63,5 | 0,2 | 05337 |
| 2,5 | 6,0 | 7,5 | – | – | 63,5 | 0,3 | 05338 |
| 2,5 | 6,0 | 7,5 | – | – | 63,5 | 0,5 | 05339 |
| 2,5 | 6,0 | 7,5 | 25,0 | 2,3 | 75,0 | – | 05344 |
| 2,5 | 6,0 | 7,5 | 25,0 | 2,3 | 63,5 | 0,2 | 05341 |
| 2,5 | 6,0 | 7,5 | 25,0 | 2,3 | 63,5 | 0,3 | 05342 |
| 2,5 | 6,0 | 7,5 | 25,0 | 2,3 | 63,5 | 0,5 | 05343 |
| 3,0 | 6,0 | 5,0 | – | – | 63,5 | – | 05361 |
| 3,0 | 6,0 | 5,0 | – | – | 63,5 | 0,2 | 05357 |
| 3,0 | 6,0 | 5,0 | – | – | 63,5 | 0,3 | 05358 |
| 3,0 | 6,0 | 5,0 | – | – | 63,5 | 0,5 | 05359 |
| 3,0 | 6,0 | 5,0 | – | – | 63,5 | 1,0 | 05360 |
| 3,0 | 6,0 | 9,0 | – | – | 63,5 | – | 05366 |
| 3,0 | 6,0 | 9,0 | – | – | 63,5 | 0,2 | 05362 |
| 3,0 | 6,0 | 9,0 | – | – | 63,5 | 0,3 | 05363 |
| 3,0 | 6,0 | 9,0 | – | – | 63,5 | 0,5 | 05364 |
| 3,0 | 6,0 | 9,0 | – | – | 63,5 | 1,0 | 05365 |
| 3,0 | 6,0 | 9,0 | 30,0 | 2,76 | 75,0 | – | 05371 |
| 3,0 | 6,0 | 9,0 | 30,0 | 2,76 | 63,5 | 0,2 | 05367 |
| 3,0 | 6,0 | 9,0 | 30,0 | 2,76 | 63,5 | 0,3 | 05368 |
| 3,0 | 6,0 | 9,0 | 30,0 | 2,76 | 63,5 | 0,5 | 05369 |
| 3,0 | 6,0 | 9,0 | 30,0 | 2,76 | 63,5 | 1,0 | 05370 |

TOLERANCES (mm)

1,0–3,0 DIAMETER

DC = +0,0000/–0,0254

DCON = h₆

RE = +0,050/–0,050

 STEELS

 STAINLESS STEELS

 CAST IRON

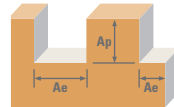
 HIGH TEMP ALLOYS

 TITANIUM

 HARDENED STEELS

 NON-FERROUS

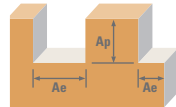
 PLASTICS/COMPOSITES



| Series M032 Fractional | Hardness | Ae x DC | Ap x DC | Vc (sfm) | DC • in | | | | |
|---|-----------------------------|-------------|---------|----------|-------------|------------|---------|---------|---------|
| | | | | | 1/32 | 5/64 | 7/64 | | |
| P CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536 | ≤ 275 Bhn or ≤ 28 HRc | Profile | ≤ 0.25 | ≤ 1 | 790 | RPM | 96570 | 38628 | 27591 |
| | | | | | (632-948) | Fz | 0.00009 | 0.00022 | 0.00031 |
| | | | | | | Feed (ipm) | 26.0 | 26.0 | 26.0 |
| | | Slot | 1 | ≤ .5 | 630 | RPM | 77011 | 30804 | 22003 |
| | | | | | (504-756) | Fz | 0.00009 | 0.00022 | 0.00031 |
| | | | | | | Feed (ipm) | 20.5 | 20.5 | 20.5 |
| | | Finish | ≤ .02 | 1 | 1565 | RPM | 191306 | 76522 | 54659 |
| | | | | | (1252-1878) | Fz | 0.00017 | 0.00041 | 0.00058 |
| | | | | | | Feed (ipm) | 95.0 | 95.0 | 95.0 |
| P ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100 | ≤ 375 Bhn or ≤ 40 HRc | Profile | ≤ 0.25 | ≤ 1 | 450 | RPM | 55008 | 22003 | 15717 |
| | | | | | (360-540) | Fz | 0.00007 | 0.00017 | 0.00023 |
| | | | | | | Feed (ipm) | 11.0 | 11.0 | 11.0 |
| | | Slot | 1 | ≤ .5 | 360 | RPM | 44006 | 17603 | 12573 |
| | | | | | (288-432) | Fz | 0.00007 | 0.00017 | 0.00024 |
| | | | | | | Feed (ipm) | 8.9 | 8.9 | 8.9 |
| | | Finish | ≤ .02 | 1 | 895 | RPM | 109405 | 43762 | 31259 |
| | | | | | (716-1074) | Fz | 0.00012 | 0.00030 | 0.00043 |
| | | | | | | Feed (ipm) | 40.0 | 40.0 | 40.0 |
| P ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100 | ≤ 560 Bhn or ≤ 55 HRc | Profile | ≤ 0.25 | ≤ 1 | 93 | RPM | 11368 | 4547 | 3248 |
| | | | | | (74-112) | Fz | 0.00003 | 0.00007 | 0.00010 |
| | | | | | | Feed (ipm) | 0.9 | 0.9 | 0.9 |
| | | Slot | 1 | ≤ .5 | 65 | RPM | 7946 | 3178 | 2270 |
| | | | | | (52-78) | Fz | 0.00003 | 0.00006 | 0.00009 |
| | | | | | | Feed (ipm) | 0.6 | 0.6 | 0.6 |
| | | Finish | ≤ .02 | 1 | 167 | RPM | 20414 | 8166 | 5833 |
| | | | | | (134-200) | Fz | 0.00004 | 0.00011 | 0.00016 |
| | | | | | | Feed (ipm) | 2.8 | 2.8 | 2.8 |
| H TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2 | ≤ 375 Bhn or ≤ 40 HRc | Profile | ≤ 0.25 | ≤ 1 | 69 | RPM | 8435 | 3374 | 2410 |
| | | | | | (55-83) | Fz | 0.00003 | 0.00007 | 0.00010 |
| | | | | | | Feed (ipm) | 0.8 | 0.8 | 0.8 |
| | | Slot | 1 | ≤ .5 | 50 | RPM | 6112 | 2445 | 1746 |
| | | | | | (40-60) | Fz | 0.00002 | 0.00006 | 0.00009 |
| | | | | | | Feed (ipm) | 0.5 | 0.5 | 0.5 |
| | | Finish | ≤ .02 | 1 | 124 | RPM | 15158 | 6063 | 4331 |
| | | | | | (99-149) | Fz | 0.00005 | 0.00012 | 0.00017 |
| | | | | | | Feed (ipm) | 2.2 | 2.2 | 2.2 |
| K CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile | ≤ 220 Bhn or ≤ 19 HRc | Profile | ≤ 0.25 | ≤ 1 | 620 | RPM | 75789 | 30316 | 21654 |
| | | | | | (496-744) | Fz | 0.00011 | 0.00028 | 0.00039 |
| | | | | | | Feed (ipm) | 25.5 | 25.5 | 25.5 |
| | | Slot | 1 | ≤ .5 | 450 | RPM | 55008 | 22003 | 15717 |
| | | | | | (360-540) | Fz | 0.00010 | 0.00024 | 0.00034 |
| | | | | | | Feed (ipm) | 16.0 | 16.0 | 16.0 |
| | | Finish | ≤ .02 | 1 | 1115 | RPM | 136298 | 54519 | 38942 |
| | | | | | (892-1338) | Fz | 0.00018 | 0.00045 | 0.00062 |
| | | | | | | Feed (ipm) | 73.0 | 73.0 | 73.0 |

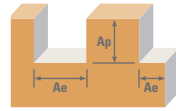
continued on next page

Series M032



| Series M032 Fractional | Hardness | Ae x DC | Ap x DC | Vc (sfm) | DC • in | | | | |
|--|-----------------------------|-------------|---------|----------|-----------|------------|---------|---------|---------|
| | | | | | 1/32 | 5/64 | 7/64 | | |
| M STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L | ≤ 275 Bhn or ≤ 28 HRc | Profile | ≤ 0.25 | ≤ 1 | 335 | RPM | 40950 | 16380 | 11700 |
| | | | | | (268-402) | Fz | 0.00008 | 0.00020 | 0.00028 |
| | | | | | | Feed (ipm) | 9.9 | 9.9 | 9.9 |
| | | Slot | 1 | ≤ .5 | 245 | RPM | 29949 | 11980 | 8557 |
| | | | | | (196-294) | Fz | 0.00007 | 0.00017 | 0.00023 |
| | | | | | | Feed (ipm) | 6.0 | 6.0 | 6.0 |
| | | Finish | ≤ .02 | 1 | 605 | RPM | 73955 | 29582 | 21130 |
| | | | | | (484-726) | Fz | 0.00012 | 0.00031 | 0.00043 |
| | | | | | | Feed (ipm) | 27.5 | 27.5 | 27.5 |
| M STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450 | ≤ 325 Bhn or ≤ 35 HRc | Profile | ≤ 0.25 | ≤ 1 | 310 | RPM | 37894 | 15158 | 10827 |
| | | | | | (248-372) | Fz | 0.00008 | 0.00020 | 0.00028 |
| | | | | | | Feed (ipm) | 9.0 | 9.0 | 9.0 |
| | | Slot | 1 | ≤ .5 | 225 | RPM | 27504 | 11002 | 7858 |
| | | | | | (180-270) | Fz | 0.00007 | 0.00017 | 0.00023 |
| | | | | | | Feed (ipm) | 5.5 | 5.5 | 5.5 |
| | | Finish | ≤ .02 | 1 | 555 | RPM | 67843 | 27137 | 19384 |
| | | | | | (444-666) | Fz | 0.00013 | 0.00031 | 0.00044 |
| | | | | | | Feed (ipm) | 25.5 | 25.5 | 25.5 |
| S SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene | ≤ 400 Bhn or ≤ 43 HRc | Profile | ≤ 0.5 | ≤ 1.5 | 200 | RPM | 24448 | 9779 | 6985 |
| | | | | | (160-240) | Fz | 0.00007 | 0.00017 | 0.00024 |
| | | | | | | Feed (ipm) | 5.1 | 5.1 | 5.1 |
| | | Slot | 1 | ≤ 1 | 145 | RPM | 17725 | 7090 | 5064 |
| | | | | | (116-174) | Fz | 0.00006 | 0.00015 | 0.00021 |
| | | | | | | Feed (ipm) | 3.2 | 3.2 | 3.2 |
| | | Finish | ≤ .02 | 1 | 360 | RPM | 44006 | 17603 | 12573 |
| | | | | | (288-432) | Fz | 0.00011 | 0.00027 | 0.00038 |
| | | | | | | Feed (ipm) | 14.5 | 14.5 | 14.5 |
| S TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si | ≤ 350 Bhn or ≤ 38 HRc | Profile | ≤ 0.5 | ≤ 1.5 | 245 | RPM | 29949 | 11980 | 8557 |
| | | | | | (196-294) | Fz | 0.00007 | 0.00018 | 0.00025 |
| | | | | | | Feed (ipm) | 6.3 | 6.3 | 6.3 |
| | | Slot | 1 | ≤ 1 | 180 | RPM | 22003 | 8801 | 6287 |
| | | | | | (144-216) | Fz | 0.00006 | 0.00015 | 0.00021 |
| | | | | | | Feed (ipm) | 3.9 | 3.9 | 3.9 |
| | | Finish | ≤ .02 | 1 | 440 | RPM | 53786 | 21514 | 15367 |
| | | | | | (352-528) | Fz | 0.00011 | 0.00028 | 0.00039 |
| | | | | | | Feed (ipm) | 18.0 | 18.0 | 18.0 |

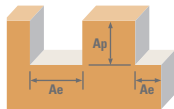
Bhn (Brinell) HRc (Rockwell C)
 rpm = Vc x 3.82 / DC
 ipm = Fz x 3 x rpm (Fz x 3 x max available rpm when recommendation exceeds machine limit)
 ramp up to 5 degrees using slotting speed and feed rates. Do not plunge.
 reduce speed and feed for materials harder than listed
 refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



| Series M032 Metric | Hardness | Ae x DC | Ap x DC | Vc (m/min) | DC • mm | | | | |
|--|-----------------------------|-------------|---------|------------|-----------|---------------|--------|--------|--------|
| | | | | | 1 | 2 | 3 | | |
| P CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536 | ≤ 275 Bhn or ≤ 28 HRc | Profile | ≤ 0.25 | ≤ 1 | 241 | RPM | 76584 | 38292 | 25528 |
| | | | | | (193-289) | Fz | 0.0029 | 0.0057 | 0.0086 |
| | | | | | | Feed (mm/min) | 660 | 660 | 660 |
| | | Slot | 1 | ≤ .5 | 192 | RPM | 61073 | 30537 | 20358 |
| | | | | | (154-230) | Fz | 0.0028 | 0.0057 | 0.0085 |
| | | | | | | Feed (ipm) | 521 | 521 | 521 |
| | | Finish | ≤ .02 | 1 | 477 | RPM | 151714 | 75857 | 50571 |
| | | | | | (382-572) | Fz | 0.0053 | 0.0106 | 0.0159 |
| | | | | | | Feed (ipm) | 2413 | 2413 | 2413 |
| P ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100 | ≤ 375 Bhn or ≤ 40 HRc | Profile | ≤ 0.25 | ≤ 1 | 137 | RPM | 43624 | 21812 | 14541 |
| | | | | | (110-165) | Fz | 0.0021 | 0.0043 | 0.0064 |
| | | | | | | Feed (ipm) | 279 | 279 | 279 |
| | | Slot | 1 | ≤ .5 | 110 | RPM | 34899 | 17449 | 11633 |
| | | | | | (88-132) | Fz | 0.0022 | 0.0043 | 0.0065 |
| | | | | | | Feed (ipm) | 226 | 226 | 226 |
| | | Finish | ≤ .02 | 1 | 273 | RPM | 86763 | 43381 | 28921 |
| | | | | | (218-327) | Fz | 0.0039 | 0.0078 | 0.0117 |
| | | | | | | Feed (ipm) | 1016 | 1016 | 1016 |
| P ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100 | ≤ 560 Bhn or ≤ 55 HRc | Profile | ≤ 0.25 | ≤ 1 | 28 | RPM | 9016 | 4508 | 3005 |
| | | | | | (23-34) | Fz | 0.0009 | 0.0018 | 0.0026 |
| | | | | | | Feed (ipm) | 24 | 24 | 24 |
| | | Slot | 1 | ≤ .5 | 20 | RPM | 6301 | 3151 | 2100 |
| | | | | | (16-24) | Fz | 0.0008 | 0.0016 | 0.0025 |
| | | | | | | Feed (ipm) | 15 | 15 | 15 |
| | | Finish | ≤ .02 | 1 | 51 | RPM | 16189 | 8095 | 5396 |
| | | | | | (41-61) | Fz | 0.0014 | 0.0029 | 0.0043 |
| | | | | | | Feed (ipm) | 70 | 70 | 70 |
| H TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2 | ≤ 375 Bhn or ≤ 40 HRc | Profile | ≤ 0.25 | ≤ 1 | 21 | RPM | 6689 | 3344 | 2230 |
| | | | | | (17-25) | Fz | 0.0009 | 0.0019 | 0.0028 |
| | | | | | | Feed (ipm) | 19 | 19 | 19 |
| | | Slot | 1 | ≤ .5 | 15 | RPM | 4847 | 2424 | 1616 |
| | | | | | (12-18) | Fz | 0.0008 | 0.0016 | 0.0024 |
| | | | | | | Feed (ipm) | 11 | 11 | 11 |
| | | Finish | ≤ .02 | 1 | 38 | RPM | 12021 | 6010 | 4007 |
| | | | | | (30-45) | Fz | 0.0015 | 0.0031 | 0.0046 |
| | | | | | | Feed (ipm) | 56 | 56 | 56 |
| K CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile | ≤ 220 Bhn or ≤ 19 HRc | Profile | ≤ 0.25 | ≤ 1 | 189 | RPM | 60104 | 30052 | 20035 |
| | | | | | (151-227) | Fz | 0.0036 | 0.0072 | 0.0108 |
| | | | | | | Feed (ipm) | 648 | 648 | 648 |
| | | Slot | 1 | ≤ .5 | 137 | RPM | 43624 | 21812 | 14541 |
| | | | | | (110-165) | Fz | 0.0031 | 0.0062 | 0.0093 |
| | | | | | | Feed (ipm) | 406 | 406 | 406 |
| | | Finish | ≤ .02 | 1 | 340 | RPM | 108090 | 54045 | 36030 |
| | | | | | (272-408) | Fz | 0.0057 | 0.0114 | 0.0172 |
| | | | | | | Feed (ipm) | 1854 | 1854 | 1854 |

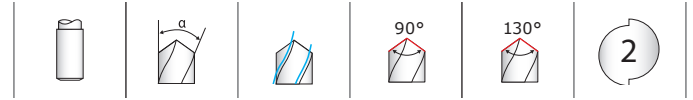
continued on next page

Series M032



| Series M032 Metric | Hardness | Ae x DC | Ap x DC | Vc (m/min) | DC • mm | | | | |
|---|-----------------------------|-------------|---------|------------|-----------|------------|--------|--------|--------|
| | | | | | 1 | 2 | 3 | | |
| M STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L | ≤ 275 Bhn or ≤ 28 HRc | Profile | ≤ 0.25 | ≤ 1 | 102 | RPM | 32475 | 16238 | 10825 |
| | | | | | (82-123) | Fz | 0.0026 | 0.0052 | 0.0077 |
| | | | | | | Feed (ipm) | 251 | 251 | 251 |
| | ≤ 325 Bhn or ≤ 35 HRc | Slot | 1 | ≤ .5 | 75 | RPM | 23751 | 11875 | 7917 |
| | | | | | (60-90) | Fz | 0.0021 | 0.0043 | 0.0064 |
| | | | | | | Feed (ipm) | 152 | 152 | 152 |
| | ≤ .02 | Finish | ≤ .02 | 1 | 184 | RPM | 58650 | 29325 | 19550 |
| | | | | | (148-221) | Fz | 0.0040 | 0.0079 | 0.0119 |
| | | | | | | Feed (ipm) | 699 | 699 | 699 |
| M STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450 | ≤ 325 Bhn or ≤ 35 HRc | Profile | ≤ 0.25 | ≤ 1 | 94 | RPM | 30052 | 15026 | 10017 |
| | | | | | (76-113) | Fz | 0.0025 | 0.0051 | 0.0076 |
| | | | | | | Feed (ipm) | 229 | 229 | 229 |
| | ≤ 400 Bhn or ≤ 43 HRc | Slot | 1 | ≤ .5 | 69 | RPM | 21812 | 10906 | 7271 |
| | | | | | (55-82) | Fz | 0.0021 | 0.0043 | 0.0064 |
| | | | | | | Feed (ipm) | 140 | 140 | 140 |
| | ≤ .02 | Finish | ≤ .02 | 1 | 169 | RPM | 53803 | 26901 | 17934 |
| | | | | | (135-203) | Fz | 0.0040 | 0.0080 | 0.0120 |
| | | | | | | Feed (ipm) | 648 | 648 | 648 |
| S SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene | ≤ 400 Bhn or ≤ 43 HRc | Profile | ≤ 0.5 | ≤ 1.5 | 61 | RPM | 19388 | 9694 | 6463 |
| | | | | | (49-73) | Fz | 0.0022 | 0.0045 | 0.0067 |
| | | | | | | Feed (ipm) | 130 | 130 | 130 |
| | ≤ 350 Bhn or ≤ 38 HRc | Slot | 1 | ≤ 1 | 44 | RPM | 14057 | 7028 | 4686 |
| | | | | | (35-53) | Fz | 0.0019 | 0.0039 | 0.0058 |
| | | | | | | Feed (ipm) | 81 | 81 | 81 |
| | ≤ .02 | Finish | ≤ .02 | 1 | 110 | RPM | 34899 | 17449 | 11633 |
| | | | | | (88-132) | Fz | 0.0035 | 0.0070 | 0.0106 |
| | | | | | | Feed (ipm) | 368 | 368 | 368 |
| S TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si | ≤ 350 Bhn or ≤ 38 HRc | Profile | ≤ 0.5 | ≤ 1.5 | 75 | RPM | 23751 | 11875 | 7917 |
| | | | | | (60-90) | Fz | 0.0022 | 0.0045 | 0.0067 |
| | | | | | | Feed (ipm) | 160 | 160 | 160 |
| | ≤ 350 Bhn or ≤ 38 HRc | Slot | 1 | ≤ 1 | 55 | RPM | 17449 | 8725 | 5816 |
| | | | | | (44-66) | Fz | 0.0019 | 0.0038 | 0.0057 |
| | | | | | | Feed (ipm) | 99 | 99 | 99 |
| | ≤ .02 | Finish | ≤ .02 | 1 | 134 | RPM | 42654 | 21327 | 14218 |
| | | | | | (107-161) | Fz | 0.0036 | 0.0071 | 0.0107 |
| | | | | | | Feed (ipm) | 457 | 457 | 457 |

Bhn (Brinell) HRc (Rockwell C)
 rpm = (Vc x 1000) / (DC x 3.14)
 mm/min = Fz x 3 x rpm (Fz x 3 x max available rpm when recommendation exceeds machine limit)
 reduce speed and feed for materials harder than listed
 refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



New Expanded Tools

TOLERANCES (inch)

.005-.125 DIAMETER

DC = +0.0000/-0.0003

DCON = h₆

STEELS

STAINLESS STEELS

CAST IRON

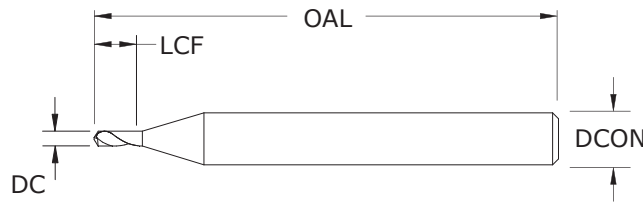
HIGH TEMP ALLOYS

TITANIUM

HARDENED STEELS

NON-FERROUS

PLASTICS/COMPOSITES

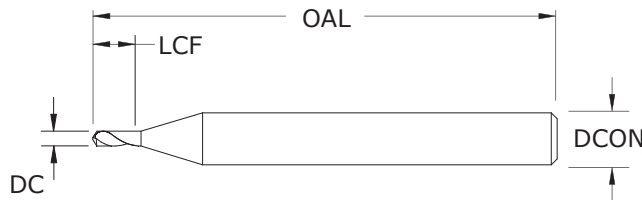


M080
FRACTIONAL SERIES

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | inch | | | POINT ANGLE | EDP NO. | |
|------------------------|------------------------|---------------------|-----------------------|-----|-------------|----------|------------------------|
| | | FLUTE LENGTH LCF | OVERALL LENGTH OAL | | | UNCOATED | TI-NAMITE-A (AITiN) |
| 0.0050 | 1/8 | 0.025 | 1-1/2 | 90 | 07016 | 07000 | |
| 0.0100 | 1/8 | 0.035 | 1-1/2 | 90 | 07017 | 07001 | |
| 0.0150 | 1/8 | 0.045 | 1-1/2 | 90 | 07018 | 07002 | |
| 0.0200 | 1/8 | 0.050 | 1-1/2 | 90 | 07019 | 07003 | |
| 0.0312 | 1/8 | 0.090 | 1-1/2 | 90 | 07020 | 07004 | |
| 0.0625 | 1/8 | 0.200 | 1-1/2 | 90 | 07021 | 07005 | |
| 0.0938 | 1/8 | 0.200 | 1-1/2 | 90 | 07022 | 07006 | |
| 0.1250 | 1/8 | 0.200 | 1-1/2 | 90 | 07023 | 07007 | |
| 0.0050 | 1/8 | 0.025 | 1-1/2 | 130 | 07024 | 07008 | |
| 0.0100 | 1/8 | 0.035 | 1-1/2 | 130 | 07025 | 07009 | |
| 0.0150 | 1/8 | 0.045 | 1-1/2 | 130 | 07026 | 07010 | |
| 0.0200 | 1/8 | 0.050 | 1-1/2 | 130 | 07027 | 07011 | |
| 0.0312 | 1/8 | 0.090 | 1-1/2 | 130 | 07028 | 07012 | |
| 0.0625 | 1/8 | 0.200 | 1-1/2 | 130 | 07029 | 07013 | |
| 0.0938 | 1/8 | 0.200 | 1-1/2 | 130 | 07030 | 07014 | |
| 0.1250 | 1/8 | 0.200 | 1-1/2 | 130 | 07031 | 07015 | |

- 4-facet point design, stub length, and mirror finish provide the highest quality spot
- Ti-Namite A coating and uncoated options for the ultimate performance and tool life in a variety of ferrous and non-ferrous workpiece materials
- Available from stock in all popular diameters and point configurations
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures

2 Flute Spotting External Coolant



New Expanded Tools

M081 METRIC SERIES

- 4-facet point design, stub length, and mirror finish provide the highest quality spot
- Ti-Namite A coating and uncoated options for the ultimate performance and tool life in a variety of ferrous and non-ferrous workpiece materials
- Available from stock in all popular diameters and point configurations
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures

| CUTTING DIAMETER DC | SHANK DIAMETER DCON | mm | | | POINT ANGLE | EDP NO. | |
|------------------------|------------------------|---------------------|-----------------------|-----|-------------|----------|------------------------|
| | | FLUTE LENGTH LCF | OVERALL LENGTH OAL | | | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0,15 | 3,0 | 0,65 | 38,0 | 90 | 07048 | 07032 | |
| 0,25 | 3,0 | 0,90 | 38,0 | 90 | 07049 | 07033 | |
| 0,40 | 3,0 | 1,15 | 38,0 | 90 | 07050 | 07034 | |
| 0,50 | 3,0 | 1,30 | 38,0 | 90 | 07051 | 07035 | |
| 1,00 | 3,0 | 2,30 | 38,0 | 90 | 07052 | 07036 | |
| 1,50 | 3,0 | 5,00 | 38,0 | 90 | 07053 | 07037 | |
| 2,00 | 3,0 | 5,00 | 38,0 | 90 | 07054 | 07038 | |
| 3,00 | 3,0 | 5,00 | 38,0 | 90 | 07055 | 07039 | |
| 0,15 | 3,0 | 0,65 | 38,0 | 130 | 07056 | 07040 | |
| 0,25 | 3,0 | 0,90 | 38,0 | 130 | 07057 | 07041 | |
| 0,40 | 3,0 | 1,15 | 38,0 | 130 | 07058 | 07042 | |
| 0,50 | 3,0 | 1,30 | 38,0 | 130 | 07059 | 07043 | |
| 1,00 | 3,0 | 2,30 | 38,0 | 130 | 07060 | 07044 | |
| 1,50 | 3,0 | 5,00 | 38,0 | 130 | 07061 | 07045 | |
| 2,00 | 3,0 | 5,00 | 38,0 | 130 | 07062 | 07046 | |
| 3,00 | 3,0 | 5,00 | 38,0 | 130 | 07063 | 07047 | |

TOLERANCES (mm)

0,15–3,0 DIAMETER

DC = +0,000/–0,008

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

| Series M080 | Hardness | Vc (sfm) | DC • in | | | | | | |
|---|-----------------------------|------------------|------------|---------|---------|--------|--------|--------|--------|
| | | | 0.005 | 0.010 | 0.020 | 0.040 | 0.080 | 0.125 | |
| P CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536 | ≤ 175 Bhn or ≤ 7 HRc | 280 (224-336) | RPM | 213920 | 106960 | 53480 | 26740 | 13370 | 8557 |
| | | | Fz | 0.00010 | 0.00021 | 0.0004 | 0.0008 | 0.0016 | 0.0026 |
| | | | Feed (ipm) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 |
| | | | RPM | 137520 | 68760 | 34380 | 17190 | 8595 | 5501 |
| | | | Fz | 0.00010 | 0.00019 | 0.0004 | 0.0008 | 0.0015 | 0.0024 |
| | | | Feed (ipm) | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 |
| H TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2 | ≤ 475 Bhn or ≤ 50 HRc | 70 (56-84) | RPM | 53480 | 26740 | 13370 | 6685 | 3343 | 2139 |
| | | | Fz | 0.00004 | 0.00008 | 0.0002 | 0.0003 | 0.0006 | 0.0010 |
| | | | Feed (ipm) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 |
| | | | RPM | 213920 | 106960 | 53480 | 26740 | 13370 | 8557 |
| | | | Fz | 0.00007 | 0.00015 | 0.0003 | 0.0006 | 0.0012 | 0.0018 |
| | | | Feed (ipm) | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 |
| K CAST IRONS Gray, Malleable, Ductile | ≤ 220 Bhn or ≤ 19 HRc | 280 (224-336) | RPM | 160440 | 80220 | 40110 | 20055 | 10028 | 6418 |
| | | | Fz | 0.00011 | 0.00021 | 0.0004 | 0.0008 | 0.0017 | 0.0026 |
| | | | Feed (ipm) | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 |
| | | | RPM | 137520 | 68760 | 34380 | 17190 | 8595 | 5501 |
| | | | Fz | 0.0001 | 0.0002 | 0.0004 | 0.0008 | 0.0015 | 0.0024 |
| | | | Feed (ipm) | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 |
| M STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F | ≤ 250 Bhn or ≤ 24 HRc | 210 (168-252) | RPM | 53480 | 26740 | 13370 | 6685 | 3343 | 2139 |
| | | | Fz | 0.00006 | 0.00012 | 0.0002 | 0.0005 | 0.0010 | 0.0015 |
| | | | Feed (ipm) | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| | | | RPM | 91680 | 45840 | 22920 | 11460 | 5730 | 3667 |
| | | | Fz | 0.00006 | 0.00012 | 0.0002 | 0.0005 | 0.0010 | 0.0015 |
| | | | Feed (ipm) | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 | 5.6 |
| S SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy | ≤ 320 Bhn or ≤ 34 HRc | 70 (56-84) | RPM | 458400 | 229200 | 114600 | 57300 | 28650 | 18336 |
| | | | Fz | 0.00012 | 0.00024 | 0.0005 | 0.0009 | 0.0019 | 0.0029 |
| | | | Feed (ipm) | 54.0 | 54.0 | 54.0 | 54.0 | 54.0 | 54.0 |
| | | | RPM | 145160 | 72580 | 36290 | 18145 | 9073 | 5806 |
| | | | Fz | 0.00010 | 0.00019 | 0.0004 | 0.0008 | 0.0016 | 0.0024 |
| | | | Feed (ipm) | 14.1 | 14.1 | 14.1 | 14.1 | 14.1 | 14.1 |
| N ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075 | ≤ 150 Bhn or ≤ 7 HRc | 600 (480-720) | RPM | 382000 | 191000 | 95500 | 47750 | 23875 | 15280 |
| | | | Fz | 0.00012 | 0.00024 | 0.0005 | 0.0009 | 0.0019 | 0.0029 |
| | | | Feed (ipm) | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 |
| | | | RPM | 382000 | 191000 | 95500 | 47750 | 23875 | 15280 |
| | | | Fz | 0.00012 | 0.00024 | 0.0005 | 0.0009 | 0.0019 | 0.0029 |
| | | | Feed (ipm) | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 |
| COPPER ALLOYS Alum Bronze, C110, Muntz Brass | ≤ 140 Bhn or ≤ 3 HRc | 190 (152-228) | RPM | 382000 | 191000 | 95500 | 47750 | 23875 | 15280 |
| | | | Fz | 0.00012 | 0.00024 | 0.0005 | 0.0009 | 0.0019 | 0.0029 |
| | | | Feed (ipm) | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 |
| | | | RPM | 382000 | 191000 | 95500 | 47750 | 23875 | 15280 |
| | | | Fz | 0.00012 | 0.00024 | 0.0005 | 0.0009 | 0.0019 | 0.0029 |
| | | | Feed (ipm) | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 |
| PLASTICS Polycarbonate, PVC | | 500 (400-600) | RPM | 382000 | 191000 | 95500 | 47750 | 23875 | 15280 |
| | | | Fz | 0.00012 | 0.00024 | 0.0005 | 0.0009 | 0.0019 | 0.0029 |
| | | | Feed (ipm) | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 |
| | | | RPM | 382000 | 191000 | 95500 | 47750 | 23875 | 15280 |
| | | | Fz | 0.00012 | 0.00024 | 0.0005 | 0.0009 | 0.0019 | 0.0029 |
| | | | Feed (ipm) | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 |

Note:

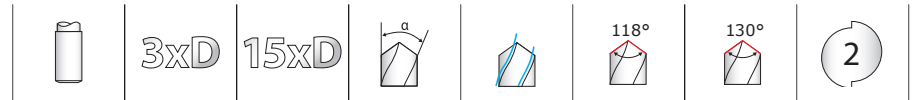
- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = Vc x 3.82 / DC
- ipm = Fr x rpm (Fr x maximum available rpm when recommendation exceeds machine limit)
- reduce speed and feed 30% when using uncoated drills
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for complete technical information

Series M081

| Series M081 | Hardness | Vc (m/min) | DC • mm | | | | | | | |
|---------------------------------------|---|-----------------------------|------------------|---------------|--------|--------|--------|--------|--------|--------|
| | | | 0.15 | 0.25 | 0.5 | 1 | 2 | 3 | | |
| P | CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536 | ≤ 175 Bhn or ≤ 7 HRc | 85 (68-102) | RPM | 180958 | 108575 | 54287 | 27144 | 13572 | 9048 |
| | | | | Fz | 0.0031 | 0.0051 | 0.0103 | 0.0206 | 0.0412 | 0.0618 |
| | | | | Feed (mm/min) | 559 | 559 | 559 | 559 | 559 | 559 |
| | ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100 | ≤ 275 Bhn or ≤ 28 HRc | 55 (44-66) | RPM | 116330 | 69798 | 34899 | 17449 | 8725 | 5816 |
| | | | | Fz | 0.0029 | 0.0048 | 0.0097 | 0.0194 | 0.0387 | 0.0581 |
| | | | | Feed (mm/min) | 338 | 338 | 338 | 338 | 338 | 338 |
| H | TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2 | ≤ 475 Bhn or ≤ 50 HRc | 21 (17-26) | RPM | 45239 | 27144 | 13572 | 6786 | 3393 | 2262 |
| | | | | Fz | 0.0012 | 0.0020 | 0.0039 | 0.0079 | 0.0157 | 0.0236 |
| | | | | Feed (mm/min) | 53 | 53 | 53 | 53 | 53 | 53 |
| K | CAST IRONS Gray, Malleable, Ductile | ≤ 220 Bhn or ≤ 19 HRc | 85 (68-102) | RPM | 180958 | 108575 | 54287 | 27144 | 13572 | 9048 |
| | | | | Fz | 0.0022 | 0.0037 | 0.0074 | 0.0148 | 0.0296 | 0.0444 |
| | | | | Feed (mm/min) | 401 | 401 | 401 | 401 | 401 | 401 |
| M | STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F | ≤ 250 Bhn or ≤ 24 HRc | 64 (51-77) | RPM | 135718 | 81431 | 40715 | 20358 | 10179 | 6786 |
| | | | | Fz | 0.0032 | 0.0053 | 0.0106 | 0.0212 | 0.0424 | 0.0636 |
| | | | | Feed (mm/min) | 432 | 432 | 432 | 432 | 432 | 432 |
| | STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, CUSTOM 450 | ≤ 275 Bhn or ≤ 28 HRc | 55 (44-66) | RPM | 116330 | 69798 | 34899 | 17449 | 8725 | 5816 |
| | | | | Fz | 0.0029 | 0.0048 | 0.0097 | 0.0194 | 0.0387 | 0.0581 |
| | | | | Feed (mm/min) | 338 | 338 | 338 | 338 | 338 | 338 |
| S | SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy | ≤ 320 Bhn or ≤ 34 HRc | 21 (17-26) | RPM | 45239 | 27144 | 13572 | 6786 | 3393 | 2262 |
| | | | | Fz | 0.0018 | 0.0030 | 0.0060 | 0.0120 | 0.0240 | 0.0359 |
| | | | | Feed (mm/min) | 81 | 81 | 81 | 81 | 81 | 81 |
| | TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si | ≤ 350 Bhn or ≤ 38 HRc | 37 (29-44) | RPM | 77553 | 46532 | 23266 | 11633 | 5816 | 3878 |
| | | | | Fz | 0.0018 | 0.0031 | 0.0061 | 0.0122 | 0.0245 | 0.0367 |
| | | | | Feed (mm/min) | 142 | 142 | 142 | 142 | 142 | 142 |
| N | ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075 | ≤ 150 Bhn or ≤ 7 HRc | 183 (146-219) | RPM | 387767 | 232660 | 116330 | 58165 | 29082 | 19388 |
| | | | | Fz | 0.0035 | 0.0059 | 0.0118 | 0.0236 | 0.0472 | 0.0707 |
| | | | | Feed (mm/min) | 1372 | 1372 | 1372 | 1372 | 1372 | 1372 |
| | COPPER ALLOYS Alum Bronze, C110, Muntz Brass | ≤ 140 Bhn or ≤ 3 HRc | 58 (46-69) | RPM | 122793 | 73676 | 36838 | 18419 | 9209 | 6140 |
| | | | | Fz | 0.0029 | 0.0049 | 0.0097 | 0.0194 | 0.0389 | 0.0583 |
| | | | | Feed (mm/min) | 358 | 358 | 358 | 358 | 358 | 358 |
| PLASTICS Polycarbonate, PVC | | 152 (122-183) | RPM | 323139 | 193883 | 96942 | 48471 | 24235 | 16157 | |
| | | | Fz | 0.0035 | 0.0059 | 0.0118 | 0.0236 | 0.0472 | 0.0707 | |
| | | | Feed (mm/min) | 1143 | 1143 | 1143 | 1143 | 1143 | 1143 | |

- Note:**
- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
 - rpm = (Vc x 1000) / (DC x 3.14)
 - mm/min = Fr x rpm (Fr x maximum available rpm when recommendation exceeds machine limit)
 - reduce speed and feed 30% when using uncoated drills
 - reduce speed and feed for materials harder than listed
 - refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for complete technical information

FRACTIONAL & METRIC
2 Flute External Coolant •
Standard & Extended Length



New Expanded Tools

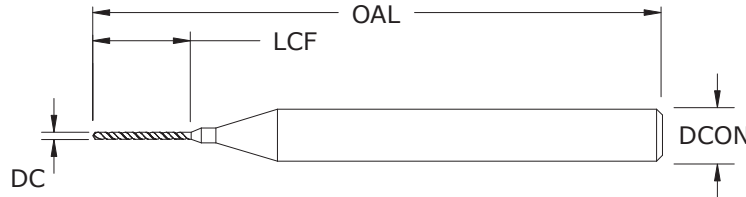
TOLERANCES (inch)

≤.125 DIAMETER
DC = +.0000/+0.0003
DCON = h₆

TOLERANCES (mm)

0.1–3.0 DIAMETER
DC = +0.000/+0.008
DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- NON-FERROUS
- HARDENED STEELS



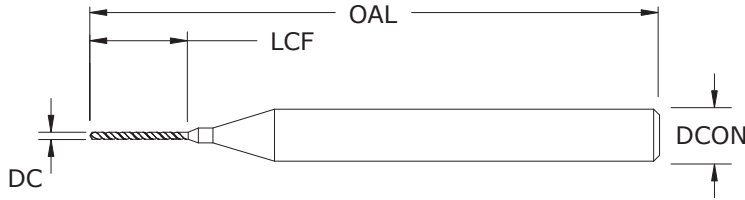
M105
FRACTIONAL & METRIC SERIES

| inch & mm | | | | | | EDP NO. | |
|---------------------|----------------|---------------------|------------------|--------------------|-------------|----------|---------------------|
| CUTTING DIAMETER DC | DECIMAL EQUIV. | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | POINT ANGLE | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0,1mm | 0.0040 | 1/8 | 0.040 | 1-1/2 | 118 | 07088 | 07098 |
| 0,1mm | 0.0040 | 1/8 | 0.070 | 1-1/2 | 118 | 07089 | 07099 |
| 0,13mm | 0.0050 | 1/8 | 0.040 | 1-1/2 | 118 | 07064 | 07066 |
| 0,13mm | 0.0050 | 1/8 | 0.070 | 1-1/2 | 118 | 07065 | 07067 |
| #97 | 0.0059 | 1/8 | 0.080 | 1-1/2 | 118 | 07236 | 07068 |
| #97 | 0.0059 | 1/8 | 0.120 | 1-1/2 | 118 | 07237 | 07069 |
| #96 | 0.0063 | 1/8 | 0.080 | 1-1/2 | 118 | 07238 | 07070 |
| #96 | 0.0063 | 1/8 | 0.120 | 1-1/2 | 118 | 07239 | 07071 |
| #95 | 0.0067 | 1/8 | 0.080 | 1-1/2 | 118 | 07240 | 07072 |
| #95 | 0.0067 | 1/8 | 0.120 | 1-1/2 | 118 | 07241 | 07073 |
| #94 | 0.0071 | 1/8 | 0.100 | 1-1/2 | 118 | 07242 | 07074 |
| #94 | 0.0071 | 1/8 | 0.150 | 1-1/2 | 118 | 07243 | 07075 |
| #93 | 0.0075 | 1/8 | 0.100 | 1-1/2 | 118 | 07244 | 07076 |
| #93 | 0.0075 | 1/8 | 0.150 | 1-1/2 | 118 | 07245 | 07077 |
| #92 | 0.0079 | 1/8 | 0.100 | 1-1/2 | 118 | 07246 | 07078 |
| #92 | 0.0079 | 1/8 | 0.150 | 1-1/2 | 118 | 07247 | 07079 |
| #91 | 0.0083 | 1/8 | 0.100 | 1-1/2 | 118 | 07248 | 07080 |
| #91 | 0.0083 | 1/8 | 0.150 | 1-1/2 | 118 | 07249 | 07081 |
| #90 | 0.0087 | 1/8 | 0.100 | 1-1/2 | 118 | 07250 | 07082 |
| #90 | 0.0087 | 1/8 | 0.150 | 1-1/2 | 118 | 07251 | 07083 |
| #89 | 0.0091 | 1/8 | 0.150 | 1-1/2 | 118 | 07252 | 07084 |
| #89 | 0.0091 | 1/8 | 0.220 | 1-1/2 | 118 | 07253 | 07085 |
| #88 | 0.0095 | 1/8 | 0.150 | 1-1/2 | 118 | 07254 | 07086 |
| #88 | 0.0095 | 1/8 | 0.220 | 1-1/2 | 118 | 07255 | 07087 |
| 0,25mm | 0.0098 | 1/8 | 0.150 | 1-1/2 | 118 | 07108 | 07114 |
| 0,25mm | 0.0098 | 1/8 | 0.220 | 1-1/2 | 118 | 07109 | 07115 |
| #87 | 0.0100 | 1/8 | 0.150 | 1-1/2 | 118 | 07258 | 07090 |
| #87 | 0.0100 | 1/8 | 0.220 | 1-1/2 | 118 | 07259 | 07091 |
| #86 | 0.0105 | 1/8 | 0.150 | 1-1/2 | 118 | 07260 | 07092 |
| #86 | 0.0105 | 1/8 | 0.220 | 1-1/2 | 118 | 07261 | 07093 |
| #85 | 0.0110 | 1/8 | 0.150 | 1-1/2 | 118 | 07262 | 07094 |
| #85 | 0.0110 | 1/8 | 0.220 | 1-1/2 | 118 | 07263 | 07095 |
| #84 | 0.0115 | 1/8 | 0.150 | 1-1/2 | 118 | 07264 | 07096 |
| #84 | 0.0115 | 1/8 | 0.220 | 1-1/2 | 118 | 07265 | 07097 |
| 0,3mm | 0.0118 | 1/8 | 0.225 | 1-1/2 | 118 | 07127 | 07132 |
| 0,3mm | 0.0118 | 1/8 | 0.280 | 1-1/2 | 118 | 07129 | 07134 |

- 4-facet point design stabilizes on entry for superior hole size control and tool life
- Mirror surface finishes improve chip flow as hole depth increases
- Ti-Namite A coating and uncoated options for the ultimate performance in a variety of ferrous and non-ferrous workpiece materials
- Available from stock in a selection of popular lengths and diameters
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures

continued on next page

2 Flute External Coolant • Standard & Extended Length



 New Expanded Tools

M105

FRACTIONAL & METRIC SERIES

continued

| CUTTING DIAMETER DC | DECIMAL EQUIV. | inch & mm | | | POINT ANGLE | EDP NO. | |
|------------------------|----------------|------------------------|---------------------|-----------------------|-------------|----------|------------------------|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | | UNCOATED | TI-NAMITE-A (AlTiN) |
| #83 | 0.0120 | 1/8 | 0.225 | 1-1/2 | 118 | 07268 | 07100 |
| #83 | 0.0120 | 1/8 | 0.280 | 1-1/2 | 118 | 07269 | 07101 |
| #82 | 0.0125 | 1/8 | 0.225 | 1-1/2 | 118 | 07270 | 07102 |
| #82 | 0.0125 | 1/8 | 0.280 | 1-1/2 | 118 | 07271 | 07103 |
| #81 | 0.0130 | 1/8 | 0.225 | 1-1/2 | 118 | 07272 | 07104 |
| #81 | 0.0130 | 1/8 | 0.280 | 1-1/2 | 118 | 07273 | 07105 |
| #80 | 0.0135 | 1/8 | 0.225 | 1-1/2 | 130 | 07274 | 07106 |
| #80 | 0.0135 | 1/8 | 0.280 | 1-1/2 | 130 | 07275 | 07107 |
| 0,35mm | 0.0138 | 1/8 | 0.225 | 1-1/2 | 130 | 07118 | 07122 |
| 0,35mm | 0.0138 | 1/8 | 0.280 | 1-1/2 | 130 | 07119 | 07123 |
| #79 | 0.0145 | 1/8 | 0.225 | 1-1/2 | 130 | 07278 | 07110 |
| #79 | 0.0145 | 1/8 | 0.280 | 1-1/2 | 130 | 07279 | 07111 |
| 1/64 | 0.0156 | 1/8 | 0.250 | 1-1/2 | 130 | 07280 | 07112 |
| 1/64 | 0.0156 | 1/8 | 0.295 | 1-1/2 | 130 | 07281 | 07113 |
| 0,4mm | 0.0157 | 1/8 | 0.250 | 1-1/2 | 130 | 07148 | 07233 |
| 0,4mm | 0.0157 | 1/8 | 0.295 | 1-1/2 | 130 | 07232 | 07234 |
| #78 | 0.0160 | 1/8 | 0.250 | 1-1/2 | 130 | 07284 | 07116 |
| #78 | 0.0160 | 1/8 | 0.295 | 1-1/2 | 130 | 07285 | 07117 |
| 0,45mm | 0.0177 | 1/8 | 0.250 | 1-1/2 | 130 | 07137 | 07143 |
| 0,45mm | 0.0177 | 1/8 | 0.295 | 1-1/2 | 130 | 07140 | 07145 |
| #77 | 0.0180 | 1/8 | 0.250 | 1-1/2 | 130 | 07288 | 07120 |
| #77 | 0.0180 | 1/8 | 0.295 | 1-1/2 | 130 | 07289 | 07121 |
| 0,5mm | 0.0197 | 1/8 | 0.260 | 1-1/2 | 130 | 07257 | 07267 |
| 0,5mm | 0.0197 | 1/8 | 0.310 | 1-1/2 | 130 | 07266 | 07276 |
| #76 | 0.0200 | 1/8 | 0.260 | 1-1/2 | 130 | 07292 | 07124 |
| #76 | 0.0200 | 1/8 | 0.310 | 1-1/2 | 130 | 07293 | 07125 |
| #75 | 0.0210 | 1/8 | 0.310 | 1-1/2 | 130 | 07294 | 07126 |
| 0,55mm | 0.0217 | 1/8 | 0.340 | 1-1/2 | 130 | 07235 | 07256 |
| #74 | 0.0225 | 1/8 | 0.340 | 1-1/2 | 130 | 07296 | 07128 |
| 0,6mm | 0.0236 | 1/8 | 0.340 | 1-1/2 | 130 | 07283 | 07286 |
| #73 | 0.0240 | 1/8 | 0.340 | 1-1/2 | 130 | 07298 | 07130 |
| #72 | 0.0250 | 1/8 | 0.340 | 1-1/2 | 130 | 07299 | 07131 |
| 0,65mm | 0.0256 | 1/8 | 0.340 | 1-1/2 | 130 | 07277 | 07282 |
| #71 | 0.0260 | 1/8 | 0.340 | 1-1/2 | 130 | 07301 | 07133 |

TOLERANCES (inch)

≤.125 DIAMETER
DC = +.0000/+0.0003
DCON = h₆

TOLERANCES (mm)

0,1–3,0 DIAMETER
DC = +0,000/+0,008
DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- NON-FERROUS
- HARDENED STEELS

continued on next page

FRACTIONAL & METRIC
2 Flute External Coolant •
Standard & Extended Length

M105

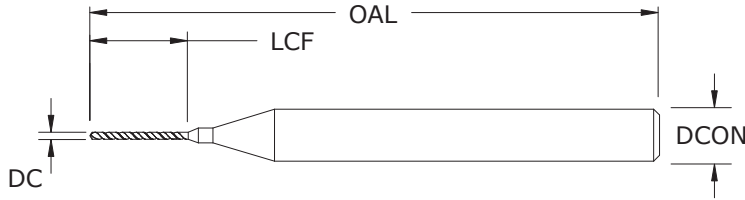
FRACTIONAL & METRIC SERIES

continued

| CUTTING DIAMETER DC | DECIMAL EQUIV. | inch & mm | | OVERALL LENGTH OAL | POINT ANGLE | EDP NO. | |
|---------------------|----------------|---------------------|------------------|--------------------|-------------|----------|---------------------|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | | | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0,7mm | 0.0276 | 1/8 | 0.400 | 1-1/2 | 130 | 07291 | 07295 |
| #70 | 0.0280 | 1/8 | 0.400 | 1-1/2 | 130 | 07303 | 07135 |
| #69 | 0.0292 | 1/8 | 0.400 | 1-1/2 | 130 | 07304 | 07136 |
| 0,75mm | 0.0295 | 1/8 | 0.400 | 1-1/2 | 130 | 07287 | 07290 |
| #68 | 0.0310 | 1/8 | 0.400 | 1-1/2 | 130 | 07306 | 07138 |
| 1/32 | 0.0312 | 1/8 | 0.400 | 1-1/2 | 130 | 07307 | 07139 |
| 0,8mm | 0.0315 | 1/8 | 0.400 | 1-1/2 | 130 | 07302 | 07305 |
| #67 | 0.0320 | 1/8 | 0.400 | 1-1/2 | 130 | 07309 | 07141 |
| #66 | 0.0330 | 1/8 | 0.400 | 1-1/2 | 130 | 07310 | 07142 |
| 0,85mm | 0.0335 | 1/8 | 0.400 | 1-1/2 | 130 | 07297 | 07300 |
| #65 | 0.0350 | 1/8 | 0.400 | 1-1/2 | 130 | 07312 | 07144 |
| 0,9mm | 0.0354 | 1/8 | 0.400 | 1-1/2 | 130 | 07313 | 07316 |
| #64 | 0.0360 | 1/8 | 0.400 | 1-1/2 | 130 | 07314 | 07146 |
| #63 | 0.0370 | 1/8 | 0.400 | 1-1/2 | 130 | 07315 | 07147 |
| 0,95mm | 0.0374 | 1/8 | 0.400 | 1-1/2 | 130 | 07308 | 07311 |
| #62 | 0.0380 | 1/8 | 0.400 | 1-1/2 | 130 | 07317 | 07149 |
| #61 | 0.0390 | 1/8 | 0.400 | 1-1/2 | 130 | 07318 | 07150 |
| 1,0mm | 0.0394 | 1/8 | 0.400 | 1-1/2 | 130 | 07319 | 07151 |
| #60 | 0.0400 | 1/8 | 0.400 | 1-1/2 | 130 | 07320 | 07152 |
| #59 | 0.0410 | 1/8 | 0.400 | 1-1/2 | 130 | 07321 | 07153 |
| 1,05mm | 0.0413 | 1/8 | 0.400 | 1-1/2 | 130 | 07322 | 07154 |
| #58 | 0.0420 | 1/8 | 0.400 | 1-1/2 | 130 | 07323 | 07155 |
| #57 | 0.0430 | 1/8 | 0.400 | 1-1/2 | 130 | 07324 | 07156 |
| 1,1mm | 0.0433 | 1/8 | 0.400 | 1-1/2 | 130 | 07325 | 07157 |
| 1,12mm | 0.0440 | 1/8 | 0.400 | 1-1/2 | 130 | 07326 | 07158 |
| 1,15mm | 0.0453 | 1/8 | 0.400 | 1-1/2 | 130 | 07327 | 07159 |
| #56 | 0.0465 | 1/8 | 0.400 | 1-1/2 | 130 | 07328 | 07160 |
| 3/64 | 0.0469 | 1/8 | 0.400 | 1-1/2 | 130 | 07329 | 07161 |
| 1,2mm | 0.0472 | 1/8 | 0.400 | 1-1/2 | 130 | 07330 | 07162 |
| 1,25mm | 0.0492 | 1/8 | 0.400 | 1-1/2 | 130 | 07331 | 07163 |
| 1,3mm | 0.0512 | 1/8 | 0.400 | 1-1/2 | 130 | 07332 | 07164 |
| #55 | 0.0520 | 1/8 | 0.400 | 1-1/2 | 130 | 07333 | 07165 |
| 1,35mm | 0.0531 | 1/8 | 0.400 | 1-1/2 | 130 | 07334 | 07166 |
| #54 | 0.0550 | 1/8 | 0.400 | 1-1/2 | 130 | 07335 | 07167 |
| 1,4mm | 0.0551 | 1/8 | 0.400 | 1-1/2 | 130 | 07336 | 07168 |
| 1,45mm | 0.0571 | 1/8 | 0.400 | 1-1/2 | 130 | 07337 | 07169 |
| 1,5mm | 0.0591 | 1/8 | 0.400 | 1-1/2 | 130 | 07338 | 07170 |
| #53 | 0.0595 | 1/8 | 0.400 | 1-1/2 | 130 | 07339 | 07171 |
| 1,55mm | 0.0610 | 1/8 | 0.400 | 1-1/2 | 130 | 07340 | 07172 |
| 1/16 | 0.0625 | 1/8 | 0.400 | 1-1/2 | 130 | 07341 | 07173 |
| 1,6mm | 0.0630 | 1/8 | 0.400 | 1-1/2 | 130 | 07342 | 07174 |
| #52 | 0.0635 | 1/8 | 0.400 | 1-1/2 | 130 | 07343 | 07175 |
| 1,65mm | 0.0650 | 1/8 | 0.400 | 1-1/2 | 130 | 07344 | 07176 |
| 1,7mm | 0.0669 | 1/8 | 0.400 | 1-1/2 | 130 | 07345 | 07177 |

continued on next page

2 Flute External Coolant • Standard & Extended Length



 New Expanded Tools

M105

FRACTIONAL & METRIC SERIES

continued

| CUTTING DIAMETER DC | DECIMAL EQUIV. | inch & mm | | | POINT ANGLE | EDP NO. | |
|---------------------|----------------|---------------------|------------------|--------------------|-------------|----------|---------------------|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | | UNCOATED | TI-NAMITE-A (AlTiN) |
| #51 | 0.0670 | 1/8 | 0.400 | 1-1/2 | 130 | 07346 | 07178 |
| 1,75mm | 0.0689 | 1/8 | 0.400 | 1-1/2 | 130 | 07347 | 07179 |
| #50 | 0.0700 | 1/8 | 0.400 | 1-1/2 | 130 | 07348 | 07180 |
| 1,8mm | 0.0709 | 1/8 | 0.400 | 1-1/2 | 130 | 07349 | 07181 |
| 1,85mm | 0.0728 | 1/8 | 0.400 | 1-1/2 | 130 | 07350 | 07182 |
| #49 | 0.0730 | 1/8 | 0.400 | 1-1/2 | 130 | 07351 | 07183 |
| 1,9mm | 0.0748 | 1/8 | 0.400 | 1-1/2 | 130 | 07352 | 07184 |
| #48 | 0.0760 | 1/8 | 0.400 | 1-1/2 | 130 | 07353 | 07185 |
| 1,95mm | 0.0768 | 1/8 | 0.400 | 1-1/2 | 130 | 07354 | 07186 |
| 5/64 | 0.0781 | 1/8 | 0.400 | 1-1/2 | 130 | 07355 | 07187 |
| #47 | 0.0785 | 1/8 | 0.400 | 1-1/2 | 130 | 07356 | 07188 |
| 2,0mm | 0.0787 | 1/8 | 0.400 | 1-1/2 | 130 | 07357 | 07189 |
| 2,05mm | 0.0807 | 1/8 | 0.400 | 1-1/2 | 130 | 07358 | 07190 |
| #46 | 0.0810 | 1/8 | 0.400 | 1-1/2 | 130 | 07359 | 07191 |
| #45 | 0.0820 | 1/8 | 0.400 | 1-1/2 | 130 | 07360 | 07192 |
| 2,1mm | 0.0827 | 1/8 | 0.400 | 1-1/2 | 130 | 07361 | 07193 |
| 2,15mm | 0.0846 | 1/8 | 0.400 | 1-1/2 | 130 | 07362 | 07194 |
| #44 | 0.0860 | 1/8 | 0.400 | 1-1/2 | 130 | 07363 | 07195 |
| 2,2mm | 0.0866 | 1/8 | 0.400 | 1-1/2 | 130 | 07364 | 07196 |
| 2,25mm | 0.0886 | 1/8 | 0.400 | 1-1/2 | 130 | 07365 | 07197 |
| #43 | 0.0890 | 1/8 | 0.400 | 1-1/2 | 130 | 07366 | 07198 |
| 2,3mm | 0.0906 | 1/8 | 0.400 | 1-1/2 | 130 | 07367 | 07199 |
| 2,35mm | 0.0925 | 1/8 | 0.400 | 1-1/2 | 130 | 07368 | 07200 |
| #42 | 0.0935 | 1/8 | 0.400 | 1-1/2 | 130 | 07369 | 07201 |
| 3/32 | 0.0938 | 1/8 | 0.400 | 1-1/2 | 130 | 07370 | 07202 |
| 2,4mm | 0.0945 | 1/8 | 0.400 | 1-1/2 | 130 | 07371 | 07203 |
| #41 | 0.0960 | 1/8 | 0.400 | 1-1/2 | 130 | 07372 | 07204 |
| 2,45mm | 0.0965 | 1/8 | 0.400 | 1-1/2 | 130 | 07373 | 07205 |
| #40 | 0.0980 | 1/8 | 0.400 | 1-1/2 | 130 | 07374 | 07206 |
| 2,5mm | 0.0984 | 1/8 | 0.400 | 1-1/2 | 130 | 07375 | 07207 |
| #39 | 0.0995 | 1/8 | 0.400 | 1-1/2 | 130 | 07376 | 07208 |
| 2,55mm | 0.1004 | 1/8 | 0.400 | 1-1/2 | 130 | 07377 | 07209 |
| #38 | 0.1015 | 1/8 | 0.400 | 1-1/2 | 130 | 07378 | 07210 |
| 2,6mm | 0.1024 | 1/8 | 0.400 | 1-1/2 | 130 | 07379 | 07211 |

TOLERANCES (inch)

≤.125 DIAMETER
DC = +.0000/+0.0003
DCON = h₆

TOLERANCES (mm)

0,1–3,0 DIAMETER
DC = +0,000/+0,008
DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- NON-FERROUS
- HARDENED STEELS

continued on next page

FRACTIONAL & METRIC
2 Flute External Coolant •
Standard & Extended Length

M105

FRACTIONAL & METRIC SERIES

continued

| CUTTING DIAMETER DC | DECIMAL EQUIV. | inch & mm | | | | POINT ANGLE | EDP NO. | |
|---------------------------|-------------------|---------------------------|------------------------|--------------------------|----------|----------------|------------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| #37 | 0.1040 | 1/8 | 0.400 | 1-1/2 | 130 | 07380 | 07212 | |
| 2,65mm | 0.1043 | 1/8 | 0.400 | 1-1/2 | 130 | 07381 | 07213 | |
| 2,7mm | 0.1063 | 1/8 | 0.400 | 1-1/2 | 130 | 07382 | 07214 | |
| #36 | 0.1065 | 1/8 | 0.400 | 1-1/2 | 130 | 07383 | 07215 | |
| 2,75mm | 0.1083 | 1/8 | 0.400 | 1-1/2 | 130 | 07384 | 07216 | |
| 7/64 | 0.1094 | 1/8 | 0.400 | 1-1/2 | 130 | 07385 | 07217 | |
| #35 | 0.1100 | 1/8 | 0.400 | 1-1/2 | 130 | 07386 | 07218 | |
| 2,8mm | 0.1102 | 1/8 | 0.400 | 1-1/2 | 130 | 07387 | 07219 | |
| #34 | 0.1110 | 1/8 | 0.400 | 1-1/2 | 130 | 07388 | 07220 | |
| 2,85mm | 0.1122 | 1/8 | 0.400 | 1-1/2 | 130 | 07389 | 07221 | |
| #33 | 0.1130 | 1/8 | 0.400 | 1-1/2 | 130 | 07390 | 07222 | |
| 2,9mm | 0.1142 | 1/8 | 0.400 | 1-1/2 | 130 | 07391 | 07223 | |
| #32 | 0.1160 | 1/8 | 0.400 | 1-1/2 | 130 | 07392 | 07224 | |
| 2,95mm | 0.1161 | 1/8 | 0.400 | 1-1/2 | 130 | 07393 | 07225 | |
| 3,0mm | 0.1181 | 1/8 | 0.400 | 1-1/2 | 130 | 07394 | 07226 | |
| #31 | 0.1200 | 1/8 | 0.400 | 1-1/2 | 130 | 07395 | 07227 | |
| 3,05mm | 0.1201 | 1/8 | 0.400 | 1-1/2 | 130 | 07396 | 07228 | |
| 3,1mm | 0.1220 | 1/8 | 0.400 | 1-1/2 | 130 | 07397 | 07229 | |
| 3,15mm | 0.1240 | 1/8 | 0.400 | 1-1/2 | 130 | 07398 | 07230 | |
| 1/8 | 0.1250 | 1/8 | 0.400 | 1-1/2 | 130 | 07399 | 07231 | |

Series M105

| Series M105 | Hardness | Vc (sfm) | DC • in | | | | | | | |
|-------------|--|-----------------------------|------------------|------------|---------|---------|--------|--------|--------|--------|
| | | | 0.004 | 0.010 | 0.020 | 0.040 | 0.080 | 0.125 | | |
| P | CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536 | ≤ 175 Bhn or ≤ 7 HRc | 130 (104-156) | RPM | 124150 | 49660 | 24830 | 12415 | 6208 | 3973 |
| | | | | Fz | 0.00012 | 0.00029 | 0.0006 | 0.0012 | 0.0023 | 0.0036 |
| | | | | Feed (ipm) | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 |
| | | | | RPM | 186225 | 74490 | 37245 | 18623 | 9311 | 5959 |
| | | | | Fz | 0.00010 | 0.00026 | 0.0005 | 0.0010 | 0.0021 | 0.0033 |
| | | | | Feed (ipm) | 19.4 | 19.4 | 19.4 | 19.4 | 19.4 | 19.4 |
| H | TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2 | ≤ 475 Bhn or ≤ 50 HRc | 80 (64-96) | RPM | 76400 | 30560 | 15280 | 7640 | 3820 | 2445 |
| | | | | Fz | 0.00005 | 0.00013 | 0.0003 | 0.0005 | 0.0010 | 0.0016 |
| | | | | Feed (ipm) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| | | | | RPM | 267400 | 106960 | 53480 | 26740 | 13370 | 8557 |
| | | | | Fz | 0.00007 | 0.00016 | 0.0003 | 0.0007 | 0.0013 | 0.0020 |
| | | | | Feed (ipm) | 17.5 | 17.5 | 17.5 | 17.5 | 17.5 | 17.5 |
| M | STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F | ≤ 275 Bhn or ≤ 28 HRc | 65 (52-78) | RPM | 62075 | 24830 | 12415 | 6208 | 3104 | 1986 |
| | | | | Fz | 0.00009 | 0.00022 | 0.0004 | 0.0009 | 0.0017 | 0.0027 |
| | | | | Feed (ipm) | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 |
| | | | | RPM | 38200 | 15280 | 7640 | 3820 | 1910 | 1222 |
| | | | | Fz | 0.0001 | 0.0002 | 0.0004 | 0.0007 | 0.0014 | 0.0022 |
| | | | | Feed (ipm) | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 |
| S | SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy | ≤ 320 Bhn or ≤ 34 HRc | 50 (40-60) | RPM | 47750 | 19100 | 9550 | 4775 | 2388 | 1528 |
| | | | | Fz | 0.00004 | 0.00011 | 0.0002 | 0.0004 | 0.0009 | 0.0014 |
| | | | | Feed (ipm) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 |
| | | | | RPM | 47750 | 19100 | 9550 | 4775 | 2388 | 1528 |
| | | | | Fz | 0.00005 | 0.00013 | 0.0003 | 0.0005 | 0.0010 | 0.0016 |
| | | | | Feed (ipm) | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| N | ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075 | ≤ 150 Bhn or ≤ 7 HRc | 245 (196-294) | RPM | 233975 | 93590 | 46795 | 23398 | 11699 | 7487 |
| | | | | Fz | 0.00020 | 0.00049 | 0.0010 | 0.0020 | 0.0039 | 0.0062 |
| | | | | Feed (ipm) | 46.1 | 46.1 | 46.1 | 46.1 | 46.1 | 46.1 |
| | | | | RPM | 171900 | 68760 | 34380 | 17190 | 8595 | 5501 |
| | | | | Fz | 0.00020 | 0.00049 | 0.0010 | 0.0020 | 0.0039 | 0.0062 |
| | | | | Feed (ipm) | 33.9 | 33.9 | 33.9 | 33.9 | 33.9 | 33.9 |
| | PLASTICS Polycarbonate, PVC | | 245 (196-294) | RPM | 233975 | 93590 | 46795 | 23398 | 11699 | 7487 |
| | | | | Fz | 0.00020 | 0.00049 | 0.0010 | 0.0020 | 0.0039 | 0.0062 |
| | | | | Feed (ipm) | 46.1 | 46.1 | 46.1 | 46.1 | 46.1 | 46.1 |

- Note:**
- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
 - rpm = Vc x 3.82 / DC
 - ipm = Fr x rpm (Fr x maximum available rpm when recommendation exceeds machine limit)
 - reduce speed and feed 30% when using uncoated drills
 - reduce speed and feed for materials harder than listed
 - refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for complete technical information



New Expanded Tools

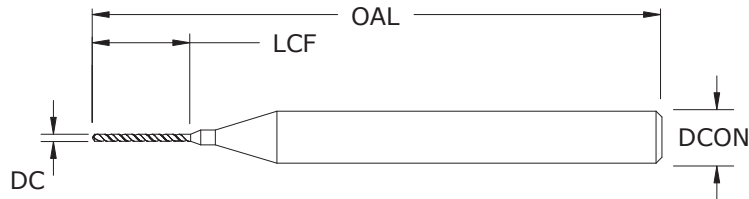
TOLERANCES (mm)

0,04–3,0 DIAMETER

DC = +0,000/–0,008

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES



M226
METRIC SERIES

| CUTTING DIAMETER DC | DECIMAL EQUIV. | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | POINT ANGLE | EDP NO. | |
|---------------------|----------------|---------------------|------------------|--------------------|-------------|----------|---------------------|
| | | | | | | UNCOATED | TI-NAMITE-A (AlTiN) |
| 0,04 | 0.0016 | 3,0 | 0,5 | 38,0 | 118 | 07722 | — |
| 0,04 | 0.0018 | 3,0 | 0,6 | 38,0 | 118 | 07723 | — |
| 0,05 | 0.0020 | 3,0 | 0,8 | 38,0 | 118 | 07724 | — |
| 0,06 | 0.0024 | 3,0 | 0,8 | 38,0 | 118 | 07725 | — |
| 0,07 | 0.0028 | 3,0 | 1,3 | 38,0 | 118 | 07726 | — |
| 0,08 | 0.0031 | 3,0 | 1,3 | 38,0 | 118 | 07727 | — |
| 0,09 | 0.0035 | 3,0 | 1,3 | 38,0 | 118 | 07728 | — |
| 0,10 | 0.0039 | 3,0 | 1,0 | 38,0 | 118 | 07729 | — |
| 0,11 | 0.0043 | 3,0 | 1,0 | 38,0 | 118 | 07730 | — |
| 0,12 | 0.0047 | 3,0 | 1,0 | 38,0 | 118 | 07731 | — |
| 0,13 | 0.0051 | 3,0 | 1,0 | 38,0 | 118 | 07732 | — |
| 0,14 | 0.0055 | 3,0 | 1,0 | 38,0 | 118 | 07733 | — |
| 0,15 | 0.0059 | 3,0 | 2,0 | 38,0 | 118 | 07734 | — |
| 0,16 | 0.0063 | 3,0 | 2,0 | 38,0 | 118 | 07735 | — |
| 0,17 | 0.0067 | 3,0 | 2,0 | 38,0 | 118 | 07736 | — |
| 0,18 | 0.0071 | 3,0 | 2,5 | 38,0 | 118 | 07737 | — |
| 0,19 | 0.0075 | 3,0 | 2,5 | 38,0 | 118 | 07738 | — |
| 0,20 | 0.0079 | 3,0 | 2,5 | 38,0 | 118 | 07739 | — |
| 0,21 | 0.0083 | 3,0 | 2,5 | 38,0 | 118 | 07740 | — |
| 0,22 | 0.0087 | 3,0 | 2,5 | 38,0 | 118 | 07741 | — |
| 0,23 | 0.0091 | 3,0 | 3,8 | 38,0 | 118 | 07742 | — |
| 0,24 | 0.0094 | 3,0 | 3,8 | 38,0 | 118 | 07743 | — |
| 0,25 | 0.0098 | 3,0 | 3,8 | 38,0 | 118 | 07744 | 07400 |
| 0,26 | 0.0102 | 3,0 | 3,8 | 38,0 | 118 | 07745 | 07401 |
| 0,27 | 0.0106 | 3,0 | 3,8 | 38,0 | 118 | 07746 | 07402 |
| 0,28 | 0.0110 | 3,0 | 3,8 | 38,0 | 118 | 07747 | 07403 |
| 0,29 | 0.0114 | 3,0 | 3,8 | 38,0 | 118 | 07748 | 07404 |
| 0,30 | 0.0118 | 3,0 | 5,7 | 38,0 | 118 | 07749 | 07405 |
| 0,31 | 0.0122 | 3,0 | 5,7 | 38,0 | 118 | 07750 | 07406 |
| 0,32 | 0.0126 | 3,0 | 5,7 | 38,0 | 118 | 07751 | 07407 |
| 0,33 | 0.0130 | 3,0 | 5,7 | 38,0 | 118 | 07752 | 07408 |
| 0,34 | 0.0134 | 3,0 | 5,7 | 38,0 | 118 | 07753 | 07409 |
| 0,35 | 0.0138 | 3,0 | 5,7 | 38,0 | 130 | 07754 | 07410 |
| 0,36 | 0.0142 | 3,0 | 5,7 | 38,0 | 130 | 07755 | 07411 |
| 0,37 | 0.0146 | 3,0 | 5,7 | 38,0 | 130 | 07756 | 07412 |
| 0,38 | 0.0150 | 3,0 | 6,4 | 38,0 | 130 | 07757 | 07413 |

- 4-facet point design stabilizes on entry for superior hole size control and tool life (>.08mm). 2-facet point on 0,08 and smaller.
- Mirror surface finishes improve chip flow as hole depth increases
- Ti-Namite A coating and uncoated options for the ultimate performance in a variety of ferrous and non-ferrous workpiece materials
- Available from stock in a selection of popular lengths and diameters
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures

continued on next page

2 Flute External Coolant



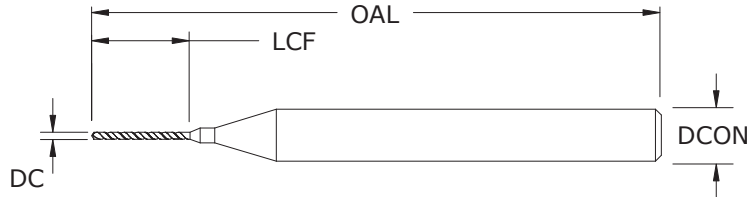
3xD

12xD



M226 METRIC SERIES

continued



 New Expanded Tools

TOLERANCES (mm)

0,04–3,0 DIAMETER

DC = +0,000/–0,008

DCON = h₆

| CUTTING DIAMETER DC | DECIMAL EQUIV. | mm | | | | POINT ANGLE | EDP NO. | |
|---------------------|----------------|---------------------|------------------|--------------------|----------|-------------|---------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| 0,39 | 0.0154 | 3,0 | 6,4 | 38,0 | 130 | 07758 | 07414 | |
| 0,40 | 0.0157 | 3,0 | 6,4 | 38,0 | 130 | 07759 | 07415 | |
| 0,41 | 0.0161 | 3,0 | 6,4 | 38,0 | 130 | 07760 | 07416 | |
| 0,42 | 0.0165 | 3,0 | 6,4 | 38,0 | 130 | 07761 | 07417 | |
| 0,43 | 0.0169 | 3,0 | 6,4 | 38,0 | 130 | 07762 | 07418 | |
| 0,44 | 0.0173 | 3,0 | 6,4 | 38,0 | 130 | 07763 | 07419 | |
| 0,45 | 0.0177 | 3,0 | 6,4 | 38,0 | 130 | 07764 | 07420 | |
| 0,46 | 0.0181 | 3,0 | 6,4 | 38,0 | 130 | 07765 | 07421 | |
| 0,47 | 0.0185 | 3,0 | 6,4 | 38,0 | 130 | 07766 | 07422 | |
| 0,48 | 0.0189 | 3,0 | 6,6 | 38,0 | 130 | 07767 | 07423 | |
| 0,49 | 0.0193 | 3,0 | 6,6 | 38,0 | 130 | 07768 | 07424 | |
| 0,50 | 0.0197 | 3,0 | 6,6 | 38,0 | 130 | 07769 | 07425 | |
| 0,51 | 0.0201 | 3,0 | 6,6 | 38,0 | 130 | 07770 | 07426 | |
| 0,52 | 0.0205 | 3,0 | 6,6 | 38,0 | 130 | 07771 | 07427 | |
| 0,53 | 0.0209 | 3,0 | 6,6 | 38,0 | 130 | 07772 | 07428 | |
| 0,54 | 0.0213 | 3,0 | 6,6 | 38,0 | 130 | 07773 | 07429 | |
| 0,55 | 0.0217 | 3,0 | 8,6 | 38,0 | 130 | 07774 | 07430 | |
| 0,56 | 0.0220 | 3,0 | 8,6 | 38,0 | 130 | 07775 | 07431 | |
| 0,57 | 0.0224 | 3,0 | 8,6 | 38,0 | 130 | 07776 | 07432 | |
| 0,58 | 0.0228 | 3,0 | 8,6 | 38,0 | 130 | 07777 | 07433 | |
| 0,59 | 0.0232 | 3,0 | 8,6 | 38,0 | 130 | 07778 | 07434 | |
| 0,60 | 0.0236 | 3,0 | 8,6 | 38,0 | 130 | 07779 | 07435 | |
| 0,61 | 0.0240 | 3,0 | 8,6 | 38,0 | 130 | 07780 | 07436 | |
| 0,62 | 0.0244 | 3,0 | 8,6 | 38,0 | 130 | 07781 | 07437 | |
| 0,63 | 0.0248 | 3,0 | 8,6 | 38,0 | 130 | 07782 | 07438 | |
| 0,64 | 0.0252 | 3,0 | 8,6 | 38,0 | 130 | 07783 | 07439 | |
| 0,65 | 0.0256 | 3,0 | 8,6 | 38,0 | 130 | 07784 | 07440 | |
| 0,66 | 0.0260 | 3,0 | 8,6 | 38,0 | 130 | 07785 | 07441 | |
| 0,67 | 0.0264 | 3,0 | 8,6 | 38,0 | 130 | 07786 | 07442 | |
| 0,68 | 0.0268 | 3,0 | 8,6 | 38,0 | 130 | 07787 | 07443 | |
| 0,69 | 0.0272 | 3,0 | 8,6 | 38,0 | 130 | 07788 | 07444 | |
| 0,70 | 0.0276 | 3,0 | 10,2 | 38,0 | 130 | 07789 | 07445 | |
| 0,71 | 0.0280 | 3,0 | 10,2 | 38,0 | 130 | 07790 | 07446 | |
| 0,72 | 0.0283 | 3,0 | 10,2 | 38,0 | 130 | 07791 | 07447 | |
| 0,73 | 0.0287 | 3,0 | 10,2 | 38,0 | 130 | 07792 | 07448 | |
| 0,74 | 0.0291 | 3,0 | 10,2 | 38,0 | 130 | 07793 | 07449 | |

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

continued on next page

| CUTTING DIAMETER DC | DECIMAL EQUIV. | mm | | | | POINT ANGLE | EDP NO. | |
|---------------------|----------------|---------------------|------------------|--------------------|----------|-------------|---------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| 0,75 | 0.0295 | 3,0 | 10,2 | 38,0 | 130 | 07794 | 07450 | |
| 0,75 | 0.0295 | 3,0 | 11,0 | 50,0 | 130 | 07795 | 07451 | |
| 0,76 | 0.0299 | 3,0 | 10,2 | 38,0 | 130 | 07796 | 07452 | |
| 0,77 | 0.0303 | 3,0 | 10,2 | 38,0 | 130 | 07797 | 07453 | |
| 0,78 | 0.0307 | 3,0 | 10,2 | 38,0 | 130 | 07798 | 07454 | |
| 0,79 | 0.0311 | 3,0 | 10,2 | 38,0 | 130 | 07799 | 07455 | |
| 0,80 | 0.0315 | 3,0 | 10,2 | 38,0 | 130 | 07800 | 07456 | |
| 0,80 | 0.0315 | 3,0 | 11,0 | 50,0 | 130 | 07801 | 07457 | |
| 0,81 | 0.0319 | 3,0 | 10,2 | 38,0 | 130 | 07802 | 07458 | |
| 0,82 | 0.0323 | 3,0 | 10,2 | 38,0 | 130 | 07803 | 07459 | |
| 0,83 | 0.0327 | 3,0 | 10,2 | 38,0 | 130 | 07804 | 07460 | |
| 0,84 | 0.0331 | 3,0 | 10,2 | 38,0 | 130 | 07805 | 07461 | |
| 0,85 | 0.0335 | 3,0 | 10,2 | 38,0 | 130 | 07806 | 07462 | |
| 0,85 | 0.0335 | 3,0 | 13,0 | 50,0 | 130 | 07807 | 07463 | |
| 0,86 | 0.0339 | 3,0 | 10,2 | 38,0 | 130 | 07808 | 07464 | |
| 0,87 | 0.0343 | 3,0 | 10,2 | 38,0 | 130 | 07809 | 07465 | |
| 0,88 | 0.0346 | 3,0 | 10,2 | 38,0 | 130 | 07810 | 07466 | |
| 0,89 | 0.0350 | 3,0 | 10,2 | 38,0 | 130 | 07811 | 07467 | |
| 0,90 | 0.0354 | 3,0 | 10,2 | 38,0 | 130 | 07812 | 07468 | |
| 0,90 | 0.0354 | 3,0 | 13,0 | 50,0 | 130 | 07813 | 07469 | |
| 0,91 | 0.0358 | 3,0 | 10,2 | 38,0 | 130 | 07814 | 07470 | |
| 0,92 | 0.0362 | 3,0 | 10,2 | 38,0 | 130 | 07815 | 07471 | |
| 0,93 | 0.0366 | 3,0 | 10,2 | 38,0 | 130 | 07816 | 07472 | |
| 0,94 | 0.0370 | 3,0 | 10,2 | 38,0 | 130 | 07817 | 07473 | |
| 0,95 | 0.0374 | 3,0 | 10,2 | 38,0 | 130 | 07818 | 07474 | |
| 0,95 | 0.0374 | 3,0 | 15,0 | 50,0 | 130 | 07819 | 07475 | |
| 0,96 | 0.0378 | 3,0 | 10,2 | 38,0 | 130 | 07820 | 07476 | |
| 0,97 | 0.0382 | 3,0 | 10,2 | 38,0 | 130 | 07821 | 07477 | |
| 0,98 | 0.0386 | 3,0 | 10,2 | 38,0 | 130 | 07822 | 07478 | |
| 0,99 | 0.0390 | 3,0 | 10,2 | 38,0 | 130 | 07823 | 07479 | |
| 1,00 | 0.0394 | 3,0 | 10,2 | 38,0 | 130 | 07824 | 07480 | |
| 1,00 | 0.0394 | 3,0 | 15,0 | 50,0 | 130 | 07825 | 07481 | |
| 1,01 | 0.0398 | 3,0 | 10,2 | 38,0 | 130 | 07826 | 07482 | |
| 1,02 | 0.0402 | 3,0 | 10,2 | 38,0 | 130 | 07827 | 07483 | |
| 1,03 | 0.0406 | 3,0 | 10,2 | 38,0 | 130 | 07828 | 07484 | |
| 1,04 | 0.0409 | 3,0 | 10,2 | 38,0 | 130 | 07829 | 07485 | |
| 1,05 | 0.0413 | 3,0 | 10,2 | 38,0 | 130 | 07830 | 07486 | |
| 1,05 | 0.0413 | 3,0 | 17,0 | 50,0 | 130 | 07831 | 07487 | |
| 1,06 | 0.0417 | 3,0 | 10,2 | 38,0 | 130 | 07832 | 07488 | |
| 1,07 | 0.0421 | 3,0 | 10,2 | 38,0 | 130 | 07833 | 07489 | |
| 1,08 | 0.0425 | 3,0 | 10,2 | 38,0 | 130 | 07834 | 07490 | |
| 1,09 | 0.0429 | 3,0 | 10,2 | 38,0 | 130 | 07835 | 07491 | |
| 1,10 | 0.0433 | 3,0 | 10,2 | 38,0 | 130 | 07836 | 07492 | |
| 1,10 | 0.0433 | 3,0 | 17,0 | 50,0 | 130 | 07837 | 07493 | |
| 1,11 | 0.0437 | 3,0 | 10,2 | 38,0 | 130 | 07838 | 07494 | |
| 1,12 | 0.0441 | 3,0 | 10,2 | 38,0 | 130 | 07839 | 07495 | |

continued

continued on next page

2 Flute External Coolant



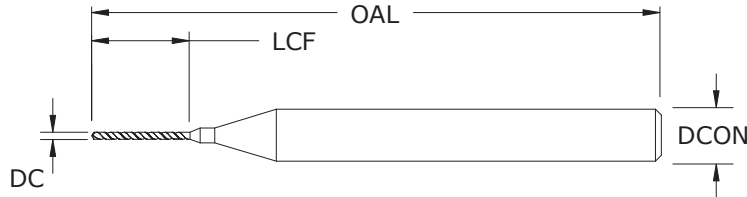
3xD

12xD



M226 METRIC SERIES

continued



 New Expanded Tools

TOLERANCES (mm)

0,04–3,0 DIAMETER

DC = +0,000/-0,008

DCON = h₆

| CUTTING DIAMETER DC | DECIMAL EQUIV. | mm | | | | POINT ANGLE | EDP NO. | |
|------------------------|----------------|------------------------|---------------------|-----------------------|----------|-------------|------------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| 1,13 | 0.0445 | 3,0 | 10,2 | 38,0 | 130 | 07840 | 07496 | |
| 1,14 | 0.0449 | 3,0 | 10,2 | 38,0 | 130 | 07841 | 07497 | |
| 1,15 | 0.0453 | 3,0 | 10,2 | 38,0 | 130 | 07842 | 07498 | |
| 1,15 | 0.0453 | 3,0 | 17,0 | 50,0 | 130 | 07843 | 07499 | |
| 1,16 | 0.0457 | 3,0 | 10,2 | 38,0 | 130 | 07844 | 07500 | |
| 1,17 | 0.0461 | 3,0 | 10,2 | 38,0 | 130 | 07845 | 07501 | |
| 1,18 | 0.0465 | 3,0 | 10,2 | 38,0 | 130 | 07846 | 07502 | |
| 1,19 | 0.0469 | 3,0 | 10,2 | 38,0 | 130 | 07847 | 07503 | |
| 1,20 | 0.0472 | 3,0 | 10,2 | 38,0 | 130 | 07848 | 07504 | |
| 1,20 | 0.0472 | 3,0 | 17,0 | 50,0 | 130 | 07849 | 07505 | |
| 1,21 | 0.0476 | 3,0 | 10,2 | 38,0 | 130 | 07850 | 07506 | |
| 1,22 | 0.0480 | 3,0 | 10,2 | 38,0 | 130 | 07851 | 07507 | |
| 1,23 | 0.0484 | 3,0 | 10,2 | 38,0 | 130 | 07852 | 07508 | |
| 1,24 | 0.0488 | 3,0 | 10,2 | 38,0 | 130 | 07853 | 07509 | |
| 1,25 | 0.0492 | 3,0 | 10,2 | 38,0 | 130 | 07854 | 07510 | |
| 1,25 | 0.0492 | 3,0 | 19,0 | 50,0 | 130 | 07855 | 07511 | |
| 1,26 | 0.0496 | 3,0 | 10,2 | 38,0 | 130 | 07856 | 07512 | |
| 1,27 | 0.0500 | 3,0 | 10,2 | 38,0 | 130 | 07857 | 07513 | |
| 1,28 | 0.0504 | 3,0 | 10,2 | 38,0 | 130 | 07858 | 07514 | |
| 1,29 | 0.0508 | 3,0 | 10,2 | 38,0 | 130 | 07859 | 07515 | |
| 1,30 | 0.0512 | 3,0 | 10,2 | 38,0 | 130 | 07860 | 07516 | |
| 1,30 | 0.0512 | 3,0 | 19,0 | 50,0 | 130 | 07861 | 07517 | |
| 1,31 | 0.0516 | 3,0 | 10,2 | 38,0 | 130 | 07862 | 07518 | |
| 1,32 | 0.0520 | 3,0 | 10,2 | 38,0 | 130 | 07863 | 07519 | |
| 1,33 | 0.0524 | 3,0 | 10,2 | 38,0 | 130 | 07864 | 07520 | |
| 1,34 | 0.0528 | 3,0 | 10,2 | 38,0 | 130 | 07865 | 07521 | |
| 1,35 | 0.0531 | 3,0 | 10,2 | 38,0 | 130 | 07866 | 07522 | |
| 1,35 | 0.0531 | 3,0 | 19,0 | 50,0 | 130 | 07867 | 07523 | |
| 1,36 | 0.0535 | 3,0 | 10,2 | 38,0 | 130 | 07868 | 07524 | |
| 1,37 | 0.0539 | 3,0 | 10,2 | 38,0 | 130 | 07869 | 07525 | |
| 1,38 | 0.0543 | 3,0 | 10,2 | 38,0 | 130 | 07870 | 07526 | |
| 1,39 | 0.0547 | 3,0 | 10,2 | 38,0 | 130 | 07871 | 07527 | |
| 1,40 | 0.0551 | 3,0 | 10,2 | 38,0 | 130 | 07872 | 07528 | |
| 1,40 | 0.0551 | 3,0 | 19,0 | 50,0 | 130 | 07873 | 07529 | |
| 1,41 | 0.0555 | 3,0 | 10,2 | 38,0 | 130 | 07874 | 07530 | |
| 1,42 | 0.0559 | 3,0 | 10,2 | 38,0 | 130 | 07875 | 07531 | |

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

continued on next page

| CUTTING DIAMETER DC | DECIMAL EQUIV. | mm | | | | POINT ANGLE | EDP NO. | |
|---------------------|----------------|---------------------|------------------|--------------------|----------|-------------|---------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| 1,43 | 0.0563 | 3,0 | 10,2 | 38,0 | 130 | 07876 | 07532 | |
| 1,44 | 0.0567 | 3,0 | 10,2 | 38,0 | 130 | 07877 | 07533 | |
| 1,45 | 0.0571 | 3,0 | 10,2 | 38,0 | 130 | 07878 | 07534 | |
| 1,45 | 0.0571 | 3,0 | 20,0 | 50,0 | 130 | 07879 | 07535 | |
| 1,46 | 0.0575 | 3,0 | 10,2 | 38,0 | 130 | 07880 | 07536 | |
| 1,47 | 0.0579 | 3,0 | 10,2 | 38,0 | 130 | 07881 | 07537 | |
| 1,48 | 0.0583 | 3,0 | 10,2 | 38,0 | 130 | 07882 | 07538 | |
| 1,49 | 0.0587 | 3,0 | 10,2 | 38,0 | 130 | 07883 | 07539 | |
| 1,50 | 0.0591 | 3,0 | 10,2 | 38,0 | 130 | 07884 | 07540 | |
| 1,50 | 0.0591 | 3,0 | 20,0 | 50,0 | 130 | 07885 | 07541 | |
| 1,51 | 0.0594 | 3,0 | 10,2 | 38,0 | 130 | 07886 | 07542 | |
| 1,52 | 0.0598 | 3,0 | 10,2 | 38,0 | 130 | 07887 | 07543 | |
| 1,53 | 0.0602 | 3,0 | 10,2 | 38,0 | 130 | 07888 | 07544 | |
| 1,54 | 0.0606 | 3,0 | 10,2 | 38,0 | 130 | 07889 | 07545 | |
| 1,55 | 0.0610 | 3,0 | 10,2 | 38,0 | 130 | 07890 | 07546 | |
| 1,55 | 0.0610 | 3,0 | 20,0 | 50,0 | 130 | 07891 | 07547 | |
| 1,56 | 0.0614 | 3,0 | 10,2 | 38,0 | 130 | 07892 | 07548 | |
| 1,57 | 0.0618 | 3,0 | 10,2 | 38,0 | 130 | 07893 | 07549 | |
| 1,58 | 0.0622 | 3,0 | 10,2 | 38,0 | 130 | 07894 | 07550 | |
| 1,59 | 0.0626 | 3,0 | 10,2 | 38,0 | 130 | 07895 | 07551 | |
| 1,60 | 0.0630 | 3,0 | 10,2 | 38,0 | 130 | 07896 | 07552 | |
| 1,60 | 0.0630 | 3,0 | 20,0 | 50,0 | 130 | 07897 | 07553 | |
| 1,61 | 0.0634 | 3,0 | 10,2 | 38,0 | 130 | 07898 | 07554 | |
| 1,62 | 0.0638 | 3,0 | 10,2 | 38,0 | 130 | 07899 | 07555 | |
| 1,63 | 0.0642 | 3,0 | 10,2 | 38,0 | 130 | 07900 | 07556 | |
| 1,64 | 0.0646 | 3,0 | 10,2 | 38,0 | 130 | 07901 | 07557 | |
| 1,65 | 0.0650 | 3,0 | 10,2 | 38,0 | 130 | 07902 | 07558 | |
| 1,65 | 0.0650 | 3,0 | 20,0 | 50,0 | 130 | 07903 | 07559 | |
| 1,66 | 0.0654 | 3,0 | 10,2 | 38,0 | 130 | 07904 | 07560 | |
| 1,67 | 0.0657 | 3,0 | 10,2 | 38,0 | 130 | 07905 | 07561 | |
| 1,68 | 0.0661 | 3,0 | 10,2 | 38,0 | 130 | 07906 | 07562 | |
| 1,69 | 0.0665 | 3,0 | 10,2 | 38,0 | 130 | 07907 | 07563 | |
| 1,70 | 0.0669 | 3,0 | 10,2 | 38,0 | 130 | 07908 | 07564 | |
| 1,70 | 0.0669 | 3,0 | 20,0 | 50,0 | 130 | 07909 | 07565 | |
| 1,71 | 0.0673 | 3,0 | 10,2 | 38,0 | 130 | 07910 | 07566 | |
| 1,72 | 0.0677 | 3,0 | 10,2 | 38,0 | 130 | 07911 | 07567 | |
| 1,73 | 0.0681 | 3,0 | 10,2 | 38,0 | 130 | 07912 | 07568 | |
| 1,74 | 0.0685 | 3,0 | 10,2 | 38,0 | 130 | 07913 | 07569 | |
| 1,75 | 0.0689 | 3,0 | 10,2 | 38,0 | 130 | 07914 | 07570 | |
| 1,75 | 0.0689 | 3,0 | 20,0 | 50,0 | 130 | 07915 | 07571 | |
| 1,76 | 0.0693 | 3,0 | 10,2 | 38,0 | 130 | 07916 | 07572 | |
| 1,77 | 0.0697 | 3,0 | 10,2 | 38,0 | 130 | 07917 | 07573 | |
| 1,78 | 0.0701 | 3,0 | 10,2 | 38,0 | 130 | 07918 | 07574 | |
| 1,79 | 0.0705 | 3,0 | 10,2 | 38,0 | 130 | 07919 | 07575 | |
| 1,80 | 0.0709 | 3,0 | 10,2 | 38,0 | 130 | 07920 | 07576 | |
| 1,80 | 0.0709 | 3,0 | 20,0 | 50,0 | 130 | 07921 | 07577 | |

continued

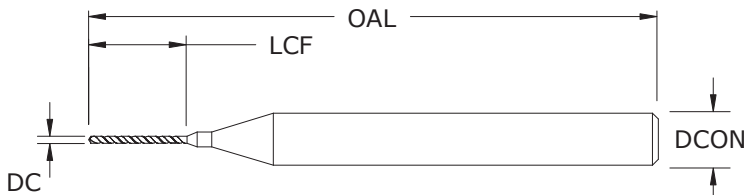
continued on next page

2 Flute External Coolant



3xD

12xD



 New Expanded Tools

M226 METRIC SERIES

continued

| CUTTING DIAMETER DC | DECIMAL EQUIV. | mm | | | | POINT ANGLE | EDP NO. | |
|------------------------|----------------|------------------------|---------------------|-----------------------|----------|-------------|------------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| 1,81 | 0.0713 | 3,0 | 10,2 | 38,0 | 130 | 07922 | 07578 | |
| 1,82 | 0.0717 | 3,0 | 10,2 | 38,0 | 130 | 07923 | 07579 | |
| 1,83 | 0.0720 | 3,0 | 10,2 | 38,0 | 130 | 07924 | 07580 | |
| 1,84 | 0.0724 | 3,0 | 10,2 | 38,0 | 130 | 07925 | 07581 | |
| 1,85 | 0.0728 | 3,0 | 10,2 | 38,0 | 130 | 07926 | 07582 | |
| 1,85 | 0.0728 | 3,0 | 22,8 | 60,0 | 130 | 07927 | 07583 | |
| 1,86 | 0.0732 | 3,0 | 10,2 | 38,0 | 130 | 07928 | 07584 | |
| 1,87 | 0.0736 | 3,0 | 10,2 | 38,0 | 130 | 07929 | 07585 | |
| 1,88 | 0.0740 | 3,0 | 10,2 | 38,0 | 130 | 07930 | 07586 | |
| 1,89 | 0.0744 | 3,0 | 10,2 | 38,0 | 130 | 07931 | 07587 | |
| 1,90 | 0.0748 | 3,0 | 10,2 | 38,0 | 130 | 07932 | 07588 | |
| 1,90 | 0.0748 | 3,0 | 22,8 | 60,0 | 130 | 07933 | 07589 | |
| 1,91 | 0.0752 | 3,0 | 10,2 | 38,0 | 130 | 07934 | 07590 | |
| 1,92 | 0.0756 | 3,0 | 10,2 | 38,0 | 130 | 07935 | 07591 | |
| 1,93 | 0.0760 | 3,0 | 10,2 | 38,0 | 130 | 07936 | 07592 | |
| 1,94 | 0.0764 | 3,0 | 10,2 | 38,0 | 130 | 07937 | 07593 | |
| 1,95 | 0.0768 | 3,0 | 10,2 | 38,0 | 130 | 07938 | 07594 | |
| 1,95 | 0.0768 | 3,0 | 24,0 | 60,0 | 130 | 07939 | 07595 | |
| 1,96 | 0.0772 | 3,0 | 10,2 | 38,0 | 130 | 07940 | 07596 | |
| 1,97 | 0.0776 | 3,0 | 10,2 | 38,0 | 130 | 07941 | 07597 | |
| 1,98 | 0.0780 | 3,0 | 10,2 | 38,0 | 130 | 07942 | 07598 | |
| 1,99 | 0.0783 | 3,0 | 10,2 | 38,0 | 130 | 07943 | 07599 | |
| 2,00 | 0.0787 | 3,0 | 10,2 | 38,0 | 130 | 07944 | 07600 | |
| 2,00 | 0.0787 | 3,0 | 24,0 | 60,0 | 130 | 07945 | 07601 | |
| 2,01 | 0.0791 | 3,0 | 10,2 | 38,0 | 130 | 07946 | 07602 | |
| 2,02 | 0.0795 | 3,0 | 10,2 | 38,0 | 130 | 07947 | 07603 | |
| 2,03 | 0.0799 | 3,0 | 10,2 | 38,0 | 130 | 07948 | 07604 | |
| 2,04 | 0.0803 | 3,0 | 10,2 | 38,0 | 130 | 07949 | 07605 | |
| 2,05 | 0.0807 | 3,0 | 10,2 | 38,0 | 130 | 07950 | 07606 | |
| 2,05 | 0.0807 | 3,0 | 25,2 | 60,0 | 130 | 07951 | 07607 | |
| 2,06 | 0.0811 | 3,0 | 10,2 | 38,0 | 130 | 07952 | 07608 | |
| 2,07 | 0.0815 | 3,0 | 10,2 | 38,0 | 130 | 07953 | 07609 | |
| 2,08 | 0.0819 | 3,0 | 10,2 | 38,0 | 130 | 07954 | 07610 | |
| 2,09 | 0.0823 | 3,0 | 10,2 | 38,0 | 130 | 07955 | 07611 | |
| 2,10 | 0.0827 | 3,0 | 10,2 | 38,0 | 130 | 07956 | 07612 | |
| 2,10 | 0.0827 | 3,0 | 25,2 | 60,0 | 130 | 07957 | 07613 | |

TOLERANCES (mm)

0,04–3,0 DIAMETER

DC = +0,000/–0,008

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

continued on next page

| CUTTING DIAMETER DC | DECIMAL EQUIV. | mm | | | | POINT ANGLE | EDP NO. | |
|---------------------------|-------------------|---------------------------|------------------------|--------------------------|----------|----------------|------------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| | | | | | | | | |
| 2,11 | 0.0831 | 3,0 | 10,2 | 38,0 | 130 | 07958 | 07614 | |
| 2,12 | 0.0835 | 3,0 | 10,2 | 38,0 | 130 | 07959 | 07615 | |
| 2,13 | 0.0839 | 3,0 | 10,2 | 38,0 | 130 | 07960 | 07616 | |
| 2,14 | 0.0843 | 3,0 | 10,2 | 38,0 | 130 | 07961 | 07617 | |
| 2,15 | 0.0846 | 3,0 | 10,2 | 38,0 | 130 | 07962 | 07618 | |
| 2,15 | 0.0846 | 3,0 | 26,4 | 60,0 | 130 | 07963 | 07619 | |
| 2,16 | 0.0850 | 3,0 | 10,2 | 38,0 | 130 | 07964 | 07620 | |
| 2,17 | 0.0854 | 3,0 | 10,2 | 38,0 | 130 | 07965 | 07621 | |
| 2,18 | 0.0858 | 3,0 | 10,2 | 38,0 | 130 | 07966 | 07622 | |
| 2,19 | 0.0862 | 3,0 | 10,2 | 38,0 | 130 | 07967 | 07623 | |
| 2,20 | 0.0866 | 3,0 | 10,2 | 38,0 | 130 | 07968 | 07624 | |
| 2,20 | 0.0866 | 3,0 | 26,4 | 60,0 | 130 | 07969 | 07625 | |
| 2,21 | 0.0870 | 3,0 | 10,2 | 38,0 | 130 | 07970 | 07626 | |
| 2,22 | 0.0874 | 3,0 | 10,2 | 38,0 | 130 | 07971 | 07627 | |
| 2,23 | 0.0878 | 3,0 | 10,2 | 38,0 | 130 | 07972 | 07628 | |
| 2,24 | 0.0882 | 3,0 | 10,2 | 38,0 | 130 | 07973 | 07629 | |
| 2,25 | 0.0886 | 3,0 | 10,2 | 38,0 | 130 | 07974 | 07630 | |
| 2,25 | 0.0886 | 3,0 | 27,6 | 60,0 | 130 | 07975 | 07631 | |
| 2,26 | 0.0890 | 3,0 | 10,2 | 38,0 | 130 | 07976 | 07632 | |
| 2,27 | 0.0894 | 3,0 | 10,2 | 38,0 | 130 | 07977 | 07633 | |
| 2,28 | 0.0898 | 3,0 | 10,2 | 38,0 | 130 | 07978 | 07634 | |
| 2,29 | 0.0902 | 3,0 | 10,2 | 38,0 | 130 | 07979 | 07635 | |
| 2,30 | 0.0906 | 3,0 | 10,2 | 38,0 | 130 | 07980 | 07636 | |
| 2,30 | 0.0906 | 3,0 | 27,6 | 60,0 | 130 | 07981 | 07637 | |
| 2,31 | 0.0909 | 3,0 | 10,2 | 38,0 | 130 | 07982 | 07638 | |
| 2,32 | 0.0913 | 3,0 | 10,2 | 38,0 | 130 | 07983 | 07639 | |
| 2,33 | 0.0917 | 3,0 | 10,2 | 38,0 | 130 | 07984 | 07640 | |
| 2,34 | 0.0921 | 3,0 | 10,2 | 38,0 | 130 | 07985 | 07641 | |
| 2,35 | 0.0925 | 3,0 | 10,2 | 38,0 | 130 | 07986 | 07642 | |
| 2,35 | 0.0925 | 3,0 | 28,8 | 60,0 | 130 | 07987 | 07643 | |
| 2,36 | 0.0929 | 3,0 | 10,2 | 38,0 | 130 | 07988 | 07644 | |
| 2,37 | 0.0933 | 3,0 | 10,2 | 38,0 | 130 | 07989 | 07645 | |
| 2,38 | 0.0937 | 3,0 | 10,2 | 38,0 | 130 | 07990 | 07646 | |
| 2,39 | 0.0941 | 3,0 | 10,2 | 38,0 | 130 | 07991 | 07647 | |
| 2,40 | 0.0945 | 3,0 | 10,2 | 38,0 | 130 | 07992 | 07648 | |
| 2,40 | 0.0945 | 3,0 | 28,8 | 60,0 | 130 | 07993 | 07649 | |
| 2,41 | 0.0949 | 3,0 | 10,2 | 38,0 | 130 | 07994 | 07650 | |
| 2,42 | 0.0953 | 3,0 | 10,2 | 38,0 | 130 | 07995 | 07651 | |
| 2,43 | 0.0957 | 3,0 | 10,2 | 38,0 | 130 | 07996 | 07652 | |
| 2,44 | 0.0961 | 3,0 | 10,2 | 38,0 | 130 | 07997 | 07653 | |
| 2,45 | 0.0965 | 3,0 | 10,2 | 38,0 | 130 | 07998 | 07654 | |
| 2,45 | 0.0965 | 3,0 | 30,0 | 60,0 | 130 | 07999 | 07655 | |
| 2,46 | 0.0969 | 3,0 | 10,2 | 38,0 | 130 | 08000 | 07656 | |
| 2,47 | 0.0972 | 3,0 | 10,2 | 38,0 | 130 | 08001 | 07657 | |
| 2,48 | 0.0976 | 3,0 | 10,2 | 38,0 | 130 | 08002 | 07658 | |
| 2,49 | 0.0980 | 3,0 | 10,2 | 38,0 | 130 | 08003 | 07659 | |

continued

continued on next page

2 Flute External Coolant



3xD

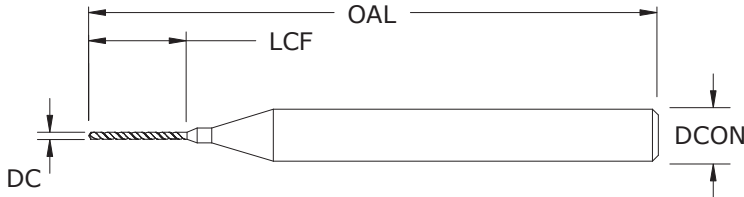
12xD



118°



130°



 New Expanded Tools

M226 METRIC SERIES

continued

| CUTTING DIAMETER DC | DECIMAL EQUIV. | mm | | | | POINT ANGLE | EDP NO. | |
|------------------------|----------------|------------------------|---------------------|-----------------------|----------|-------------|------------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| 2,50 | 0.0984 | 3,0 | 10,2 | 38,0 | 130 | 08004 | 07660 | |
| 2,50 | 0.0984 | 3,0 | 30,0 | 60,0 | 130 | 08005 | 07661 | |
| 2,51 | 0.0988 | 3,0 | 10,2 | 38,0 | 130 | 08006 | 07662 | |
| 2,52 | 0.0992 | 3,0 | 10,2 | 38,0 | 130 | 08007 | 07663 | |
| 2,53 | 0.0996 | 3,0 | 10,2 | 38,0 | 130 | 08008 | 07664 | |
| 2,54 | 0.1000 | 3,0 | 10,2 | 38,0 | 130 | 08009 | 07665 | |
| 2,55 | 0.1004 | 3,0 | 10,2 | 38,0 | 130 | 08010 | 07666 | |
| 2,55 | 0.1004 | 3,0 | 31,2 | 60,0 | 130 | 08011 | 07667 | |
| 2,56 | 0.1008 | 3,0 | 10,2 | 38,0 | 130 | 08012 | 07668 | |
| 2,57 | 0.1012 | 3,0 | 10,2 | 38,0 | 130 | 08013 | 07669 | |
| 2,58 | 0.1016 | 3,0 | 10,2 | 38,0 | 130 | 08014 | 07670 | |
| 2,59 | 0.1020 | 3,0 | 10,2 | 38,0 | 130 | 08015 | 07671 | |
| 2,60 | 0.1024 | 3,0 | 10,2 | 38,0 | 130 | 08016 | 07672 | |
| 2,60 | 0.1024 | 3,0 | 31,2 | 60,0 | 130 | 08017 | 07673 | |
| 2,61 | 0.1028 | 3,0 | 10,2 | 38,0 | 130 | 08018 | 07674 | |
| 2,62 | 0.1031 | 3,0 | 10,2 | 38,0 | 130 | 08019 | 07675 | |
| 2,63 | 0.1035 | 3,0 | 10,2 | 38,0 | 130 | 08020 | 07676 | |
| 2,64 | 0.1039 | 3,0 | 10,2 | 38,0 | 130 | 08021 | 07677 | |
| 2,65 | 0.1043 | 3,0 | 10,2 | 38,0 | 130 | 08022 | 07678 | |
| 2,65 | 0.1043 | 3,0 | 32,4 | 60,0 | 130 | 08023 | 07679 | |
| 2,66 | 0.1047 | 3,0 | 10,2 | 38,0 | 130 | 08024 | 07680 | |
| 2,67 | 0.1051 | 3,0 | 10,2 | 38,0 | 130 | 08025 | 07681 | |
| 2,68 | 0.1055 | 3,0 | 10,2 | 38,0 | 130 | 08026 | 07682 | |
| 2,69 | 0.1059 | 3,0 | 10,2 | 38,0 | 130 | 08027 | 07683 | |
| 2,70 | 0.1063 | 3,0 | 10,2 | 38,0 | 130 | 08028 | 07684 | |
| 2,70 | 0.1063 | 3,0 | 32,4 | 60,0 | 130 | 08029 | 07685 | |
| 2,71 | 0.1067 | 3,0 | 10,2 | 38,0 | 130 | 08030 | 07686 | |
| 2,72 | 0.1071 | 3,0 | 10,2 | 38,0 | 130 | 08031 | 07687 | |
| 2,73 | 0.1075 | 3,0 | 10,2 | 38,0 | 130 | 08032 | 07688 | |
| 2,74 | 0.1079 | 3,0 | 10,2 | 38,0 | 130 | 08033 | 07689 | |
| 2,75 | 0.1083 | 3,0 | 10,2 | 38,0 | 130 | 08034 | 07690 | |
| 2,75 | 0.1083 | 3,0 | 33,6 | 60,0 | 130 | 08035 | 07691 | |
| 2,76 | 0.1087 | 3,0 | 10,2 | 38,0 | 130 | 08036 | 07692 | |
| 2,77 | 0.1091 | 3,0 | 10,2 | 38,0 | 130 | 08037 | 07693 | |
| 2,78 | 0.1094 | 3,0 | 10,2 | 38,0 | 130 | 08038 | 07694 | |
| 2,79 | 0.1098 | 3,0 | 10,2 | 38,0 | 130 | 08039 | 07695 | |

TOLERANCES (mm)

0,04–3,0 DIAMETER

DC = +0,000/-0,008

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

continued on next page

continued

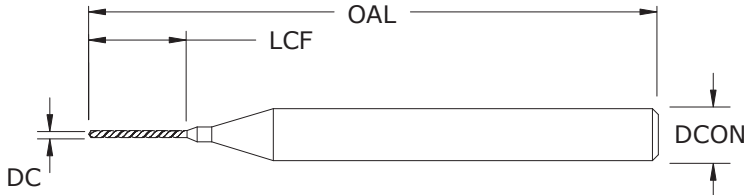
| CUTTING DIAMETER DC | DECIMAL EQUIV. | mm | | | | POINT ANGLE | EDP NO. | |
|---------------------|----------------|---------------------|------------------|--------------------|----------|-------------|---------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| 2,80 | 0.1102 | 3,0 | 10,2 | 38,0 | 130 | 08040 | 07696 | |
| 2,80 | 0.1102 | 3,0 | 33,6 | 60,0 | 130 | 08041 | 07697 | |
| 2,81 | 0.1106 | 3,0 | 10,2 | 38,0 | 130 | 08042 | 07698 | |
| 2,82 | 0.1110 | 3,0 | 10,2 | 38,0 | 130 | 08043 | 07699 | |
| 2,83 | 0.1114 | 3,0 | 10,2 | 38,0 | 130 | 08044 | 07700 | |
| 2,84 | 0.1118 | 3,0 | 10,2 | 38,0 | 130 | 08045 | 07701 | |
| 2,85 | 0.1122 | 3,0 | 10,2 | 38,0 | 130 | 08046 | 07702 | |
| 2,85 | 0.1122 | 3,0 | 34,8 | 60,0 | 130 | 08047 | 07703 | |
| 2,86 | 0.1126 | 3,0 | 10,2 | 38,0 | 130 | 08048 | 07704 | |
| 2,87 | 0.1130 | 3,0 | 10,2 | 38,0 | 130 | 08049 | 07705 | |
| 2,88 | 0.1134 | 3,0 | 10,2 | 38,0 | 130 | 08050 | 07706 | |
| 2,89 | 0.1138 | 3,0 | 10,2 | 38,0 | 130 | 08051 | 07707 | |
| 2,90 | 0.1142 | 3,0 | 10,2 | 38,0 | 130 | 08052 | 07708 | |
| 2,90 | 0.1142 | 3,0 | 34,8 | 60,0 | 130 | 08053 | 07709 | |
| 2,91 | 0.1146 | 3,0 | 10,2 | 38,0 | 130 | 08054 | 07710 | |
| 2,92 | 0.1150 | 3,0 | 10,2 | 38,0 | 130 | 08055 | 07711 | |
| 2,93 | 0.1154 | 3,0 | 10,2 | 38,0 | 130 | 08056 | 07712 | |
| 2,94 | 0.1157 | 3,0 | 10,2 | 38,0 | 130 | 08057 | 07713 | |
| 2,95 | 0.1161 | 3,0 | 10,2 | 38,0 | 130 | 08058 | 07714 | |
| 2,95 | 0.1161 | 3,0 | 36,0 | 60,0 | 130 | 08059 | 07715 | |
| 2,96 | 0.1165 | 3,0 | 10,2 | 38,0 | 130 | 08060 | 07716 | |
| 2,97 | 0.1169 | 3,0 | 10,2 | 38,0 | 130 | 08061 | 07717 | |
| 2,98 | 0.1173 | 3,0 | 10,2 | 38,0 | 130 | 08062 | 07718 | |
| 2,99 | 0.1177 | 3,0 | 10,2 | 38,0 | 130 | 08063 | 07719 | |
| 3,00 | 0.1181 | 3,0 | 10,2 | 38,0 | 130 | 08064 | 07720 | |
| 3,00 | 0.1181 | 3,0 | 36,0 | 60,0 | 130 | 08065 | 07721 | |

2 Flute Left Hand Cut External Coolant



3xD

12xD



 New Expanded Tools

L226 METRIC SERIES

- 4-facet point design stabilizes on entry for superior hole size control and tool life (>.08mm). 2-facet point on 0,08 and smaller.
- Mirror surface finishes improve chip flow as hole depth increases
- Ti-Namite A coating and uncoated options for the ultimate performance in a variety of ferrous and non-ferrous workpiece materials
- Available from stock in a selection of popular lengths and diameters
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures

| CUTTING DIAMETER DC | DECIMAL EQUIV. | mm | | | | POINT ANGLE | EDP NO. | |
|---------------------|----------------|---------------------|------------------|--------------------|----------|-------------|---------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AITiN) | |
| 0,04 | 0.0016 | 3,0 | 0,5 | 38,0 | 118 | 08228 | — | |
| 0,05 | 0.0020 | 3,0 | 0,8 | 38,0 | 118 | 08229 | — | |
| 0,06 | 0.0024 | 3,0 | 0,8 | 38,0 | 118 | 08230 | — | |
| 0,07 | 0.0028 | 3,0 | 1,3 | 38,0 | 118 | 08231 | — | |
| 0,08 | 0.0031 | 3,0 | 1,3 | 38,0 | 118 | 08232 | — | |
| 0,09 | 0.0035 | 3,0 | 1,3 | 38,0 | 118 | 08233 | — | |
| 0,10 | 0.0039 | 3,0 | 1,0 | 38,0 | 118 | 08234 | — | |
| 0,11 | 0.0043 | 3,0 | 1,0 | 38,0 | 118 | 08235 | — | |
| 0,12 | 0.0047 | 3,0 | 1,0 | 38,0 | 118 | 08236 | — | |
| 0,13 | 0.0051 | 3,0 | 1,0 | 38,0 | 118 | 08237 | — | |
| 0,14 | 0.0055 | 3,0 | 2,0 | 38,0 | 118 | 08238 | — | |
| 0,15 | 0.0059 | 3,0 | 2,0 | 38,0 | 118 | 08239 | — | |
| 0,16 | 0.0063 | 3,0 | 2,0 | 38,0 | 118 | 08240 | — | |
| 0,17 | 0.0067 | 3,0 | 2,0 | 38,0 | 118 | 08241 | — | |
| 0,18 | 0.0071 | 3,0 | 2,5 | 38,0 | 118 | 08242 | — | |
| 0,19 | 0.0075 | 3,0 | 2,5 | 38,0 | 118 | 08243 | — | |
| 0,20 | 0.0079 | 3,0 | 2,5 | 38,0 | 118 | 08244 | — | |
| 0,21 | 0.0083 | 3,0 | 2,5 | 38,0 | 118 | 08245 | — | |
| 0,22 | 0.0087 | 3,0 | 2,5 | 38,0 | 118 | 08246 | — | |
| 0,23 | 0.0091 | 3,0 | 3,8 | 38,0 | 118 | 08247 | — | |
| 0,24 | 0.0094 | 3,0 | 3,8 | 38,0 | 118 | 08248 | — | |
| 0,25 | 0.0098 | 3,0 | 3,8 | 38,0 | 118 | 08249 | 08066 | |
| 0,26 | 0.0102 | 3,0 | 3,8 | 38,0 | 118 | 08250 | 08067 | |
| 0,27 | 0.0106 | 3,0 | 3,8 | 38,0 | 118 | 08251 | 08068 | |
| 0,28 | 0.0110 | 3,0 | 3,8 | 38,0 | 118 | 08252 | 08069 | |
| 0,29 | 0.0114 | 3,0 | 3,8 | 38,0 | 118 | 08253 | 08070 | |
| 0,30 | 0.0118 | 3,0 | 5,7 | 38,0 | 118 | 08254 | 08071 | |
| 0,31 | 0.0122 | 3,0 | 5,7 | 38,0 | 118 | 08255 | 08072 | |
| 0,32 | 0.0126 | 3,0 | 5,7 | 38,0 | 118 | 08256 | 08073 | |
| 0,33 | 0.0130 | 3,0 | 5,7 | 38,0 | 118 | 08257 | 08074 | |
| 0,34 | 0.0134 | 3,0 | 5,7 | 38,0 | 118 | 08258 | 08075 | |
| 0,35 | 0.0138 | 3,0 | 5,7 | 38,0 | 130 | 08259 | 08076 | |
| 0,36 | 0.0142 | 3,0 | 5,7 | 38,0 | 130 | 08260 | 08077 | |
| 0,37 | 0.0146 | 3,0 | 5,7 | 38,0 | 130 | 08261 | 08078 | |
| 0,38 | 0.0150 | 3,0 | 6,4 | 38,0 | 130 | 08262 | 08079 | |
| 0,39 | 0.0154 | 3,0 | 6,4 | 38,0 | 130 | 08263 | 08080 | |

TOLERANCES (mm)

0,04–3,0 DIAMETER

DC = +0,000/–0,008

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

continued on next page

2 Flute Left Hand Cut External Coolant

METRIC

L226
METRIC SERIES

| CUTTING DIAMETER DC | DECIMAL EQUIV. | mm | | | | POINT ANGLE | EDP NO. | |
|---------------------|----------------|---------------------|------------------|--------------------|----------|-------------|---------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| 0,40 | 0.0157 | 3,0 | 6,4 | 38,0 | 130 | 08264 | 08081 | |
| 0,41 | 0.0161 | 3,0 | 6,4 | 38,0 | 130 | 08265 | 08082 | |
| 0,42 | 0.0165 | 3,0 | 6,4 | 38,0 | 130 | 08266 | 08083 | |
| 0,43 | 0.0169 | 3,0 | 6,4 | 38,0 | 130 | 08267 | 08084 | |
| 0,44 | 0.0173 | 3,0 | 6,4 | 38,0 | 130 | 08268 | 08085 | |
| 0,45 | 0.0177 | 3,0 | 6,4 | 38,0 | 130 | 08269 | 08086 | |
| 0,46 | 0.0181 | 3,0 | 6,4 | 38,0 | 130 | 08270 | 08087 | |
| 0,47 | 0.0185 | 3,0 | 6,4 | 38,0 | 130 | 08271 | 08088 | |
| 0,48 | 0.0189 | 3,0 | 6,6 | 38,0 | 130 | 08272 | 08089 | |
| 0,49 | 0.0193 | 3,0 | 6,6 | 38,0 | 130 | 08273 | 08090 | |
| 0,50 | 0.0197 | 3,0 | 6,6 | 38,0 | 130 | 08274 | 08091 | |
| 0,51 | 0.0201 | 3,0 | 6,6 | 38,0 | 130 | 08275 | 08092 | |
| 0,52 | 0.0205 | 3,0 | 6,6 | 38,0 | 130 | 08276 | 08093 | |
| 0,53 | 0.0209 | 3,0 | 6,6 | 38,0 | 130 | 08277 | 08094 | |
| 0,54 | 0.0213 | 3,0 | 6,6 | 38,0 | 130 | 08278 | 08095 | |
| 0,55 | 0.0217 | 3,0 | 8,6 | 38,0 | 130 | 08279 | 08096 | |
| 0,56 | 0.0220 | 3,0 | 8,6 | 38,0 | 130 | 08280 | 08097 | |
| 0,57 | 0.0224 | 3,0 | 8,6 | 38,0 | 130 | 08281 | 08098 | |
| 0,58 | 0.0228 | 3,0 | 8,6 | 38,0 | 130 | 08282 | 08099 | |
| 0,59 | 0.0232 | 3,0 | 8,6 | 38,0 | 130 | 08283 | 08100 | |
| 0,60 | 0.0236 | 3,0 | 8,6 | 38,0 | 130 | 08284 | 08101 | |
| 0,61 | 0.0240 | 3,0 | 8,6 | 38,0 | 130 | 08285 | 08102 | |
| 0,62 | 0.0244 | 3,0 | 8,6 | 38,0 | 130 | 08286 | 08103 | |
| 0,63 | 0.0248 | 3,0 | 8,6 | 38,0 | 130 | 08287 | 08104 | |
| 0,64 | 0.0252 | 3,0 | 8,6 | 38,0 | 130 | 08288 | 08105 | |
| 0,65 | 0.0256 | 3,0 | 8,6 | 38,0 | 130 | 08289 | 08106 | |
| 0,66 | 0.0260 | 3,0 | 8,6 | 38,0 | 130 | 08290 | 08107 | |
| 0,67 | 0.0264 | 3,0 | 8,6 | 38,0 | 130 | 08291 | 08108 | |
| 0,68 | 0.0268 | 3,0 | 8,6 | 38,0 | 130 | 08292 | 08109 | |
| 0,69 | 0.0272 | 3,0 | 8,6 | 38,0 | 130 | 08293 | 08110 | |
| 0,70 | 0.0276 | 3,0 | 10,2 | 38,0 | 130 | 08294 | 08111 | |
| 0,71 | 0.0280 | 3,0 | 10,2 | 38,0 | 130 | 08295 | 08112 | |
| 0,72 | 0.0283 | 3,0 | 10,2 | 38,0 | 130 | 08296 | 08113 | |
| 0,73 | 0.0287 | 3,0 | 10,2 | 38,0 | 130 | 08297 | 08114 | |
| 0,74 | 0.0291 | 3,0 | 10,2 | 38,0 | 130 | 08298 | 08115 | |
| 0,75 | 0.0295 | 3,0 | 10,2 | 38,0 | 130 | 08299 | 08116 | |
| 0,75 | 0.0295 | 3,0 | 11,0 | 50,0 | 130 | 08300 | 08117 | |
| 0,76 | 0.0299 | 3,0 | 10,2 | 38,0 | 130 | 08301 | 08118 | |
| 0,77 | 0.0303 | 3,0 | 10,2 | 38,0 | 130 | 08302 | 08119 | |
| 0,78 | 0.0307 | 3,0 | 10,2 | 38,0 | 130 | 08303 | 08120 | |
| 0,79 | 0.0311 | 3,0 | 10,2 | 38,0 | 130 | 08304 | 08121 | |
| 0,80 | 0.0315 | 3,0 | 10,2 | 38,0 | 130 | 08305 | 08122 | |
| 0,80 | 0.0315 | 3,0 | 11,0 | 50,0 | 130 | 08306 | 08123 | |
| 0,81 | 0.0319 | 3,0 | 10,2 | 38,0 | 130 | 08307 | 08124 | |
| 0,82 | 0.0323 | 3,0 | 10,2 | 38,0 | 130 | 08308 | 08125 | |
| 0,83 | 0.0327 | 3,0 | 10,2 | 38,0 | 130 | 08309 | 08126 | |

continued

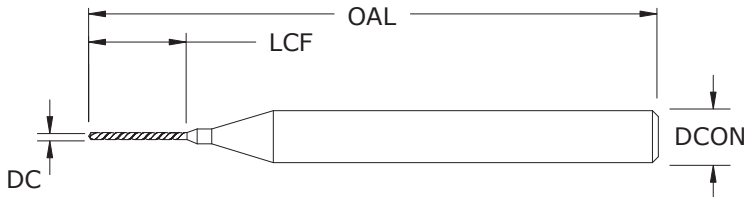
continued on next page

2 Flute Left Hand Cut External Coolant



3xD

12xD



 New Expanded Tools

L226 METRIC SERIES

continued

| CUTTING DIAMETER DC | DECIMAL EQUIV. | mm | | | | POINT ANGLE | EDP NO. | |
|---------------------|----------------|---------------------|------------------|--------------------|----------|-------------|---------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AITiN) | |
| 0,84 | 0.0331 | 3,0 | 10,2 | 38,0 | 130 | 08310 | 08127 | |
| 0,85 | 0.0335 | 3,0 | 10,2 | 38,0 | 130 | 08311 | 08128 | |
| 0,85 | 0.0335 | 3,0 | 13,0 | 50,0 | 130 | 08312 | 08129 | |
| 0,86 | 0.0339 | 3,0 | 10,2 | 38,0 | 130 | 08313 | 08130 | |
| 0,87 | 0.0343 | 3,0 | 10,2 | 38,0 | 130 | 08314 | 08131 | |
| 0,88 | 0.0346 | 3,0 | 10,2 | 38,0 | 130 | 08315 | 08132 | |
| 0,89 | 0.0350 | 3,0 | 10,2 | 38,0 | 130 | 08316 | 08133 | |
| 0,90 | 0.0354 | 3,0 | 10,2 | 38,0 | 130 | 08317 | 08134 | |
| 0,90 | 0.0354 | 3,0 | 13,0 | 50,0 | 130 | 08318 | 08135 | |
| 0,91 | 0.0358 | 3,0 | 10,2 | 38,0 | 130 | 08319 | 08136 | |
| 0,92 | 0.0362 | 3,0 | 10,2 | 38,0 | 130 | 08320 | 08137 | |
| 0,93 | 0.0366 | 3,0 | 10,2 | 38,0 | 130 | 08321 | 08138 | |
| 0,94 | 0.0370 | 3,0 | 10,2 | 38,0 | 130 | 08322 | 08139 | |
| 0,95 | 0.0374 | 3,0 | 10,2 | 38,0 | 130 | 08323 | 08140 | |
| 0,95 | 0.0374 | 3,0 | 15,0 | 50,0 | 130 | 08324 | 08141 | |
| 0,96 | 0.0378 | 3,0 | 10,2 | 38,0 | 130 | 08325 | 08142 | |
| 0,97 | 0.0382 | 3,0 | 10,2 | 38,0 | 130 | 08326 | 08143 | |
| 0,98 | 0.0386 | 3,0 | 10,2 | 38,0 | 130 | 08327 | 08144 | |
| 0,99 | 0.0390 | 3,0 | 10,2 | 38,0 | 130 | 08328 | 08145 | |
| 1,00 | 0.0394 | 3,0 | 10,2 | 38,0 | 130 | 08329 | 08146 | |
| 1,00 | 0.0394 | 3,0 | 15,0 | 50,0 | 130 | 08330 | 08147 | |
| 1,05 | 0.0413 | 3,0 | 10,2 | 38,0 | 130 | 08331 | 08148 | |
| 1,05 | 0.0413 | 3,0 | 17,0 | 50,0 | 130 | 08332 | 08149 | |
| 1,10 | 0.0433 | 3,0 | 10,2 | 38,0 | 130 | 08333 | 08150 | |
| 1,10 | 0.0433 | 3,0 | 17,0 | 50,0 | 130 | 08334 | 08151 | |
| 1,15 | 0.0453 | 3,0 | 10,2 | 38,0 | 130 | 08335 | 08152 | |
| 1,15 | 0.0453 | 3,0 | 17,0 | 50,0 | 130 | 08336 | 08153 | |
| 1,20 | 0.0472 | 3,0 | 10,2 | 38,0 | 130 | 08337 | 08154 | |
| 1,20 | 0.0472 | 3,0 | 17,0 | 50,0 | 130 | 08338 | 08155 | |
| 1,25 | 0.0492 | 3,0 | 10,2 | 38,0 | 130 | 08339 | 08156 | |
| 1,25 | 0.0492 | 3,0 | 19,0 | 50,0 | 130 | 08340 | 08157 | |
| 1,30 | 0.0512 | 3,0 | 10,2 | 38,0 | 130 | 08341 | 08158 | |
| 1,30 | 0.0512 | 3,0 | 19,0 | 50,0 | 130 | 08342 | 08159 | |
| 1,35 | 0.0531 | 3,0 | 10,2 | 38,0 | 130 | 08343 | 08160 | |
| 1,35 | 0.0531 | 3,0 | 19,0 | 50,0 | 130 | 08344 | 08161 | |
| 1,40 | 0.0551 | 3,0 | 10,2 | 38,0 | 130 | 08345 | 08162 | |

TOLERANCES (mm)

0,04–3,0 DIAMETER

DC = +0,000/–0,008

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

continued on next page

2 Flute Left Hand Cut External Coolant

METRIC

L226
METRIC SERIES

| CUTTING DIAMETER DC | DECIMAL EQUIV. | mm | | | | POINT ANGLE | EDP NO. | |
|---------------------------|-------------------|---------------------------|------------------------|--------------------------|----------|----------------|------------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| 1,40 | 0.0551 | 3,0 | 19,0 | 50,0 | 130 | 08346 | 08163 | |
| 1,45 | 0.0571 | 3,0 | 10,2 | 38,0 | 130 | 08347 | 08164 | |
| 1,45 | 0.0571 | 3,0 | 20,0 | 50,0 | 130 | 08348 | 08165 | |
| 1,50 | 0.0591 | 3,0 | 10,2 | 38,0 | 130 | 08349 | 08166 | |
| 1,50 | 0.0591 | 3,0 | 20,0 | 50,0 | 130 | 08350 | 08167 | |
| 1,55 | 0.0610 | 3,0 | 10,2 | 38,0 | 130 | 08351 | 08168 | |
| 1,55 | 0.0610 | 3,0 | 20,0 | 50,0 | 130 | 08352 | 08169 | |
| 1,60 | 0.0630 | 3,0 | 10,2 | 38,0 | 130 | 08353 | 08170 | |
| 1,60 | 0.0630 | 3,0 | 20,0 | 50,0 | 130 | 08354 | 08171 | |
| 1,65 | 0.0650 | 3,0 | 10,2 | 38,0 | 130 | 08355 | 08172 | |
| 1,65 | 0.0650 | 3,0 | 20,0 | 50,0 | 130 | 08356 | 08173 | |
| 1,70 | 0.0669 | 3,0 | 10,2 | 38,0 | 130 | 08357 | 08174 | |
| 1,70 | 0.0669 | 3,0 | 20,0 | 50,0 | 130 | 08358 | 08175 | |
| 1,75 | 0.0689 | 3,0 | 10,2 | 38,0 | 130 | 08359 | 08176 | |
| 1,75 | 0.0689 | 3,0 | 20,0 | 50,0 | 130 | 08360 | 08177 | |
| 1,80 | 0.0709 | 3,0 | 10,2 | 38,0 | 130 | 08361 | 08178 | |
| 1,80 | 0.0709 | 3,0 | 20,0 | 50,0 | 130 | 08362 | 08179 | |
| 1,85 | 0.0728 | 3,0 | 10,2 | 38,0 | 130 | 08363 | 08180 | |
| 1,85 | 0.0728 | 3,0 | 22,8 | 60,0 | 130 | 08364 | 08181 | |
| 1,90 | 0.0748 | 3,0 | 10,2 | 38,0 | 130 | 08365 | 08182 | |
| 1,90 | 0.0748 | 3,0 | 22,8 | 60,0 | 130 | 08366 | 08183 | |
| 1,95 | 0.0768 | 3,0 | 10,2 | 38,0 | 130 | 08367 | 08184 | |
| 1,95 | 0.0768 | 3,0 | 23,4 | 60,0 | 130 | 08368 | 08185 | |
| 2,00 | 0.0787 | 3,0 | 10,2 | 38,0 | 130 | 08369 | 08186 | |
| 2,00 | 0.0787 | 3,0 | 24,0 | 60,0 | 130 | 08370 | 08187 | |
| 2,05 | 0.0807 | 3,0 | 10,2 | 38,0 | 130 | 08371 | 08188 | |
| 2,05 | 0.0807 | 3,0 | 25,2 | 60,0 | 130 | 08372 | 08189 | |
| 2,10 | 0.0827 | 3,0 | 10,2 | 38,0 | 130 | 08373 | 08190 | |
| 2,10 | 0.0827 | 3,0 | 25,2 | 60,0 | 130 | 08374 | 08191 | |
| 2,15 | 0.0846 | 3,0 | 10,2 | 38,0 | 130 | 08375 | 08192 | |
| 2,15 | 0.0846 | 3,0 | 26,4 | 60,0 | 130 | 08376 | 08193 | |
| 2,20 | 0.0866 | 3,0 | 10,2 | 38,0 | 130 | 08377 | 08194 | |
| 2,20 | 0.0866 | 3,0 | 26,4 | 60,0 | 130 | 08378 | 08195 | |
| 2,25 | 0.0886 | 3,0 | 10,2 | 38,0 | 130 | 08379 | 08196 | |
| 2,25 | 0.0886 | 3,0 | 27,6 | 60,0 | 130 | 08380 | 08197 | |
| 2,30 | 0.0906 | 3,0 | 10,2 | 38,0 | 130 | 08381 | 08198 | |
| 2,30 | 0.0906 | 3,0 | 27,6 | 60,0 | 130 | 08382 | 08199 | |
| 2,35 | 0.0925 | 3,0 | 10,2 | 38,0 | 130 | 08383 | 08200 | |
| 2,35 | 0.0925 | 3,0 | 28,8 | 60,0 | 130 | 08384 | 08201 | |
| 2,40 | 0.0945 | 3,0 | 10,2 | 38,0 | 130 | 08385 | 08202 | |
| 2,40 | 0.0945 | 3,0 | 28,8 | 60,0 | 130 | 08386 | 08203 | |
| 2,45 | 0.0965 | 3,0 | 10,2 | 38,0 | 130 | 08387 | 08204 | |
| 2,45 | 0.0965 | 3,0 | 30,0 | 60,0 | 130 | 08388 | 08205 | |
| 2,50 | 0.0984 | 3,0 | 10,2 | 38,0 | 130 | 08389 | 08206 | |
| 2,50 | 0.0984 | 3,0 | 30,0 | 60,0 | 130 | 08390 | 08207 | |
| 2,55 | 0.1004 | 3,0 | 10,2 | 38,0 | 130 | 08391 | 08208 | |

continued

continued on next page

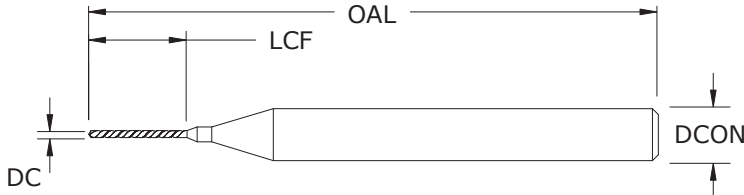
METRIC

2 Flute Left Hand Cut External Coolant



3xD

12xD



 New Expanded Tools

L226 METRIC SERIES

continued

| CUTTING DIAMETER DC | DECIMAL EQUIV. | mm | | | | POINT ANGLE | EDP NO. | |
|------------------------|----------------|------------------------|---------------------|-----------------------|----------|-------------|------------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | OVERALL LENGTH OAL | UNCOATED | | TI-NAMITE-A (AlTiN) | |
| 2,55 | 0.1004 | 3,0 | 31,2 | 60,0 | 130 | 08392 | 08209 | |
| 2,60 | 0.1024 | 3,0 | 10,2 | 38,0 | 130 | 08393 | 08210 | |
| 2,60 | 0.1024 | 3,0 | 31,2 | 60,0 | 130 | 08394 | 08211 | |
| 2,65 | 0.1043 | 3,0 | 10,2 | 38,0 | 130 | 08395 | 08212 | |
| 2,65 | 0.1043 | 3,0 | 32,4 | 60,0 | 130 | 08396 | 08213 | |
| 2,70 | 0.1063 | 3,0 | 10,2 | 38,0 | 130 | 08397 | 08214 | |
| 2,70 | 0.1063 | 3,0 | 32,4 | 60,0 | 130 | 08398 | 08215 | |
| 2,75 | 0.1083 | 3,0 | 10,2 | 38,0 | 130 | 08399 | 08216 | |
| 2,75 | 0.1083 | 3,0 | 33,6 | 60,0 | 130 | 08400 | 08217 | |
| 2,80 | 0.1102 | 3,0 | 10,2 | 38,0 | 130 | 08401 | 08218 | |
| 2,80 | 0.1102 | 3,0 | 33,6 | 60,0 | 130 | 08402 | 08219 | |
| 2,85 | 0.1122 | 3,0 | 10,2 | 38,0 | 130 | 08403 | 08220 | |
| 2,85 | 0.1122 | 3,0 | 34,8 | 60,0 | 130 | 08404 | 08221 | |
| 2,90 | 0.1142 | 3,0 | 10,2 | 38,0 | 130 | 08405 | 08222 | |
| 2,90 | 0.1142 | 3,0 | 34,8 | 60,0 | 130 | 08406 | 08223 | |
| 2,95 | 0.1161 | 3,0 | 10,2 | 38,0 | 130 | 08407 | 08224 | |
| 2,95 | 0.1161 | 3,0 | 36,0 | 60,0 | 130 | 08408 | 08225 | |
| 3,00 | 0.1181 | 3,0 | 10,2 | 38,0 | 130 | 08409 | 08226 | |
| 3,00 | 0.1181 | 3,0 | 36,0 | 60,0 | 130 | 08410 | 08227 | |

TOLERANCES (mm)

0,04–3,0 DIAMETER

DC = +0,000/-0,008

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

| Series M226 • L226 | Hardness | Vc (m/min) | DC • mm | | | | | | | |
|--------------------|--|-----------------------------|----------------|---------------|--------|--------|-------|-------|-------|-------|
| | | | 0.04 | 0.25 | 0.5 | 1 | 2 | 3 | | |
| P | CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536 | ≤ 175 Bhn or ≤ 7 HRc | 40 (32-48) | RPM | 315060 | 50410 | 25205 | 12602 | 6301 | 4201 |
| | | | | Fz | 0.001 | 0.007 | 0.014 | 0.029 | 0.058 | 0.086 |
| | | | | Feed (mm/min) | 363 | 363 | 363 | 363 | 363 | 363 |
| | | | | RPM | 472590 | 75614 | 37807 | 18904 | 9452 | 6301 |
| | | | | Fz | 0.001 | 0.007 | 0.013 | 0.026 | 0.052 | 0.078 |
| | | | | Feed (mm/min) | 493 | 493 | 493 | 493 | 493 | 493 |
| H | TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2 | ≤ 475 Bhn or ≤ 50 HRc | 24 (20-29) | RPM | 193883 | 31021 | 15511 | 7755 | 3878 | 2585 |
| | | | | Fz | 0.001 | 0.003 | 0.007 | 0.013 | 0.026 | 0.039 |
| | | | | Feed (mm/min) | 102 | 102 | 102 | 102 | 102 | 102 |
| | | | | RPM | 678591 | 108575 | 54287 | 27144 | 13572 | 9048 |
| | | | | Fz | 0.001 | 0.004 | 0.008 | 0.016 | 0.033 | 0.049 |
| | | | | Feed (mm/min) | 445 | 445 | 445 | 445 | 445 | 445 |
| K | CAST IRONS Gray, Malleable, Ductile | ≤ 220 Bhn or ≤ 19 HRc | 85 (68-102) | RPM | 157530 | 25205 | 12602 | 6301 | 3151 | 2100 |
| | | | | Fz | 0.001 | 0.005 | 0.011 | 0.022 | 0.044 | 0.065 |
| | | | | Feed (mm/min) | 137 | 137 | 137 | 137 | 137 | 137 |
| | | | | RPM | 96942 | 15511 | 7755 | 3878 | 1939 | 1293 |
| | | | | Fz | 0.001 | 0.004 | 0.009 | 0.018 | 0.035 | 0.053 |
| | | | | Feed (mm/min) | 69 | 69 | 69 | 69 | 69 | 69 |
| M | STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F | ≤ 275 Bhn or ≤ 28 HRc | 20 (16-24) | RPM | 121177 | 19388 | 9694 | 4847 | 2424 | 1616 |
| | | | | Fz | 0.000 | 0.003 | 0.006 | 0.011 | 0.022 | 0.033 |
| | | | | Feed (mm/min) | 53 | 53 | 53 | 53 | 53 | 53 |
| | | | | RPM | 121177 | 19388 | 9694 | 4847 | 2424 | 1616 |
| | | | | Fz | 0.001 | 0.004 | 0.008 | 0.017 | 0.034 | 0.051 |
| | | | | Feed (mm/min) | 82 | 82 | 82 | 82 | 82 | 82 |
| S | STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, CUSTOM 450 | ≤ 320 Bhn or ≤ 35 HRc | 15 (12-18) | RPM | 593768 | 95003 | 47501 | 23751 | 11875 | 7917 |
| | | | | Fz | 0.002 | 0.012 | 0.025 | 0.049 | 0.099 | 0.148 |
| | | | | Feed (mm/min) | 1171 | 1171 | 1171 | 1171 | 1171 | 1171 |
| | | | | RPM | 436237 | 69798 | 34899 | 17449 | 8725 | 5816 |
| | | | | Fz | 0.002 | 0.012 | 0.025 | 0.049 | 0.099 | 0.148 |
| | | | | Feed (mm/min) | 861 | 861 | 861 | 861 | 861 | 861 |
| N | SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy | ≤ 320 Bhn or ≤ 34 HRc | 15 (12-18) | RPM | 593768 | 95003 | 47501 | 23751 | 11875 | 7917 |
| | | | | Fz | 0.002 | 0.012 | 0.025 | 0.049 | 0.099 | 0.148 |
| | | | | Feed (mm/min) | 1171 | 1171 | 1171 | 1171 | 1171 | 1171 |
| | | | | RPM | 593768 | 95003 | 47501 | 23751 | 11875 | 7917 |
| | | | | Fz | 0.002 | 0.012 | 0.025 | 0.049 | 0.099 | 0.148 |
| | | | | Feed (mm/min) | 1171 | 1171 | 1171 | 1171 | 1171 | 1171 |
| S | TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si | ≤ 350 Bhn or ≤ 38 HRc | 15 (12-18) | RPM | 593768 | 95003 | 47501 | 23751 | 11875 | 7917 |
| | | | | Fz | 0.002 | 0.012 | 0.025 | 0.049 | 0.099 | 0.148 |
| | | | | Feed (mm/min) | 1171 | 1171 | 1171 | 1171 | 1171 | 1171 |
| | | | | RPM | 593768 | 95003 | 47501 | 23751 | 11875 | 7917 |
| | | | | Fz | 0.002 | 0.012 | 0.025 | 0.049 | 0.099 | 0.148 |
| | | | | Feed (mm/min) | 1171 | 1171 | 1171 | 1171 | 1171 | 1171 |
| N | ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075 | ≤ 150 Bhn or ≤ 7 HRc | 75 (60-90) | RPM | 593768 | 95003 | 47501 | 23751 | 11875 | 7917 |
| | | | | Fz | 0.002 | 0.012 | 0.025 | 0.049 | 0.099 | 0.148 |
| | | | | Feed (mm/min) | 1171 | 1171 | 1171 | 1171 | 1171 | 1171 |
| | | | | RPM | 436237 | 69798 | 34899 | 17449 | 8725 | 5816 |
| | | | | Fz | 0.002 | 0.012 | 0.025 | 0.049 | 0.099 | 0.148 |
| | | | | Feed (mm/min) | 861 | 861 | 861 | 861 | 861 | 861 |
| N | COPPER ALLOYS Alum Bronze, C110, Muntz Brass | ≤ 140 Bhn or ≤ 3 HRc | 55 (44-66) | RPM | 593768 | 95003 | 47501 | 23751 | 11875 | 7917 |
| | | | | Fz | 0.002 | 0.012 | 0.025 | 0.049 | 0.099 | 0.148 |
| | | | | Feed (mm/min) | 1171 | 1171 | 1171 | 1171 | 1171 | 1171 |
| | | | | RPM | 593768 | 95003 | 47501 | 23751 | 11875 | 7917 |
| | | | | Fz | 0.002 | 0.012 | 0.025 | 0.049 | 0.099 | 0.148 |
| | | | | Feed (mm/min) | 1171 | 1171 | 1171 | 1171 | 1171 | 1171 |
| N | PLASTICS Polycarbonate, PVC | 75 (60-90) | 75 (60-90) | RPM | 593768 | 95003 | 47501 | 23751 | 11875 | 7917 |
| | | | | Fz | 0.002 | 0.012 | 0.025 | 0.049 | 0.099 | 0.148 |
| | | | | Feed (mm/min) | 1171 | 1171 | 1171 | 1171 | 1171 | 1171 |

- Note:**
- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
 - rpm = Vc x 3.82 / DC
 - ipm = Fr x rpm (Fr x maximum available rpm when recommendation exceeds machine limit)
 - reduce speed and feed 30% when using uncoated drills
 - reduce speed and feed for materials harder than listed
 - refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for complete technical information

2 Flute Internal Coolant

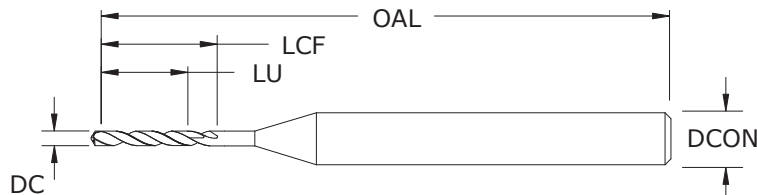


8xD

15xD



M814 METRIC SERIES



 New Expanded Tools

- Split point and double margin design provide superior hole finish and size control
- Coolant hole feature allows straight through drilling without a peck cycle
- Proprietary high-performance coating and mirror polished fluting increase tool life and productivity in moderate-to-difficult workpiece materials
- Available from stock in a selection of popular lengths and diameters
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures

| CUTTING DIAMETER DC | DECIMAL EQUIVALENT | mm | | | | OVERALL LENGTH OAL | EDP NO. |
|------------------------|--------------------|------------------------|---------------------|----------------------|-------------------------|-----------------------|---------|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | CLEARED LENGTH LU | TI-NAMITE-CR (AICrN) | | |
| 1,0 | 0.0394 | 4,0 | 13,3 | 8,0 | 53,0 | 06000 | |
| 1,1 | 0.0433 | 4,0 | 14,1 | 8,8 | 53,0 | 06001 | |
| 1,2 | 0.0472 | 4,0 | 14,9 | 9,6 | 53,0 | 06002 | |
| 1,3 | 0.0512 | 4,0 | 15,7 | 10,4 | 53,0 | 06003 | |
| 1,4 | 0.0551 | 4,0 | 16,5 | 11,2 | 53,0 | 06004 | |
| 1,5 | 0.0591 | 4,0 | 17,3 | 12,0 | 53,0 | 06005 | |
| 1,6 | 0.0630 | 4,0 | 18,1 | 12,8 | 64,0 | 06006 | |
| 1,7 | 0.0669 | 4,0 | 18,9 | 13,6 | 64,0 | 06007 | |
| 1,8 | 0.0709 | 4,0 | 20,4 | 14,4 | 64,0 | 06008 | |
| 1,9 | 0.0748 | 4,0 | 21,2 | 15,2 | 64,0 | 06009 | |
| 2,0 | 0.0787 | 4,0 | 22,0 | 16,0 | 64,0 | 06010 | |
| 2,1 | 0.0827 | 4,0 | 22,8 | 16,8 | 64,0 | 06011 | |
| 2,2 | 0.0866 | 4,0 | 25,7 | 17,6 | 64,0 | 06012 | |
| 2,3 | 0.0906 | 4,0 | 26,5 | 18,4 | 64,0 | 06013 | |
| 2,4 | 0.0945 | 4,0 | 27,3 | 19,2 | 64,0 | 06014 | |
| 2,5 | 0.0984 | 4,0 | 28,1 | 20,0 | 64,0 | 06015 | |
| 2,6 | 0.1024 | 4,0 | 28,9 | 20,8 | 76,0 | 06016 | |
| 2,7 | 0.1063 | 4,0 | 29,7 | 21,6 | 76,0 | 06017 | |
| 2,8 | 0.1102 | 4,0 | 30,5 | 22,4 | 76,0 | 06018 | |
| 2,9 | 0.1142 | 4,0 | 32,2 | 23,2 | 76,0 | 06019 | |
| 3,0 | 0.1181 | 4,0 | 33,0 | 24,0 | 76,0 | 06020 | |
| 3,1 | 0.1220 | 4,0 | 33,8 | 24,8 | 76,0 | 06021 | |
| 3,2 | 0.1260 | 4,0 | 34,6 | 25,6 | 76,0 | 06022 | |
| 3,3 | 0.1299 | 4,0 | 35,4 | 26,4 | 76,0 | 06023 | |
| 3,4 | 0.1339 | 4,0 | 38,1 | 27,2 | 76,0 | 06024 | |
| 3,5 | 0.1378 | 4,0 | 38,9 | 28,0 | 76,0 | 06025 | |
| 3,6 | 0.1417 | 4,0 | 39,7 | 28,8 | 76,0 | 06026 | |
| 3,7 | 0.1457 | 4,0 | 40,5 | 29,6 | 76,0 | 06027 | |
| 3,8 | 0.1496 | 4,0 | 41,3 | 30,4 | 76,0 | 06028 | |
| 3,9 | 0.1535 | 4,0 | 42,1 | 31,2 | 76,0 | 06029 | |
| 4,0 | 0.1575 | 4,0 | 42,9 | 32,0 | 76,0 | 06030 | |
| 1,0 | 0.0394 | 4,0 | 20,3 | 15,0 | 64,0 | 06031 | |
| 1,1 | 0.0433 | 4,0 | 21,8 | 16,5 | 64,0 | 06032 | |
| 1,2 | 0.0472 | 4,0 | 23,3 | 18,0 | 64,0 | 06033 | |

TOLERANCES (mm)

1,0–4,0 DIAMETER

DC = +0,000/–0,008

DCON = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

continued on next page

| CUTTING DIAMETER DC | DECIMAL EQUIVALENT | mm | | | | EDP NO. | |
|---------------------------|-----------------------|---------------------------|------------------------|-------------------------|--------------------------|-------------------------|--|
| | | SHANK DIAMETER DCON | FLUTE LENGTH LCF | CLEARED LENGTH LU | OVERALL LENGTH OAL | TI-NAMITE-CR (AlCrN) | |
| 1,3 | 0.0512 | 4,0 | 24,8 | 19,5 | 64,0 | 06034 | |
| 1,4 | 0.0551 | 4,0 | 26,3 | 21,0 | 64,0 | 06035 | |
| 1,5 | 0.0591 | 4,0 | 27,8 | 22,5 | 64,0 | 06036 | |
| 1,6 | 0.0630 | 4,0 | 29,3 | 24,0 | 81,0 | 06037 | |
| 1,7 | 0.0669 | 4,0 | 30,8 | 25,5 | 81,0 | 06038 | |
| 1,8 | 0.0709 | 4,0 | 33,0 | 27,0 | 81,0 | 06039 | |
| 1,9 | 0.0748 | 4,0 | 34,5 | 28,5 | 81,0 | 06040 | |
| 2,0 | 0.0787 | 4,0 | 36,0 | 30,0 | 81,0 | 06041 | |
| 2,1 | 0.0827 | 4,0 | 37,5 | 31,5 | 81,0 | 06042 | |
| 2,2 | 0.0866 | 4,0 | 41,1 | 33,0 | 81,0 | 06043 | |
| 2,3 | 0.0906 | 4,0 | 42,6 | 34,5 | 81,0 | 06044 | |
| 2,4 | 0.0945 | 4,0 | 44,1 | 36,0 | 81,0 | 06045 | |
| 2,5 | 0.0984 | 4,0 | 45,6 | 37,5 | 90,0 | 06046 | |
| 2,6 | 0.1024 | 4,0 | 47,1 | 39,0 | 90,0 | 06047 | |
| 2,7 | 0.1063 | 4,0 | 48,6 | 40,5 | 90,0 | 06048 | |
| 2,8 | 0.1102 | 4,0 | 50,1 | 42,0 | 90,0 | 06049 | |
| 2,9 | 0.1142 | 4,0 | 52,5 | 43,5 | 90,0 | 06050 | |
| 3,0 | 0.1181 | 4,0 | 54,0 | 45,0 | 90,0 | 06051 | |
| 3,1 | 0.1220 | 4,0 | 55,5 | 46,5 | 106,0 | 06052 | |
| 3,2 | 0.1260 | 4,0 | 57,0 | 48,0 | 106,0 | 06053 | |
| 3,3 | 0.1299 | 4,0 | 58,5 | 49,5 | 106,0 | 06054 | |
| 3,4 | 0.1339 | 4,0 | 61,9 | 51,0 | 106,0 | 06055 | |
| 3,5 | 0.1378 | 4,0 | 63,4 | 52,5 | 106,0 | 06056 | |
| 3,6 | 0.1417 | 4,0 | 64,9 | 54,0 | 106,0 | 06057 | |
| 3,7 | 0.1457 | 4,0 | 66,4 | 55,5 | 106,0 | 06058 | |
| 3,8 | 0.1496 | 4,0 | 67,9 | 57,0 | 106,0 | 06059 | |
| 3,9 | 0.1535 | 4,0 | 69,4 | 58,6 | 106,0 | 06060 | |
| 4,0 | 0.1575 | 4,0 | 70,9 | 60,0 | 106,0 | 06061 | |

continued

Series M814 8xD

| Series M814 8xD | Hardness | Vc (m/min) | DC • mm | | | | | |
|--|---|-----------------------------|------------------|---------------|--------|--------|--------|--------|
| | | | 1 | 2 | 3 | 4 | | |
| P | CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536 | ≤ 175 Bhn or ≤ 7 HRc | 125 (100-150) | RPM | 39746 | 19873 | 13249 | 9937 |
| | | | | Fz | 0.0229 | 0.0458 | 0.0686 | 0.0915 |
| | | | | Feed (mm/min) | 909 | 909 | 909 | 909 |
| | ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100 | ≤ 275 Bhn or ≤ 28 HRc | 94 (76-113) | RPM | 30052 | 15026 | 10017 | 7513 |
| | | | | Fz | 0.0216 | 0.0431 | 0.0647 | 0.0862 |
| | | | | Feed (mm/min) | 648 | 648 | 648 | 648 |
| H | TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2 | ≤ 475 Bhn or ≤ 50 HRc | 46 (37-55) | RPM | 14541 | 7271 | 4847 | 3635 |
| | | | | Fz | 0.0101 | 0.0203 | 0.0304 | 0.0405 |
| | | | | Feed (mm/min) | 147 | 147 | 147 | 147 |
| K | CAST IRONS Gray, Malleable, Ductile | ≤ 220 Bhn or ≤ 19 HRc | 110 (88-132) | RPM | 34899 | 17449 | 11633 | 8725 |
| | | | | Fz | 0.0318 | 0.0636 | 0.0954 | 0.1272 |
| | | | | Feed (mm/min) | 1110 | 1110 | 1110 | 1110 |
| M | STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F | ≤ 275 Bhn or ≤ 28 HRc | 55 (44-66) | RPM | 17449 | 8725 | 5816 | 4362 |
| | | | | Fz | 0.0178 | 0.0355 | 0.0533 | 0.0710 |
| | | | | Feed (mm/min) | 310 | 310 | 310 | 310 |
| | STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, CUSTOM 450 | ≤ 325 Bhn or ≤ 35 HRc | 38 (30-46) | RPM | 12118 | 6059 | 4039 | 3029 |
| | | | | Fz | 0.0140 | 0.0281 | 0.0421 | 0.0562 |
| | | | | Feed (mm/min) | 170 | 170 | 170 | 170 |
| S | SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy | ≤ 320 Bhn or ≤ 34 HRc | 27 (22-33) | RPM | 8725 | 4362 | 2908 | 2181 |
| | | | | Fz | 0.0096 | 0.0192 | 0.0288 | 0.0384 |
| | | | | Feed (mm/min) | 84 | 84 | 84 | 84 |
| TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si | ≤ 350 Bhn or ≤ 38 HRc | 46 (37-55) | RPM | 14541 | 7271 | 4847 | 3635 | |
| | | | Fz | 0.0093 | 0.0185 | 0.0278 | 0.0370 | |
| | | | Feed (mm/min) | 135 | 135 | 135 | 135 | |
| N | ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075 | ≤ 150 Bhn or ≤ 7 HRc | 130 (104-155) | RPM | 41200 | 20600 | 13733 | 10300 |
| | | | | Fz | 0.0395 | 0.0789 | 0.1184 | 0.1578 |
| | | | | Feed (mm/min) | 1626 | 1626 | 1626 | 1626 |
| COPPER ALLOYS Alum Bronze, C110, Muntz Brass | ≤ 140 Bhn or ≤ 3 HRc | 99 (79-119) | RPM | 31506 | 15753 | 10502 | 7877 | |
| | | | Fz | 0.0407 | 0.0814 | 0.1221 | 0.1629 | |
| | | | Feed (mm/min) | 1283 | 1283 | 1283 | 1283 | |

Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = (Vc x 1000) / (DC x 3.14)
- mm/min = Fr x rpm (Fr x maximum available rpm when recommendation exceeds machine limit)
- reduce speed and feed 30% when using uncoated drills
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for complete technical information

Series M814 15xD

| Series M814 15xD | Hardness | Vc (m/min) | DC • mm | | | | |
|---|-----------------------------|------------------|---------------|--------|--------|--------|--------|
| | | | 1 | 2 | 3 | 4 | |
| P CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536 | ≤ 175 Bhn or ≤ 7 HRC | 125 (100-150) | RPM | 39746 | 19873 | 13249 | 9937 |
| | | | Fz | 0.0160 | 0.0320 | 0.0479 | 0.0639 |
| | | | Feed (mm/min) | 635 | 635 | 635 | 635 |
| | ≤ 275 Bhn or ≤ 28 HRC | 94 (76-113) | RPM | 30052 | 15026 | 10017 | 7513 |
| | | | Fz | 0.0139 | 0.0279 | 0.0418 | 0.0558 |
| | | | Feed (mm/min) | 419 | 419 | 419 | 419 |
| H TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2 | ≤ 475 Bhn or ≤ 50 HRC | 46 (37-55) | RPM | 14541 | 7271 | 4847 | 3635 |
| | | | Fz | 0.0070 | 0.0140 | 0.0210 | 0.0279 |
| | | | Feed (mm/min) | 102 | 102 | 102 | 102 |
| | ≤ 220 Bhn or ≤ 19 HRC | 110 (68-132) | RPM | 34899 | 17449 | 11633 | 8725 |
| | | | Fz | 0.0229 | 0.0459 | 0.0688 | 0.0917 |
| | | | Feed (mm/min) | 800 | 800 | 800 | 800 |
| M STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F | ≤ 275 Bhn or ≤ 28 HRC | 55 (44-66) | RPM | 17449 | 8725 | 5816 | 4362 |
| | | | Fz | 0.0127 | 0.0253 | 0.0380 | 0.0507 |
| | | | Feed (mm/min) | 221 | 221 | 221 | 221 |
| | ≤ 325 Bhn or ≤ 35 HRC | 38 (30-46) | RPM | 12118 | 6059 | 4039 | 3029 |
| | | | Fz | 0.0094 | 0.0189 | 0.0283 | 0.0377 |
| | | | Feed (mm/min) | 114 | 114 | 114 | 114 |
| S SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspaloy | ≤ 320 Bhn or ≤ 34 HRC | 27 (22-33) | RPM | 8725 | 4362 | 2908 | 2181 |
| | | | Fz | 0.0064 | 0.0128 | 0.0192 | 0.0256 |
| | | | Feed (mm/min) | 56 | 56 | 56 | 56 |
| | ≤ 350 Bhn or ≤ 38 HRC | 46 (37-55) | RPM | 14541 | 7271 | 4847 | 3635 |
| | | | Fz | 0.0077 | 0.0154 | 0.0231 | 0.0307 |
| | | | Feed (mm/min) | 112 | 112 | 112 | 112 |
| N ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075 | ≤ 150 Bhn or ≤ 7 HRC | 130 (104-155) | RPM | 41200 | 20600 | 13733 | 10300 |
| | | | Fz | 0.0287 | 0.0573 | 0.0860 | 0.1147 |
| | | | Feed (mm/min) | 1181 | 1181 | 1181 | 1181 |
| | ≤ 140 Bhn or ≤ 3 HRC | 99 (79-119) | RPM | 31506 | 15753 | 10502 | 7877 |
| | | | Fz | 0.0286 | 0.0572 | 0.0859 | 0.1145 |
| | | | Feed (mm/min) | 902 | 902 | 902 | 902 |

Note:

- Bhn (Brinell) HRC (Rockwell C) HRb (Rockwell B)
- rpm = (Vc x 1000) / (DC x 3.14)
- mm/min = Fr x rpm (Fr x maximum available rpm when recommendation exceeds machine limit)
- reduce speed and feed 30% when using uncoated drills
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for complete technical information

EDP Number Index

| EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE |
|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|
| 02215 | 10 | 02284 | 14 | 02353 | 67 | 02422 | 45 | 02489 | 50 | 02556 | 58 | 02623 | 60 |
| 02216 | 10 | 02285 | 14 | 02354 | 67 | 02423 | 45 | 02490 | 50 | 02557 | 58 | 02624 | 60 |
| 02217 | 10 | 02286 | 14 | 02355 | 67 | 02424 | 45 | 02491 | 50 | 02558 | 58 | 02625 | 60 |
| 02218 | 10 | 02287 | 14 | 02356 | 67 | 02425 | 45 | 02492 | 50 | 02559 | 58 | 02626 | 60 |
| 02219 | 10 | 02288 | 14 | 02357 | 67 | 02426 | 45 | 02493 | 50 | 02560 | 58 | 02627 | 60 |
| 02220 | 10 | 02289 | 14 | 02360 | 67 | 02427 | 45 | 02494 | 50 | 02561 | 58 | 02628 | 60 |
| 02221 | 10 | 02290 | 14 | 02361 | 67 | 02428 | 45 | 02495 | 50 | 02562 | 58 | 02629 | 60 |
| 02222 | 10 | 02291 | 14 | 02362 | 67 | 02429 | 46 | 02496 | 50 | 02563 | 58 | 02630 | 60 |
| 02223 | 10 | 02292 | 14 | 02363 | 67 | 02430 | 46 | 02497 | 50 | 02564 | 58 | 02631 | 60 |
| 02224 | 10 | 02293 | 14 | 02364 | 67 | 02431 | 46 | 02498 | 51 | 02565 | 58 | 02632 | 60 |
| 02225 | 10 | 02294 | 14 | 02365 | 67 | 02432 | 46 | 02499 | 51 | 02566 | 58 | 02633 | 60 |
| 02226 | 10 | 02295 | 14 | 02366 | 67 | 02433 | 46 | 02500 | 51 | 02567 | 58 | 02634 | 60 |
| 02227 | 10 | 02296 | 14 | 02367 | 67 | 02434 | 46 | 02501 | 51 | 02568 | 58 | 02635 | 60 |
| 02228 | 10 | 02297 | 14 | 02368 | 11 | 02435 | 46 | 02502 | 51 | 02569 | 58 | 02636 | 60 |
| 02229 | 10 | 02298 | 14 | 02369 | 11 | 02436 | 15 | 02503 | 51 | 02570 | 58 | 02637 | 60 |
| 02230 | 10 | 02299 | 14 | 02370 | 11 | 02437 | 15 | 02504 | 21 | 02571 | 58 | 02638 | 60 |
| 02231 | 11 | 02300 | 14 | 02371 | 11 | 02438 | 15 | 02505 | 21 | 02572 | 23 | 02639 | 60 |
| 02232 | 11 | 02301 | 14 | 02372 | 11 | 02439 | 15 | 02506 | 21 | 02573 | 23 | 02640 | 54 |
| 02233 | 11 | 02302 | 14 | 02373 | 11 | 02440 | 15 | 02507 | 21 | 02574 | 23 | 02641 | 54 |
| 02234 | 11 | 02303 | 14 | 02374 | 11 | 02441 | 15 | 02508 | 21 | 02575 | 23 | 02642 | 54 |
| 02235 | 11 | 02304 | 15 | 02375 | 11 | 02442 | 15 | 02509 | 21 | 02576 | 23 | 02643 | 54 |
| 02236 | 11 | 02305 | 15 | 02376 | 11 | 02443 | 15 | 02510 | 21 | 02577 | 23 | 02644 | 54 |
| 02238 | 43 | 02306 | 15 | 02377 | 11 | 02444 | 15 | 02511 | 21 | 02578 | 23 | 02645 | 54 |
| 02239 | 43 | 02307 | 15 | 02378 | 11 | 02445 | 15 | 02512 | 21 | 02579 | 23 | 02646 | 54 |
| 02240 | 43 | 02308 | 15 | 02379 | 11 | 02446 | 15 | 02513 | 21 | 02580 | 23 | 02647 | 54 |
| 02241 | 43 | 02309 | 15 | 02380 | 11 | 02447 | 15 | 02514 | 21 | 02581 | 23 | 02648 | 54 |
| 02242 | 43 | 02310 | 15 | 02381 | 11 | 02448 | 15 | 02515 | 21 | 02582 | 23 | 02649 | 54 |
| 02243 | 43 | 02312 | 48 | 02382 | 11 | 02449 | 15 | 02516 | 21 | 02583 | 23 | 02650 | 54 |
| 02244 | 43 | 02313 | 48 | 02383 | 11 | 02450 | 15 | 02517 | 21 | 02584 | 23 | 02651 | 54 |
| 02245 | 43 | 02314 | 48 | 02384 | 11 | 02451 | 15 | 02518 | 21 | 02585 | 23 | 02652 | 54 |
| 02246 | 43 | 02315 | 48 | 02385 | 11 | 02452 | 15 | 02519 | 21 | 02586 | 23 | 02653 | 54 |
| 02247 | 43 | 02316 | 48 | 02386 | 12 | 02453 | 16 | 02520 | 21 | 02587 | 23 | 02654 | 54 |
| 02248 | 43 | 02317 | 48 | 02387 | 12 | 02454 | 16 | 02521 | 21 | 02588 | 23 | 02655 | 54 |
| 02249 | 43 | 02318 | 48 | 02388 | 12 | 02455 | 16 | 02522 | 21 | 02589 | 23 | 02656 | 54 |
| 02250 | 43 | 02319 | 48 | 02389 | 12 | 02456 | 16 | 02523 | 21 | 02590 | 23 | 02657 | 54 |
| 02251 | 43 | 02320 | 48 | 02390 | 12 | 02457 | 16 | 02524 | 21 | 02591 | 23 | 02658 | 54 |
| 02252 | 43 | 02321 | 48 | 02391 | 12 | 02458 | 16 | 02525 | 21 | 02592 | 23 | 02659 | 54 |
| 02253 | 43 | 02322 | 48 | 02392 | 12 | 02459 | 16 | 02526 | 21 | 02593 | 23 | 02660 | 54 |
| 02254 | 43 | 02323 | 48 | 02393 | 12 | 02460 | 16 | 02527 | 21 | 02594 | 23 | 02661 | 54 |
| 02255 | 43 | 02324 | 48 | 02394 | 12 | 02461 | 16 | 02528 | 21 | 02595 | 23 | 02662 | 54 |
| 02256 | 43 | 02325 | 48 | 02395 | 12 | 02462 | 16 | 02529 | 21 | 02596 | 23 | 02663 | 54 |
| 02257 | 43 | 02326 | 48 | 02396 | 13 | 02463 | 17 | 02530 | 21 | 02597 | 23 | 02664 | 54 |
| 02258 | 43 | 02327 | 48 | 02397 | 13 | 02464 | 17 | 02531 | 21 | 02598 | 23 | 02665 | 54 |
| 02259 | 43 | 02328 | 48 | 02398 | 13 | 02465 | 17 | 02532 | 21 | 02599 | 23 | 02666 | 54 |
| 02260 | 43 | 02329 | 48 | 02399 | 13 | 02466 | 17 | 02533 | 21 | 02600 | 23 | 02667 | 55 |
| 02261 | 43 | 02330 | 48 | 02400 | 13 | 02467 | 17 | 02534 | 21 | 02601 | 23 | 02668 | 55 |
| 02262 | 43 | 02331 | 48 | 02401 | 13 | 02468 | 17 | 02535 | 21 | 02602 | 23 | 02669 | 55 |
| 02263 | 43 | 02332 | 48 | 02402 | 44 | 02469 | 17 | 02536 | 21 | 02603 | 23 | 02670 | 55 |
| 02264 | 43 | 02333 | 48 | 02403 | 44 | 02470 | 49 | 02537 | 21 | 02604 | 23 | 02671 | 55 |
| 02265 | 43 | 02334 | 48 | 02404 | 44 | 02471 | 49 | 02538 | 57 | 02605 | 23 | 02672 | 55 |
| 02266 | 43 | 02335 | 48 | 02405 | 44 | 02472 | 49 | 02539 | 57 | 02606 | 59 | 02673 | 55 |
| 02267 | 43 | 02336 | 48 | 02406 | 44 | 02473 | 49 | 02540 | 57 | 02607 | 59 | 02674 | 55 |
| 02268 | 44 | 02337 | 48 | 02407 | 44 | 02474 | 49 | 02541 | 58 | 02608 | 59 | 02675 | 55 |
| 02269 | 44 | 02338 | 48 | 02408 | 44 | 02475 | 49 | 02542 | 58 | 02609 | 60 | 02676 | 55 |
| 02270 | 44 | 02339 | 48 | 02409 | 44 | 02476 | 49 | 02543 | 58 | 02610 | 60 | 02677 | 55 |
| 02271 | 44 | 02340 | 48 | 02410 | 44 | 02477 | 49 | 02544 | 58 | 02611 | 60 | 02678 | 55 |
| 02272 | 44 | 02341 | 48 | 02411 | 44 | 02478 | 49 | 02545 | 58 | 02612 | 60 | 02679 | 55 |
| 02273 | 44 | 02342 | 49 | 02412 | 44 | 02479 | 49 | 02546 | 58 | 02613 | 60 | 02680 | 55 |
| 02275 | 14 | 02343 | 49 | 02413 | 44 | 02480 | 49 | 02547 | 58 | 02614 | 60 | 02681 | 55 |
| 02276 | 14 | 02344 | 49 | 02414 | 44 | 02481 | 49 | 02548 | 58 | 02615 | 60 | 02682 | 55 |
| 02277 | 14 | 02345 | 49 | 02415 | 44 | 02482 | 49 | 02549 | 58 | 02616 | 60 | 02683 | 55 |
| 02278 | 14 | 02346 | 49 | 02416 | 44 | 02483 | 49 | 02550 | 58 | 02617 | 60 | 02684 | 55 |
| 02279 | 14 | 02347 | 49 | 02417 | 44 | 02484 | 49 | 02551 | 58 | 02618 | 60 | 02685 | 55 |
| 02280 | 14 | 02349 | 67 | 02418 | 45 | 02485 | 49 | 02552 | 58 | 02619 | 60 | 02686 | 55 |
| 02281 | 14 | 02350 | 67 | 02419 | 45 | 02486 | 49 | 02553 | 58 | 02620 | 60 | 02687 | 55 |
| 02282 | 14 | 02351 | 67 | 02420 | 45 | 02487 | 49 | 02554 | 58 | 02621 | 60 | 02688 | 55 |
| 02283 | 14 | 02352 | 67 | 02421 | 45 | 02488 | 50 | 02555 | 58 | 02622 | 60 | 02689 | 55 |

EDP Number Index

| EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE |
|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|
| 03428 | 19 | 03495 | 53 | 03562 | 29 | 03629 | 33 | 03696 | 35 | 03763 | 61 | 03830 | 36 |
| 03429 | 19 | 03496 | 53 | 03563 | 29 | 03630 | 33 | 03697 | 24 | 03764 | 61 | 03831 | 36 |
| 03430 | 19 | 03497 | 53 | 03564 | 29 | 03631 | 33 | 03698 | 24 | 03765 | 61 | 03832 | 37 |
| 03431 | 19 | 03498 | 53 | 03565 | 29 | 03632 | 33 | 03699 | 24 | 03766 | 61 | 03833 | 37 |
| 03432 | 19 | 03499 | 53 | 03566 | 29 | 03633 | 33 | 03700 | 24 | 03767 | 61 | 03834 | 37 |
| 03433 | 19 | 03500 | 53 | 03567 | 29 | 03634 | 33 | 03701 | 24 | 03768 | 61 | 03835 | 37 |
| 03434 | 19 | 03501 | 53 | 03568 | 29 | 03635 | 33 | 03702 | 24 | 03769 | 61 | 03836 | 37 |
| 03435 | 19 | 03502 | 53 | 03569 | 29 | 03636 | 33 | 03703 | 24 | 03770 | 61 | 03837 | 37 |
| 03436 | 19 | 03503 | 53 | 03570 | 29 | 03637 | 33 | 03704 | 24 | 03771 | 61 | 03838 | 37 |
| 03437 | 19 | 03504 | 53 | 03571 | 29 | 03638 | 33 | 03705 | 24 | 03772 | 61 | 03839 | 37 |
| 03438 | 19 | 03505 | 53 | 03572 | 29 | 03639 | 33 | 03706 | 24 | 03773 | 61 | 03840 | 37 |
| 03439 | 19 | 03506 | 53 | 03573 | 29 | 03640 | 33 | 03707 | 24 | 03774 | 61 | 03841 | 37 |
| 03440 | 19 | 03507 | 53 | 03574 | 29 | 03641 | 33 | 03708 | 24 | 03775 | 61 | 03842 | 37 |
| 03441 | 19 | 03508 | 26 | 03575 | 29 | 03642 | 33 | 03709 | 24 | 03776 | 61 | 03843 | 37 |
| 03442 | 19 | 03509 | 26 | 03576 | 29 | 03643 | 34 | 03710 | 24 | 03777 | 61 | 03844 | 37 |
| 03443 | 19 | 03510 | 26 | 03577 | 29 | 03644 | 34 | 03711 | 24 | 03778 | 62 | 03845 | 37 |
| 03444 | 19 | 03511 | 26 | 03578 | 29 | 03645 | 34 | 03712 | 24 | 03779 | 62 | 03846 | 37 |
| 03445 | 19 | 03512 | 26 | 03579 | 30 | 03646 | 34 | 03713 | 24 | 03780 | 62 | 03847 | 37 |
| 03446 | 19 | 03513 | 26 | 03580 | 30 | 03647 | 34 | 03714 | 24 | 03781 | 62 | 03848 | 37 |
| 03447 | 19 | 03514 | 26 | 03581 | 30 | 03648 | 34 | 03715 | 24 | 03782 | 62 | 03849 | 37 |
| 03448 | 19 | 03515 | 26 | 03582 | 30 | 03649 | 34 | 03716 | 24 | 03783 | 62 | 03850 | 37 |
| 03449 | 19 | 03516 | 26 | 03583 | 30 | 03650 | 34 | 03717 | 24 | 03784 | 62 | 03851 | 37 |
| 03450 | 19 | 03517 | 26 | 03584 | 30 | 03651 | 34 | 03718 | 24 | 03785 | 62 | 03852 | 37 |
| 03451 | 19 | 03518 | 26 | 03585 | 30 | 03652 | 34 | 03719 | 24 | 03786 | 62 | 03853 | 37 |
| 03452 | 19 | 03519 | 26 | 03586 | 30 | 03653 | 34 | 03720 | 24 | 03787 | 62 | 03854 | 37 |
| 03453 | 19 | 03520 | 26 | 03587 | 30 | 03654 | 34 | 03721 | 24 | 03788 | 62 | 03855 | 37 |
| 03454 | 52 | 03521 | 26 | 03588 | 30 | 03655 | 34 | 03722 | 24 | 03789 | 62 | 03856 | 37 |
| 03455 | 52 | 03522 | 26 | 03589 | 31 | 03656 | 34 | 03723 | 24 | 03790 | 62 | 03857 | 37 |
| 03456 | 52 | 03523 | 26 | 03590 | 31 | 03657 | 34 | 03724 | 25 | 03791 | 62 | 03858 | 37 |
| 03457 | 52 | 03524 | 26 | 03591 | 31 | 03658 | 34 | 03725 | 25 | 03792 | 62 | 03859 | 38 |
| 03458 | 52 | 03525 | 26 | 03592 | 31 | 03659 | 34 | 03726 | 25 | 03793 | 62 | 03860 | 38 |
| 03459 | 52 | 03526 | 26 | 03593 | 31 | 03660 | 34 | 03727 | 25 | 03794 | 62 | 03861 | 38 |
| 03460 | 52 | 03527 | 26 | 03594 | 31 | 03661 | 34 | 03728 | 25 | 03795 | 62 | 03862 | 38 |
| 03461 | 52 | 03528 | 26 | 03595 | 31 | 03662 | 34 | 03729 | 25 | 03796 | 62 | 03863 | 38 |
| 03462 | 52 | 03529 | 26 | 03596 | 31 | 03663 | 34 | 03730 | 25 | 03797 | 62 | 03864 | 38 |
| 03463 | 52 | 03530 | 26 | 03597 | 31 | 03664 | 34 | 03731 | 25 | 03798 | 62 | 03865 | 38 |
| 03464 | 52 | 03531 | 26 | 03598 | 31 | 03665 | 34 | 03732 | 25 | 03799 | 62 | 03866 | 38 |
| 03465 | 52 | 03532 | 26 | 03599 | 31 | 03666 | 34 | 03733 | 25 | 03800 | 62 | 03867 | 38 |
| 03466 | 52 | 03533 | 26 | 03600 | 31 | 03667 | 34 | 03734 | 25 | 03801 | 62 | 03868 | 38 |
| 03467 | 52 | 03534 | 26 | 03601 | 31 | 03668 | 34 | 03735 | 25 | 03802 | 62 | 03869 | 38 |
| 03468 | 52 | 03535 | 27 | 03602 | 31 | 03669 | 34 | 03736 | 25 | 03803 | 62 | 03870 | 38 |
| 03469 | 52 | 03536 | 27 | 03603 | 31 | 03670 | 35 | 03737 | 25 | 03804 | 62 | 03871 | 38 |
| 03470 | 52 | 03537 | 27 | 03604 | 31 | 03671 | 35 | 03738 | 25 | 03805 | 36 | 03872 | 38 |
| 03471 | 52 | 03538 | 27 | 03605 | 31 | 03672 | 35 | 03739 | 25 | 03806 | 36 | 03873 | 38 |
| 03472 | 52 | 03539 | 27 | 03606 | 32 | 03673 | 35 | 03740 | 25 | 03807 | 36 | 03874 | 38 |
| 03473 | 52 | 03540 | 27 | 03607 | 32 | 03674 | 35 | 03741 | 25 | 03808 | 36 | 03875 | 38 |
| 03474 | 52 | 03541 | 27 | 03608 | 32 | 03675 | 35 | 03742 | 25 | 03809 | 36 | 03876 | 38 |
| 03475 | 52 | 03542 | 27 | 03609 | 32 | 03676 | 35 | 03743 | 25 | 03810 | 36 | 03877 | 38 |
| 03476 | 52 | 03543 | 27 | 03610 | 32 | 03677 | 35 | 03744 | 25 | 03811 | 36 | 03878 | 38 |
| 03477 | 52 | 03544 | 27 | 03611 | 32 | 03678 | 35 | 03745 | 25 | 03812 | 36 | 03879 | 38 |
| 03478 | 52 | 03545 | 27 | 03612 | 32 | 03679 | 35 | 03746 | 25 | 03813 | 36 | 03880 | 38 |
| 03479 | 52 | 03546 | 27 | 03613 | 32 | 03680 | 35 | 03747 | 25 | 03814 | 36 | 03881 | 38 |
| 03480 | 52 | 03547 | 27 | 03614 | 32 | 03681 | 35 | 03748 | 25 | 03815 | 36 | 03882 | 38 |
| 03481 | 53 | 03548 | 27 | 03615 | 32 | 03682 | 35 | 03749 | 25 | 03816 | 36 | 03883 | 38 |
| 03482 | 53 | 03549 | 27 | 03616 | 33 | 03683 | 35 | 03750 | 25 | 03817 | 36 | 03884 | 38 |
| 03483 | 53 | 03550 | 27 | 03617 | 33 | 03684 | 35 | 03751 | 61 | 03818 | 36 | 03885 | 38 |
| 03484 | 53 | 03551 | 28 | 03618 | 33 | 03685 | 35 | 03752 | 61 | 03819 | 36 | 03886 | 39 |
| 03485 | 53 | 03552 | 28 | 03619 | 33 | 03686 | 35 | 03753 | 61 | 03820 | 36 | 03887 | 39 |
| 03486 | 53 | 03553 | 28 | 03620 | 33 | 03687 | 35 | 03754 | 61 | 03821 | 36 | 03888 | 39 |
| 03487 | 53 | 03554 | 28 | 03621 | 33 | 03688 | 35 | 03755 | 61 | 03822 | 36 | 03889 | 39 |
| 03488 | 53 | 03555 | 28 | 03622 | 33 | 03689 | 35 | 03756 | 61 | 03823 | 36 | 03890 | 39 |
| 03489 | 53 | 03556 | 28 | 03623 | 33 | 03690 | 35 | 03757 | 61 | 03824 | 36 | 03891 | 39 |
| 03490 | 53 | 03557 | 28 | 03624 | 33 | 03691 | 35 | 03758 | 61 | 03825 | 36 | 03892 | 39 |
| 03491 | 53 | 03558 | 28 | 03625 | 33 | 03692 | 35 | 03759 | 61 | 03826 | 36 | 03893 | 39 |
| 03492 | 53 | 03559 | 28 | 03626 | 33 | 03693 | 35 | 03760 | 61 | 03827 | 36 | 03894 | 39 |
| 03493 | 53 | 03560 | 28 | 03627 | 33 | 03694 | 35 | 03761 | 61 | 03828 | 36 | 03895 | 39 |
| 03494 | 53 | 03561 | 28 | 03628 | 33 | 03695 | 35 | 03762 | 61 | 03829 | 36 | 03896 | 39 |

EDP Number Index

| EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE |
|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|
| 03897 | 39 | 03964 | 41 | 05005 | 70 | 05072 | 73 | 05283 | 82 | 05350 | 83 | 06045 | 115 |
| 03898 | 39 | 03965 | 41 | 05006 | 69 | 05073 | 73 | 05284 | 82 | 05351 | 84 | 06046 | 115 |
| 03899 | 39 | 03966 | 41 | 05007 | 70 | 05074 | 73 | 05285 | 82 | 05352 | 83 | 06047 | 115 |
| 03900 | 39 | 03967 | 42 | 05008 | 69 | 05075 | 73 | 05286 | 82 | 05353 | 84 | 06048 | 115 |
| 03901 | 39 | 03968 | 42 | 05009 | 70 | 05076 | 72 | 05287 | 82 | 05354 | 84 | 06049 | 115 |
| 03902 | 39 | 03969 | 42 | 05010 | 69 | 05077 | 72 | 05288 | 82 | 05355 | 84 | 06050 | 115 |
| 03903 | 39 | 03970 | 42 | 05011 | 70 | 05078 | 72 | 05289 | 82 | 05356 | 84 | 06051 | 115 |
| 03904 | 39 | 03971 | 42 | 05012 | 70 | 05079 | 72 | 05290 | 82 | 05357 | 84 | 06052 | 115 |
| 03905 | 39 | 03972 | 42 | 05013 | 70 | 05080 | 72 | 05291 | 82 | 05358 | 84 | 06053 | 115 |
| 03906 | 39 | 03973 | 42 | 05014 | 70 | 05081 | 72 | 05292 | 82 | 05359 | 84 | 06054 | 115 |
| 03907 | 39 | 03974 | 42 | 05015 | 70 | 05082 | 72 | 05293 | 82 | 05360 | 84 | 06055 | 115 |
| 03908 | 39 | 03975 | 42 | 05016 | 70 | 05083 | 72 | 05294 | 82 | 05361 | 84 | 06056 | 115 |
| 03909 | 39 | 03976 | 42 | 05017 | 69 | 05084 | 72 | 05295 | 82 | 05362 | 84 | 06057 | 115 |
| 03910 | 39 | 03977 | 42 | 05018 | 70 | 05085 | 72 | 05296 | 82 | 05363 | 84 | 06058 | 115 |
| 03911 | 39 | 03978 | 42 | 05019 | 69 | 05086 | 72 | 05297 | 82 | 05364 | 84 | 06059 | 115 |
| 03912 | 39 | 03979 | 42 | 05020 | 70 | 05087 | 72 | 05298 | 82 | 05365 | 84 | 06060 | 115 |
| 03913 | 40 | 03980 | 42 | 05021 | 69 | 05088 | 72 | 05299 | 82 | 05366 | 84 | 06061 | 115 |
| 03914 | 40 | 03981 | 42 | 05022 | 70 | 05089 | 72 | 05300 | 82 | 05367 | 84 | 07000 | 89 |
| 03915 | 40 | 03982 | 42 | 05023 | 69 | 05090 | 73 | 05301 | 82 | 05368 | 84 | 07001 | 89 |
| 03916 | 40 | 03983 | 42 | 05024 | 70 | 05091 | 73 | 05302 | 82 | 05369 | 84 | 07002 | 89 |
| 03917 | 40 | 03984 | 42 | 05025 | 70 | 05092 | 73 | 05303 | 82 | 05370 | 84 | 07003 | 89 |
| 03918 | 40 | 03985 | 42 | 05026 | 70 | 05093 | 73 | 05304 | 82 | 05371 | 84 | 07004 | 89 |
| 03919 | 40 | 03986 | 42 | 05027 | 70 | 05094 | 73 | 05305 | 82 | 06000 | 114 | 07005 | 89 |
| 03920 | 40 | 03987 | 42 | 05028 | 70 | 05095 | 73 | 05306 | 83 | 06001 | 114 | 07006 | 89 |
| 03921 | 40 | 03988 | 42 | 05029 | 70 | 05096 | 73 | 05307 | 83 | 06002 | 114 | 07007 | 89 |
| 03922 | 40 | 03989 | 42 | 05030 | 74 | 05097 | 73 | 05308 | 83 | 06003 | 114 | 07008 | 89 |
| 03923 | 40 | 03990 | 42 | 05031 | 75 | 05098 | 73 | 05309 | 83 | 06004 | 114 | 07009 | 89 |
| 03924 | 40 | 03991 | 42 | 05032 | 74 | 05099 | 73 | 05310 | 83 | 06005 | 114 | 07010 | 89 |
| 03925 | 40 | 03992 | 42 | 05033 | 75 | 05100 | 73 | 05311 | 83 | 06006 | 114 | 07011 | 89 |
| 03926 | 40 | 03993 | 42 | 05034 | 74 | 05101 | 73 | 05312 | 83 | 06007 | 114 | 07012 | 89 |
| 03927 | 40 | 04000 | 10 | 05035 | 75 | 05102 | 73 | 05313 | 83 | 06008 | 114 | 07013 | 89 |
| 03928 | 40 | 04001 | 14 | 05036 | 74 | 05103 | 73 | 05314 | 83 | 06009 | 114 | 07014 | 89 |
| 03929 | 40 | 04002 | 12 | 05037 | 75 | 05104 | 73 | 05315 | 83 | 06010 | 114 | 07015 | 89 |
| 03930 | 40 | 04003 | 16 | 05038 | 74 | 05105 | 73 | 05316 | 83 | 06011 | 114 | 07016 | 89 |
| 03931 | 40 | 04004 | 10 | 05039 | 75 | 05106 | 73 | 05317 | 83 | 06012 | 114 | 07017 | 89 |
| 03932 | 40 | 04005 | 14 | 05040 | 74 | 05107 | 73 | 05318 | 83 | 06013 | 114 | 07018 | 89 |
| 03933 | 40 | 04006 | 12 | 05041 | 75 | 05108 | 73 | 05319 | 83 | 06014 | 114 | 07019 | 89 |
| 03934 | 40 | 04007 | 16 | 05042 | 74 | 05109 | 73 | 05320 | 83 | 06015 | 114 | 07020 | 89 |
| 03935 | 40 | 04008 | 21 | 05043 | 75 | 05110 | 73 | 05321 | 83 | 06016 | 114 | 07021 | 89 |
| 03936 | 40 | 04009 | 23 | 05044 | 74 | 05111 | 73 | 05322 | 83 | 06017 | 114 | 07022 | 89 |
| 03937 | 40 | 04010 | 21 | 05045 | 75 | 05112 | 72 | 05323 | 83 | 06018 | 114 | 07023 | 89 |
| 03938 | 40 | 04011 | 23 | 05046 | 74 | 05113 | 72 | 05324 | 83 | 06019 | 114 | 07024 | 89 |
| 03939 | 40 | 04012 | 45 | 05047 | 75 | 05114 | 72 | 05325 | 83 | 06020 | 114 | 07025 | 89 |
| 03940 | 41 | 04013 | 50 | 05048 | 74 | 05115 | 72 | 05326 | 83 | 06021 | 114 | 07026 | 89 |
| 03941 | 41 | 04014 | 45 | 05049 | 75 | 05116 | 72 | 05327 | 83 | 06022 | 114 | 07027 | 89 |
| 03942 | 41 | 04015 | 50 | 05050 | 74 | 05117 | 72 | 05328 | 83 | 06023 | 114 | 07028 | 89 |
| 03943 | 41 | 04016 | 58 | 05051 | 75 | 05118 | 72 | 05329 | 83 | 06024 | 114 | 07029 | 89 |
| 03944 | 41 | 04017 | 60 | 05052 | 74 | 05119 | 72 | 05330 | 83 | 06025 | 114 | 07030 | 89 |
| 03945 | 41 | 04018 | 58 | 05053 | 75 | 05120 | 72 | 05331 | 83 | 06026 | 114 | 07031 | 89 |
| 03946 | 41 | 04019 | 60 | 05054 | 73 | 05121 | 72 | 05332 | 83 | 06027 | 114 | 07032 | 90 |
| 03947 | 41 | 04020 | 14 | 05055 | 73 | 05122 | 72 | 05333 | 84 | 06028 | 114 | 07033 | 90 |
| 03948 | 41 | 04021 | 14 | 05056 | 73 | 05123 | 72 | 05334 | 84 | 06029 | 114 | 07034 | 90 |
| 03949 | 41 | 04022 | 14 | 05057 | 73 | 05124 | 72 | 05335 | 84 | 06030 | 114 | 07035 | 90 |
| 03950 | 41 | 04023 | 14 | 05058 | 73 | 05125 | 72 | 05336 | 84 | 06031 | 114 | 07036 | 90 |
| 03951 | 41 | 04024 | 43 | 05059 | 73 | 05270 | 82 | 05337 | 84 | 06032 | 114 | 07037 | 90 |
| 03952 | 41 | 04025 | 43 | 05060 | 73 | 05271 | 82 | 05338 | 84 | 06033 | 114 | 07038 | 90 |
| 03953 | 41 | 04026 | 43 | 05061 | 73 | 05272 | 82 | 05339 | 84 | 06034 | 115 | 07039 | 90 |
| 03954 | 41 | 04027 | 43 | 05062 | 73 | 05273 | 82 | 05340 | 84 | 06035 | 115 | 07040 | 90 |
| 03955 | 41 | 04028 | 48 | 05063 | 73 | 05274 | 82 | 05341 | 84 | 06036 | 115 | 07041 | 90 |
| 03956 | 41 | 04029 | 48 | 05064 | 73 | 05275 | 82 | 05342 | 84 | 06037 | 115 | 07042 | 90 |
| 03957 | 41 | 04030 | 48 | 05065 | 73 | 05276 | 82 | 05343 | 84 | 06038 | 115 | 07043 | 90 |
| 03958 | 41 | 04031 | 48 | 05066 | 73 | 05277 | 82 | 05344 | 84 | 06039 | 115 | 07044 | 90 |
| 03959 | 41 | 05000 | 66 | 05067 | 73 | 05278 | 82 | 05345 | 83 | 06040 | 115 | 07045 | 90 |
| 03960 | 41 | 05001 | 67 | 05068 | 73 | 05279 | 82 | 05346 | 83 | 06041 | 115 | 07046 | 90 |
| 03961 | 41 | 05002 | 66 | 05069 | 73 | 05280 | 82 | 05347 | 83 | 06042 | 115 | 07047 | 90 |
| 03962 | 41 | 05003 | 67 | 05070 | 73 | 05281 | 82 | 05348 | 83 | 06043 | 115 | 07048 | 90 |
| 03963 | 41 | 05004 | 69 | 05071 | 73 | 05282 | 82 | 05349 | 83 | 06044 | 115 | 07049 | 90 |

EDP Number Index

| EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE |
|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|
| 07050 | 90 | 07117 | 94 | 07184 | 96 | 07251 | 93 | 07318 | 95 | 07385 | 97 | 07452 | 101 |
| 07051 | 90 | 07118 | 94 | 07185 | 96 | 07252 | 93 | 07319 | 95 | 07386 | 97 | 07453 | 101 |
| 07052 | 90 | 07119 | 94 | 07186 | 96 | 07253 | 93 | 07320 | 95 | 07387 | 97 | 07454 | 101 |
| 07053 | 90 | 07120 | 94 | 07187 | 96 | 07254 | 93 | 07321 | 95 | 07388 | 97 | 07455 | 101 |
| 07054 | 90 | 07121 | 94 | 07188 | 96 | 07255 | 93 | 07322 | 95 | 07389 | 97 | 07456 | 101 |
| 07055 | 90 | 07122 | 94 | 07189 | 96 | 07256 | 94 | 07323 | 95 | 07390 | 97 | 07457 | 101 |
| 07056 | 90 | 07123 | 94 | 07190 | 96 | 07257 | 94 | 07324 | 95 | 07391 | 97 | 07458 | 101 |
| 07057 | 90 | 07124 | 94 | 07191 | 96 | 07258 | 93 | 07325 | 95 | 07392 | 97 | 07459 | 101 |
| 07058 | 90 | 07125 | 94 | 07192 | 96 | 07259 | 93 | 07326 | 95 | 07393 | 97 | 07460 | 101 |
| 07059 | 90 | 07126 | 94 | 07193 | 96 | 07260 | 93 | 07327 | 95 | 07394 | 97 | 07461 | 101 |
| 07060 | 90 | 07127 | 93 | 07194 | 96 | 07261 | 93 | 07328 | 95 | 07395 | 97 | 07462 | 101 |
| 07061 | 90 | 07128 | 94 | 07195 | 96 | 07262 | 93 | 07329 | 95 | 07396 | 97 | 07463 | 101 |
| 07062 | 90 | 07129 | 93 | 07196 | 96 | 07263 | 93 | 07330 | 95 | 07397 | 97 | 07464 | 101 |
| 07063 | 90 | 07130 | 94 | 07197 | 96 | 07264 | 93 | 07331 | 95 | 07398 | 97 | 07465 | 101 |
| 07064 | 93 | 07131 | 94 | 07198 | 96 | 07265 | 93 | 07332 | 95 | 07399 | 97 | 07466 | 101 |
| 07065 | 93 | 07132 | 93 | 07199 | 96 | 07266 | 94 | 07333 | 95 | 07400 | 99 | 07467 | 101 |
| 07066 | 93 | 07133 | 94 | 07200 | 96 | 07267 | 94 | 07334 | 95 | 07401 | 99 | 07468 | 101 |
| 07067 | 93 | 07134 | 93 | 07201 | 96 | 07268 | 94 | 07335 | 95 | 07402 | 99 | 07469 | 101 |
| 07068 | 93 | 07135 | 95 | 07202 | 96 | 07269 | 94 | 07336 | 95 | 07403 | 99 | 07470 | 101 |
| 07069 | 93 | 07136 | 95 | 07203 | 96 | 07270 | 94 | 07337 | 95 | 07404 | 99 | 07471 | 101 |
| 07070 | 93 | 07137 | 94 | 07204 | 96 | 07271 | 94 | 07338 | 95 | 07405 | 99 | 07472 | 101 |
| 07071 | 93 | 07138 | 95 | 07205 | 96 | 07272 | 94 | 07339 | 95 | 07406 | 99 | 07473 | 101 |
| 07072 | 93 | 07139 | 95 | 07206 | 96 | 07273 | 94 | 07340 | 95 | 07407 | 99 | 07474 | 101 |
| 07073 | 93 | 07140 | 94 | 07207 | 96 | 07274 | 94 | 07341 | 95 | 07408 | 99 | 07475 | 101 |
| 07074 | 93 | 07141 | 95 | 07208 | 96 | 07275 | 94 | 07342 | 95 | 07409 | 99 | 07476 | 101 |
| 07075 | 93 | 07142 | 95 | 07209 | 96 | 07276 | 94 | 07343 | 95 | 07410 | 99 | 07477 | 101 |
| 07076 | 93 | 07143 | 94 | 07210 | 96 | 07277 | 94 | 07344 | 95 | 07411 | 99 | 07478 | 101 |
| 07077 | 93 | 07144 | 95 | 07211 | 96 | 07278 | 94 | 07345 | 95 | 07412 | 99 | 07479 | 101 |
| 07078 | 93 | 07145 | 94 | 07212 | 97 | 07279 | 94 | 07346 | 96 | 07413 | 99 | 07480 | 101 |
| 07079 | 93 | 07146 | 95 | 07213 | 97 | 07280 | 94 | 07347 | 96 | 07414 | 100 | 07481 | 101 |
| 07080 | 93 | 07147 | 95 | 07214 | 97 | 07281 | 94 | 07348 | 96 | 07415 | 100 | 07482 | 101 |
| 07081 | 93 | 07148 | 94 | 07215 | 97 | 07282 | 94 | 07349 | 96 | 07416 | 100 | 07483 | 101 |
| 07082 | 93 | 07149 | 95 | 07216 | 97 | 07283 | 94 | 07350 | 96 | 07417 | 100 | 07484 | 101 |
| 07083 | 93 | 07150 | 95 | 07217 | 97 | 07284 | 94 | 07351 | 96 | 07418 | 100 | 07485 | 101 |
| 07084 | 93 | 07151 | 95 | 07218 | 97 | 07285 | 94 | 07352 | 96 | 07419 | 100 | 07486 | 101 |
| 07085 | 93 | 07152 | 95 | 07219 | 97 | 07286 | 94 | 07353 | 96 | 07420 | 100 | 07487 | 101 |
| 07086 | 93 | 07153 | 95 | 07220 | 97 | 07287 | 95 | 07354 | 96 | 07421 | 100 | 07488 | 101 |
| 07087 | 93 | 07154 | 95 | 07221 | 97 | 07288 | 94 | 07355 | 96 | 07422 | 100 | 07489 | 101 |
| 07088 | 93 | 07155 | 95 | 07222 | 97 | 07289 | 94 | 07356 | 96 | 07423 | 100 | 07490 | 101 |
| 07089 | 93 | 07156 | 95 | 07223 | 97 | 07290 | 95 | 07357 | 96 | 07424 | 100 | 07491 | 101 |
| 07090 | 93 | 07157 | 95 | 07224 | 97 | 07291 | 95 | 07358 | 96 | 07425 | 100 | 07492 | 101 |
| 07091 | 93 | 07158 | 95 | 07225 | 97 | 07292 | 94 | 07359 | 96 | 07426 | 100 | 07493 | 101 |
| 07092 | 93 | 07159 | 95 | 07226 | 97 | 07293 | 94 | 07360 | 96 | 07427 | 100 | 07494 | 101 |
| 07093 | 93 | 07160 | 95 | 07227 | 97 | 07294 | 94 | 07361 | 96 | 07428 | 100 | 07495 | 101 |
| 07094 | 93 | 07161 | 95 | 07228 | 97 | 07295 | 95 | 07362 | 96 | 07429 | 100 | 07496 | 102 |
| 07095 | 93 | 07162 | 95 | 07229 | 97 | 07296 | 94 | 07363 | 96 | 07430 | 100 | 07497 | 102 |
| 07096 | 93 | 07163 | 95 | 07230 | 97 | 07297 | 95 | 07364 | 96 | 07431 | 100 | 07498 | 102 |
| 07097 | 93 | 07164 | 95 | 07231 | 97 | 07298 | 94 | 07365 | 96 | 07432 | 100 | 07499 | 102 |
| 07098 | 93 | 07165 | 95 | 07232 | 94 | 07299 | 94 | 07366 | 96 | 07433 | 100 | 07500 | 102 |
| 07099 | 93 | 07166 | 95 | 07233 | 94 | 07300 | 95 | 07367 | 96 | 07434 | 100 | 07501 | 102 |
| 07100 | 94 | 07167 | 95 | 07234 | 94 | 07301 | 94 | 07368 | 96 | 07435 | 100 | 07502 | 102 |
| 07101 | 94 | 07168 | 95 | 07235 | 94 | 07302 | 95 | 07369 | 96 | 07436 | 100 | 07503 | 102 |
| 07102 | 94 | 07169 | 95 | 07236 | 93 | 07303 | 95 | 07370 | 96 | 07437 | 100 | 07504 | 102 |
| 07103 | 94 | 07170 | 95 | 07237 | 93 | 07304 | 95 | 07371 | 96 | 07438 | 100 | 07505 | 102 |
| 07104 | 94 | 07171 | 95 | 07238 | 93 | 07305 | 95 | 07372 | 96 | 07439 | 100 | 07506 | 102 |
| 07105 | 94 | 07172 | 95 | 07239 | 93 | 07306 | 95 | 07373 | 96 | 07440 | 100 | 07507 | 102 |
| 07106 | 94 | 07173 | 95 | 07240 | 93 | 07307 | 95 | 07374 | 96 | 07441 | 100 | 07508 | 102 |
| 07107 | 94 | 07174 | 95 | 07241 | 93 | 07308 | 95 | 07375 | 96 | 07442 | 100 | 07509 | 102 |
| 07108 | 93 | 07175 | 95 | 07242 | 93 | 07309 | 95 | 07376 | 96 | 07443 | 100 | 07510 | 102 |
| 07109 | 93 | 07176 | 95 | 07243 | 93 | 07310 | 95 | 07377 | 96 | 07444 | 100 | 07511 | 102 |
| 07110 | 94 | 07177 | 95 | 07244 | 93 | 07311 | 95 | 07378 | 96 | 07445 | 100 | 07512 | 102 |
| 07111 | 94 | 07178 | 96 | 07245 | 93 | 07312 | 95 | 07379 | 96 | 07446 | 100 | 07513 | 102 |
| 07112 | 94 | 07179 | 96 | 07246 | 93 | 07313 | 95 | 07380 | 97 | 07447 | 100 | 07514 | 102 |
| 07113 | 94 | 07180 | 96 | 07247 | 93 | 07314 | 95 | 07381 | 97 | 07448 | 100 | 07515 | 102 |
| 07114 | 93 | 07181 | 96 | 07248 | 93 | 07315 | 95 | 07382 | 97 | 07449 | 100 | 07516 | 102 |
| 07115 | 93 | 07182 | 96 | 07249 | 93 | 07316 | 95 | 07383 | 97 | 07450 | 101 | 07517 | 102 |
| 07116 | 94 | 07183 | 96 | 07250 | 93 | 07317 | 95 | 07384 | 97 | 07451 | 101 | 07518 | 102 |

EDP Number Index

| EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE |
|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|
| 07988 | 105 | 08055 | 107 | 08122 | 109 | 08189 | 111 | 08256 | 108 | 08323 | 110 | 08390 | 111 |
| 07989 | 105 | 08056 | 107 | 08123 | 109 | 08190 | 111 | 08257 | 108 | 08324 | 110 | 08391 | 111 |
| 07990 | 105 | 08057 | 107 | 08124 | 109 | 08191 | 111 | 08258 | 108 | 08325 | 110 | 08392 | 112 |
| 07991 | 105 | 08058 | 107 | 08125 | 109 | 08192 | 111 | 08259 | 108 | 08326 | 110 | 08393 | 112 |
| 07992 | 105 | 08059 | 107 | 08126 | 109 | 08193 | 111 | 08260 | 108 | 08327 | 110 | 08394 | 112 |
| 07993 | 105 | 08060 | 107 | 08127 | 110 | 08194 | 111 | 08261 | 108 | 08328 | 110 | 08395 | 112 |
| 07994 | 105 | 08061 | 107 | 08128 | 110 | 08195 | 111 | 08262 | 108 | 08329 | 110 | 08396 | 112 |
| 07995 | 105 | 08062 | 107 | 08129 | 110 | 08196 | 111 | 08263 | 108 | 08330 | 110 | 08397 | 112 |
| 07996 | 105 | 08063 | 107 | 08130 | 110 | 08197 | 111 | 08264 | 109 | 08331 | 110 | 08398 | 112 |
| 07997 | 105 | 08064 | 107 | 08131 | 110 | 08198 | 111 | 08265 | 109 | 08332 | 110 | 08399 | 112 |
| 07998 | 105 | 08065 | 107 | 08132 | 110 | 08199 | 111 | 08266 | 109 | 08333 | 110 | 08400 | 112 |
| 07999 | 105 | 08066 | 108 | 08133 | 110 | 08200 | 111 | 08267 | 109 | 08334 | 110 | 08401 | 112 |
| 08000 | 105 | 08067 | 108 | 08134 | 110 | 08201 | 111 | 08268 | 109 | 08335 | 110 | 08402 | 112 |
| 08001 | 105 | 08068 | 108 | 08135 | 110 | 08202 | 111 | 08269 | 109 | 08336 | 110 | 08403 | 112 |
| 08002 | 105 | 08069 | 108 | 08136 | 110 | 08203 | 111 | 08270 | 109 | 08337 | 110 | 08404 | 112 |
| 08003 | 105 | 08070 | 108 | 08137 | 110 | 08204 | 111 | 08271 | 109 | 08338 | 110 | 08405 | 112 |
| 08004 | 106 | 08071 | 108 | 08138 | 110 | 08205 | 111 | 08272 | 109 | 08339 | 110 | 08406 | 112 |
| 08005 | 106 | 08072 | 108 | 08139 | 110 | 08206 | 111 | 08273 | 109 | 08340 | 110 | 08407 | 112 |
| 08006 | 106 | 08073 | 108 | 08140 | 110 | 08207 | 111 | 08274 | 109 | 08341 | 110 | 08408 | 112 |
| 08007 | 106 | 08074 | 108 | 08141 | 110 | 08208 | 111 | 08275 | 109 | 08342 | 110 | 08409 | 112 |
| 08008 | 106 | 08075 | 108 | 08142 | 110 | 08209 | 112 | 08276 | 109 | 08343 | 110 | 08410 | 112 |
| 08009 | 106 | 08076 | 108 | 08143 | 110 | 08210 | 112 | 08277 | 109 | 08344 | 110 | 08500 | 10 |
| 08010 | 106 | 08077 | 108 | 08144 | 110 | 08211 | 112 | 08278 | 109 | 08345 | 110 | 08501 | 14 |
| 08011 | 106 | 08078 | 108 | 08145 | 110 | 08212 | 112 | 08279 | 109 | 08346 | 111 | 08502 | 10 |
| 08012 | 106 | 08079 | 108 | 08146 | 110 | 08213 | 112 | 08280 | 109 | 08347 | 111 | 08503 | 14 |
| 08013 | 106 | 08080 | 108 | 08147 | 110 | 08214 | 112 | 08281 | 109 | 08348 | 111 | 08504 | 10 |
| 08014 | 106 | 08081 | 109 | 08148 | 110 | 08215 | 112 | 08282 | 109 | 08349 | 111 | 08505 | 10 |
| 08015 | 106 | 08082 | 109 | 08149 | 110 | 08216 | 112 | 08283 | 109 | 08350 | 111 | 08506 | 14 |
| 08016 | 106 | 08083 | 109 | 08150 | 110 | 08217 | 112 | 08284 | 109 | 08351 | 111 | 08507 | 10 |
| 08017 | 106 | 08084 | 109 | 08151 | 110 | 08218 | 112 | 08285 | 109 | 08352 | 111 | 08508 | 14 |
| 08018 | 106 | 08085 | 109 | 08152 | 110 | 08219 | 112 | 08286 | 109 | 08353 | 111 | 08509 | 11 |
| 08019 | 106 | 08086 | 109 | 08153 | 110 | 08220 | 112 | 08287 | 109 | 08354 | 111 | 08510 | 15 |
| 08020 | 106 | 08087 | 109 | 08154 | 110 | 08221 | 112 | 08288 | 109 | 08355 | 111 | 08511 | 11 |
| 08021 | 106 | 08088 | 109 | 08155 | 110 | 08222 | 112 | 08289 | 109 | 08356 | 111 | 08512 | 15 |
| 08022 | 106 | 08089 | 109 | 08156 | 110 | 08223 | 112 | 08290 | 109 | 08357 | 111 | 08513 | 11 |
| 08023 | 106 | 08090 | 109 | 08157 | 110 | 08224 | 112 | 08291 | 109 | 08358 | 111 | 08514 | 15 |
| 08024 | 106 | 08091 | 109 | 08158 | 110 | 08225 | 112 | 08292 | 109 | 08359 | 111 | 08515 | 11 |
| 08025 | 106 | 08092 | 109 | 08159 | 110 | 08226 | 112 | 08293 | 109 | 08360 | 111 | 08516 | 15 |
| 08026 | 106 | 08093 | 109 | 08160 | 110 | 08227 | 112 | 08294 | 109 | 08361 | 111 | 08517 | 11 |
| 08027 | 106 | 08094 | 109 | 08161 | 110 | 08228 | 108 | 08295 | 109 | 08362 | 111 | 08518 | 15 |
| 08028 | 106 | 08095 | 109 | 08162 | 110 | 08229 | 108 | 08296 | 109 | 08363 | 111 | 08519 | 11 |
| 08029 | 106 | 08096 | 109 | 08163 | 111 | 08230 | 108 | 08297 | 109 | 08364 | 111 | 08520 | 15 |
| 08030 | 106 | 08097 | 109 | 08164 | 111 | 08231 | 108 | 08298 | 109 | 08365 | 111 | 08521 | 11 |
| 08031 | 106 | 08098 | 109 | 08165 | 111 | 08232 | 108 | 08299 | 109 | 08366 | 111 | 08522 | 15 |
| 08032 | 106 | 08099 | 109 | 08166 | 111 | 08233 | 108 | 08300 | 109 | 08367 | 111 | 08523 | 11 |
| 08033 | 106 | 08100 | 109 | 08167 | 111 | 08234 | 108 | 08301 | 109 | 08368 | 111 | 08524 | 15 |
| 08034 | 106 | 08101 | 109 | 08168 | 111 | 08235 | 108 | 08302 | 109 | 08369 | 111 | 08525 | 11 |
| 08035 | 106 | 08102 | 109 | 08169 | 111 | 08236 | 108 | 08303 | 109 | 08370 | 111 | 08526 | 15 |
| 08036 | 106 | 08103 | 109 | 08170 | 111 | 08237 | 108 | 08304 | 109 | 08371 | 111 | 08527 | 11 |
| 08037 | 106 | 08104 | 109 | 08171 | 111 | 08238 | 108 | 08305 | 109 | 08372 | 111 | 08528 | 15 |
| 08038 | 106 | 08105 | 109 | 08172 | 111 | 08239 | 108 | 08306 | 109 | 08373 | 111 | 08529 | 11 |
| 08039 | 106 | 08106 | 109 | 08173 | 111 | 08240 | 108 | 08307 | 109 | 08374 | 111 | 08530 | 15 |
| 08040 | 107 | 08107 | 109 | 08174 | 111 | 08241 | 108 | 08308 | 109 | 08375 | 111 | 08531 | 11 |
| 08041 | 107 | 08108 | 109 | 08175 | 111 | 08242 | 108 | 08309 | 109 | 08376 | 111 | 08532 | 15 |
| 08042 | 107 | 08109 | 109 | 08176 | 111 | 08243 | 108 | 08310 | 110 | 08377 | 111 | 08533 | 12 |
| 08043 | 107 | 08110 | 109 | 08177 | 111 | 08244 | 108 | 08311 | 110 | 08378 | 111 | 08534 | 16 |
| 08044 | 107 | 08111 | 109 | 08178 | 111 | 08245 | 108 | 08312 | 110 | 08379 | 111 | 08535 | 12 |
| 08045 | 107 | 08112 | 109 | 08179 | 111 | 08246 | 108 | 08313 | 110 | 08380 | 111 | 08536 | 16 |
| 08046 | 107 | 08113 | 109 | 08180 | 111 | 08247 | 108 | 08314 | 110 | 08381 | 111 | 08537 | 12 |
| 08047 | 107 | 08114 | 109 | 08181 | 111 | 08248 | 108 | 08315 | 110 | 08382 | 111 | 08538 | 16 |
| 08048 | 107 | 08115 | 109 | 08182 | 111 | 08249 | 108 | 08316 | 110 | 08383 | 111 | 08539 | 12 |
| 08049 | 107 | 08116 | 109 | 08183 | 111 | 08250 | 108 | 08317 | 110 | 08384 | 111 | 08540 | 16 |
| 08050 | 107 | 08117 | 109 | 08184 | 111 | 08251 | 108 | 08318 | 110 | 08385 | 111 | 08541 | 12 |
| 08051 | 107 | 08118 | 109 | 08185 | 111 | 08252 | 108 | 08319 | 110 | 08386 | 111 | 08542 | 16 |
| 08052 | 107 | 08119 | 109 | 08186 | 111 | 08253 | 108 | 08320 | 110 | 08387 | 111 | 08543 | 12 |
| 08053 | 107 | 08120 | 109 | 08187 | 111 | 08254 | 108 | 08321 | 110 | 08388 | 111 | 08544 | 16 |
| 08054 | 107 | 08121 | 109 | 08188 | 111 | 08255 | 108 | 08322 | 110 | 08389 | 111 | 08545 | 12 |

EDP Number Index

| EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE |
|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|
| 08546 | 16 | 08613 | 13 | 08680 | 12 | 08747 | 17 | 08814 | 31 | 08881 | 28 | 08948 | 30 |
| 08547 | 12 | 08614 | 17 | 08681 | 16 | 08748 | 13 | 08815 | 27 | 08882 | 30 | 08949 | 32 |
| 08548 | 16 | 08615 | 13 | 08682 | 12 | 08749 | 17 | 08816 | 29 | 08883 | 32 | 08950 | 28 |
| 08549 | 12 | 08616 | 17 | 08683 | 16 | 08750 | 13 | 08817 | 31 | 08884 | 27 | 08951 | 30 |
| 08550 | 16 | 08617 | 13 | 08684 | 12 | 08751 | 17 | 08818 | 27 | 08885 | 29 | 08952 | 32 |
| 08551 | 12 | 08618 | 17 | 08685 | 16 | 08752 | 13 | 08819 | 29 | 08886 | 31 | 08953 | 28 |
| 08552 | 16 | 08619 | 13 | 08686 | 12 | 08753 | 17 | 08820 | 31 | 08887 | 27 | 08954 | 30 |
| 08553 | 12 | 08620 | 17 | 08687 | 16 | 08754 | 13 | 08821 | 27 | 08888 | 29 | 08955 | 32 |
| 08554 | 16 | 08621 | 13 | 08688 | 12 | 08755 | 17 | 08822 | 29 | 08889 | 31 | 08956 | 28 |
| 08555 | 12 | 08622 | 17 | 08689 | 16 | 08756 | 13 | 08823 | 31 | 08890 | 27 | 08957 | 30 |
| 08556 | 16 | 08623 | 13 | 08690 | 12 | 08757 | 17 | 08824 | 27 | 08891 | 29 | 08958 | 32 |
| 08557 | 12 | 08624 | 17 | 08691 | 16 | 08758 | 13 | 08825 | 29 | 08892 | 31 | 08959 | 28 |
| 08558 | 16 | 08625 | 13 | 08692 | 12 | 08759 | 17 | 08826 | 31 | 08893 | 27 | 08960 | 30 |
| 08559 | 12 | 08626 | 17 | 08693 | 16 | 08760 | 13 | 08827 | 27 | 08894 | 29 | 08961 | 32 |
| 08560 | 16 | 08627 | 13 | 08694 | 12 | 08761 | 17 | 08828 | 29 | 08895 | 31 | 08962 | 28 |
| 08561 | 12 | 08628 | 17 | 08695 | 16 | 08762 | 13 | 08829 | 31 | 08896 | 27 | 08963 | 30 |
| 08562 | 16 | 08629 | 13 | 08696 | 12 | 08763 | 17 | 08830 | 27 | 08897 | 29 | 08964 | 32 |
| 08563 | 12 | 08630 | 17 | 08697 | 16 | 08764 | 13 | 08831 | 29 | 08898 | 31 | 08965 | 28 |
| 08564 | 16 | 08631 | 13 | 08698 | 12 | 08765 | 17 | 08832 | 31 | 08899 | 27 | 08966 | 30 |
| 08565 | 12 | 08632 | 17 | 08699 | 16 | 08766 | 13 | 08833 | 27 | 08900 | 29 | 08967 | 32 |
| 08566 | 16 | 08633 | 13 | 08700 | 12 | 08767 | 17 | 08834 | 29 | 08901 | 31 | 08968 | 28 |
| 08567 | 12 | 08634 | 17 | 08701 | 16 | 08768 | 13 | 08835 | 31 | 08902 | 27 | 08969 | 30 |
| 08568 | 16 | 08635 | 13 | 08702 | 12 | 08769 | 17 | 08836 | 28 | 08903 | 29 | 08970 | 32 |
| 08569 | 12 | 08636 | 17 | 08703 | 16 | 08770 | 13 | 08837 | 29 | 08904 | 31 | 08971 | 28 |
| 08570 | 16 | 08637 | 13 | 08704 | 12 | 08771 | 17 | 08838 | 31 | 08905 | 27 | 08972 | 30 |
| 08571 | 12 | 08638 | 17 | 08705 | 16 | 08772 | 13 | 08839 | 28 | 08906 | 29 | 08973 | 32 |
| 08572 | 16 | 08639 | 13 | 08706 | 12 | 08773 | 17 | 08840 | 30 | 08907 | 31 | 08974 | 28 |
| 08573 | 12 | 08640 | 17 | 08707 | 16 | 08774 | 13 | 08841 | 32 | 08908 | 27 | 08975 | 30 |
| 08574 | 16 | 08641 | 10 | 08708 | 12 | 08775 | 17 | 08842 | 28 | 08909 | 29 | 08976 | 32 |
| 08575 | 12 | 08642 | 14 | 08709 | 16 | 08776 | 13 | 08843 | 30 | 08910 | 31 | 08977 | 28 |
| 08576 | 16 | 08643 | 10 | 08710 | 12 | 08777 | 17 | 08844 | 32 | 08911 | 27 | 08978 | 30 |
| 08577 | 12 | 08644 | 14 | 08711 | 16 | 08778 | 13 | 08845 | 28 | 08912 | 29 | 08979 | 32 |
| 08578 | 16 | 08645 | 10 | 08712 | 12 | 08779 | 17 | 08846 | 30 | 08913 | 31 | 08980 | 28 |
| 08579 | 12 | 08646 | 10 | 08713 | 16 | 08780 | 13 | 08847 | 32 | 08914 | 27 | 08981 | 30 |
| 08580 | 16 | 08647 | 14 | 08714 | 12 | 08781 | 17 | 08848 | 28 | 08915 | 29 | 08982 | 32 |
| 08581 | 12 | 08648 | 10 | 08715 | 16 | 08782 | 27 | 08849 | 30 | 08916 | 31 | 08983 | 28 |
| 08582 | 16 | 08649 | 14 | 08716 | 12 | 08783 | 29 | 08850 | 32 | 08917 | 27 | 08984 | 30 |
| 08583 | 13 | 08650 | 11 | 08717 | 16 | 08784 | 31 | 08851 | 28 | 08918 | 29 | 08985 | 32 |
| 08584 | 17 | 08651 | 15 | 08718 | 12 | 08785 | 27 | 08852 | 30 | 08919 | 31 | 08986 | 43 |
| 08585 | 13 | 08652 | 11 | 08719 | 16 | 08786 | 29 | 08853 | 32 | 08920 | 27 | 08987 | 48 |
| 08586 | 17 | 08653 | 15 | 08720 | 12 | 08787 | 31 | 08854 | 28 | 08921 | 29 | 08988 | 43 |
| 08587 | 13 | 08654 | 11 | 08721 | 16 | 08788 | 27 | 08855 | 30 | 08922 | 31 | 08989 | 48 |
| 08588 | 17 | 08655 | 15 | 08722 | 12 | 08789 | 29 | 08856 | 32 | 08923 | 27 | 08990 | 43 |
| 08589 | 13 | 08656 | 11 | 08723 | 16 | 08790 | 31 | 08857 | 28 | 08924 | 29 | 08991 | 48 |
| 08590 | 17 | 08657 | 15 | 08724 | 13 | 08791 | 27 | 08858 | 30 | 08925 | 31 | 08992 | 43 |
| 08591 | 13 | 08658 | 11 | 08725 | 17 | 08792 | 29 | 08859 | 32 | 08926 | 27 | 08993 | 48 |
| 08592 | 17 | 08659 | 15 | 08726 | 13 | 08793 | 31 | 08860 | 28 | 08927 | 29 | 08994 | 44 |
| 08593 | 13 | 08660 | 11 | 08727 | 17 | 08794 | 27 | 08861 | 30 | 08928 | 31 | 08995 | 49 |
| 08594 | 17 | 08661 | 15 | 08728 | 13 | 08795 | 29 | 08862 | 32 | 08929 | 27 | 08996 | 44 |
| 08595 | 13 | 08662 | 11 | 08729 | 17 | 08796 | 31 | 08863 | 28 | 08930 | 29 | 08997 | 49 |
| 08596 | 17 | 08663 | 15 | 08730 | 13 | 08797 | 27 | 08864 | 30 | 08931 | 31 | 08998 | 44 |
| 08597 | 13 | 08664 | 11 | 08731 | 17 | 08798 | 29 | 08865 | 32 | 08932 | 27 | 08999 | 49 |
| 08598 | 17 | 08665 | 15 | 08732 | 13 | 08799 | 31 | 08866 | 28 | 08933 | 29 | 09000 | 44 |
| 08599 | 13 | 08666 | 11 | 08733 | 17 | 08800 | 27 | 08867 | 30 | 08934 | 31 | 09001 | 49 |
| 08600 | 17 | 08667 | 15 | 08734 | 13 | 08801 | 29 | 08868 | 32 | 08935 | 27 | 09002 | 44 |
| 08601 | 13 | 08668 | 11 | 08735 | 17 | 08802 | 31 | 08869 | 28 | 08936 | 29 | 09003 | 49 |
| 08602 | 17 | 08669 | 15 | 08736 | 13 | 08803 | 27 | 08870 | 30 | 08937 | 31 | 09004 | 44 |
| 08603 | 13 | 08670 | 11 | 08737 | 17 | 08804 | 29 | 08871 | 32 | 08938 | 28 | 09005 | 49 |
| 08604 | 17 | 08671 | 15 | 08738 | 13 | 08805 | 31 | 08872 | 28 | 08939 | 29 | 09006 | 44 |
| 08605 | 13 | 08672 | 11 | 08739 | 17 | 08806 | 27 | 08873 | 30 | 08940 | 31 | 09007 | 49 |
| 08606 | 17 | 08673 | 15 | 08740 | 13 | 08807 | 29 | 08874 | 32 | 08941 | 28 | 09008 | 44 |
| 08607 | 13 | 08674 | 12 | 08741 | 17 | 08808 | 31 | 08875 | 28 | 08942 | 30 | 09009 | 49 |
| 08608 | 17 | 08675 | 16 | 08742 | 13 | 08809 | 27 | 08876 | 30 | 08943 | 32 | 09010 | 44 |
| 08609 | 13 | 08676 | 12 | 08743 | 17 | 08810 | 29 | 08877 | 32 | 08944 | 28 | 09011 | 49 |
| 08610 | 17 | 08677 | 16 | 08744 | 13 | 08811 | 31 | 08878 | 28 | 08945 | 30 | 09012 | 44 |
| 08611 | 13 | 08678 | 12 | 08745 | 17 | 08812 | 27 | 08879 | 30 | 08946 | 32 | 09013 | 49 |
| 08612 | 17 | 08679 | 16 | 08746 | 13 | 08813 | 29 | 08880 | 32 | 08947 | 28 | 09014 | 44 |

EDP Number Index

| EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE |
|------------|------|------------|------|------------|------|------------|------|------------|------|------------|------|------------|------|
| 09015..... | 49 | 09082..... | 46 | 09149..... | 49 | 09216..... | 46 | 09283..... | 72 | 09350..... | 25 | 09417..... | 36 |
| 09016..... | 44 | 09083..... | 51 | 09150..... | 44 | 09217..... | 51 | 09284..... | 72 | 09351..... | 24 | 09418..... | 37 |
| 09017..... | 49 | 09084..... | 46 | 09151..... | 49 | 09218..... | 46 | 09285..... | 72 | 09352..... | 19 | 09419..... | 38 |
| 09018..... | 45 | 09085..... | 51 | 09152..... | 44 | 09219..... | 51 | 09286..... | 72 | 09353..... | 18 | 09420..... | 39 |
| 09019..... | 50 | 09086..... | 46 | 09153..... | 49 | 09220..... | 46 | 09287..... | 72 | 09354..... | 19 | 09421..... | 40 |
| 09020..... | 45 | 09087..... | 51 | 09154..... | 44 | 09221..... | 51 | 09288..... | 72 | 09355..... | 18 | 09422..... | 41 |
| 09021..... | 50 | 09088..... | 46 | 09155..... | 49 | 09222..... | 46 | 09289..... | 72 | 09356..... | 19 | 09423..... | 42 |
| 09022..... | 45 | 09089..... | 51 | 09156..... | 44 | 09223..... | 51 | 09290..... | 72 | 09357..... | 18 | 09424..... | 36 |
| 09023..... | 50 | 09090..... | 46 | 09157..... | 49 | 09224..... | 46 | 09291..... | 72 | 09358..... | 19 | 09425..... | 37 |
| 09024..... | 45 | 09091..... | 51 | 09158..... | 45 | 09225..... | 51 | 09292..... | 72 | 09359..... | 18 | 09426..... | 38 |
| 09025..... | 50 | 09092..... | 46 | 09159..... | 50 | 09226..... | 46 | 09293..... | 72 | 09360..... | 19 | 09427..... | 39 |
| 09026..... | 45 | 09093..... | 51 | 09160..... | 45 | 09227..... | 51 | 09294..... | 72 | 09361..... | 18 | 09428..... | 40 |
| 09027..... | 50 | 09094..... | 46 | 09161..... | 50 | 09228..... | 46 | 09295..... | 72 | 09362..... | 19 | 09429..... | 41 |
| 09028..... | 45 | 09095..... | 51 | 09162..... | 45 | 09229..... | 51 | 09296..... | 72 | 09363..... | 18 | 09430..... | 42 |
| 09029..... | 50 | 09096..... | 46 | 09163..... | 50 | 09230..... | 46 | 09297..... | 72 | 09364..... | 19 | 09431..... | 36 |
| 09030..... | 45 | 09097..... | 51 | 09164..... | 45 | 09231..... | 51 | 09298..... | 25 | 09365..... | 18 | 09432..... | 37 |
| 09031..... | 50 | 09098..... | 46 | 09165..... | 50 | 09232..... | 46 | 09299..... | 24 | 09366..... | 19 | 09433..... | 38 |
| 09032..... | 45 | 09099..... | 51 | 09166..... | 45 | 09233..... | 51 | 09300..... | 25 | 09367..... | 18 | 09434..... | 39 |
| 09033..... | 50 | 09100..... | 46 | 09167..... | 50 | 09234..... | 46 | 09301..... | 24 | 09368..... | 19 | 09435..... | 40 |
| 09034..... | 45 | 09101..... | 51 | 09168..... | 45 | 09235..... | 51 | 09302..... | 25 | 09369..... | 18 | 09436..... | 41 |
| 09035..... | 50 | 09102..... | 46 | 09169..... | 50 | 09236..... | 46 | 09303..... | 24 | 09370..... | 19 | 09437..... | 42 |
| 09036..... | 45 | 09103..... | 51 | 09170..... | 45 | 09237..... | 51 | 09304..... | 25 | 09371..... | 18 | 09438..... | 36 |
| 09037..... | 50 | 09104..... | 46 | 09171..... | 50 | 09238..... | 46 | 09305..... | 24 | 09372..... | 19 | 09439..... | 37 |
| 09038..... | 45 | 09105..... | 51 | 09172..... | 45 | 09239..... | 51 | 09306..... | 25 | 09373..... | 18 | 09440..... | 38 |
| 09039..... | 50 | 09106..... | 46 | 09173..... | 50 | 09240..... | 46 | 09307..... | 24 | 09374..... | 19 | 09441..... | 39 |
| 09040..... | 45 | 09107..... | 51 | 09174..... | 45 | 09241..... | 51 | 09308..... | 25 | 09375..... | 18 | 09442..... | 40 |
| 09041..... | 50 | 09108..... | 46 | 09175..... | 50 | 09242..... | 46 | 09309..... | 24 | 09376..... | 19 | 09443..... | 41 |
| 09042..... | 45 | 09109..... | 51 | 09176..... | 45 | 09243..... | 51 | 09310..... | 25 | 09377..... | 18 | 09444..... | 42 |
| 09043..... | 50 | 09110..... | 46 | 09177..... | 50 | 09244..... | 46 | 09311..... | 24 | 09378..... | 19 | 09445..... | 36 |
| 09044..... | 45 | 09111..... | 51 | 09178..... | 45 | 09245..... | 51 | 09312..... | 25 | 09379..... | 18 | 09446..... | 37 |
| 09045..... | 50 | 09112..... | 46 | 09179..... | 50 | 09246..... | 46 | 09313..... | 24 | 09380..... | 19 | 09447..... | 38 |
| 09046..... | 45 | 09113..... | 51 | 09180..... | 45 | 09247..... | 51 | 09314..... | 25 | 09381..... | 18 | 09448..... | 39 |
| 09047..... | 50 | 09114..... | 46 | 09181..... | 50 | 09248..... | 46 | 09315..... | 24 | 09382..... | 19 | 09449..... | 40 |
| 09048..... | 45 | 09115..... | 51 | 09182..... | 45 | 09249..... | 51 | 09316..... | 25 | 09383..... | 18 | 09450..... | 41 |
| 09049..... | 50 | 09116..... | 47 | 09183..... | 50 | 09250..... | 46 | 09317..... | 24 | 09384..... | 19 | 09451..... | 42 |
| 09050..... | 45 | 09117..... | 51 | 09184..... | 45 | 09251..... | 51 | 09318..... | 25 | 09385..... | 18 | 09452..... | 36 |
| 09051..... | 50 | 09118..... | 47 | 09185..... | 50 | 09252..... | 46 | 09319..... | 24 | 09386..... | 19 | 09453..... | 37 |
| 09052..... | 45 | 09119..... | 51 | 09186..... | 45 | 09253..... | 51 | 09320..... | 25 | 09387..... | 18 | 09454..... | 38 |
| 09053..... | 50 | 09120..... | 47 | 09187..... | 50 | 09254..... | 46 | 09321..... | 24 | 09388..... | 19 | 09455..... | 39 |
| 09054..... | 45 | 09121..... | 51 | 09188..... | 45 | 09255..... | 51 | 09322..... | 25 | 09389..... | 18 | 09456..... | 40 |
| 09055..... | 50 | 09122..... | 47 | 09189..... | 50 | 09256..... | 47 | 09323..... | 24 | 09390..... | 19 | 09457..... | 41 |
| 09056..... | 45 | 09123..... | 51 | 09190..... | 45 | 09257..... | 51 | 09324..... | 25 | 09391..... | 18 | 09458..... | 42 |
| 09057..... | 50 | 09124..... | 47 | 09191..... | 50 | 09258..... | 47 | 09325..... | 24 | 09392..... | 19 | 09459..... | 36 |
| 09058..... | 45 | 09125..... | 51 | 09192..... | 45 | 09259..... | 51 | 09326..... | 25 | 09393..... | 18 | 09460..... | 37 |
| 09059..... | 50 | 09126..... | 43 | 09193..... | 50 | 09260..... | 47 | 09327..... | 24 | 09394..... | 19 | 09461..... | 38 |
| 09060..... | 45 | 09127..... | 48 | 09194..... | 45 | 09261..... | 51 | 09328..... | 25 | 09395..... | 18 | 09462..... | 39 |
| 09061..... | 50 | 09128..... | 43 | 09195..... | 50 | 09262..... | 47 | 09329..... | 24 | 09396..... | 19 | 09463..... | 40 |
| 09062..... | 46 | 09129..... | 48 | 09196..... | 45 | 09263..... | 51 | 09330..... | 25 | 09397..... | 18 | 09464..... | 41 |
| 09063..... | 50 | 09130..... | 43 | 09197..... | 50 | 09264..... | 47 | 09331..... | 24 | 09398..... | 19 | 09465..... | 42 |
| 09064..... | 46 | 09131..... | 48 | 09198..... | 45 | 09265..... | 51 | 09332..... | 25 | 09399..... | 18 | 09466..... | 36 |
| 09065..... | 50 | 09132..... | 43 | 09199..... | 50 | 09266..... | 73 | 09333..... | 24 | 09400..... | 19 | 09467..... | 37 |
| 09066..... | 46 | 09133..... | 48 | 09200..... | 45 | 09267..... | 73 | 09334..... | 25 | 09401..... | 18 | 09468..... | 38 |
| 09067..... | 50 | 09134..... | 44 | 09201..... | 50 | 09268..... | 73 | 09335..... | 24 | 09402..... | 19 | 09469..... | 39 |
| 09068..... | 46 | 09135..... | 49 | 09202..... | 46 | 09269..... | 73 | 09336..... | 25 | 09403..... | 18 | 09470..... | 40 |
| 09069..... | 51 | 09136..... | 44 | 09203..... | 50 | 09270..... | 72 | 09337..... | 24 | 09404..... | 19 | 09471..... | 41 |
| 09070..... | 46 | 09137..... | 49 | 09204..... | 46 | 09271..... | 72 | 09338..... | 25 | 09405..... | 18 | 09472..... | 42 |
| 09071..... | 51 | 09138..... | 44 | 09205..... | 50 | 09272..... | 72 | 09339..... | 24 | 09406..... | 39 | 09473..... | 36 |
| 09072..... | 46 | 09139..... | 49 | 09206..... | 46 | 09273..... | 72 | 09340..... | 25 | 09407..... | 40 | 09474..... | 37 |
| 09073..... | 51 | 09140..... | 44 | 09207..... | 50 | 09274..... | 73 | 09341..... | 24 | 09408..... | 41 | 09475..... | 38 |
| 09074..... | 46 | 09141..... | 49 | 09208..... | 46 | 09275..... | 73 | 09342..... | 25 | 09409..... | 42 | 09476..... | 39 |
| 09075..... | 51 | 09142..... | 44 | 09209..... | 51 | 09276..... | 73 | 09343..... | 24 | 09410..... | 36 | 09477..... | 40 |
| 09076..... | 46 | 09143..... | 49 | 09210..... | 46 | 09277..... | 73 | 09344..... | 25 | 09411..... | 37 | 09478..... | 41 |
| 09077..... | 51 | 09144..... | 44 | 09211..... | 51 | 09278..... | 72 | 09345..... | 24 | 09412..... | 38 | 09479..... | 42 |
| 09078..... | 46 | 09145..... | 49 | 09212..... | 46 | 09279..... | 72 | 09346..... | 25 | 09413..... | 39 | 09480..... | 36 |
| 09079..... | 51 | 09146..... | 44 | 09213..... | 51 | 09280..... | 72 | 09347..... | 24 | 09414..... | 40 | 09481..... | 37 |
| 09080..... | 46 | 09147..... | 49 | 09214..... | 46 | 09281..... | 72 | 09348..... | 25 | 09415..... | 41 | 09482..... | 38 |
| 09081..... | 51 | 09148..... | 44 | 09215..... | 51 | 09282..... | 72 | 09349..... | 24 | 09416..... | 42 | 09483..... | 39 |

EDP Number Index

| EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE | EDP NO. | PAGE |
|------------|------|------------|------|------------|------|------------|------|------------|------|------------|------|------------|------|
| 09484..... | 40 | 09543..... | 36 | 09602..... | 31 | 09661..... | 35 | 09720..... | 30 | 09779..... | 34 | 09838..... | 53 |
| 09485..... | 41 | 09544..... | 37 | 09603..... | 33 | 09662..... | 26 | 09721..... | 32 | 09780..... | 35 | 09839..... | 52 |
| 09486..... | 42 | 09545..... | 38 | 09604..... | 34 | 09663..... | 27 | 09722..... | 33 | 09781..... | 26 | 09840..... | 53 |
| 09487..... | 36 | 09546..... | 39 | 09605..... | 35 | 09664..... | 29 | 09723..... | 34 | 09782..... | 28 | 09841..... | 52 |
| 09488..... | 37 | 09547..... | 40 | 09606..... | 26 | 09665..... | 31 | 09724..... | 35 | 09783..... | 30 | 09842..... | 53 |
| 09489..... | 38 | 09548..... | 41 | 09607..... | 27 | 09666..... | 33 | 09725..... | 26 | 09784..... | 62 | 09843..... | 52 |
| 09490..... | 39 | 09549..... | 42 | 09608..... | 29 | 09667..... | 34 | 09726..... | 28 | 09785..... | 61 | 09844..... | 53 |
| 09491..... | 40 | 09550..... | 36 | 09609..... | 31 | 09668..... | 35 | 09727..... | 30 | 09786..... | 62 | 09845..... | 52 |
| 09492..... | 41 | 09551..... | 37 | 09610..... | 33 | 09669..... | 26 | 09728..... | 32 | 09787..... | 61 | 09846..... | 53 |
| 09493..... | 42 | 09552..... | 38 | 09611..... | 34 | 09670..... | 27 | 09729..... | 33 | 09788..... | 62 | 09847..... | 52 |
| 09494..... | 36 | 09553..... | 39 | 09612..... | 35 | 09671..... | 29 | 09730..... | 34 | 09789..... | 61 | 09848..... | 53 |
| 09495..... | 37 | 09554..... | 40 | 09613..... | 26 | 09672..... | 31 | 09731..... | 35 | 09790..... | 62 | 09849..... | 52 |
| 09496..... | 38 | 09555..... | 41 | 09614..... | 27 | 09673..... | 33 | 09732..... | 26 | 09791..... | 61 | 09850..... | 53 |
| 09497..... | 39 | 09556..... | 42 | 09615..... | 29 | 09674..... | 34 | 09733..... | 28 | 09792..... | 62 | 09851..... | 52 |
| 09498..... | 40 | 09557..... | 36 | 09616..... | 31 | 09675..... | 35 | 09734..... | 30 | 09793..... | 61 | 09852..... | 53 |
| 09499..... | 41 | 09558..... | 37 | 09617..... | 33 | 09676..... | 26 | 09735..... | 32 | 09794..... | 62 | 09853..... | 52 |
| 09500..... | 42 | 09559..... | 38 | 09618..... | 34 | 09677..... | 27 | 09736..... | 33 | 09795..... | 61 | 09854..... | 53 |
| 09501..... | 36 | 09560..... | 39 | 09619..... | 35 | 09678..... | 29 | 09737..... | 34 | 09796..... | 62 | 09855..... | 52 |
| 09502..... | 37 | 09561..... | 40 | 09620..... | 26 | 09679..... | 31 | 09738..... | 35 | 09797..... | 61 | 09856..... | 53 |
| 09503..... | 38 | 09562..... | 41 | 09621..... | 27 | 09680..... | 33 | 09739..... | 26 | 09798..... | 62 | 09857..... | 52 |
| 09504..... | 39 | 09563..... | 42 | 09622..... | 29 | 09681..... | 34 | 09740..... | 28 | 09799..... | 61 | 09858..... | 53 |
| 09505..... | 40 | 09564..... | 36 | 09623..... | 31 | 09682..... | 35 | 09741..... | 30 | 09800..... | 62 | 09859..... | 52 |
| 09506..... | 41 | 09565..... | 37 | 09624..... | 33 | 09683..... | 26 | 09742..... | 32 | 09801..... | 61 | 09860..... | 53 |
| 09507..... | 42 | 09566..... | 38 | 09625..... | 34 | 09684..... | 27 | 09743..... | 33 | 09802..... | 62 | 09861..... | 52 |
| 09508..... | 36 | 09567..... | 39 | 09626..... | 35 | 09685..... | 29 | 09744..... | 34 | 09803..... | 61 | 09862..... | 53 |
| 09509..... | 37 | 09568..... | 40 | 09627..... | 26 | 09686..... | 31 | 09745..... | 35 | 09804..... | 62 | 09863..... | 52 |
| 09510..... | 38 | 09569..... | 41 | 09628..... | 27 | 09687..... | 33 | 09746..... | 26 | 09805..... | 61 | 09864..... | 53 |
| 09511..... | 39 | 09570..... | 42 | 09629..... | 29 | 09688..... | 34 | 09747..... | 28 | 09806..... | 62 | 09865..... | 52 |
| 09512..... | 40 | 09571..... | 36 | 09630..... | 31 | 09689..... | 35 | 09748..... | 30 | 09807..... | 61 | 09866..... | 53 |
| 09513..... | 41 | 09572..... | 37 | 09631..... | 33 | 09690..... | 26 | 09749..... | 32 | 09808..... | 62 | 09867..... | 52 |
| 09514..... | 42 | 09573..... | 38 | 09632..... | 34 | 09691..... | 27 | 09750..... | 33 | 09809..... | 61 | 09868..... | 53 |
| 09515..... | 36 | 09574..... | 39 | 09633..... | 35 | 09692..... | 29 | 09751..... | 34 | 09810..... | 62 | 09869..... | 52 |
| 09516..... | 37 | 09575..... | 40 | 09634..... | 26 | 09693..... | 31 | 09752..... | 35 | 09811..... | 61 | 09870..... | 53 |
| 09517..... | 38 | 09576..... | 41 | 09635..... | 27 | 09694..... | 33 | 09753..... | 26 | 09812..... | 62 | 09871..... | 52 |
| 09518..... | 39 | 09577..... | 42 | 09636..... | 29 | 09695..... | 34 | 09754..... | 28 | 09813..... | 61 | 09872..... | 53 |
| 09519..... | 40 | 09578..... | 36 | 09637..... | 31 | 09696..... | 35 | 09755..... | 30 | 09814..... | 62 | 09873..... | 52 |
| 09520..... | 41 | 09579..... | 37 | 09638..... | 33 | 09697..... | 26 | 09756..... | 32 | 09815..... | 61 | 09874..... | 53 |
| 09521..... | 42 | 09580..... | 38 | 09639..... | 34 | 09698..... | 27 | 09757..... | 33 | 09816..... | 62 | 09875..... | 52 |
| 09522..... | 36 | 09581..... | 39 | 09640..... | 35 | 09699..... | 29 | 09758..... | 34 | 09817..... | 61 | 09876..... | 53 |
| 09523..... | 37 | 09582..... | 40 | 09641..... | 26 | 09700..... | 31 | 09759..... | 35 | 09818..... | 62 | 09877..... | 52 |
| 09524..... | 38 | 09583..... | 41 | 09642..... | 27 | 09701..... | 33 | 09760..... | 26 | 09819..... | 61 | 09878..... | 53 |
| 09525..... | 39 | 09584..... | 42 | 09643..... | 29 | 09702..... | 34 | 09761..... | 28 | 09820..... | 62 | 09879..... | 52 |
| 09526..... | 40 | 09585..... | 36 | 09644..... | 31 | 09703..... | 35 | 09762..... | 30 | 09821..... | 61 | 09880..... | 53 |
| 09527..... | 41 | 09586..... | 37 | 09645..... | 33 | 09704..... | 26 | 09763..... | 32 | 09822..... | 62 | 09881..... | 52 |
| 09528..... | 42 | 09587..... | 38 | 09646..... | 34 | 09705..... | 27 | 09764..... | 33 | 09823..... | 61 | 09882..... | 53 |
| 09529..... | 36 | 09588..... | 39 | 09647..... | 35 | 09706..... | 29 | 09765..... | 34 | 09824..... | 62 | 09883..... | 52 |
| 09530..... | 37 | 09589..... | 40 | 09648..... | 26 | 09707..... | 31 | 09766..... | 35 | 09825..... | 61 | 09884..... | 53 |
| 09531..... | 38 | 09590..... | 41 | 09649..... | 27 | 09708..... | 33 | 09767..... | 26 | 09826..... | 62 | 09885..... | 52 |
| 09532..... | 39 | 09591..... | 42 | 09650..... | 29 | 09709..... | 34 | 09768..... | 28 | 09827..... | 61 | 09886..... | 53 |
| 09533..... | 40 | 09592..... | 36 | 09651..... | 31 | 09710..... | 35 | 09769..... | 30 | 09828..... | 62 | 09887..... | 52 |
| 09534..... | 41 | 09593..... | 37 | 09652..... | 33 | 09711..... | 26 | 09770..... | 32 | 09829..... | 61 | 09888..... | 53 |
| 09535..... | 42 | 09594..... | 38 | 09653..... | 34 | 09712..... | 28 | 09771..... | 33 | 09830..... | 62 | 09889..... | 52 |
| 09536..... | 36 | 09595..... | 31 | 09654..... | 35 | 09713..... | 29 | 09772..... | 34 | 09831..... | 61 | 09890..... | 53 |
| 09537..... | 37 | 09596..... | 33 | 09655..... | 26 | 09714..... | 32 | 09773..... | 35 | 09832..... | 62 | 09891..... | 52 |
| 09538..... | 38 | 09597..... | 34 | 09656..... | 27 | 09715..... | 33 | 09774..... | 26 | 09833..... | 61 | | |
| 09539..... | 39 | 09598..... | 35 | 09657..... | 29 | 09716..... | 34 | 09775..... | 28 | 09834..... | 62 | | |
| 09540..... | 40 | 09599..... | 26 | 09658..... | 31 | 09717..... | 35 | 09776..... | 30 | 09835..... | 61 | | |
| 09541..... | 41 | 09600..... | 27 | 09659..... | 33 | 09718..... | 26 | 09777..... | 32 | 09836..... | 62 | | |
| 09542..... | 42 | 09601..... | 29 | 09660..... | 34 | 09719..... | 28 | 09778..... | 33 | 09837..... | 61 | | |

Decimal Equivalents

Fraction • Number • Letter • Metric Sizes

| INCH | METRIC | DECIMAL EQUIVALENT | INCH | METRIC | DECIMAL EQUIVALENT | INCH | METRIC | DECIMAL EQUIVALENT | INCH | METRIC | DECIMAL EQUIVALENT | INCH | METRIC | DECIMAL EQUIVALENT | INCH | METRIC | DECIMAL EQUIVALENT |
|------|--------|--------------------|------|--------|--------------------|-------|--------|--------------------|-------|--------|--------------------|-------|--------|--------------------|-------|--------|--------------------|
| - | 0,10 | 0.0039 | - | 1,60 | 0.0630 | 9/64 | 3,57 | 0.1406 | #1 | 5,79 | 0.2280 | R | 8,61 | 0.3390 | - | 13,00 | 0.5118 |
| - | 0,20 | 0.0079 | #52 | 1,61 | 0.0635 | - | 3,60 | 0.1417 | - | 5,80 | 0.2283 | - | 8,70 | 0.3425 | 33/64 | 13,10 | 0.5156 |
| - | 0,25 | 0.0098 | - | 1,65 | 0.0650 | #27 | 3,66 | 0.1440 | - | 5,90 | 0.2323 | 11/32 | 8,73 | 0.3438 | 17/32 | 13,49 | 0.5312 |
| - | 0,30 | 0.0118 | #51 | 1,70 | 0.0669 | - | 3,70 | 0.1457 | A | 5,94 | 0.2340 | - | 8,75 | 0.3445 | - | 13,50 | 0.5315 |
| #80 | 0,34 | 0.0135 | - | 1,75 | 0.0689 | #26 | 3,73 | 0.1470 | 15/64 | 5,95 | 0.2344 | - | 8,80 | 0.3465 | 35/64 | 13,89 | 0.5469 |
| - | 0,35 | 0.0138 | #50 | 1,78 | 0.0700 | - | 3,75 | 0.1476 | - | 6,00 | 0.2362 | S | 8,84 | 0.3480 | - | 14,00 | 0.5512 |
| #79 | 0,37 | 0.0145 | - | 1,80 | 0.0709 | #25 | 3,80 | 0.1495 | B | 6,05 | 0.2380 | - | 8,90 | 0.3504 | 9/16 | 14,29 | 0.5625 |
| 1/64 | 0,40 | 0.0156 | #49 | 1,85 | 0.0728 | - | 3,80 | 0.1496 | - | 6,10 | 0.2402 | - | 9,00 | 0.3543 | - | 14,50 | 0.5709 |
| #78 | 0,41 | 0.0160 | - | 1,90 | 0.0748 | #24 | 3,86 | 0.1520 | C | 6,15 | 0.2420 | T | 9,09 | 0.3580 | 37/64 | 14,68 | 0.5781 |
| - | 0,45 | 0.0177 | #48 | 1,93 | 0.0760 | - | 3,90 | 0.1535 | - | 6,20 | 0.2441 | - | 9,10 | 0.3583 | - | 15,00 | 0.5906 |
| #77 | 0,46 | 0.0180 | - | 1,95 | 0.0768 | #23 | 3,91 | 0.1540 | D | 6,25 | 0.2461 | 23/64 | 9,13 | 0.3594 | 19/32 | 15,08 | 0.5938 |
| - | 0,50 | 0.0197 | 5/64 | 1,98 | 0.0781 | 5/32 | 3,97 | 0.1562 | - | 6,30 | 0.2480 | - | 9,20 | 0.3622 | 39/64 | 15,48 | 0.6094 |
| #76 | 0,51 | 0.0200 | #47 | 1,99 | 0.0785 | #22 | 3,99 | 0.1570 | E | 6,35 | 0.2500 | - | 9,25 | 0.3642 | - | 15,50 | 0.6102 |
| #75 | 0,53 | 0.0210 | - | 2,00 | 0.0787 | - | 4,00 | 0.1575 | 1/4 | 6,35 | 0.2500 | - | 9,30 | 0.3661 | 5/8 | 15,88 | 0.6250 |
| - | 0,55 | 0.0217 | - | 2,05 | 0.0807 | #21 | 4,04 | 0.1590 | - | 6,40 | 0.2520 | U | 9,35 | 0.3680 | - | 16,00 | 0.6299 |
| #74 | 0,57 | 0.0225 | #46 | 2,06 | 0.0810 | #20 | 4,09 | 0.1610 | - | 6,50 | 0.2559 | - | 9,40 | 0.3701 | 41/64 | 16,27 | 0.6406 |
| - | 0,60 | 0.0236 | #45 | 2,08 | 0.0820 | - | 4,10 | 0.1614 | F | 6,53 | 0.2570 | - | 9,50 | 0.3740 | - | 16,50 | 0.6496 |
| #73 | 0,61 | 0.0240 | - | 2,10 | 0.0827 | - | 4,20 | 0.1654 | - | 6,60 | 0.2598 | 3/8 | 9,53 | 0.3750 | 21/32 | 16,67 | 0.6562 |
| #72 | 0,64 | 0.0250 | - | 2,15 | 0.0846 | #19 | 4,22 | 0.1660 | G | 6,63 | 0.2610 | V | 9,56 | 0.3770 | - | 17,00 | 0.6693 |
| - | 0,65 | 0.0256 | #44 | 2,18 | 0.0860 | - | 4,25 | 0.1673 | - | 6,70 | 0.2638 | - | 9,60 | 0.3780 | 43/64 | 17,07 | 0.6719 |
| #71 | 0,66 | 0.0260 | - | 2,20 | 0.0866 | - | 4,30 | 0.1693 | 17/64 | 6,75 | 0.2656 | - | 9,70 | 0.3819 | 11/16 | 17,46 | 0.6875 |
| - | 0,70 | 0.0276 | - | 2,25 | 0.0886 | #18 | 4,31 | 0.1695 | H | 6,76 | 0.2660 | - | 9,75 | 0.3839 | - | 17,50 | 0.6890 |
| #70 | 0,71 | 0.0280 | #43 | 2,26 | 0.0890 | 11/64 | 4,37 | 0.1719 | - | 6,80 | 0.2677 | W | 9,80 | 0.3858 | 45/64 | 17,86 | 0.7031 |
| #69 | 0,74 | 0.0292 | - | 2,30 | 0.0906 | #17 | 4,39 | 0.1730 | - | 6,90 | 0.2717 | - | 9,90 | 0.3898 | - | 18,00 | 0.7087 |
| - | 0,75 | 0.0295 | - | 2,35 | 0.0925 | - | 4,40 | 0.1732 | I | 6,91 | 0.2720 | 25/64 | 9,92 | 0.3906 | 23/32 | 18,26 | 0.7188 |
| #68 | 0,79 | 0.0310 | #42 | 2,37 | 0.0935 | #16 | 4,50 | 0.1770 | - | 7,00 | 0.2756 | - | 10,00 | 0.3937 | - | 18,50 | 0.7283 |
| 1/32 | 0,79 | 0.0313 | 3/32 | 2,38 | 0.0938 | - | 4,50 | 0.1772 | J | 7,04 | 0.2770 | X | 10,08 | 0.3970 | 47/64 | 18,65 | 0.7344 |
| - | 0,80 | 0.0315 | - | 2,40 | 0.0945 | #15 | 4,57 | 0.1800 | - | 7,10 | 0.2795 | - | 10,10 | 0.3976 | - | 19,00 | 0.7480 |
| #67 | 0,81 | 0.0320 | #41 | 2,44 | 0.0960 | - | 4,60 | 0.1811 | K | 7,14 | 0.2810 | - | 10,20 | 0.4016 | 3/4 | 19,05 | 0.7500 |
| #66 | 0,84 | 0.0330 | - | 2,45 | 0.0965 | #14 | 4,62 | 0.1820 | 9/32 | 7,14 | 0.2812 | Y | 10,26 | 0.4040 | 49/64 | 19,45 | 0.7656 |
| - | 0,85 | 0.0335 | #40 | 2,50 | 0.0984 | #13 | 4,70 | 0.1850 | - | 7,20 | 0.2835 | - | 10,30 | 0.4055 | - | 19,50 | 0.7677 |
| #65 | 0,89 | 0.0350 | #39 | 2,53 | 0.0995 | - | 4,75 | 0.1870 | - | 7,25 | 0.2854 | 13/32 | 10,32 | 0.4062 | 25/32 | 19,84 | 0.7812 |
| - | 0,90 | 0.0354 | #38 | 2,58 | 0.1015 | 3/16 | 4,76 | 0.1875 | - | 7,30 | 0.2874 | - | 10,40 | 0.4094 | - | 20,00 | 0.7874 |
| #64 | 0,91 | 0.0360 | - | 2,60 | 0.1024 | #12 | 4,80 | 0.1890 | L | 7,37 | 0.2900 | Z | 10,49 | 0.4130 | 51/64 | 20,24 | 0.7969 |
| #63 | 0,94 | 0.0370 | #37 | 2,64 | 0.1040 | #11 | 4,85 | 0.1910 | - | 7,40 | 0.2913 | - | 10,50 | 0.4134 | - | 20,50 | 0.8071 |
| - | 0,95 | 0.0374 | - | 2,70 | 0.1063 | - | 4,90 | 0.1929 | M | 7,49 | 0.2950 | - | 10,60 | 0.4173 | 13/16 | 20,64 | 0.8125 |
| #62 | 0,97 | 0.0380 | #36 | 2,71 | 0.1065 | #10 | 4,91 | 0.1935 | - | 7,50 | 0.2953 | - | 10,70 | 0.4213 | - | 21,00 | 0.8268 |
| #61 | 0,99 | 0.0390 | - | 2,75 | 0.1083 | #9 | 4,98 | 0.1960 | 19/64 | 7,54 | 0.2969 | 27/64 | 10,72 | 0.4219 | 53/64 | 21,03 | 0.8281 |
| - | 1,00 | 0.0394 | 7/64 | 2,78 | 0.1094 | - | 5,00 | 0.1969 | - | 7,60 | 0.2992 | - | 10,80 | 0.4252 | 27/32 | 21,43 | 0.8438 |
| #60 | 1,02 | 0.0400 | #35 | 2,79 | 0.1100 | #8 | 5,05 | 0.1990 | N | 7,67 | 0.3020 | - | 10,90 | 0.4291 | - | 21,50 | 0.8465 |
| #59 | 1,04 | 0.0410 | - | 2,80 | 0.1102 | - | 5,10 | 0.2008 | - | 7,70 | 0.3031 | - | 11,00 | 0.4331 | 55/64 | 21,84 | 0.8594 |
| - | 1,05 | 0.0413 | #34 | 2,82 | 0.1110 | #7 | 5,11 | 0.2010 | - | 7,75 | 0.3051 | - | 11,10 | 0.4370 | - | 22,00 | 0.8661 |
| #58 | 1,07 | 0.0420 | #33 | 2,87 | 0.1130 | 13/64 | 5,16 | 0.2031 | - | 7,80 | 0.3071 | 7/16 | 11,11 | 0.4375 | 7/8 | 22,23 | 0.8750 |
| #57 | 1,09 | 0.0430 | - | 2,90 | 0.1142 | #6 | 5,18 | 0.2040 | - | 7,90 | 0.3110 | - | 11,20 | 0.4409 | - | 22,50 | 0.8858 |
| - | 1,10 | 0.0433 | #32 | 2,95 | 0.1160 | - | 5,20 | 0.2047 | 5/16 | 7,94 | 0.3125 | - | 11,30 | 0.4449 | 57/64 | 22,62 | 0.8906 |
| - | 1,15 | 0.0453 | - | 3,00 | 0.1181 | #5 | 5,22 | 0.2055 | - | 8,00 | 0.3150 | - | 11,40 | 0.4488 | - | 23,00 | 0.9055 |
| #56 | 1,18 | 0.0465 | #31 | 3,05 | 0.1200 | - | 5,25 | 0.2067 | O | 8,03 | 0.3160 | - | 11,50 | 0.4528 | 29/32 | 23,02 | 0.9062 |
| 3/64 | 1,19 | 0.0469 | - | 3,10 | 0.1220 | - | 5,3 | 0.2087 | - | 8,10 | 0.3189 | 29/64 | 11,51 | 0.4531 | 59/64 | 23,42 | 0.9219 |
| - | 1,20 | 0.0472 | 1/8 | 3,18 | 0.1250 | #4 | 5,31 | 0.2090 | - | 8,20 | 0.3228 | - | 11,60 | 0.4567 | - | 23,50 | 0.9252 |
| - | 1,25 | 0.0492 | - | 3,20 | 0.1260 | - | 5,40 | 0.2126 | P | 8,20 | 0.3230 | - | 11,70 | 0.4606 | 15/16 | 23,81 | 0.9375 |
| - | 1,30 | 0.0512 | - | 3,25 | 0.1280 | #3 | 5,41 | 0.2130 | - | 8,25 | 0.3248 | - | 11,80 | 0.4646 | - | 24,00 | 0.9449 |
| #55 | 1,32 | 0.0520 | #30 | 3,26 | 0.1285 | - | 5,50 | 0.2165 | - | 8,30 | 0.3268 | - | 11,90 | 0.4685 | 61/64 | 24,21 | 0.9531 |
| - | 1,35 | 0.0531 | - | 3,30 | 0.1299 | 7/32 | 5,56 | 0.2188 | 21/64 | 8,33 | 0.3281 | 15/32 | 11,91 | 0.4688 | - | 24,50 | 0.9646 |
| #54 | 1,40 | 0.0550 | - | 3,40 | 0.1339 | - | 5,60 | 0.2205 | - | 8,40 | 0.3307 | - | 12,00 | 0.4724 | 31/32 | 24,61 | 0.9688 |
| #53 | 1,51 | 0.0595 | #29 | 3,45 | 0.1360 | #2 | 5,61 | 0.2210 | Q | 8,43 | 0.3320 | 31/64 | 12,30 | 0.4844 | - | 25,00 | 0.9843 |
| - | 1,55 | 0.0610 | - | 3,50 | 0.1378 | - | 5,70 | 0.2244 | - | 8,50 | 0.3346 | - | 12,50 | 0.4921 | 63/64 | 25,00 | 0.9844 |
| 1/16 | 1,59 | 0.0625 | #28 | 3,57 | 0.1405 | - | 5,75 | 0.2264 | - | 8,60 | 0.3386 | 1/2 | 12,70 | 0.5000 | 1 | 25,40 | 1.0000 |

Hardness Conversion Chart

| ROCKWELL HARDNESS (HRb) | ROCKWELL HARDNESS (HRc) | BRINELL HARDNESS (HB) | VICKERS HARDNESS (HV) | TENSILE STRENGTH (N/mm ²) | PSI (1000lb/in ²) |
|-------------------------------|-------------------------------|-----------------------------|-----------------------------|---|----------------------------------|
| 67 | — | 121 | 122 | 401 | 58 |
| 70 | — | 126 | 127 | 432 | 63 |
| 73 | — | 132 | 132 | 448 | 65 |
| 75 | — | 136 | 137 | 455 | 66 |
| 77 | — | 140 | 143 | 463 | 67 |
| 80 | — | 147 | 150 | 479 | 69 |
| 82 | — | 153 | 156 | 494 | 72 |
| 84 | — | 159 | 163 | 525 | 76 |
| 86 | — | 165 | 171 | 540 | 78 |
| 89 | — | 177 | 178 | 556 | 81 |
| 91 | — | 186 | 188 | 602 | 88 |
| 93 | — | 197 | 196 | 632 | 92 |
| 96 | — | 216 | 212 | 664 | 97 |
| 97 | — | 223 | 218 | 695 | 101 |
| 98 | 21 | 230 | 234 | 756 | 110 |
| — | 22 | 236 | 241 | 772 | 112 |
| — | 23 | 242 | 247 | 787 | 114 |
| — | 24 | 248 | 255 | 818 | 118 |
| — | 25 | 254 | 261 | 849 | 123 |
| — | 27 | 266 | 269 | 865 | 125 |
| — | 28 | 272 | 275 | 895 | 130 |
| — | 29 | 278 | 284 | 911 | 132 |
| — | 30 | 284 | 292 | 942 | 136 |
| — | 31 | 293 | 300 | 973 | 141 |
| — | 32 | 302 | 308 | 988 | 143 |
| — | 33 | 310 | 318 | 1019 | 147 |
| — | 34 | 319 | 327 | 1050 | 152 |
| — | 35 | 328 | 337 | 1096 | 159 |
| — | 37 | 345 | 349 | 1127 | 163 |
| — | 38 | 353 | 359 | 1158 | 168 |
| — | 39 | 362 | 370 | 1189 | 172 |
| — | 40 | 370 | 381 | 1235 | 179 |
| — | 41 | 381 | 395 | 1266 | 183 |
| — | 42 | 391 | 408 | 1312 | 190 |
| — | 44 | 411 | 422 | 1359 | 197 |
| — | 45 | 422 | 437 | 1420 | 206 |
| — | 46 | 433 | 452 | 1467 | 212 |
| — | 48 | 455 | 470 | 1513 | 219 |
| — | 50 | 479 | 497 | 1559 | 226 |
| — | 51 | 485 | 517 | 1621 | 235 |
| — | 52 | 497 | 532 | 1668 | 241 |
| — | 54 | — | 573 | 1729 | 250 |
| — | 56 | — | 609 | 1807 | 262 |
| — | 57 | — | 630 | 1884 | 273 |
| — | 59 | — | 670 | 1961 | 284 |
| — | 60 | — | 698 | 2039 | 295 |
| — | 61 | — | 725 | — | — |
| — | 62 | — | 740 | — | — |
| — | 63 | — | 780 | — | — |
| — | 64 | — | 812 | — | — |
| — | 65 | — | 847 | — | — |
| — | 66 | — | 885 | — | — |
| — | 67 | — | 926 | — | — |
| — | 68 | — | 971 | — | — |

Conversions from each scale are approximate

SOLUTIONS AROUND THE GLOBE

KYOCERA SGS Precision Tools is an ISO 9001:2015 Certified leader of round solid carbide cutting tool technology for the aerospace, metalworking, and automotive industries with manufacturing sites in the United States and United Kingdom. Our global network of Sales Representatives, Industrial Distributors, and Agents blanket the world selling into more than 60 countries.

LEADERS IN SOLID CARBIDE TOOL TECHNOLOGY

Brand names such as Z-Carb, S-Carb®, V-Carb, Hi-PerCarb®, Multi-Carb have become synonymous with high performance tooling in the machining and metalworking industry.

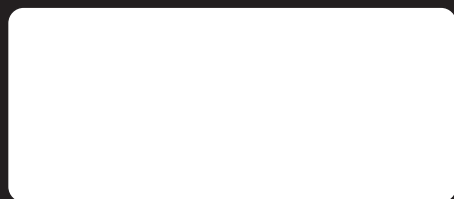
We're proud to have pioneered some of the world's most advanced cutting technology right here on our Northeast Ohio manufacturing campus. KSPT high performance end mills, drills and routers are increasing productivity and reducing cost around the world.

EXCEEDING CUSTOMER EXPECTATIONS

As the world's manufacturing needs change, so does KSPT. It's all about the science, starting with our lab inspected substrate materials to our tool designs and coatings. Our exceptional team of researchers, engineers, and machinists are dedicated to developing the absolute best and delivering the ultimate Value at the spindle®.

- Incredible batch-to-batch consistency
- Metallurgical lab dedicated to testing and rigorous quality control
- ISO 9001:2015 Certified quality procedures
- Patented geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality—even at extreme parameters
- Specialists in extreme and demanding product applications
- Comprehensive tooling services
- Experienced Field Sales Engineers who work to optimize a tool for your particular application
- Dedicated multi-lingual customer service representatives

SGS PRODUCTS ARE DISTRIBUTED BY:



www.sgsmicrotools.com

MICRO
SGS[®]
Solid Carbide Tools



UNITED STATES OF AMERICA

KYOCERA SGS Precision Tools
150 Marc Drive
Cuyahoga Falls, Ohio 44223 U.S.A.
customer service -
US and Canada: (330) 686-5700
fax - US & Canada: (800) 447-4017
international fax: (330) 686-2146
orders: sales@kyocera-sgstool.com
web: www.kyocera-sgstool.com

UNITED KINGDOM

KYOCERA SGS Precision Tools Europe Ltd.
10 Ashville Way
Wokingham, Berkshire
RG41 2PL England
phone: (44) 1189-795-200
fax: (44) 1189-795-295
e-mail: SalesEU@kyocera-sgstool.com
web: www.kyocera-sgstool.co.uk

JAPAN

KYOCERA Corporation
International Sales Dept.
6 Takeda Tobadono-cho,
Fushimi-ku, Kyoto 612-8501, Japan
phone: +81-75-604-3473
fax: +81-75-604-3472
web: global.kyocera.com/prdct/tool/index.html

COMMERCIAL OFFICES

EASTERN EUROPE

SINTCOM
Sintcom Tools
95 Arsenalski Blvd.
1421 Sofia, Bulgaria
phone: (359) 283-64421
fax: (359) 286-52493
e-mail: sintcom@sintcomtools.com

FRANCE

DOGA-KSPTE FRANCE
8, Avenue Gutenberg
78310 Maurepas, France
phone: +33 (0) 1 30 66 41 64
fax: +33 (0) 1 30 66 41 49
e-mail: KSPTF@kyocera-sgstool.com
web: www.doga.fr

GERMANY

KADIGO Tool Systems GmbH
Walramster. 27
65510 Idstein, Germany
phone: +49-212-645573-0
fax: +49-212-38089693
e-mail: info@kadigo-ts.com

INDIA

KYOCERA Asia Pacific India Pvt. Ltd
Plot No.51, Phase-I,
Udyog Vihar Gurgaon 122016,
Haryana, India
phone: +91-124-4025022
fax: +91-124-4025001

KOREA

KYOCERA Precision Tools Korea Co., Ltd.
2LT 69BL, Namdong Industrial Estate,
638-1, Kozan-Dong, Namdong Incheon,
Korea
phone: +82-32-821-8365
fax: +82-32-821-8369
web: www.kptk.co.kr/

POLAND

KYOCERA SGS Precision Tools
phone: +48 530 432 002
e-mail: SalesEU@kyocera-sgstool.com

RUSSIA

HALTEC
phone: (7) 495-252-05-00
e-mail: info@haltec.ru
web: www.haltec.ru

SPAIN

KYOCERA SGS Precision Tools IBERICA
e-mail: SalesEU@kyocera-sgstool.com

THAILAND

KYOCERA Asia Pacific (Thailand) Co., Ltd.
1 Capital Work Place Building
7th Floor, Soi Chamchan, Sukhumvit
55 Road, Klongton Nua, Wattana,
Bangkok 10110, Thailand
phone: +66-2-030-6688
fax: +66-2-030-6600

SINGAPORE

KYOCERA Asia Pacific Pte. Ltd.
298 Tiong Bahru Road, #13-03/05 Central Plaza,
Singapore 168730
phone: +65-6373-6700
fax: +65-6271-0600
web: asia.kyocera.com/products/cuttingtools/
index.html

CHINA

KYOCERA (China) Sales & Trading Corporation
Room 140, Building A3, Daning Central Square,
No. 700 Wanrong Road,
Zhabei District, Shanghai, 200072,
P.R. China
phone: +86-21-3660-7711
fax: +86-21-568-6200
web: www.kyocera.com.cn/prdct/cuttingtool

