# High Performance Milling

## Solid Carbide Metalworking Solutions

www.onsrud.com

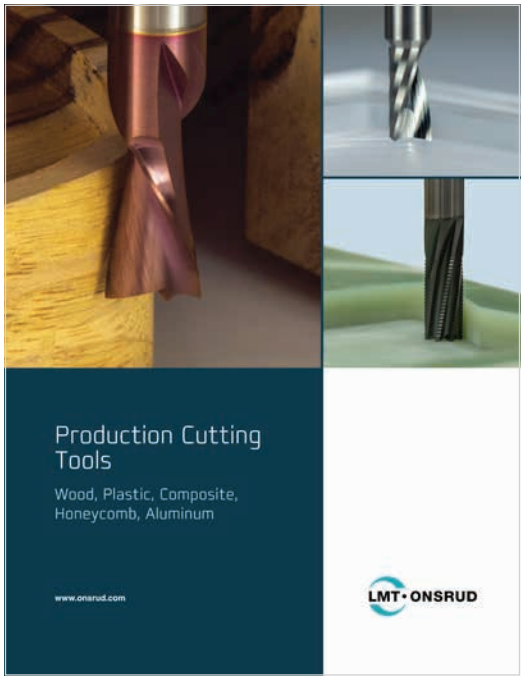
LMT • ONSRUD

Since our beginning over 75 years ago, LMT Onsrud has endeavored to innovate and to develop the best cutting tool solutions in the market. LMT Onsrud is recognized as a leading manufacturer of solid round tooling for a wide range of materials from plastics to composites to exotic metals.

Today our promise remains the same - to consistently provide premium cutting tool solutions to meet your needs and to provide exceptional support throughout all phases of planning, development and production.

**Materials Cut:**

- Composites
- Exotic Metals
- Honeycomb
- Non-Ferrous Metals
- Plastics and Acrylics
- Solid Surface
- Stainless Steels
- Wood and Composite Woods




**LMT Onsrud**
Production Cutting Tools


**LMT Onsrud**
High Performance Milling

## High Performance Milling Tools

### End Mills for Aluminum (ISO N)



### Universal End Mills for ISO P, K, M, S



### End Mills for Nickel-Based Alloys (ISO S)



### End Mills for Titanium (ISO S)



### End Mills for 5-Axis Milling



### End Mills for Hardened Steel (ISO H)



### Technical Information

See Page 96

# Icon Selection

## Point Geometry

- Square Corner
- Corner Radius
- Ballnose
- Corner Chamfer

## Helix Angle

- 36-38 degree dual helix angle
- 40 degree helix angle
- 38 degree helix angle
- 36 degree helix angle
- 30 degree helix angle
- 38-39 degree dual helix angle
- 35-36 degree dual helix angle
- 39-41 degree dual helix angle
- 45 degree helix angle

## Shank Tolerance

- h6 Shank Tolerance

## Application

- Trochoidal milling
- Slotting
- Copying

## Tool Material

- SC Solid Carbide

## Coating

- ZRN ZRN
- ESG ESG
- ESR ESR
- X X
- DLC DLC

## Flutes

- Z=2 2 flute
- Z=3 3 flute
- Z=4 4 flute
- Z=5 5 flute
- Z=7 7 flute
- Z=9 9 flute
- Z=11 11 flute

## Coolant

- Coolant Through

NEW

# AMP Series

AMP Series end mills are designed to machine ISO N, non-ferrous materials. They excel in semi-finishing and finishing applications and produce exceptional floor and wall finishes. The free cutting geometry provides efficient chip evacuation and low horsepower consumption.

**Features and Benefits**

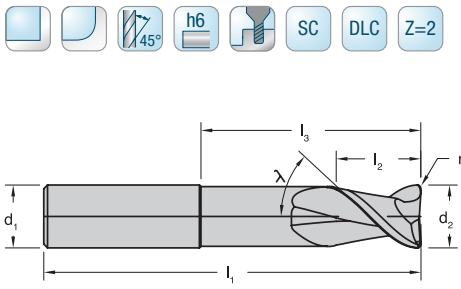
- Optimized cutting geometry for chatter free machining and improved part finish
- Enhanced flute shape improves rigidity and chip evacuation
- Premium carbide substrate provides increased wear resistance
- Optional high hardness PVD coating for extreme tool life

**Applications**

- Slotting
- Pocketing
- Profiling
- Finishing

**Usage**

- ISO N Non-Ferrous
- Aluminum
- Brass
- Bronze
- Copper




| | | Uncoated | DLC |
|---|---|---|---|
| P | | | |
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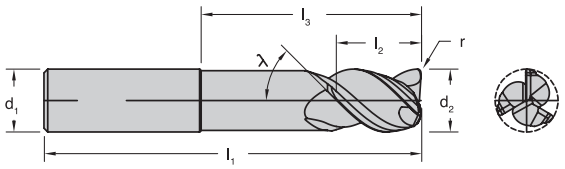
| K | | | |
| N | | ■ | ■ |
| S | | | |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | DLC Ident No. | DLC SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| APS-2 | 1/8 | 1/4 | 2 | - | 1/8 | 2 | Square | AMP400002 | 2658151 | AMP400003 | 2658152 |
| APM-2 | 1/8 | 1/2 | 2 | - | 1/8 | 2 | Square | AMP400020 | 2658169 | AMP400021 | 2658170 |
| APS-2 | 1/4 | 3/8 | 2 | - | 1/4 | 2 | Square | AMP700102 | 2658229 | AMP700103 | 2658230 |
| APS-2 | 1/4 | 3/8 | 2 | - | 1/4 | 2 | 0.015 | AMP700106 | 2658231 | AMP700107 | 2658232 |
| APS-2 | 1/4 | 3/8 | 2 | - | 1/4 | 2 | 0.030 | AMP700110 | 2658233 | AMP700111 | 2658234 |
| APM-2 | 1/4 | 3/4 | 2 | - | 1/4 | 2 | Square | AMP700752 | 2658313 | AMP700753 | 2658314 |
| APM-2 | 1/4 | 3/4 | 2 | - | 1/4 | 2 | 0.015 | AMP700756 | 2658315 | AMP700757 | 2658316 |
| APM-2 | 1/4 | 3/4 | 2 | - | 1/4 | 2 | 0.030 | AMP700760 | 2658317 | AMP700761 | 2658318 |
| APS-2 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 2 | Square | AMP700202 | 2658241 | AMP700203 | 2658242 |
| APS-2 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 2 | 0.030 | AMP700210 | 2658245 | AMP700211 | 2658246 |
| APS-2 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 2 | 0.060 | AMP700214 | 2658247 | AMP700215 | 2658248 |
| APM-2 | 3/8 | 1 | 2 1/2 | - | 3/8 | 2 | Square | AMP700852 | 2658325 | AMP700853 | 2658326 |
| APM-2 | 3/8 | 1 | 2 1/2 | - | 3/8 | 2 | 0.030 | AMP700860 | 2658329 | AMP700861 | 2658330 |
| APM-2 | 3/8 | 1 | 2 1/2 | - | 3/8 | 2 | 0.060 | AMP700864 | 2658331 | AMP700865 | 2658332 |
| APS-2 | 1/2 | 5/8 | 3 | - | 1/2 | 2 | Square | AMP700302 | 2658255 | AMP700303 | 2658256 |
| APS-2 | 1/2 | 5/8 | 3 | - | 1/2 | 2 | 0.030 | AMP700310 | 2658259 | AMP700311 | 2658260 |
| APS-2 | 1/2 | 5/8 | 3 | - | 1/2 | 2 | 0.060 | AMP700314 | 2658261 | AMP700315 | 2658262 |
| APM-2 | 1/2 | 1 1/4 | 3 | - | 1/2 | 2 | Square | AMP700952 | 2658339 | AMP700953 | 2658340 |
| APM-2 | 1/2 | 1 1/4 | 3 | - | 1/2 | 2 | 0.030 | AMP700960 | 2658343 | AMP700961 | 2658344 |
| APM-2 | 1/2 | 1 1/4 | 3 | - | 1/2 | 2 | 0.060 | AMP700964 | 2658345 | AMP700965 | 2658346 |
| APS-2 | 3/4 | 1 | 3 | - | 3/4 | 2 | Square | AMP700502 | 2658283 | AMP700503 | 2658284 |
| APS-2 | 3/4 | 1 | 3 | - | 3/4 | 2 | 0.030 | AMP700510 | 2658285 | AMP700511 | 2658286 |
| APS-2 | 3/4 | 1 | 3 | - | 3/4 | 2 | 0.120 | AMP700522 | 2658291 | AMP700523 | 2658292 |
| APM-2 | 3/4 | 1 5/8 | 4 | - | 3/4 | 2 | Square | AMP701152 | 2658367 | AMP701153 | 2658368 |
| APM-2 | 3/4 | 1 5/8 | 4 | - | 3/4 | 2 | 0.030 | AMP701160 | 2658369 | AMP701161 | 2658370 |
| APM-2 | 3/4 | 1 5/8 | 4 | - | 3/4 | 2 | 0.120 | AMP701172 | 2658375 | AMP701173 | 2658376 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice


| | | Uncoated | DLC |
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| P | | | |
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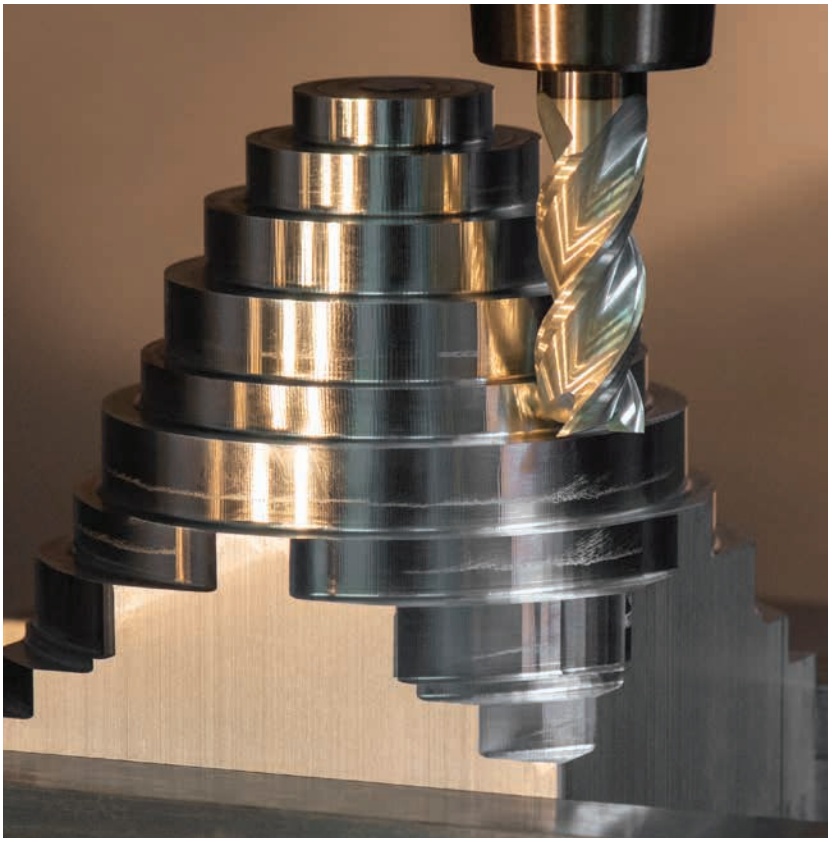
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | DLC Ident No. | DLC SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| APS-3 | 1/8 | 1/4 | 2 | - | 1/8 | 3 | Square | AMP400038 | 2658187 | AMP400039 | 2658188 |
| APM-3 | 1/8 | 1/2 | 2 | - | 1/8 | 3 | Square | AMP400056 | 2658205 | AMP400057 | 2658206 |
| APS-3 | 3/16 | 5/16 | 2 | - | 3/16 | 3 | Square | AMP400044 | 2658193 | AMP400045 | 2658194 |
| APM-3 | 3/16 | 9/16 | 2 1/2 | - | 3/16 | 3 | Square | AMP400062 | 2658211 | AMP400063 | 2658212 |
| APL-3 | 3/16 | 7/8 | 2 1/2 | - | 3/16 | 3 | Square | AMP400078 | 2658223 | AMP400079 | 2658224 |
| APS-3 | 1/4 | 3/8 | 2 | - | 1/4 | 3 | Square | AMP703102 | 2658481 | AMP703103 | 2658482 |
| APS-3 | 1/4 | 3/8 | 2 | - | 1/4 | 3 | 0.015 | AMP703106 | 2658483 | AMP703107 | 2658484 |
| APS-3 | 1/4 | 3/8 | 2 | - | 1/4 | 3 | 0.030 | AMP703110 | 2658485 | AMP703111 | 2658486 |
| APS-3 | 1/4 | 3/8 | 2 | - | 1/4 | 3 | 0.060 | AMP703114 | 2658487 | AMP703115 | 2658488 |
| APM-3 | 1/4 | 3/4 | 2 | - | 1/4 | 3 | Square | AMP703752 | 2658570 | AMP703753 | 2658571 |
| APM-3 | 1/4 | 3/4 | 2 | - | 1/4 | 3 | 0.015 | AMP703756 | 2658572 | AMP703757 | 2658573 |
| APM-3 | 1/4 | 3/4 | 2 | - | 1/4 | 3 | 0.030 | AMP703760 | 2658574 | AMP703761 | 2658575 |
| APM-3 | 1/4 | 3/4 | 2 | - | 1/4 | 3 | 0.060 | AMP703764 | 2658576 | AMP703765 | 2658577 |
| APS-3 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 3 | Square | AMP703202 | 2658493 | AMP703203 | 2658494 |
| APS-3 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 3 | 0.015 | AMP703206 | 2658495 | AMP703207 | 2658496 |
| APS-3 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 3 | 0.030 | AMP703210 | 2658497 | AMP703211 | 2658498 |
| APS-3 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 3 | 0.060 | AMP703214 | 2658499 | AMP703215 | 2658500 |
| APS-3 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 3 | 0.120 | AMP703222 | 2658503 | AMP703223 | 2658504 |
| APM-3 | 3/8 | 1 | 2 1/2 | - | 3/8 | 3 | Square | AMP703852 | 2658582 | AMP703853 | 2658583 |
| APM-3 | 3/8 | 1 | 2 1/2 | - | 3/8 | 3 | 0.015 | AMP703856 | 2658584 | AMP703857 | 2658585 |
| APM-3 | 3/8 | 1 | 2 1/2 | - | 3/8 | 3 | 0.030 | AMP703860 | 2658586 | AMP703861 | 2658587 |
| APM-3 | 3/8 | 1 | 2 1/2 | - | 3/8 | 3 | 0.060 | AMP703864 | 2658588 | AMP703865 | 2658589 |
| APM-3 | 3/8 | 1 | 2 1/2 | - | 3/8 | 3 | 0.120 | AMP703872 | 2658592 | AMP703873 | 2658593 |
| APS-3 | 1/2 | 5/8 | 3 | - | 1/2 | 3 | Square | AMP703302 | 2658507 | AMP703303 | 2658508 |
| APS-3 | 1/2 | 5/8 | 3 | - | 1/2 | 3 | 0.015 | AMP703306 | 2658509 | AMP703307 | 2658510 |
| APS-3 | 1/2 | 5/8 | 3 | - | 1/2 | 3 | 0.030 | AMP703310 | 2658511 | AMP703311 | 2658512 |
| APS-3 | 1/2 | 5/8 | 3 | - | 1/2 | 3 | 0.060 | AMP703314 | 2658513 | AMP703315 | 2658514 |
| APS-3 | 1/2 | 5/8 | 3 | - | 1/2 | 3 | 0.120 | AMP703322 | 2658517 | AMP703323 | 2658518 |
| APM-3 | 1/2 | 1 1/4 | 3 | - | 1/2 | 3 | Square | AMP703952 | 2658596 | AMP703953 | 2658597 |
| APM-3 | 1/2 | 1 1/4 | 3 | - | 1/2 | 3 | 0.015 | AMP703956 | 2658598 | AMP703957 | 2658599 |
| APM-3 | 1/2 | 1 1/4 | 3 | - | 1/2 | 3 | 0.030 | AMP703960 | 2658600 | AMP703961 | 2658601 |
| APM-3 | 1/2 | 1 1/4 | 3 | - | 1/2 | 3 | 0.060 | AMP703964 | 2658602 | AMP703965 | 2658603 |
| APM-3 | 1/2 | 1 1/4 | 3 | - | 1/2 | 3 | 0.120 | AMP703972 | 2658606 | AMP703973 | 2658607 |
| APS-3 | 3/4 | 1 | 3 | - | 3/4 | 3 | Square | AMP703502 | 2658539 | AMP703503 | 2658540 |
| APS-3 | 3/4 | 1 | 3 | - | 3/4 | 3 | 0.030 | AMP703510 | 2658542 | AMP703511 | 2658543 |
| APS-3 | 3/4 | 1 | 3 | - | 3/4 | 3 | 0.120 | AMP703522 | 2658548 | AMP703523 | 2658549 |
| APM-3 | 3/4 | 1 5/8 | 4 | - | 3/4 | 3 | Square | AMP704152 | 2658628 | AMP704153 | 2658629 |
| APM-3 | 3/4 | 1 5/8 | 4 | - | 3/4 | 3 | 0.030 | AMP704160 | 2658630 | AMP704161 | 2658631 |
| APM-3 | 3/4 | 1 5/8 | 4 | - | 3/4 | 3 | 0.120 | AMP704172 | 2658636 | AMP704173 | 2658637 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice

# Aluminum Finisher (AF) Series

The AF Series of end mills are optimized for slotting and finishing non-ferrous materials.



**Features and Benefits**

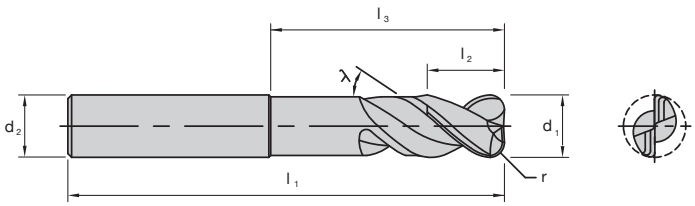
- 2 flute tools with open flute geometry optimized for slotting applications.
- 3 flute tools with large “sweet spot” for chatter free machining at high RPM and heavy cuts.
- Chip former on flute face for optimal chip removal. Heat and chips on deep pocket applications.
- Reduced chatter will increase tool life, produce a higher quality part and optimize cutting efficiencies.
- Polished flutes for better chip removal and low HP requirements.
- Industry’s largest selection of corner radii and neck and flute lengths in a standard program.
- Available uncoated with high polished flutes and specialty ZRN coatings for Aluminum.

**Applications**

- Slotting
- Pocketing
- Profiling
- High Material Removal

**Usage**

- ISO N Non-Ferrous
- Aluminum
- Brass
- Bronze
- Copper


| | | Uncoated | ZRN |
|---|---|---|---|
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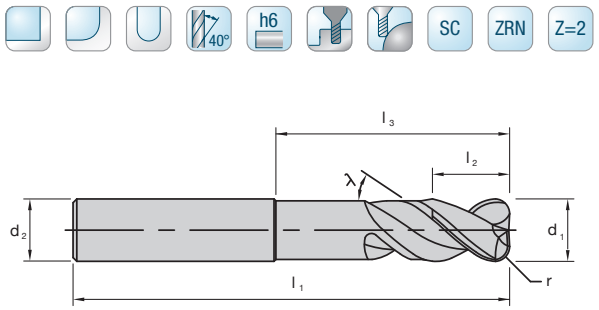
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFS-2 | 1/8 | 1/4 | 2 | – | 1/8 | 2 | Square | AMC400002 | 7088758 | AMC400003 | 2607633 |
| AFS-2 | 1/8 | 1/4 | 2 | – | 1/8 | 2 | 0.010 | AMC400004 | 2601592 | AMC400005 | 2607634 |
| AFS-2 | 1/8 | 1/4 | 2 | – | 1/8 | 2 | Ball | AMC400006 | 2601593 | AMC400007 | 2607635 |
| AFM-2 | 1/8 | 1/2 | 2 | – | 1/8 | 2 | Square | AMC400020 | 7088759 | AMC400021 | 2607642 |
| AFM-2 | 1/8 | 1/2 | 2 | – | 1/8 | 2 | 0.010 | AMC400022 | 2601600 | AMC400023 | 2607643 |
| AFM-2 | 1/8 | 1/2 | 2 | – | 1/8 | 2 | Ball | AMC400024 | 2601601 | AMC400025 | 2607644 |
| AFS-2 | 3/16 | 5/16 | 2 | – | 3/16 | 2 | Square | AMC400008 | 2601594 | AMC400009 | 2607636 |
| AFS-2 | 3/16 | 5/16 | 2 | – | 3/16 | 2 | 0.010 | AMC400010 | 2601595 | AMC400011 | 2607637 |
| AFS-2 | 3/16 | 5/16 | 2 | – | 3/16 | 2 | Ball | AMC400012 | 2601596 | AMC400013 | 2607638 |
| AFM-2 | 3/16 | 9/16 | 2 1/2 | – | 3/16 | 2 | Square | AMC400026 | 2601602 | AMC400027 | 2607645 |
| AFM-2 | 3/16 | 9/16 | 2 1/2 | – | 3/16 | 2 | 0.010 | AMC400028 | 2601603 | AMC400029 | 2607646 |
| AFM-2 | 3/16 | 9/16 | 2 1/2 | – | 3/16 | 2 | Ball | AMC400030 | 2601604 | AMC400031 | 2607647 |
| AFS-2 | 1/4 | 3/8 | 2 | – | 1/4 | 2 | Square | AMC700102 | 2826586 | AMC700103 | 2601626 |
| AFS-2 | 1/4 | 3/8 | 2 | – | 1/4 | 2 | 0.015 | AMC700106 | 2601627 | AMC700107 | 2601628 |
| AFS-2 | 1/4 | 3/8 | 2 | – | 1/4 | 2 | 0.030 | AMC700110 | 2601629 | AMC700111 | 2601630 |
| AFS-2 | 1/4 | 3/8 | 2 | – | 1/4 | 2 | 0.060 | AMC700114 | 2601631 | AMC700115 | 2601632 |
| AFS-2 | 1/4 | 3/8 | 2 | – | 1/4 | 2 | 0.090 | AMC700118 | 2601633 | AMC700119 | 2601634 |
| AFS-2 | 1/4 | 3/8 | 2 | – | 1/4 | 2 | Ball | AMC700138 | 2601635 | AMC700139 | 2601636 |
| AFM-2 | 1/4 | 3/4 | 2 | – | 1/4 | 2 | Square | AMC700752 | 2826587 | AMC700753 | 2601722 |
| AFM-2 | 1/4 | 3/4 | 2 | – | 1/4 | 2 | 0.015 | AMC700756 | 2601723 | AMC700757 | 2601724 |
| AFM-2 | 1/4 | 3/4 | 2 | – | 1/4 | 2 | 0.030 | AMC700760 | 2823368 | AMC700761 | 2601725 |
| AFM-2 | 1/4 | 3/4 | 2 | – | 1/4 | 2 | 0.060 | AMC700764 | 2601726 | AMC700765 | 2601727 |
| AFM-2 | 1/4 | 3/4 | 2 | – | 1/4 | 2 | 0.090 | AMC700768 | 2601728 | AMC700769 | 2601729 |
| AFM-2 | 1/4 | 3/4 | 2 | – | 1/4 | 2 | Ball | AMC700788 | 2601730 | AMC700789 | 2601731 |
| AFL-2 | 1/4 | 1 1/4 | 2 1/2 | – | 1/4 | 2 | Square | AMC701402 | 2601818 | AMC701403 | 2601819 |
| AFL-2 | 1/4 | 1 1/4 | 2 1/2 | – | 1/4 | 2 | 0.015 | AMC701406 | 2601820 | AMC701407 | 2601821 |
| AFL-2 | 1/4 | 1 1/4 | 2 1/2 | – | 1/4 | 2 | 0.030 | AMC701410 | 2601822 | AMC701411 | 2601823 |
| AFL-2 | 1/4 | 1 1/4 | 2 1/2 | – | 1/4 | 2 | 0.060 | AMC701414 | 2601824 | AMC701415 | 2601825 |
| AFL-2 | 1/4 | 1 1/4 | 2 1/2 | – | 1/4 | 2 | 0.090 | AMC701418 | 2601826 | AMC701419 | 2601827 |
| AFL-2 | 1/4 | 1 1/4 | 2 1/2 | – | 1/4 | 2 | Ball | AMC701438 | 2601828 | AMC701439 | 2601829 |
| AFNS-2 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 2 | Square | AMC706102 | 7088749 | AMC706103 | 2602362 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice

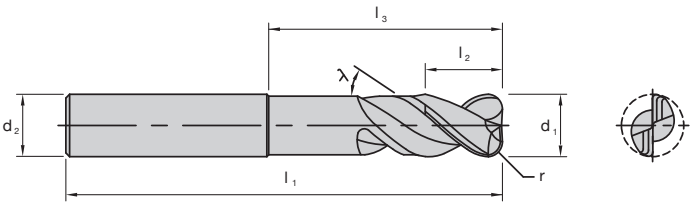



| | Uncoated | ZRN |
|---|---|---|
| P | | |
| M | | |
| K | | |
| N | ■ | ■ |
| S | | |
| H | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFNS-2 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 2 | 0.015 | AMC706106 | 2602363 | AMC706107 | 2602364 |
| AFNS-2 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 2 | 0.030 | AMC706110 | 2602365 | AMC706111 | 2602366 |
| AFNS-2 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 2 | 0.060 | AMC706114 | 2602367 | AMC706115 | 2602368 |
| AFNS-2 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 2 | Ball | AMC706138 | 2602371 | AMC706139 | 2602372 |
| AFNM-2 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 2 | Square | AMC706752 | 7088752 | AMC706753 | 2602459 |
| AFNM-2 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 2 | 0.015 | AMC706756 | 2602460 | AMC706757 | 2602461 |
| AFNM-2 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 2 | 0.030 | AMC706760 | 2602462 | AMC706761 | 2602463 |
| AFNM-2 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 2 | 0.060 | AMC706764 | 2602464 | AMC706765 | 2602465 |
| AFNM-2 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 2 | Ball | AMC706788 | 2602468 | AMC706789 | 2602469 |
| AFNL-2 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 2 | Square | AMC707402 | 2602556 | AMC707403 | 2602557 |
| AFNL-2 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 2 | 0.015 | AMC707406 | 2602558 | AMC707407 | 2602559 |
| AFNL-2 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 2 | 0.030 | AMC707410 | 2602560 | AMC707411 | 2602561 |
| AFNL-2 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 2 | 0.060 | AMC707414 | 2602562 | AMC707415 | 2602563 |
| AFNL-2 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 2 | Ball | AMC707438 | 2602566 | AMC707439 | 2602567 |
| AFS-2 | 5/16 | 9/16 | 2 1/2 | – | 5/16 | 2 | Square | AMC400014 | 2601597 | AMC400015 | 2607639 |
| AFS-2 | 5/16 | 9/16 | 2 1/2 | – | 5/16 | 2 | 0.015 | AMC400016 | 2601598 | AMC400017 | 2607640 |
| AFS-2 | 5/16 | 9/16 | 2 1/2 | – | 5/16 | 2 | Ball | AMC400018 | 2601599 | AMC400019 | 2607641 |
| AFM-2 | 5/16 | 13/16 | 2 1/2 | – | 5/16 | 2 | Square | AMC400032 | 2601605 | AMC400033 | 2607648 |
| AFM-2 | 5/16 | 13/16 | 2 1/2 | – | 5/16 | 2 | 0.015 | AMC400034 | 2601606 | AMC400035 | 2607649 |
| AFM-2 | 5/16 | 13/16 | 2 1/2 | – | 5/16 | 2 | Ball | AMC400036 | 2601607 | AMC400037 | 2607650 |
| AFS-2 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 2 | Square | AMC700202 | 2826588 | AMC700203 | 2601637 |
| AFS-2 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 2 | 0.015 | AMC700206 | 2601638 | AMC700207 | 2601639 |
| AFS-2 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 2 | 0.030 | AMC700210 | 2601640 | AMC700211 | 2601641 |
| AFS-2 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 2 | 0.060 | AMC700214 | 2601642 | AMC700215 | 2601643 |
| AFS-2 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 2 | 0.090 | AMC700218 | 2601644 | AMC700219 | 2601645 |
| AFS-2 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 2 | 0.120 | AMC700222 | 2601646 | AMC700223 | 2601647 |
| AFS-2 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 2 | Ball | AMC700238 | 2601650 | AMC700239 | 2601651 |
| AFM-2 | 3/8 | 1 | 2 1/2 | – | 3/8 | 2 | Square | AMC700852 | 2601732 | AMC700853 | 2826589 |
| AFM-2 | 3/8 | 1 | 2 1/2 | – | 3/8 | 2 | 0.015 | AMC700856 | 2601733 | AMC700857 | 2601734 |
| AFM-2 | 3/8 | 1 | 2 1/2 | – | 3/8 | 2 | 0.030 | AMC700860 | 2601735 | AMC700861 | 2601736 |
| AFM-2 | 3/8 | 1 | 2 1/2 | – | 3/8 | 2 | 0.060 | AMC700864 | 2601737 | AMC700865 | 2601738 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice


| | | Uncoated | ZRN |
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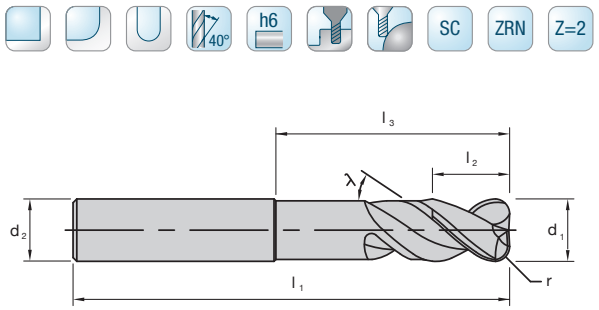
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFM-2 | 3/8 | 1 | 2 1/2 | – | 3/8 | 2 | 0.090 | AMC700868 | 2601739 | AMC700869 | 2601740 |
| AFM-2 | 3/8 | 1 | 2 1/2 | – | 3/8 | 2 | 0.120 | AMC700872 | 2601741 | AMC700873 | 2601742 |
| AFM-2 | 3/8 | 1 | 2 1/2 | – | 3/8 | 2 | Ball | AMC700888 | 2601745 | AMC700889 | 2601746 |
| AFL-2 | 3/8 | 1 1/2 | 4 | – | 3/8 | 2 | Square | AMC701502 | 2601830 | AMC701503 | 2601831 |
| AFL-2 | 3/8 | 1 1/2 | 4 | – | 3/8 | 2 | 0.015 | AMC701506 | 7116084 | AMC701507 | 2601833 |
| AFL-2 | 3/8 | 1 1/2 | 4 | – | 3/8 | 2 | 0.030 | AMC701510 | 2601834 | AMC701511 | 2601835 |
| AFL-2 | 3/8 | 1 1/2 | 4 | – | 3/8 | 2 | 0.060 | AMC701514 | 2601836 | AMC701515 | 2601837 |
| AFL-2 | 3/8 | 1 1/2 | 4 | – | 3/8 | 2 | 0.090 | AMC701518 | 2601838 | AMC701519 | 2601839 |
| AFL-2 | 3/8 | 1 1/2 | 4 | – | 3/8 | 2 | 0.120 | AMC701522 | 2601840 | AMC701523 | 2601841 |
| AFL-2 | 3/8 | 1 1/2 | 4 | – | 3/8 | 2 | Ball | AMC701538 | 2601844 | AMC701539 | 2601845 |
| AFNS-2 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 2 | Square | AMC706202 | 7088750 | AMC706203 | 7088751 |
| AFNS-2 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 2 | 0.015 | AMC706206 | 2602373 | AMC706207 | 2602374 |
| AFNS-2 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 2 | 0.030 | AMC706210 | 2602375 | AMC706211 | 2602376 |
| AFNS-2 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 2 | 0.060 | AMC706214 | 2602377 | AMC706215 | 2602378 |
| AFNS-2 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 2 | 0.090 | AMC706218 | 2602379 | AMC706219 | 2602380 |
| AFNS-2 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 2 | 0.120 | AMC706222 | 2602381 | AMC706223 | 2602382 |
| AFNS-2 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 2 | Ball | AMC706238 | 2602385 | AMC706239 | 2602386 |
| AFNM-2 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 2 | Square | AMC706852 | 7088753 | AMC706853 | 2602470 |
| AFNM-2 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 2 | 0.015 | AMC706856 | 2602471 | AMC706857 | 2602472 |
| AFNM-2 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 2 | 0.030 | AMC706860 | 2602473 | AMC706861 | 2602474 |
| AFNM-2 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 2 | 0.060 | AMC706864 | 2602475 | AMC706865 | 2602476 |
| AFNM-2 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 2 | 0.090 | AMC706868 | 2602477 | AMC706869 | 2602478 |
| AFNM-2 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 2 | 0.120 | AMC706872 | 2602479 | AMC706873 | 2602480 |
| AFNM-2 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 2 | Ball | AMC706888 | 2602483 | AMC706889 | 2602484 |
| AFNL-2 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 2 | Square | AMC707502 | 2602568 | AMC707503 | 2602569 |
| AFNL-2 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 2 | 0.015 | AMC707506 | 2602570 | AMC707507 | 2602571 |
| AFNL-2 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 2 | 0.030 | AMC707510 | 2602572 | AMC707511 | 2602573 |
| AFNL-2 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 2 | 0.060 | AMC707514 | 2602574 | AMC707515 | 2602575 |
| AFNL-2 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 2 | 0.090 | AMC707518 | 2602576 | AMC707519 | 2602577 |
| AFNL-2 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 2 | 0.120 | AMC707522 | 2602578 | AMC707523 | 2602579 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice




| | Uncoated | ZRN |
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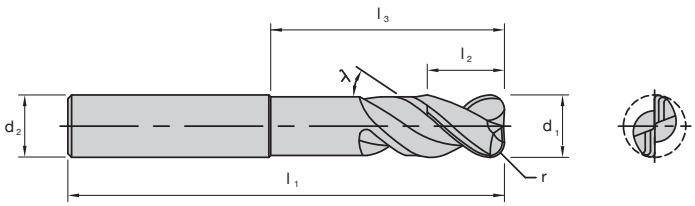
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFNL-2 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 2 | Ball | AMC707538 | 2602582 | AMC707539 | 2602583 |
| AFS-2 | 1/2 | 5/8 | 3 | – | 1/2 | 2 | Square | AMC700302 | 2826590 | AMC700303 | 2601652 |
| AFS-2 | 1/2 | 5/8 | 3 | – | 1/2 | 2 | 0.015 | AMC700306 | 7057543 | AMC700307 | 2601653 |
| AFS-2 | 1/2 | 5/8 | 3 | – | 1/2 | 2 | 0.030 | AMC700310 | 2601654 | AMC700311 | 2601655 |
| AFS-2 | 1/2 | 5/8 | 3 | – | 1/2 | 2 | 0.060 | AMC700314 | 2601656 | AMC700315 | 2601657 |
| AFS-2 | 1/2 | 5/8 | 3 | – | 1/2 | 2 | 0.090 | AMC700318 | 2601658 | AMC700319 | 2601659 |
| AFS-2 | 1/2 | 5/8 | 3 | – | 1/2 | 2 | 0.120 | AMC700322 | 2601660 | AMC700323 | 2601661 |
| AFS-2 | 1/2 | 5/8 | 3 | – | 1/2 | 2 | 0.190 | AMC700330 | 2601664 | AMC700331 | 2601665 |
| AFS-2 | 1/2 | 5/8 | 3 | – | 1/2 | 2 | Ball | AMC700338 | 2601666 | AMC700339 | 2601667 |
| AFM-2 | 1/2 | 1 1/4 | 3 | – | 1/2 | 2 | Square | AMC700952 | 2826591 | AMC700953 | 2601747 |
| AFM-2 | 1/2 | 1 1/4 | 3 | – | 1/2 | 2 | 0.015 | AMC700956 | 2601748 | AMC700957 | 2601749 |
| AFM-2 | 1/2 | 1 1/4 | 3 | – | 1/2 | 2 | 0.030 | AMC700960 | 2601750 | AMC700961 | 2601751 |
| AFM-2 | 1/2 | 1 1/4 | 3 | – | 1/2 | 2 | 0.060 | AMC700964 | 2601752 | AMC700965 | 2601753 |
| AFM-2 | 1/2 | 1 1/4 | 3 | – | 1/2 | 2 | 0.090 | AMC700968 | 2601754 | AMC700969 | 2601755 |
| AFM-2 | 1/2 | 1 1/4 | 3 | – | 1/2 | 2 | 0.120 | AMC700972 | 2601756 | AMC700973 | 2601757 |
| AFM-2 | 1/2 | 1 1/4 | 3 | – | 1/2 | 2 | 0.190 | AMC700980 | 2601760 | AMC700981 | 2601761 |
| AFM-2 | 1/2 | 1 1/4 | 3 | – | 1/2 | 2 | Ball | AMC700988 | 2601762 | AMC700989 | 2601763 |
| AFL-2 | 1/2 | 2 | 4 | – | 1/2 | 2 | Square | AMC701602 | 2601846 | AMC701603 | 2601847 |
| AFL-2 | 1/2 | 2 | 4 | – | 1/2 | 2 | 0.015 | AMC701606 | 2601848 | AMC701607 | 2601849 |
| AFL-2 | 1/2 | 2 | 4 | – | 1/2 | 2 | 0.030 | AMC701610 | 2601850 | AMC701611 | 2601851 |
| AFL-2 | 1/2 | 2 | 4 | – | 1/2 | 2 | 0.060 | AMC701614 | 2601852 | AMC701615 | 2601853 |
| AFL-2 | 1/2 | 2 | 4 | – | 1/2 | 2 | 0.090 | AMC701618 | 2601854 | AMC701619 | 2601855 |
| AFL-2 | 1/2 | 2 | 4 | – | 1/2 | 2 | 0.120 | AMC701622 | 2601856 | AMC701623 | 2601857 |
| AFL-2 | 1/2 | 2 | 4 | – | 1/2 | 2 | 0.190 | AMC701630 | 2601860 | AMC701631 | 2601861 |
| AFL-2 | 1/2 | 2 | 4 | – | 1/2 | 2 | Ball | AMC701638 | 2601862 | AMC701639 | 2601863 |
| AFNS-2 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 2 | Square | AMC706302 | 2602387 | AMC706303 | 2602388 |
| AFNS-2 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 2 | 0.015 | AMC706306 | 2602389 | AMC706307 | 2602390 |
| AFNS-2 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 2 | 0.030 | AMC706310 | 2602391 | AMC706311 | 2602392 |
| AFNS-2 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 2 | 0.060 | AMC706314 | 2602393 | AMC706315 | 2602394 |
| AFNS-2 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 2 | 0.090 | AMC706318 | 2602395 | AMC706319 | 2602396 |
| AFNS-2 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 2 | 0.120 | AMC706322 | 2602397 | AMC706323 | 2602398 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice


| | | Uncoated | ZRN |
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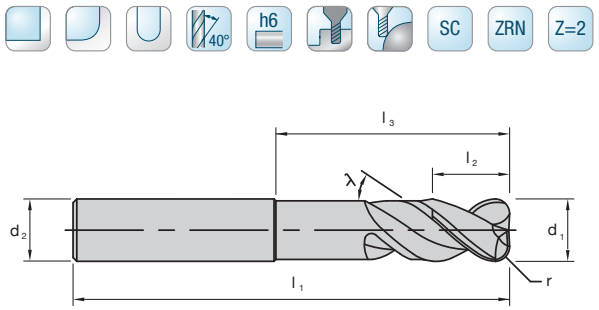
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFNS-2 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 2 | 0.190 | AMC706330 | 2602401 | AMC706331 | 2602402 |
| AFNS-2 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 2 | Ball | AMC706338 | 2602403 | AMC706339 | 2602404 |
| AFNM-2 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 2 | Square | AMC706952 | 7088754 | AMC706953 | 2602485 |
| AFNM-2 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 2 | 0.015 | AMC706956 | 2602486 | AMC706957 | 2602487 |
| AFNM-2 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 2 | 0.030 | AMC706960 | 2602488 | AMC706961 | 2602489 |
| AFNM-2 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 2 | 0.060 | AMC706964 | 2602490 | AMC706965 | 2602491 |
| AFNM-2 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 2 | 0.090 | AMC706968 | 2602492 | AMC706969 | 2602493 |
| AFNM-2 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 2 | 0.120 | AMC706972 | 2602494 | AMC706973 | 2602495 |
| AFNM-2 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 2 | 0.190 | AMC706980 | 2602498 | AMC706981 | 2602499 |
| AFNM-2 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 2 | Ball | AMC706988 | 2602500 | AMC706989 | 2602501 |
| AFNL-2 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 2 | Square | AMC707602 | 2602584 | AMC707603 | 2602585 |
| AFNL-2 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 2 | 0.015 | AMC707606 | 2602586 | AMC707607 | 2602587 |
| AFNL-2 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 2 | 0.030 | AMC707610 | 2602588 | AMC707611 | 2602589 |
| AFNL-2 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 2 | 0.060 | AMC707614 | 2602590 | AMC707615 | 2602591 |
| AFNL-2 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 2 | 0.090 | AMC707618 | 2602592 | AMC707619 | 2602593 |
| AFNL-2 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 2 | 0.120 | AMC707622 | 2602594 | AMC707623 | 2602595 |
| AFNL-2 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 2 | 0.190 | AMC707630 | 2602598 | AMC707631 | 2602599 |
| AFNL-2 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 2 | Ball | AMC707638 | 2602600 | AMC707639 | 2602601 |
| AFS-2 | 5/8 | 3/4 | 3 | – | 5/8 | 2 | Square | AMC700402 | 2601668 | AMC700403 | 2601669 |
| AFS-2 | 5/8 | 3/4 | 3 | – | 5/8 | 2 | 0.030 | AMC700410 | 2601670 | AMC700411 | 2601671 |
| AFS-2 | 5/8 | 3/4 | 3 | – | 5/8 | 2 | 0.060 | AMC700414 | 2601672 | AMC700415 | 2601673 |
| AFS-2 | 5/8 | 3/4 | 3 | – | 5/8 | 2 | 0.120 | AMC700422 | 2601676 | AMC700423 | 2601677 |
| AFS-2 | 5/8 | 3/4 | 3 | – | 5/8 | 2 | 0.250 | AMC700434 | 2601682 | AMC700435 | 2601683 |
| AFS-2 | 5/8 | 3/4 | 3 | – | 5/8 | 2 | Ball | AMC700438 | 2601684 | AMC700439 | 2601685 |
| AFM-2 | 5/8 | 1 5/8 | 4 | – | 5/8 | 2 | Square | AMC701052 | 2601764 | AMC701053 | 2601765 |
| AFM-2 | 5/8 | 1 5/8 | 4 | – | 5/8 | 2 | 0.030 | AMC701060 | 2601766 | AMC701061 | 2601767 |
| AFM-2 | 5/8 | 1 5/8 | 4 | – | 5/8 | 2 | 0.060 | AMC701064 | 2601768 | AMC701065 | 2601769 |
| AFM-2 | 5/8 | 1 5/8 | 4 | – | 5/8 | 2 | 0.120 | AMC701072 | 2601772 | AMC701073 | 2601773 |
| AFM-2 | 5/8 | 1 5/8 | 4 | – | 5/8 | 2 | 0.250 | AMC701084 | 2601778 | AMC701085 | 2601779 |
| AFM-2 | 5/8 | 1 5/8 | 4 | – | 5/8 | 2 | Ball | AMC701088 | 2601780 | AMC701089 | 2601781 |
| AFL-2 | 5/8 | 2 1/4 | 5 | – | 5/8 | 2 | Square | AMC701702 | 2601864 | AMC701703 | 2601865 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice




| | Uncoated | ZRN |
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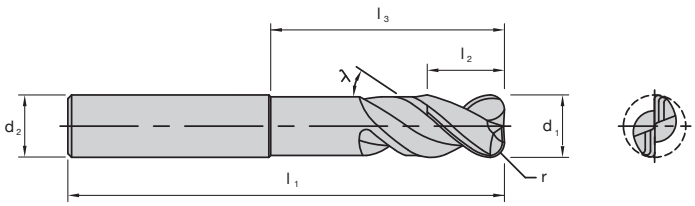
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFL-2 | 5/8 | 2 1/4 | 5 | – | 5/8 | 2 | 0.030 | AMC701710 | 2601866 | AMC701711 | 2601867 |
| AFL-2 | 5/8 | 2 1/4 | 5 | – | 5/8 | 2 | 0.060 | AMC701714 | 2601868 | AMC701715 | 2601869 |
| AFL-2 | 5/8 | 2 1/4 | 5 | – | 5/8 | 2 | 0.120 | AMC701722 | 2601872 | AMC701723 | 2601873 |
| AFL-2 | 5/8 | 2 1/4 | 5 | – | 5/8 | 2 | 0.250 | AMC701734 | 2601878 | AMC701735 | 2601879 |
| AFL-2 | 5/8 | 2 1/4 | 5 | – | 5/8 | 2 | Ball | AMC701738 | 2601880 | AMC701739 | 2601881 |
| AFNS-2 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 2 | Square | AMC706402 | 2602405 | AMC706403 | 2602406 |
| AFNS-2 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 2 | 0.030 | AMC706410 | 2602407 | AMC706411 | 2602408 |
| AFNS-2 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 2 | 0.060 | AMC706414 | 2602409 | AMC706415 | 2602410 |
| AFNS-2 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 2 | 0.120 | AMC706422 | 2602413 | AMC706423 | 2602414 |
| AFNS-2 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 2 | 0.250 | AMC706434 | 2602419 | AMC706435 | 2602420 |
| AFNS-2 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 2 | Ball | AMC706438 | 2602421 | AMC706439 | 2602422 |
| AFNM-2 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 2 | Square | AMC707052 | 2602502 | AMC707053 | 2602503 |
| AFNM-2 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 2 | 0.030 | AMC707060 | 2602504 | AMC707061 | 2602505 |
| AFNM-2 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 2 | 0.060 | AMC707064 | 2602506 | AMC707065 | 2602507 |
| AFNM-2 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 2 | 0.120 | AMC707072 | 2602510 | AMC707073 | 2602511 |
| AFNM-2 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 2 | 0.250 | AMC707084 | 2602516 | AMC707085 | 2602517 |
| AFNM-2 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 2 | Ball | AMC707088 | 2602518 | AMC707089 | 2602519 |
| AFNL-2 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 2 | Square | AMC707702 | 2602602 | AMC707703 | 2602603 |
| AFNL-2 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 2 | 0.030 | AMC707710 | 2602604 | AMC707711 | 2602605 |
| AFNL-2 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 2 | 0.060 | AMC707714 | 2602606 | AMC707715 | 2602607 |
| AFNL-2 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 2 | 0.120 | AMC707722 | 2602610 | AMC707723 | 2602611 |
| AFNL-2 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 2 | 0.250 | AMC707734 | 2602616 | AMC707735 | 2602617 |
| AFNL-2 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 2 | Ball | AMC707738 | 2602618 | AMC707739 | 2602619 |
| AFS-2 | 3/4 | 1 | 3 | – | 3/4 | 2 | Square | AMC700502 | 2601686 | AMC700503 | 2601687 |
| AFS-2 | 3/4 | 1 | 3 | – | 3/4 | 2 | 0.030 | AMC700510 | 2601688 | AMC700511 | 2601689 |
| AFS-2 | 3/4 | 1 | 3 | – | 3/4 | 2 | 0.060 | AMC700514 | 2601690 | AMC700515 | 2601691 |
| AFS-2 | 3/4 | 1 | 3 | – | 3/4 | 2 | 0.090 | AMC700518 | 2601692 | AMC700519 | 2601693 |
| AFS-2 | 3/4 | 1 | 3 | – | 3/4 | 2 | 0.120 | AMC700522 | 2601694 | AMC700523 | 2601695 |
| AFS-2 | 3/4 | 1 | 3 | – | 3/4 | 2 | 0.190 | AMC700530 | 2601698 | AMC700531 | 2601699 |
| AFS-2 | 3/4 | 1 | 3 | – | 3/4 | 2 | 0.250 | AMC700534 | 2601700 | AMC700535 | 2601701 |
| AFS-2 | 3/4 | 1 | 3 | – | 3/4 | 2 | Ball | AMC700538 | 2601702 | AMC700539 | 2601703 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice


| | | Uncoated | ZRN |
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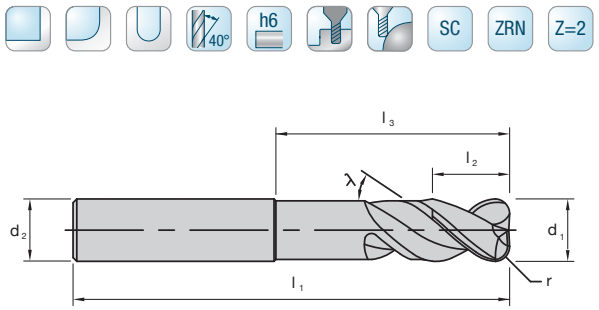
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFM-2 | 3/4 | 1 5/8 | 4 | – | 3/4 | 2 | Square | AMC701152 | 2601782 | AMC701153 | 2601783 |
| AFM-2 | 3/4 | 1 5/8 | 4 | – | 3/4 | 2 | 0.030 | AMC701160 | 2601784 | AMC701161 | 2601785 |
| AFM-2 | 3/4 | 1 5/8 | 4 | – | 3/4 | 2 | 0.060 | AMC701164 | 2601786 | AMC701165 | 2601787 |
| AFM-2 | 3/4 | 1 5/8 | 4 | – | 3/4 | 2 | 0.090 | AMC701168 | 2601788 | AMC701169 | 2601789 |
| AFM-2 | 3/4 | 1 5/8 | 4 | – | 3/4 | 2 | 0.120 | AMC701172 | 2601790 | AMC701173 | 2601791 |
| AFM-2 | 3/4 | 1 5/8 | 4 | – | 3/4 | 2 | 0.190 | AMC701180 | 2601794 | AMC701181 | 2601795 |
| AFM-2 | 3/4 | 1 5/8 | 4 | – | 3/4 | 2 | 0.250 | AMC701184 | 2601796 | AMC701185 | 2601797 |
| AFM-2 | 3/4 | 1 5/8 | 4 | – | 3/4 | 2 | Ball | AMC701188 | 2601798 | AMC701189 | 2601799 |
| AFL-2 | 3/4 | 2 1/2 | 5 | – | 3/4 | 2 | Square | AMC701802 | 2601882 | AMC701803 | 2601883 |
| AFL-2 | 3/4 | 2 1/2 | 5 | – | 3/4 | 2 | 0.030 | AMC701810 | 2601884 | AMC701811 | 2601885 |
| AFL-2 | 3/4 | 2 1/2 | 5 | – | 3/4 | 2 | 0.060 | AMC701814 | 2601886 | AMC701815 | 2601887 |
| AFL-2 | 3/4 | 2 1/2 | 5 | – | 3/4 | 2 | 0.090 | AMC701818 | 2601888 | AMC701819 | 2601889 |
| AFL-2 | 3/4 | 2 1/2 | 5 | – | 3/4 | 2 | 0.120 | AMC701822 | 2601890 | AMC701823 | 2601891 |
| AFL-2 | 3/4 | 2 1/2 | 5 | – | 3/4 | 2 | 0.190 | AMC701830 | 2601894 | AMC701831 | 2601895 |
| AFL-2 | 3/4 | 2 1/2 | 5 | – | 3/4 | 2 | 0.250 | AMC701834 | 2601896 | AMC701835 | 2601897 |
| AFL-2 | 3/4 | 2 1/2 | 5 | – | 3/4 | 2 | Ball | AMC701838 | 2601898 | AMC701839 | 2601899 |
| AFNS-2 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 2 | Square | AMC706502 | 2602423 | AMC706503 | 2602424 |
| AFNS-2 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 2 | 0.030 | AMC706510 | 2602425 | AMC706511 | 2602426 |
| AFNS-2 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 2 | 0.060 | AMC706514 | 2602427 | AMC706515 | 2602428 |
| AFNS-2 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 2 | 0.090 | AMC706518 | 2602429 | AMC706519 | 2602430 |
| AFNS-2 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 2 | 0.120 | AMC706522 | 2602431 | AMC706523 | 2602432 |
| AFNS-2 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 2 | 0.190 | AMC706530 | 2602435 | AMC706531 | 2602436 |
| AFNS-2 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 2 | 0.250 | AMC706534 | 2602437 | AMC706535 | 2602438 |
| AFNS-2 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 2 | Ball | AMC706538 | 2602439 | AMC706539 | 2602440 |
| AFNM-2 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 2 | Square | AMC707152 | 2602520 | AMC707153 | 2602521 |
| AFNM-2 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 2 | 0.030 | AMC707160 | 2602522 | AMC707161 | 2602523 |
| AFNM-2 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 2 | 0.060 | AMC707164 | 2602524 | AMC707165 | 2602525 |
| AFNM-2 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 2 | 0.090 | AMC707168 | 2602526 | AMC707169 | 2602527 |
| AFNM-2 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 2 | 0.120 | AMC707172 | 2602528 | AMC707173 | 2602529 |
| AFNM-2 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 2 | 0.190 | AMC707180 | 2602532 | AMC707181 | 2602533 |
| AFNM-2 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 2 | 0.250 | AMC707184 | 2602534 | AMC707185 | 2602535 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice

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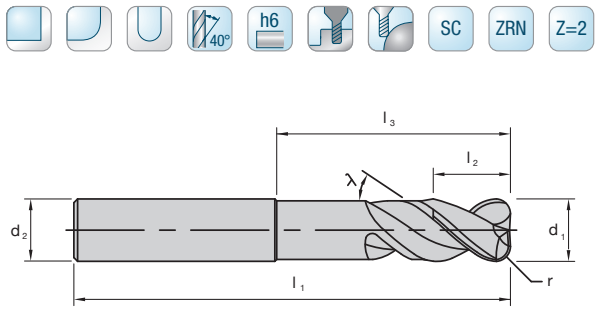
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFNM-2 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 2 | Ball | AMC707188 | 2602536 | AMC707189 | 2602537 |
| AFNL-2 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 2 | Square | AMC707802 | 2602620 | AMC707803 | 2602621 |
| AFNL-2 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 2 | 0.030 | AMC707810 | 2602622 | AMC707811 | 2602623 |
| AFNL-2 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 2 | 0.060 | AMC707814 | 2602624 | AMC707815 | 2602625 |
| AFNL-2 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 2 | 0.090 | AMC707818 | 2602626 | AMC707819 | 2602627 |
| AFNL-2 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 2 | 0.120 | AMC707822 | 2602628 | AMC707823 | 2602629 |
| AFNL-2 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 2 | 0.190 | AMC707830 | 2602632 | AMC707831 | 2602633 |
| AFNL-2 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 2 | 0.250 | AMC707834 | 2602634 | AMC707835 | 2602635 |
| AFNL-2 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 2 | Ball | AMC707838 | 2602636 | AMC707839 | 2602637 |
| AFS-2 | 1 | 1 1/4 | 4 | – | 1 | 2 | Square | AMC700602 | 2601704 | AMC700603 | 2601705 |
| AFS-2 | 1 | 1 1/4 | 4 | – | 1 | 2 | 0.030 | AMC700610 | 2601706 | AMC700611 | 2601707 |
| AFS-2 | 1 | 1 1/4 | 4 | – | 1 | 2 | 0.060 | AMC700614 | 2601708 | AMC700615 | 2601709 |
| AFS-2 | 1 | 1 1/4 | 4 | – | 1 | 2 | 0.120 | AMC700622 | 2601712 | AMC700623 | 2601713 |
| AFS-2 | 1 | 1 1/4 | 4 | – | 1 | 2 | 0.190 | AMC700630 | 2601716 | AMC700631 | 2601717 |
| AFS-2 | 1 | 1 1/4 | 4 | – | 1 | 2 | 0.250 | AMC700634 | 2601718 | AMC700635 | 2601719 |
| AFS-2 | 1 | 1 1/4 | 4 | – | 1 | 2 | Ball | AMC700638 | 2601720 | AMC700639 | 2601721 |
| AFM-2 | 1 | 2 1/2 | 5 | – | 1 | 2 | Square | AMC701252 | 2601800 | AMC701253 | 2601801 |
| AFM-2 | 1 | 2 1/2 | 5 | – | 1 | 2 | 0.030 | AMC701260 | 2601802 | AMC701261 | 2601803 |
| AFM-2 | 1 | 2 1/2 | 5 | – | 1 | 2 | 0.060 | AMC701264 | 2601804 | AMC701265 | 2601805 |
| AFM-2 | 1 | 2 1/2 | 5 | – | 1 | 2 | 0.120 | AMC701272 | 2601808 | AMC701273 | 2601809 |
| AFM-2 | 1 | 2 1/2 | 5 | – | 1 | 2 | 0.190 | AMC701280 | 2601812 | AMC701281 | 2601813 |
| AFM-2 | 1 | 2 1/2 | 5 | – | 1 | 2 | 0.250 | AMC701284 | 2601814 | AMC701285 | 2601815 |
| AFM-2 | 1 | 2 1/2 | 5 | – | 1 | 2 | Ball | AMC701288 | 2601816 | AMC701289 | 2601817 |
| AFL-2 | 1 | 3 1/4 | 6 | – | 1 | 2 | Square | AMC701902 | 2601900 | AMC701903 | 2601901 |
| AFL-2 | 1 | 3 1/4 | 6 | – | 1 | 2 | 0.030 | AMC701910 | 2601902 | AMC701911 | 2601903 |
| AFL-2 | 1 | 3 1/4 | 6 | – | 1 | 2 | 0.060 | AMC701914 | 2601904 | AMC701915 | 2601905 |
| AFL-2 | 1 | 3 1/4 | 6 | – | 1 | 2 | 0.120 | AMC701922 | 2601908 | AMC701923 | 2601909 |
| AFL-2 | 1 | 3 1/4 | 6 | – | 1 | 2 | 0.190 | AMC701930 | 2601912 | AMC701931 | 2601913 |
| AFL-2 | 1 | 3 1/4 | 6 | – | 1 | 2 | 0.250 | AMC701934 | 2601914 | AMC701935 | 2601915 |
| AFL-2 | 1 | 3 1/4 | 6 | – | 1 | 2 | Ball | AMC701938 | 2601916 | AMC701939 | 2601917 |
| AFNS-2 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 2 | Square | AMC706602 | 2602441 | AMC706603 | 2602442 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice




| | | Uncoated | ZRN |
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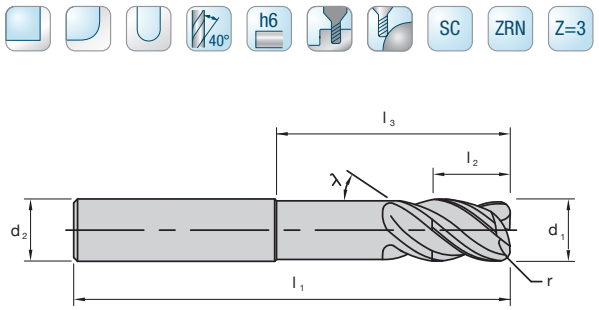
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFNS-2 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 2 | 0.030 | AMC706610 | 2602443 | AMC706611 | 2602444 |
| AFNS-2 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 2 | 0.060 | AMC706614 | 2602445 | AMC706615 | 2602446 |
| AFNS-2 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 2 | 0.120 | AMC706622 | 2602449 | AMC706623 | 2602450 |
| AFNS-2 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 2 | 0.190 | AMC706630 | 2602453 | AMC706631 | 2602454 |
| AFNS-2 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 2 | 0.250 | AMC706634 | 2602455 | AMC706635 | 2602456 |
| AFNS-2 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 2 | Ball | AMC706638 | 2602457 | AMC706639 | 2602458 |
| AFNM-2 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 2 | Square | AMC707252 | 2602538 | AMC707253 | 2602539 |
| AFNM-2 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 2 | 0.030 | AMC707260 | 2602540 | AMC707261 | 2602541 |
| AFNM-2 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 2 | 0.060 | AMC707264 | 2602542 | AMC707265 | 2602543 |
| AFNM-2 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 2 | 0.120 | AMC707272 | 2602546 | AMC707273 | 2602547 |
| AFNM-2 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 2 | 0.190 | AMC707280 | 2602550 | AMC707281 | 2602551 |
| AFNM-2 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 2 | 0.250 | AMC707284 | 2602552 | AMC707285 | 2602553 |
| AFNM-2 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 2 | Ball | AMC707288 | 2602554 | AMC707289 | 2602555 |
| AFNL-2 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 2 | Square | AMC707902 | 2602638 | AMC707903 | 2602639 |
| AFNL-2 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 2 | 0.030 | AMC707910 | 2602640 | AMC707911 | 2602641 |
| AFNL-2 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 2 | 0.060 | AMC707914 | 2602642 | AMC707915 | 2602643 |
| AFNL-2 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 2 | 0.120 | AMC707922 | 2602646 | AMC707923 | 2602647 |
| AFNL-2 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 2 | 0.190 | AMC707930 | 2602650 | AMC707931 | 2602651 |
| AFNL-2 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 2 | 0.250 | AMC707934 | 2602652 | AMC707935 | 2602653 |
| AFNL-2 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 2 | Ball | AMC707938 | 2602654 | AMC707939 | 2602655 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice

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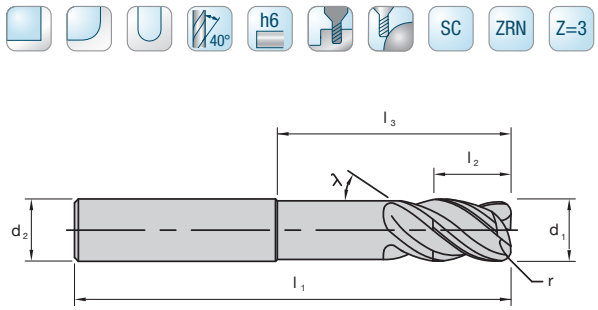
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFS-3 | 1/8 | 1/4 | 2 | – | 1/8 | 3 | Square | AMC400038 | 2601608 | AMC400039 | 2607651 |
| AFS-3 | 1/8 | 1/4 | 2 | – | 1/8 | 3 | 0.010 | AMC400040 | 2601609 | AMC400041 | 2607652 |
| AFS-3 | 1/8 | 1/4 | 2 | – | 1/8 | 3 | Ball | AMC400042 | 2601610 | AMC400043 | 2607653 |
| AFM-3 | 1/8 | 1/2 | 2 | – | 1/8 | 3 | Square | AMC400056 | 2601617 | AMC400057 | 2608226 |
| AFM-3 | 1/8 | 1/2 | 2 | – | 1/8 | 3 | 0.010 | AMC400058 | 2601618 | AMC400059 | 2608227 |
| AFM-3 | 1/8 | 1/2 | 2 | – | 1/8 | 3 | Ball | AMC400060 | 2601619 | AMC400061 | 2608228 |
| AFS-3 | 3/16 | 5/16 | 2 | – | 3/16 | 3 | Square | AMC400044 | 2601611 | AMC400045 | 2607654 |
| AFS-3 | 3/16 | 5/16 | 2 | – | 3/16 | 3 | 0.010 | AMC400046 | 2601612 | AMC400047 | 2608221 |
| AFS-3 | 3/16 | 5/16 | 2 | – | 3/16 | 3 | Ball | AMC400048 | 2601613 | AMC400049 | 2608222 |
| AFM-3 | 3/16 | 9/16 | 2 1/2 | – | 3/16 | 3 | Square | AMC400062 | 2601620 | AMC400063 | 2608229 |
| AFM-3 | 3/16 | 9/16 | 2 1/2 | – | 3/16 | 3 | 0.010 | AMC400064 | 2601621 | AMC400065 | 2608230 |
| AFM-3 | 3/16 | 9/16 | 2 1/2 | – | 3/16 | 3 | Ball | AMC400066 | 2601622 | AMC400067 | 2608231 |
| AFL-3 | 3/16 | 7/8 | 2 1/2 | – | 3/16 | 3 | Square | AMC400078 | 2641947 | AMC400079 | 2641948 |
| AFS-3 | 1/4 | 3/8 | 2 | – | 1/4 | 3 | Square | AMC703102 | 2601990 | AMC703103 | 2601991 |
| AFS-3 | 1/4 | 3/8 | 2 | – | 1/4 | 3 | 0.015 | AMC703106 | 2601992 | AMC703107 | 2601993 |
| AFS-3 | 1/4 | 3/8 | 2 | – | 1/4 | 3 | 0.030 | AMC703110 | 2601994 | AMC703111 | 2601995 |
| AFS-3 | 1/4 | 3/8 | 2 | – | 1/4 | 3 | 0.060 | AMC703114 | 2601996 | AMC703115 | 2601997 |
| AFS-3 | 1/4 | 3/8 | 2 | – | 1/4 | 3 | 0.090 | AMC703118 | 2601998 | AMC703119 | 2601999 |
| AFS-3 | 1/4 | 3/8 | 2 | – | 1/4 | 3 | Ball | AMC703138 | 2602000 | AMC703139 | 2602001 |
| AFM-3 | 1/4 | 3/4 | 2 | – | 1/4 | 3 | Square | AMC703752 | 2602090 | AMC703753 | 2602091 |
| AFM-3 | 1/4 | 3/4 | 2 | – | 1/4 | 3 | 0.015 | AMC703756 | 2602092 | AMC703757 | 2602093 |
| AFM-3 | 1/4 | 3/4 | 2 | – | 1/4 | 3 | 0.030 | AMC703760 | 2602094 | AMC703761 | 2602095 |
| AFM-3 | 1/4 | 3/4 | 2 | – | 1/4 | 3 | 0.060 | AMC703764 | 2602096 | AMC703765 | 2602097 |
| AFM-3 | 1/4 | 3/4 | 2 | – | 1/4 | 3 | 0.090 | AMC703768 | 2602098 | AMC703769 | 2602099 |
| AFM-3 | 1/4 | 3/4 | 2 | – | 1/4 | 3 | Ball | AMC703788 | 2602100 | AMC703789 | 2602101 |
| AFL-3 | 1/4 | 1 1/4 | 2 1/2 | – | 1/4 | 3 | Square | AMC704402 | 2602190 | AMC704403 | 2602191 |
| AFL-3 | 1/4 | 1 1/4 | 2 1/2 | – | 1/4 | 3 | 0.015 | AMC704406 | 2602192 | AMC704407 | 2602193 |
| AFL-3 | 1/4 | 1 1/4 | 2 1/2 | – | 1/4 | 3 | 0.030 | AMC704410 | 2602194 | AMC704411 | 2602195 |
| AFL-3 | 1/4 | 1 1/4 | 2 1/2 | – | 1/4 | 3 | 0.060 | AMC704414 | 2602196 | AMC704415 | 2602197 |
| AFL-3 | 1/4 | 1 1/4 | 2 1/2 | – | 1/4 | 3 | 0.090 | AMC704418 | 2602198 | AMC704419 | 2602199 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice

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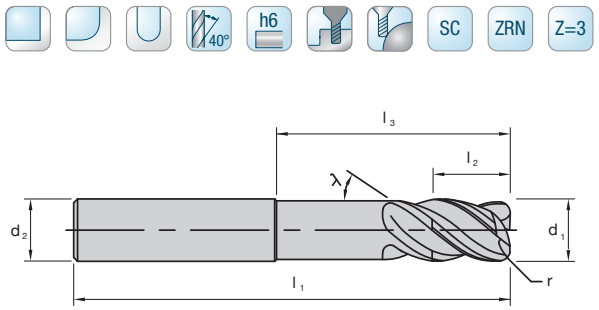
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFL-3 | 1/4 | 1 1/4 | 2 1/2 | – | 1/4 | 3 | Ball | AMC704438 | 2602200 | AMC704439 | 2602201 |
| AFNS-3 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 3 | Square | AMC709102 | 2602674 | AMC709103 | 2602675 |
| AFNS-3 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 3 | 0.015 | AMC709106 | 2602676 | AMC709107 | 2602677 |
| AFNS-3 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 3 | 0.030 | AMC709110 | 2602678 | AMC709111 | 2602679 |
| AFNS-3 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 3 | 0.060 | AMC709114 | 2602680 | AMC709115 | 2602681 |
| AFNS-3 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 3 | 0.090 | AMC709118 | 2602682 | AMC709119 | 2602683 |
| AFNS-3 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 3 | Ball | AMC709138 | 2602684 | AMC709139 | 2602685 |
| AFNM-3 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 3 | Square | AMC709752 | 2602774 | AMC709753 | 2602775 |
| AFNM-3 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 3 | 0.015 | AMC709756 | 2602776 | AMC709757 | 2602777 |
| AFNM-3 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 3 | 0.030 | AMC709760 | 2602778 | AMC709761 | 2602779 |
| AFNM-3 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 3 | 0.060 | AMC709764 | 2602780 | AMC709765 | 2602781 |
| AFNM-3 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 3 | 0.090 | AMC709768 | 2602782 | AMC709769 | 2602783 |
| AFNM-3 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 3 | Ball | AMC709788 | 2602784 | AMC709789 | 2602785 |
| AFNL-3 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 3 | Square | AMC710402 | 2602874 | AMC710403 | 2602875 |
| AFNL-3 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 3 | 0.015 | AMC710406 | 2602876 | AMC710407 | 2602877 |
| AFNL-3 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 3 | 0.030 | AMC710410 | 2602878 | AMC710411 | 2602879 |
| AFNL-3 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 3 | 0.060 | AMC710414 | 2602880 | AMC710415 | 2602881 |
| AFNL-3 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 3 | 0.090 | AMC710418 | 2602882 | AMC710419 | 2602883 |
| AFNL-3 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 3 | Ball | AMC710438 | 2602884 | AMC710439 | 2602885 |
| AFS-3 | 5/16 | 9/16 | 2 1/2 | – | 5/16 | 3 | Square | AMC400050 | 2601614 | AMC400051 | 2608223 |
| AFS-3 | 5/16 | 9/16 | 2 1/2 | – | 5/16 | 3 | 0.015 | AMC400052 | 2601615 | AMC400053 | 2608224 |
| AFS-3 | 5/16 | 9/16 | 2 1/2 | – | 5/16 | 3 | Ball | AMC400054 | 2601616 | AMC400055 | 2608225 |
| AFM-3 | 5/16 | 13/16 | 2 1/2 | – | 5/16 | 3 | Square | AMC400068 | 2601623 | AMC400069 | 2608232 |
| AFM-3 | 5/16 | 13/16 | 2 1/2 | – | 5/16 | 3 | 0.015 | AMC400070 | 2601624 | AMC400071 | 2608233 |
| AFM-3 | 5/16 | 13/16 | 2 1/2 | – | 5/16 | 3 | Ball | AMC400074 | 2601625 | AMC400075 | 2608234 |
| AFL-3 | 5/16 | 1 1/4 | 3 | – | 5/16 | 3 | Square | AMC400080 | 2641949 | AMC400081 | 2641950 |
| AFS-3 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 3 | Square | AMC703202 | 2602002 | AMC703203 | 2602003 |
| AFS-3 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 3 | 0.015 | AMC703206 | 2602004 | AMC703207 | 2602005 |
| AFS-3 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 3 | 0.030 | AMC703210 | 2602006 | AMC703211 | 2602007 |
| AFS-3 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 3 | 0.060 | AMC703214 | 2602008 | AMC703215 | 2602009 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice

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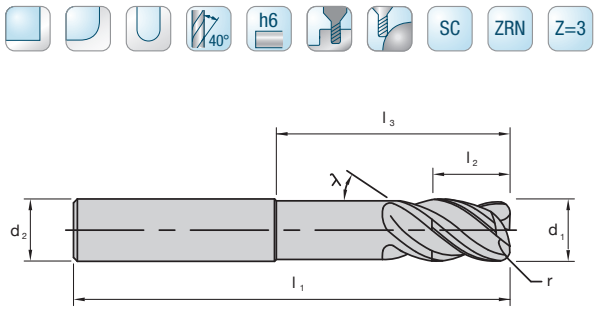
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFS-3 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 3 | 0.090 | AMC703218 | 2602010 | AMC703219 | 2602011 |
| AFS-3 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 3 | 0.120 | AMC703222 | 2602012 | AMC703223 | 2602013 |
| AFS-3 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 3 | Ball | AMC703238 | 2602016 | AMC703239 | 2602017 |
| AFM-3 | 3/8 | 1 | 2 1/2 | – | 3/8 | 3 | Square | AMC703852 | 2602102 | AMC703853 | 2602103 |
| AFM-3 | 3/8 | 1 | 2 1/2 | – | 3/8 | 3 | 0.015 | AMC703856 | 2602104 | AMC703857 | 2602105 |
| AFM-3 | 3/8 | 1 | 2 1/2 | – | 3/8 | 3 | 0.030 | AMC703860 | 2602106 | AMC703861 | 2602107 |
| AFM-3 | 3/8 | 1 | 2 1/2 | – | 3/8 | 3 | 0.060 | AMC703864 | 2602108 | AMC703865 | 2602109 |
| AFM-3 | 3/8 | 1 | 2 1/2 | – | 3/8 | 3 | 0.090 | AMC703868 | 2602110 | AMC703869 | 2602111 |
| AFM-3 | 3/8 | 1 | 2 1/2 | – | 3/8 | 3 | 0.120 | AMC703872 | 2602112 | AMC703873 | 2602113 |
| AFM-3 | 3/8 | 1 | 2 1/2 | – | 3/8 | 3 | Ball | AMC703888 | 2602116 | AMC703889 | 2602117 |
| AFL-3 | 3/8 | 1 1/2 | 4 | – | 3/8 | 3 | Square | AMC704502 | 2602202 | AMC704503 | 2602203 |
| AFL-3 | 3/8 | 1 1/2 | 4 | – | 3/8 | 3 | 0.015 | AMC704506 | 2602204 | AMC704507 | 2602205 |
| AFL-3 | 3/8 | 1 1/2 | 4 | – | 3/8 | 3 | 0.030 | AMC704510 | 2602206 | AMC704511 | 2602207 |
| AFL-3 | 3/8 | 1 1/2 | 4 | – | 3/8 | 3 | 0.060 | AMC704514 | 2602208 | AMC704515 | 2602209 |
| AFL-3 | 3/8 | 1 1/2 | 4 | – | 3/8 | 3 | 0.090 | AMC704518 | 2602210 | AMC704519 | 2602211 |
| AFL-3 | 3/8 | 1 1/2 | 4 | – | 3/8 | 3 | 0.120 | AMC704522 | 2602212 | AMC704523 | 2602213 |
| AFL-3 | 3/8 | 1 1/2 | 4 | – | 3/8 | 3 | Ball | AMC704538 | 2602216 | AMC704539 | 2602217 |
| AFNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | Square | AMC709202 | 2602686 | AMC709203 | 2602687 |
| AFNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | 0.015 | AMC709206 | 2602688 | AMC709207 | 2602689 |
| AFNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | 0.030 | AMC709210 | 2602690 | AMC709211 | 2602691 |
| AFNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | 0.060 | AMC709214 | 2602692 | AMC709215 | 2602693 |
| AFNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | 0.090 | AMC709218 | 2602694 | AMC709219 | 2602695 |
| AFNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | 0.120 | AMC709222 | 2602696 | AMC709223 | 2602697 |
| AFNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | Ball | AMC709238 | 2602700 | AMC709239 | 2602701 |
| AFNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | Square | AMC709852 | 2602786 | AMC709853 | 2602787 |
| AFNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | 0.015 | AMC709856 | 2602788 | AMC709857 | 2602789 |
| AFNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | 0.030 | AMC709860 | 2602790 | AMC709861 | 2602791 |
| AFNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | 0.060 | AMC709864 | 2602792 | AMC709865 | 2602793 |
| AFNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | 0.090 | AMC709868 | 2602794 | AMC709869 | 2602795 |
| AFNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | 0.120 | AMC709872 | 2602796 | AMC709873 | 2602797 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice




| | | Uncoated | ZRN |
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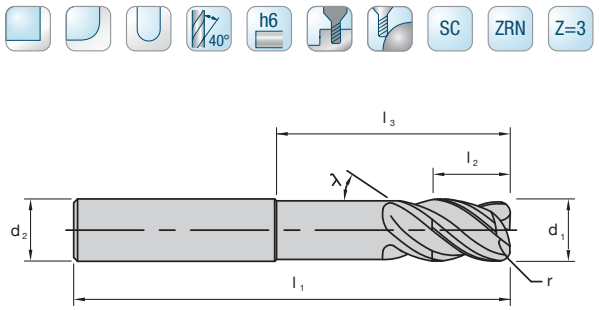
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | Ball | AMC709888 | 2602800 | AMC709889 | 2602801 |
| AFNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | Square | AMC710502 | 2602886 | AMC710503 | 2602887 |
| AFNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | 0.015 | AMC710506 | 2602888 | AMC710507 | 2602889 |
| AFNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | 0.030 | AMC710510 | 2602890 | AMC710511 | 2602891 |
| AFNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | 0.060 | AMC710514 | 2602892 | AMC710515 | 2602893 |
| AFNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | 0.090 | AMC710518 | 2602894 | AMC710519 | 2602895 |
| AFNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | 0.120 | AMC710522 | 2602896 | AMC710523 | 2602897 |
| AFNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | Ball | AMC710538 | 2602900 | AMC710539 | 2602901 |
| AFS-3 | 1/2 | 5/8 | 3 | – | 1/2 | 3 | Square | AMC703302 | 2602018 | AMC703303 | 2602019 |
| AFS-3 | 1/2 | 5/8 | 3 | – | 1/2 | 3 | 0.015 | AMC703306 | 2602020 | AMC703307 | 2602021 |
| AFS-3 | 1/2 | 5/8 | 3 | – | 1/2 | 3 | 0.030 | AMC703310 | 2602022 | AMC703311 | 2602023 |
| AFS-3 | 1/2 | 5/8 | 3 | – | 1/2 | 3 | 0.060 | AMC703314 | 2602024 | AMC703315 | 2602025 |
| AFS-3 | 1/2 | 5/8 | 3 | – | 1/2 | 3 | 0.090 | AMC703318 | 2602026 | AMC703319 | 2602027 |
| AFS-3 | 1/2 | 5/8 | 3 | – | 1/2 | 3 | 0.120 | AMC703322 | 2602028 | AMC703323 | 2602029 |
| AFS-3 | 1/2 | 5/8 | 3 | – | 1/2 | 3 | 0.190 | AMC703330 | 2602032 | AMC703331 | 2602033 |
| AFS-3 | 1/2 | 5/8 | 3 | – | 1/2 | 3 | Ball | AMC703338 | 2602034 | AMC703339 | 2602035 |
| AFM-3 | 1/2 | 1 1/4 | 3 | – | 1/2 | 3 | Square | AMC703952 | 2602118 | AMC703953 | 2602119 |
| AFM-3 | 1/2 | 1 1/4 | 3 | – | 1/2 | 3 | 0.015 | AMC703956 | 2602120 | AMC703957 | 2602121 |
| AFM-3 | 1/2 | 1 1/4 | 3 | – | 1/2 | 3 | 0.030 | AMC703960 | 2602122 | AMC703961 | 2602123 |
| AFM-3 | 1/2 | 1 1/4 | 3 | – | 1/2 | 3 | 0.060 | AMC703964 | 2602124 | AMC703965 | 2602125 |
| AFM-3 | 1/2 | 1 1/4 | 3 | – | 1/2 | 3 | 0.090 | AMC703968 | 2602126 | AMC703969 | 2602127 |
| AFM-3 | 1/2 | 1 1/4 | 3 | – | 1/2 | 3 | 0.120 | AMC703972 | 2602128 | AMC703973 | 2602129 |
| AFM-3 | 1/2 | 1 1/4 | 3 | – | 1/2 | 3 | 0.190 | AMC703980 | 2602132 | AMC703981 | 2602133 |
| AFM-3 | 1/2 | 1 1/4 | 3 | – | 1/2 | 3 | Ball | AMC703988 | 2602134 | AMC703989 | 2602135 |
| AFL-3 | 1/2 | 2 | 4 | – | 1/2 | 3 | Square | AMC704602 | 2602218 | AMC704603 | 2602219 |
| AFL-3 | 1/2 | 2 | 4 | – | 1/2 | 3 | 0.015 | AMC704606 | 2602220 | AMC704607 | 2602221 |
| AFL-3 | 1/2 | 2 | 4 | – | 1/2 | 3 | 0.030 | AMC704610 | 2602222 | AMC704611 | 2602223 |
| AFL-3 | 1/2 | 2 | 4 | – | 1/2 | 3 | 0.060 | AMC704614 | 2602224 | AMC704615 | 2602225 |
| AFL-3 | 1/2 | 2 | 4 | – | 1/2 | 3 | 0.090 | AMC704618 | 2602226 | AMC704619 | 2602227 |
| AFL-3 | 1/2 | 2 | 4 | – | 1/2 | 3 | 0.120 | AMC704622 | 2602228 | AMC704623 | 2602229 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice




| | Uncoated | ZRN |
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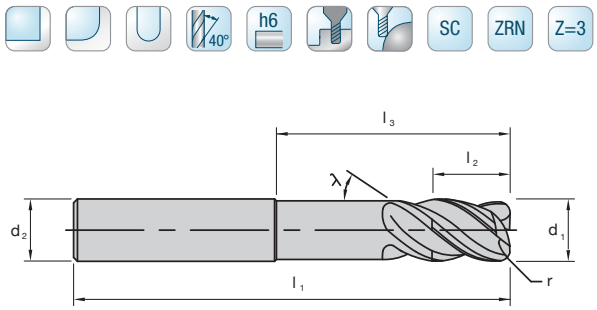
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFL-3 | 1/2 | 2 | 4 | – | 1/2 | 3 | 0.190 | AMC704630 | 2602232 | AMC704631 | 2602233 |
| AFL-3 | 1/2 | 2 | 4 | – | 1/2 | 3 | Ball | AMC704638 | 2602234 | AMC704639 | 2602235 |
| AFX-3 | 1/2 | 3 1/8 | 6 | – | 1/2 | 3 | Square | AMC705252 | 2602290 | AMC705253 | 2602291 |
| AFX-3 | 1/2 | 3 1/8 | 6 | – | 1/2 | 3 | 0.015 | AMC705256 | 2602292 | AMC705257 | 2602293 |
| AFX-3 | 1/2 | 3 1/8 | 6 | – | 1/2 | 3 | 0.030 | AMC705260 | 2602294 | AMC705261 | 2602295 |
| AFX-3 | 1/2 | 3 1/8 | 6 | – | 1/2 | 3 | 0.060 | AMC705264 | 2602296 | AMC705265 | 2602297 |
| AFX-3 | 1/2 | 3 1/8 | 6 | – | 1/2 | 3 | 0.090 | AMC705268 | 2602298 | AMC705269 | 2602299 |
| AFX-3 | 1/2 | 3 1/8 | 6 | – | 1/2 | 3 | 0.120 | AMC705272 | 2602300 | AMC705273 | 2602301 |
| AFX-3 | 1/2 | 3 1/8 | 6 | – | 1/2 | 3 | 0.190 | AMC705280 | 2602304 | AMC705281 | 2602305 |
| AFX-3 | 1/2 | 3 1/8 | 6 | – | 1/2 | 3 | Ball | AMC705288 | 2602306 | AMC705289 | 2602307 |
| AFNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | Square | AMC709302 | 2602702 | AMC709303 | 2602703 |
| AFNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.015 | AMC709306 | 2602704 | AMC709307 | 2602705 |
| AFNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.030 | AMC709310 | 2602706 | AMC709311 | 2602707 |
| AFNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.060 | AMC709314 | 2602708 | AMC709315 | 2602709 |
| AFNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.090 | AMC709318 | 2602710 | AMC709319 | 2602711 |
| AFNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.120 | AMC709322 | 2602712 | AMC709323 | 2602713 |
| AFNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.190 | AMC709330 | 2602716 | AMC709331 | 2602717 |
| AFNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | Ball | AMC709338 | 2602718 | AMC709339 | 2602719 |
| AFNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | Square | AMC709952 | 2602802 | AMC709953 | 2602803 |
| AFNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.015 | AMC709956 | 2602804 | AMC709957 | 2602805 |
| AFNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.030 | AMC709960 | 2602806 | AMC709961 | 2602807 |
| AFNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.060 | AMC709964 | 2602808 | AMC709965 | 2602809 |
| AFNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.090 | AMC709968 | 2602810 | AMC709969 | 2602811 |
| AFNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.120 | AMC709972 | 2602812 | AMC709973 | 2602813 |
| AFNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.190 | AMC709980 | 2602816 | AMC709981 | 2602817 |
| AFNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | Ball | AMC709988 | 2602818 | AMC709989 | 2602819 |
| AFNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | Square | AMC710602 | 2602902 | AMC710603 | 2602903 |
| AFNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.015 | AMC710606 | 2602904 | AMC710607 | 2602905 |
| AFNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.030 | AMC710610 | 2602906 | AMC710611 | 2602907 |
| AFNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.060 | AMC710614 | 2602908 | AMC710615 | 2602909 |

■ = First Choice □ = Second Choice

Cutting data recommendations on page 97

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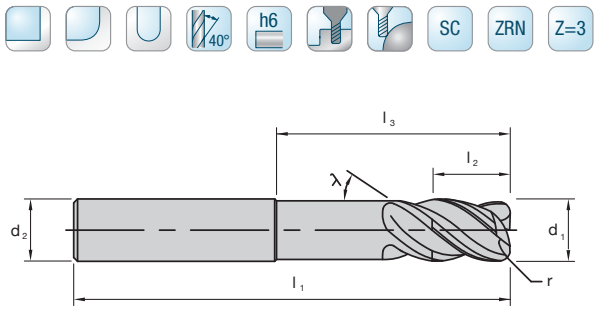
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.090 | AMC710618 | 2602910 | AMC710619 | 2602911 |
| AFNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.120 | AMC710622 | 2602912 | AMC710623 | 2602913 |
| AFNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.190 | AMC710630 | 2602916 | AMC710631 | 2602917 |
| AFNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | Ball | AMC710638 | 2602918 | AMC710639 | 2602919 |
| AFS-3 | 5/8 | 3/4 | 3 | – | 5/8 | 3 | Square | AMC703402 | 2602036 | AMC703403 | 2602037 |
| AFS-3 | 5/8 | 3/4 | 3 | – | 5/8 | 3 | 0.030 | AMC703410 | 2602038 | AMC703411 | 2602039 |
| AFS-3 | 5/8 | 3/4 | 3 | – | 5/8 | 3 | 0.060 | AMC703414 | 2602040 | AMC703415 | 2602041 |
| AFS-3 | 5/8 | 3/4 | 3 | – | 5/8 | 3 | 0.090 | AMC703418 | 2602042 | AMC703419 | 2602043 |
| AFS-3 | 5/8 | 3/4 | 3 | – | 5/8 | 3 | 0.120 | AMC703422 | 2602044 | AMC703423 | 2602045 |
| AFS-3 | 5/8 | 3/4 | 3 | – | 5/8 | 3 | 0.190 | AMC703430 | 2602048 | AMC703431 | 2602049 |
| AFS-3 | 5/8 | 3/4 | 3 | – | 5/8 | 3 | 0.250 | AMC703434 | 2602050 | AMC703435 | 2602051 |
| AFS-3 | 5/8 | 3/4 | 3 | – | 5/8 | 3 | Ball | AMC703438 | 2602052 | AMC703439 | 2602053 |
| AFM-3 | 5/8 | 1 5/8 | 4 | – | 5/8 | 3 | Square | AMC704052 | 2602136 | AMC704053 | 2602137 |
| AFM-3 | 5/8 | 1 5/8 | 4 | – | 5/8 | 3 | 0.030 | AMC704060 | 2602138 | AMC704061 | 2602139 |
| AFM-3 | 5/8 | 1 5/8 | 4 | – | 5/8 | 3 | 0.060 | AMC704064 | 2602140 | AMC704065 | 2602141 |
| AFM-3 | 5/8 | 1 5/8 | 4 | – | 5/8 | 3 | 0.090 | AMC704068 | 2602142 | AMC704069 | 2602143 |
| AFM-3 | 5/8 | 1 5/8 | 4 | – | 5/8 | 3 | 0.120 | AMC704072 | 2602144 | AMC704073 | 2602145 |
| AFM-3 | 5/8 | 1 5/8 | 4 | – | 5/8 | 3 | 0.190 | AMC704080 | 2602148 | AMC704081 | 2602149 |
| AFM-3 | 5/8 | 1 5/8 | 4 | – | 5/8 | 3 | 0.250 | AMC704084 | 2602150 | AMC704085 | 2602151 |
| AFM-3 | 5/8 | 1 5/8 | 4 | – | 5/8 | 3 | Ball | AMC704088 | 2602152 | AMC704089 | 2602153 |
| AFL-3 | 5/8 | 2 1/4 | 5 | – | 5/8 | 3 | Square | AMC704702 | 2602236 | AMC704703 | 2602237 |
| AFL-3 | 5/8 | 2 1/4 | 5 | – | 5/8 | 3 | 0.030 | AMC704710 | 2602238 | AMC704711 | 2602239 |
| AFL-3 | 5/8 | 2 1/4 | 5 | – | 5/8 | 3 | 0.060 | AMC704714 | 2602240 | AMC704715 | 2602241 |
| AFL-3 | 5/8 | 2 1/4 | 5 | – | 5/8 | 3 | 0.090 | AMC704718 | 2602242 | AMC704719 | 2602243 |
| AFL-3 | 5/8 | 2 1/4 | 5 | – | 5/8 | 3 | 0.120 | AMC704722 | 2602244 | AMC704723 | 2602245 |
| AFL-3 | 5/8 | 2 1/4 | 5 | – | 5/8 | 3 | 0.190 | AMC704730 | 2602248 | AMC704731 | 2602249 |
| AFL-3 | 5/8 | 2 1/4 | 5 | – | 5/8 | 3 | 0.250 | AMC704734 | 2602250 | AMC704735 | 2602251 |
| AFL-3 | 5/8 | 2 1/4 | 5 | – | 5/8 | 3 | Ball | AMC704738 | 2602252 | AMC704739 | 2602253 |
| AFX-3 | 5/8 | 3 1/4 | 6 | – | 5/8 | 3 | Square | AMC705352 | 2602308 | AMC705353 | 2602309 |
| AFX-3 | 5/8 | 3 1/4 | 6 | – | 5/8 | 3 | 0.030 | AMC705360 | 2602310 | AMC705361 | 2602311 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice




| | Uncoated | ZRN |
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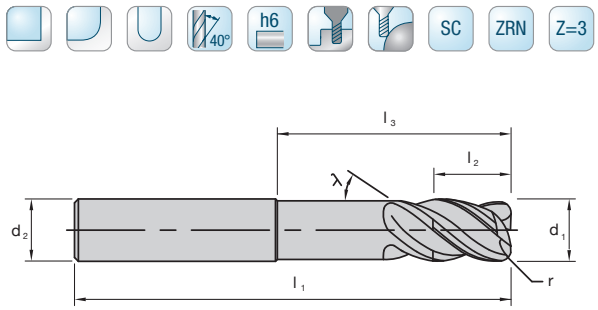
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | Square | AMC709402 | 2602720 | AMC709403 | 2602721 |
| AFNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | 0.030 | AMC709410 | 2602722 | AMC709411 | 2602723 |
| AFNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | 0.060 | AMC709414 | 2602724 | AMC709415 | 2602725 |
| AFNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | 0.090 | AMC709418 | 2602726 | AMC709419 | 2602727 |
| AFNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | 0.120 | AMC709422 | 2602728 | AMC709423 | 2602729 |
| AFNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | 0.190 | AMC709430 | 2602732 | AMC709431 | 2602733 |
| AFNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | 0.250 | AMC709434 | 2602734 | AMC709435 | 2602735 |
| AFNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | Ball | AMC709438 | 2602736 | AMC709439 | 2602737 |
| AFNM-3 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 3 | Square | AMC710052 | 2602820 | AMC710053 | 2602821 |
| AFNM-3 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 3 | 0.030 | AMC710060 | 2602822 | AMC710061 | 2602823 |
| AFNM-3 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 3 | 0.060 | AMC710064 | 2602824 | AMC710065 | 2602825 |
| AFNM-3 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 3 | 0.090 | AMC710068 | 2602826 | AMC710069 | 2602827 |
| AFNM-3 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 3 | 0.120 | AMC710072 | 2602828 | AMC710073 | 2602829 |
| AFNM-3 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 3 | 0.190 | AMC710080 | 2602832 | AMC710081 | 2602833 |
| AFNM-3 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 3 | 0.250 | AMC710084 | 2602834 | AMC710085 | 2602835 |
| AFNM-3 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 3 | Ball | AMC710088 | 2602836 | AMC710089 | 2602837 |
| AFNL-3 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 3 | Square | AMC710702 | 2602920 | AMC710703 | 2602921 |
| AFNL-3 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 3 | 0.030 | AMC710710 | 2602922 | AMC710711 | 2602923 |
| AFNL-3 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 3 | 0.060 | AMC710714 | 2602924 | AMC710715 | 2602925 |
| AFNL-3 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 3 | 0.090 | AMC710718 | 2602926 | AMC710719 | 2602927 |
| AFNL-3 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 3 | 0.120 | AMC710722 | 2602928 | AMC710723 | 2602929 |
| AFNL-3 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 3 | 0.190 | AMC710730 | 2602932 | AMC710731 | 2602933 |
| AFNL-3 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 3 | 0.250 | AMC710734 | 2602934 | AMC710735 | 2602935 |
| AFNL-3 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 3 | Ball | AMC710738 | 2602936 | AMC710739 | 2602937 |
| AFS-3 | 3/4 | 1 | 3 | – | 3/4 | 3 | Square | AMC703502 | 2602054 | AMC703503 | 2602055 |
| AFS-3 | 3/4 | 1 | 3 | – | 3/4 | 3 | 0.030 | AMC703510 | 2602056 | AMC703511 | 2602057 |
| AFS-3 | 3/4 | 1 | 3 | – | 3/4 | 3 | 0.060 | AMC703514 | 2602058 | AMC703515 | 2602059 |
| AFS-3 | 3/4 | 1 | 3 | – | 3/4 | 3 | 0.090 | AMC703518 | 2602060 | AMC703519 | 2602061 |
| AFS-3 | 3/4 | 1 | 3 | – | 3/4 | 3 | 0.120 | AMC703522 | 2602062 | AMC703523 | 2602063 |
| AFS-3 | 3/4 | 1 | 3 | – | 3/4 | 3 | 0.190 | AMC703530 | 2602066 | AMC703531 | 2602067 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice




| | | Uncoated | ZRN |
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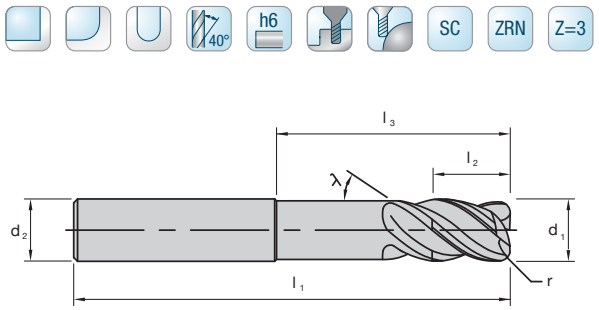
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFS-3 | 3/4 | 1 | 3 | – | 3/4 | 3 | 0.250 | AMC703534 | 2602068 | AMC703535 | 2602069 |
| AFS-3 | 3/4 | 1 | 3 | – | 3/4 | 3 | Ball | AMC703538 | 2602070 | AMC703539 | 2602071 |
| AFM-3 | 3/4 | 1 5/8 | 4 | – | 3/4 | 3 | Square | AMC704152 | 2602154 | AMC704153 | 2602155 |
| AFM-3 | 3/4 | 1 5/8 | 4 | – | 3/4 | 3 | 0.030 | AMC704160 | 2602156 | AMC704161 | 2602157 |
| AFM-3 | 3/4 | 1 5/8 | 4 | – | 3/4 | 3 | 0.060 | AMC704164 | 2602158 | AMC704165 | 2602159 |
| AFM-3 | 3/4 | 1 5/8 | 4 | – | 3/4 | 3 | 0.090 | AMC704168 | 2602160 | AMC704169 | 2602161 |
| AFM-3 | 3/4 | 1 5/8 | 4 | – | 3/4 | 3 | 0.120 | AMC704172 | 2602162 | AMC704173 | 2602163 |
| AFM-3 | 3/4 | 1 5/8 | 4 | – | 3/4 | 3 | 0.190 | AMC704180 | 2602166 | AMC704181 | 2602167 |
| AFM-3 | 3/4 | 1 5/8 | 4 | – | 3/4 | 3 | 0.250 | AMC704184 | 2602168 | AMC704185 | 2602169 |
| AFM-3 | 3/4 | 1 5/8 | 4 | – | 3/4 | 3 | Ball | AMC704188 | 2602170 | AMC704189 | 2602171 |
| AFL-3 | 3/4 | 2 1/2 | 5 | – | 3/4 | 3 | Square | AMC704802 | 2602254 | AMC704803 | 2602255 |
| AFL-3 | 3/4 | 2 1/2 | 5 | – | 3/4 | 3 | 0.030 | AMC704810 | 2602256 | AMC704811 | 2602257 |
| AFL-3 | 3/4 | 2 1/2 | 5 | – | 3/4 | 3 | 0.060 | AMC704814 | 2602258 | AMC704815 | 2602259 |
| AFL-3 | 3/4 | 2 1/2 | 5 | – | 3/4 | 3 | 0.090 | AMC704818 | 2602260 | AMC704819 | 2602261 |
| AFL-3 | 3/4 | 2 1/2 | 5 | – | 3/4 | 3 | 0.120 | AMC704822 | 2602262 | AMC704823 | 2602263 |
| AFL-3 | 3/4 | 2 1/2 | 5 | – | 3/4 | 3 | 0.190 | AMC704830 | 2602266 | AMC704831 | 2602267 |
| AFL-3 | 3/4 | 2 1/2 | 5 | – | 3/4 | 3 | 0.250 | AMC704834 | 2602268 | AMC704835 | 2602269 |
| AFL-3 | 3/4 | 2 1/2 | 5 | – | 3/4 | 3 | Ball | AMC704838 | 2602270 | AMC704839 | 2602271 |
| AFX-3 | 3/4 | 3 1/4 | 6 | – | 3/4 | 3 | Square | AMC705452 | 2602326 | AMC705453 | 2602327 |
| AFX-3 | 3/4 | 3 1/4 | 6 | – | 3/4 | 3 | 0.030 | AMC705460 | 2602328 | AMC705461 | 2602329 |
| AFX-3 | 3/4 | 3 1/4 | 6 | – | 3/4 | 3 | 0.060 | AMC705464 | 2602330 | AMC705465 | 2602331 |
| AFX-3 | 3/4 | 3 1/4 | 6 | – | 3/4 | 3 | 0.090 | AMC705468 | 2602332 | AMC705469 | 2602333 |
| AFX-3 | 3/4 | 3 1/4 | 6 | – | 3/4 | 3 | 0.120 | AMC705472 | 2602334 | AMC705473 | 2602335 |
| AFX-3 | 3/4 | 3 1/4 | 6 | – | 3/4 | 3 | 0.190 | AMC705480 | 2602338 | AMC705481 | 2602339 |
| AFX-3 | 3/4 | 3 1/4 | 6 | – | 3/4 | 3 | 0.250 | AMC705484 | 2602340 | AMC705485 | 2602341 |
| AFX-3 | 3/4 | 3 1/4 | 6 | – | 3/4 | 3 | Ball | AMC705488 | 2602342 | AMC705489 | 2602343 |
| AFNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | Square | AMC709502 | 2602738 | AMC709503 | 2602739 |
| AFNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.030 | AMC709510 | 2602740 | AMC709511 | 2602741 |
| AFNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.060 | AMC709514 | 2602742 | AMC709515 | 2602743 |
| AFNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.090 | AMC709518 | 2602744 | AMC709519 | 2602745 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice




| | Uncoated | ZRN |
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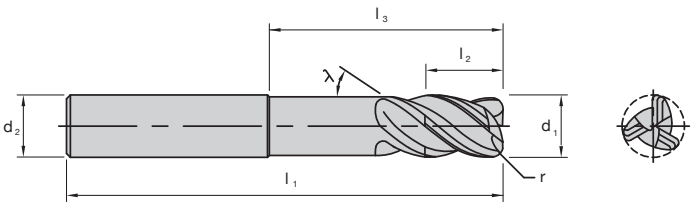
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.120 | AMC709522 | 2602746 | AMC709523 | 2602747 |
| AFNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.190 | AMC709530 | 2602750 | AMC709531 | 2602751 |
| AFNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.250 | AMC709534 | 2602752 | AMC709535 | 2602753 |
| AFNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | Ball | AMC709538 | 2602754 | AMC709539 | 2602755 |
| AFNM-3 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 3 | Square | AMC710152 | 2602838 | AMC710153 | 2602839 |
| AFNM-3 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 3 | 0.030 | AMC710160 | 2602840 | AMC710161 | 2602841 |
| AFNM-3 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 3 | 0.060 | AMC710164 | 2602842 | AMC710165 | 2602843 |
| AFNM-3 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 3 | 0.090 | AMC710168 | 2602844 | AMC710169 | 2602845 |
| AFNM-3 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 3 | 0.120 | AMC710172 | 2602846 | AMC710173 | 2602847 |
| AFNM-3 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 3 | 0.190 | AMC710180 | 2602850 | AMC710181 | 2602851 |
| AFNM-3 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 3 | 0.250 | AMC710184 | 2602852 | AMC710185 | 2602853 |
| AFNM-3 | 3/4 | 1 | 5 | 3 1/8 | 3/4 | 3 | Ball | AMC710188 | 2602854 | AMC710189 | 2602855 |
| AFNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | Square | AMC710802 | 2602938 | AMC710803 | 2602939 |
| AFNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.030 | AMC710810 | 2602940 | AMC710811 | 2602941 |
| AFNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.060 | AMC710814 | 2602942 | AMC710815 | 2602943 |
| AFNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.090 | AMC710818 | 2602944 | AMC710819 | 2602945 |
| AFNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.120 | AMC710822 | 2602946 | AMC710823 | 2602947 |
| AFNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.190 | AMC710830 | 2602950 | AMC710831 | 2602951 |
| AFNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.250 | AMC710834 | 2602952 | AMC710835 | 2602953 |
| AFNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | Ball | AMC710838 | 2602954 | AMC710839 | 2602955 |
| AFS-3 | 1 | 1 1/4 | 4 | – | 1 | 3 | Square | AMC703602 | 2602072 | AMC703603 | 2602073 |
| AFS-3 | 1 | 1 1/4 | 4 | – | 1 | 3 | 0.030 | AMC703610 | 2602074 | AMC703611 | 2602075 |
| AFS-3 | 1 | 1 1/4 | 4 | – | 1 | 3 | 0.060 | AMC703614 | 2602076 | AMC703615 | 2602077 |
| AFS-3 | 1 | 1 1/4 | 4 | – | 1 | 3 | 0.120 | AMC703622 | 2602080 | AMC703623 | 2602081 |
| AFS-3 | 1 | 1 1/4 | 4 | – | 1 | 3 | 0.190 | AMC703630 | 2602084 | AMC703631 | 2602085 |
| AFS-3 | 1 | 1 1/4 | 4 | – | 1 | 3 | 0.250 | AMC703634 | 2602086 | AMC703635 | 2602087 |
| AFS-3 | 1 | 1 1/4 | 4 | – | 1 | 3 | Ball | AMC703638 | 2602088 | AMC703639 | 2602089 |
| AFM-3 | 1 | 2 1/2 | 5 | – | 1 | 3 | Square | AMC704252 | 2602172 | AMC704253 | 2602173 |
| AFM-3 | 1 | 2 1/2 | 5 | – | 1 | 3 | 0.030 | AMC704260 | 2602174 | AMC704261 | 2602175 |
| AFM-3 | 1 | 2 1/2 | 5 | – | 1 | 3 | 0.060 | AMC704264 | 2602176 | AMC704265 | 2602177 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice


| | | Uncoated | ZRN |
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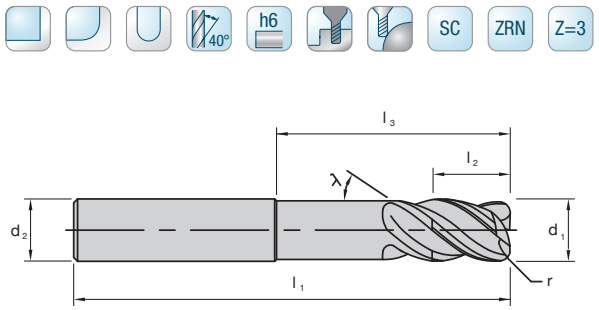
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFM-3 | 1 | 2 1/2 | 5 | – | 1 | 3 | 0.120 | AMC704272 | 2602180 | AMC704273 | 2602181 |
| AFM-3 | 1 | 2 1/2 | 5 | – | 1 | 3 | 0.190 | AMC704280 | 2602184 | AMC704281 | 2602185 |
| AFM-3 | 1 | 2 1/2 | 5 | – | 1 | 3 | 0.250 | AMC704284 | 2602186 | AMC704285 | 2602187 |
| AFM-3 | 1 | 2 1/2 | 5 | – | 1 | 3 | Ball | AMC704288 | 2602188 | AMC704289 | 2602189 |
| AFL-3 | 1 | 3 1/4 | 6 | – | 1 | 3 | Square | AMC704902 | 2602272 | AMC704903 | 2602273 |
| AFL-3 | 1 | 3 1/4 | 6 | – | 1 | 3 | 0.030 | AMC704910 | 2602274 | AMC704911 | 2602275 |
| AFL-3 | 1 | 3 1/4 | 6 | – | 1 | 3 | 0.060 | AMC704914 | 2602276 | AMC704915 | 2602277 |
| AFL-3 | 1 | 3 1/4 | 6 | – | 1 | 3 | 0.120 | AMC704922 | 2602280 | AMC704923 | 2602281 |
| AFL-3 | 1 | 3 1/4 | 6 | – | 1 | 3 | 0.190 | AMC704930 | 2602284 | AMC704931 | 2602285 |
| AFL-3 | 1 | 3 1/4 | 6 | – | 1 | 3 | 0.250 | AMC704934 | 2602286 | AMC704935 | 2602287 |
| AFL-3 | 1 | 3 1/4 | 6 | – | 1 | 3 | Ball | AMC704938 | 2602288 | AMC704939 | 2602289 |
| AFX-3 | 1 | 4 1/8 | 7 | – | 1 | 3 | Square | AMC705552 | 2602344 | AMC705553 | 2602345 |
| AFX-3 | 1 | 4 1/8 | 7 | – | 1 | 3 | 0.030 | AMC705560 | 2602346 | AMC705561 | 2602347 |
| AFX-3 | 1 | 4 1/8 | 7 | – | 1 | 3 | 0.060 | AMC705564 | 2602348 | AMC705565 | 2602349 |
| AFX-3 | 1 | 4 1/8 | 7 | – | 1 | 3 | 0.120 | AMC705572 | 2602352 | AMC705573 | 2602353 |
| AFX-3 | 1 | 4 1/8 | 7 | – | 1 | 3 | 0.190 | AMC705580 | 2602356 | AMC705581 | 2602357 |
| AFX-3 | 1 | 4 1/8 | 7 | – | 1 | 3 | 0.250 | AMC705584 | 2602358 | AMC705585 | 2602359 |
| AFX-3 | 1 | 4 1/8 | 7 | – | 1 | 3 | Ball | AMC705588 | 2602360 | AMC705589 | 2602361 |
| AFNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | Square | AMC709602 | 2602756 | AMC709603 | 2602757 |
| AFNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.030 | AMC709610 | 2602758 | AMC709611 | 2602759 |
| AFNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.060 | AMC709614 | 2602760 | AMC709615 | 2602761 |
| AFNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.120 | AMC709622 | 2602764 | AMC709623 | 2602765 |
| AFNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.190 | AMC709630 | 2602768 | AMC709631 | 2602769 |
| AFNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.250 | AMC709634 | 2602770 | AMC709635 | 2602771 |
| AFNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | Ball | AMC709638 | 2602772 | AMC709639 | 2602773 |
| AFNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | Square | AMC710252 | 2602856 | AMC710253 | 2602857 |
| AFNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.030 | AMC710260 | 2602858 | AMC710261 | 2602859 |
| AFNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.060 | AMC710264 | 2602860 | AMC710265 | 2602861 |
| AFNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.120 | AMC710272 | 2602864 | AMC710273 | 2602865 |
| AFNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.190 | AMC710280 | 2602868 | AMC710281 | 2602869 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice

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| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.250 | AMC710284 | 2602870 | AMC710285 | 2602871 |
| AFNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | Ball | AMC710288 | 2602872 | AMC710289 | 2602873 |
| AFNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | Square | AMC710902 | 2602956 | AMC710903 | 2602957 |
| AFNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.030 | AMC710910 | 2602958 | AMC710911 | 2602959 |
| AFNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.060 | AMC710914 | 2602960 | AMC710915 | 2602961 |
| AFNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.120 | AMC710922 | 2602964 | AMC710923 | 2602965 |
| AFNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.190 | AMC710930 | 2602968 | AMC710931 | 2602969 |
| AFNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.250 | AMC710934 | 2602970 | AMC710935 | 2602971 |
| AFNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | Ball | AMC710938 | 2602972 | AMC710939 | 2602973 |
| AFNX-3 | 1 | 1 1/4 | 7 | 4 5/8 | 1 | 3 | Square | AMC710952 | 2602974 | AMC710953 | 2602975 |
| AFNX-3 | 1 | 1 1/4 | 7 | 4 5/8 | 1 | 3 | 0.030 | AMC710960 | 2602976 | AMC710961 | 2602977 |

Cutting data recommendations on page 97

■ = First Choice ☐ = Second Choice

# Aluminum Finisher Coolant Through (AFC) Series

LMT Onsrud's AFC 3 flute series endmills, coolant through designs dissipates heat and clears chips effectively.

**Features and Benefits**

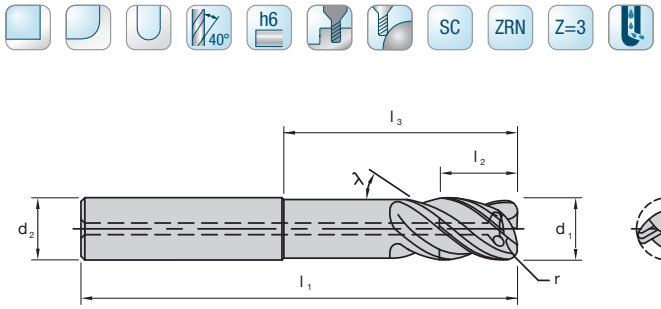
- Slot over 15% faster with AFC Series.
- Available uncoated with high polished flutes and specialty coatings for Aluminum.
- Industry's largest selection of corner radii and neck and flute lengths in a standard program.
- Coolant at the cutting edge also contributes to superior finishes and prevents chips from adhering between the flutes.

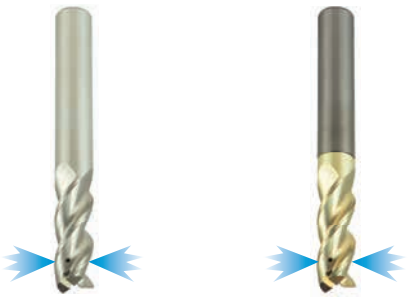
**Applications**

- Slotting
- Pocketing
- Profiling
- High Material Removal

**Usage**

- ISO N Non-Ferrous
- Aluminum
- Brass
- Bronze
- Copper



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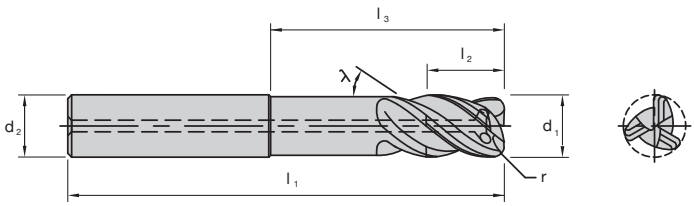
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFCNS-3 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 3 | Square | AMC715102 | 2603309 | AMC715103 | 2603310 |
| AFCNS-3 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 3 | 0.015 | AMC715106 | 2828189 | AMC715107 | 2603311 |
| AFCNS-3 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 3 | 0.030 | AMC715110 | 2603312 | AMC715111 | 2823370 |
| AFCNS-3 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 3 | 0.060 | AMC715114 | 2603313 | AMC715115 | 2603314 |
| AFCNS-3 | 1/4 | 3/8 | 4 | 1 1/2 | 1/4 | 3 | Ball | AMC715138 | 2603317 | AMC715139 | 2603318 |
| AFCNM-3 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 3 | Square | AMC715752 | 2603407 | AMC715753 | 2603408 |
| AFCNM-3 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 3 | 0.015 | AMC715756 | 2603409 | AMC715757 | 2603410 |
| AFCNM-3 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 3 | 0.030 | AMC715760 | 2603411 | AMC715761 | 2603412 |
| AFCNM-3 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 3 | 0.060 | AMC715764 | 2603413 | AMC715765 | 2603414 |
| AFCNM-3 | 1/4 | 3/8 | 4 | 1 3/4 | 1/4 | 3 | Ball | AMC715788 | 2603417 | AMC715789 | 2603418 |
| AFCNL-3 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 3 | Square | AMC716402 | 2603507 | AMC716403 | 2603508 |
| AFCNL-3 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 3 | 0.015 | AMC716406 | 2603509 | AMC716407 | 2603510 |
| AFCNL-3 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 3 | 0.030 | AMC716410 | 2603511 | AMC716411 | 2603512 |
| AFCNL-3 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 3 | 0.060 | AMC716414 | 2603513 | AMC716415 | 2603514 |
| AFCNL-3 | 1/4 | 3/8 | 4 | 2 1/8 | 1/4 | 3 | Ball | AMC716438 | 2603517 | AMC716439 | 2603518 |
| AFCM-3 | 3/8 | 1 | 3 | – | 3/8 | 3 | Square | AMC717018 | 2641930 | AMC717019 | 2641938 |
| AFCM-3 | 3/8 | 1 | 3 | – | 3/8 | 3 | 0.015 | AMC717020 | 2641931 | AMC717021 | 2641939 |
| AFCNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | Square | AMC715202 | 2603319 | AMC715203 | 2603320 |
| AFCNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | 0.015 | AMC715206 | 2603321 | AMC715207 | 2603322 |
| AFCNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | 0.030 | AMC715210 | 2603323 | AMC715211 | 2603324 |
| AFCNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | 0.060 | AMC715214 | 2603325 | AMC715215 | 2603326 |
| AFCNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | 0.090 | AMC715218 | 2603327 | AMC715219 | 2603328 |
| AFCNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | 0.120 | AMC715222 | 2603329 | AMC715223 | 2603330 |
| AFCNS-3 | 3/8 | 1/2 | 4 | 1 3/4 | 3/8 | 3 | Ball | AMC715238 | 2603333 | AMC715239 | 2603334 |
| AFCNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | Square | AMC715852 | 2603419 | AMC715853 | 2603420 |
| AFCNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | 0.015 | AMC715856 | 2603421 | AMC715857 | 2603422 |
| AFCNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | 0.030 | AMC715860 | 2603423 | AMC715861 | 2603424 |
| AFCNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | 0.060 | AMC715864 | 2603425 | AMC715865 | 2603426 |
| AFCNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | 0.090 | AMC715868 | 2603427 | AMC715869 | 2603428 |
| AFCNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | 0.120 | AMC715872 | 2603429 | AMC715873 | 2603430 |
| AFCNM-3 | 3/8 | 1/2 | 4 | 2 1/4 | 3/8 | 3 | Ball | AMC715888 | 2603433 | AMC715889 | 2603434 |

Cutting data recommendations on page 98

■ = First Choice ☐ = Second Choice

# Aluminum Finisher Coolant Through End Mills


| | Uncoated | ZRN |
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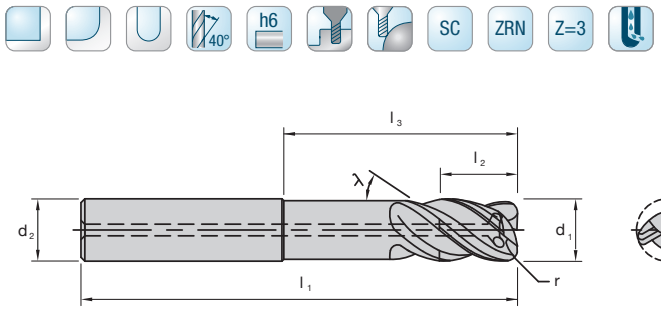
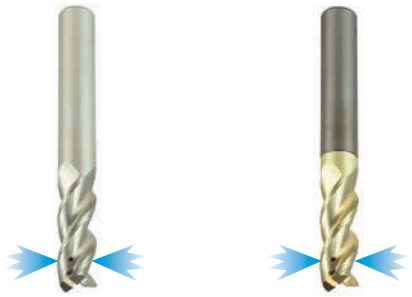
| M | | |
| K | | |
| N | ■ | ■ |
| S | | |
| H | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFCNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | Square | AMC716502 | 2603519 | AMC716503 | 2603520 |
| AFCNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | 0.015 | AMC716506 | 2603521 | AMC716507 | 2603522 |
| AFCNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | 0.030 | AMC716510 | 2603523 | AMC716511 | 2603524 |
| AFCNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | 0.060 | AMC716514 | 2603525 | AMC716515 | 2603526 |
| AFCNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | 0.090 | AMC716518 | 2603527 | AMC716519 | 2603528 |
| AFCNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | 0.120 | AMC716522 | 2603529 | AMC716523 | 2603530 |
| AFCNL-3 | 3/8 | 1/2 | 5 | 2 3/4 | 3/8 | 3 | Ball | AMC716538 | 2603533 | AMC716539 | 2603534 |
| AFCM-3 | 1/2 | 1 1/4 | 3 | – | 1/2 | 3 | Square | AMC717022 | 2641932 | AMC717023 | 2641940 |
| AFCM-3 | 1/2 | 1 1/4 | 3 | – | 1/2 | 3 | 0.015 | AMC717024 | 2641933 | AMC717025 | 2641941 |
| AFCNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | Square | AMC715302 | 2603335 | AMC715303 | 2603336 |
| AFCNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.015 | AMC715306 | 2603337 | AMC715307 | 2603338 |
| AFCNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.030 | AMC715310 | 2603339 | AMC715311 | 2603340 |
| AFCNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.060 | AMC715314 | 2603341 | AMC715315 | 2603342 |
| AFCNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.090 | AMC715318 | 2603343 | AMC715319 | 2603344 |
| AFCNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.120 | AMC715322 | 2603345 | AMC715323 | 2603346 |
| AFCNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.190 | AMC715330 | 2603349 | AMC715331 | 2603350 |
| AFCNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | Ball | AMC715338 | 2603351 | AMC715339 | 2603352 |
| AFCNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | Square | AMC715952 | 2603435 | AMC715953 | 2603436 |
| AFCNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.015 | AMC715956 | 2603437 | AMC715957 | 2603438 |
| AFCNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.030 | AMC715960 | 2603439 | AMC715961 | 2603440 |
| AFCNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.060 | AMC715964 | 2603441 | AMC715965 | 2603442 |
| AFCNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.090 | AMC715968 | 2603443 | AMC715969 | 2603444 |
| AFCNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.120 | AMC715972 | 2603445 | AMC715973 | 2603446 |
| AFCNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.190 | AMC715980 | 2603449 | AMC715981 | 2603450 |
| AFCNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | Ball | AMC715988 | 2603451 | AMC715989 | 2603452 |
| AFCNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | Square | AMC716602 | 2603535 | AMC716603 | 2603536 |
| AFCNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.015 | AMC716606 | 2603537 | AMC716607 | 2603538 |
| AFCNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.030 | AMC716610 | 2603539 | AMC716611 | 2603540 |
| AFCNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.060 | AMC716614 | 2603541 | AMC716615 | 2603542 |
| AFCNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.090 | AMC716618 | 2603543 | AMC716619 | 2603544 |
| AFCNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.120 | AMC716622 | 2603545 | AMC716623 | 2603546 |

Cutting data recommendations on page 98

■ = First Choice ☐ = Second Choice



| | | Uncoated | ZRN |
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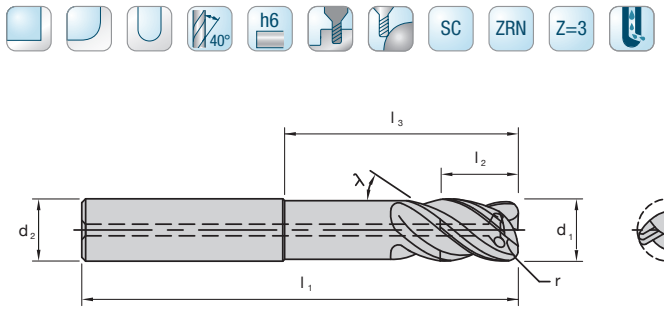
| N | | ■ | ■ |
| S | | | |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFCNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.190 | AMC716630 | 2603549 | AMC716631 | 2603550 |
| AFCNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | Ball | AMC716638 | 2603551 | AMC716639 | 2603552 |
| AFCNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | Square | AMC715402 | 2603353 | AMC715403 | 2603354 |
| AFCNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | 0.030 | AMC715410 | 2603355 | AMC715411 | 2603356 |
| AFCNM-3 | 5/8 | 3/4 | 6 | 3 1/8 | 5/8 | 3 | Square | AMC716052 | 2603453 | AMC716053 | 2603454 |
| AFCNM-3 | 5/8 | 3/4 | 6 | 3 1/8 | 5/8 | 3 | 0.030 | AMC716060 | 2603455 | AMC716061 | 2603456 |
| AFCNL-3 | 5/8 | 3/4 | 6 | 4 /18 | 5/8 | 3 | Square | AMC713702 | 2603237 | AMC716703 | 2603554 |
| AFCNL-3 | 5/8 | 3/4 | 6 | 4 /18 | 5/8 | 3 | 0.030 | AMC716710 | 2603555 | AMC716711 | 2603556 |
| AFCM-3 | 3/4 | 1 5/8 | 4 | – | 3/4 | 3 | Square | AMC717026 | 2641934 | AMC717027 | 2641942 |
| AFCM-3 | 3/4 | 1 5/8 | 4 | – | 3/4 | 3 | 0.030 | AMC717028 | 2641935 | AMC717029 | 2641943 |
| AFCNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | Square | AMC715502 | 2603371 | AMC715503 | 2603372 |
| AFCNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.030 | AMC715510 | 2603373 | AMC715511 | 2603374 |
| AFCNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.060 | AMC715514 | 2603375 | AMC715515 | 2603376 |
| AFCNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.090 | AMC715518 | 2603377 | AMC715519 | 2603378 |
| AFCNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.120 | AMC715522 | 2603379 | AMC715523 | 2603380 |
| AFCNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.190 | AMC715530 | 2603383 | AMC715531 | 2603384 |
| AFCNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.250 | AMC715534 | 2603385 | AMC715535 | 2603386 |
| AFCNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | Ball | AMC715538 | 2603387 | AMC715539 | 2603388 |
| AFCNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | Square | AMC716152 | 2603471 | AMC716153 | 2603472 |
| AFCNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | 0.030 | AMC716160 | 2603473 | AMC716161 | 2603474 |
| AFCNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | 0.060 | AMC716164 | 2603475 | AMC716165 | 2603476 |
| AFCNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | 0.090 | AMC716168 | 2603477 | AMC716169 | 2603478 |
| AFCNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | 0.120 | AMC716172 | 2603479 | AMC716173 | 2603480 |
| AFCNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | 0.190 | AMC716180 | 2603483 | AMC716181 | 2603484 |
| AFCNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | 0.250 | AMC716184 | 2603485 | AMC716185 | 2603486 |
| AFCNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | Ball | AMC716188 | 2603487 | AMC716189 | 2603488 |
| AFCNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | Square | AMC716802 | 2603571 | AMC716803 | 2603572 |
| AFCNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.030 | AMC716810 | 2603573 | AMC716811 | 2603574 |
| AFCNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.060 | AMC716814 | 2603575 | AMC716815 | 2603576 |
| AFCNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.090 | AMC716818 | 2603577 | AMC716819 | 2603578 |
| AFCNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.120 | AMC716822 | 2603579 | AMC716823 | 2603580 |

Cutting data recommendations on page 98

■ = First Choice ☐ = Second Choice

# Aluminum Finisher Coolant Through End Mills




| | | Uncoated | ZRN |
|---|---|---|---|
| P | | | |
| M | | | |
| K | | | |
| N | | ■ | ■ |
| S | | | |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Uncoated Ident No. | Uncoated SAP No. | ZRN Coated Ident No. | ZRN Coated SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFCNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.190 | AMC716830 | 2603583 | AMC716831 | 2603584 |
| AFCNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.250 | AMC716834 | 2603585 | AMC716835 | 2603586 |
| AFCNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | Ball | AMC716838 | 2603587 | AMC716839 | 2603588 |
| AFCM-3 | 1 | 2 1/2 | 5 | – | 1 | 3 | Square | AMC717030 | 2641936 | AMC717031 | 2641944 |
| AFCM-3 | 1 | 2 1/2 | 5 | – | 1 | 3 | 0.030 | AMC717032 | 2641937 | AMC717033 | 2641945 |
| AFCNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | Square | AMC715602 | 2603389 | AMC715603 | 2603390 |
| AFCNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.030 | AMC715610 | 2603391 | AMC715611 | 2603392 |
| AFCNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.060 | AMC715614 | 2603393 | AMC715615 | 2603394 |
| AFCNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.120 | AMC715622 | 2603397 | AMC715623 | 2603398 |
| AFCNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.190 | AMC715630 | 2603401 | AMC715631 | 2603402 |
| AFCNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.250 | AMC715634 | 2603403 | AMC715635 | 2603404 |
| AFCNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | Ball | AMC715638 | 2603405 | AMC715639 | 2603406 |
| AFCNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | Square | AMC716252 | 2603489 | AMC716253 | 2603490 |
| AFCNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.030 | AMC716260 | 2603491 | AMC716261 | 2603492 |
| AFCNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.060 | AMC716264 | 2603493 | AMC716265 | 2603494 |
| AFCNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.120 | AMC716272 | 2603497 | AMC716273 | 2603498 |
| AFCNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.190 | AMC716280 | 2603501 | AMC716281 | 2603502 |
| AFCNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.250 | AMC716284 | 2603503 | AMC716285 | 2603504 |
| AFCNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | Ball | AMC716288 | 2603505 | AMC716289 | 2603506 |
| AFCNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | Square | AMC716902 | 2603589 | AMC716903 | 2603590 |
| AFCNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.030 | AMC716910 | 2603591 | AMC716911 | 2603592 |
| AFCNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.060 | AMC716914 | 2603593 | AMC716915 | 2603594 |
| AFCNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.120 | AMC716922 | 2603597 | AMC716923 | 2603598 |
| AFCNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.190 | AMC716930 | 2603601 | AMC716931 | 2603602 |
| AFCNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.250 | AMC716934 | 2603603 | AMC716935 | 2603604 |
| AFCNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | Ball | AMC716938 | 2603605 | AMC716939 | 2603606 |

Cutting data recommendations on page 98

■ = First Choice ☐ = Second Choice

# High RPM Aluminum (AHR) Series

The High RPM Aluminum (AHR) end mill is the latest addition in LMT Onsrud's endmill portfolio. The tool's geometry is designed to run at spindle speeds of up to 33,000 RPM. The AHR series performs heavy roughing at extreme surface footages. A non-rougher and rougher pattern is offered. Coolant Through is standard.

**Features and Benefits**

- Optimized geometry for heavy roughing at extreme surface footages.
- Newly designed rougher pattern to reduce horsepower consumption.
- Precise coolant hole configuration to lubricate every cutting surface.
- Polished flutes for smooth chip evacuation.
- Rough shank for increased tool-holding power.

**Applications**

- Roughing
- Heavy Profile
- HEM Profile

**Usage**

- Aluminum

**Aluminum Milling:** Roughing & Finishing

**Tool:**
AHR2656051
Cutting Diameter ($d_1$) = 1" No. of Flutes (z) = 3

**Cutting Material:**
Solid Carbide

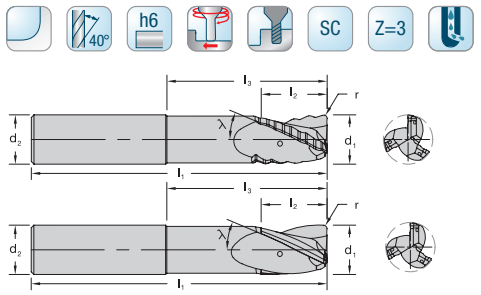
**Material:**
7050 Aluminum

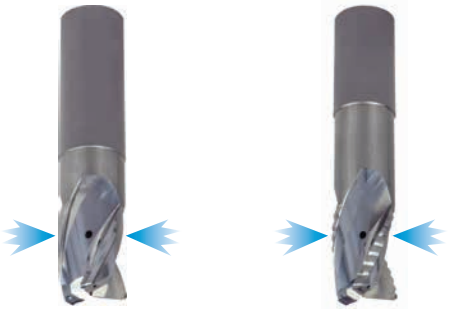
**Roughing Cutting Data:**

| | |
|---|---|
| SFM ($v_c$) | = 8,620 |
| RPM (n) | = 33,000 |
| Feed ($v_f$) | = 700 in/min |
| Chipload ($f_z$) | = 0.007 in |
| RDoC ($a_e$) | = 0.30 in |
| ADoC ($a_p$) | = 1.00 in |
| MRR (Q) | = 210 $in^3$/min or 4.20 $in^3$/min/per HP |

**Finishing Cutting Data:**

| | |
|---|---|
| SFM ($v_c$) | = 8,620 |
| RPM (n) | = 33,000 |
| Feed ($v_f$) | = 1,200 in/min |
| Chipload ($f_z$) | = 0.0121 in |
| RDoC ($a_e$) | = 0.10 in |
| ADoC ($a_p$) | = 1.00 in |
| MRR (Q) | = 120 $in^3$/min or 4.0 $in^3$/min/per HP |



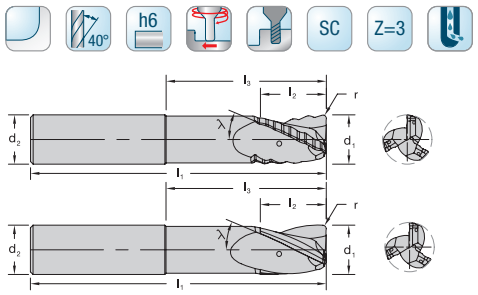



| | Non Rougher | Rougher |
|---|---|---|
| P | | |
| M | | |
| K | | |
| N | ■ | ■ |
| S | | |
| H | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Rougher Ident No. | Rougher SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AHRNS-3 | 1/2 | 5/8 | 3 | 1 5/8 | 1/2 | 3 | 0.030 | AHR2656024 | 2656024 | AHR2656060 | 2656060 |
| AHRNS-3 | 1/2 | 5/8 | 3 | 1 5/8 | 1/2 | 3 | 0.060 | AHR2656025 | 2656025 | AHR2656061 | 2656061 |
| AHRNS-3 | 1/2 | 5/8 | 3 | 1 5/8 | 1/2 | 3 | 0.090 | AHR2656026 | 2656026 | AHR2656062 | 2656062 |
| AHRNS-3 | 1/2 | 5/8 | 3 | 1 5/8 | 1/2 | 3 | 0.120 | AHR2656027 | 2656027 | AHR2656063 | 2656063 |
| AHRNM-3 | 1/2 | 5/8 | 4 | 2 1/4 | 1/2 | 3 | 0.030 | AHR2656028 | 2656028 | AHR2656064 | 2656064 |
| AHRNM-3 | 1/2 | 5/8 | 4 | 2 1/4 | 1/2 | 3 | 0.060 | AHR2656029 | 2656029 | AHR2656065 | 2656065 |
| AHRNM-3 | 1/2 | 5/8 | 4 | 2 1/4 | 1/2 | 3 | 0.090 | AHR2656030 | 2656030 | AHR2656066 | 2656066 |
| AHRNM-3 | 1/2 | 5/8 | 4 | 2 1/4 | 1/2 | 3 | 0.120 | AHR2656031 | 2656031 | AHR2656067 | 2656067 |
| AHRNL-3 | 1/2 | 5/8 | 6 | 3 1/4 | 1/2 | 3 | 0.030 | AHR2656032 | 2656032 | AHR2656068 | 2656068 |
| AHRNL-3 | 1/2 | 5/8 | 6 | 3 1/4 | 1/2 | 3 | 0.060 | AHR2656033 | 2656033 | AHR2656069 | 2656069 |
| AHRNL-3 | 1/2 | 5/8 | 6 | 3 1/4 | 1/2 | 3 | 0.090 | AHR2656034 | 2656034 | AHR2656070 | 2656070 |
| AHRNL-3 | 1/2 | 5/8 | 6 | 3 1/4 | 1/2 | 3 | 0.120 | AHR2656035 | 2656035 | AHR2656071 | 2656071 |
| AHRNS-3 | 3/4 | 1 | 4 | 1 5/8 | 3/4 | 3 | 0.030 | AHR2656036 | 2656036 | AHR2656072 | 2656072 |
| AHRNS-3 | 3/4 | 1 | 4 | 1 5/8 | 3/4 | 3 | 0.060 | AHR2656037 | 2656037 | AHR2656073 | 2656073 |
| AHRNS-3 | 3/4 | 1 | 4 | 1 5/8 | 3/4 | 3 | 0.090 | AHR2656038 | 2656038 | AHR2656074 | 2656074 |
| AHRNS-3 | 3/4 | 1 | 4 | 1 5/8 | 3/4 | 3 | 0.120 | AHR2656039 | 2656039 | AHR2656075 | 2656075 |
| AHRNM-3 | 3/4 | 1 | 4 | 2 1/4 | 3/4 | 3 | 0.030 | AHR2656040 | 2656040 | AHR2656076 | 2656076 |
| AHRNM-3 | 3/4 | 1 | 4 | 2 1/4 | 3/4 | 3 | 0.060 | AHR2656041 | 2656041 | AHR2656077 | 2656077 |
| AHRNM-3 | 3/4 | 1 | 4 | 2 1/4 | 3/4 | 3 | 0.090 | AHR2656042 | 2656042 | AHR2656078 | 2656078 |
| AHRNM-3 | 3/4 | 1 | 4 | 2 1/4 | 3/4 | 3 | 0.120 | AHR2656043 | 2656043 | AHR2656079 | 2656079 |
| AHRNL-3 | 3/4 | 1 | 5 | 3 1/4 | 3/4 | 3 | 0.030 | AHR2656044 | 2656044 | AHR2656080 | 2656080 |
| AHRNL-3 | 3/4 | 1 | 5 | 3 1/4 | 3/4 | 3 | 0.060 | AHR2656045 | 2656045 | AHR2656081 | 2656081 |
| AHRNL-3 | 3/4 | 1 | 5 | 3 1/4 | 3/4 | 3 | 0.090 | AHR2656046 | 2656046 | AHR2656082 | 2656082 |
| AHRNL-3 | 3/4 | 1 | 5 | 3 1/4 | 3/4 | 3 | 0.120 | AHR2656047 | 2656047 | AHR2656083 | 2656083 |
| AHRNS-3 | 1 | 1 1/4 | 5 | 2 1/4 | 1 | 3 | 0.030 | AHR2656048 | 2656048 | AHR2656084 | 2656084 |
| AHRNS-3 | 1 | 1 1/4 | 5 | 2 1/4 | 1 | 3 | 0.060 | AHR2656049 | 2656049 | AHR2656085 | 2656085 |
| AHRNS-3 | 1 | 1 1/4 | 5 | 2 1/4 | 1 | 3 | 0.090 | AHR2656050 | 2656050 | AHR2656086 | 2656086 |
| AHRNS-3 | 1 | 1 1/4 | 5 | 2 1/4 | 1 | 3 | 0.120 | AHR2656051 | 2656051 | AHR2656087 | 2656087 |
| AHRNM-3 | 1 | 1 1/4 | 6 | 3 1/4 | 1 | 3 | 0.030 | AHR2656052 | 2656052 | AHR2656088 | 2656088 |
| AHRNM-3 | 1 | 1 1/4 | 6 | 3 1/4 | 1 | 3 | 0.060 | AHR2656053 | 2656053 | AHR2656089 | 2656089 |

Cutting data recommendations on page 98

■ = First Choice ☐ = Second Choice




| | | Non Rougher | Rougher |
|---|---|---|---|
| P | | | |
| M | | | |
| K | | | |
| N | | ■ | ■ |
| S | | | |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Rougher Ident No. | Rougher SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AHRNM-3 | 1 | 1 1/4 | 6 | 3 1/4 | 1 | 3 | 0.090 | AHR2656054 | 2656054 | AHR2656090 | 2656090 |
| AHRNM-3 | 1 | 1 1/4 | 6 | 3 1/4 | 1 | 3 | 0.120 | AHR2656055 | 2656055 | AHR2656091 | 2656091 |
| AHRNL-3 | 1 | 1 1/4 | 7 | 4 1/4 | 1 | 3 | 0.030 | AHR2656056 | 2656056 | AHR2656092 | 2656092 |
| AHRNL-3 | 1 | 1 1/4 | 7 | 4 1/4 | 1 | 3 | 0.060 | AHR2656057 | 2656057 | AHR2656093 | 2656093 |
| AHRNL-3 | 1 | 1 1/4 | 7 | 4 1/4 | 1 | 3 | 0.090 | AHR2656058 | 2656058 | AHR2656094 | 2656094 |
| AHRNL-3 | 1 | 1 1/4 | 7 | 4 1/4 | 1 | 3 | 0.120 | AHR2656059 | 2656059 | AHR2656095 | 2656095 |

Cutting data recommendations on page 98

■ = First Choice □ = Second Choice

# Aluminum Rougher (AR) Series

LMT Onsrud has a complete line of AR end mills designed to provide exceptional performance and tool life within non-ferrous roughing applications. Available 3 flute configurations, coolant or non-coolant through, these tools provide high material removal rates and are optimized to slot 30% faster than our standard AF Series tooling. The coolant through design directs coolant at the cutting edge, removing chips and heat, even during the deepest pocketing applications.

**Features and Benefits**

- 3 flute, coolant or non-coolant through designs.
- Achieve high material removal rates.
- Sinusoidal chipbreaker pattern with open flute design.
- Slot 30% faster than standard AF Series tooling.
- Radial coolant holes directs coolant to cutting edge removing heat and chips on deep pocket applications.
- ZRN coated for increased tool life.

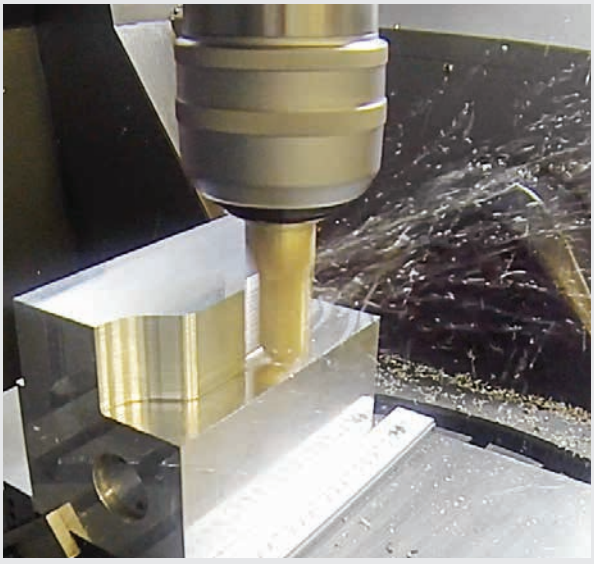
**Applications**

- Slotting
- Pocketing
- Profiling
- High material removal

**Usage**

- ISO N Non-ferrous
- Aluminum
- Non-ferrous materials

ZRN coating enhances tool life and chip evacuation.



**Aluminum Milling:** Roughing

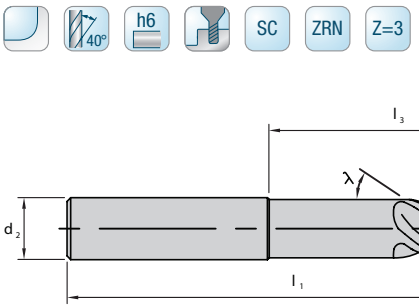
**Tool:**
Aluminum Roughing Tool (Ident No. AMC800129)
Cutting Diameter ($d_1$) = 3/4" No. of Flutes (z) = 3

**Cutting Material:** Solid Carbide

**Material:** 6061-T6 Aluminum

**Cutting Data:**

| | |
|---|---|
| SFM ($v_c$) | = 884 |
| RPM (n) | = 4,500 |
| Feed ($v_f$) | = 60 - 100 in/min |
| Chipload ($f_z$) | = .004 - .007 in |
| RDoC ($a_e$) | = .016 - .213 in |
| ADoC ($a_p$) | = 1.2 - 1.3 in |

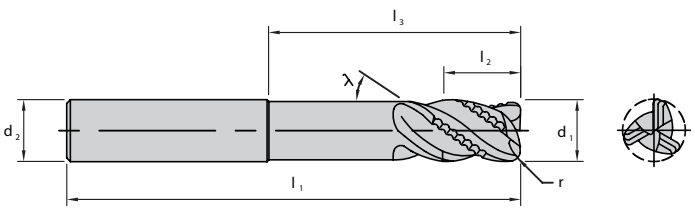



| | 3-Flute |
|---|---|
| **P** | |
| **M** | |
| **K** | |
| **N** | ■ |
| **S** | |
| **H** | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| ARS-3 | 3/8 | 1/2 | 3 | - | 3/8 | 3 | 0.030 | AMC800103 | 2609637 |
| ARM-3 | 3/8 | 7/8 | 2 1/2 | - | 3/8 | 3 | 0.030 | AMC800393 | 2647546 |
| ARNS-3 | 3/8 | 1/2 | 4 | 1 5/8 | 3/8 | 3 | 0.030 | AMC800111 | 2609641 |
| ARS-3 | 1/2 | 5/8 | 3 | - | 1/2 | 3 | 0.030 | AMC800105 | 2609638 |
| ARS-3 | 1/2 | 5/8 | 3 | - | 1/2 | 3 | 0.060 | AMC800397 | 2647547 |
| ARM-3 | 1/2 | 1 1/4 | 3 | - | 1/2 | 3 | 0.030 | AMC800399 | 2647548 |
| ARM-3 | 1/2 | 1 1/4 | 3 | - | 1/2 | 3 | 0.060 | AMC800401 | 2647549 |
| ARNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.030 | AMC800113 | 2609642 |
| ARNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.060 | AMC800115 | 2609643 |
| ARNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.030 | AMC800125 | 2609648 |
| ARNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.060 | AMC800127 | 2609649 |
| ARNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.030 | AMC800135 | 2609653 |
| ARNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.060 | AMC800137 | 2609654 |
| ARS-3 | 5/8 | 3/4 | 3 | - | 5/8 | 3 | 0.030 | AMC800407 | 2647550 |
| ARS-3 | 5/8 | 3/4 | 3 | - | 5/8 | 3 | 0.060 | AMC800409 | 2647551 |
| ARM-3 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 3 | 0.030 | AMC800411 | 2647552 |
| ARM-3 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 3 | 0.060 | AMC800413 | 2647553 |
| ARNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | 0.030 | AMC800419 | 2647554 |
| ARNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | 0.060 | AMC800421 | 2647555 |
| ARNM-3 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 3 | 0.030 | AMC800423 | 2647556 |
| ARNM-3 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 3 | 0.060 | AMC800425 | 2647557 |
| ARNL-3 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 3 | 0.030 | AMC800427 | 2647558 |
| ARNL-3 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 3 | 0.060 | AMC800429 | 2647559 |
| ARS-3 | 3/4 | 1 | 4 | - | 3/4 | 3 | 0.030 | AMC800217 | 2641645 |
| ARS-3 | 3/4 | 1 | 4 | - | 3/4 | 3 | 0.060 | AMC800107 | 2609639 |
| ARS-3 | 3/4 | 1 | 3 | - | 3/4 | 3 | 0.120 | AMC800431 | 2647560 |
| ARM-3 | 3/4 | 1 3/4 | 4 | - | 3/4 | 3 | 0.030 | AMC800433 | 2647561 |
| ARM-3 | 3/4 | 1 3/4 | 4 | - | 3/4 | 3 | 0.060 | AMC800435 | 2647562 |
| ARM-3 | 3/4 | 1 3/4 | 4 | - | 3/4 | 3 | 0.120 | AMC800437 | 2647563 |
| ARNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.030 | AMC800219 | 2641646 |
| ARNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.060 | AMC800117 | 2609644 |

Cutting data recommendations on page 99

■ = First Choice ☐ = Second Choice

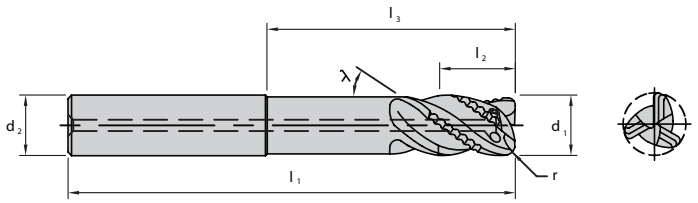

| | | 3-Flute |
|---|---|---|
| **P** | | |
| **M** | | |
| **K** | | |
| **N** | | ■ |
| **S** | | |
| **H** | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| ARNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.120 | AMC800119 | 2609645 |
| ARNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | 0.030 | AMC800221 | 2641647 |
| ARNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | 0.060 | AMC800129 | 2609650 |
| ARNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | 0.120 | AMC800131 | 2609651 |
| ARNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.030 | AMC800223 | 2641648 |
| ARNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.060 | AMC800139 | 2609655 |
| ARNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.120 | AMC800141 | 2609656 |
| ARS-3 | 1 | 1 1/4 | 4 | - | 1 | 3 | 0.030 | AMC800225 | 2641649 |
| ARS-3 | 1 | 1 1/4 | 4 | - | 1 | 3 | 0.060 | AMC800109 | 2609640 |
| ARS-3 | 1 | 1 1/4 | 4 | - | 1 | 3 | 0.120 | AMC800445 | 2647564 |
| ARM-3 | 1 | 2 3/8 | 5 | - | 1 | 3 | 0.030 | AMC800447 | 2647565 |
| ARM-3 | 1 | 2 3/8 | 5 | - | 1 | 3 | 0.060 | AMC800449 | 2647566 |
| ARM-3 | 1 | 2 3/8 | 5 | - | 1 | 3 | 0.120 | AMC800451 | 2647567 |
| ARNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.030 | AMC800227 | 2641650 |
| ARNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.060 | AMC800121 | 2609646 |
| ARNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.120 | AMC800123 | 2609647 |
| ARNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.030 | AMC800229 | 2641651 |
| ARNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.060 | AMC800459 | 2647568 |
| ARNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.120 | AMC800133 | 2609652 |
| ARNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.030 | AMC800231 | 2641652 |
| ARNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.060 | AMC800461 | 2647569 |
| ARNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.120 | AMC800143 | 2609657 |

Cutting data recommendations on page 99

■ = First Choice ☐ = Second Choice

# Aluminum Rougher Coolant Through End Mills

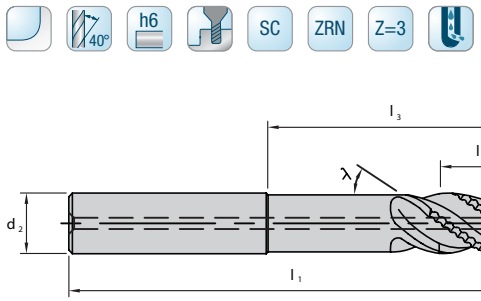

| | 3-Flute |
|---|---|
| P | |
| M | |
| K | |
| N | ■ |
| S | |
| H | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| ARCS-3 | 3/8 | 1/2 | 3 | - | 3/8 | 3 | 0.030 | AMC800145 | 2609658 |
| ARCM-3 | 3/8 | 7/8 | 2 1/2 | - | 3/8 | 3 | 0.030 | AMC800463 | 2647570 |
| ARCNS-3 | 3/8 | 1/2 | 4 | 1 5/8 | 3/8 | 3 | 0.030 | AMC800467 | 2647571 |
| ARCS-3 | 1/2 | 5/8 | 3 | - | 1/2 | 3 | 0.030 | AMC800147 | 2609659 |
| ARCS-3 | 1/2 | 5/8 | 3 | - | 1/2 | 3 | 0.060 | AMC800469 | 2647572 |
| ARCM-3 | 1/2 | 1 1/4 | 3 | - | 1/2 | 3 | 0.030 | AMC800471 | 2647573 |
| ARCM-3 | 1/2 | 1 1/4 | 3 | - | 1/2 | 3 | 0.060 | AMC800473 | 2647574 |
| ARCNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.030 | AMC800153 | 2609662 |
| ARCNS-3 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 3 | 0.060 | AMC800155 | 2609663 |
| ARCNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.030 | AMC800165 | 2609668 |
| ARCNM-3 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 3 | 0.060 | AMC800167 | 2609669 |
| ARCNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.030 | AMC800175 | 2607755 |
| ARCNL-3 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 3 | 0.060 | AMC800177 | 2607756 |
| ARCS-3 | 5/8 | 3/4 | 3 | - | 5/8 | 3 | 0.030 | AMC800479 | 2647575 |
| ARCS-3 | 5/8 | 3/4 | 3 | - | 5/8 | 3 | 0.060 | AMC800481 | 2647576 |
| ARCM-3 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 3 | 0.030 | AMC800483 | 2647577 |
| ARCM-3 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 3 | 0.060 | AMC800485 | 2647578 |
| ARCNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | 0.030 | AMC800491 | 2647579 |
| ARCNS-3 | 5/8 | 3/4 | 4 | 2 1/8 | 5/8 | 3 | 0.060 | AMC800493 | 2647580 |
| ARCNM-3 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 3 | 0.030 | AMC800495 | 2647581 |
| ARCNM-3 | 5/8 | 3/4 | 5 | 3 1/8 | 5/8 | 3 | 0.060 | AMC800497 | 2647582 |
| ARCNL-3 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 3 | 0.030 | AMC800499 | 2647583 |
| ARCNL-3 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 3 | 0.060 | AMC800501 | 2647584 |
| ARCS-3 | 3/4 | 1 | 4 | - | 3/4 | 3 | 0.030 | AMC800233 | 2641653 |
| ARCS-3 | 3/4 | 1 | 4 | - | 3/4 | 3 | 0.060 | AMC800149 | 2609660 |
| ARCS-3 | 3/4 | 1 | 4 | - | 3/4 | 3 | 0.120 | AMC800503 | 2647585 |
| ARCM-3 | 3/4 | 1 3/4 | 4 | - | 3/4 | 3 | 0.030 | AMC800505 | 2647586 |
| ARCM-3 | 3/4 | 1 3/4 | 4 | - | 3/4 | 3 | 0.060 | AMC800507 | 2647587 |

Cutting data recommendations on page 99

■ = First Choice ☐ = Second Choice

# Aluminum Rougher Coolant Through End Mills




| | 3-Flute |
|---|---|
| P | |
| M | |
| K | |
| N | ■ |
| S | |
| H | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| ARCM-3 | 3/4 | 1 3/4 | 4 | - | 3/4 | 3 | 0.120 | AMC800509 | 2647588 |
| ARCNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.030 | AMC800235 | 2641654 |
| ARCNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.060 | AMC800157 | 2609664 |
| ARCNS-3 | 3/4 | 1 | 4 | 2 1/8 | 3/4 | 3 | 0.120 | AMC800159 | 2609665 |
| ARCNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | 0.030 | AMC800237 | 2641655 |
| ARCNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | 0.060 | AMC800169 | 2607752 |
| ARCNM-3 | 3/4 | 1 | 6 | 3 1/8 | 3/4 | 3 | 0.120 | AMC800171 | 2607753 |
| ARCNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.030 | AMC800239 | 2641656 |
| ARCNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.060 | AMC800179 | 2607757 |
| ARCNL-3 | 3/4 | 1 | 6 | 4 1/8 | 3/4 | 3 | 0.120 | AMC800181 | 2607758 |
| ARCS-3 | 1 | 1 1/4 | 4 | - | 1 | 3 | 0.030 | AMC800241 | 2641657 |
| ARCS-3 | 1 | 1 1/4 | 4 | - | 1 | 3 | 0.060 | AMC800151 | 2609661 |
| ARCS-3 | 1 | 1 1/4 | 4 | - | 1 | 3 | 0.120 | AMC800517 | 2647589 |
| ARCM-3 | 1 | 2 3/8 | 5 | - | 1 | 3 | 0.030 | AMC800519 | 2647590 |
| ARCM-3 | 1 | 2 3/8 | 5 | - | 1 | 3 | 0.060 | AMC800521 | 2647591 |
| ARCM-3 | 1 | 2 3/8 | 5 | - | 1 | 3 | 0.120 | AMC800523 | 2647592 |
| ARCNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.030 | AMC800243 | 2641658 |
| ARCNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.060 | AMC800161 | 2609666 |
| ARCNS-3 | 1 | 1 1/4 | 5 | 2 1/8 | 1 | 3 | 0.120 | AMC800163 | 2609667 |
| ARCNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.030 | AMC800245 | 2641659 |
| ARCNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.060 | AMC800531 | 2647593 |
| ARCNM-3 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 3 | 0.120 | AMC800173 | 2607754 |
| ARCNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.030 | AMC800247 | 2641660 |
| ARCNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.060 | AMC800533 | 2647594 |
| ARCNL-3 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 3 | 0.120 | AMC800183 | 2607759 |

Cutting data recommendations on page 99

■ = First Choice ☐ = Second Choice

# MaxQ Series

MaxQ end mills allow you to maximize your classic milling techniques in demanding applications across a broad range of materials. Providing the versatility for slot milling to high speed machining, MaxQ can achieve unmatched material removal rates. From pocketing to profiling, MaxQ delivers the maximum in productivity.

**Features and Benefits**

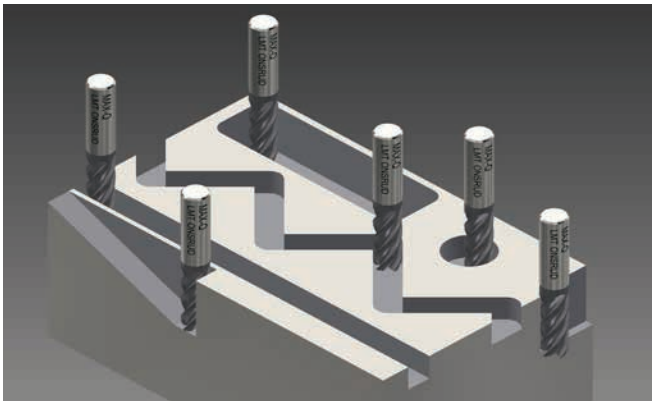
- Proprietary design and tool composition allows for machining high-strength alloys as easily as it machines steel.
- Optimized 4 & 5 Flute geometry for maximum feed rates and a broad technique range from slotting to profiling.
- Full radial engagement up to 1 times diameter deep.
- Optimized exit geometry for unmatched material removal rates.
- ENDURASpeed coating for maximum heat resistance, longer tool life and fewer tool changes.

**Applications**

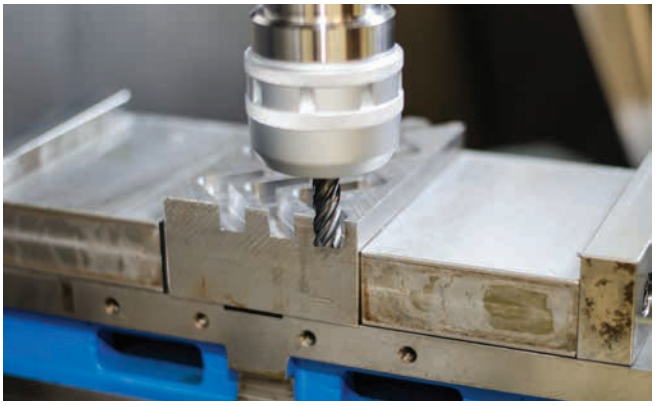
- Slotting
- Pocketing
- Profiling

**Usage**

- High-temp alloys
- Steel
- Stainless Steel
- Cast Iron

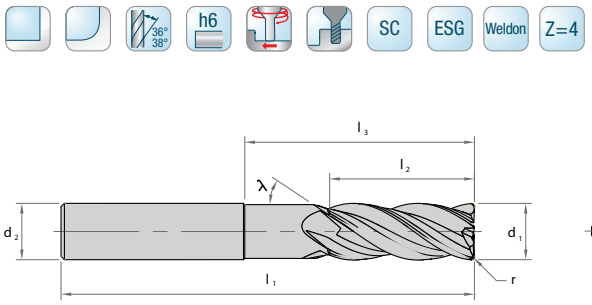


Versatility from slotting to profiling to pocketing.



Unmatched material removal rates.

ENDURASpeed Coating provides maximum heat resistance.




| | | 4-Flute | 4-Flute Weldon |
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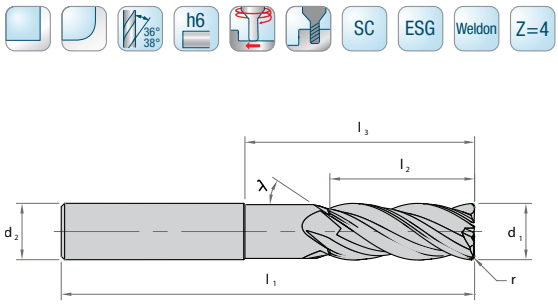
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXQS-4 | 1/8 | 1/4 | 2 | – | 1/8 | 4 | Square | MXQ2650000 | 2650000 | MXQ2650000W | 2650100 |
| MXQS-4 | 1/8 | 1/4 | 2 | – | 1/8 | 4 | 0.015 | MXQ2650001 | 2650001 | MXQ2650001W | 2650101 |
| MXQM-4 | 1/8 | 1/2 | 2 | – | 1/8 | 4 | Square | MXQ2650002 | 2650002 | MXQ2650002W | 2650102 |
| MXQM-4 | 1/8 | 1/2 | 2 | – | 1/8 | 4 | 0.015 | MXQ2650003 | 2650003 | MXQ2650003W | 2650103 |
| MXQS-4 | 3/16 | 5/16 | 2 | – | 3/16 | 4 | Square | MXQ2650004 | 2650004 | MXQ2650004W | 2650104 |
| MXQS-4 | 3/16 | 5/16 | 2 | – | 3/16 | 4 | 0.015 | MXQ2650005 | 2650005 | MXQ2650005W | 2650105 |
| MXQM-4 | 3/16 | 9/16 | 2 1/2 | – | 3/16 | 4 | Square | MXQ2650006 | 2650006 | MXQ2650006W | 2650106 |
| MXQM-4 | 3/16 | 9/16 | 2 1/2 | – | 3/16 | 4 | 0.015 | MXQ2650007 | 2650007 | MXQ2650007W | 2650107 |
| MXQS-4 | 1/4 | 3/8 | 2 1/2 | – | 1/4 | 4 | Square | MXQ2650008 | 2650008 | MXQ2650008W | 2650108 |
| MXQS-4 | 1/4 | 3/8 | 2 1/2 | – | 1/4 | 4 | 0.015 | MXQ2650009 | 2650009 | MXQ2650009W | 2650109 |
| MXQS-4 | 1/4 | 3/8 | 2 1/2 | – | 1/4 | 4 | 0.030 | MXQ2650010 | 2650010 | MXQ2650010W | 2650110 |
| MXQM-4 | 1/4 | 3/4 | 2 1/2 | – | 1/4 | 4 | Square | MXQ2650011 | 2650011 | MXQ2650011W | 2650111 |
| MXQM-4 | 1/4 | 3/4 | 2 1/2 | – | 1/4 | 4 | 0.015 | MXQ2650012 | 2650012 | MXQ2650012W | 2650112 |
| MXQM-4 | 1/4 | 3/4 | 2 1/2 | – | 1/4 | 4 | 0.030 | MXQ2650013 | 2650013 | MXQ2650013W | 2650113 |
| MXQNS-4 | 1/4 | 3/8 | 3 | 1 1/8 | 1/4 | 4 | 0.015 | MXQ2650014 | 2650014 | MXQ2650014W | 2650114 |
| MXQNS-4 | 1/4 | 3/8 | 3 | 1 1/8 | 1/4 | 4 | 0.030 | MXQ2650015 | 2650015 | MXQ2650015W | 2650115 |
| MXQS-4 | 5/16 | 7/16 | 2 | – | 5/16 | 4 | Square | MXQ2650016 | 2650016 | MXQ2650016W | 2650116 |
| MXQS-4 | 5/16 | 7/16 | 2 | – | 5/16 | 4 | 0.015 | MXQ2650017 | 2650017 | MXQ2650017W | 2650117 |
| MXQM-4 | 5/16 | 1 | 3 | – | 5/16 | 4 | Square | MXQ2650018 | 2650018 | MXQ2650018W | 2650118 |
| MXQM-4 | 5/16 | 1 | 3 | – | 5/16 | 4 | 0.015 | MXQ2650019 | 2650019 | MXQ2650019W | 2650119 |
| MXQS-4 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 4 | Square | MXQ2650020 | 2650020 | MXQ2650020W | 2650120 |
| MXQS-4 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 4 | 0.015 | MXQ2650021 | 2650021 | MXQ2650021W | 2650121 |
| MXQS-4 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 4 | 0.030 | MXQ2650022 | 2650022 | MXQ2650022W | 2650122 |
| MXQS-4 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 4 | 0.060 | MXQ2650104 | 2650208 | MXQ2650104W | 2650320 |
| MXQS-4 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 4 | 0.090 | MXQ2650105 | 2650209 | MXQ2650105W | 2650321 |
| MXQS-4 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 4 | 0.120 | MXQ2650106 | 2650210 | MXQ2650106W | 2650322 |
| MXQM-4 | 3/8 | 1 1/8 | 3 | – | 3/8 | 4 | Square | MXQ2650023 | 2650023 | MXQ2650023W | 2650123 |
| MXQM-4 | 3/8 | 1 1/8 | 3 | – | 3/8 | 4 | 0.015 | MXQ2650024 | 2650024 | MXQ2650024W | 2650124 |
| MXQM-4 | 3/8 | 1 1/8 | 3 | – | 3/8 | 4 | 0.030 | MXQ2650025 | 2650025 | MXQ2650025W | 2650125 |
| MXQM-4 | 3/8 | 1 1/8 | 3 | – | 3/8 | 4 | 0.060 | MXQ2650107 | 2650211 | MXQ2650107W | 2650323 |
| MXQM-4 | 3/8 | 1 1/8 | 3 | – | 3/8 | 4 | 0.090 | MXQ2650108 | 2650212 | MXQ2650108W | 2650324 |

Cutting data recommendations on page 100-101

■ = First Choice □ = Second Choice




| | | 4-Flute | 4-Flute Weldon |
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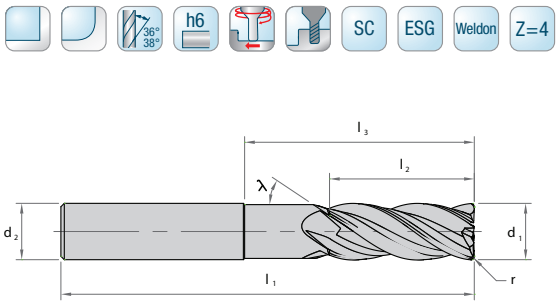
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXQM-4 | 3/8 | 1 1/8 | 3 | – | 3/8 | 4 | 0.120 | MXQ2650109 | 2650213 | MXQ2650109W | 2650325 |
| MXQNS-4 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 4 | Square | MXQ2650110 | 2650214 | MXQ2650110W | 2650326 |
| MXQNS-4 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 4 | 0.015 | MXQ2650026 | 2650026 | MXQ2650026W | 2650126 |
| MXQNS-4 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 4 | 0.030 | MXQ2650027 | 2650027 | MXQ2650027W | 2650127 |
| MXQNS-4 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 4 | 0.060 | MXQ2650111 | 2650215 | MXQ2650111W | 2650327 |
| MXQNS-4 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 4 | 0.090 | MXQ2650112 | 2650216 | MXQ2650112W | 2650328 |
| MXQNS-4 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 4 | 0.120 | MXQ2650113 | 2650217 | MXQ2650113W | 2650329 |
| MXQS-4 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 4 | Square | MXQ2650028 | 2650028 | MXQ2650028W | 2650128 |
| MXQS-4 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 4 | 0.015 | MXQ2650029 | 2650029 | MXQ2650029W | 2650129 |
| MXQS-4 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 4 | 0.030 | MXQ2650030 | 2650030 | MXQ2650030W | 2650130 |
| MXQS-4 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 4 | 0.060 | MXQ2650114 | 2650218 | MXQ2650114W | 2650330 |
| MXQS-4 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 4 | 0.090 | MXQ2650115 | 2650219 | MXQ2650115W | 2650331 |
| MXQS-4 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 4 | 0.120 | MXQ2650116 | 2650220 | MXQ2650116W | 2650332 |
| MXQS-4 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 4 | 0.190 | MXQ2650117 | 2650221 | MXQ2650117W | 2650333 |
| MXQM-4 | 1/2 | 1 1/4 | 3 | – | 1/2 | 4 | Square | MXQ2650034 | 2650034 | MXQ2650034W | 2650134 |
| MXQM-4 | 1/2 | 1 1/4 | 3 | – | 1/2 | 4 | 0.015 | MXQ2650035 | 2650035 | MXQ2650035W | 2650135 |
| MXQM-4 | 1/2 | 1 1/4 | 3 | – | 1/2 | 4 | 0.030 | MXQ2650036 | 2650036 | MXQ2650036W | 2650136 |
| MXQM-4 | 1/2 | 1 1/4 | 3 | – | 1/2 | 4 | 0.060 | MXQ2650122 | 2650226 | MXQ2650122W | 2650338 |
| MXQM-4 | 1/2 | 1 1/4 | 3 | – | 1/2 | 4 | 0.090 | MXQ2650123 | 2650227 | MXQ2650123W | 2650339 |
| MXQM-4 | 1/2 | 1 1/4 | 3 | – | 1/2 | 4 | 0.120 | MXQ2650124 | 2650228 | MXQ2650124W | 2650340 |
| MXQM-4 | 1/2 | 1 1/4 | 3 | – | 1/2 | 4 | 0.190 | MXQ2650125 | 2650229 | MXQ2650125W | 2650341 |
| MXQNS-4 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 4 | Square | MXQ2650040 | 2650040 | MXQ2650040W | 2650140 |
| MXQNS-4 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 4 | 0.030 | MXQ2650041 | 2650041 | MXQ2650041W | 2650141 |
| MXQNS-4 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 4 | 0.060 | MXQ2650042 | 2650042 | MXQ2650042W | 2650142 |
| MXQNS-4 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 4 | 0.090 | MXQ2650130 | 2650234 | MXQ2650130W | 2650346 |
| MXQNS-4 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 4 | 0.120 | MXQ2650131 | 2650235 | MXQ2650131W | 2650347 |
| MXQNS-4 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 4 | 0.190 | MXQ2650132 | 2650236 | MXQ2650132W | 2650348 |
| MXQS-4 | 5/8 | 3/4 | 3 | – | 5/8 | 4 | Square | MXQ2650046 | 2650046 | MXQ2650046W | 2650146 |
| MXQS-4 | 5/8 | 3/4 | 3 | – | 5/8 | 4 | 0.030 | MXQ2650047 | 2650047 | MXQ2650047W | 2650147 |
| MXQS-4 | 5/8 | 3/4 | 3 | – | 5/8 | 4 | 0.060 | MXQ2650136 | 2650240 | MXQ2650136W | 2650352 |
| MXQS-4 | 5/8 | 3/4 | 3 | – | 5/8 | 4 | 0.120 | MXQ2650137 | 2650241 | MXQ2650137W | 2650353 |

Cutting data recommendations on page 100-101

■ = First Choice □ = Second Choice




| | | 4-Flute | 4-Flute Weldon |
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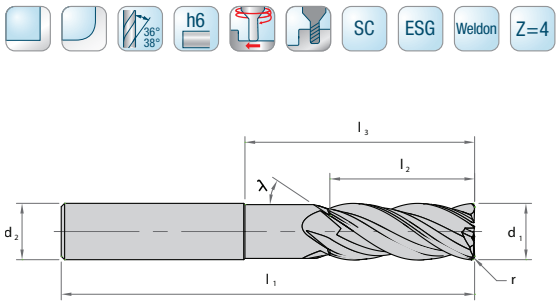
| N | | | |
| S | | □ | □ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXQS-4 | 5/8 | 3/4 | 3 | – | 5/8 | 4 | 0.190 | MXQ2650138 | 2650242 | MXQ2650138W | 2650354 |
| MXQS-4 | 5/8 | 3/4 | 3 | – | 5/8 | 4 | 0.250 | MXQ2650139 | 2650243 | MXQ2650139W | 2650355 |
| MXQM-4 | 5/8 | 1 3/8 | 3 1/2 | – | 5/8 | 4 | Square | MXQ2650048 | 2650048 | MXQ2650048W | 2650148 |
| MXQM-4 | 5/8 | 1 3/8 | 3 1/2 | – | 5/8 | 4 | 0.030 | MXQ2650049 | 2650049 | MXQ2650049W | 2650149 |
| MXQM-4 | 5/8 | 1 3/8 | 3 1/2 | – | 5/8 | 4 | 0.060 | MXQ2650140 | 2650244 | MXQ2650140W | 2650356 |
| MXQM-4 | 5/8 | 1 3/8 | 3 1/2 | – | 5/8 | 4 | 0.120 | MXQ2650141 | 2650245 | MXQ2650141W | 2650357 |
| MXQM-4 | 5/8 | 1 3/8 | 3 1/2 | – | 5/8 | 4 | 0.190 | MXQ2650142 | 2650246 | MXQ2650142W | 2650358 |
| MXQM-4 | 5/8 | 1 3/8 | 3 1/2 | – | 5/8 | 4 | 0.250 | MXQ2650143 | 2650247 | MXQ2650143W | 2650359 |
| MXQS-4 | 3/4 | 1 1/8 | 3 | – | 3/4 | 4 | Square | MXQ2650050 | 2650050 | MXQ2650050W | 2650150 |
| MXQS-4 | 3/4 | 1 1/8 | 3 | – | 3/4 | 4 | 0.030 | MXQ2650051 | 2650051 | MXQ2650051W | 2650151 |
| MXQS-4 | 3/4 | 1 1/8 | 3 | – | 3/4 | 4 | 0.060 | MXQ2650052 | 2650052 | MXQ2650052W | 2650152 |
| MXQS-4 | 3/4 | 1 1/8 | 3 | – | 3/4 | 4 | 0.090 | MXQ2650144 | 2650248 | MXQ2650144W | 2650360 |
| MXQS-4 | 3/4 | 1 1/8 | 3 | – | 3/4 | 4 | 0.120 | MXQ2650053 | 2650053 | MXQ2650053W | 2650153 |
| MXQS-4 | 3/4 | 1 1/8 | 3 | – | 3/4 | 4 | 0.190 | MXQ2650145 | 2650249 | MXQ2650145W | 2650361 |
| MXQS-4 | 3/4 | 1 1/8 | 3 | – | 3/4 | 4 | 0.250 | MXQ2650146 | 2650250 | MXQ2650146W | 2650362 |
| MXQM-4 | 3/4 | 1 5/8 | 4 | – | 3/4 | 4 | Square | MXQ2650059 | 2650059 | MXQ2650059W | 2650159 |
| MXQM-4 | 3/4 | 1 5/8 | 4 | – | 3/4 | 4 | 0.030 | MXQ2650060 | 2650060 | MXQ2650060W | 2650160 |
| MXQM-4 | 3/4 | 1 5/8 | 4 | – | 3/4 | 4 | 0.060 | MXQ2650061 | 2650061 | MXQ2650061W | 2650161 |
| MXQM-4 | 3/4 | 1 5/8 | 4 | – | 3/4 | 4 | 0.090 | MXQ2650156 | 2650260 | MXQ2650156W | 2650372 |
| MXQM-4 | 3/4 | 1 5/8 | 4 | – | 3/4 | 4 | 0.120 | MXQ2650062 | 2650062 | MXQ2650062W | 2650162 |
| MXQM-4 | 3/4 | 1 5/8 | 4 | – | 3/4 | 4 | 0.190 | MXQ2650157 | 2650261 | MXQ2650157W | 2650373 |
| MXQM-4 | 3/4 | 1 5/8 | 4 | – | 3/4 | 4 | 0.250 | MXQ2650158 | 2650262 | MXQ2650158W | 2650374 |
| MXQL-4 | 3/4 | 2 1/4 | 5 | – | 3/4 | 4 | Square | MXQ2650100 | 2650200 | MXQ2650100W | 2650204 |
| MXQL-4 | 3/4 | 2 1/4 | 5 | – | 3/4 | 4 | 0.030 | MXQ2650101 | 2650201 | MXQ2650101W | 2650205 |
| MXQL-4 | 3/4 | 2 1/4 | 5 | – | 3/4 | 4 | 0.060 | MXQ2650162 | 2650266 | MXQ2650162W | 2650378 |
| MXQL-4 | 3/4 | 2 1/4 | 5 | – | 3/4 | 4 | 0.090 | MXQ2650163 | 2650267 | MXQ2650163W | 2650379 |
| MXQL-4 | 3/4 | 2 1/4 | 5 | – | 3/4 | 4 | 0.120 | MXQ2650164 | 2650268 | MXQ2650164W | 2650380 |
| MXQL-4 | 3/4 | 2 1/4 | 5 | – | 3/4 | 4 | 0.190 | MXQ2650165 | 2650269 | MXQ2650165W | 2650381 |
| MXQL-4 | 3/4 | 2 1/4 | 5 | – | 3/4 | 4 | 0.250 | MXQ2650166 | 2650270 | MXQ2650166W | 2650382 |
| MXQNS-4 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 4 | Square | MXQ2650172 | 2650276 | MXQ2650172W | 2650388 |
| MXQNS-4 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 4 | 0.030 | MXQ2650067 | 2650067 | MXQ2650067W | 2650167 |

Cutting data recommendations on page 100-101

■ = First Choice □ = Second Choice




| | | 4-Flute | 4-Flute Weldon |
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| P | | ■ | ■ |
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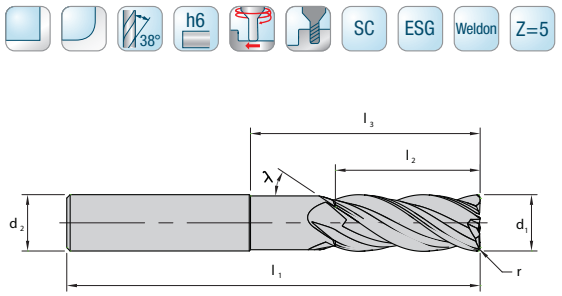
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXQNS-4 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 4 | 0.060 | MXQ2650068 | 2650068 | MXQ2650068W | 2650168 |
| MXQNS-4 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 4 | 0.090 | MXQ2650173 | 2650277 | MXQ2650173W | 2650389 |
| MXQNS-4 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 4 | 0.120 | MXQ2650069 | 2650069 | MXQ2650069W | 2650169 |
| MXQNS-4 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 4 | 0.190 | MXQ2650174 | 2650278 | MXQ2650174W | 2650390 |
| MXQNS-4 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 4 | 0.250 | MXQ2650175 | 2650279 | MXQ2650175W | 2650391 |
| MXQNM-4 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 4 | Square | MXQ2650180 | 2650284 | MXQ2650180W | 2650396 |
| MXQNM-4 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 4 | 0.030 | MXQ2650073 | 2650073 | MXQ2650073W | 2650173 |
| MXQNM-4 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 4 | 0.060 | MXQ2650074 | 2650074 | MXQ2650074W | 2650174 |
| MXQNM-4 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 4 | 0.090 | MXQ2650181 | 2650285 | MXQ2650181W | 2650397 |
| MXQNM-4 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 4 | 0.120 | MXQ2650075 | 2650075 | MXQ2650075W | 2650175 |
| MXQNM-4 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 4 | 0.190 | MXQ2650182 | 2650286 | MXQ2650182W | 2650398 |
| MXQNM-4 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 4 | 0.250 | MXQ2650183 | 2650287 | MXQ2650183W | 2650399 |
| MXQS-4 | 1 | 1 1/4 | 4 | – | 1 | 4 | Square | MXQ2650188 | 2650292 | MXQ2650188W | 2650404 |
| MXQS-4 | 1 | 1 1/4 | 4 | – | 1 | 4 | 0.030 | MXQ2650079 | 2650079 | MXQ2650079W | 2650179 |
| MXQS-4 | 1 | 1 1/4 | 4 | – | 1 | 4 | 0.060 | MXQ2650189 | 2650293 | MXQ2650189W | 2650405 |
| MXQS-4 | 1 | 1 1/4 | 4 | – | 1 | 4 | 0.090 | MXQ2650190 | 2650294 | MXQ2650190W | 2650406 |
| MXQS-4 | 1 | 1 1/4 | 4 | – | 1 | 4 | 0.120 | MXQ2650080 | 2650080 | MXQ2650080W | 2650180 |
| MXQS-4 | 1 | 1 1/4 | 4 | – | 1 | 4 | 0.190 | MXQ2650191 | 2650295 | MXQ2650191W | 2650407 |
| MXQS-4 | 1 | 1 1/4 | 4 | – | 1 | 4 | 0.250 | MXQ2650192 | 2650296 | MXQ2650192W | 2650408 |
| MXQM-4 | 1 | 2 | 5 | – | 1 | 4 | Square | MXQ2650202 | 2650306 | MXQ2650202W | 2650418 |
| MXQM-4 | 1 | 2 | 5 | – | 1 | 4 | 0.030 | MXQ2650086 | 2650086 | MXQ2650086W | 2650186 |
| MXQM-4 | 1 | 2 | 5 | – | 1 | 4 | 0.060 | MXQ2650203 | 2650307 | MXQ2650203W | 2650419 |
| MXQM-4 | 1 | 2 | 5 | – | 1 | 4 | 0.090 | MXQ2650204 | 2650308 | MXQ2650204W | 2650420 |
| MXQM-4 | 1 | 2 | 5 | – | 1 | 4 | 0.120 | MXQ2650087 | 2650087 | MXQ2650087W | 2650187 |
| MXQM-4 | 1 | 2 | 5 | – | 1 | 4 | 0.190 | MXQ2650088 | 2650088 | MXQ2650088W | 2650188 |
| MXQM-4 | 1 | 2 | 5 | – | 1 | 4 | 0.250 | MXQ2650089 | 2650089 | MXQ2650089W | 2650189 |

Cutting data recommendations on page 100-101

■ = First Choice □ = Second Choice




| | | 5-Flute | 5-Flute Weldon |
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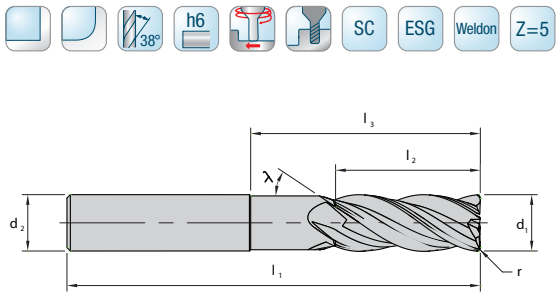
| N | | | |
| S | | □ | □ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXQS-5 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 5 | Square | MXQ2650567 | 2650633 | MXQ2650567W | 2650696 |
| MXQS-5 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 5 | 0.015 | MXQ2650568 | 2650634 | MXQ2650568W | 2650697 |
| MXQS-5 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 5 | 0.030 | MXQ2650569 | 2650635 | MXQ2650569W | 2650698 |
| MXQS-5 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 5 | 0.060 | MXQ2650570 | 2650636 | MXQ2650570W | 2650699 |
| MXQS-5 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 5 | 0.090 | MXQ2650571 | 2650637 | MXQ2650571W | 2650700 |
| MXQS-5 | 3/8 | 1/2 | 2 1/2 | – | 3/8 | 5 | 0.120 | MXQ2650572 | 2650638 | MXQ2650572W | 2650701 |
| MXQM-5 | 3/8 | 7/8 | 2 1/2 | – | 3/8 | 5 | Square | MXQ2650573 | 2650639 | MXQ2650573W | 2650702 |
| MXQM-5 | 3/8 | 7/8 | 2 1/2 | – | 3/8 | 5 | 0.015 | MXQ2650574 | 2650640 | MXQ2650574W | 2650703 |
| MXQM-5 | 3/8 | 7/8 | 2 1/2 | – | 3/8 | 5 | 0.030 | MXQ2650575 | 2650641 | MXQ2650575W | 2650704 |
| MXQM-5 | 3/8 | 7/8 | 2 1/2 | – | 3/8 | 5 | 0.060 | MXQ2650576 | 2650642 | MXQ2650576W | 2650705 |
| MXQM-5 | 3/8 | 7/8 | 2 1/2 | – | 3/8 | 5 | 0.090 | MXQ2650577 | 2650643 | MXQ2650577W | 2650706 |
| MXQM-5 | 3/8 | 7/8 | 2 1/2 | – | 3/8 | 5 | 0.120 | MXQ2650578 | 2650644 | MXQ2650578W | 2650707 |
| MXQL-5 | 3/8 | 1 1/4 | 3 | – | 3/8 | 5 | Square | MXQ2650579 | 2650645 | MXQ2650579W | 2650708 |
| MXQL-5 | 3/8 | 1 1/4 | 3 | – | 3/8 | 5 | 0.015 | MXQ2650580 | 2650646 | MXQ2650580W | 2650709 |
| MXQL-5 | 3/8 | 1 1/4 | 3 | – | 3/8 | 5 | 0.030 | MXQ2650581 | 2650647 | MXQ2650581W | 2650710 |
| MXQL-5 | 3/8 | 1 1/4 | 3 | – | 3/8 | 5 | 0.060 | MXQ2650582 | 2650648 | MXQ2650582W | 2650711 |
| MXQL-5 | 3/8 | 1 1/4 | 3 | – | 3/8 | 5 | 0.090 | MXQ2650583 | 2650649 | MXQ2650583W | 2650712 |
| MXQL-5 | 3/8 | 1 1/4 | 3 | – | 3/8 | 5 | 0.120 | MXQ2650584 | 2650650 | MXQ2650584W | 2650713 |
| MXQNS-5 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 5 | Square | MXQ2650585 | 2650651 | MXQ2650585W | 2650714 |
| MXQNS-5 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 5 | 0.015 | MXQ2650586 | 2650652 | MXQ2650586W | 2650715 |
| MXQNS-5 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 5 | 0.030 | MXQ2650587 | 2650653 | MXQ2650587W | 2650716 |
| MXQNS-5 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 5 | 0.060 | MXQ2650588 | 2650654 | MXQ2650588W | 2650717 |
| MXQNS-5 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 5 | 0.090 | MXQ2650589 | 2650655 | MXQ2650589W | 2650718 |
| MXQNS-5 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 5 | 0.120 | MXQ2650590 | 2650656 | MXQ2650590W | 2650719 |
| MXQS-5 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 5 | Square | MXQ2650031 | 2650031 | MXQ2650031W | 2650131 |
| MXQS-5 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 5 | 0.015 | MXQ2650032 | 2650032 | MXQ2650032W | 2650132 |
| MXQS-5 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 5 | 0.030 | MXQ2650033 | 2650033 | MXQ2650033W | 2650133 |
| MXQS-5 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 5 | 0.060 | MXQ2650118 | 2650222 | MXQ2650118W | 2650334 |
| MXQS-5 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 5 | 0.090 | MXQ2650119 | 2650223 | MXQ2650119W | 2650335 |
| MXQS-5 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 5 | 0.120 | MXQ2650120 | 2650224 | MXQ2650120W | 2650336 |

Cutting data recommendations on page 102-103

■ = First Choice □ = Second Choice




| | 5-Flute | 5-Flute Weldon |
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| **P** | ■ | ■ |
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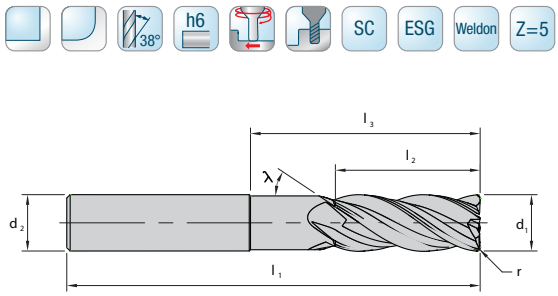
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXQS-5 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 5 | 0.190 | MXQ2650121 | 2650225 | MXQ2650121W | 2650337 |
| MXQM-5 | 1/2 | 1 1/4 | 3 | – | 1/2 | 5 | Square | MXQ2650037 | 2650037 | MXQ2650037W | 2650137 |
| MXQM-5 | 1/2 | 1 1/4 | 3 | – | 1/2 | 5 | 0.015 | MXQ2650038 | 2650038 | MXQ2650038W | 2650138 |
| MXQM-5 | 1/2 | 1 1/4 | 3 | – | 1/2 | 5 | 0.030 | MXQ2650039 | 2650039 | MXQ2650039W | 2650139 |
| MXQM-5 | 1/2 | 1 1/4 | 3 | – | 1/2 | 5 | 0.060 | MXQ2650126 | 2650230 | MXQ2650126W | 2650342 |
| MXQM-5 | 1/2 | 1 1/4 | 3 | – | 1/2 | 5 | 0.090 | MXQ2650127 | 2650231 | MXQ2650127W | 2650343 |
| MXQM-5 | 1/2 | 1 1/4 | 3 | – | 1/2 | 5 | 0.120 | MXQ2650128 | 2650232 | MXQ2650128W | 2650344 |
| MXQM-5 | 1/2 | 1 1/4 | 3 | – | 1/2 | 5 | 0.190 | MXQ2650129 | 2650233 | MXQ2650129W | 2650345 |
| MXQL-5 | 1/2 | 1 5/8 | 4 | – | 1/2 | 5 | Square | MXQ2650591 | 2650657 | MXQ2650591W | 2650720 |
| MXQL-5 | 1/2 | 1 5/8 | 4 | – | 1/2 | 5 | 0.015 | MXQ2650592 | 2650658 | MXQ2650592W | 2650721 |
| MXQL-5 | 1/2 | 1 5/8 | 4 | – | 1/2 | 5 | 0.030 | MXQ2650593 | 2650659 | MXQ2650593W | 2650722 |
| MXQL-5 | 1/2 | 1 5/8 | 4 | – | 1/2 | 5 | 0.060 | MXQ2650594 | 2650660 | MXQ2650594W | 2650723 |
| MXQXL-5 | 1/2 | 2 1/8 | 4 | – | 1/2 | 5 | Square | MXQ2650596 | 2650662 | MXQ2650596W | 2650725 |
| MXQXL-5 | 1/2 | 2 1/8 | 4 | – | 1/2 | 5 | 0.015 | MXQ2650597 | 2650663 | MXQ2650597W | 2650726 |
| MXQXL-5 | 1/2 | 2 1/8 | 4 | – | 1/2 | 5 | 0.030 | MXQ2650598 | 2650664 | MXQ2650598W | 2650727 |
| MXQXL-5 | 1/2 | 2 1/8 | 4 | – | 1/2 | 5 | 0.060 | MXQ2650599 | 2650665 | MXQ2650599W | 2650728 |
| MXQNS-5 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 5 | Square | MXQ2650043 | 2650043 | MXQ2650043W | 2650143 |
| MXQNS-5 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 5 | 0.030 | MXQ2650044 | 2650044 | MXQ2650044W | 2650144 |
| MXQNS-5 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 5 | 0.060 | MXQ2650045 | 2650045 | MXQ2650045W | 2650145 |
| MXQNS-5 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 5 | 0.090 | MXQ2650133 | 2650237 | MXQ2650133W | 2650349 |
| MXQNS-5 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 5 | 0.120 | MXQ2650134 | 2650238 | MXQ2650134W | 2650350 |
| MXQNS-5 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 5 | 0.190 | MXQ2650135 | 2650239 | MXQ2650135W | 2650351 |
| MXQS-5 | 5/8 | 3/4 | 3 | – | 5/8 | 5 | Square | MXQ2650601 | 2650667 | MXQ2650601W | 2650730 |
| MXQS-5 | 5/8 | 3/4 | 3 | – | 5/8 | 5 | 0.030 | MXQ2650602 | 2650668 | MXQ2650602W | 2650731 |
| MXQS-5 | 5/8 | 3/4 | 3 | – | 5/8 | 5 | 0.060 | MXQ2650603 | 2650669 | MXQ2650603W | 2650732 |
| MXQS-5 | 5/8 | 3/4 | 3 | – | 5/8 | 5 | 0.090 | MXQ2650604 | 2650670 | MXQ2650604W | 2650733 |
| MXQS-5 | 5/8 | 3/4 | 3 | – | 5/8 | 5 | 0.120 | MXQ2650605 | 2650671 | MXQ2650605W | 2650734 |
| MXQS-5 | 5/8 | 3/4 | 3 | – | 5/8 | 5 | 0.190 | MXQ2650606 | 2650672 | MXQ2650606W | 2650735 |
| MXQM-5 | 5/8 | 1 3/8 | 3 1/2 | – | 5/8 | 5 | Square | MXQ2650607 | 2650673 | MXQ2650607W | 2650736 |
| MXQM-5 | 5/8 | 1 3/8 | 3 1/2 | – | 5/8 | 5 | 0.030 | MXQ2650608 | 2650674 | MXQ2650608W | 2650737 |
| MXQM-5 | 5/8 | 1 3/8 | 3 1/2 | – | 5/8 | 5 | 0.060 | MXQ2650609 | 2650675 | MXQ2650609W | 2650738 |

Cutting data recommendations on page 102-103

■ = First Choice □ = Second Choice




| | 5-Flute | 5-Flute Weldon |
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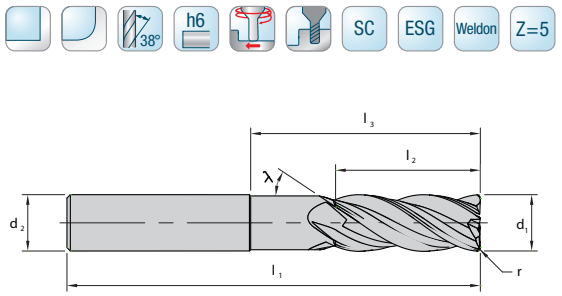
| **H** | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXQM-5 | 5/8 | 1 3/8 | 3 1/2 | – | 5/8 | 5 | 0.090 | MXQ2650610 | 2650676 | MXQ2650610W | 2650739 |
| MXQM-5 | 5/8 | 1 3/8 | 3 1/2 | – | 5/8 | 5 | 0.120 | MXQ2650611 | 2650677 | MXQ2650611W | 2650740 |
| MXQM-5 | 5/8 | 1 3/8 | 3 1/2 | – | 5/8 | 5 | 0.190 | MXQ2650612 | 2650678 | MXQ2650612W | 2650741 |
| MXQL-5 | 5/8 | 1 5/8 | 3 1/2 | – | 5/8 | 5 | Square | MXQ2650613 | 2650679 | MXQ2650613W | 2650742 |
| MXQL-5 | 5/8 | 1 5/8 | 3 1/2 | – | 5/8 | 5 | 0.030 | MXQ2650614 | 2650680 | MXQ2650614W | 2650743 |
| MXQL-5 | 5/8 | 1 5/8 | 3 1/2 | – | 5/8 | 5 | 0.060 | MXQ2650615 | 2650681 | MXQ2650615W | 2650744 |
| MXQXL-5 | 5/8 | 2 1/4 | 4 | – | 5/8 | 5 | Square | MXQ2650616 | 2650682 | MXQ2650616W | 2650745 |
| MXQXL-5 | 5/8 | 2 1/4 | 4 | – | 5/8 | 5 | 0.030 | MXQ2650617 | 2650683 | MXQ2650617W | 2650746 |
| MXQXL-5 | 5/8 | 2 1/4 | 4 | – | 5/8 | 5 | 0.060 | MXQ2650618 | 2650684 | MXQ2650618W | 2650747 |
| MXQS-5 | 3/4 | 1 1/8 | 3 | – | 3/4 | 5 | Square | MXQ2650054 | 2650054 | MXQ2650054W | 2650154 |
| MXQS-5 | 3/4 | 1 1/8 | 3 | – | 3/4 | 5 | 0.030 | MXQ2650055 | 2650055 | MXQ2650055W | 2650155 |
| MXQS-5 | 3/4 | 1 1/8 | 3 | – | 3/4 | 5 | 0.060 | MXQ2650056 | 2650056 | MXQ2650056W | 2650156 |
| MXQS-5 | 3/4 | 1 1/8 | 3 | – | 3/4 | 5 | 0.090 | MXQ2650147 | 2650251 | MXQ2650147W | 2650363 |
| MXQS-5 | 3/4 | 1 1/8 | 3 | – | 3/4 | 5 | 0.120 | MXQ2650057 | 2650057 | MXQ2650057W | 2650157 |
| MXQS-5 | 3/4 | 1 1/8 | 3 | – | 3/4 | 5 | 0.190 | MXQ2650148 | 2650252 | MXQ2650148W | 2650364 |
| MXQS-5 | 3/4 | 1 1/8 | 3 | – | 3/4 | 5 | 0.250 | MXQ2650149 | 2650253 | MXQ2650149W | 2650365 |
| MXQM-5 | 3/4 | 1 1/2 | 4 | – | 3/4 | 5 | Square | MXQ2650150 | 2650254 | MXQ2650150W | 2650366 |
| MXQM-5 | 3/4 | 1 1/2 | 4 | – | 3/4 | 5 | 0.030 | MXQ2650151 | 2650255 | MXQ2650151W | 2650367 |
| MXQM-5 | 3/4 | 1 1/2 | 4 | – | 3/4 | 5 | 0.060 | MXQ2650152 | 2650256 | MXQ2650152W | 2650368 |
| MXQM-5 | 3/4 | 1 1/2 | 4 | – | 3/4 | 5 | 0.090 | MXQ2650153 | 2650257 | MXQ2650153W | 2650369 |
| MXQM-5 | 3/4 | 1 1/2 | 4 | – | 3/4 | 5 | 0.120 | MXQ2650058 | 2650058 | MXQ2650058W | 2650158 |
| MXQM-5 | 3/4 | 1 1/2 | 4 | – | 3/4 | 5 | 0.190 | MXQ2650154 | 2650258 | MXQ2650154W | 2650370 |
| MXQM-5 | 3/4 | 1 1/2 | 4 | – | 3/4 | 5 | 0.250 | MXQ2650155 | 2650259 | MXQ2650155W | 2650371 |
| MXQM-5 | 3/4 | 1 5/8 | 4 | – | 3/4 | 5 | Square | MXQ2650063 | 2650063 | MXQ2650063W | 2650163 |
| MXQM-5 | 3/4 | 1 5/8 | 4 | – | 3/4 | 5 | 0.030 | MXQ2650064 | 2650064 | MXQ2650064W | 2650164 |
| MXQM-5 | 3/4 | 1 5/8 | 4 | – | 3/4 | 5 | 0.060 | MXQ2650065 | 2650065 | MXQ2650065W | 2650165 |
| MXQM-5 | 3/4 | 1 5/8 | 4 | – | 3/4 | 5 | 0.090 | MXQ2650159 | 2650263 | MXQ2650159W | 2650375 |
| MXQM-5 | 3/4 | 1 5/8 | 4 | – | 3/4 | 5 | 0.120 | MXQ2650066 | 2650066 | MXQ2650066W | 2650166 |
| MXQM-5 | 3/4 | 1 5/8 | 4 | – | 3/4 | 5 | 0.190 | MXQ2650160 | 2650264 | MXQ2650160W | 2650376 |
| MXQM-5 | 3/4 | 1 5/8 | 4 | – | 3/4 | 5 | 0.250 | MXQ2650161 | 2650265 | MXQ2650161W | 2650377 |
| MXQL-5 | 3/4 | 2 1/4 | 5 | – | 3/4 | 5 | Square | MXQ2650102 | 2650202 | MXQ2650102W | 2650206 |

Cutting data recommendations on page 102-103

■ = First Choice □ = Second Choice




| | | 5-Flute | 5-Flute Weldon |
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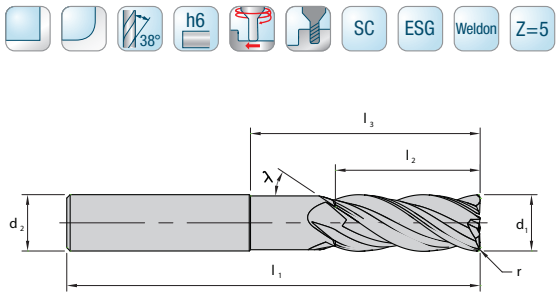
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXQL-5 | 3/4 | 2 1/4 | 5 | – | 3/4 | 5 | 0.030 | MXQ2650103 | 2650203 | MXQ2650103W | 2650207 |
| MXQL-5 | 3/4 | 2 1/4 | 5 | – | 3/4 | 5 | 0.060 | MXQ2650167 | 2650271 | MXQ2650167W | 2650383 |
| MXQL-5 | 3/4 | 2 1/4 | 5 | – | 3/4 | 5 | 0.090 | MXQ2650168 | 2650272 | MXQ2650168W | 2650384 |
| MXQL-5 | 3/4 | 2 1/4 | 5 | – | 3/4 | 5 | 0.120 | MXQ2650169 | 2650273 | MXQ2650169W | 2650385 |
| MXQL-5 | 3/4 | 2 1/4 | 5 | – | 3/4 | 5 | 0.190 | MXQ2650170 | 2650274 | MXQ2650170W | 2650386 |
| MXQL-5 | 3/4 | 2 1/4 | 5 | – | 3/4 | 5 | 0.250 | MXQ2650171 | 2650275 | MXQ2650171W | 2650387 |
| MXQXL-5 | 3/4 | 3 1/8 | 5 | – | 3/4 | 5 | Square | MXQ2650619 | 2650688 | MXQ2650619W | 2650748 |
| MXQXL-5 | 3/4 | 3 1/8 | 5 | – | 3/4 | 5 | 0.030 | MXQ2650620 | 2650689 | MXQ2650620W | 2650749 |
| MXQXL-5 | 3/4 | 3 1/8 | 5 | – | 3/4 | 5 | 0.060 | MXQ2650621 | 2650690 | MXQ2650621W | 2650750 |
| MXQNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | Square | MXQ2650176 | 2650280 | MXQ2650176W | 2650392 |
| MXQNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | 0.030 | MXQ2650070 | 2650070 | MXQ2650070W | 2650170 |
| MXQNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | 0.060 | MXQ2650071 | 2650071 | MXQ2650071W | 2650171 |
| MXQNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | 0.090 | MXQ2650177 | 2650281 | MXQ2650177W | 2650393 |
| MXQNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | 0.120 | MXQ2650072 | 2650072 | MXQ2650072W | 2650172 |
| MXQNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | 0.190 | MXQ2650178 | 2650282 | MXQ2650178W | 2650394 |
| MXQNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | 0.250 | MXQ2650179 | 2650283 | MXQ2650179W | 2650395 |
| MXQNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | Square | MXQ2650184 | 2650288 | MXQ2650184W | 2650400 |
| MXQNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | 0.030 | MXQ2650076 | 2650076 | MXQ2650076W | 2650176 |
| MXQNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | 0.060 | MXQ2650077 | 2650077 | MXQ2650077W | 2650177 |
| MXQNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | 0.090 | MXQ2650185 | 2650289 | MXQ2650185W | 2650401 |
| MXQNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | 0.120 | MXQ2650078 | 2650078 | MXQ2650078W | 2650178 |
| MXQNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | 0.190 | MXQ2650186 | 2650290 | MXQ2650186W | 2650402 |
| MXQNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | 0.250 | MXQ2650187 | 2650291 | MXQ2650187W | 2650403 |
| MXQS-5 | 1 | 1 1/4 | 4 | – | 1 | 5 | Square | MXQ2650193 | 2650297 | MXQ2650193W | 2650409 |
| MXQS-5 | 1 | 1 1/4 | 4 | – | 1 | 5 | 0.030 | MXQ2650081 | 2650081 | MXQ2650081W | 2650181 |
| MXQS-5 | 1 | 1 1/4 | 4 | – | 1 | 5 | 0.060 | MXQ2650194 | 2650298 | MXQ2650194W | 2650410 |
| MXQS-5 | 1 | 1 1/4 | 4 | – | 1 | 5 | 0.090 | MXQ2650195 | 2650299 | MXQ2650195W | 2650411 |
| MXQS-5 | 1 | 1 1/4 | 4 | – | 1 | 5 | 0.120 | MXQ2650082 | 2650082 | MXQ2650082W | 2650182 |
| MXQS-5 | 1 | 1 1/4 | 4 | – | 1 | 5 | 0.190 | MXQ2650083 | 2650083 | MXQ2650083W | 2650183 |
| MXQS-5 | 1 | 1 1/4 | 4 | – | 1 | 5 | 0.250 | MXQ2650084 | 2650084 | MXQ2650084W | 2650184 |
| MXQS-5 | 1 | 1 1/2 | 4 | – | 1 | 5 | Square | MXQ2650196 | 2650300 | MXQ2650196W | 2650412 |

Cutting data recommendations on page 102-103

■ = First Choice □ = Second Choice

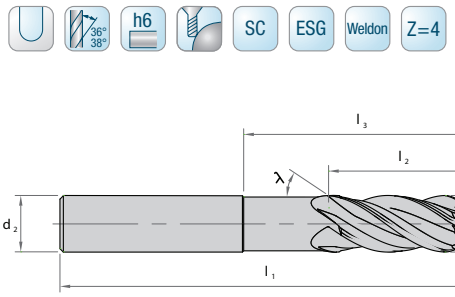



| | | 5-Flute | 5-Flute Weldon |
|---|---|---|---|
| P | | ■ | ■ |
| M | | ■ | ■ |
| K | | ■ | ■ |
| N | | | |
| S | | □ | □ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXQS-5 | 1 | 1 1/2 | 4 | – | 1 | 5 | 0.030 | MXQ2650197 | 2650301 | MXQ2650197W | 2650413 |
| MXQS-5 | 1 | 1 1/2 | 4 | – | 1 | 5 | 0.060 | MXQ2650198 | 2650302 | MXQ2650198W | 2650414 |
| MXQS-5 | 1 | 1 1/2 | 4 | – | 1 | 5 | 0.090 | MXQ2650199 | 2650303 | MXQ2650199W | 2650415 |
| MXQS-5 | 1 | 1 1/2 | 4 | – | 1 | 5 | 0.120 | MXQ2650085 | 2650085 | MXQ2650085W | 2650185 |
| MXQS-5 | 1 | 1 1/2 | 4 | – | 1 | 5 | 0.190 | MXQ2650200 | 2650304 | MXQ2650200W | 2650416 |
| MXQS-5 | 1 | 1 1/2 | 4 | – | 1 | 5 | 0.250 | MXQ2650201 | 2650305 | MXQ2650201W | 2650417 |
| MXQM-5 | 1 | 2 | 5 | – | 1 | 5 | Square | MXQ2650205 | 2650309 | MXQ2650205W | 2650421 |
| MXQM-5 | 1 | 2 | 5 | – | 1 | 5 | 0.030 | MXQ2650090 | 2650090 | MXQ2650090W | 2650190 |
| MXQM-5 | 1 | 2 | 5 | – | 1 | 5 | 0.060 | MXQ2650206 | 2650310 | MXQ2650206W | 2650422 |
| MXQM-5 | 1 | 2 | 5 | – | 1 | 5 | 0.090 | MXQ2650207 | 2650311 | MXQ2650207W | 2650423 |
| MXQM-5 | 1 | 2 | 5 | – | 1 | 5 | 0.120 | MXQ2650091 | 2650091 | MXQ2650091W | 2650191 |
| MXQM-5 | 1 | 2 | 5 | – | 1 | 5 | 0.190 | MXQ2650092 | 2650092 | MXQ2650092W | 2650192 |
| MXQM-5 | 1 | 2 | 5 | – | 1 | 5 | 0.250 | MXQ2650093 | 2650093 | MXQ2650093W | 2650193 |
| MXQXL-5 | 1 | 3 1/8 | 6 | – | 1 | 5 | Square | MXQ2650623 | 2650692 | MXQ2650623W | 2650752 |
| MXQXL-5 | 1 | 3 1/8 | 6 | – | 1 | 5 | 0.030 | MXQ2650624 | 2650693 | MXQ2650624W | 2650753 |
| MXQXL-5 | 1 | 3 1/8 | 6 | – | 1 | 5 | 0.060 | MXQ2650625 | 2650694 | MXQ2650625W | 2650754 |
| MXQNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | Square | MXQ2650208 | 2650312 | MXQ2650208W | 2650424 |
| MXQNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | 0.030 | MXQ2650209 | 2650313 | MXQ2650209W | 2650425 |
| MXQNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | 0.060 | MXQ2650094 | 2650094 | MXQ2650094W | 2650194 |
| MXQNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | 0.090 | MXQ2650210 | 2650314 | MXQ2650210W | 2650426 |
| MXQNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | 0.120 | MXQ2650095 | 2650095 | MXQ2650095W | 2650195 |
| MXQNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | 0.190 | MXQ2650211 | 2650315 | MXQ2650211W | 2650427 |
| MXQNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | 0.250 | MXQ2650096 | 2650096 | MXQ2650096W | 2650196 |
| MXQNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | Square | MXQ2650212 | 2650316 | MXQ2650212W | 2650428 |
| MXQNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | 0.030 | MXQ2650213 | 2650317 | MXQ2650213W | 2650429 |
| MXQNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | 0.060 | MXQ2650097 | 2650097 | MXQ2650097W | 2650197 |
| MXQNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | 0.090 | MXQ2650214 | 2650318 | MXQ2650214W | 2650430 |
| MXQNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | 0.120 | MXQ2650098 | 2650098 | MXQ2650098W | 2650198 |
| MXQNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | 0.190 | MXQ2650215 | 2650319 | MXQ2650215W | 2650431 |
| MXQNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | 0.250 | MXQ2650099 | 2650099 | MXQ2650099W | 2650199 |

Cutting data recommendations on page 102-103

■ = First Choice □ = Second Choice

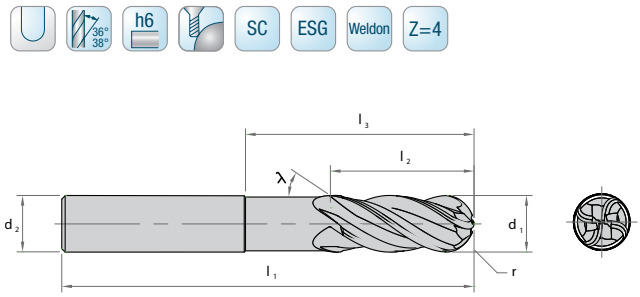



| | | 4-Flute Ballnose | 4-Flute Weldon Ballnose |
|---|---|---|---|
| P | | ■ | ■ |
| M | | ■ | ■ |
| K | | ■ | ■ |
| N | | | |
| S | | □ | □ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ballnose Ident No. | Ballnose SAP No. | Ballnose Weldon Ident No. | Ballnose Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXBS-4 | 1/8 | 1/4 | 2 | – | 1/8 | 4 | Ball | MXB2650500 | 2650500 | MXB2650500W | 2650567 |
| MXBM-4 | 1/8 | 1/2 | 2 1/2 | – | 1/8 | 4 | Ball | MXB2650501 | 2650501 | MXB2650501W | 2650568 |
| MXBL-4 | 1/8 | 3/4 | 2 1/2 | – | 1/8 | 4 | Ball | MXB2650502 | 2650502 | MXB2650502W | 2650569 |
| MXBNS-4 | 1/8 | 3/16 | 3 | 1/2 | 1/8 | 4 | Ball | MXB2650503 | 2650503 | MXB2650503W | 2650570 |
| MXBS-4 | 3/16 | 5/16 | 2 | – | 3/16 | 4 | Ball | MXB2650504 | 2650504 | MXB2650504W | 2650571 |
| MXBM-4 | 3/16 | 5/8 | 2 1/2 | – | 3/16 | 4 | Ball | MXB2650505 | 2650505 | MXB2650505W | 2650572 |
| MXBL-4 | 3/16 | 3/4 | 2 1/2 | – | 3/16 | 4 | Ball | MXB2650506 | 2650506 | MXB2650506W | 2650573 |
| MXBNS-4 | 3/16 | 1/4 | 3 | 3/4 | 3/16 | 4 | Ball | MXB2650507 | 2650507 | MXB2650507W | 2650574 |
| MXBS-4 | 1/4 | 3/8 | 2 | – | 1/4 | 4 | Ball | MXB2650508 | 2650508 | MXB2650508W | 2650575 |
| MXBM-4 | 1/4 | 3/4 | 2 1/2 | – | 1/4 | 4 | Ball | MXB2650509 | 2650509 | MXB2650509W | 2650576 |
| MXBL-4 | 1/4 | 1 1/8 | 3 | – | 1/4 | 4 | Ball | MXB2650510 | 2650510 | MXB2650510W | 2650577 |
| MXBNS-4 | 1/4 | 3/8 | 3 | 5/8 | 1/4 | 4 | Ball | MXB2650511 | 2650511 | MXB2650511W | 2650578 |
| MXBNM-4 | 1/4 | 3/8 | 4 | 1 1/8 | 1/4 | 4 | Ball | MXB2650512 | 2650512 | MXB2650512W | 2650579 |
| MXBNL-4 | 1/4 | 3/8 | 4 | 1 5/8 | 1/4 | 4 | Ball | MXB2650513 | 2650513 | MXB2650513W | 2650580 |
| MXBS-4 | 5/16 | 1/2 | 2 1/2 | – | 5/16 | 4 | Ball | MXB2650514 | 2650514 | MXB2650514W | 2650581 |
| MXBM-4 | 5/16 | 3/4 | 2 1/2 | – | 5/16 | 4 | Ball | MXB2650515 | 2650515 | MXB2650515W | 2650582 |
| MXBL-4 | 5/16 | 1 1/4 | 3 | – | 5/16 | 4 | Ball | MXB2650516 | 2650516 | MXB2650516W | 2650583 |
| MXBNS-4 | 5/16 | 1/2 | 4 | 1 1/8 | 5/16 | 4 | Ball | MXB2650517 | 2650517 | MXB2650517W | 2650584 |
| MXBS-4 | 3/8 | 1/2 | 2 | – | 3/8 | 4 | Ball | MXB2650518 | 2650518 | MXB2650518W | 2650585 |
| MXBM-4 | 3/8 | 7/8 | 3 | – | 3/8 | 4 | Ball | MXB2650519 | 2650519 | MXB2650519W | 2650586 |
| MXBL-4 | 3/8 | 1 1/4 | 3 | – | 3/8 | 4 | Ball | MXB2650520 | 2650520 | MXB2650520W | 2650587 |
| MXBNS-4 | 3/8 | 1/2 | 4 | 1 1/8 | 3/8 | 4 | Ball | MXB2650521 | 2650521 | MXB2650521W | 2650588 |
| MXBNM-4 | 3/8 | 1/2 | 4 | 2 1/8 | 3/8 | 4 | Ball | MXB2650522 | 2650522 | MXB2650522W | 2650589 |
| MXBNL-4 | 3/8 | 1/2 | 6 | 3 1/8 | 3/8 | 4 | Ball | MXB2650523 | 2650523 | MXB2650523W | 2650590 |
| MXBS-4 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 4 | Ball | MXB2650524 | 2650524 | MXB2650524W | 2650591 |
| MXBM-4 | 1/2 | 1 1/8 | 3 | – | 1/2 | 4 | Ball | MXB2650525 | 2650525 | MXB2650525W | 2650592 |
| MXBL-4 | 1/2 | 1 5/8 | 4 | – | 1/2 | 4 | Ball | MXB2650526 | 2650526 | MXB2650526W | 2650593 |
| MXBNS-4 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 4 | Ball | MXB2650527 | 2650527 | MXB2650527W | 2650594 |
| MXBNM-4 | 1/2 | 5/8 | 6 | 3 1/8 | 1/2 | 4 | Ball | MXB2650528 | 2650528 | MXB2650528W | 2650595 |

Cutting data recommendations on page 100-101

■ = First Choice □ = Second Choice

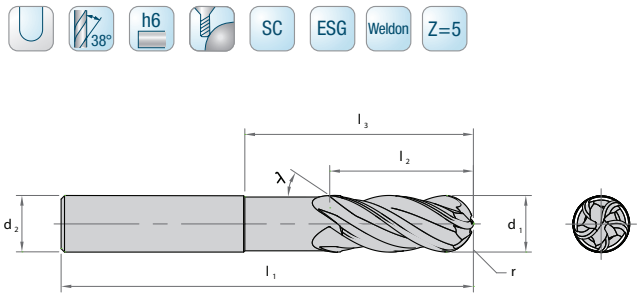



| | | 4-Flute Ballnose | 4-Flute Weldon Ballnose |
|---|---|---|---|
| P | | ■ | ■ |
| M | | ■ | ■ |
| K | | ■ | ■ |
| N | | | |
| S | | □ | □ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ballnose Ident No. | Ballnose SAP No. | Ballnose Weldon Ident No. | Ballnose Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXBNL-4 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 4 | Ball | MXB2650529 | 2650529 | MXB2650529W | 2650596 |
| MXBS-4 | 5/8 | 3/4 | 3 | – | 5/8 | 4 | Ball | • MXB2650530 | 2650530 | MXB2650530W | 2650597 |
| MXBM-4 | 5/8 | 1 5/8 | 3 1/2 | – | 5/8 | 4 | Ball | MXB2650531 | 2650531 | MXB2650531W | 2650598 |
| MXBL-4 | 5/8 | 2 1/8 | 4 | – | 5/8 | 4 | Ball | MXB2650532 | 2650532 | MXB2650532W | 2650599 |
| MXBNS-4 | 5/8 | 3/4 | 4 | 2 3/8 | 5/8 | 4 | Ball | MXB2650533 | 2650533 | MXB2650533W | 2650600 |
| MXBNM-4 | 5/8 | 3/4 | 6 | 3 3/8 | 5/8 | 4 | Ball | MXB2650534 | 2650534 | MXB2650534W | 2650601 |
| MXBNL-4 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 4 | Ball | MXB2650535 | 2650535 | MXB2650535W | 2650602 |
| MXBS-4 | 3/4 | 1 1/8 | 4 | – | 3/4 | 4 | Ball | MXB2650536 | 2650536 | MXB2650536W | 2650603 |
| MXBM-4 | 3/4 | 1 5/8 | 4 | – | 3/4 | 4 | Ball | MXB2650537 | 2650537 | MXB2650537W | 2650604 |
| MXBL-4 | 3/4 | 2 1/4 | 5 | – | 3/4 | 4 | Ball | MXB2650538 | 2650538 | MXB2650538W | 2650605 |
| MXBNS-4 | 3/4 | 1 1/8 | 4 | 2 1/2 | 3/4 | 4 | Ball | MXB2650539 | 2650539 | MXB2650539W | 2650606 |
| MXBNM-4 | 3/4 | 1 1/8 | 6 | 3 1/2 | 3/4 | 4 | Ball | MXB2650540 | 2650540 | MXB2650540W | 2650607 |
| MXBNL-4 | 3/4 | 1 1/8 | 6 | 4 1/8 | 3/4 | 4 | Ball | MXB2650541 | 2650541 | MXB2650541W | 2650608 |
| MXBS-4 | 1 | 1 1/4 | 4 | – | 1 | 4 | Ball | MXB2650542 | 2650542 | MXB2650542W | 2650609 |
| MXBM-4 | 1 | 2 1/4 | 5 | – | 1 | 4 | Ball | MXB2650543 | 2650543 | MXB2650543W | 2650610 |
| MXBL-4 | 1 | 3 1/4 | 6 | – | 1 | 4 | Ball | MXB2650544 | 2650544 | MXB2650544W | 2650611 |
| MXBNS-4 | 1 | 1 1/4 | 5 | 2 1/2 | 1 | 4 | Ball | MXB2650545 | 2650545 | MXB2650545W | 2650612 |
| MXBNM-4 | 1 | 1 1/4 | 7 | 3 5/8 | 1 | 4 | Ball | MXB2650546 | 2650546 | MXB2650546W | 2650613 |

Cutting data recommendations on page 100-101

■ = First Choice □ = Second Choice




| | | 5-Flute Ballnose | 5-Flute Weldon Ballnose |
|---|---|---|---|
| P | | ■ | ■ |
| M | | ■ | ■ |
| K | | ■ | ■ |
| N | | | |
| S | | □ | □ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ballnose Ident No. | Ballnose SAP No. | Ballnose Weldon Ident No. | Ballnose Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXBS-5 | 3/8 | 7/8 | 3 | – | 3/8 | 5 | Ball | MXB2650548 | 2650548 | MXB2650548W | 2650614 |
| MXBM-5 | 3/8 | 1 1/4 | 3 | – | 3/8 | 5 | Ball | MXB2650549 | 2650549 | MXB2650549W | 2650615 |
| MXBNM-5 | 3/8 | 1/2 | 4 | 2 1/8 | 3/8 | 5 | Ball | MXB2650550 | 2650550 | MXB2650550W | 2650616 |
| MXBNL-5 | 3/8 | 1/2 | 6 | 3 1/8 | 3/8 | 5 | Ball | MXB2650551 | 2650551 | MXB2650551W | 2650617 |
| MXBS-5 | 1/2 | 1 1/8 | 3 | – | 1/2 | 5 | Ball | MXB2650552 | 2650552 | MXB2650552W | 2650618 |
| MXBM-5 | 1/2 | 1 5/8 | 4 | – | 1/2 | 5 | Ball | MXB2650553 | 2650553 | MXB2650553W | 2650619 |
| MXBXL-5 | 1/2 | 2 1/8 | 4 | – | 1/2 | 5 | Ball | MXB2650600 | 2650666 | MXB2650600W | 2650729 |
| MXBNM-5 | 1/2 | 5/8 | 6 | 3 1/8 | 1/2 | 5 | Ball | MXB2650554 | 2650554 | MXB2650554W | 2650620 |
| MXBNL-5 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 5 | Ball | MXB2650555 | 2650555 | MXB2650555W | 2650621 |
| MXBS-5 | 5/8 | 1 5/8 | 3 1/2 | – | 5/8 | 5 | Ball | MXB2650556 | 2650556 | MXB2650556W | 2650622 |
| MXBM-5 | 5/8 | 2 1/8 | 4 | – | 5/8 | 5 | Ball | MXB2650557 | 2650557 | MXB2650557W | 2650623 |
| MXBNM-5 | 5/8 | 3/4 | 6 | 3 3/8 | 5/8 | 5 | Ball | MXB2650558 | 2650558 | MXB2650558W | 2650624 |
| MXBNL-5 | 5/8 | 3/4 | 6 | 4 1/8 | 5/8 | 5 | Ball | MXB2650559 | 2650559 | MXB2650559W | 2650625 |
| MXBS-5 | 3/4 | 1 5/8 | 4 | – | 3/4 | 5 | Ball | MXB2650560 | 2650560 | MXB2650560W | 2650626 |
| MXBM-5 | 3/4 | 2 1/4 | 5 | – | 3/4 | 5 | Ball | MXB2650561 | 2650561 | MXB2650561W | 2650627 |
| MXBXL-5 | 3/4 | 3 1/8 | 5 | – | 3/4 | 5 | Ball | MXB2650622 | 2650691 | MXB2650622W | 2650751 |
| MXBNM-5 | 3/4 | 1 1/8 | 6 | 3 1/2 | 3/4 | 5 | Ball | MXB2650562 | 2650562 | MXB2650562W | 2650628 |
| MXBNL-5 | 3/4 | 1 1/8 | 6 | 4 1/8 | 3/4 | 5 | Ball | MXB2650563 | 2650563 | MXB2650563W | 2650629 |
| MXBS-5 | 1 | 2 1/4 | 5 | – | 1 | 5 | Ball | MXB2650564 | 2650564 | MXB2650564W | 2650630 |
| MXBM-5 | 1 | 3 1/4 | 6 | – | 1 | 5 | Ball | MXB2650565 | 2650565 | MXB2650565W | 2650631 |
| MXBNM-5 | 1 | 3 1/4 | 7 | 3 5/8 | 1 | 5 | Ball | MXB2650566 | 2650566 | MXB2650566W | 2650632 |

Cutting data recommendations on page 102-103

■ = First Choice □ = Second Choice

# MaxQ+ Series

The MaxQ+ Series is LMT Onsrud's latest innovation to join the MaxQ line. These end mills are universal for P, M, and K materials for all your challenging applications. Experience versatility with the expansive offering of 4 flute, 5 flute, and ballnose options.

**Features and Benefits**

- Unique ENDURASpeed coating for maxiumum heat resistance, long tool life, and fewer tool changes
- Higher material removal rate (MRR) in light and medium applications
- Available in four and five flutes with a large selection of corner radii
- Ballnose offering

**Applications - 4-Flute**

- Full Slotting
- Heavy Profiling
- HEM Profiling
- Semi-Finishing

**Applications - 5-Flute**

- Full Slotting
- Heavy Profiling
- HEM Profiling
- Finishing

**Usage**

- High-temp Alloys
- Steel
- Stainless Steel
- Cast Iron

**Stainless Steel Milling:** HEM Profile

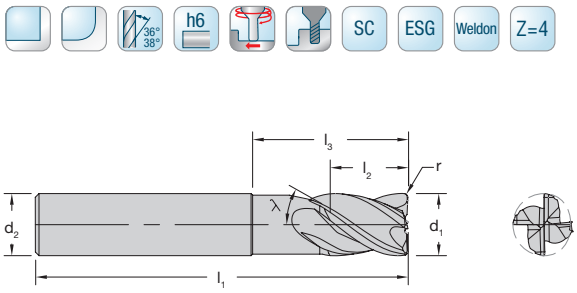
**Tool:**
MXP (Ident No. MXP2650615)
Cutting Diameter ($d_1$) = 5/8" No. of Flutes (z) = 5

**Cutting Material:**
Solid Carbide

**Material:**
17-4 Stainless Steel

**Cutting Data:**

| | |
|---|---|
| SFM ($v_c$) | = 475 |
| RPM (n) | = 2900 |
| Feed ($v_f$) | = 94 in/min |
| Chipload ($f_z$) | = .0065 in |
| RDoC ($a_e$) | = .0350 in |
| ADoC ($a_p$) | = 1.5 in |
| MRR (Q) | = 5.0 in3/min |

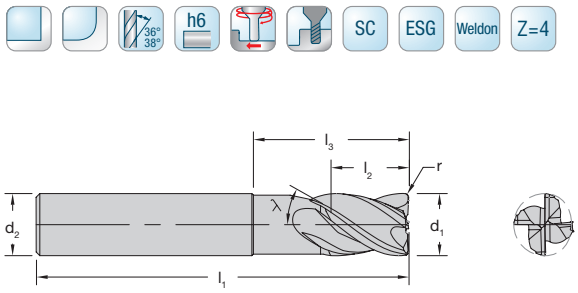



| | | 4-Flute | 4-Flute Weldon |
|---|---|---|---|
| P | | ■ | ■ |
| M | | ■ | ■ |
| K | | ■ | ■ |
| N | | | |
| S | | □ | □ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXPS-4 | 1/8 | 1/4 | 2 | - | 1/8 | 4 | Square | MXP2650000 | 2657225 | MXP2650000W | 2657226 |
| MXPS-4 | 1/8 | 1/4 | 2 | - | 1/8 | 4 | 0.015 | MXP2650001 | 2657227 | MXP2650001W | 2657228 |
| MXPM-4 | 1/8 | 1/2 | 2 | - | 1/8 | 4 | Square | MXP2650002 | 2657229 | MXP2650002W | 2657230 |
| MXPM-4 | 1/8 | 1/2 | 2 | - | 1/8 | 4 | 0.015 | MXP2650003 | 2657231 | MXP2650003W | 2657232 |
| MXPS-4 | 3/16 | 5/16 | 2 | - | 3/16 | 4 | Square | MXP2650004 | 2657233 | MXP2650004W | 2657234 |
| MXPS-4 | 3/16 | 5/16 | 2 | - | 3/16 | 4 | 0.015 | MXP2650005 | 2657235 | MXP2650005W | 2657236 |
| MXPM-4 | 3/16 | 9/16 | 2 1/2 | - | 3/16 | 4 | Square | MXP2650006 | 2657237 | MXP2650006W | 2657238 |
| MXPM-4 | 3/16 | 9/16 | 2 1/2 | - | 3/16 | 4 | 0.015 | MXP2650007 | 2657239 | MXP2650007W | 2657240 |
| MXPS-4 | 1/4 | 3/8 | 2 1/2 | - | 1/4 | 4 | Square | MXP2650008 | 2657241 | MXP2650008W | 2657242 |
| MXPS-4 | 1/4 | 3/8 | 2 1/2 | - | 1/4 | 4 | 0.015 | MXP2650009 | 2657243 | MXP2650009W | 2657244 |
| MXPS-4 | 1/4 | 3/8 | 2 1/2 | - | 1/4 | 4 | 0.030 | MXP2650010 | 2657245 | MXP2650010W | 2657246 |
| MXPM-4 | 1/4 | 3/4 | 2 1/2 | - | 1/4 | 4 | Square | MXP2650011 | 2657247 | MXP2650011W | 2657248 |
| MXPM-4 | 1/4 | 3/4 | 2 1/2 | - | 1/4 | 4 | 0.015 | MXP2650012 | 2657249 | MXP2650012W | 2657250 |
| MXPM-4 | 1/4 | 3/4 | 2 1/2 | - | 1/4 | 4 | 0.030 | MXP2650013 | 2657251 | MXP2650013W | 2657252 |
| MXPNS-4 | 1/4 | 3/8 | 3 | 1 1/8 | 1/4 | 4 | 0.015 | MXP2650014 | 2657253 | MXP2650014W | 2657254 |
| MXPNS-4 | 1/4 | 3/8 | 3 | 1 1/8 | 1/4 | 4 | 0.030 | MXP2650015 | 2657255 | MXP2650015W | 2657256 |
| MXPS-4 | 5/16 | 7/16 | 2 | - | 5/16 | 4 | Square | MXP2650016 | 2657257 | MXP2650016W | 2657258 |
| MXPS-4 | 5/16 | 7/16 | 2 | - | 5/16 | 4 | 0.015 | MXP2650017 | 2657259 | MXP2650017W | 2657260 |
| MXPM-4 | 5/16 | 1 | 3 | - | 5/16 | 4 | Square | MXP2650018 | 2657261 | MXP2650018W | 2657262 |
| MXPM-4 | 5/16 | 1 | 3 | - | 5/16 | 4 | 0.015 | MXP2650019 | 2657263 | MXP2650019W | 2657264 |
| MXPS-4 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 4 | Square | MXP2650020 | 2657265 | MXP2650020W | 2657266 |
| MXPS-4 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 4 | 0.015 | MXP2650021 | 2657267 | MXP2650021W | 2657268 |
| MXPS-4 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 4 | 0.030 | MXP2650022 | 2657269 | MXP2650022W | 2657270 |
| MXPS-4 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 4 | 0.060 | MXP2650104 | 2657271 | MXP2650104W | 2657272 |
| MXPS-4 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 4 | 0.090 | MXP2650105 | 2657273 | MXP2650105W | 2657274 |
| MXPS-4 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 4 | 0.120 | MXP2650106 | 2657275 | MXP2650106W | 2657276 |
| MXPM-4 | 3/8 | 1 1/8 | 3 | - | 3/8 | 4 | Square | MXP2650023 | 2657277 | MXP2650023W | 2657278 |
| MXPM-4 | 3/8 | 1 1/8 | 3 | - | 3/8 | 4 | 0.015 | MXP2650024 | 2657279 | MXP2650024W | 2657280 |
| MXPM-4 | 3/8 | 1 1/8 | 3 | - | 3/8 | 4 | 0.030 | MXP2650025 | 2657281 | MXP2650025W | 2657282 |
| MXPM-4 | 3/8 | 1 1/8 | 3 | - | 3/8 | 4 | 0.060 | MXP2650107 | 2657283 | MXP2650107W | 2657284 |
| MXPM-4 | 3/8 | 1 1/8 | 3 | - | 3/8 | 4 | 0.090 | MXP2650108 | 2657285 | MXP2650108W | 2657286 |

Cutting data recommendations on page 104-105

■ = First Choice □ = Second Choice




| | | 4-Flute | 4-Flute Weldon |
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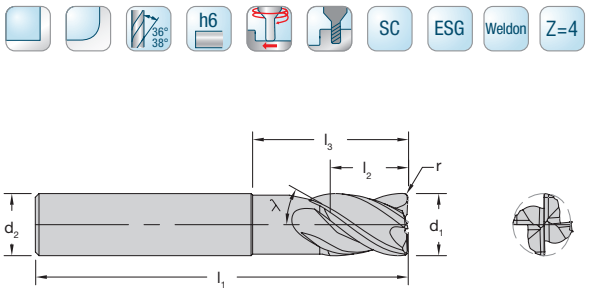
| N | | | |
| S | | □ | □ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXPM-4 | 3/8 | 1 1/8 | 3 | - | 3/8 | 4 | 0.120 | MXP2650109 | 2657287 | MXP2650109W | 2657288 |
| MXPNS-4 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 4 | Square | MXP2650110 | 2657289 | MXP2650110W | 2657290 |
| MXPNS-4 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 4 | 0.015 | MXP2650026 | 2657291 | MXP2650026W | 2657292 |
| MXPNS-4 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 4 | 0.030 | MXP2650027 | 2657293 | MXP2650027W | 2657294 |
| MXPNS-4 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 4 | 0.060 | MXP2650111 | 2657295 | MXP2650111W | 2657296 |
| MXPNS-4 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 4 | 0.090 | MXP2650112 | 2657297 | MXP2650112W | 2657298 |
| MXPNS-4 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 4 | 0.120 | MXP2650113 | 2657299 | MXP2650113W | 2657300 |
| MXPS-4 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 4 | Square | MXP2650028 | 2657301 | MXP2650028W | 2657302 |
| MXPS-4 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 4 | 0.015 | MXP2650029 | 2657303 | MXP2650029W | 2657304 |
| MXPS-4 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 4 | 0.030 | MXP2650030 | 2657305 | MXP2650030W | 2657306 |
| MXPS-4 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 4 | 0.060 | MXP2650114 | 2657307 | MXP2650114W | 2657308 |
| MXPS-4 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 4 | 0.120 | MXP2650116 | 2657309 | MXP2650116W | 2657310 |
| MXPM-4 | 1/2 | 1 1/4 | 3 | - | 1/2 | 4 | Square | MXP2650034 | 2657311 | MXP2650034W | 2657312 |
| MXPM-4 | 1/2 | 1 1/4 | 3 | - | 1/2 | 4 | 0.015 | MXP2650035 | 2657313 | MXP2650035W | 2657314 |
| MXPM-4 | 1/2 | 1 1/4 | 3 | - | 1/2 | 4 | 0.030 | MXP2650036 | 2657315 | MXP2650036W | 2657316 |
| MXPM-4 | 1/2 | 1 1/4 | 3 | - | 1/2 | 4 | 0.060 | MXP2650122 | 2657317 | MXP2650122W | 2657318 |
| MXPM-4 | 1/2 | 1 1/4 | 3 | - | 1/2 | 4 | 0.120 | MXP2650124 | 2657319 | MXP2650124W | 2657320 |
| MXPNS-4 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 4 | Square | MXP2650040 | 2657321 | MXP2650040W | 2657322 |
| MXPNS-4 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 4 | 0.030 | MXP2650041 | 2657323 | MXP2650041W | 2657324 |
| MXPNS-4 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 4 | 0.060 | MXP2650042 | 2657325 | MXP2650042W | 2657326 |
| MXPNS-4 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 4 | 0.120 | MXP2650131 | 2657327 | MXP2650131W | 2657328 |
| MXPS-4 | 5/8 | 3/4 | 3 | - | 5/8 | 4 | Square | MXP2650046 | 2657329 | MXP2650046W | 2657330 |
| MXPS-4 | 5/8 | 3/4 | 3 | - | 5/8 | 4 | 0.030 | MXP2650047 | 2657331 | MXP2650047W | 2657332 |
| MXPS-4 | 5/8 | 3/4 | 3 | - | 5/8 | 4 | 0.060 | MXP2650136 | 2657333 | MXP2650136W | 2657334 |
| MXPS-4 | 5/8 | 3/4 | 3 | - | 5/8 | 4 | 0.120 | MXP2650137 | 2657335 | MXP2650137W | 2657336 |
| MXPS-4 | 5/8 | 3/4 | 3 | - | 5/8 | 4 | 0.190 | MXP2650138 | 2657337 | MXP2650138W | 2657338 |
| MXPM-4 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 4 | Square | MXP2650048 | 2657339 | MXP2650048W | 2657340 |
| MXPM-4 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 4 | 0.030 | MXP2650049 | 2657341 | MXP2650049W | 2657342 |
| MXPM-4 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 4 | 0.060 | MXP2650140 | 2657343 | MXP2650140W | 2657344 |
| MXPM-4 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 4 | 0.120 | MXP2650141 | 2657345 | MXP2650141W | 2657346 |
| MXPM-4 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 4 | 0.190 | MXP2650142 | 2657347 | MXP2650142W | 2657348 |

Cutting data recommendations on page 104-105

■ = First Choice □ = Second Choice




| | | 4-Flute | 4-Flute Weldon |
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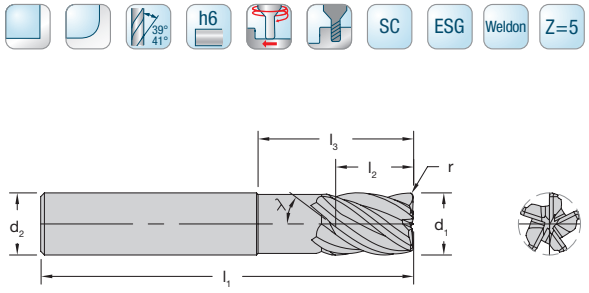
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXPS-4 | 3/4 | 1 1/8 | 3 | - | 3/4 | 4 | Square | MXP2650050 | 2657349 | MXP2650050W | 2657350 |
| MXPS-4 | 3/4 | 1 1/8 | 3 | - | 3/4 | 4 | 0.030 | MXP2650051 | 2657351 | MXP2650051W | 2657352 |
| MXPS-4 | 3/4 | 1 1/8 | 3 | - | 3/4 | 4 | 0.060 | MXP2650052 | 2657353 | MXP2650052W | 2657354 |
| MXPS-4 | 3/4 | 1 1/8 | 3 | - | 3/4 | 4 | 0.120 | MXP2650053 | 2657355 | MXP2650053W | 2657356 |
| MXPM-4 | 3/4 | 1 5/8 | 4 | - | 3/4 | 4 | Square | MXP2650059 | 2657365 | MXP2650059W | 2657366 |
| MXPM-4 | 3/4 | 1 5/8 | 4 | - | 3/4 | 4 | 0.030 | MXP2650060 | 2657367 | MXP2650060W | 2657368 |
| MXPM-4 | 3/4 | 1 5/8 | 4 | - | 3/4 | 4 | 0.060 | MXP2650061 | 2657369 | MXP2650061W | 2657370 |
| MXPM-4 | 3/4 | 1 5/8 | 4 | - | 3/4 | 4 | 0.120 | MXP2650062 | 2657371 | MXP2650062W | 2657372 |
| MXPL-4 | 3/4 | 2 1/4 | 5 | - | 3/4 | 4 | Square | MXP2650100 | 2657373 | MXP2650100W | 2657374 |
| MXPL-4 | 3/4 | 2 1/4 | 5 | - | 3/4 | 4 | 0.030 | MXP2650101 | 2657375 | MXP2650101W | 2657376 |
| MXPL-4 | 3/4 | 2 1/4 | 5 | - | 3/4 | 4 | 0.060 | MXP2650162 | 2657377 | MXP2650162W | 2657378 |
| MXPL-4 | 3/4 | 2 1/4 | 5 | - | 3/4 | 4 | 0.120 | MXP2650164 | 2657379 | MXP2650164W | 2657380 |
| MXPNS-4 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 4 | Square | MXP2650172 | 2657381 | MXP2650172W | 2657382 |
| MXPNS-4 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 4 | 0.030 | MXP2650067 | 2657359 | MXP2650067W | 2657360 |
| MXPNS-4 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 4 | 0.060 | MXP2650068 | 2657361 | MXP2650068W | 2657362 |
| MXPNS-4 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 4 | 0.120 | MXP2650069 | 2657363 | MXP2650069W | 2657364 |
| MXPNM-4 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 4 | Square | MXP2650180 | 2657357 | MXP2650180W | 2657358 |
| MXPNM-4 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 4 | 0.030 | MXP2650073 | 2657383 | MXP2650073W | 2657384 |
| MXPNM-4 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 4 | 0.060 | MXP2650074 | 2657385 | MXP2650074W | 2657386 |
| MXPNM-4 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 4 | 0.120 | MXP2650075 | 2657387 | MXP2650075W | 2657388 |
| MXPS-4 | 1 | 1 1/4 | 4 | - | 1 | 4 | 0.030 | MXP2650079 | 2657389 | MXP2650079W | 2657390 |
| MXPS-4 | 1 | 1 1/4 | 4 | - | 1 | 4 | 0.060 | MXP2650189 | 2657391 | MXP2650189W | 2657392 |
| MXPM-4 | 1 | 2 | 5 | - | 1 | 4 | 0.030 | MXP2650086 | 2657393 | MXP2650086W | 2657394 |
| MXPM-4 | 1 | 2 | 5 | - | 1 | 4 | 0.060 | MXP2650203 | 2657395 | MXP2650203W | 2657396 |

Cutting data recommendations on page 104-105

■ = First Choice □ = Second Choice




| | | 5-Flute | 5-Flute Weldon |
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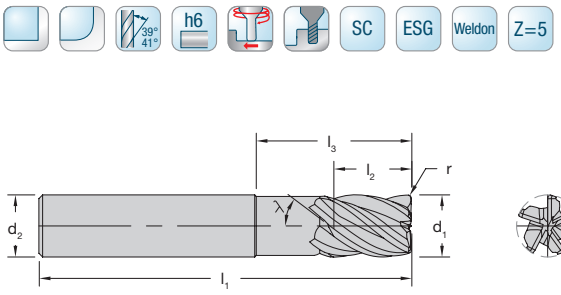
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXPS-5 | 1/4 | 3/8 | 2 1/2 | - | 1/4 | 5 | Square | MXP2650700 | 2656817 | MXP2650700W | 2656818 |
| MXPS-5 | 1/4 | 3/8 | 2 1/2 | - | 1/4 | 5 | 0.015 | MXP2650701 | 2656819 | MXP2650701W | 2656820 |
| MXPS-5 | 1/4 | 3/8 | 2 1/2 | - | 1/4 | 5 | 0.030 | MXP2650702 | 2656821 | MXP2650702W | 2656822 |
| MXPM-5 | 1/4 | 3/4 | 2 1/2 | - | 1/4 | 5 | Square | MXP2650703 | 2656823 | MXP2650703W | 2656824 |
| MXPM-5 | 1/4 | 3/4 | 2 1/2 | - | 1/4 | 5 | 0.015 | MXP2650704 | 2656825 | MXP2650704W | 2656826 |
| MXPM-5 | 1/4 | 3/4 | 2 1/2 | - | 1/4 | 5 | 0.030 | MXP2650705 | 2656827 | MXP2650705W | 2656828 |
| MXPNS-5 | 1/4 | 3/8 | 3 | 1 1/8 | 1/4 | 5 | 0.015 | MXP2650706 | 2656829 | MXP2650706W | 2656830 |
| MXPNS-5 | 1/4 | 3/8 | 3 | 1 1/8 | 1/4 | 5 | 0.030 | MXP2650707 | 2656831 | MXP2650707W | 2656832 |
| MXPM-5 | 3/8 | 7/8 | 2 1/2 | - | 3/8 | 5 | Square | MXP2650573 | 2656833 | MXP2650573W | 2656834 |
| MXPM-5 | 3/8 | 7/8 | 2 1/2 | - | 3/8 | 5 | 0.015 | MXP2650574 | 2656835 | MXP2650574W | 2656836 |
| MXPM-5 | 3/8 | 7/8 | 2 1/2 | - | 3/8 | 5 | 0.030 | MXP2650575 | 2656837 | MXP2650575W | 2656838 |
| MXPM-5 | 3/8 | 7/8 | 2 1/2 | - | 3/8 | 5 | 0.060 | MXP2650576 | 2656839 | MXP2650576W | 2656840 |
| MXPM-5 | 3/8 | 7/8 | 2 1/2 | - | 3/8 | 5 | 0.090 | MXP2650577 | 2656841 | MXP2650577W | 2656842 |
| MXPM-5 | 3/8 | 7/8 | 2 1/2 | - | 3/8 | 5 | 0.120 | MXP2650578 | 2656843 | MXP2650578W | 2656844 |
| MXPL-5 | 3/8 | 1 1/4 | 3 | - | 3/8 | 5 | Square | MXP2650579 | 2656845 | MXP2650579W | 2656846 |
| MXPL-5 | 3/8 | 1 1/4 | 3 | - | 3/8 | 5 | 0.015 | MXP2650580 | 2656847 | MXP2650580W | 2656848 |
| MXPL-5 | 3/8 | 1 1/4 | 3 | - | 3/8 | 5 | 0.030 | MXP2650581 | 2656849 | MXP2650581W | 2656850 |
| MXPL-5 | 3/8 | 1 1/4 | 3 | - | 3/8 | 5 | 0.060 | MXP2650582 | 2656851 | MXP2650582W | 2656852 |
| MXPL-5 | 3/8 | 1 1/4 | 3 | - | 3/8 | 5 | 0.090 | MXP2650583 | 2656853 | MXP2650583W | 2656854 |
| MXPL-5 | 3/8 | 1 1/4 | 3 | - | 3/8 | 5 | 0.120 | MXP2650584 | 2656855 | MXP2650584W | 2656856 |
| MXPNS-5 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 5 | Square | MXP2650585 | 2656857 | MXP2650585W | 2656858 |
| MXPNS-5 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 5 | 0.015 | MXP2650586 | 2656859 | MXP2650586W | 2656860 |
| MXPNS-5 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 5 | 0.030 | MXP2650587 | 2656861 | MXP2650587W | 2656862 |
| MXPNS-5 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 5 | 0.060 | MXP2650588 | 2656863 | MXP2650588W | 2656864 |
| MXPNS-5 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 5 | 0.090 | MXP2650589 | 2656865 | MXP2650589W | 2656866 |
| MXPNS-5 | 3/8 | 1/2 | 3 1/2 | 1 5/8 | 3/8 | 5 | 0.120 | MXP2650590 | 2656867 | MXP2650590W | 2656868 |
| MXPS-5 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 5 | Square | MXP2650031 | 2656869 | MXP2650031W | 2656870 |
| MXPS-5 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 5 | 0.015 | MXP2650032 | 2656871 | MXP2650032W | 2656872 |
| MXPS-5 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 5 | 0.030 | MXP2650033 | 2656873 | MXP2650033W | 2656874 |
| MXPS-5 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 5 | 0.060 | MXP2650118 | 2656875 | MXP2650118W | 2656876 |
| MXPS-5 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 5 | 0.090 | MXP2650119 | 2656877 | MXP2650119W | 2656878 |

Cutting data recommendations on page 106-107

■ = First Choice □ = Second Choice




| | | 5-Flute | 5-Flute Weldon |
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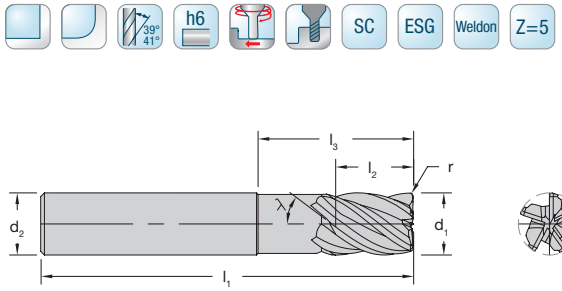
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXPS-5 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 5 | 0.120 | MXP2650120 | 2656879 | MXP2650120W | 2656880 |
| MXPS-5 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 5 | 0.190 | MXP2650121 | 2656881 | MXP2650121W | 2656882 |
| MXPM-5 | 1/2 | 1 1/4 | 3 | - | 1/2 | 5 | Square | MXP2650037 | 2656883 | MXP2650037W | 2656884 |
| MXPM-5 | 1/2 | 1 1/4 | 3 | - | 1/2 | 5 | 0.015 | MXP2650038 | 2656885 | MXP2650038W | 2656886 |
| MXPM-5 | 1/2 | 1 1/4 | 3 | - | 1/2 | 5 | 0.030 | MXP2650039 | 2656887 | MXP2650039W | 2656888 |
| MXPM-5 | 1/2 | 1 1/4 | 3 | - | 1/2 | 5 | 0.060 | MXP2650126 | 2656889 | MXP2650126W | 2656890 |
| MXPM-5 | 1/2 | 1 1/4 | 3 | - | 1/2 | 5 | 0.090 | MXP2650127 | 2656891 | MXP2650127W | 2656892 |
| MXPM-5 | 1/2 | 1 1/4 | 3 | - | 1/2 | 5 | 0.120 | MXP2650128 | 2656893 | MXP2650128W | 2656894 |
| MXPM-5 | 1/2 | 1 1/4 | 3 | - | 1/2 | 5 | 0.190 | MXP2650129 | 2656895 | MXP2650129W | 2656896 |
| MXPL-5 | 1/2 | 1 5/8 | 4 | - | 1/2 | 5 | Square | MXP2650591 | 2656897 | MXP2650591W | 2656898 |
| MXPL-5 | 1/2 | 1 5/8 | 4 | - | 1/2 | 5 | 0.015 | MXP2650592 | 2656899 | MXP2650592W | 2656900 |
| MXPL-5 | 1/2 | 1 5/8 | 4 | - | 1/2 | 5 | 0.030 | MXP2650593 | 2656901 | MXP2650593W | 2656902 |
| MXPL-5 | 1/2 | 1 5/8 | 4 | - | 1/2 | 5 | 0.060 | MXP2650594 | 2656903 | MXP2650594W | 2656904 |
| MXPXL-5 | 1/2 | 2 1/8 | 4 | - | 1/2 | 5 | Square | MXP2650596 | 2656905 | MXP2650596W | 2656906 |
| MXPXL-5 | 1/2 | 2 1/8 | 4 | - | 1/2 | 5 | 0.015 | MXP2650597 | 2656907 | MXP2650597W | 2656908 |
| MXPXL-5 | 1/2 | 2 1/8 | 4 | - | 1/2 | 5 | 0.030 | MXP2650598 | 2656909 | MXP2650598W | 2656910 |
| MXPXL-5 | 1/2 | 2 1/8 | 4 | - | 1/2 | 5 | 0.060 | MXP2650599 | 2656911 | MXP2650599W | 2656912 |
| MXPNS-5 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 5 | Square | MXP2650043 | 2656913 | MXP2650043W | 2656914 |
| MXPNS-5 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 5 | 0.030 | MXP2650044 | 2656915 | MXP2650044W | 2656916 |
| MXPNS-5 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 5 | 0.060 | MXP2650045 | 2656917 | MXP2650045W | 2656918 |
| MXPNS-5 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 5 | 0.090 | MXP2650133 | 2656919 | MXP2650133W | 2656920 |
| MXPNS-5 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 5 | 0.120 | MXP2650134 | 2656921 | MXP2650134W | 2656922 |
| MXPNS-5 | 1/2 | 5/8 | 4 | 1 3/4 | 1/2 | 5 | 0.190 | MXP2650135 | 2656923 | MXP2650135W | 2656924 |
| MXPS-5 | 5/8 | 3/4 | 3 | - | 5/8 | 5 | Square | MXP2650601 | 2656925 | MXP2650601W | 2656926 |
| MXPS-5 | 5/8 | 3/4 | 3 | - | 5/8 | 5 | 0.030 | MXP2650602 | 2656927 | MXP2650602W | 2656928 |
| MXPS-5 | 5/8 | 3/4 | 3 | - | 5/8 | 5 | 0.060 | MXP2650603 | 2656929 | MXP2650603W | 2656930 |
| MXPS-5 | 5/8 | 3/4 | 3 | - | 5/8 | 5 | 0.090 | MXP2650604 | 2656931 | MXP2650604W | 2656932 |
| MXPS-5 | 5/8 | 3/4 | 3 | - | 5/8 | 5 | 0.120 | MXP2650605 | 2656933 | MXP2650605W | 2656934 |
| MXPM-5 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 5 | Square | MXP2650607 | 2656935 | MXP2650607W | 2656936 |
| MXPM-5 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 5 | 0.030 | MXP2650608 | 2656937 | MXP2650608W | 2656938 |
| MXPM-5 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 5 | 0.060 | MXP2650609 | 2656939 | MXP2650609W | 2656940 |

Cutting data recommendations on page 106-107

■ = First Choice □ = Second Choice




| | | 5-Flute | 5-Flute Weldon |
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| M | | ■ | ■ |
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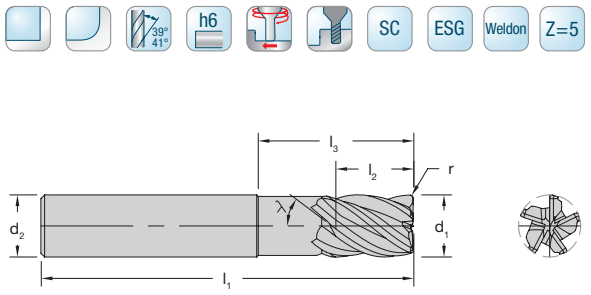
| N | | | |
| S | | □ | □ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXPM-5 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 5 | 0.090 | MXP2650610 | 2656941 | MXP2650610W | 2656942 |
| MXPM-5 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 5 | 0.120 | MXP2650611 | 2656943 | MXP2650611W | 2656944 |
| MXPL-5 | 5/8 | 1 5/8 | 3 1/2 | - | 5/8 | 5 | Square | MXP2650613 | 2656945 | MXP2650613W | 2656946 |
| MXPL-5 | 5/8 | 1 5/8 | 3 1/2 | - | 5/8 | 5 | 0.030 | MXP2650614 | 2656947 | MXP2650614W | 2656948 |
| MXPL-5 | 5/8 | 1 5/8 | 3 1/2 | - | 5/8 | 5 | 0.060 | MXP2650615 | 2656949 | MXP2650615W | 2656950 |
| MXPL-5 | 5/8 | 2 1/4 | 4 | - | 5/8 | 5 | Square | MXP2650616 | 2656951 | MXP2650616W | 2656952 |
| MXPL-5 | 5/8 | 2 1/4 | 4 | - | 5/8 | 5 | 0.030 | MXP2650617 | 2656953 | MXP2650617W | 2656954 |
| MXPL-5 | 5/8 | 2 1/4 | 4 | - | 5/8 | 5 | 0.060 | MXP2650618 | 2656955 | MXP2650618W | 2656956 |
| MXPS-5 | 3/4 | 1 1/8 | 3 | - | 3/4 | 5 | Square | MXP2650054 | 2656957 | MXP2650054W | 2656958 |
| MXPS-5 | 3/4 | 1 1/8 | 3 | - | 3/4 | 5 | 0.030 | MXP2650055 | 2656959 | MXP2650055W | 2656960 |
| MXPS-5 | 3/4 | 1 1/8 | 3 | - | 3/4 | 5 | 0.060 | MXP2650056 | 2656961 | MXP2650056W | 2656962 |
| MXPS-5 | 3/4 | 1 1/8 | 3 | - | 3/4 | 5 | 0.090 | MXP2650147 | 2656963 | MXP2650147W | 2656964 |
| MXPS-5 | 3/4 | 1 1/8 | 3 | - | 3/4 | 5 | 0.120 | MXP2650057 | 2656965 | MXP2650057W | 2656966 |
| MXPS-5 | 3/4 | 1 1/8 | 3 | - | 3/4 | 5 | 0.190 | MXP2650148 | 2656967 | MXP2650148W | 2656968 |
| MXPS-5 | 3/4 | 1 1/8 | 3 | - | 3/4 | 5 | 0.250 | MXP2650149 | 2656969 | MXP2650149W | 2656970 |
| MXPM-5 | 3/4 | 1 1/2 | 4 | - | 3/4 | 5 | Square | MXP2650150 | 2656971 | MXP2650150W | 2656972 |
| MXPM-5 | 3/4 | 1 1/2 | 4 | - | 3/4 | 5 | 0.030 | MXP2650151 | 2656973 | MXP2650151W | 2656974 |
| MXPM-5 | 3/4 | 1 1/2 | 4 | - | 3/4 | 5 | 0.060 | MXP2650152 | 2656975 | MXP2650152W | 2656976 |
| MXPM-5 | 3/4 | 1 1/2 | 4 | - | 3/4 | 5 | 0.090 | MXP2650153 | 2656977 | MXP2650153W | 2656978 |
| MXPM-5 | 3/4 | 1 1/2 | 4 | - | 3/4 | 5 | 0.120 | MXP2650058 | 2656979 | MXP2650058W | 2656980 |
| MXPM-5 | 3/4 | 1 1/2 | 4 | - | 3/4 | 5 | 0.190 | MXP2650154 | 2656981 | MXP2650154W | 2656982 |
| MXPM-5 | 3/4 | 1 1/2 | 4 | - | 3/4 | 5 | 0.250 | MXP2650155 | 2656983 | MXP2650155W | 2656984 |
| MXPM-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | Square | MXP2650063 | 2656985 | MXP2650063W | 2656986 |
| MXPM-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | 0.030 | MXP2650064 | 2656987 | MXP2650064W | 2656988 |
| MXPM-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | 0.060 | MXP2650065 | 2656989 | MXP2650065W | 2656990 |
| MXPM-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | 0.090 | MXP2650159 | 2656991 | MXP2650159W | 2656992 |
| MXPM-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | 0.120 | MXP2650066 | 2656993 | MXP2650066W | 2656994 |
| MXPM-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | 0.190 | MXP2650160 | 2656995 | MXP2650160W | 2656996 |
| MXPM-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | 0.250 | MXP2650161 | 2656997 | MXP2650161W | 2656998 |
| MXPL-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | Square | MXP2650102 | 2656999 | MXP2650102W | 2657000 |
| MXPL-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | 0.030 | MXP2650103 | 2657001 | MXP2650103W | 2657002 |

Cutting data recommendations on page 106-107

■ = First Choice □ = Second Choice




| | | 5-Flute | 5-Flute Weldon |
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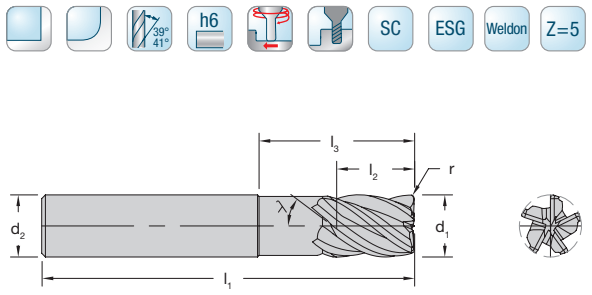
| N | | | |
| S | | □ | □ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXPL-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | 0.060 | MXP2650167 | 2657003 | MXP2650167W | 2657004 |
| MXPL-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | 0.090 | MXP2650168 | 2657005 | MXP2650168W | 2657006 |
| MXPL-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | 0.120 | MXP2650169 | 2657007 | MXP2650169W | 2657008 |
| MXPL-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | 0.190 | MXP2650170 | 2657009 | MXP2650170W | 2657010 |
| MXPL-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | 0.250 | MXP2650171 | 2657011 | MXP2650171W | 2657012 |
| MXPXL-5 | 3/4 | 3 1/8 | 5 | - | 3/4 | 5 | Square | MXP2650619 | 2657013 | MXP2650619W | 2657014 |
| MXPXL-5 | 3/4 | 3 1/8 | 5 | - | 3/4 | 5 | 0.030 | MXP2650620 | 2657015 | MXP2650620W | 2657016 |
| MXPXL-5 | 3/4 | 3 1/8 | 5 | - | 3/4 | 5 | 0.060 | MXP2650621 | 2657017 | MXP2650621W | 2657018 |
| MXPNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | Square | MXP2650176 | 2657019 | MXP2650176W | 2657020 |
| MXPNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | 0.030 | MXP2650070 | 2657021 | MXP2650070W | 2657022 |
| MXPNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | 0.060 | MXP2650071 | 2657023 | MXP2650071W | 2657024 |
| MXPNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | 0.090 | MXP2650177 | 2657025 | MXP2650177W | 2657026 |
| MXPNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | 0.120 | MXP2650072 | 2657027 | MXP2650072W | 2657028 |
| MXPNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | 0.190 | MXP2650178 | 2657029 | MXP2650178W | 2657030 |
| MXPNS-5 | 3/4 | 1 1/8 | 5 | 2 3/8 | 3/4 | 5 | 0.250 | MXP2650179 | 2657031 | MXP2650179W | 2657032 |
| MXPNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | Square | MXP2650184 | 2657033 | MXP2650184W | 2657034 |
| MXPNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | 0.030 | MXP2650076 | 2657035 | MXP2650076W | 2657036 |
| MXPNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | 0.060 | MXP2650077 | 2657037 | MXP2650077W | 2657038 |
| MXPNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | 0.090 | MXP2650185 | 2657039 | MXP2650185W | 2657040 |
| MXPNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | 0.120 | MXP2650078 | 2657041 | MXP2650078W | 2657042 |
| MXPNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | 0.190 | MXP2650186 | 2657043 | MXP2650186W | 2657044 |
| MXPNM-5 | 3/4 | 1 1/8 | 6 | 3 1/8 | 3/4 | 5 | 0.250 | MXP2650187 | 2657045 | MXP2650187W | 2657046 |
| MXPS-5 | 1 | 1 1/4 | 4 | - | 1 | 5 | Square | MXP2650193 | 2657047 | MXP2650193W | 2657048 |
| MXPS-5 | 1 | 1 1/4 | 4 | - | 1 | 5 | 0.030 | MXP2650081 | 2657049 | MXP2650081W | 2657050 |
| MXPS-5 | 1 | 1 1/4 | 4 | - | 1 | 5 | 0.060 | MXP2650194 | 2657051 | MXP2650194W | 2657052 |
| MXPS-5 | 1 | 1 1/4 | 4 | - | 1 | 5 | 0.120 | MXP2650082 | 2657053 | MXP2650082W | 2657054 |
| MXPS-5 | 1 | 1 1/4 | 4 | - | 1 | 5 | 0.190 | MXP2650083 | 2657055 | MXP2650083W | 2657056 |
| MXPS-5 | 1 | 1 1/4 | 4 | - | 1 | 5 | 0.250 | MXP2650084 | 2657057 | MXP2650084W | 2657058 |
| MXPS-5 | 1 | 1 1/2 | 4 | - | 1 | 5 | Square | MXP2650196 | 2657059 | MXP2650196W | 2657060 |
| MXPS-5 | 1 | 1 1/2 | 4 | - | 1 | 5 | 0.030 | MXP2650197 | 2657061 | MXP2650197W | 2657062 |
| MXPS-5 | 1 | 1 1/2 | 4 | - | 1 | 5 | 0.060 | MXP2650198 | 2657063 | MXP2650198W | 2657064 |

Cutting data recommendations on page 106-107

■ = First Choice □ = Second Choice




| | | 5-Flute | 5-Flute Weldon |
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| P | | ■ | ■ |
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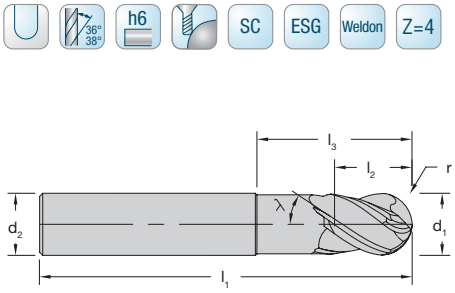
| K | | ■ | ■ |
| N | | | |
| S | | □ | □ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXPS-5 | 1 | 1 1/2 | 4 | - | 1 | 5 | 0.120 | MXP2650085 | 2657065 | MXP2650085W | 2657066 |
| MXPS-5 | 1 | 1 1/2 | 4 | - | 1 | 5 | 0.190 | MXP2650200 | 2657067 | MXP2650200W | 2657068 |
| MXPS-5 | 1 | 1 1/2 | 4 | - | 1 | 5 | 0.250 | MXP2650201 | 2657069 | MXP2650201W | 2657070 |
| MXPM-5 | 1 | 2 | 5 | - | 1 | 5 | Square | MXP2650205 | 2657071 | MXP2650205W | 2657072 |
| MXPM-5 | 1 | 2 | 5 | - | 1 | 5 | 0.030 | MXP2650090 | 2657073 | MXP2650090W | 2657074 |
| MXPM-5 | 1 | 2 | 5 | - | 1 | 5 | 0.060 | MXP2650206 | 2657075 | MXP2650206W | 2657076 |
| MXPM-5 | 1 | 2 | 5 | - | 1 | 5 | 0.120 | MXP2650091 | 2657077 | MXP2650091W | 2657078 |
| MXPM-5 | 1 | 2 | 5 | - | 1 | 5 | 0.190 | MXP2650092 | 2657079 | MXP2650092W | 2657080 |
| MXPM-5 | 1 | 2 | 5 | - | 1 | 5 | 0.250 | MXP2650093 | 2657081 | MXP2650093W | 2657082 |
| MXPXL-5 | 1 | 3 1/8 | 6 | - | 1 | 5 | Square | MXP2650623 | 2657083 | MXP2650623W | 2657084 |
| MXPXL-5 | 1 | 3 1/8 | 6 | - | 1 | 5 | 0.030 | MXP2650624 | 2657085 | MXP2650624W | 2657086 |
| MXPXL-5 | 1 | 3 1/8 | 6 | - | 1 | 5 | 0.060 | MXP2650625 | 2657087 | MXP2650625W | 2657088 |
| MXPNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | Square | MXP2650208 | 2657089 | MXP2650208W | 2657090 |
| MXPNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | 0.030 | MXP2650209 | 2657091 | MXP2650209W | 2657092 |
| MXPNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | 0.060 | MXP2650094 | 2657093 | MXP2650094W | 2657094 |
| MXPNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | 0.120 | MXP2650095 | 2657095 | MXP2650095W | 2657096 |
| MXPNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | 0.190 | MXP2650211 | 2657097 | MXP2650211W | 2657098 |
| MXPNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | 0.250 | MXP2650096 | 2657099 | MXP2650096W | 2657100 |
| MXPNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | Square | MXP2650212 | 2657101 | MXP2650212W | 2657102 |
| MXPNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | 0.030 | MXP2650213 | 2657103 | MXP2650213W | 2657104 |
| MXPNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | 0.060 | MXP2650097 | 2657105 | MXP2650097W | 2657106 |
| MXPNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | 0.120 | MXP2650098 | 2657107 | MXP2650098W | 2657108 |
| MXPNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | 0.190 | MXP2650215 | 2657109 | MXP2650215W | 2657110 |
| MXPNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | 0.250 | MXP2650099 | 2657111 | MXP2650099W | 2657112 |

Cutting data recommendations on page 106-107

■ = First Choice □ = Second Choice




| | | 4-Flute Ballnose | 4-Flute Ballnose Weldon |
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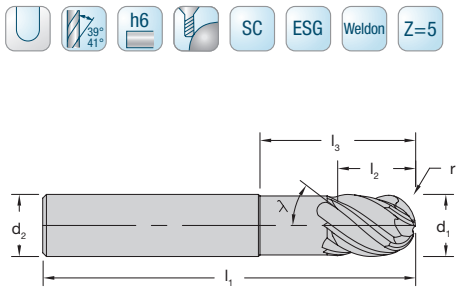
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ballnose Ident No. | Ballnose SAP No. | Ballnose Weldon Ident No. | Ballnose Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXPNS-4 | 1/8 | 3/16 | 3 | 1/2 | 1/8 | 4 | Ball | MXP2650503 | 2657131 | MXP2650503W | 2657132 |
| MXPS-4 | 1/8 | 1/4 | 2 | - | 1/8 | 4 | Ball | MXP2650500 | 2657133 | MXP2650500W | 2657134 |
| MXPM-4 | 1/8 | 1/2 | 2 1/2 | - | 1/8 | 4 | Ball | MXP2650501 | 2657135 | MXP2650501W | 2657136 |
| MXPL-4 | 1/8 | 3/4 | 2 1/2 | - | 1/8 | 4 | Ball | MXP2650502 | 2657137 | MXP2650502W | 2657138 |
| MXPS-4 | 3/16 | 5/16 | 2 | - | 3/16 | 4 | Ball | MXP2650504 | 2657139 | MXP2650504W | 2657140 |
| MXPM-4 | 3/16 | 5/8 | 2 1/2 | - | 3/16 | 4 | Ball | MXP2650505 | 2657141 | MXP2650505W | 2657142 |
| MXPS-4 | 1/4 | 3/8 | 2 | - | 1/4 | 4 | Ball | MXP2650508 | 2657143 | MXP2650508W | 2657144 |
| MXPM-4 | 1/4 | 3/4 | 2 1/2 | - | 1/4 | 4 | Ball | MXP2650509 | 2657145 | MXP2650509W | 2657146 |
| MXPNM-4 | 1/4 | 3/8 | 4 | 1 1/8 | 1/4 | 4 | Ball | MXP2650512 | 2657147 | MXP2650512W | 2657148 |
| MXPNL-4 | 1/4 | 3/8 | 4 | 1 5/8 | 1/4 | 4 | Ball | MXP2650513 | 2657149 | MXP2650513W | 2657150 |
| MXPS-4 | 5/16 | 1/2 | 2 1/2 | - | 5/16 | 4 | Ball | MXP2650514 | 2657151 | MXP2650514W | 2657152 |
| MXPM-4 | 5/16 | 3/4 | 2 1/2 | - | 5/16 | 4 | Ball | MXP2650515 | 2657153 | MXP2650515W | 2657154 |
| MXPS-4 | 3/8 | 1/2 | 2 | - | 3/8 | 4 | Ball | MXP2650518 | 2657155 | MXP2650518W | 2657156 |
| MXPM-4 | 3/8 | 7/8 | 3 | - | 3/8 | 4 | Ball | MXP2650519 | 2657157 | MXP2650519W | 2657158 |
| MXPL-4 | 3/8 | 1 1/4 | 3 | - | 3/8 | 4 | Ball | MXP2650520 | 2657159 | MXP2650520W | 2657160 |
| MXPNM-4 | 3/8 | 1/2 | 4 | 2 1/8 | 3/8 | 4 | Ball | MXP2650522 | 2657161 | MXP2650522W | 2657162 |
| MXPS-4 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 4 | Ball | MXP2650524 | 2657163 | MXP2650524W | 2657164 |
| MXPM-4 | 1/2 | 1 1/8 | 3 | - | 1/2 | 4 | Ball | MXP2650525 | 2657165 | MXP2650525W | 2657166 |
| MXPL-4 | 1/2 | 1 5/8 | 4 | - | 1/2 | 4 | Ball | MXP2650526 | 2657167 | MXP2650526W | 2657168 |
| MXPNS-4 | 1/2 | 5/8 | 4 | 2 1/8 | 1/2 | 4 | Ball | MXP2650527 | 2657169 | MXP2650527W | 2657170 |
| MXPS-4 | 3/4 | 1 1/8 | 4 | - | 3/4 | 4 | Ball | MXP2650536 | 2657171 | MXP2650536W | 2657172 |
| MXPM-4 | 3/4 | 1 5/8 | 4 | - | 3/4 | 4 | Ball | MXP2650537 | 2657173 | MXP2650537W | 2657174 |
| MXPL-4 | 3/4 | 2 1/4 | 5 | - | 3/4 | 4 | Ball | MXP2650538 | 2657175 | MXP2650538W | 2657176 |
| MXPNS-4 | 3/4 | 1 1/8 | 4 | 2 1/2 | 3/4 | 4 | Ball | MXP2650539 | 2657177 | MXP2650539W | 2657178 |
| MXPNM-4 | 3/4 | 1 1/8 | 6 | 3 1/2 | 3/4 | 4 | Ball | MXP2650540 | 2657179 | MXP2650540W | 2657180 |
| MXPNL-4 | 3/4 | 1 1/8 | 6 | 4 1/8 | 3/4 | 4 | Ball | MXP2650541 | 2657181 | MXP2650541W | 2657182 |
| MXPS-4 | 1 | 1 1/4 | 4 | - | 1 | 4 | Ball | MXP2650542 | 2657183 | MXP2650542W | 2657184 |
| MXPM-4 | 1 | 2 1/4 | 5 | - | 1 | 4 | Ball | MXP2650543 | 2657185 | MXP2650543W | 2657186 |
| MXPL-4 | 1 | 3 1/4 | 6 | - | 1 | 4 | Ball | MXP2650544 | 2657187 | MXP2650544W | 2657188 |
| MXPNS-4 | 1 | 1 1/4 | 5 | 2 1/2 | 1 | 4 | Ball | MXP2650545 | 2657189 | MXP2650545W | 2657190 |
| MXPNM-4 | 1 | 1 1/4 | 7 | 3 5/8 | 1 | 4 | Ball | MXP2650546 | 2657191 | MXP2650546W | 2657192 |

Cutting data recommendations on page 104-105

■ = First Choice □ = Second Choice




| | | 5-Flute Ballnose | 5-Flute Ballnose Weldon |
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| P | | ■ | ■ |
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| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ballnose Ident No. | Ballnose SAP No. | Ballnose Weldon Ident No. | Ballnose Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXPS-5 | 1/4 | 3/8 | 2 | - | 1/4 | 5 | Ball | MXP2650710 | 2657193 | MXP2650710W | 2657194 |
| MXPM-5 | 1/4 | 3/4 | 2 1/2 | - | 1/4 | 5 | Ball | MXP2650711 | 2657195 | MXP2650711W | 2657196 |
| MXPNM-5 | 1/4 | 3/8 | 4 | 1 1/8 | 1/4 | 5 | Ball | MXP2650712 | 2657197 | MXP2650712W | 2657198 |
| MXPNL-5 | 1/4 | 3/8 | 4 | 1 5/8 | 1/4 | 5 | Ball | MXP2650713 | 2657199 | MXP2650713W | 2657200 |
| MXPS-5 | 3/8 | 7/8 | 3 | - | 3/8 | 5 | Ball | MXP2650548 | 2657201 | MXP2650548W | 2657202 |
| MXPM-5 | 3/8 | 1 1/4 | 3 | - | 3/8 | 5 | Ball | MXP2650549 | 2657203 | MXP2650549W | 2657204 |
| MXPNM-5 | 3/8 | 1/2 | 4 | 2 1/8 | 3/8 | 5 | Ball | MXP2650550 | 2657205 | MXP2650550W | 2657206 |
| MXPS-5 | 1/2 | 1 1/8 | 3 | - | 1/2 | 5 | Ball | MXP2650552 | 2657207 | MXP2650552W | 2657208 |
| MXPM-5 | 1/2 | 1 5/8 | 4 | - | 1/2 | 5 | Ball | MXP2650553 | 2657209 | MXP2650553W | 2657210 |
| MXPL-5 | 1/2 | 2 1/8 | 4 | - | 1/2 | 5 | Ball | MXP2650600 | 2657211 | MXP2650600W | 2657212 |
| MXPS-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | Ball | MXP2650560 | 2657213 | MXP2650560W | 2657214 |
| MXPM-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | Ball | MXP2650561 | 2657215 | MXP2650561W | 2657216 |
| MXPNM-5 | 3/4 | 1 1/8 | 6 | 3 1/2 | 3/4 | 5 | Ball | MXP2650562 | 2657217 | MXP2650562W | 2657218 |
| MXPS-5 | 1 | 2 1/4 | 5 | - | 1 | 5 | Ball | MXP2650564 | 2657219 | MXP2650564W | 2657220 |
| MXPM-5 | 1 | 3 1/4 | 6 | - | 1 | 5 | Ball | MXP2650565 | 2657221 | MXP2650565W | 2657222 |
| MXPNM-5 | 1 | 3 1/4 | 7 | 3 5/8 | 1 | 5 | Ball | MXP2650566 | 2657223 | MXP2650566W | 2657224 |

Cutting data recommendations on page 106-107

■ = First Choice □ = Second Choice

# TV-7 Series

TV-7 Series 7 flute endmills for high efficiency machining in exotic metals and stainless steel.

**Features and Benefits**

- Optimized for high speed machining techniques with low radial engagement.
- Produce accurate and superior workpiece finishes.
- The unique geometry and large core diameter prevents deflections.
- Industry's largest selection of corner radii and neck and flute lengths in a standard program.
- ENDURASpeed coating features high heat resistance which leads to increased wear resistance and tool life.

**Applications**

- High Efficiency Machining (HEM) profile (7%-10%)
- Finishing

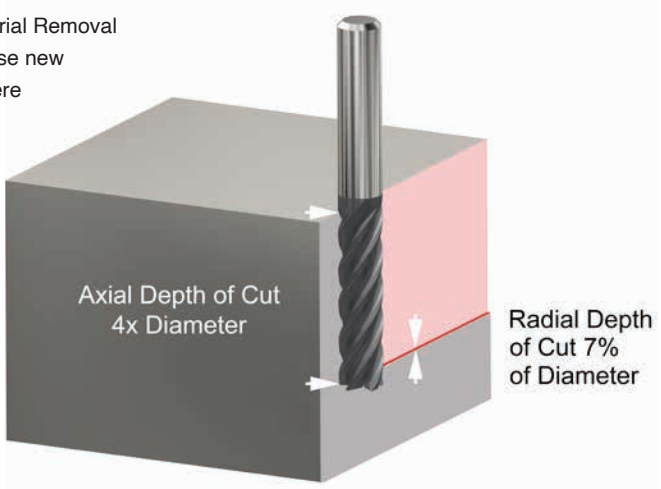
**Usage**

- High-temp Alloys
- Stainless Steel
- Steel
- Cast Iron

Finishing operation in titanium

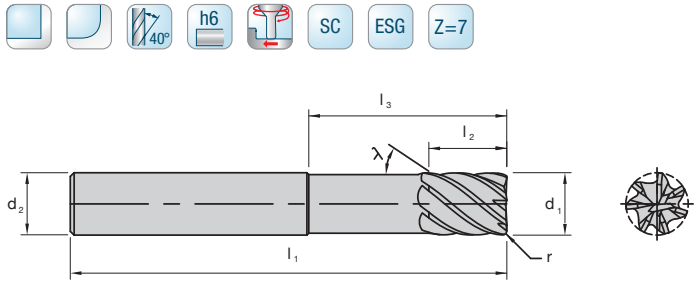
**High Efficiency Machining (HEM) Tech Tips**

HEM tool path strategies offer dramatic improvements in the Material Removal Rate (MRR) and reduced roughing cycle time. Correctly used, these new roughing tool path strategies will reduce overall cycle time anywhere from 20 to 60% on the average.




Below are some elements of what the HEM tool path looks like.

1) Deep Axial Depths. Axial cut depths increase up to 4 times the tool diameter. This distributes the tool wear over the length of the tool.
2) Light Radial Engagement. Using light radial engagements reduces the cutting pressure on the end mill.
3) Increased Flute Count. The light radial engagement allows for a higher flute count on the end mill. This will increase MRR while utilizing a higher core strength to minimize end mill deflection.
4) Higher Spindle Speeds. With only a small percentage that the end mill is engaged in the material, the spindle rpm is increased. This will maintain the necessary heat for proper chip plasticization and preventing built up edge.
5) Higher Feed Rates. The light radial engagement allows the use of chip thinning calculations to help maintain the correct chip load. A 7% radial engagement, typically allows a doubling of the normal feed rate used in slotting.




| | | 7-Flute |
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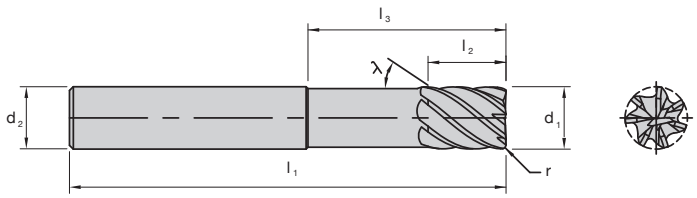
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| TVS-7 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 7 | Square | EMC700051 | 2611932 |
| TVS-7 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 7 | 0.015 | EMC700053 | 2611934 |
| TVS-7 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 7 | 0.030 | EMC700055 | 2611936 |
| TVS-7 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 7 | 0.060 | EMC700057 | 2611938 |
| TVS-7 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 7 | 0.090 | EMC700059 | 2611939 |
| TVS-7 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 7 | 0.120 | EMC700061 | 2611940 |
| TVM-7 | 1/2 | 1 1/4 | 3 | – | 1/2 | 7 | Square | EMC700107 | 2605655 |
| TVM-7 | 1/2 | 1 1/4 | 3 | – | 1/2 | 7 | 0.015 | EMC700109 | 2605656 |
| TVM-7 | 1/2 | 1 1/4 | 3 | – | 1/2 | 7 | 0.030 | EMC700111 | 2605657 |
| TVM-7 | 1/2 | 1 1/4 | 3 | – | 1/2 | 7 | 0.060 | EMC700113 | 2605658 |
| TVM-7 | 1/2 | 1 1/4 | 3 | – | 1/2 | 7 | 0.090 | EMC700115 | 2605659 |
| TVM-7 | 1/2 | 1 1/4 | 3 | – | 1/2 | 7 | 0.120 | EMC700117 | 2605660 |
| TVL-7 | 1/2 | 2 | 4 | – | 1/2 | 7 | Square | EMC700163 | 2611302 |
| TVL-7 | 1/2 | 2 | 4 | – | 1/2 | 7 | 0.015 | EMC700165 | 2611303 |
| TVL-7 | 1/2 | 2 | 4 | – | 1/2 | 7 | 0.030 | EMC700167 | 2611304 |
| TVL-7 | 1/2 | 2 | 4 | – | 1/2 | 7 | 0.060 | EMC700169 | 2611305 |
| TVL-7 | 1/2 | 2 | 4 | – | 1/2 | 7 | 0.090 | EMC700171 | 2611306 |
| TVL-7 | 1/2 | 2 | 4 | – | 1/2 | 7 | 0.120 | EMC700173 | 2611307 |
| TVNS-7 | 1/2 | 5/8 | 5 | 2 1/8 | 1/2 | 7 | Square | EMC700219 | 2611328 |
| TVNS-7 | 1/2 | 5/8 | 5 | 2 1/8 | 1/2 | 7 | 0.015 | EMC700221 | 2611330 |
| TVNS-7 | 1/2 | 5/8 | 5 | 2 1/8 | 1/2 | 7 | 0.030 | EMC700223 | 2611331 |
| TVNS-7 | 1/2 | 5/8 | 5 | 2 1/8 | 1/2 | 7 | 0.060 | EMC700225 | 2611332 |
| TVNS-7 | 1/2 | 5/8 | 5 | 2 1/8 | 1/2 | 7 | 0.090 | EMC700227 | 2611333 |
| TVNS-7 | 1/2 | 5/8 | 5 | 2 1/8 | 1/2 | 7 | 0.120 | EMC700229 | 2611334 |
| TVNM-7 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 7 | Square | EMC700275 | 2611355 |
| TVNM-7 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 7 | 0.015 | EMC700277 | 2611356 |
| TVNM-7 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 7 | 0.030 | EMC700279 | 2611357 |
| TVNM-7 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 7 | 0.060 | EMC700281 | 2611358 |
| TVNM-7 | 1/2 | 5/8 | 5 | 3 1/8 | 1/2 | 7 | 0.120 | EMC700285 | 2611360 |
| TVNL-7 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 7 | Square | EMC700331 | 2611381 |
| TVNL-7 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 7 | 0.015 | EMC700333 | 2611382 |

Cutting data recommendations on page 108

■ = First Choice ☐ = Second Choice




| | 7-Flute |
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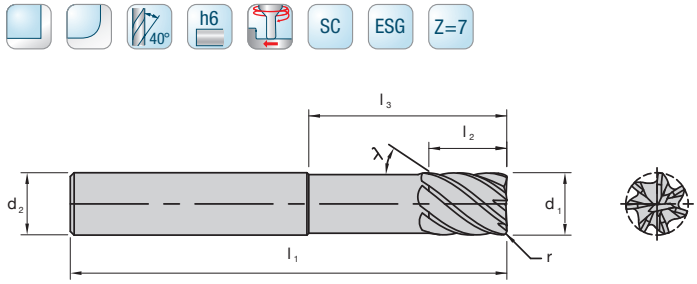
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| TVNL-7 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 7 | 0.030 | EMC700335 | 2611383 |
| TVNL-7 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 7 | 0.060 | EMC700337 | 2611384 |
| TVNL-7 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 7 | 0.090 | EMC700339 | 2611385 |
| TVNL-7 | 1/2 | 5/8 | 6 | 4 1/8 | 1/2 | 7 | 0.120 | EMC700341 | 2611386 |
| TVS-7 | 5/8 | 3/4 | 3 | – | 5/8 | 7 | Square | EMC700065 | 2611942 |
| TVS-7 | 5/8 | 3/4 | 3 | – | 5/8 | 7 | 0.030 | EMC700067 | 2611943 |
| TVS-7 | 5/8 | 3/4 | 3 | – | 5/8 | 7 | 0.060 | EMC700069 | 2611944 |
| TVS-7 | 5/8 | 3/4 | 3 | – | 5/8 | 7 | 0.120 | EMC700073 | 2611946 |
| TVS-7 | 5/8 | 3/4 | 3 | – | 5/8 | 7 | 0.190 | EMC700075 | 2611947 |
| TVM-7 | 5/8 | 1 5/8 | 3 1/2 | – | 5/8 | 7 | Square | EMC700121 | 2605661 |
| TVM-7 | 5/8 | 1 5/8 | 3 1/2 | – | 5/8 | 7 | 0.030 | EMC700123 | 2605662 |
| TVM-7 | 5/8 | 1 5/8 | 3 1/2 | – | 5/8 | 7 | 0.060 | EMC700125 | 2605663 |
| TVM-7 | 5/8 | 1 5/8 | 3 1/2 | – | 5/8 | 7 | 0.120 | EMC700129 | 2605665 |
| TVM-7 | 5/8 | 1 5/8 | 3 1/2 | – | 5/8 | 7 | 0.190 | EMC700131 | 2605666 |
| TVL-7 | 5/8 | 2 1/8 | 4 | – | 5/8 | 7 | Square | EMC700177 | 2611308 |
| TVL-7 | 5/8 | 2 1/8 | 4 | – | 5/8 | 7 | 0.030 | EMC700179 | 2611309 |
| TVL-7 | 5/8 | 2 1/8 | 4 | – | 5/8 | 7 | 0.060 | EMC700181 | 2611310 |
| TVL-7 | 5/8 | 2 1/8 | 4 | – | 5/8 | 7 | 0.120 | EMC700185 | 2611312 |
| TVL-7 | 5/8 | 2 1/8 | 4 | – | 5/8 | 7 | 0.190 | EMC700187 | 2611313 |
| TVS-7 | 3/4 | 1 1/8 | 3 | – | 3/4 | 7 | Square | EMC700079 | 2611948 |
| TVS-7 | 3/4 | 1 1/8 | 3 | – | 3/4 | 7 | 0.030 | EMC700081 | 2611949 |
| TVS-7 | 3/4 | 1 1/8 | 3 | – | 3/4 | 7 | 0.060 | EMC700083 | 2611950 |
| TVS-7 | 3/4 | 1 1/8 | 3 | – | 3/4 | 7 | 0.090 | EMC700085 | 2611951 |
| TVS-7 | 3/4 | 1 1/8 | 3 | – | 3/4 | 7 | 0.120 | EMC700087 | 2611952 |
| TVS-7 | 3/4 | 1 1/8 | 3 | – | 3/4 | 7 | 0.190 | EMC700089 | 2611953 |
| TVS-7 | 3/4 | 1 1/8 | 3 | – | 3/4 | 7 | 0.250 | EMC700091 | 2611954 |
| TVNS-7 | 3/4 | 1 1/8 | 5 | 2 5/8 | 3/4 | 7 | Square | EMC700247 | 2611341 |
| TVNS-7 | 3/4 | 1 1/8 | 5 | 2 5/8 | 3/4 | 7 | .030 | EMC700249 | 2611342 |
| TVNS-7 | 3/4 | 1 1/8 | 5 | 2 5/8 | 3/4 | 7 | 0.060 | EMC700251 | 2611343 |
| TVNS-7 | 3/4 | 1 1/8 | 5 | 2 5/8 | 3/4 | 7 | 0.090 | EMC700253 | 2611344 |
| TVNS-7 | 3/4 | 1 1/8 | 5 | 2 5/8 | 3/4 | 7 | 0.120 | EMC700255 | 2611345 |

Cutting data recommendations on page 108

■ = First Choice ☐ = Second Choice




| | | 7-Flute |
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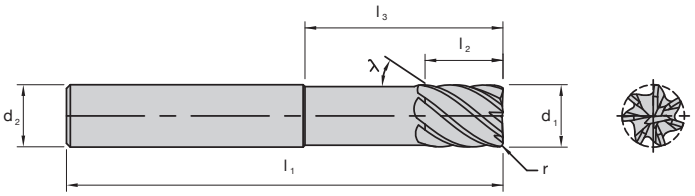
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| TVNS-7 | 3/4 | 1 1/8 | 5 | 2 5/8 | 3/4 | 7 | 0.190 | EMC700257 | 2611346 |
| TVNS-7 | 3/4 | 1 1/8 | 5 | 2 5/8 | 3/4 | 7 | 0.250 | EMC700259 | 2611347 |
| TVNM-7 | 3/4 | 1 1/8 | 5 | 3 1/8 | 3/4 | 7 | Square | EMC700303 | 2611367 |
| TVNM-7 | 3/4 | 1 1/8 | 5 | 3 1/8 | 3/4 | 7 | .030 | EMC700305 | 2611368 |
| TVNM-7 | 3/4 | 1 1/8 | 5 | 3 1/8 | 3/4 | 7 | 0.060 | EMC700307 | 2611369 |
| TVNM-7 | 3/4 | 1 1/8 | 5 | 3 1/8 | 3/4 | 7 | 0.090 | EMC700309 | 2611370 |
| TVNM-7 | 3/4 | 1 1/8 | 5 | 3 1/8 | 3/4 | 7 | 0.120 | EMC700311 | 2611371 |
| TVNM-7 | 3/4 | 1 1/8 | 5 | 3 1/8 | 3/4 | 7 | 0.190 | EMC700313 | 2611372 |
| TVNM-7 | 3/4 | 1 1/8 | 5 | 3 1/8 | 3/4 | 7 | 0.250 | EMC700315 | 2611373 |
| TVNL-7 | 3/4 | 1 1/8 | 6 | 4 1/8 | 3/4 | 7 | Square | EMC700359 | 2611393 |
| TVNL-7 | 3/4 | 1 1/8 | 6 | 4 1/8 | 3/4 | 7 | .030 | EMC700361 | 2611394 |
| TVNL-7 | 3/4 | 1 1/8 | 6 | 4 1/8 | 3/4 | 7 | 0.060 | EMC700363 | 2611395 |
| TVNL-7 | 3/4 | 1 1/8 | 6 | 4 1/8 | 3/4 | 7 | 0.090 | EMC700365 | 2611396 |
| TVNL-7 | 3/4 | 1 1/8 | 6 | 4 1/8 | 3/4 | 7 | 0.120 | EMC700367 | 2611397 |
| TVNL-7 | 3/4 | 1 1/8 | 6 | 4 1/8 | 3/4 | 7 | 0.190 | EMC700369 | 2611398 |
| TVNL-7 | 3/4 | 1 1/8 | 6 | 4 1/8 | 3/4 | 7 | 0.250 | EMC700371 | 2611399 |
| TVM-7 | 3/4 | 1 5/8 | 4 | – | 3/4 | 7 | Square | EMC700135 | 2605667 |
| TVM-7 | 3/4 | 1 5/8 | 4 | – | 3/4 | 7 | .030 | EMC700137 | 2605668 |
| TVM-7 | 3/4 | 1 5/8 | 4 | – | 3/4 | 7 | 0.060 | EMC700139 | 2605669 |
| TVM-7 | 3/4 | 1 5/8 | 4 | – | 3/4 | 7 | 0.090 | EMC700141 | 2605670 |
| TVM-7 | 3/4 | 1 5/8 | 4 | – | 3/4 | 7 | 0.120 | EMC700143 | 2605671 |
| TVM-7 | 3/4 | 1 5/8 | 4 | – | 3/4 | 7 | 0.190 | EMC700145 | 2605672 |
| TVM-7 | 3/4 | 1 5/8 | 4 | – | 3/4 | 7 | 0.250 | EMC700147 | 2605673 |
| TVL-7 | 3/4 | 2 5/8 | 5 | – | 3/4 | 7 | Square | EMC700191 | 2611314 |
| TVL-7 | 3/4 | 2 5/8 | 5 | – | 3/4 | 7 | .030 | EMC700193 | 2611315 |
| TVL-7 | 3/4 | 2 5/8 | 5 | – | 3/4 | 7 | 0.060 | EMC700195 | 2611316 |
| TVL-7 | 3/4 | 2 5/8 | 5 | – | 3/4 | 7 | 0.090 | EMC700197 | 2611317 |
| TVL-7 | 3/4 | 2 5/8 | 5 | – | 3/4 | 7 | 0.120 | EMC700199 | 2611318 |
| TVL-7 | 3/4 | 2 5/8 | 5 | – | 3/4 | 7 | 0.190 | EMC700201 | 2611319 |
| TVL-7 | 3/4 | 2 5/8 | 5 | – | 3/4 | 7 | 0.250 | EMC700203 | 2611320 |
| TVS-7 | 1 | 1 1/4 | 4 | – | 1 | 7 | Square | EMC700093 | 2611955 |

Cutting data recommendations on page 108

■ = First Choice ☐ = Second Choice




| | | 7-Flute |
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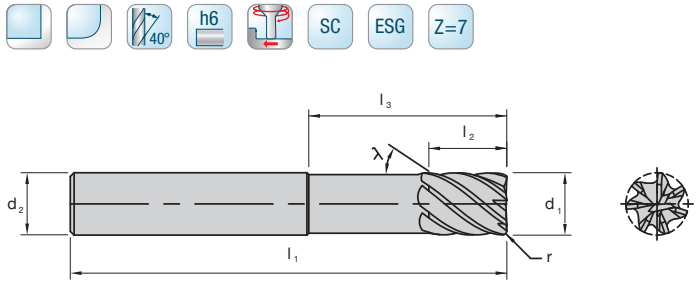
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| TVS-7 | 1 | 1 1/4 | 4 | – | 1 | 7 | 0.030 | EMC700095 | 2611956 |
| TVS-7 | 1 | 1 1/4 | 4 | – | 1 | 7 | 0.060 | EMC700097 | 2611957 |
| TVS-7 | 1 | 1 1/4 | 4 | – | 1 | 7 | 0.120 | EMC700101 | 2611959 |
| TVS-7 | 1 | 1 1/4 | 4 | – | 1 | 7 | 0.190 | EMC700103 | 2611960 |
| TVS-7 | 1 | 1 1/4 | 4 | – | 1 | 7 | 0.250 | EMC700105 | 2611298 |
| TVNS-7 | 1 | 1 1/4 | 5 | 2 5/8 | 1 | 7 | Square | EMC700261 | 2611348 |
| TVNS-7 | 1 | 1 1/4 | 5 | 2 5/8 | 1 | 7 | 0.030 | EMC700263 | 2611349 |
| TVNS-7 | 1 | 1 1/4 | 5 | 2 5/8 | 1 | 7 | 0.060 | EMC700265 | 2611350 |
| TVNS-7 | 1 | 1 1/4 | 5 | 2 5/8 | 1 | 7 | 0.120 | EMC700269 | 2611352 |
| TVNS-7 | 1 | 1 1/4 | 5 | 2 5/8 | 1 | 7 | 0.190 | EMC700271 | 2611353 |
| TVNS-7 | 1 | 1 1/4 | 5 | 2 5/8 | 1 | 7 | 0.250 | EMC700273 | 2611354 |
| TVNM-7 | 1 | 1 1/4 | 5 | 3 1/8 | 1 | 7 | Square | EMC700317 | 2611374 |
| TVNM-7 | 1 | 1 1/4 | 5 | 3 1/8 | 1 | 7 | 0.030 | EMC700319 | 2611375 |
| TVNM-7 | 1 | 1 1/4 | 5 | 3 1/8 | 1 | 7 | 0.060 | EMC700321 | 2611376 |
| TVNM-7 | 1 | 1 1/4 | 5 | 3 1/8 | 1 | 7 | 0.120 | EMC700325 | 2611378 |
| TVNM-7 | 1 | 1 1/4 | 5 | 3 1/8 | 1 | 7 | 0.190 | EMC700327 | 2611379 |
| TVNM-7 | 1 | 1 1/4 | 5 | 3 1/8 | 1 | 7 | 0.250 | EMC700329 | 2611380 |
| TVNL-7 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 7 | Square | EMC700373 | 2611400 |
| TVNL-7 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 7 | 0.030 | EMC700375 | 2611401 |
| TVNL-7 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 7 | 0.060 | EMC700377 | 2611402 |
| TVNL-7 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 7 | 0.120 | EMC700381 | 2611404 |
| TVNL-7 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 7 | 0.190 | EMC700383 | 2611405 |
| TVNL-7 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 7 | 0.250 | EMC700385 | 2611406 |
| TVM-7 | 1 | 2 | 5 | – | 1 | 7 | Square | EMC700149 | 2605674 |
| TVM-7 | 1 | 2 | 5 | – | 1 | 7 | 0.030 | EMC700151 | 2605675 |
| TVM-7 | 1 | 2 | 5 | – | 1 | 7 | 0.060 | EMC700153 | 2605676 |
| TVM-7 | 1 | 2 | 5 | – | 1 | 7 | 0.120 | EMC700157 | 2605678 |
| TVM-7 | 1 | 2 | 5 | – | 1 | 7 | 0.190 | EMC700159 | 2605679 |
| TVM-7 | 1 | 2 | 5 | – | 1 | 7 | 0.250 | EMC700161 | 2605680 |
| TVL-7 | 1 | 3 | 6 | – | 1 | 7 | Square | EMC700205 | 2611321 |
| TVL-7 | 1 | 3 | 6 | – | 1 | 7 | 0.030 | EMC700207 | 2611322 |

Cutting data recommendations on page 108

■ = First Choice ☐ = Second Choice




| | 7-Flute |
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| **P** | ■ |
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| **S** | ■ |
| **H** | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| TVL-7 | 1 | 3 | 6 | – | 1 | 7 | 0.060 | EMC700209 | 2611323 |
| TVL-7 | 1 | 3 | 6 | – | 1 | 7 | 0.120 | EMC700213 | 2611325 |
| TVL-7 | 1 | 3 | 6 | – | 1 | 7 | 0.190 | EMC700215 | 2611326 |
| TVL-7 | 1 | 3 | 6 | – | 1 | 7 | 0.250 | EMC700217 | 2611327 |
| TVNM-7 | 1 | 1 1/4 | 5 | 3 1/8 | 1 | 7 | 0.030 | EMC700319 | 2611375 |
| TVNM-7 | 1 | 1 1/4 | 5 | 3 1/8 | 1 | 7 | 0.060 | EMC700321 | 2611376 |
| TVNM-7 | 1 | 1 1/4 | 5 | 3 1/8 | 1 | 7 | 0.120 | EMC700325 | 2611378 |
| TVNM-7 | 1 | 1 1/4 | 5 | 3 1/8 | 1 | 7 | 0.190 | EMC700327 | 2611379 |
| TVNM-7 | 1 | 1 1/4 | 5 | 3 1/8 | 1 | 7 | 0.250 | EMC700329 | 2611380 |
| TVNL-7 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 7 | Square | EMC700373 | 2611400 |
| TVNL-7 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 7 | 0.030 | EMC700375 | 2611401 |
| TVNL-7 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 7 | 0.060 | EMC700377 | 2611402 |
| TVNL-7 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 7 | 0.120 | EMC700381 | 2611404 |
| TVNL-7 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 7 | 0.190 | EMC700383 | 2611405 |
| TVNL-7 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 7 | 0.250 | EMC700385 | 2611406 |

Cutting data recommendations on page 108

■ = First Choice ☐ = Second Choice

# MXR Series

Superalloy materials possess high mechanical strength, while resisting material deformation under higher heat applications. These materials have proven valuable and highly versatile within the aerospace and energy industries due to their resistance to corrosion under extreme conditions.

Machining superalloys presents many challenges, the reduction of tool life being the most challenging to overcome. LMT Onsrud has developed a line of cutting tools, specifically for nickel-based alloys, that have been proven to increase tool life up to 20% over other tooling options. This allows for longer run times and fewer tool changes, increasing both your in-cut time and productivity.

**Features and Benefits**

- 4 or 5 flute design.
- ENDURASpeed Red Coating formulated for longer tool life in nickel based alloys.
- Square, Corner Radii, Ballnose available.
- Optimized variable helix geometry for unmatched Material Removal Rate (MRR) and work piece finish.
- 4 flute ballnose for optimal contouring.
- Edge conditioning specific for nickel based alloys.

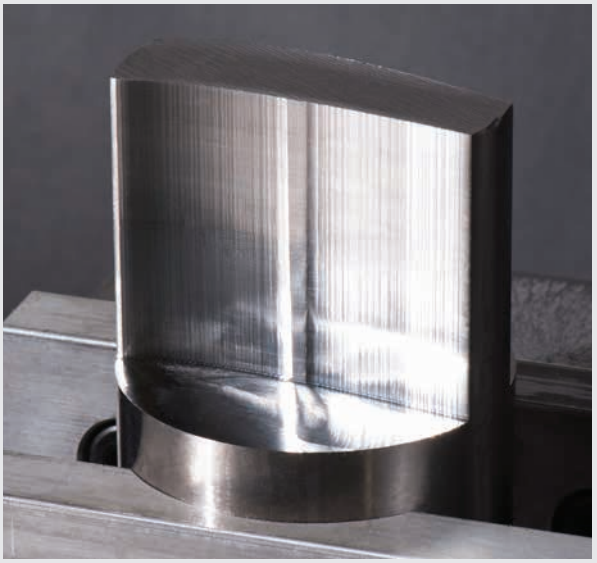
**Applications**

- High Efficiency Machining (HEM) heavy profiling – 15% radial engagement
- High Efficiency Machining (HEM) profile - 8-10%
- Contouring

**Usage**

- Nickel based Alloys
- High-temp Alloys

ENDURASpeed Red coated 4 or 5 flute design for High Efficiency Machining (HEM) heavy profiling.



**Inconel Milling:** High Efficiency Machining (*HEM)

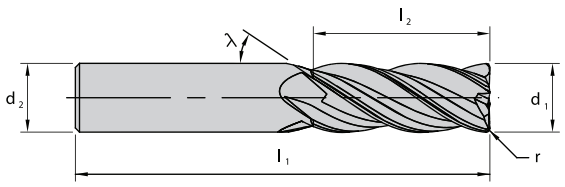
**Tool:**
MXR Series Tool (Ident No. MXR2650167)
Cutting Diameter ($d_1$) = 3/4" No. of Flutes (z) = 5

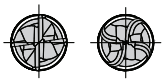
**Cutting Material:** Solid Carbide

**Material:** 718 Inconel

**Cutting Data:**

| | |
|---|---|
| SFM ($v_c$) | = 63.8 |
| RPM (n) | = 4325 |
| Feed ($v_f$) | = 3.25 in/min |
| Chipload ($f_z$) | = .002 in |
| RDoC ($a_e$) | = .060 in |
| ADoC ($a_p$) | = 1.125 in |

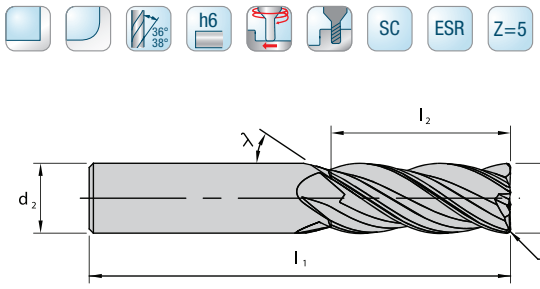



| | | 4-Flute | 4-Flute Ballnose |
|---|---|---|---|
| P | | | |
| M | | | |
| K | | | |
| N | | | |
| S | | ■ | ■ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Ballnose Ident No. | Ballnose SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MXRS-4 | 1/4 | 3/8 | 2 1/2 | - | 1/4 | 4 | Square | MXR2650008 | 2649532 | - | - |
| MXRS-4 | 1/4 | 3/8 | 2 1/2 | - | 1/4 | 4 | 0.015 | MXR2650009 | 2649533 | - | - |
| MXRS-4 | 1/4 | 3/8 | 2 | - | 1/4 | 4 | Ball | - | - | MXR2650500 | 2649563 |
| MXRM-4 | 1/4 | 3/4 | 2 1/2 | - | 1/4 | 4 | Square | MXR2650011 | 2649534 | - | - |
| MXRM-4 | 1/4 | 3/4 | 2 1/2 | - | 1/4 | 4 | 0.015 | MXR2650012 | 2649535 | - | - |
| MXRM-4 | 1/4 | 3/4 | 2 1/2 | - | 1/4 | 4 | Ball | - | - | MXR2650501 | 2649564 |
| MXRS-4 | 3/8 | 1/2 | 2 | - | 3/8 | 4 | Ball | - | - | MXR2650518 | 2649565 |
| MXRM-4 | 3/8 | 7/8 | 3 | - | 3/8 | 4 | Ball | - | - | MXR2650519 | 2649566 |
| MXRS-4 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 4 | Ball | - | - | MXR2650524 | 2649567 |
| MXRM-4 | 1/2 | 1 1/8 | 3 | - | 1/2 | 4 | Ball | - | - | MXR2650525 | 2649568 |
| MXRS-4 | 5/8 | 3/4 | 3 | - | 5/8 | 4 | Ball | - | - | MXR2650530 | 2649569 |
| MXRM-4 | 5/8 | 1 5/8 | 3 1/2 | - | 5/8 | 4 | Ball | - | - | MXR2650531 | 2649570 |
| MXRS-4 | 3/4 | 1 1/8 | 4 | - | 3/4 | 4 | Ball | - | - | MXR2650536 | 2649571 |
| MXRM-4 | 3/4 | 1 5/8 | 4 | - | 3/4 | 4 | Ball | - | - | MXR2650537 | 2649572 |

Cutting data recommendations on page 109

■ = First Choice ☐ = Second Choice




| | 5-Flute |
|---|---|
| **P** | |
| **M** | |
| **K** | |
| **N** | |
| **S** | ■ |
| **H** | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| MXRS-5 | 3/8 | 1/2 | 2-1/2 | - | 3/8 | 5 | Square | MXR2650567 | 2649536 |
| MXRS-5 | 3/8 | 1/2 | 2-1/2 | - | 3/8 | 5 | 0.015 | MXR2650568 | 2649537 |
| MXRS-5 | 3/8 | 1/2 | 2-1/2 | - | 3/8 | 5 | 0.030 | MXR2650569 | 2649538 |
| MXRM-5 | 3/8 | 7/8 | 2-1/2 | - | 3/8 | 5 | Square | MXR2650573 | 2649539 |
| MXRM-5 | 3/8 | 7/8 | 2-1/2 | - | 3/8 | 5 | 0.015 | MXR2650574 | 2649540 |
| MXRM-5 | 3/8 | 7/8 | 2-1/2 | - | 3/8 | 5 | 0.030 | MXR2650575 | 2649541 |
| MXRS-5 | 1/2 | 5/8 | 2-1/2 | - | 1/2 | 5 | Square | MXR2650031 | 2649542 |
| MXRS-5 | 1/2 | 5/8 | 2-1/2 | - | 1/2 | 5 | 0.015 | MXR2650032 | 2649543 |
| MXRS-5 | 1/2 | 5/8 | 2-1/2 | - | 1/2 | 5 | 0.030 | MXR2650033 | 2649544 |
| MXRM-5 | 1/2 | 1-1/4 | 3 | - | 1/2 | 5 | Square | MXR2650037 | 2649545 |
| MXRM-5 | 1/2 | 1-1/4 | 3 | - | 1/2 | 5 | 0.015 | MXR2650038 | 2649546 |
| MXRM-5 | 1/2 | 1-1/4 | 3 | - | 1/2 | 5 | 0.030 | MXR2650039 | 2649547 |
| MXRS-5 | 5/8 | 3/4 | 3 | - | 5/8 | 5 | Square | MXR2650601 | 2649548 |
| MXRS-5 | 5/8 | 3/4 | 3 | - | 5/8 | 5 | 0.030 | MXR2650602 | 2649549 |
| MXRS-5 | 5/8 | 3/4 | 3 | - | 5/8 | 5 | 0.060 | MXR2650603 | 2649550 |
| MXRM-5 | 5/8 | 1-3/8 | 3-1/2 | - | 5/8 | 5 | Square | MXR2650607 | 2649551 |
| MXRM-5 | 5/8 | 1-3/8 | 3-1/2 | - | 5/8 | 5 | 0.030 | MXR2650608 | 2649552 |
| MXRM-5 | 5/8 | 1-3/8 | 3-1/2 | - | 5/8 | 5 | 0.060 | MXR2650609 | 2649553 |
| MXRS-5 | 3/4 | 1-1/8 | 3 | - | 3/4 | 5 | Square | MXR2650054 | 2649554 |
| MXRS-5 | 3/4 | 1-1/8 | 3 | - | 3/4 | 5 | 0.030 | MXR2650055 | 2649555 |
| MXRS-5 | 3/4 | 1-1/8 | 3 | - | 3/4 | 5 | 0.060 | MXR2650056 | 2649556 |
| MXRM-5 | 3/4 | 1-1/2 | 4 | - | 3/4 | 5 | Square | MXR2650150 | 2649557 |
| MXRM-5 | 3/4 | 1-1/2 | 4 | - | 3/4 | 5 | 0.030 | MXR2650151 | 2649558 |
| MXRM-5 | 3/4 | 1-1/2 | 4 | - | 3/4 | 5 | 0.060 | MXR2650152 | 2649559 |
| MXRL-5 | 3/4 | 2-1/4 | 5 | - | 3/4 | 5 | Square | MXR2650102 | 2649560 |
| MXRL-5 | 3/4 | 2-1/4 | 5 | - | 3/4 | 5 | 0.030 | MXR2650103 | 2649561 |
| MXRL-5 | 3/4 | 2-1/4 | 5 | - | 3/4 | 5 | 0.060 | MXR2650167 | 2649562 |

Cutting data recommendations on page 109

■ = First Choice ☐ = Second Choice

# HXR Series

In nickel-based alloys, maximizing a tools capability by using the entire cut length is important to increasing tool life and reducing production costs. In high efficiency machining (HEM), focus is made on maintaining the proper chip load throughout the cut. This is achieved through the variation of feed rate and tool engagement. HXR end mills have been engineered for high efficiency machining (HEM) of superalloy materials. Configured in 7, 9, or 11 flute designs, these tools allow for lower radial engagement and faster machining, leading to higher material removal rates and optimal part finish.

**Features and Benefits**

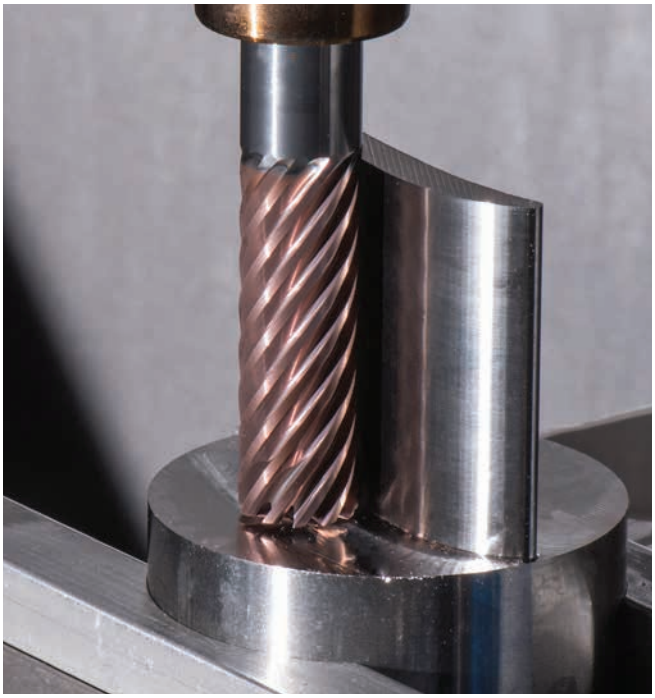
- 7, 9, or 11 flute cutting options.
- Enhanced part finish.
- Faster material removal.
- Chipbreaker design enhances chip removal in longer lengths.
- ENDURASpeed Red Coating formulated for longer tool life in nickel based alloys.

**Applications**

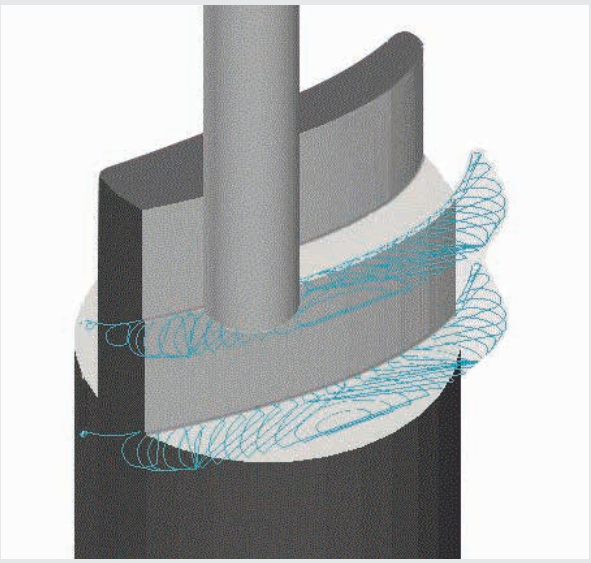
- High Efficiency Machining (HEM) profiling
- Finishing

**Usage**

- Nickel based Alloys
- High-temp Alloys



Achieve faster material removal rates while attaining improved part finish.



**Inconel Milling:** Finishing Pass

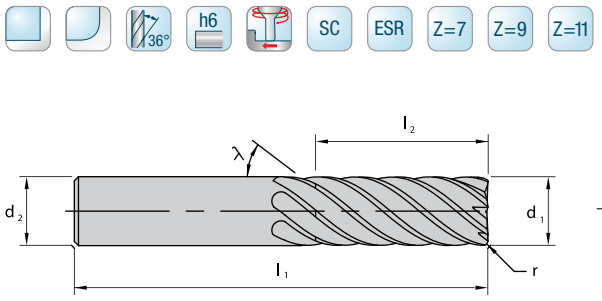
**Tool:**
HXR Tool Series (Ident No. HXR2650030)
Cutting Diameter ($d_1$) = 3/4" No. of Flutes (z) = 11

**Cutting Material:** Solid Carbide

**Material:** 718 Inconel

**Cutting Data:**

| | |
|---|---|
| SFM ($v_c$) | = 72.8 |
| RPM (n) | = 371 |
| Feed ($v_f$) | = 3.7 in/min |
| Chipload ($f_z$) | = .0009 in |
| RDoC ($a_e$) | = .0225 in |
| ADoC ($a_p$) | = 2.25 in |




| | | Non Chipbreaker | Chipbreaker |
|---|---|---|---|
| P | | | |
| M | | | |
| K | | | |
| N | | | |
| S | | ■ | ■ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Chipbreaker Ident No. | Chibreaker SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HXRS-7 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 7 | Square | HXR2650000 | 2649730 | - | - |
| HXRS-7 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 7 | 0.015 | HXR2650001 | 2649731 | - | - |
| HXRM-7 | 3/8 | 7/8 | 2 1/2 | - | 3/8 | 7 | Square | HXR2650002 | 2649732 | - | - |
| HXRM-7 | 3/8 | 7/8 | 2 1/2 | - | 3/8 | 7 | 0.015 | HXR2650003 | 2649733 | - | - |
| HXRL-7 | 3/8 | 1 1/4 | 3 | - | 3/8 | 7 | Square | HXR2650004 | 2649734 | HXR2650005 | 2649735 |
| HXRL-7 | 3/8 | 1 1/4 | 3 | - | 3/8 | 7 | 0.015 | HXR2650006 | 2649736 | HXR2650007 | 2649737 |
| HXRS-9 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 9 | Square | HXR2650008 | 2649738 | - | - |
| HXRS-9 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 9 | 0.030 | HXR2650009 | 2649739 | - | - |
| HXRM-9 | 1/2 | 1 1/4 | 3 | - | 1/2 | 9 | Square | HXR2650010 | 2649740 | - | - |
| HXRM-9 | 1/2 | 1 1/4 | 3 | - | 1/2 | 9 | 0.030 | HXR2650011 | 2649741 | - | - |
| HXRL-9 | 1/2 | 1 5/8 | 4 | - | 1/2 | 9 | Square | HXR2650012 | 2649742 | HXR2650013 | 2649743 |
| HXRL-9 | 1/2 | 1 5/8 | 4 | - | 1/2 | 9 | 0.030 | HXR2650014 | 2649744 | HXR2650015 | 2649745 |
| HXRS-9 | 5/8 | 3/4 | 3 | - | 5/8 | 9 | Square | HXR2650016 | 2649746 | - | - |
| HXRS-9 | 5/8 | 3/4 | 3 | - | 5/8 | 9 | 0.030 | HXR2650017 | 2649747 | - | - |
| HXRM-9 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 9 | Square | HXR2650018 | 2649748 | - | - |
| HXRM-9 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 9 | 0.030 | HXR2650019 | 2649749 | - | - |
| HXRL-9 | 5/8 | 2 1/4 | 5 | - | 5/8 | 9 | Square | HXR2650020 | 2649750 | HXR2650021 | 2649751 |
| HXRL-9 | 5/8 | 2 1/4 | 5 | - | 5/8 | 9 | 0.030 | HXR2650022 | 2649752 | HXR2650023 | 2649753 |
| HXRS-11 | 3/4 | 1 1/8 | 3 | - | 3/4 | 11 | Square | HXR2650024 | 2649754 | - | - |
| HXRS-11 | 3/4 | 1 1/8 | 3 | - | 3/4 | 11 | 0.030 | HXR2650025 | 2649755 | - | - |
| HXRM-11 | 3/4 | 1 5/8 | 4 | - | 3/4 | 11 | Square | HXR2650026 | 2649756 | - | - |
| HXRM-11 | 3/4 | 1 5/8 | 4 | - | 3/4 | 11 | 0.030 | HXR2650027 | 2649757 | - | - |
| HXRL-11 | 3/4 | 2 1/4 | 5 | - | 3/4 | 11 | Square | HXR2650028 | 2649758 | HXR2650029 | 2649759 |
| HXRL-11 | 3/4 | 2 1/4 | 5 | - | 3/4 | 11 | 0.030 | HXR2650030 | 2649760 | HXR2650031 | 2649761 |

Cutting data recommendations on page 109

■ = First Choice ☐ = Second Choice

# RXR Series

Machining nickel-based alloys poses many challenges. RXR series of endmills answers the challenges of tool life and reduces tool pressure.

**Features and Benefits**

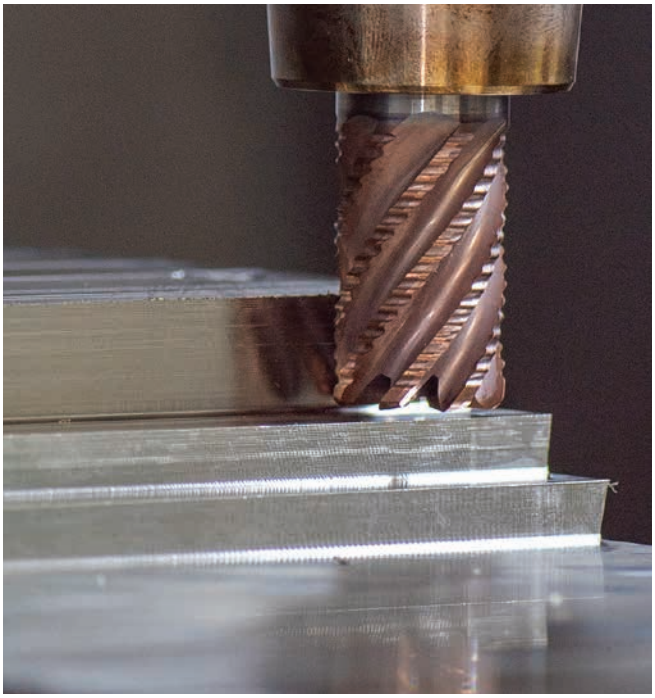
- 7 flute variable indexed geometry for unmatched material removal rates
- Fine pitch OD rougher pattern allows for reduced pressure on the cutting edge
- ENDURASpeed red coating formulated for longer tool life in nickel-based alloys

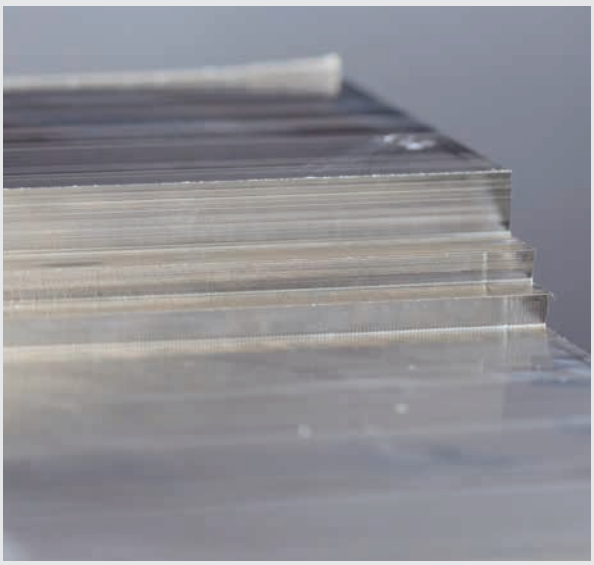
**Applications**

- Roughing

**Usage**

- Inconel
- Nickel-based alloys





**Inconel Milling:** Heavy Profile

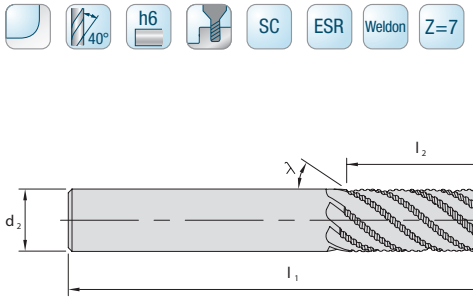
**Tool:**
RXR Tool Series (Ident No. RXR2652258)
Cutting Diameter ($d_1$) = 3/4" No. of Flutes (z) = 7

**Cutting Material:** Solid Carbide

**Material:** 718 Inconel

**Cutting Data:**

| | |
|---|---|
| SFM ($v_c$) | = 100 |
| RPM (n) | = 509 |
| Feed ($v_f$) | = 11 in/min |
| Chipload ($f_z$) | = .0035 in |
| RDoC ($a_e$) | = .060 in |
| ADoC ($a_p$) | = 1in |




| | | 7-Flute | 7-Flute Weldon |
|---|---|---|---|
| P | | | |
| M | | | |
| K | | | |
| N | | | |
| S | | ■ | ■ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. | Weldon Ident No. | Weldon SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RXRS-7 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 7 | 0.030 | RXR2652254 | 2652254 | RXR2652254W | 2652276 |
| RXRS-7 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 7 | 0.060 | RXR2652255 | 2652255 | RXR2652255W | 2652277 |
| RXRM-7 | 1/2 | 1 1/4 | 3 | - | 1/2 | 7 | 0.030 | RXR2652256 | 2652256 | RXR2652256W | 2652278 |
| RXRM-7 | 1/2 | 1 1/4 | 3 | - | 1/2 | 7 | 0.060 | RXR2652257 | 2652257 | RXR2652257W | 2652279 |
| RXRL-7 | 1/2 | 1 5/8 | 4 | - | 1/2 | 7 | 0.030 | RXR2652258 | 2652258 | RXR2652258W | 2652280 |
| RXRL-7 | 1/2 | 1 5/8 | 4 | - | 1/2 | 7 | 0.060 | RXR2652259 | 2652259 | RXR2652259W | 2652281 |
| RXRS-7 | 5/8 | 3/4 | 3 | - | 5/8 | 7 | 0.030 | RXR2652260 | 2652260 | RXR2652260W | 2652282 |
| RXRS-7 | 5/8 | 3/4 | 3 | - | 5/8 | 7 | 0.060 | RXR2652261 | 2652261 | RXR2652261W | 2652283 |
| RXRM-7 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 7 | 0.030 | RXR2652262 | 2652262 | RXR2652262W | 2652284 |
| RXRM-7 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 7 | 0.060 | RXR2652263 | 2652263 | RXR2652263W | 2652285 |
| RXRL-7 | 5/8 | 2 1/4 | 4 | - | 5/8 | 7 | 0.030 | RXR2652264 | 2652264 | RXR2652264W | 2652286 |
| RXRL-7 | 5/8 | 2 1/4 | 4 | - | 5/8 | 7 | 0.060 | RXR2652265 | 2652265 | RXR2652265W | 2652287 |
| RXRS-7 | 3/4 | 1 1/8 | 3 | - | 3/4 | 7 | 0.030 | RXR2652266 | 2652266 | RXR2652266W | 2652288 |
| RXRS-7 | 3/4 | 1 1/8 | 3 | - | 3/4 | 7 | 0.060 | RXR2652267 | 2652267 | RXR2652267W | 2652289 |
| RXRM-7 | 3/4 | 1 5/8 | 4 | - | 3/4 | 7 | 0.030 | RXR2652268 | 2652268 | RXR2652268W | 2652290 |
| RXRM-7 | 3/4 | 1 5/8 | 4 | - | 3/4 | 7 | 0.060 | RXR2652269 | 2652269 | RXR2652269W | 2652291 |
| RXRL-7 | 3/4 | 2 1/4 | 5 | - | 3/4 | 7 | 0.030 | RXR2652270 | 2652270 | RXR2652270W | 2652292 |
| RXRL-7 | 3/4 | 2 1/4 | 5 | - | 3/4 | 7 | 0.060 | RXR2652271 | 2652271 | RXR2652271W | 2652293 |
| RXRS-7 | 1 | 1 1/4 | 4 | - | 1 | 7 | 0.030 | RXR2652272 | 2652272 | RXR2652272W | 2652294 |
| RXRS-7 | 1 | 1 1/4 | 4 | - | 1 | 7 | 0.060 | RXR2652273 | 2652273 | RXR2652273W | 2652295 |
| RXRM-7 | 1 | 2 1/4 | 5 | - | 1 | 7 | 0.030 | RXR2652274 | 2652274 | RXR2652274W | 2652296 |
| RXRM-7 | 1 | 2 1/4 | 5 | - | 1 | 7 | 0.060 | RXR2652275 | 2652275 | RXR2652275W | 2652297 |

Cutting data recommendations on page 110

■ = First Choice ☐ = Second Choice

# TXR Series

The TRX end mill range has been developed from the ground up specifically for titanium. All features from substrate to geometry and coating were evaluated and fine-tuned.

**Optimum Cutting Performance**

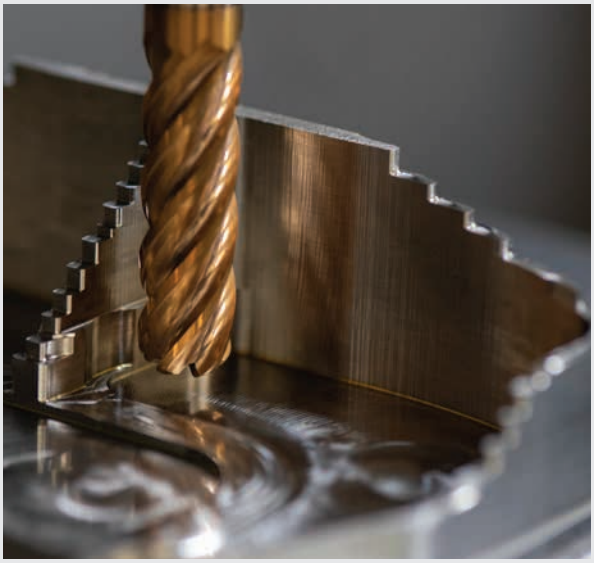
- Unequal flute spacing, and modified helix angles provide ideal harmonic dampening for smooth cutting characteristics.
- Highly controlled micro geometry with a special edge preparation ensures consistent performance.
- A new nanocomposite “X” coating formulated with excellent wear resistant qualities for titanium.

**Applications - 5 Flute**

- Roughing
- Heavy Profiling – 20% radial engagement
- HEM Profiling – 7% radial engagement
- Applications in ISO-S titanium alloys

**Applications - 7 Flute**

- HEM Profiling – 7-10% radial engagement
- Finishing operations
- Applications in ISO-S titanium alloys



**Titanium Milling:** Heavy Profile

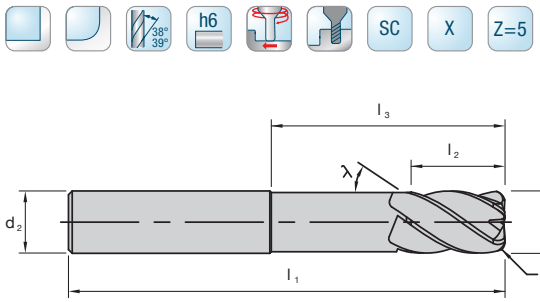
**Tool:**
TRX (Ident No. TRX2650602)
Cutting Diameter (d1) = 5/8” No. of Flutes (z) =5

**Cutting Material:** Solid Carbide

**Material:** 6Al-4V Titanium

**Cutting Data:**

| | |
|---|---|
| SFM ($v_c$) | = 230 |
| RPM (n) | = 1,400 |
| Feed ($v_f$) | = 22 in/min |
| Chipload ($f_z$) | = .0031 in |
| RDoC ($a_e$) | = .100 - .125 in |
| ADoC ($a_p$) | = .500 in |

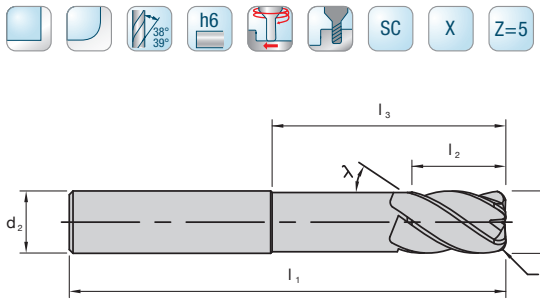



| | 5-Flute |
|---|---|
| **P** | □ |
| **M** | □ |
| **K** | □ |
| **N** | |
| **S** | ■ |
| **H** | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| TRXS-5 | 1/4 | 3/8 | 2 | - | 1/4 | 5 | Square | TRX2652101 | 2652101 |
| TRXS-5 | 1/4 | 3/8 | 2 | - | 1/4 | 5 | 0.015 | TRX2652102 | 2652102 |
| TRXM-5 | 1/4 | 3/4 | 2 1/2 | - | 1/4 | 5 | Square | TRX2652103 | 2652103 |
| TRXM-5 | 1/4 | 3/4 | 2 1/2 | - | 1/4 | 5 | 0.015 | TRX2652104 | 2652104 |
| TRXL-5 | 1/4 | 1 1/8 | 3 | - | 1/4 | 5 | Square | TRX2652105 | 2652105 |
| TRXL-5 | 1/4 | 1 1/8 | 3 | - | 1/4 | 5 | 0.015 | TRX2652106 | 2652106 |
| TRXS-5 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 5 | Square | TRX2650567 | 2652107 |
| TRXS-5 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 5 | 0.015 | TRX2650568 | 2652108 |
| TRXS-5 | 3/8 | 1/2 | 2 1/2 | - | 3/8 | 5 | 0.030 | TRX2650569 | 2652109 |
| TRXM-5 | 3/8 | 7/8 | 2 1/2 | - | 3/8 | 5 | Square | TRX2650573 | 2652110 |
| TRXM-5 | 3/8 | 7/8 | 2 1/2 | - | 3/8 | 5 | 0.015 | TRX2650574 | 2652111 |
| TRXM-5 | 3/8 | 7/8 | 2 1/2 | - | 3/8 | 5 | 0.030 | TRX2650575 | 2652112 |
| TRXL-5 | 3/8 | 1 1/4 | 3 | - | 3/8 | 5 | Square | TRX2650579 | 2652113 |
| TRXL-5 | 3/8 | 1 1/4 | 3 | - | 3/8 | 5 | 0.015 | TRX2650580 | 2652114 |
| TRXL-5 | 3/8 | 1 1/4 | 3 | - | 3/8 | 5 | 0.030 | TRX2650581 | 2652115 |
| TRXS-5 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 5 | Square | TRX2650031 | 2652116 |
| TRXS-5 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 5 | 0.015 | TRX2650032 | 2652117 |
| TRXS-5 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 5 | 0.030 | TRX2650033 | 2652118 |
| TRXS-5 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 5 | 0.060 | TRX2650118 | 2652119 |
| TRXS-5 | 1/2 | 5/8 | 2 1/2 | - | 1/2 | 5 | 0.120 | TRX2650120 | 2652120 |
| TRXM-5 | 1/2 | 1 1/4 | 3 | - | 1/2 | 5 | Square | TRX2650037 | 2652121 |
| TRXM-5 | 1/2 | 1 1/4 | 3 | - | 1/2 | 5 | 0.015 | TRX2650038 | 2652122 |
| TRXM-5 | 1/2 | 1 1/4 | 3 | - | 1/2 | 5 | 0.030 | TRX2650039 | 2652123 |
| TRXM-5 | 1/2 | 1 1/4 | 3 | - | 1/2 | 5 | 0.060 | TRX2650126 | 2652124 |
| TRXM-5 | 1/2 | 1 1/4 | 3 | - | 1/2 | 5 | 0.120 | TRX2650128 | 2652125 |
| TRXL-5 | 1/2 | 1 5/8 | 4 | - | 1/2 | 5 | Square | TRX2650591 | 2652126 |
| TRXL-5 | 1/2 | 1 5/8 | 4 | - | 1/2 | 5 | 0.015 | TRX2650592 | 2652127 |
| TRXL-5 | 1/2 | 1 5/8 | 4 | - | 1/2 | 5 | 0.030 | TRX2650593 | 2652128 |
| TRXL-5 | 1/2 | 1 5/8 | 4 | - | 1/2 | 5 | 0.060 | TRX2650594 | 2652129 |
| TRXL-5 | 1/2 | 1 5/8 | 4 | - | 1/2 | 5 | 0.120 | TRX2652130 | 2652130 |

Cutting data recommendations on page 110

■ = First Choice □ = Second Choice

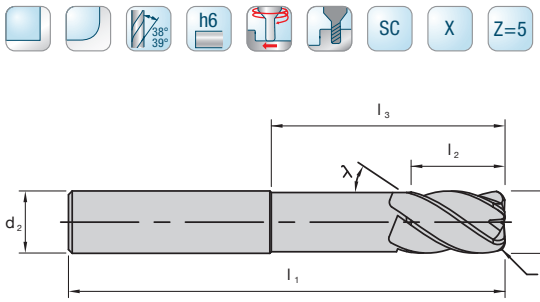



| | 5-Flute |
|---|---|
| P | □ |
| M | □ |
| K | □ |
| N | |
| S | ■ |
| H | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| TRXXL-5 | 1/2 | 2 1/8 | 4 | - | 1/2 | 5 | Square | TRX2650596 | 2652131 |
| TRXXL-5 | 1/2 | 2 1/8 | 4 | - | 1/2 | 5 | 0.015 | TRX2650597 | 2652132 |
| TRXXL-5 | 1/2 | 2 1/8 | 4 | - | 1/2 | 5 | 0.030 | TRX2650598 | 2652133 |
| TRXXL-5 | 1/2 | 2 1/8 | 4 | - | 1/2 | 5 | 0.060 | TRX2650599 | 2652134 |
| TRXXL-5 | 1/2 | 2 1/8 | 4 | - | 1/2 | 5 | 0.120 | TRX2652135 | 2652135 |
| TRXNS-5 | 1/2 | 5/8 | 4 | - | 1/2 | 5 | Square | TRX2650043 | 2652136 |
| TRXNS-5 | 1/2 | 5/8 | 4 | - | 1/2 | 5 | 0.030 | TRX2650044 | 2652137 |
| TRXNS-5 | 1/2 | 5/8 | 4 | - | 1/2 | 5 | 0.060 | TRX2650045 | 2652138 |
| TRXNS-5 | 1/2 | 5/8 | 4 | - | 1/2 | 5 | 0.120 | TRX2650134 | 2652139 |
| TRXS-5 | 5/8 | 3/4 | 3 | - | 5/8 | 5 | Square | TRX2650601 | 2652140 |
| TRXS-5 | 5/8 | 3/4 | 3 | - | 5/8 | 5 | 0.030 | TRX2650602 | 2652141 |
| TRXS-5 | 5/8 | 3/4 | 3 | - | 5/8 | 5 | 0.060 | TRX2650603 | 2652142 |
| TRXS-5 | 5/8 | 3/4 | 3 | - | 5/8 | 5 | 0.120 | TRX2650605 | 2652143 |
| TRXM-5 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 5 | Square | TRX2650607 | 2652144 |
| TRXM-5 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 5 | 0.030 | TRX2650608 | 2652145 |
| TRXM-5 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 5 | 0.060 | TRX2650609 | 2652146 |
| TRXM-5 | 5/8 | 1 3/8 | 3 1/2 | - | 5/8 | 5 | 0.120 | TRX2650611 | 2652147 |
| TRXL-5 | 5/8 | 1 5/8 | 3 1/2 | - | 5/8 | 5 | Square | TRX2650613 | 2652148 |
| TRXL-5 | 5/8 | 1 5/8 | 3 1/2 | - | 5/8 | 5 | 0.030 | TRX2650614 | 2652149 |
| TRXL-5 | 5/8 | 1 5/8 | 3 1/2 | - | 5/8 | 5 | 0.060 | TRX2650615 | 2652150 |
| TRXXL-5 | 5/8 | 2 1/4 | 4 | - | 5/8 | 5 | Square | TRX2650616 | 2652151 |
| TRXXL-5 | 5/8 | 2 1/4 | 4 | - | 5/8 | 5 | 0.030 | TRX2650617 | 2652152 |
| TRXXL-5 | 5/8 | 2 1/4 | 4 | - | 5/8 | 5 | 0.060 | TRX2650618 | 2652153 |
| TRXS-5 | 3/4 | 1 1/8 | 3 | - | 3/4 | 5 | Square | TRX2650054 | 2652154 |
| TRXS-5 | 3/4 | 1 1/8 | 3 | - | 3/4 | 5 | 0.030 | TRX2650055 | 2652155 |
| TRXS-5 | 3/4 | 1 1/8 | 3 | - | 3/4 | 5 | 0.060 | TRX2650056 | 2652156 |
| TRXS-5 | 3/4 | 1 1/8 | 3 | - | 3/4 | 5 | 0.090 | TRX2650147 | 2652157 |
| TRXS-5 | 3/4 | 1 1/8 | 3 | - | 3/4 | 5 | 0.120 | TRX2650057 | 2652158 |
| TRXS-5 | 3/4 | 1 1/8 | 3 | - | 3/4 | 5 | 0.250 | TRX2650149 | 2652159 |
| TRXM-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | Square | TRX2650063 | 2652160 |

Cutting data recommendations on page 110

■ = First Choice □ = Second Choice




| | 5-Flute |
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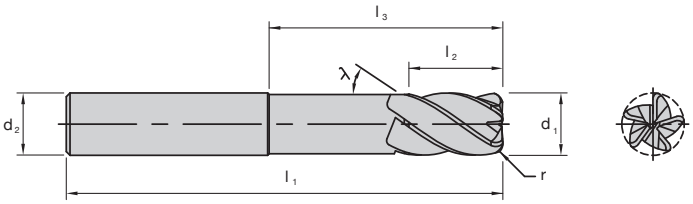
| **P** | □ |
| **M** | □ |
| **K** | □ |
| **N** | |
| **S** | ■ |
| **H** | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| TRXM-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | 0.030 | TRX2650064 | 2652161 |
| TRXM-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | 0.060 | TRX2650065 | 2652162 |
| TRXM-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | 0.090 | TRX2650159 | 2652163 |
| TRXM-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | 0.120 | TRX2650066 | 2652164 |
| TRXM-5 | 3/4 | 1 5/8 | 4 | - | 3/4 | 5 | 0.250 | TRX2650161 | 2652165 |
| TRXL-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | Square | TRX2650102 | 2652166 |
| TRXL-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | 0.030 | TRX2650103 | 2652167 |
| TRXL-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | 0.060 | TRX2650167 | 2652168 |
| TRXL-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | 0.090 | TRX2650168 | 2652169 |
| TRXL-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | 0.120 | TRX2650169 | 2652170 |
| TRXL-5 | 3/4 | 2 1/4 | 5 | - | 3/4 | 5 | 0.250 | TRX2650171 | 2652171 |
| TRXXL-5 | 3/4 | 3 1/8 | 5 | - | 3/4 | 5 | Square | TRX2650619 | 2652172 |
| TRXXL-5 | 3/4 | 3 1/8 | 5 | - | 3/4 | 5 | 0.030 | TRX2650620 | 2652173 |
| TRXXL-5 | 3/4 | 3 1/8 | 5 | - | 3/4 | 5 | 0.060 | TRX2650621 | 2652174 |
| TRXNS-5 | 3/4 | 1 1/8 | 5 | 2 5/8 | 3/4 | 5 | Square | TRX2652175 | 2652175 |
| TRXNS-5 | 3/4 | 1 1/8 | 5 | 2 5/8 | 3/4 | 5 | 0.030 | TRX2652176 | 2652176 |
| TRXNS-5 | 3/4 | 1 1/8 | 5 | 2 5/8 | 3/4 | 5 | 0.060 | TRX2652177 | 2652177 |
| TRXNS-5 | 3/4 | 1 1/8 | 5 | 2 5/8 | 3/4 | 5 | 0.090 | TRX2652178 | 2652178 |
| TRXNS-5 | 3/4 | 1 1/8 | 5 | 2 5/8 | 3/4 | 5 | 0.120 | TRX2652179 | 2652179 |
| TRXNS-5 | 3/4 | 1 1/8 | 5 | 2 5/8 | 3/4 | 5 | 0.190 | TRX2652180 | 2652180 |
| TRXS-5 | 1 | 1 1/4 | 4 | - | 1 | 5 | Square | TRX2650193 | 2652181 |
| TRXS-5 | 1 | 1 1/4 | 4 | - | 1 | 5 | 0.030 | TRX2650081 | 2652182 |
| TRXS-5 | 1 | 1 1/4 | 4 | - | 1 | 5 | 0.060 | TRX2650194 | 2652183 |
| TRXS-5 | 1 | 1 1/4 | 4 | - | 1 | 5 | 0.090 | TRX2650195 | 2652184 |
| TRXM-5 | 1 | 1 5/8 | 4 | - | 1 | 5 | Square | TRX2652185 | 2652185 |
| TRXM-5 | 1 | 1 5/8 | 4 | - | 1 | 5 | 0.030 | TRX2652186 | 2652186 |
| TRXM-5 | 1 | 1 5/8 | 4 | - | 1 | 5 | 0.060 | TRX2652187 | 2652187 |
| TRXM-5 | 1 | 1 5/8 | 4 | - | 1 | 5 | 0.090 | TRX2652188 | 2652188 |
| TRXL-5 | 1 | 2 1/8 | 5 | - | 1 | 5 | Square | TRX2650205 | 2652189 |
| TRXL-5 | 1 | 2 1/8 | 5 | - | 1 | 5 | 0.030 | TRX2650090 | 2652190 |

Cutting data recommendations on page 110

■ = First Choice □ = Second Choice


| | 5-Flute |
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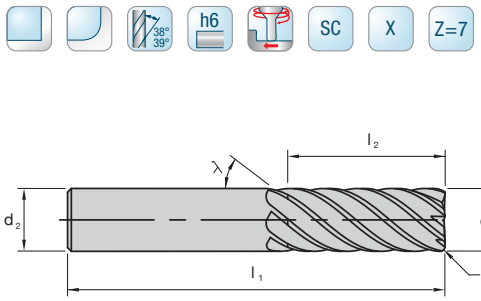
| **P** | □ |
| **M** | □ |
| **K** | □ |
| **N** | |
| **S** | ■ |
| **H** | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|
| TRXL-5 | 1 | 2 1/8 | 5 | - | 1 | 5 | 0.060 | TRX2650206 | 2652191 |
| TRXL-5 | 1 | 2 1/8 | 5 | - | 1 | 5 | 0.090 | TRX2650207 | 2652192 |
| TRXXL-5 | 1 | 3 1/8 | 6 | - | 1 | 5 | Square | TRX2650623 | 2652193 |
| TRXXL-5 | 1 | 3 1/8 | 6 | - | 1 | 5 | 0.030 | TRX2650624 | 2652194 |
| TRXXL-5 | 1 | 3 1/8 | 6 | - | 1 | 5 | 0.060 | TRX2650625 | 2652195 |
| TRXNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | Square | TRX2650208 | 2652196 |
| TRXNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | 0.030 | TRX2650209 | 2652197 |
| TRXNM-5 | 1 | 1 1/4 | 6 | 3 1/8 | 1 | 5 | 0.060 | TRX2650094 | 2652198 |
| TRXNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | Square | TRX2650212 | 2652199 |
| TRXNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | 0.030 | TRX2650213 | 2652200 |
| TRXNL-5 | 1 | 1 1/4 | 7 | 4 1/8 | 1 | 5 | 0.060 | TRX2650097 | 2652201 |

Cutting data recommendations on page 110

■ = First Choice □ = Second Choice

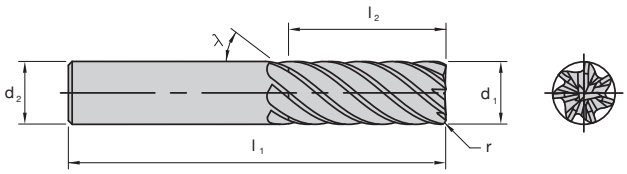



| | 7-Flute | 7-Flute Chip Splitter |
|---|---|---|
| **P** | □ | □ |
| **M** | □ | □ |
| **K** | □ | □ |
| **N** | | |
| **S** | ■ | ■ |
| **H** | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | Ident SAP No. | Chip Splitter Ident No. | Chip Splitter SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TRXM-7 | 3/8 | 7/8 | 3 | – | 3/8 | 7 | Square | TRX700021 | 2653617 | TRX700022 | 2653723 |
| TRXM-7 | 3/8 | 7/8 | 3 | – | 3/8 | 7 | 0.015 | TRX700023 | 2653618 | TRX700024 | 2653724 |
| TRXM-7 | 3/8 | 7/8 | 3 | – | 3/8 | 7 | 0.020 | TRX700025 | 2653619 | TRX700026 | 2653725 |
| TRXM-7 | 3/8 | 7/8 | 3 | – | 3/8 | 7 | 0.030 | TRX700027 | 2653620 | TRX700028 | 2653726 |
| TRXM-7 | 3/8 | 7/8 | 3 | – | 3/8 | 7 | 0.040 | TRX700029 | 2653621 | TRX700030 | 2653727 |
| TRXL-7 | 3/8 | 1 1/4 | 3 | – | 3/8 | 7 | Square | TRX700031 | 2653622 | TRX700032 | 2653728 |
| TRXL-7 | 3/8 | 1 1/4 | 3 | – | 3/8 | 7 | 0.015 | TRX700033 | 2653623 | TRX700034 | 2653729 |
| TRXL-7 | 3/8 | 1 1/4 | 3 | – | 3/8 | 7 | 0.030 | TRX700035 | 2653624 | TRX700036 | 2653730 |
| TRXS-7 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 7 | Square | TRX700051 | 2653625 | – | – |
| TRXS-7 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 7 | 0.020 | TRX700401 | 2653626 | – | – |
| TRXS-7 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 7 | 0.030 | TRX700055 | 2653627 | – | – |
| TRXS-7 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 7 | 0.040 | TRX700403 | 2653628 | – | – |
| TRXS-7 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 7 | 0.060 | TRX700057 | 2653629 | – | – |
| TRXS-7 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 7 | 0.090 | TRX700059 | 2653630 | – | – |
| TRXS-7 | 1/2 | 5/8 | 2 1/2 | – | 1/2 | 7 | 0.120 | TRX700061 | 2653631 | – | – |
| TRXM-7 | 1/2 | 1 1/4 | 3 | – | 1/2 | 7 | Square | TRX700107 | 2653632 | TRX700108 | 2653731 |
| TRXM-7 | 1/2 | 1 1/4 | 3 | – | 1/2 | 7 | 0.030 | TRX700111 | 2653633 | TRX700112 | 2653732 |
| TRXM-7 | 1/2 | 1 1/4 | 3 | – | 1/2 | 7 | 0.060 | TRX700113 | 2653634 | – | – |
| TRXM-7 | 1/2 | 1 1/4 | 3 | – | 1/2 | 7 | 0.090 | TRX700115 | 2653635 | – | – |
| TRXM-7 | 1/2 | 1 1/4 | 3 | – | 1/2 | 7 | 0.120 | TRX700117 | 2653636 | – | – |
| TRXXL-7 | 1/2 | 2 1/8 | 4 | – | 1/2 | 7 | Square | TRX700163 | 2653637 | TRX700164 | 2653733 |
| TRXXL-7 | 1/2 | 2 1/8 | 4 | – | 1/2 | 7 | 0.030 | TRX700167 | 2653638 | TRX700168 | 2653734 |
| TRXXL-7 | 1/2 | 2 1/8 | 4 | – | 1/2 | 7 | 0.060 | TRX700169 | 2653639 | – | – |
| TRXXL-7 | 1/2 | 2 1/8 | 4 | – | 1/2 | 7 | 0.090 | TRX700171 | 2653640 | – | – |
| TRXXL-7 | 1/2 | 2 1/8 | 4 | – | 1/2 | 7 | 0.120 | TRX700173 | 2653641 | – | – |
| TRXNM-7 | 1/2 | 1 1/4 | 5 | 3 1/8 | 1/2 | 7 | Square | TRX700405 | 2653642 | TRX700406 | 2653735 |
| TRXNM-7 | 1/2 | 1 1/4 | 5 | 3 1/8 | 1/2 | 7 | 0.030 | TRX700407 | 2653643 | TRX700408 | 2653736 |
| TRXNM-7 | 1/2 | 1 1/4 | 5 | 3 1/8 | 1/2 | 7 | 0.060 | TRX700409 | 2653644 | – | – |
| TRXNM-7 | 1/2 | 1 1/4 | 5 | 3 1/8 | 1/2 | 7 | 0.120 | TRX700411 | 2653645 | – | – |
| TRXNL-7 | 1/2 | 1 1/4 | 6 | 4 1/8 | 1/2 | 7 | Square | TRX700413 | 2653646 | TRX700414 | 2653737 |

Cutting data recommendations on page 110

■ = First Choice □ = Second Choice

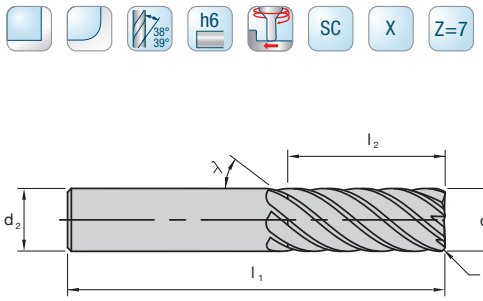




| | | 7-Flute | 7-Flute Chip Splitter |
|---|---|---|---|
| P | | □ | □ |
| M | | □ | □ |
| K | | □ | □ |
| N | | | |
| S | | ■ | ■ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | Ident SAP No. | Chip Splitter Ident No. | Chip Splitter SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TRXNL-7 | 1/2 | 1 1/4 | 6 | 4 1/8 | 1/2 | 7 | 0.030 | TRX700415 | 2653647 | TRX700416 | 2653738 |
| TRXNL-7 | 1/2 | 1 1/4 | 6 | 4 1/8 | 1/2 | 7 | 0.060 | TRX700417 | 2653648 | – | – |
| TRXNL-7 | 1/2 | 1 1/4 | 6 | 4 1/8 | 1/2 | 7 | 0.090 | TRX700419 | 2653649 | – | – |
| TRXNL-7 | 1/2 | 1 1/4 | 6 | 4 1/8 | 1/2 | 7 | 0.120 | TRX700421 | 2653650 | – | – |
| TRXM-7 | 5/8 | 1 1/4 | 3 1/2 | – | 5/8 | 7 | Square | TRX700423 | 2653651 | TRX700424 | 2653739 |
| TRXM-7 | 5/8 | 1 1/4 | 3 1/2 | – | 5/8 | 7 | 0.030 | TRX700425 | 2653652 | TRX700426 | 2653740 |
| TRXM-7 | 5/8 | 1 1/4 | 3 1/2 | – | 5/8 | 7 | 0.060 | TRX700427 | 2653653 | TRX700428 | 2653741 |
| TRXM-7 | 5/8 | 1 1/4 | 3 1/2 | – | 5/8 | 7 | 0.120 | TRX700429 | 2653654 | – | – |
| TRXL-7 | 5/8 | 1 3/4 | 4 | – | 5/8 | 7 | Square | TRX700431 | 2653655 | TRX700432 | 2653742 |
| TRXL-7 | 5/8 | 1 3/4 | 4 | – | 5/8 | 7 | 0.030 | TRX700433 | 2653656 | TRX700434 | 2653743 |
| TRXL-7 | 5/8 | 1 3/4 | 4 | – | 5/8 | 7 | 0.060 | TRX700435 | 2653657 | TRX700436 | 2653744 |
| TRXL-7 | 5/8 | 1 3/4 | 4 | – | 5/8 | 7 | 0.120 | TRX700437 | 2653658 | – | – |
| TRXXL-7 | 5/8 | 2 1/4 | 5 | – | 5/8 | 7 | Square | TRX700177 | 2653659 | TRX700178 | 2653745 |
| TRXXL-7 | 5/8 | 2 1/4 | 5 | – | 5/8 | 7 | 0.030 | TRX700179 | 2653660 | TRX700180 | 2653746 |
| TRXXL-7 | 5/8 | 2 1/4 | 5 | – | 5/8 | 7 | 0.060 | TRX700181 | 2653661 | TRX700182 | 2653747 |
| TRXXL-7 | 5/8 | 2 1/4 | 5 | – | 5/8 | 7 | 0.120 | TRX700185 | 2653662 | – | – |
| TRXNM-7 | 5/8 | 1 5/8 | 5 | 3 1/8 | 5/8 | 7 | Square | TRX700439 | 2653663 | TRX700440 | 2653748 |
| TRXNM-7 | 5/8 | 1 5/8 | 5 | 3 1/8 | 5/8 | 7 | 0.030 | TRX700441 | 2653664 | TRX700442 | 2653749 |
| TRXNM-7 | 5/8 | 1 5/8 | 5 | 3 1/8 | 5/8 | 7 | 0.060 | TRX700443 | 2653665 | TRX700444 | 2653750 |
| TRXNM-7 | 5/8 | 1 5/8 | 5 | 3 1/8 | 5/8 | 7 | 0.090 | TRX700445 | 2653666 | – | – |
| TRXNM-7 | 5/8 | 1 5/8 | 5 | 3 1/8 | 5/8 | 7 | 0.120 | TRX700447 | 2653667 | – | – |
| TRXS-7 | 3/4 | 1 1/4 | 4 | – | 3/4 | 7 | Square | TRX700079 | 2653668 | – | – |
| TRXS-7 | 3/4 | 1 1/4 | 4 | – | 3/4 | 7 | 0.030 | TRX700081 | 2653669 | – | – |
| TRXS-7 | 3/4 | 1 1/4 | 4 | – | 3/4 | 7 | 0.060 | TRX700083 | 2653670 | – | – |
| TRXS-7 | 3/4 | 1 1/4 | 4 | – | 3/4 | 7 | 0.090 | TRX700085 | 2653671 | – | – |
| TRXS-7 | 3/4 | 1 1/4 | 4 | – | 3/4 | 7 | 0.120 | TRX700087 | 2653672 | – | – |
| TRXS-7 | 3/4 | 1 1/4 | 4 | – | 3/4 | 7 | 0.250 | TRX700091 | 2653673 | – | – |
| TRXM-7 | 3/4 | 1 3/4 | 4 | – | 3/4 | 7 | Square | TRX700135 | 2653674 | TRX700136 | 2653751 |
| TRXM-7 | 3/4 | 1 3/4 | 4 | – | 3/4 | 7 | 0.030 | TRX700137 | 2653675 | TRX700138 | 2653752 |
| TRXM-7 | 3/4 | 1 3/4 | 4 | – | 3/4 | 7 | 0.060 | TRX700139 | 2653676 | TRX700140 | 2653753 |

Cutting data recommendations on page 110

■ = First Choice □ = Second Choice

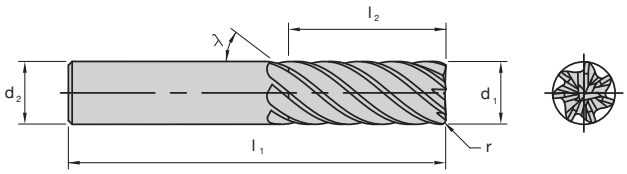



| | | 7-Flute | 7-Flute Chip Splitter |
|---|---|---|---|
| P | | □ | □ |
| M | | □ | □ |
| K | | □ | □ |
| N | | | |
| S | | ■ | ■ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | Ident SAP No. | Chip Splitter Ident No. | Chip Splitter SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TRXM-7 | 3/4 | 1 3/4 | 4 | – | 3/4 | 7 | 0.090 | TRX700141 | 2653677 | – | – |
| TRXM-7 | 3/4 | 1 3/4 | 4 | – | 3/4 | 7 | 0.120 | TRX700145 | 2653678 | – | – |
| TRXM-7 | 3/4 | 1 3/4 | 4 | – | 3/4 | 7 | 0.250 | TRX700147 | 2653679 | – | – |
| TRXL-7 | 3/4 | 2 5/8 | 5 | – | 3/4 | 7 | Square | TRX700191 | 2653680 | TRX700192 | 2653754 |
| TRXL-7 | 3/4 | 2 5/8 | 5 | – | 3/4 | 7 | 0.030 | TRX700193 | 2653681 | TRX700194 | 2653755 |
| TRXL-7 | 3/4 | 2 5/8 | 5 | – | 3/4 | 7 | 0.060 | TRX700195 | 2653682 | TRX700196 | 2653756 |
| TRXL-7 | 3/4 | 2 5/8 | 5 | – | 3/4 | 7 | 0.090 | TRX700197 | 2653683 | – | – |
| TRXL-7 | 3/4 | 2 5/8 | 5 | – | 3/4 | 7 | 0.120 | TRX700199 | 2653684 | – | – |
| TRXL-7 | 3/4 | 2 5/8 | 5 | – | 3/4 | 7 | 0.250 | TRX700203 | 2653685 | – | – |
| TRXNM-7 | 3/4 | 1 5/8 | 5 | 3 1/8 | 3/4 | 7 | Square | TRX700449 | 2653686 | – | – |
| TRXNM-7 | 3/4 | 1 5/8 | 5 | 3 1/8 | 3/4 | 7 | 0.030 | TRX700451 | 2653687 | – | – |
| TRXNM-7 | 3/4 | 1 5/8 | 5 | 3 1/8 | 3/4 | 7 | 0.060 | TRX700453 | 2653688 | – | – |
| TRXNM-7 | 3/4 | 1 5/8 | 5 | 3 1/8 | 3/4 | 7 | 0.090 | TRX700455 | 2653689 | – | – |
| TRXNM-7 | 3/4 | 1 5/8 | 5 | 3 1/8 | 3/4 | 7 | 0.120 | TRX700457 | 2653690 | – | – |
| TRXNM-7 | 3/4 | 1 5/8 | 5 | 3 1/8 | 3/4 | 7 | 0.250 | TRX700459 | 2653691 | – | – |
| TRXNL-7 | 3/4 | 1 5/8 | 6 | 4 1/8 | 3/4 | 7 | Square | TRX700461 | 2653692 | – | – |
| TRXNL-7 | 3/4 | 1 5/8 | 6 | 4 1/8 | 3/4 | 7 | 0.030 | TRX700463 | 2653693 | – | – |
| TRXNL-7 | 3/4 | 1 5/8 | 6 | 4 1/8 | 3/4 | 7 | 0.060 | TRX700465 | 2653694 | – | – |
| TRXNL-7 | 3/4 | 1 5/8 | 6 | 4 1/8 | 3/4 | 7 | 0.090 | TRX700467 | 2653695 | – | – |
| TRXNL-7 | 3/4 | 1 5/8 | 6 | 4 1/8 | 3/4 | 7 | 0.120 | TRX700469 | 2653696 | – | – |
| TRXNL-7 | 3/4 | 1 5/8 | 6 | 4 1/8 | 3/4 | 7 | 0.250 | TRX700471 | 2653697 | – | – |
| TRXS-7 | 1 | 1 3/8 | 4 | – | 1 | 7 | Square | TRX700093 | 2653698 | – | – |
| TRXS-7 | 1 | 1 3/8 | 4 | – | 1 | 7 | 0.030 | TRX700095 | 2653699 | – | – |
| TRXS-7 | 1 | 1 3/8 | 4 | – | 1 | 7 | 0.060 | TRX700097 | 2653700 | – | – |
| TRXS-7 | 1 | 1 3/8 | 4 | – | 1 | 7 | 0.120 | TRX700101 | 2653701 | – | – |
| TRXS-7 | 1 | 1 3/8 | 4 | – | 1 | 7 | 0.250 | TRX700105 | 2653702 | – | – |
| TRXL-7 | 1 | 2 3/8 | 5 | – | 1 | 7 | Square | TRX700473 | 2653703 | – | – |
| TRXL-7 | 1 | 2 3/8 | 5 | – | 1 | 7 | 0.030 | TRX700475 | 2653704 | – | – |
| TRXL-7 | 1 | 2 3/8 | 5 | – | 1 | 7 | 0.060 | TRX700477 | 2653705 | – | – |
| TRXL-7 | 1 | 2 3/8 | 5 | – | 1 | 7 | 0.120 | TRX700479 | 2653706 | – | – |

Cutting data recommendations on page 110

■ = First Choice □ = Second Choice


| | | 7-Flute | 7-Flute Chip Splitter |
|---|---|---|---|
| P | | □ | □ |
| M | | □ | □ |
| K | | □ | □ |
| N | | | |
| S | | ■ | ■ |
| H | | | |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Ident No. | Ident SAP No. | Chip Splitter Ident No. | Chip Splitter SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TRXL-7 | 1 | 2 3/8 | 5 | – | 1 | 7 | 0.250 | TRX700481 | 2653707 | – | – |
| TRXXL-7 | 1 | 3 3/8 | 6 | – | 1 | 7 | Square | TRX700483 | 2653708 | – | – |
| TRXXL-7 | 1 | 3 3/8 | 6 | – | 1 | 7 | 0.030 | TRX700485 | 2653709 | – | – |
| TRXXL-7 | 1 | 3 3/8 | 6 | – | 1 | 7 | 0.060 | TRX700487 | 2653710 | – | – |
| TRXXL-7 | 1 | 3 3/8 | 6 | – | 1 | 7 | 0.120 | TRX700489 | 2653711 | – | – |
| TRXXL-7 | 1 | 3 3/8 | 6 | – | 1 | 7 | 0.250 | TRX700491 | 2653712 | – | – |
| TRXNM-7 | 1 | 2 | 5 | 3 1/8 | 1 | 7 | Square | TRX700493 | 2653713 | – | – |
| TRXNM-7 | 1 | 2 | 5 | 3 1/8 | 1 | 7 | 0.030 | TRX700495 | 2653714 | – | – |
| TRXNM-7 | 1 | 2 | 5 | 3 1/8 | 1 | 7 | 0.060 | TRX700497 | 2653715 | – | – |
| TRXNM-7 | 1 | 2 | 5 | 3 1/8 | 1 | 7 | 0.120 | TRX700499 | 2653716 | – | – |
| TRXNM-7 | 1 | 2 | 5 | 3 1/8 | 1 | 7 | 0.250 | TRX700501 | 2653717 | – | – |
| TRXNL-7 | 1 | 2 | 7 | 4 1/8 | 1 | 7 | Square | TRX700503 | 2653718 | – | – |
| TRXNL-7 | 1 | 2 | 7 | 4 1/8 | 1 | 7 | 0.030 | TRX700505 | 2653719 | – | – |
| TRXNL-7 | 1 | 2 | 7 | 4 1/8 | 1 | 7 | 0.060 | TRX700507 | 2653720 | – | – |
| TRXNL-7 | 1 | 2 | 7 | 4 1/8 | 1 | 7 | 0.120 | TRX700509 | 2653721 | – | – |
| TRXNL-7 | 1 | 2 | 7 | 4 1/8 | 1 | 7 | 0.250 | TRX700511 | 2653722 | – | – |

Cutting data recommendations on page 110

■ = First Choice □ = Second Choice

# Radial Milling Cutter (RMC) Series

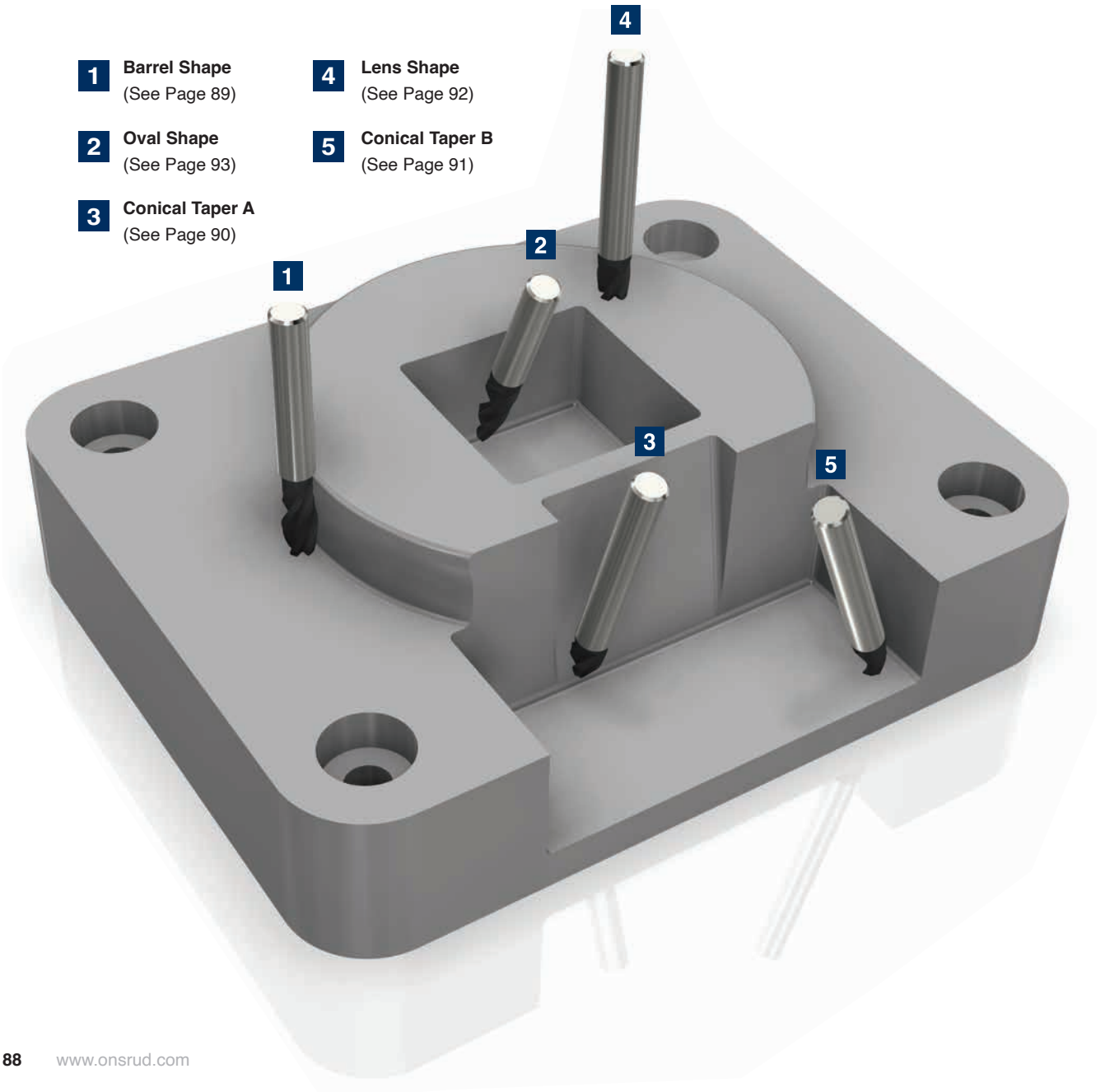
## The Perfect Solution

### Reduced Cycle Times. Increased Surface Quality.

A new breed of cutting tools powered by the latest in CAM technology is ready to take on some of the toughest challenges in the machining of complex parts.

LMT Onsrud's Radial Milling Cutter family, with their large radii profiles, emulate ballnose tooling on an entirely different scale. The large radii increases your step over distance between tool paths. This enables more efficient strategies in blade machining, mold making, and the production of thin-walled aerostructures.

To take full advantage of this concept, a 5-axis machining center and a CAM system capable of supporting the tool path strategies is required.



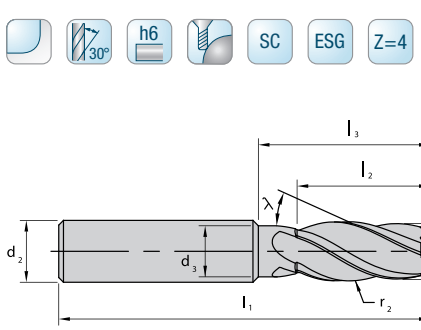

**1** **Barrel Shape** (See Page 89)

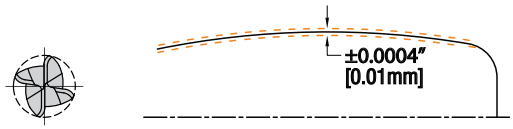
**2** **Oval Shape** (See Page 93)

**3** **Conical Taper A** (See Page 90)

**4** **Lens Shape** (See Page 92)

**5** **Conical Taper B** (See Page 91)

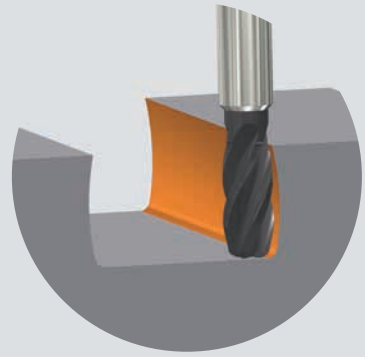



| | | 4-Flute |
|---|---|---|
| P | | ■ |
| M | | ■ |
| K | | ■ |
| N | | ■ |
| S | | ■ |
| H | | ■ |

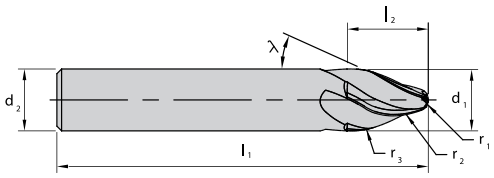
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Neck Diameter $d_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius r | Barrel Radius $r_3$ | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RMC-B | 3/8 | 7/8 | 3 | 1 1/8 | 0.278 | 3/8 | 4 | 0.080 | 2.000 | RMC2647625 | 2647625 |
| RMC-B | 1/2 | 1 | 3 | 1 3/8 | 0.399 | 1/2 | 4 | 0.080 | 2.500 | RMC2647626 | 2647626 |
| **Metric** | | | | | | | | | | | |
| RMC-B | 10 | 21 | 73 | 30 | 8 | 10 | 4 | 1 | 60 | RMC2647642 | 2647642 |

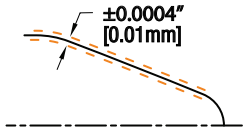
The Barrel Shape has a continuous radius along the length of cut and a reduced neck.



Cutting data recommendations on page 111

■ = First Choice ☐ = Second Choice

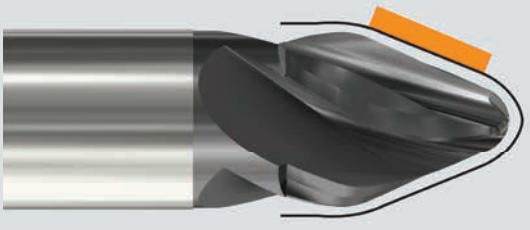




| | 4-Flute |
|---|---|
| P | ■ |
| M | ■ |
| K | ■ |
| N | ■ |
| S | ■ |
| H | ■ |

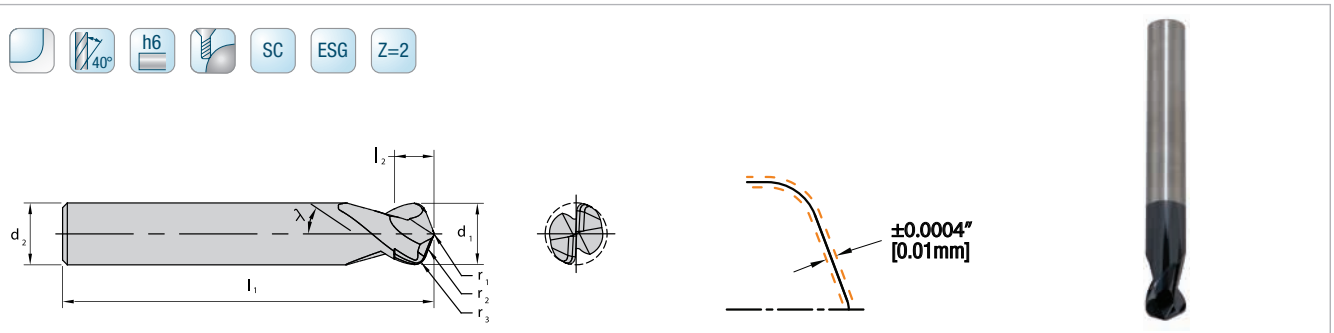
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Neck Diameter $d_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius $r_1$ | Corner Radius $r_2$ | Corner Radius $r_3$ | Tilt Angle | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RMC-CTA | 1/4 | 0.425 | 2 1/2 | - | - | 1/4 | 4 | 0.040 | 10 | 0.120 | 12.5° | RMC2647631 | 2647631 |
| RMC-CTA | 5/8 | 1 1/4 | 4 | - | - | 5/8 | 4 | 0.080 | 40 | 0.190 | 12.5° | RMC2647632 | 2647632 |
| RMC-CTA | 5/16 | .0450 | 3 | - | - | 5/16 | 4 | 0.060 | 10 | 0.150 | 17.5° | RMC2647633 | 2647633 |
| RMC-CTA | 3/8 | 0.475 | 3 | - | - | 3/8 | 4 | 0.080 | 10 | 0.190 | 20° | RMC2647634 | 2647634 |
| RMC-CTA | 1/2 | 1/2 | 3 | - | - | 1/2 | 4 | 0.120 | 10 | 0.250 | 20° | RMC2647635 | 2647635 |
| RMC-CTA | 5/8 | 5/8 | 4 | - | - | 5/8 | 4 | 0.160 | 60 | 0.250 | 20° | RMC2647636 | 2647636 |
| **Metric** | | | | | | | | | | | | | |
| RMC-CTA | 16 | 24 | 109 | - | - | 16 | 4 | 4 | 1000 | 5 | 12.5° | RMC2647646 | 2647646 |
| RMC-CTA | 6 | 9.5 | 64 | - | - | 6 | 4 | 1 | 250 | 3 | 17.5° | RMC2647647 | 2647647 |
| RMC-CTA | 10 | 12.5 | 80 | - | - | 10 | 4 | 2 | 250 | 5 | 20° | RMC2647648 | 2647648 |
| RMC-CTA | 12 | 22 | 88 | - | - | 12 | 4 | 3 | 250 | 6 | 20° | RMC2647649 | 2647649 |

The Conical Taper Form A is a side cutting end mill with a mutiple radii blend for milling steep walls with a tilt angle <45°.



Cutting data recommendations on page 111

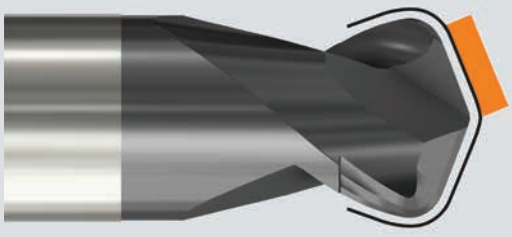
■ = First Choice ☐ = Second Choice

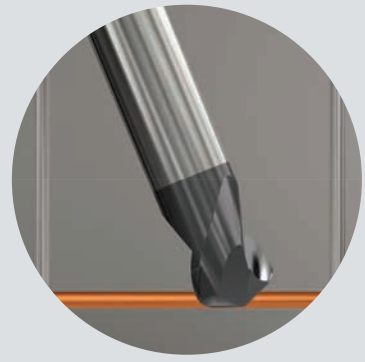



| | 2-Flute |
|---|---|
| P | ■ |
| M | ■ |
| K | ■ |
| N | ■ |
| S | ■ |
| H | ■ |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Neck Diameter $d_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius $r_1$ | Corner Radius $r_2$ | Corner Radius $r_3$ | Tilt Angle | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RMC-CTB | 3/8 | 1/4 | 3 | - | - | 3/8 | 2 | 0.040 | 8 | 0.060 | 70° | RMC2647637 | 2647637 |
| **Metric** | | | | | | | | | | | | | |
| RMC-CTB | 10 | 6 | 81 | - | - | 10 | 2 | 1 | 200 | 2 | 70° | RMC2647650 | 2648216 |

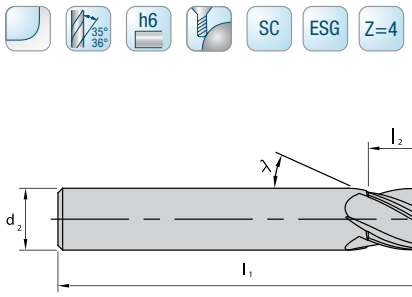
The Conical Taper Form B has an end cutting geometry for tilt angles >45° for semi-finishing and finishing workpiece floors.

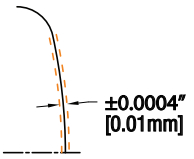




Cutting data recommendations on page 111

■ = First Choice ☐ = Second Choice

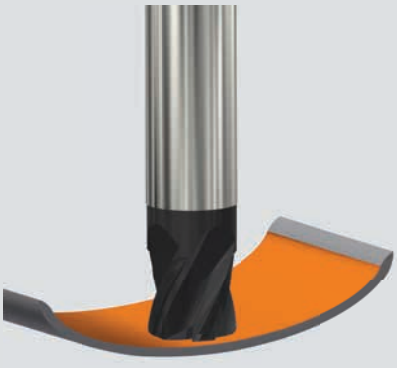



| | 2-Flute |
|---|---|
| P | ■ |
| M | ■ |
| K | ■ |
| N | ■ |
| S | ■ |
| H | ■ |

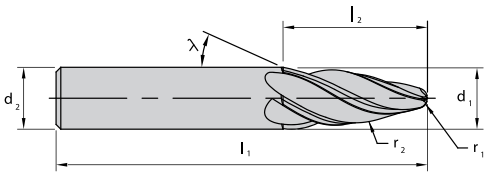
| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Neck Diameter $d_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius $r_1$ | Lens Radius $r_2$ | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RMC-L | 0.1575 | 1/4 | 2 1/2 | 3/4 | 0.1575 | 1/4 | 4 | 0.010 | 0.250 | RMC2647638 | 2647638 |
| RMC-L | 5/16 | 5/16 | 2 1/2 | - | - | 5/16 | 4 | 0.030 | 0.600 | RMC2647639 | 2647639 |
| RMC-L | 3/8 | 3/8 | 3 | - | - | 3/8 | 4 | 0.040 | 0.800 | RMC2647640 | 2647640 |
| RMC-L | 1/2 | 1/2 | 3 | - | - | 1/2 | 4 | 0.050 | 1.000 | RMC2647641 | 2647641 |
| **Metric** | | | | | | | | | | | |
| RMC-L | 16 | 16 | 100 | - | - | 16 | 4 | 2 | 30 | RMC2647651 | 2648217 |

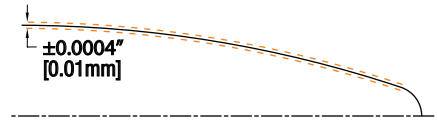
The Lens Shape Radial Milling Cutter utilizes a convex face cutting geometry which is useful for contoured floor finishing.



Cutting data recommendations on page 111

■ = First Choice ☐ = Second Choice


| | | 4-Flute |
|---|---|---|
| P | | ■ |
| M | | ■ |
| K | | ■ |
| N | | ■ |
| S | | ■ |
| H | | ■ |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Neck Length $l_3$ | Neck Diameter $d_3$ | Shank Diameter $d_2$ | Flutes z | Corner Radius $r_1$ | Oval Radius $r_2$ | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RMC-O | 1/4 | 0.830 | 2 1/2 | - | - | 1/4 | 4 | 0.040 | 3.750 | RMC2647627 | 2647627 |
| RMC-O | 3/8 | 0.915 | 3 | - | - | 3/8 | 4 | 0.080 | 3.375 | RMC2647628 | 2647628 |
| RMC-O | 1/2 | 1.100 | 3 | - | - | 1/2 | 4 | 0.080 | 3.125 | RMC2647629 | 2647629 |
| RMC-O | 5/8 | 1.150 | 3 1/2 | - | - | 5/8 | 4 | 0.120 | 3.000 | RMC2647630 | 2647630 |
| **Metric** | | | | | | | | | | | |
| RMC-O | 6 | 22 | 64 | - | - | 6 | 4 | 1 | 95 | RMC2647643 | 2647643 |
| RMC-O | 10 | 24.5 | 73 | - | - | 10 | 4 | 2 | 90 | RMC2647644 | 2647644 |
| RMC-O | 12 | 27 | 84 | - | - | 12 | 4 | 2 | 85 | RMC2647645 | 2647645 |

The Oval Shape has a side cutting geometry with a continuous radius ending at the cutting diameter.

Cutting data recommendations on page 111

■ = First Choice ☐ = Second Choice

# MDR Ballnose Series

The MDR Ballnose is optimized for High Speed Machining techniques with low radial engagement in mold and die steel.

**Features and Benefits**

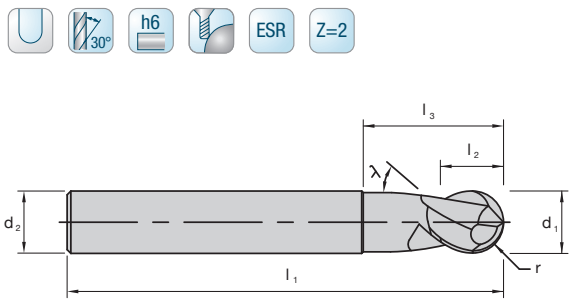
- Engineered to provide more clearance to make complex contours attainable.
- Unique conical design stabilizes the tool for superior finish.
- ENDURASpeed Red coating combined with a reinforced cutting edge ensures longer tool life.
- The MDR 2 flute ball nose end mill is specifically designed for mold steels.

**Applications**

- Finishing

**Usage**

- Mold and Die Steel




| | | 2-Flute |
|---|---|---|
| P | | |
| M | | |
| K | | |
| N | | |
| S | | |
| H | | ■ |

| Series | Cutting Diameter $d_1$ | LOC $l_2$ | Overall Length $l_1$ | Extended Reach $l_3$ | Shank Diameter $d_2$ | Angle | Flutes z | Corner Radius r | Ident No. | SAP No. |
|---|---|---|---|---|---|---|---|---|---|---|
| MDR-2 | 1/16 | 1/16 | 3 | 1/8 | 1/4 | 8 | 2 | 0.031 | MDR2641036 | 2641036 |
| MDR-2 | 3/32 | 3/32 | 3 | 3/16 | 1/4 | 8 | 2 | 0.047 | MDR2641037 | 2641037 |
| MDR-2 | 1/8 | 1/8 | 3 | 1/4 | 1/4 | 9 | 2 | 0.063 | MDR2641038 | 2641038 |
| MDR-2 | 3/16 | 3/16 | 3 | 3/8 | 1/4 | 9 | 2 | 0.094 | MDR2641039 | 2641039 |
| MDR-2 | 1/4 | 1/4 | 3 1/2 | 1/2 | 1/4 | - | 2 | 0.125 | MDR2641040 | 2641040 |
| MDR-2 | 5/16 | 5/16 | 4 | 3/4 | 5/16 | - | 2 | 0.156 | MDR2641041 | 2641041 |
| MDR-2 | 3/8 | 3/8 | 4 | 7/8 | 3/8 | - | 2 | 0.188 | MDR2641042 | 2641042 |
| MDR-2 | 1/2 | 1/2 | 4 1/2 | 1 1/8 | 1/2 | - | 2 | 0.250 | MDR2641043 | 2641043 |

| Cutting Diameter (inch) | Tolerances (inch) Diameter | SHK |
|---|---|---|
| 1/16 - 3/32 | +0/-0.0010 | h6 |
| > 3/32 - 1/4 | +0/-0.0012 | h6 |
| > 1/4 - 3/8 | +0/-0.0016 | h6 |
| > 3/8 - 1/2 | +0/-0.0020 | h6 |

Cutting data recommendations on page 111

■ = First Choice □ = Second Choice

# TECHNICAL
## INFORMATION

## AMP Series
## Cutting Data Recommendations

| ISO Grade | Material | SFM Range | Application | Recommended Starting Parameters | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Rad DOC % of Dia. | Axial DOC x Dia. | SFM Starting | 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
| N | **Aluminum** | 500 - 1500 | Full Slotting | 100% | 1x | 1000 | .0006 | .0008 | .0010 | .0012 | .0018 | .0022 | .0027 | .0034 | .0042 |
| | | | Heavy Profile | 33% | 1x | 1200 | .0011 | .0015 | .0020 | .0026 | .0032 | .0042 | .0054 | .0064 | .0085 |
| | | | HEM Profile | 15% | 2x | 1200 | .0015 | .0020 | .0027 | .0035 | .0043 | .0056 | .0071 | .0084 | .0112 |
| | | | Finishing | 5% | 2x | 1000 | .0024 | .0033 | .0044 | .0057 | .0070 | .0092 | .0116 | .0137 | .0183 |
| | **Brass / Bronze** | 500 - 900 | Full Slotting | 100% | 1x | 600 | .0005 | .0007 | .0008 | .0010 | .0014 | .0016 | .0020 | .0024 | .0032 |
| | | | Heavy Profile | 25% | 1x | 700 | .0011 | .0013 | .0019 | .0022 | .0029 | .0038 | .0047 | .0057 | .0075 |
| | | | HEM Profile | 15% | 2x | 700 | .0013 | .0016 | .0023 | .0027 | .0035 | .0047 | .0057 | .0069 | .0090 |
| | | | Finishing | 5% | 2x | 600 | .0022 | .0026 | .0037 | .0044 | .0057 | .0076 | .0094 | .0113 | .0148 |
| | **Copper Alloys** | 700 - 1000 | Full Slotting | 100% | 1x | 500 | .0006 | .0007 | .0008 | .0009 | .0010 | .0012 | .0014 | .0016 | .0020 |
| | | | Heavy Profile | 25% | 1x | 600 | .0012 | .0014 | .0016 | .0019 | .0021 | .0025 | .0029 | .0033 | .0037 |
| | | | HEM Profile | 15% | 2x | 600 | .0015 | .0017 | .0020 | .0023 | .0026 | .0031 | .0035 | .0040 | .0045 |
| | | | Finishing | 5% | 2x | 500 | .0024 | .0028 | .0033 | .0037 | .0042 | .0050 | .0057 | .0065 | .0074 |
| | **Magnesium** | 500 - 900 | Full Slotting | 100% | 1x | 500 | .0006 | .0007 | .0008 | .0009 | .0010 | .0012 | .0014 | .0016 | .0020 |
| | | | Heavy Profile | 33% | 1x | 700 | .0011 | .0015 | .0020 | .0026 | .0032 | .0042 | .0054 | .0064 | .0085 |
| | | | HEM Profile | 15% | 2x | 700 | .0015 | .0020 | .0027 | .0035 | .0043 | .0056 | .0071 | .0084 | .0112 |
| | | | Finishing | 5% | 2x | 500 | .0024 | .0033 | .0044 | .0057 | .0070 | .0092 | .0116 | .0137 | .0183 |

**Remember To Check Horsepower Requirements For Your Cut**

**Required Motor Horsepower** = (Feed Rate) x Axial DOC x Radial DoC x Unit Power x Machine Efficiency %

**Unit Power For Aluminum Alloys ≈** 0.32
**Unit Power For Brass / Bronze Alloys ≈** 0.64
**Unit Power For Copper Alloys ≈** 1
**Unit Power For Magnesium Alloys ≈** 0.16
**Machine Efficiency % ≈** 0.8

## AF 2 & 3 Flute Series Non-Coolant Through
## Cutting Data Recommendations

| ISO Grade | Material | Unit Power | SFM Range | Application | Recommended Starting Parameters | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Rad DOC % of DIA | Axial DOC x DIA | SFM Starting | Chip Load Per Tooth | | | | | | | |
| | | | | | | | | 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
| N | **Aluminum** | 0.32 | 500 - 1500 | Full Slotting | 100% | 1x | 1000 | .0015 | .0020 | .0027 | .0035 | .0043 | .0056 | .0070 | .0085 | .0112 |
| | | | | Heavy Profile | 33% | 1x | 1200 | .0016 | .0021 | .0029 | .0037 | .0046 | .0060 | .0074 | .0090 | .0119 |
| | | | | HEM* Profile | 15% | 2x | 1200 | .0021 | .0028 | .0038 | .0049 | .0060 | .0078 | .0098 | .0119 | .0157 |
| | | | | Finishing | 5% | 2x | 1000 | .0034 | .0046 | .0062 | .0080 | .0099 | .0128 | .0161 | .0195 | .0257 |
| | **Brass / Bronze** | 0.64 | 500 - 900 | Full Slotting | 100% | 1x | 600 | .0013 | .0016 | .0023 | .0027 | .0034 | .0046 | .0057 | .0069 | .0091 |
| | | | | Heavy Profile | 25% | 1x | 700 | .0015 | .0018 | .0027 | .0031 | .0039 | .0053 | .0066 | .0080 | .0105 |
| | | | | HEM* Profile | 15% | 2x | 700 | .0018 | .0022 | .0032 | .0038 | .0048 | .0064 | .0080 | .0097 | .0127 |
| | | | | Finishing | 5% | 2x | 600 | .0030 | .0037 | .0053 | .0062 | .0078 | .0106 | .0131 | .0158 | .0209 |
| | **Copper Alloys** | 1 | 700 - 1000 | Full Slotting | 100% | 1x | 500 | .0014 | .0017 | .0020 | .0023 | .0026 | .0030 | .0035 | .0040 | .0045 |
| | | | | Heavy Profile | 25% | 1x | 600 | .0016 | .0020 | .0023 | .0027 | .0030 | .0035 | .0040 | .0046 | .0052 |
| | | | | HEM* Profile | 15% | 2x | 600 | .0020 | .0024 | .0028 | .0032 | .0036 | .0042 | .0049 | .0056 | .0063 |
| | | | | Finishing | 5% | 2x | 500 | .0032 | .0039 | .0046 | .0053 | .0060 | .0069 | .0080 | .0092 | .0103 |
| | **Magnesium** | 0.16 | 500 - 900 | Full Slotting | 100% | 1x | 500 | .0016 | .0019 | .0028 | .0034 | .0042 | .0056 | .0070 | .0085 | .0112 |
| | | | | Heavy Profile | 33% | 1x | 700 | .0017 | .0020 | .0030 | .0036 | .0045 | .0060 | .0074 | .0090 | .0119 |
| | | | | HEM* Profile | 15% | 2x | 700 | .0022 | .0027 | .0039 | .0048 | .0059 | .0078 | .0098 | .0119 | .0157 |
| | | | | Finishing | 5% | 2x | 500 | .0037 | .0044 | .0064 | .0078 | .0096 | .0128 | .0161 | .0195 | .0257 |

## AF 3 Flute Series Coolant Through Cutting Data Recommendations

| ISO Grade | Material | Unit Power | SFM Range | Application | Recommended Starting Parameters | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Rad DOC % of DIA | Axial DOC x DIA | SFM Starting | Chip Load Per Tooth | | | | |
| | | | | | | | | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
| N | **Aluminum** | 0.32 | 500 - 1500 | Full Slotting | 100% | 1x | 1000 | .0032 | .0051 | .0067 | .0084 | .0100 | .0130 |
| | | | | Heavy Profile | 33% | 1x | 1200 | .0034 | .0054 | .0071 | .0089 | .0106 | .0138 |
| | | | | HEM* Profile | 15% | 2x | 1200 | .0045 | .0071 | .0094 | .0118 | .0140 | .0182 |
| | | | | Finishing | 5% | 2x | 1000 | .0073 | .0117 | .0154 | .0193 | .0229 | .0298 |
| | **Brass / Bronze** | 0.64 | 500 - 900 | Full Slotting | 100% | 1x | 600 | .0026 | .0039 | .0053 | .0065 | .0079 | .0105 |
| | | | | Heavy Profile | 25% | 1x | 700 | .0030 | .0045 | .0061 | .0075 | .0091 | .0121 |
| | | | | HEM* Profile | 15% | 2x | 700 | .0036 | .0055 | .0074 | .0091 | .0111 | .0147 |
| | | | | Finishing | 5% | 2x | 600 | .0060 | .0089 | .0122 | .0149 | .0181 | .0241 |
| | **Copper Alloys** | 1 | 300-800 | Full Slotting | 100% | 1x | 400 | .0024 | .0031 | .0036 | .0042 | .0048 | .0054 |
| | | | | Heavy Profile | 25% | 1x | 600 | .0028 | .0036 | .0042 | .0048 | .0055 | .0062 |
| | | | | HEM* Profile | 15% | 2x | 600 | .0034 | .0043 | .0050 | .0059 | .0067 | .0076 |
| | | | | Finishing | 5% | 2x | 400 | .0055 | .0071 | .0083 | .0096 | .0110 | .0124 |
| | **Magnesium** | 0.16 | 500 - 900 | Full Slotting | 100% | 1x | 500 | .0032 | .0043 | .0067 | .0084 | .0100 | .0130 |
| | | | | Heavy Profile | 25% | 1x | 700 | .0037 | .0050 | .0077 | .0097 | .0115 | .0150 |
| | | | | HEM* Profile | 15% | 2x | 700 | .0045 | .0060 | .0094 | .0118 | .0140 | .0182 |
| | | | | Finishing | 5% | 2x | 500 | .0073 | .0099 | .0154 | .0193 | .0229 | .0298 |

Remember to check horsepower requirements for your cut
Machine efficiency % ≈ 0.8

HEM* = High Efficiency Machining

## AHR Series Finisher Cutting Data Recommendations

| ISO Grade | Material | Unit Power | RPM Range | Application | Recommended Starting Parameters | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Rad DOC % of Dia. | Axial DOC x Dia. | 1/2 | 3/4 | 1 |
| N | **Aluminum** | 0.18 | 25k-33k | Full Slotting | 100% | 0.5x | .0033 | .0040 | .0050 |
| | | | | Heavy Profile | 30% | 1x | .0036 | .0052 | .0070 |
| | | | | HEM Profile | 10% | 1x | .0055 | .0080 | .0110 |

## AHR Series Rougher Cutting Data Recommendations

| ISO Grade | Material | Unit Power | RPM Range | Application | Recommended Starting Parameters | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Rad DOC % of Dia. | Axial DOC x Dia. | 1/2 | 3/4 | 1 |
| N | **Aluminum** | 0.18 | 25k-33k | Full Slotting | 100% | 1x | .0036 | .0054 | .0065 |
| | | | | Heavy Profile | 30% | 1x | .0039 | .0059 | .0075 |

## Efficiency Ratings

| Spindle Type | % |
|---|---|
| **Direct Drive** | 90% |
| **Gear Drive** | 85% |
| **Average** | 80% |

**Determining Power Requirements:**

Step 1: **Metal Removal Rate (MRR)** = (Tool Feed Rate) x Radial DOC x Axial DOC

Step 2: **Spindle HP** = Metal Removal Rate (MRR) x UHP

Step 3: **Motor HP** = Spindle HP / Efficiency %

Step 4: **Spindle Torque (ft. lbs)** = (Spindle HP x 63,030) / RPM

**Determining Cubic inches per minute per HP:**

**Cubic inches per minute per HP** = Spindle HP / Metal Removal Rate (MRR)

## AR Series Non-Coolant Through Cutting Data Recommendations

| ISO Grade | Material | Unit Power | SFM Range | Application | Recommended Starting Parameters | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Rad DOC % of DIA | Axial DOC x DIA | SFM Starting | Chip Load Per Tooth | | | |
| | | | | | | | | 3/8 | 1/2 | 3/4 | 1 |
| N | **Aluminum** | 0.32 | 500 - 1500 | Full Slotting | 100% | 1x | 1000 | .0060 | .0080 | .0120 | .0156 |
| | | | | Heavy Profile | 33% | 1x | 1200 | .0064 | .0085 | .0128 | .0166 |
| | | | | Profile | 15% | 1x | 1200 | .0084 | .0112 | .0168 | .0218 |
| | **Brass / Bronze** | 0.64 | 500 - 900 | Full Slotting | 100% | 1x | 500 | .0046 | .0063 | .0094 | .0126 |
| | | | | Heavy Profile | 33% | 1x | 700 | .0049 | .0067 | .0100 | .0134 |
| | | | | Profile | 15% | 1x | 700 | .0064 | .0088 | .0132 | .0176 |
| | **Copper Alloys** | 1 | 700 - 1000 | Full Slotting | 100% | 1x | 400 | .0038 | .0043 | .0058 | .0065 |
| | | | | Heavy Profile | 33% | 1x | 600 | .0040 | .0046 | .0062 | .0069 |
| | | | | Profile | 15% | 1x | 600 | .0053 | .0060 | .0081 | .0091 |
| | **Magnesium** | 0.16 | 500 - 900 | Full Slotting | 100% | 1x | 500 | .0051 | .0080 | .0120 | .0155 |
| | | | | Heavy Profile | 33% | 1x | 700 | .0054 | .0085 | .0128 | .0165 |
| | | | | Profile | 15% | 1x | 700 | .0071 | .0112 | .0168 | .0217 |

## AR Series Coolant Through Cutting Data Recommendations

| ISO Grade | Material | Unit Power | SFM Range | Application | Recommended Starting Parameters | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Rad DOC % of DIA | Axial DOC x DIA | SFM Starting | Chip Load Per Tooth | | | |
| | | | | | | | | 3/8 | 1/2 | 3/4 | 1 |
| N | **Aluminum** | 0.32 | 500 - 1500 | Full Slotting | 100% | 1x | 1000 | .0066 | .0088 | .0132 | .0170 |
| | | | | Heavy Profile | 33% | 1x | 1200 | .0070 | .0094 | .0140 | .0181 |
| | | | | Profile | 15% | 1x | 1200 | .0092 | .0123 | .0185 | .0238 |
| | **Brass / Bronze** | .064 | 500 - 900 | Full Slotting | 100% | 1x | 500 | .0050 | .0069 | .0103 | .0138 |
| | | | | Heavy Profile | 33% | 1x | 700 | .0053 | .0073 | .0110 | .0147 |
| | | | | Profile | 15% | 1x | 700 | .0070 | .0097 | .0144 | .0193 |
| | **Copper Alloys** | 1 | 700 - 1000 | Full Slotting | 100% | 1x | 400 | .0041 | .0047 | .0063 | .0071 |
| | | | | Heavy Profile | 33% | 1x | 600 | .0044 | .0050 | .0067 | .0075 |
| | | | | Profile | 15% | 1x | 600 | .0057 | .0066 | .0088 | .0099 |
| | **Magnesium** | 0.16 | 500 - 900 | Full Slotting | 100% | 1x | 500 | .0056 | .0088 | .0132 | .0170 |
| | | | | Heavy Profile | 33% | 1x | 700 | .0060 | .0094 | .0140 | .0181 |
| | | | | Profile | 15% | 1x | 700 | .0078 | .0123 | .0185 | .0238 |

Remember to check horsepower requirements for your cut
Machine efficiency % ≈ 0.8

HEM* = High Efficiency Machining

# MaxQ 4 Flute
# Cutting Data Recommendations

LMT • ONSRUD

| ISO Grade | Material / Grade | SFM Hardness | | Application | Rad DOC | Axial DOC | SFM |
|---|---|---|---|---|---|---|---|
| | | < 32Rc | > 32Rc | | % of DIA | x DIA | Starting (<32Rc) |
| P | **Carbon Steel**<br>10XX, 11XX<br>12XX, 15XX | 400 - 600 | 150 - 250 | Full Slotting | 100% | .5x | 350 |
| | | 350 - 650 | 150 - 250 | Heavy Profile | 33% | 1.25x | 400 |
| | | 500 - 850 | 225 - 325 | HEM* Profile | 15% | 2x | 550 |
| | | 350 - 450 | 200 - 300 | Finishing | 3-5% | 2x | 450 |
| | **Alloy Steel**<br>13XX, 40XX, 41XX, 43XX<br>44XX, 46XX, 47XX, 48XX | 275 - 400 | 100 - 200 | Full Slotting | 100% | .5x | 325 |
| | | 300 - 450 | 150 - 225 | Heavy Profile | 33% | 1.25x | 350 |
| | | 450 - 750 | 175 - 300 | HEM* Profile | 15% | 2x | 500 |
| | | 375 - 450 | 200 - 250 | Finishing | 3-5% | 2x | 450 |
| | **Mold & Die Steel**<br>300M, 4340, 52100, M50, A2,<br>D2, H13, L2, M2, P20, S7, T15, W2 | 225 - 325 | 70 - 150 | Full Slotting | 100% | .5x | 275 |
| | | 225 - 375 | 70 - 150 | Heavy Profile | 33% | 1.25x | 275 |
| | | 350 - 500 | 150 - 275 | HEM* Profile | 10% | 2x | 400 |
| | | 300 - 400 | 125 - 225 | Finishing | 3-5% | 2x | 350 |
| | **Tool Steel**<br>PM STEELS | 125 - 275 | - | Full Slotting | 100% | .5x | 200 |
| | | 175 - 325 | - | Heavy Profile | 25% | 1.25x | 250 |
| | | 275 - 475 | - | HEM* Profile | 10% | 2x | 350 |
| | | 250 - 350 | - | Finishing | 3-5% | 2x | 350 |
| M | **Austenitic Stainless**<br>301, 302, 303, 304/304L/304H, 316/316L,<br>317L, 321/321H, 347/347H, Nitronic, 309/309S,<br>310/310S/310H, 330 | 200 - 325 | 80 - 200 | Full Slotting | 100% | .5x | 275 |
| | | 250 - 350 | 80 - 200 | Heavy Profile | 33% | 1.25x | 325 |
| | | 300 - 500 | 150 - 275 | HEM* Profile | 15% | 2x | 400 |
| | | 250 - 350 | 175 - 275 | Finishing | 3-5% | 2x | 350 |
| | **Martensitic Stainless**<br>403, 405, 409, 410/410S/410HT,<br>416/416HT, 420, 422, 430, 440C | 200 - 325 | 100 - 250 | Full Slotting | 100% | .5x | 275 |
| | | 225 - 350 | 100 - 250 | Heavy Profile | 25% | 1.25x | 300 |
| | | 275 - 450 | 125 - 250 | HEM* Profile | 10% | 2x | 400 |
| | | 250 - 350 | 150 - 275 | Finishing | 3-5% | 2x | 350 |
| | **Precipitation Stainless**<br>13-8 PH, 15-5 PH, 15-7 PH<br>17-4 PH, 17-7 PH, S143 | 160 - 225 | 90 - 180 | Full Slotting | 100% | .5x | 200 |
| | | 180 - 250 | 90 - 125 | Heavy Profile | 25% | 1.25x | 225 |
| | | 225 - 450 | 125 - 250 | HEM* Profile | 10% | 2x | 400 |
| | | 225 - 325 | 150 - 275 | Finishing | 3-5% | 2x | 325 |
| K | **Cast Iron Grey**<br>20A, 25A, 30A, 35A,<br>40A, 45A, 50A | 250 - 400 | 130 - 300 | Full Slotting | 100% | .5x | 375 |
| | | 250 - 450 | 170 - 300 | Heavy Profile | 33% | 1.25x | 425 |
| | | 300 - 550 | 350 - 500 | HEM* Profile | 10% | 2x | 500 |
| | | 300 - 400 | 300 - 400 | Finishing | 3-5% | 2x | 400 |
| | **Cast Ductile / Nodular**<br>40010, 60-40-18, 65-45-12<br>32510, 32518 | 120 - 300 | 80 - 140 | Full Slotting | 100% | .5x | 275 |
| | | 220 - 350 | 100 - 150 | Heavy Profile | 33% | 1.25x | 325 |
| | | 300 - 500 | 170 - 270 | HEM* Profile | 10% | 2x | 450 |
| | | 275 - 400 | 140 - 200 | Finishing | 3-5% | 2x | 400 |
| S | **Cobalt Base**<br>Haynes 21, 25, L-605, Mar-M302,<br>NASA Co-W-Re, Stellite, Ultimet | 70 - 120 | 40 - 90 | Full Slotting | 100% | .33x | 100 |
| | | 70 - 120 | 40 - 90 | Heavy Profile | 20% | .75x | 100 |
| | | 150 - 210 | 80 - 100 | HEM* Profile | 8% | 1.25x | 170 |
| | | 80 - 120 | 80 - 100 | Finishing | 3-5% | 1.5x | 100 |
| | **Iron Base**<br>A-286, Discaloy<br>Incoloy 800-802, Multimet, 16-25-6 | 60 - 90 | 40 - 70 | Full Slotting | 100% | .33x | 70 |
| | | 80 - 140 | 40 - 70 | Heavy Profile | 20% | .75x | 120 |
| | | 150 - 200 | 60 - 80 | HEM* Profile | 8% | 1.25x | 170 |
| | | 80 - 120 | 60 - 80 | Finishing | 3-5% | 1.5x | 120 |
| | **Nickel Base**<br>Hastelloy, Haynes 242, Inconel 600, 625, 718, Invar,<br>Kovar, Monel, Nimonic, Rene 41, 77, 95, Udimet,<br>Waspaloy | 70 - 100 | 40 - 80 | Full Slotting | 100% | .33x | 70 |
| | | 70 - 120 | 40 - 90 | Heavy Profile | 20% | .75x | 90 |
| | | 100 - 150 | 70 - 120 | HEM* Profile | 8% | 1.25x | 125 |
| | | 90 - 125 | 70 - 100 | Finishing | 3-5% | 1.5x | 125 |
| | **Titanium**<br>6Al-4V, Commercially Pure,<br>Titanium Aluminide | 120 - 180 | 80 - 120 | Full Slotting | 100% | 1x | 140 |
| | | 120 - 200 | 90 - 130 | Heavy Profile | 30% | 1x | 160 |
| | | 200 - 450 | 100 - 140 | HEM* Profile | 10% | 1.5x | 350 |
| | | 200 - 400 | 100 - 140 | Finishing | 3-5% | 1.5x | 300 |
| | **Titanium**<br>Ti 10-2-3, Beta 21S, Ti5553 | 80 - 120 | 60 - 100 | Full Slotting | 100% | 1x | 100 |
| | | 90 - 140 | 80 - 120 | Heavy Profile | 20% | 1x | 120 |
| | | 100 - 150 | 80 - 120 | HEM* Profile | 8% | 1.5x | 140 |
| | | 100 - 160 | 100 - 120 | Finishing | 3-5% | 1.5x | 160 |

HEM* = High Efficiency Machining

| Chip Load Per Tooth (Inches) | | | | | | |
|---|---|---|---|---|---|---|
| 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
| .0008 | .0016 | .0024 | .0028 | .0036 | .0044 | .0050 |
| .0009 | .0017 | .0026 | .0030 | .0038 | .0047 | .0053 |
| .0011 | .0022 | .0034 | .0039 | .0050 | .0062 | .0070 |
| .0020 | .0041 | .0061 | .0071 | .0092 | .0112 | .0128 |
| .0008 | .0016 | .0024 | .0028 | .0036 | .0044 | .0050 |
| .0009 | .0017 | .0026 | .0030 | .0038 | .0047 | .0053 |
| .0011 | .0022 | .0034 | .0039 | .0050 | .0062 | .0070 |
| .0020 | .0041 | .0061 | .0071 | .0092 | .0112 | .0128 |
| .0004 | .0012 | .0019 | .0024 | .0028 | .0033 | .0038 |
| .0004 | .0013 | .0020 | .0026 | .0030 | .0035 | .0040 |
| .0007 | .0020 | .0032 | .0040 | .0047 | .0055 | .0063 |
| .0010 | .0031 | .0048 | .0061 | .0071 | .0084 | .0097 |
| .0005 | .0010 | .0020 | .0025 | .0030 | .0035 | .0040 |
| .0006 | .0012 | .0023 | .0029 | .0035 | .0040 | .0046 |
| .0008 | .0017 | .0033 | .0042 | .0050 | .0058 | .0067 |
| .0013 | .0026 | .0051 | .0064 | .0077 | .0089 | .0102 |
| .0006 | .0013 | .0022 | .0026 | .0032 | .0039 | .0045 |
| .0006 | .0014 | .0023 | .0028 | .0034 | .0041 | .0048 |
| .0008 | .0018 | .0031 | .0036 | .0045 | .0055 | .0063 |
| .0015 | .0033 | .0056 | .0066 | .0082 | .0100 | .0115 |
| .0004 | .0010 | .0020 | .0023 | .0030 | .0035 | .0040 |
| .0005 | .0012 | .0023 | .0027 | .0035 | .0040 | .0046 |
| .0007 | .0017 | .0033 | .0038 | .0050 | .0058 | .0067 |
| .0010 | .0026 | .0051 | .0059 | .0077 | .0089 | .0102 |
| .0004 | .0010 | .0020 | .0025 | .0030 | .0035 | .0040 |
| .0005 | .0012 | .0023 | .0029 | .0035 | .0040 | .0046 |
| .0007 | .0017 | .0033 | .0042 | .0050 | .0058 | .0067 |
| .0010 | .0026 | .0051 | .0064 | .0077 | .0089 | .0102 |
| .0005 | .0015 | .0025 | .0030 | .0035 | .0040 | .0046 |
| .0005 | .0016 | .0027 | .0032 | .0037 | .0043 | .0049 |
| .0008 | .0025 | .0042 | .0050 | .0058 | .0067 | .0077 |
| .0013 | .0038 | .0064 | .0077 | .0089 | .0102 | .0117 |
| .0005 | .0011 | .0020 | .0025 | .0030 | .0035 | .0040 |
| .0005 | .0012 | .0021 | .0027 | .0032 | .0037 | .0043 |
| .0008 | .0018 | .0033 | .0042 | .0050 | .0058 | .0067 |
| .0013 | .0028 | .0051 | .0064 | .0077 | .0089 | .0102 |
| .0003 | .0008 | .0015 | .0020 | .0024 | .0027 | .0030 |
| .0004 | .0010 | .0019 | .0025 | .0030 | .0034 | .0038 |
| .0006 | .0015 | .0028 | .0037 | .0044 | .0050 | .0055 |
| .0008 | .0020 | .0038 | .0051 | .0061 | .0069 | .0077 |
| .0004 | .0010 | .0020 | .0025 | .0030 | .0035 | .0040 |
| .0005 | .0013 | .0025 | .0031 | .0038 | .0044 | .0050 |
| .0007 | .0018 | .0037 | .0046 | .0055 | .0065 | .0074 |
| .0010 | .0026 | .0051 | .0064 | .0077 | .0089 | .0102 |
| .0003 | .0008 | .0016 | .0020 | .0023 | .0027 | .0030 |
| .0004 | .0010 | .0020 | .0025 | .0029 | .0034 | .0038 |
| .0006 | .0015 | .0029 | .0037 | .0042 | .0050 | .0055 |
| .0008 | .0020 | .0041 | .0051 | .0059 | .0069 | .0077 |
| .0004 | .0010 | .0020 | .0025 | .0030 | .0036 | .0041 |
| .0004 | .0011 | .0022 | .0027 | .0033 | .0039 | .0045 |
| .0007 | .0017 | .0033 | .0042 | .0050 | .0060 | .0068 |
| .0010 | .0026 | .0051 | .0064 | .0077 | .0092 | .0105 |
| .0003 | .0007 | .0015 | .0020 | .0023 | .0027 | .0030 |
| .0004 | .0009 | .0019 | .0025 | .0029 | .0034 | .0038 |
| .0006 | .0013 | .0028 | .0037 | .0042 | .0050 | .0055 |
| .0008 | .0018 | .0038 | .0051 | .0059 | .0069 | .0077 |

| ISO Grade | Material / Grade | SFM Hardness | | Application | Rad DOC | Axial DOC | SFM |
|---|---|---|---|---|---|---|---|
| | | < 32Rc | > 32Rc | | % of DIA | x DIA | Starting (<32Rc) |
| P | **Carbon Steel** 10XX, 11XX 12XX, 15XX | 400 - 600 | 150 - 250 | Full Slotting | 100% | .5x | 350 |
| | | 350 - 650 | 150 - 250 | Heavy Profile | 33% | 1.25x | 400 |
| | | 500 - 850 | 225 - 325 | HEM* Profile | 15% | 2x | 550 |
| | | 350 - 450 | 200 - 300 | Finishing | 3-5% | 2x | 450 |
| | **Alloy Steel** 13XX, 40XX, 41XX, 43XX 44XX, 46XX, 47XX, 48XX | 275 - 400 | 100 - 200 | Full Slotting | 100% | .5x | 325 |
| | | 300 - 450 | 150 - 225 | Heavy Profile | 33% | 1.25x | 350 |
| | | 450 - 750 | 175 - 300 | HEM* Profile | 15% | 2x | 500 |
| | | 375 - 450 | 200 - 250 | Finishing | 3-5% | 2x | 450 |
| | **Mold & Die Steel** 300M, 4340, 52100, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2 | 225 - 325 | 70 - 150 | Full Slotting | 100% | .5x | 275 |
| | | 225 - 375 | 70 - 150 | Heavy Profile | 33% | 1.25x | 275 |
| | | 350 - 500 | 150 - 275 | HEM* Profile | 10% | 2x | 400 |
| | | 300 - 400 | 125 - 225 | Finishing | 3-5% | 2x | 350 |
| | **Tool Steel** PM STEELS | 125 - 275 | – | Full Slotting | 100% | .5x | 200 |
| | | 175 - 325 | – | Heavy Profile | 25% | 1.25x | 250 |
| | | 275 - 475 | – | HEM* Profile | 10% | 2x | 350 |
| | | 250 - 350 | – | Finishing | 3-5% | 2x | 350 |
| M | **Austenitic Stainless** 301, 302, 303, 304/304L/304H, 316/316L, 317L, 321/321H, 347/347H, Nitronic, 309/309S, 310/310S/310H, 330 | 200 - 325 | 80 - 200 | Full Slotting | 100% | .5x | 275 |
| | | 250 - 350 | 80 - 200 | Heavy Profile | 33% | 1.25x | 325 |
| | | 300 - 500 | 150 - 275 | HEM* Profile | 15% | 2x | 400 |
| | | 250 - 350 | 175 - 275 | Finishing | 3-5% | 2x | 350 |
| | **Martensitic Stainless** 403, 405, 409, 410/410S/410HT, 416/416HT, 420, 422, 430, 440C | 200 - 325 | 100 - 250 | Full Slotting | 100% | .5x | 275 |
| | | 225 - 350 | 100 - 250 | Heavy Profile | 25% | 1.25x | 300 |
| | | 275 - 450 | 125 - 250 | HEM* Profile | 10% | 2x | 400 |
| | | 250 - 350 | 150 - 275 | Finishing | 3-5% | 2x | 350 |
| | **Precipitation Stainless** 13-8 PH, 15-5 PH, 15-7 PH 17-4 PH, 17-7 PH, S143 | 160 - 225 | 90 - 180 | Full Slotting | 100% | .5x | 200 |
| | | 180 - 250 | 90 - 125 | Heavy Profile | 25% | 1.25x | 225 |
| | | 225 - 450 | 125 - 250 | HEM* Profile | 10% | 2x | 400 |
| | | 225 - 325 | 150 - 275 | Finishing | 3-5% | 2x | 325 |
| K | **Cast Iron Grey** 20A, 25A, 30A, 35A, 40A, 45A, 50A | 250 - 400 | 130 - 300 | Full Slotting | 100% | .5x | 375 |
| | | 250 - 450 | 170 - 300 | Heavy Profile | 33% | 1.25x | 425 |
| | | 300 - 550 | 350 - 500 | HEM* Profile | 10% | 2x | 500 |
| | | 300 - 400 | 300 - 400 | Finishing | 3-5% | 2x | 400 |
| | **Cast Ductile / Nodular** 40010, 60-40-18, 65-45-12 32510, 32518 | 120 - 300 | 80 - 140 | Full Slotting | 100% | .5x | 275 |
| | | 220 - 350 | 100 - 150 | Heavy Profile | 33% | 1.25x | 325 |
| | | 300 - 500 | 170 - 270 | HEM* Profile | 10% | 2x | 450 |
| | | 275 - 400 | 140 - 200 | Finishing | 3-5% | 2x | 400 |
| S | **Cobalt Base** Haynes 21, 25, L-605, Mar-M302, NASA Co-W-Re, Stellite, Ultimet | 70 - 120 | 40 - 90 | Full Slotting | 100% | .33x | 100 |
| | | 70 - 120 | 40 - 90 | Heavy Profile | 20% | .75x | 100 |
| | | 150 - 210 | 80 - 100 | HEM* Profile | 8% | 1.25x | 170 |
| | | 80 - 120 | 80 - 100 | Finishing | 3-5% | 1.5x | 100 |
| | **Iron Base** A-286, Discaloy Incoloy 800-802, Multimet, 16-25-6 | 60 - 90 | 40 - 70 | Full Slotting | 100% | .25x | 70 |
| | | 80 - 140 | 40 - 70 | Heavy Profile | 20% | .75x | 120 |
| | | 150 - 200 | 60 - 80 | HEM* Profile | 8% | 1.25x | 170 |
| | | 80 - 120 | 60 - 80 | Finishing | 3-5% | 1.5x | 120 |
| | **Nickel Base** Hastelloy, Haynes 242, Inconel 600, 625, 718, Invar, Kovar, Monel, Nimonic, Rene 41, 77, 95, Udimet, Waspaloy | 70 - 100 | 40 - 80 | Full Slotting | 100% | .25x | 70 |
| | | 70 - 120 | 40 - 90 | Heavy Profile | 20% | .75x | 90 |
| | | 100 - 150 | 70 - 120 | HEM* Profile | 8% | 1.5x | 125 |
| | | 90 - 125 | 70 - 100 | Finishing | 3-5% | 1.5x | 125 |
| | **Titanium** 6Al-4V, Commercially Pure, Titanium Aluminide | 120 - 180 | 80 - 120 | Full Slotting | 100% | .5x | 140 |
| | | 120 - 200 | 90 - 130 | Heavy Profile | 30% | 1x | 160 |
| | | 200 - 450 | 100 - 140 | HEM* Profile | 10% | 1.5x | 350 |
| | | 200 - 400 | 100 - 140 | Finishing | 3-5% | 1.5x | 300 |
| | **Titanium** Ti 10-2-3, Beta 21S, Ti 5553 | 80 - 120 | 60 - 100 | Full Slotting | 100% | .25x | 100 |
| | | 90 - 140 | 80 - 120 | Heavy Profile | 20% | 1x | 120 |
| | | 100 - 150 | 80 - 120 | HEM* Profile | 8% | 1.5x | 140 |
| | | 100 - 160 | 100 - 120 | Finishing | 3-5% | 1.5x | 160 |

HEM* = High Efficiency Machining

| Chip Load Per Tooth (Inches) | | | | | | |
|---|---|---|---|---|---|---|
| 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
| .0005 | .0012 | .0020 | .0024 | .0031 | .0037 | .0043 |
| .0005 | .0013 | .0021 | .0026 | .0033 | .0039 | .0046 |
| .0007 | .0017 | .0028 | .0034 | .0043 | .0052 | .0060 |
| .0013 | .0031 | .0051 | .0061 | .0079 | .0094 | .0110 |
| .0005 | .0120 | .0020 | .0024 | .0030 | .0037 | .0043 |
| .0005 | .0128 | .0021 | .0026 | .0032 | .0039 | .0046 |
| .0007 | .0168 | .0028 | .0034 | .0042 | .0052 | .0060 |
| .0013 | .0306 | .0051 | .0061 | .0077 | .0094 | .0110 |
| .0003 | .0010 | .0150 | .0020 | .0024 | .0029 | .0033 |
| .0003 | .0011 | .0160 | .0021 | .0026 | .0031 | .0035 |
| .0005 | .0017 | .0250 | .0033 | .0040 | .0048 | .0055 |
| .0008 | .0026 | .0383 | .0051 | .0061 | .0074 | .0084 |
| .0003 | .0008 | .0015 | .0020 | .0025 | .0030 | .0035 |
| .0003 | .0009 | .0017 | .0023 | .0029 | .0035 | .0040 |
| .0005 | .0013 | .0025 | .0033 | .0042 | .0050 | .0058 |
| .0008 | .0020 | .0038 | .0051 | .0064 | .0077 | .0089 |
| .0004 | .0010 | .0018 | .0022 | .0027 | .0033 | .0040 |
| .0004 | .0011 | .0019 | .0023 | .0029 | .0035 | .0043 |
| .0006 | .0014 | .0025 | .0031 | .0038 | .0046 | .0056 |
| .0010 | .0026 | .0046 | .0056 | .0069 | .0084 | .0102 |
| .0003 | .0008 | .0015 | .0017 | .0023 | .0026 | .0030 |
| .0003 | .0009 | .0018 | .0020 | .0026 | .0030 | .0035 |
| .0005 | .0013 | .0026 | .0029 | .0038 | .0044 | .0050 |
| .0008 | .0020 | .0039 | .0044 | .0057 | .0067 | .0077 |
| .0003 | .0008 | .0160 | .0021 | .0025 | .0030 | .0035 |
| .0003 | .0009 | .0185 | .0024 | .0029 | .0035 | .0040 |
| .0005 | .0013 | .0267 | .0035 | .0042 | .0050 | .0058 |
| .0008 | .0019 | .0408 | .0054 | .0064 | .0077 | .0089 |
| .0003 | .0011 | .0020 | .0025 | .0030 | .0035 | .0040 |
| .0003 | .0012 | .0021 | .0027 | .0032 | .0037 | .0043 |
| .0005 | .0018 | .0033 | .0042 | .0050 | .0058 | .0067 |
| .0008 | .0028 | .0051 | .0064 | .0077 | .0089 | .0102 |
| .0003 | .0008 | .0015 | .0020 | .0025 | .0030 | .0035 |
| .0003 | .0009 | .0016 | .0021 | .0027 | .0032 | .0037 |
| .0005 | .0013 | .0025 | .0033 | .0042 | .0050 | .0058 |
| .0008 | .0020 | .0038 | .0051 | .0064 | .0077 | .0089 |
| .0002 | .0005 | .0011 | .0014 | .0018 | .0023 | .0027 |
| .0003 | .0006 | .0014 | .0018 | .0023 | .0029 | .0034 |
| .0004 | .0009 | .0020 | .0026 | .0033 | .0042 | .0050 |
| .0005 | .0013 | .0028 | .0036 | .0046 | .0059 | .0069 |
| .0003 | .0008 | .0015 | .0019 | .0025 | .0030 | .0035 |
| .0004 | .0010 | .0019 | .0023 | .0031 | .0038 | .0044 |
| .0006 | .0015 | .0028 | .0034 | .0046 | .0055 | .0065 |
| .0008 | .0020 | .0038 | .0047 | .0064 | .0077 | .0089 |
| .0002 | .0005 | .0011 | .0015 | .0019 | .0022 | .0026 |
| .0003 | .0006 | .0014 | .0019 | .0024 | .0028 | .0033 |
| .0004 | .0009 | .0020 | .0028 | .0035 | .0041 | .0048 |
| .0005 | .0013 | .0028 | .0038 | .0048 | .0056 | .0066 |
| .0003 | .0008 | .0015 | .0020 | .0025 | .0030 | .0034 |
| .0003 | .0008 | .0016 | .0021 | .0027 | .0033 | .0037 |
| .0005 | .0013 | .0025 | .0033 | .0042 | .0050 | .0057 |
| .0008 | .0019 | .0038 | .0050 | .0064 | .0077 | .0087 |
| .0002 | .0005 | .0011 | .0015 | .0018 | .0022 | .0026 |
| .0003 | .0006 | .0014 | .0019 | .0023 | .0028 | .0033 |
| .0004 | .0009 | .0020 | .0028 | .0033 | .0041 | .0048 |
| .0005 | .0013 | .0028 | .0038 | .0046 | .0056 | .0066 |

# MaxQ+ 4 Flute
# Cutting Data Recommendations

LMT • ONSRUD

| ISO Grade | Material / Grade | Machinability Rating | SFM Hardness | | Application | Rad DOC | Axial DOC | SFM |
|---|---|---|---|---|---|---|---|---|
| | | | < 32Rc | > 32Rc | | % of DIA | x DIA | Starting (<32Rc) |
| P | **Carbon Steel** 10XX, 11XX 12XX, 15XX | 50 - 100% | 340 - 480 | 120 - 200 | Full Slotting | 100% | 125% | 400 |
| | | | 280 - 520 | 120 - 200 | Heavy Profile | 25% | 150% | 450 |
| | | | 500 - 850 | 225 - 325 | HEM* Profile | 15% | 200% | 550 |
| | | | 280 - 360 | 160 - 240 | Semi-Finishing | 6-8% | 200% | 325 |
| | **Alloy Steel** 13XX, 40XX, 41XX, 43XX 44XX, 46XX, 47XX, 48XX | 45 - 65% | 220 - 375 | 80 - 160 | Full Slotting | 100% | 125% | 300 |
| | | | 240 - 400 | 120 - 180 | Heavy Profile | 25% | 150% | 375 |
| | | | 450 - 750 | 175 - 300 | HEM* Profile | 15% | 200% | 500 |
| | | | 300 - 360 | 160 - 200 | Semi-Finishing | 6-8% | 200% | 325 |
| | **Mold & Die Steel** 300M, 4340, 52100, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2 | 35 - 65% | 180 - 260 | 60 - 120 | Full Slotting | 100% | 100% | 225 |
| | | | 180 - 300 | 60 - 120 | Heavy Profile | 25% | 125% | 275 |
| | | | 350 - 500 | 150 - 275 | HEM* Profile | 10% | 200% | 400 |
| | | | 240 - 320 | 100 - 180 | Semi-Finishing | 6-8% | 200% | 300 |
| | **Tool Steel** PM STEELS | 25 - 50% | 100 - 220 | - | Full Slotting | 100% | 125% | 200 |
| | | | 140 - 260 | - | Heavy Profile | 25% | 150% | 230 |
| | | | 275 - 475 | - | HEM* Profile | 10% | 200% | 350 |
| | | | 200 - 280 | - | Semi-Finishing | 6-8% | 200% | 250 |
| M | **Austenitic Stainles** 301, 302, 303, 304/304L/04H, 316/316L, 317L, 321/321H, 347/347H, Nitronic, 309/309S, 310/310S/310H, 330 | 40 - 65% | 160 - 250 | 60 - 130 | Full Slotting | 100% | 100% | 225 |
| | | | 160 - 300 | 60 -130 | Heavy Profile | 25% | 125% | 275 |
| | | | 300 - 500 | 150 - 275 | HEM* Profile | 15% | 200% | 375 |
| | | | 160 - 235 | 115 - 180 | Semi-Finishing | 6-8% | 200% | 250 |
| | **Martensitic Stainless** 403, 405, 409 410/410S/410HT, 416/416HT, 420, 422, 430, 440C | 25 - 75% | 160 - 260 | 80 - 200 | Full Slotting | 100% | 100% | 225 |
| | | | 180 - 280 | 80 - 200 | Heavy Profile | 25% | 125% | 275 |
| | | | 275 - 450 | 125 - 250 | HEM* Profile | 10% | 200% | 400 |
| | | | 200 - 280 | 120 - 220 | Semi-Finishing | 6-8% | 200% | 250 |
| | **Precipitation Stainless** 13-8 PH, 15-5 PH, 15-7 PH 17-4 PH, 17-7 PH, S143 | 30 - 45% | 130 - 180 | 80 - 160 | Full Slotting | 100% | 100% | 160 |
| | | | 145 - 225 | 80 - 100 | Heavy Profile | 25% | 125% | 175 |
| | | | 160 - 475 | 125 - 250 | HEM* Profile | 10% | 200% | 400 |
| | | | 200 - 275 | 120 - 220 | Semi-Finishing | 6-8% | 200% | 225 |
| K | **Cast Iron Grey** 20A, 25A, 30A, 35A, 40A, 45A, 50A | 35 - 70% | 200 - 350 | 110 - 240 | Full Slotting | 100% | 100% | 275 |
| | | | 200 - 450 | 140 - 240 | Heavy Profile | 25% | 125% | 350 |
| | | | 300 - 550 | 350 - 500 | HEM* Profile | 10% | 200% | 500 |
| | | | 240 - 320 | 240 - 320 | Semi-Finishing | 6-8% | 200% | 300 |
| | **Cast Ductile / Nodular** 40010, 60-40-18, 65-45-12 32510, 32518 | 35 - 60% | 100 - 240 | 80 - 140 | Full Slotting | 100% | 100% | 225 |
| | | | 200 - 300 | 100 - 150 | Heavy Profile | 25% | 125% | 275 |
| | | | 300 - 500 | 170 - 270 | HEM* Profile | 10% | 200% | 450 |
| | | | 220 - 320 | 140 - 200 | Semi-Finishing | 6-8% | 200% | 300 |
| S | **Cobalt Base** Haynes 21, 25, L-605, Mar-M302, NASA Co-W-Re, Stellite, Ultimet | 5 - 30% | 60 - 100 | 30 - 80 | Full Slotting | 100% | 30% | 80 |
| | | | 60 - 100 | 30 - 80 | Heavy Profile | 20% | 75% | 80 |
| | | | 100 - 170 | 80 - 100 | HEM* Profile | 8% | 125% | 130 |
| | | | 70 - 100 | 70 - 90 | Semi-Finishing | 5-7% | 150% | 90 |
| | **Iron Base** A-286, Discaloy Incoloy 800-802, Multimet, 16-25-6 | 9 - 45% | 50 - 80 | 30 - 60 | Full Slotting | 100% | 20% | 70 |
| | | | 70 - 120 | 30 - 60 | Heavy Profile | 20% | 75% | 100 |
| | | | 100 - 160 | 60 - 80 | HEM* Profile | 8% | 125% | 140 |
| | | | 70 - 100 | 50 - 70 | Semi-Finishing | 5-7% | 150% | 80 |
| | **Nickel Base** Hastelloy, Haynes 242, Inconel 600, 625, 718, Invar, Kovar, Monel, Nimonic, Rene 41, 77, 95, Udimet, Waspaloy | 9 - 45% | 60 - 80 | 30 - 70 | Full Slotting | 100% | 20% | 70 |
| | | | 60 - 100 | 30 - 80 | Heavy Profile | 20% | 75% | 90 |
| | | | 100 - 150 | 70 - 120 | HEM* Profile | 8% | 150% | 125 |
| | | | 80 - 120 | 60 - 80 | Semi-Finishing | 5-7% | 150% | 100 |
| | **Titanium** 6Al-4V, Commercially Pure, Titanium Aluminide | 5 - 30% | 100 - 140 | 70 - 110 | Full Slotting | 100% | 50% | 140 |
| | | | 100 - 160 | 80 - 120 | Heavy Profile | 20% | 100% | 180 |
| | | | 180 - 300 | 100 - 140 | HEM* Profile | 10% | 150% | 275 |
| | | | 160 - 360 | 80 - 120 | Semi-Finishing | 5-7% | 150% | 250 |
| | **Titanium** Ti 10-2-3, Beta 21S, Ti5553 | 5 - 30% | 70 - 110 | 50 - 80 | Full Slotting | 100% | 20% | 70 |
| | | | 80 - 110 | 70 - 100 | Heavy Profile | 20% | 100% | 80 |
| | | | 100 - 150 | 80 - 120 | HEM* Profile | 8% | 150% | 100 |
| | | | 80 - 130 | 80 - 100 | Semi-Finishing | 5-7% | 150% | 110 |

HEM* = High Efficiency Machining

| Chip Load Per Tooth (Inches) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
| 0.0006 | 0.0009 | 0.0012 | 0.0015 | 0.0018 | 0.0022 | 0.0027 | 0.0032 | 0.0037 |
| 0.0008 | 0.0012 | 0.0017 | 0.0021 | 0.0024 | 0.0029 | 0.0036 | 0.0042 | 0.0051 |
| 0.0011 | 0.0016 | 0.0022 | 0.0027 | 0.0033 | 0.004 | 0.0049 | 0.0058 | 0.0067 |
| 0.0009 | 0.0014 | 0.0018 | 0.0023 | 0.0027 | 0.0033 | 0.0041 | 0.0048 | 0.0056 |
| 0.0006 | 0.0009 | 0.0012 | 0.0015 | 0.0018 | 0.0022 | 0.0027 | 0.0032 | 0.0037 |
| 0.0008 | 0.0012 | 0.0017 | 0.0021 | 0.0024 | 0.0029 | 0.0036 | 0.0042 | 0.0051 |
| 0.0011 | 0.0016 | 0.0021 | 0.0026 | 0.0032 | 0.0039 | 0.0047 | 0.0056 | 0.0065 |
| 0.0008 | 0.0013 | 0.0017 | 0.0021 | 0.0025 | 0.0031 | 0.0038 | 0.0045 | 0.0052 |
| 0.0003 | 0.0005 | 0.0009 | 0.0011 | 0.0013 | 0.0017 | 0.0021 | 0.0025 | 0.0029 |
| 0.0004 | 0.0007 | 0.0012 | 0.0015 | 0.0018 | 0.0024 | 0.0029 | 0.0035 | 0.004 |
| 0.0007 | 0.0011 | 0.002 | 0.0024 | 0.0028 | 0.0037 | 0.0046 | 0.0054 | 0.0063 |
| 0.0005 | 0.0008 | 0.0014 | 0.0017 | 0.002 | 0.0026 | 0.0032 | 0.0038 | 0.0044 |
| 0.0004 | 0.0006 | 0.0008 | 0.0012 | 0.0016 | 0.002 | 0.0024 | 0.0028 | 0.0032 |
| 0.0006 | 0.0008 | 0.0011 | 0.0017 | 0.0021 | 0.0027 | 0.0032 | 0.0037 | 0.0044 |
| 0.0009 | 0.0013 | 0.0017 | 0.0026 | 0.0035 | 0.0043 | 0.0052 | 0.0061 | 0.0069 |
| 0.0006 | 0.0009 | 0.0012 | 0.0018 | 0.0024 | 0.003 | 0.0036 | 0.0042 | 0.0048 |
| 0.0005 | 0.0006 | 0.001 | 0.0014 | 0.0018 | 0.0022 | 0.0026 | 0.003 | 0.0035 |
| 0.0007 | 0.0008 | 0.0014 | 0.0019 | 0.0024 | 0.0029 | 0.0035 | 0.0039 | 0.0048 |
| 0.0009 | 0.0011 | 0.0018 | 0.0025 | 0.0033 | 0.0039 | 0.0047 | 0.0055 | 0.0064 |
| 0.0008 | 0.0009 | 0.0015 | 0.0021 | 0.0027 | 0.0032 | 0.0039 | 0.0045 | 0.0053 |
| 0.0003 | 0.0005 | 0.0008 | 0.0011 | 0.0014 | 0.0018 | 0.0022 | 0.0026 | 0.003 |
| 0.0004 | 0.0007 | 0.001 | 0.0015 | 0.0019 | 0.0024 | 0.0029 | 0.0035 | 0.0042 |
| 0.0008 | 0.0013 | 0.0019 | 0.0028 | 0.0035 | 0.0045 | 0.0055 | 0.0066 | 0.0075 |
| 0.0005 | 0.0008 | 0.0011 | 0.0017 | 0.0021 | 0.0027 | 0.0033 | 0.004 | 0.0045 |
| 0.0003 | 0.0004 | 0.0008 | 0.0012 | 0.0015 | 0.0019 | 0.0022 | 0.0026 | 0.003 |
| 0.0004 | 0.0006 | 0.0011 | 0.0017 | 0.002 | 0.0025 | 0.0029 | 0.0034 | 0.0042 |
| 0.0007 | 0.0009 | 0.0017 | 0.0026 | 0.0033 | 0.0041 | 0.0048 | 0.0056 | 0.0065 |
| 0.0003 | 0.0004 | 0.0008 | 0.0012 | 0.0015 | 0.0019 | 0.0022 | 0.0026 | 0.003 |
| 0.0004 | 0.0006 | 0.0011 | 0.0015 | 0.0019 | 0.0023 | 0.0028 | 0.0032 | 0.0036 |
| 0.0006 | 0.0008 | 0.0015 | 0.0021 | 0.0025 | 0.0031 | 0.0037 | 0.0042 | 0.005 |
| 0.001 | 0.0015 | 0.0028 | 0.0038 | 0.0048 | 0.0058 | 0.0069 | 0.0079 | 0.009 |
| 0.0006 | 0.0009 | 0.0017 | 0.0023 | 0.0029 | 0.0035 | 0.0041 | 0.0047 | 0.0054 |
| 0.0004 | 0.0005 | 0.0008 | 0.0012 | 0.0016 | 0.002 | 0.0024 | 0.0028 | 0.0032 |
| 0.0006 | 0.0007 | 0.0011 | 0.0017 | 0.0021 | 0.0027 | 0.0032 | 0.0037 | 0.0044 |
| 0.001 | 0.0013 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 | 0.008 |
| 0.0006 | 0.0008 | 0.0012 | 0.0018 | 0.0024 | 0.003 | 0.0036 | 0.0042 | 0.0048 |
| 0.0002 | 0.0003 | 0.0005 | 0.0008 | 0.001 | 0.0013 | 0.0016 | 0.0019 | 0.0022 |
| 0.0003 | 0.0005 | 0.0008 | 0.0012 | 0.0014 | 0.0019 | 0.0023 | 0.0027 | 0.0033 |
| 0.0006 | 0.0008 | 0.0014 | 0.0022 | 0.0028 | 0.0036 | 0.0044 | 0.0053 | 0.0061 |
| 0.0003 | 0.0005 | 0.0008 | 0.0012 | 0.0015 | 0.002 | 0.0024 | 0.0029 | 0.0033 |
| 0.0003 | 0.0004 | 0.0008 | 0.0012 | 0.0015 | 0.0019 | 0.0022 | 0.0026 | 0.003 |
| 0.0005 | 0.0006 | 0.0012 | 0.0018 | 0.0022 | 0.0027 | 0.0032 | 0.0037 | 0.0045 |
| 0.0007 | 0.001 | 0.0019 | 0.0029 | 0.0036 | 0.0046 | 0.0053 | 0.0062 | 0.0072 |
| 0.0005 | 0.0006 | 0.0012 | 0.0018 | 0.0023 | 0.0029 | 0.0033 | 0.0039 | 0.0045 |
| 0.0002 | 0.0003 | 0.0005 | 0.0008 | 0.001 | 0.0013 | 0.0016 | 0.0019 | 0.0022 |
| 0.0003 | 0.0005 | 0.0008 | 0.0012 | 0.0014 | 0.0019 | 0.0023 | 0.0027 | 0.0033 |
| 0.0005 | 0.0007 | 0.0012 | 0.0019 | 0.0024 | 0.0031 | 0.0038 | 0.0046 | 0.0053 |
| 0.0003 | 0.0005 | 0.0008 | 0.0012 | 0.0015 | 0.002 | 0.0024 | 0.0029 | 0.0033 |
| 0.0003 | 0.0004 | 0.0008 | 0.0012 | 0.0016 | 0.002 | 0.0023 | 0.0027 | 0.0031 |
| 0.0005 | 0.0006 | 0.0012 | 0.0018 | 0.0023 | 0.0029 | 0.0033 | 0.0038 | 0.0047 |
| 0.0007 | 0.0009 | 0.0017 | 0.0026 | 0.0035 | 0.0043 | 0.005 | 0.0059 | 0.0067 |
| 0.0005 | 0.0006 | 0.0012 | 0.0018 | 0.0024 | 0.003 | 0.0035 | 0.0041 | 0.0047 |
| 0.0002 | 0.0003 | 0.0005 | 0.0008 | 0.001 | 0.0013 | 0.0016 | 0.0019 | 0.0022 |
| 0.0003 | 0.0005 | 0.0008 | 0.0012 | 0.0014 | 0.0019 | 0.0023 | 0.0027 | 0.0033 |
| 0.0005 | 0.0007 | 0.0012 | 0.0019 | 0.0024 | 0.0031 | 0.0038 | 0.0046 | 0.0053 |
| 0.0003 | 0.0005 | 0.0008 | 0.0012 | 0.0015 | 0.002 | 0.0024 | 0.0029 | 0.0033 |

| ISO Grade | Material / Grade | Machinability Rating | SFM Hardness | | Application | Rad DOC | Axial DOC | SFM |
|---|---|---|---|---|---|---|---|---|
| | | | < 32Rc | > 32Rc | | % of DIA | x DIA | Starting (<32Rc) |
| P | **Carbon Steel** 10XX, 11XX 12XX, 15XX | 50 - 100% | 340 - 480 | 120 - 200 | Full Slotting | 100% | 125% | 400 |
| | | | 280 - 520 | 120 - 200 | Heavy Profile | 25% | 150% | 450 |
| | | | 500 - 850 | 225 - 325 | HEM* Profile | 15% | 200% | 550 |
| | | | 280 - 360 | 160 - 240 | Finishing | 2-5% | 200% | 325 |
| | **Alloy Steel** 13XX, 40XX, 41XX, 43XX 44XX, 46XX, 47XX, 48XX | 45 - 65% | 220 - 375 | 80 - 160 | Full Slotting | 100% | 125% | 300 |
| | | | 240 - 400 | 120 - 180 | Heavy Profile | 25% | 150% | 375 |
| | | | 450 - 750 | 175 - 300 | HEM* Profile | 15% | 200% | 500 |
| | | | 300 - 360 | 160 - 200 | Finishing | 2-5% | 200% | 325 |
| | **Mold & Die Steel** 300M, 4340, 52100, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2 | 35 - 65% | 180 - 260 | 60 - 120 | Full Slotting | 100% | 100% | 225 |
| | | | 180 - 300 | 60 - 120 | Heavy Profile | 25% | 125% | 275 |
| | | | 350 - 500 | 150 - 275 | HEM* Profile | 10% | 200% | 400 |
| | | | 240 - 320 | 100 - 180 | Finishing | 2-5% | 200% | 300 |
| | **Tool Steel** PM STEELS | 25 - 50% | 100 - 220 | - | Full Slotting | 100% | 125% | 200 |
| | | | 140 - 260 | - | Heavy Profile | 25% | 150% | 230 |
| | | | 275 - 475 | - | HEM* Profile | 10% | 200% | 350 |
| | | | 200 - 280 | - | Finishing | 2-5% | 200% | 250 |
| M | **Austenitic Stainless** 301, 302, 303, 304/304L/304H, 316/316L, 317L, 321/321H, 347/347H, Nitronic, 309/309S, 310/310S/310H, 330 | 40 - 65% | 160 - 250 | 60 - 130 | Full Slotting | 100% | 100% | 225 |
| | | | 160 - 300 | 60 -130 | Heavy Profile | 25% | 125% | 275 |
| | | | 300 - 500 | 150 - 275 | HEM* Profile | 10% | 200% | 375 |
| | | | 160 - 235 | 115 - 180 | Finishing | 2-5% | 200% | 250 |
| | **Martensitic Stainless** 403, 405, 409, 410/410S/410HT, 416/416HT, 420, 422, 430, 440C | 25 - 75% | 160 - 260 | 80 - 200 | Full Slotting | 100% | 100% | 225 |
| | | | 180 - 280 | 80 - 200 | Heavy Profile | 25% | 125% | 275 |
| | | | 275 - 450 | 125 - 250 | HEM* Profile | 10% | 200% | 400 |
| | | | 200 - 280 | 120 - 220 | Finishing | 2-5% | 200% | 250 |
| | **Precipitation Stainless** 13-8 PH, 15-5 PH, 15-7 PH 17-4 PH, 17-7 PH, S143 | 30 - 45% | 130 - 180 | 80 - 160 | Full Slotting | 100% | 100% | 160 |
| | | | 145 - 225 | 80 - 100 | Heavy Profile | 25% | 125% | 175 |
| | | | 160 - 475 | 125 - 250 | HEM* Profile | 10% | 200% | 400 |
| | | | 200 - 275 | 120 - 220 | Finishing | 2-5% | 200% | 225 |
| K | **Cast Iron Grey** 20A, 25A, 30A, 35A, 40A, 45A, 50A | 35 - 70% | 200 - 350 | 110 - 240 | Full Slotting | 100% | 100% | 275 |
| | | | 200 - 450 | 140 - 240 | Heavy Profile | 25% | 125% | 350 |
| | | | 300 - 550 | 350 - 500 | HEM* Profile | 10% | 200% | 500 |
| | | | 240 - 320 | 240 - 320 | Finishing | 2-5% | 200% | 300 |
| | **Cast Ductile / Nodular** 40010, 60-40-18, 65-45-12 32510, 32518 | 35 - 60% | 100 - 240 | 80 - 140 | Full Slotting | 100% | 100% | 225 |
| | | | 200 - 300 | 100 - 150 | Heavy Profile | 25% | 125% | 275 |
| | | | 300 - 500 | 170 - 270 | HEM* Profile | 10% | 200% | 450 |
| | | | 220 - 320 | 140 - 200 | Finishing | 2-5% | 200% | 300 |
| S | **Cobalt Base** Haynes 21, 25, L-605, Mar-M302, NASA Co-W-Re, Stellite, Ultimet | 5 - 30% | 60 - 100 | 30 - 80 | Full Slotting | 100% | 30% | 80 |
| | | | 60 - 100 | 30 - 80 | Heavy Profile | 20% | 75% | 80 |
| | | | 100 - 170 | 80 - 100 | HEM* Profile | 8% | 125% | 130 |
| | | | 70 - 100 | 70 - 90 | Finishing | 2-5% | 200% | 90 |
| | **Iron Base** A-286, Discaloy Incoloy 800-802, Multimet, 16-25-6 | 9 - 45% | 50 - 80 | 30 - 60 | Full Slotting | 100% | 20% | 70 |
| | | | 70 - 120 | 30 - 60 | Heavy Profile | 20% | 75% | 100 |
| | | | 100 - 160 | 60 - 80 | HEM* Profile | 8% | 125% | 140 |
| | | | 70 - 100 | 50 - 70 | Finishing | 2-5% | 200% | 80 |
| | **Nickel Base** Hastelloy, Haynes 242, Inconel 600, 625, 718, Invar, Kovar, Monel, Nimonic, Rene 41, 77, 95, Udimet, Waspaloy | 9 - 45% | 60 - 80 | 30 - 70 | Full Slotting | 100% | 20% | 70 |
| | | | 60 - 100 | 30 - 80 | Heavy Profile | 20% | 75% | 90 |
| | | | 100 - 150 | 70 - 120 | HEM* Profile | 8% | 150% | 125 |
| | | | 80 - 120 | 60 - 80 | Finishing | 2-5% | 200% | 100 |
| | **Titanium** 6Al-4V, Commercially Pure, Titanium Aluminide | 5 - 30% | 100 - 140 | 70 - 110 | Full Slotting | 100% | 50% | 140 |
| | | | 100 - 160 | 80 - 120 | Heavy Profile | 20% | 100% | 180 |
| | | | 180 - 300 | 100 - 140 | HEM* Profile | 10% | 150% | 275 |
| | | | 160 - 360 | 80 - 120 | Finishing | 2-5% | 200% | 250 |
| | **Titanium** Ti 10-2-3, Beta 21S, Ti 5553 | 5 - 30% | 70 - 110 | 50 - 80 | Full Slotting | 100% | 20% | 70 |
| | | | 80 - 110 | 70 - 100 | Heavy Profile | 20% | 100% | 80 |
| | | | 100 - 150 | 80 - 120 | HEM* Profile | 8% | 150% | 100 |
| | | | 80 - 130 | 80 - 100 | Finishing | 2-5% | 200% | 110 |

HEM* = High Efficiency Machining

| Chip Load Per Tooth (Inches) | | | | | | |
|---|---|---|---|---|---|---|
| 1/4 | 3/8 | 1/4 | 1/2 | 5/8 | 3/4 | 1 |
| 0.0008 | 0.0014 | 0.0018 | 0.0023 | 0.0027 | 0.0031 | .0043 |
| 0.0011 | 0.0019 | 0.0024 | 0.0031 | 0.0036 | 0.0043 | .0046 |
| 0.0015 | 0.0025 | 0.0033 | 0.0042 | 0.0049 | 0.0056 | .0060 |
| 0.0012 | 0.0021 | 0.0027 | 0.0035 | 0.0041 | 0.0047 | .0110 |
| 0.0008 | 0.0012 | 0.0018 | 0.0022 | 0.0027 | 0.0031 | .0043 |
| 0.0011 | 0.0016 | 0.0024 | 0.0029 | 0.0036 | 0.0043 | .0046 |
| 0.0014 | 0.0021 | 0.0032 | 0.0039 | 0.0047 | 0.0054 | .0060 |
| 0.0011 | 0.0017 | 0.0025 | 0.0031 | 0.0038 | 0.0043 | .0110 |
| 0.006 | 0.001 | 0.0014 | 0.0017 | 0.0021 | 0.0024 | .0033 |
| 0.0083 | 0.0014 | 0.0019 | 0.0024 | 0.0029 | 0.0033 | .0035 |
| 0.015 | 0.0025 | 0.0035 | 0.0043 | 0.0053 | 0.006 | .0055 |
| 0.009 | 0.0015 | 0.0021 | 0.0026 | 0.0032 | 0.0036 | .0084 |
| 0.0006 | 0.0013 | 0.0017 | 0.002 | 0.0025 | 0.0028 | .0035 |
| 0.0008 | 0.0017 | 0.0023 | 0.0027 | 0.0033 | 0.0039 | .0040 |
| 0.0013 | 0.0028 | 0.0037 | 0.0043 | 0.0054 | 0.0061 | .0058 |
| 0.0009 | 0.002 | 0.0026 | 0.003 | 0.0038 | 0.0042 | .0089 |
| 0.0007 | 0.0014 | 0.0018 | 0.0022 | 0.0026 | 0.0031 | .0040 |
| 0.001 | 0.0019 | 0.0024 | 0.0029 | 0.0034 | 0.0043 | .0043 |
| 0.0015 | 0.003 | 0.0039 | 0.0048 | 0.0056 | 0.0067 | .0056 |
| 0.0011 | 0.0021 | 0.0027 | 0.0033 | 0.0039 | 0.0047 | .0102 |
| 0.0005 | 0.0011 | 0.0014 | 0.0018 | 0.0022 | 0.0026 | .0030 |
| 0.0007 | 0.0015 | 0.0019 | 0.0024 | 0.0029 | 0.0036 | .0035 |
| 0.0013 | 0.0028 | 0.0035 | 0.0045 | 0.0055 | 0.0065 | .0050 |
| 0.0008 | 0.0017 | 0.0021 | 0.0027 | 0.0033 | 0.0039 | .0077 |
| 0.0005 | 0.0011 | 0.0015 | 0.0018 | 0.0022 | 0.0026 | .0035 |
| 0.0007 | 0.0015 | 0.002 | 0.0024 | 0.0029 | 0.0036 | .0040 |
| 0.0011 | 0.0024 | 0.0033 | 0.0039 | 0.0048 | 0.0056 | .0058 |
| 0.0005 | 0.0011 | 0.0015 | 0.0018 | 0.0022 | 0.0026 | .0089 |
| 0.0008 | 0.0015 | 0.002 | 0.0025 | 0.0028 | 0.0032 | .0040 |
| 0.0011 | 0.002 | 0.0027 | 0.0033 | 0.0037 | 0.0044 | .0043 |
| 0.002 | 0.0038 | 0.005 | 0.0063 | 0.007 | 0.008 | .0067 |
| 0.0012 | 0.0023 | 0.003 | 0.0038 | 0.0042 | 0.0048 | .0102 |
| 0.0006 | 0.0012 | 0.0016 | 0.002 | 0.0024 | 0.0028 | .0035 |
| 0.0008 | 0.0016 | 0.0021 | 0.0027 | 0.0032 | 0.0039 | .0037 |
| 0.0015 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 | .0058 |
| 0.0009 | 0.0018 | 0.0024 | 0.003 | 0.0036 | 0.0042 | .0089 |
| 0.0005 | 0.001 | 0.0012 | 0.0015 | 0.0018 | 0.0021 | .0027 |
| 0.0008 | 0.0014 | 0.0017 | 0.0022 | 0.0026 | 0.0032 | .0034 |
| 0.0014 | 0.0028 | 0.0033 | 0.0041 | 0.005 | 0.0058 | .0050 |
| 0.0008 | 0.0015 | 0.0018 | 0.0023 | 0.0027 | 0.0032 | .0069 |
| 0.0005 | 0.0012 | 0.0015 | 0.0018 | 0.0021 | 0.0025 | .0035 |
| 0.0008 | 0.0017 | 0.0022 | 0.0026 | 0.003 | 0.0038 | .0044 |
| 0.0012 | 0.0029 | 0.0036 | 0.0043 | 0.005 | 0.006 | .0065 |
| 0.0008 | 0.0018 | 0.0023 | 0.0027 | 0.0032 | 0.0038 | .0089 |
| 0.0005 | 0.001 | 0.0012 | 0.0015 | 0.0018 | 0.0021 | .0026 |
| 0.0008 | 0.0014 | 0.0017 | 0.0022 | 0.0026 | 0.0032 | .0033 |
| 0.0014 | 0.0028 | 0.0033 | 0.0041 | 0.005 | 0.0058 | .0048 |
| 0.0008 | 0.0015 | 0.0018 | 0.0023 | 0.0027 | 0.0032 | .0066 |
| 0.0005 | 0.0012 | 0.0015 | 0.0018 | 0.0022 | 0.0026 | .0034 |
| 0.0008 | 0.0017 | 0.0022 | 0.0026 | 0.0031 | 0.0039 | .0037 |
| 0.0011 | 0.0026 | 0.0033 | 0.0039 | 0.0048 | 0.0056 | .0057 |
| 0.0008 | 0.0018 | 0.0023 | 0.0027 | 0.0033 | 0.0039 | .0087 |
| 0.0005 | 0.001 | 0.0012 | 0.0015 | 0.0018 | 0.0021 | .0026 |
| 0.0008 | 0.0014 | 0.0017 | 0.0022 | 0.0026 | 0.0032 | .0033 |
| 0.0012 | 0.0024 | 0.0029 | 0.0036 | 0.0043 | 0.005 | .0048 |
| 0.0008 | 0.0015 | 0.0018 | 0.0023 | 0.0027 | 0.0032 | .0066 |

# TV-7 End Mills
# Cutting Data Recommendations

| ISO Grade | Material / Grade | SFM Hardness | | Application | Recommended Starting Parameters (<32Rc) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | < 32Rc | > 32Rc | | Rad DOC % of DIA | Axial DOC x DIA | SFM Starting (<32Rc) | Chip Load Per Tooth | | | | |
| | | | | | | | | 1/2 | 5/8 | 3/4 | 1 | 1 1/4 |
| P | **Carbon Steel** 10XX, 11XX 12XX, 15XX | 450 - 800 | 150 - 250 | HEM* Profile | 10% | 2x | 650 | .0050 | .0058 | .0067 | .0075 | .0083 |
| | | 450 - 800 | 150 - 250 | HEM* Profile | 7% | 2x | 650 | .0059 | .0069 | .0078 | .0088 | .0098 |
| | | 300 - 600 | 150 - 250 | Finishing | 2-3% | 2x | 450 | .0096 | .0112 | .0128 | .0144 | .0160 |
| | **Alloy Steel** 13XX, 40XX, 41XX, 43XX 44XX, 46XX, 47XX, 48XX | 400 - 750 | 100 - 200 | HEM* Profile | 10% | 2x | 600 | .0042 | .0050 | .0058 | .0067 | .0075 |
| | | 400 - 750 | 100 - 200 | HEM* Profile | 7% | 2x | 600 | .0049 | .0059 | .0069 | .0078 | .0088 |
| | | 200 - 450 | 100 - 200 | Finishing | 2-3% | 2x | 400 | .0080 | .0096 | .0112 | .0128 | .0144 |
| | **Mold & Die Steel** M50, A2, D2, H13, L2, M2, P20, S7, T15, W2 | 300 - 550 | 70 - 150 | HEM* Profile | 10% | 2x | 400 | .0037 | .0043 | .0050 | .0058 | .0067 |
| | | 300 - 550 | 70 - 150 | HEM* Profile | 7% | 2x | 400 | .0043 | .0051 | .0059 | .0069 | .0078 |
| | | 150 - 250 | 70 - 150 | Finishing | 2-3% | 2x | 200 | .0070 | .0083 | .0096 | .0112 | .0128 |
| | **Tool Steel** PM STEELS | 250 - 500 | – | HEM* Profile | 10% | 2x | 350 | .0042 | .0050 | .0058 | .0067 | .0075 |
| | | 250 - 500 | – | HEM* Profile | 7% | 2x | 350 | .0049 | .0059 | .0069 | .0078 | .0088 |
| | | 100 - 200 | – | Finishing | 2-3% | 2x | 150 | .0080 | .0096 | .0112 | .0128 | .0144 |
| M | **Austenitic Stainless** 301, 302, 303, 304/304L/304H, 316/316L, 317L, 321/321H, 347/347H, Nitronic, 309/309S, 310/310S/310H, 330 | 250 - 400 | 80 - 200 | HEM* Profile | 10% | 2x | 375 | .0040 | .0047 | .0053 | .0060 | .0067 |
| | | 250 - 400 | 80 - 200 | HEM* Profile | 7% | 2x | 375 | .0047 | .0055 | .0063 | .0071 | .0078 |
| | | 200 - 350 | 80 - 200 | Finishing | 2-3% | 2x | 250 | .0077 | .0090 | .0102 | .0115 | .0128 |
| | **Martensitic Stainless** 403, 405, 409, 410/410S/410HT, 416/416HT, 420, 422, 430, 440C | 300 - 500 | 100 - 250 | HEM* Profile | 10% | 2x | 400 | .0042 | .0050 | .0058 | .0067 | .0075 |
| | | 300 - 500 | 100 - 250 | HEM* Profile | 7% | 2x | 400 | .0049 | .0059 | .0069 | .0078 | .0088 |
| | | 300 - 450 | 100 - 250 | Finishing | 2-3% | 2x | 350 | .0080 | .0096 | .0112 | .0128 | .0144 |
| | **Precipitation Stainless** 13-8 PH, 15-5 PH, 15-7 PH 17-4 PH, 17-7 PH, S143 | 250 - 500 | 90 - 125 | HEM* Profile | 10% | 2x | 325 | .0040 | .0047 | .0053 | .0060 | .0067 |
| | | 250 - 500 | 90 - 125 | HEM* Profile | 7% | 2x | 325 | .0047 | .0055 | .0063 | .0071 | .0078 |
| | | 120 - 225 | 90 - 125 | Finishing | 2-3% | 2x | 225 | .0077 | .0090 | .0102 | .0115 | .0128 |
| K | **Cast Iron Grey** 20A, 25A, 30A, 35A, 40A, 45A, 50A | 400 - 750 | 130 - 300 | HEM* Profile | 10% | 2x | 550 | .0050 | .0058 | .0067 | .0075 | .0083 |
| | | 400 - 750 | 130 - 300 | HEM* Profile | 7% | 2x | 550 | .0059 | .0069 | .0078 | .0088 | .0098 |
| | | 375 - 500 | 130 - 300 | Finishing | 2-3% | 2x | 450 | .0096 | .0112 | .0128 | .0144 | .0160 |
| | **Cast Ductile / Nodular** 40010, 60-40-18, 65-45-12 32510, 32518 | 270 - 650 | 80 - 140 | HEM* Profile | 10% | 2x | 400 | .0033 | .0040 | .0047 | .0053 | .0060 |
| | | 270 - 650 | 80 - 140 | HEM* Profile | 7% | 2x | 400 | .0039 | .0047 | .0055 | .0063 | .0071 |
| | | 180 - 350 | 80 - 140 | Finishing | 2-3% | 2x | 275 | .0064 | .0077 | .0090 | .0102 | .0115 |
| S | **Cobalt Base** Haynes 21, 25, L-605, Mar-M302, NASA Co-W-Re, Stellite, Ultimet | 90 - 160 | 40 - 90 | HEM* Profile | 10% | 1.25x | 125 | .0027 | .0030 | .0035 | .0040 | .0045 |
| | | 90 - 160 | 40 - 90 | HEM* Profile | 7% | 1.25x | 125 | .0031 | .0035 | .0041 | .0047 | .0053 |
| | | 70 - 140 | 40 - 90 | Finishing | 2-3% | 1.5x | 100 | .0051 | .0058 | .0067 | .0077 | .0086 |
| | **Iron Base** A-286, Discaloy Incoloy 800-802, Multimet, 16-25-6 | 100 - 160 | 40 - 70 | HEM* Profile | 10% | 1.25x | 140 | .0030 | .0035 | .0040 | .0045 | .0050 |
| | | 100 - 160 | 40 - 70 | HEM* Profile | 7% | 1.25x | 140 | .0035 | .0041 | .0047 | .0053 | .0059 |
| | | 90 - 135 | 40 - 70 | Finishing | 2-3% | 1.5x | 110 | .0058 | .0067 | .0077 | .0086 | .0096 |
| | **Nickel Base** Hastelloy, Haynes 242, Inconel 600, 625, 718, Invar, Kovar, Monel, Nimonic, Rene 41, 77, 95, Udimet, Waspaloy | 100 - 150 | 40 - 90 | HEM* Profile | 10% | 1.5x | 130 | .0033 | .0040 | .0047 | .0053 | .0060 |
| | | 100 - 150 | 40 - 90 | HEM* Profile | 7% | 1.5x | 130 | .0039 | .0047 | .0055 | .0063 | .0071 |
| | | 105 - 180 | 40 - 90 | Finishing | 3% | 1.5x | 110 | .0064 | .0077 | .0090 | .0102 | .0115 |
| | **Titanium** 6Al-4V, Commercially Pure, Titanium Aluminide | 180 - 350 | 100 - 160 | HEM* Profile | 10% | 1.5x | 325 | .0033 | .0040 | .0047 | .0053 | .0060 |
| | | 180 - 350 | 100 - 160 | HEM* Profile | 7% | 1.5x | 325 | .0038 | .0045 | .0053 | .0063 | .0071 |
| | | 160 - 300 | 100 - 220 | Finishing | 3% | 1.5x | 250 | .0064 | .0077 | .0090 | .0102 | .0115 |
| | **Titanium** Ti 10-2-3, Beta 21S, Ti5553 | 120 - 180 | 80 - 140 | HEM* Profile | 10% | 1.5x | 150 | .0023 | .0028 | .0033 | .0038 | .0043 |
| | | 120 - 180 | 80 - 140 | HEM* Profile | 7% | 1.5x | 150 | .0027 | .0033 | .0039 | .0045 | .0051 |
| | | 80 - 140 | 100 - 120 | Finishing | 3% | 1.5x | 115 | .0045 | .0054 | .0064 | .0074 | .0083 |

HEM* = High Efficiency Machining

## MXR End Mills
## Cutting Data Recommendations

| ISO Grade | Material / Grade | SFM Hardness | | Application | Recommended Starting Parameters (<32Rc) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | < 32Rc | > 32Rc | | Rad DOC % of DIA | Axial DOC x DIA | SFM Starting (<32Rc) | Chip Load Per Tooth | | | | | |
| | | | | | | | | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
| S | **Cobalt Base** Haynes 21, 25, L-605, Mar-M302, NASA Co-W-Re, Stellite, Ultimet | 70 - 120 | 40 - 90 | Full Slotting | 100% | .33x | 100 | .0002 | .0005 | .0011 | .0014 | .0018 | .0023 | .0027 |
| | | 70 - 120 | 40 - 90 | Heavy Profile | 15% | .75x | 100 | .0003 | .0007 | .0015 | .0020 | .0025 | .0032 | .0038 |
| | | 150 - 210 | 80 - 100 | HEM Profile | 8% | 1.25x | 170 | .0004 | .0009 | .0020 | .0026 | .0033 | .0042 | .0050 |
| | **Iron Base** A-286, Discaloy Incoloy 800-802, Multimet, 16-25-6 | 60 - 90 | 40 - 70 | Full Slotting | 100% | .25x | 70 | .0003 | .0008 | .0015 | .0019 | .0025 | .0030 | .0035 |
| | | 80 - 140 | 40 - 70 | Heavy Profile | 15% | .75x | 120 | .0004 | .0011 | .0021 | .0026 | .0035 | .0042 | .0049 |
| | | 150 - 200 | 60 - 80 | HEM Profile | 8% | 1.25x | 170 | .0006 | .0015 | .0028 | .0034 | .0046 | .0055 | .0065 |
| | **Nickel Base** Hastelloy, Haynes 242, Inconel 600, 625, 718, Invar, Kovar, Monel, Nimonic, Rene 41, 77, 95, Udimet, Waspaloy | 70 - 100 | 40 - 80 | Full Slotting | 100% | .25x | 70 | .0002 | .0005 | .0011 | .0015 | .0019 | .0022 | .0026 |
| | | 70 - 120 | 40 - 90 | Heavy Profile | 15% | .75x | 90 | .0003 | .0007 | .0015 | .0021 | .0027 | .0031 | .0036 |
| | | 100 - 150 | 70 - 120 | HEM Profile | 8% | 1.50x | 125 | .0004 | .0009 | .0020 | .0028 | .0035 | .0041 | .0048 |
| | **Titanium** 6Al-4V, Commercially Pure, Titanium Aluminide | 120 - 180 | 80 - 120 | Full Slotting | 100% | .5x | 140 | .0003 | .0008 | .0015 | .0020 | .0025 | .0030 | .0034 |
| | | 120 - 200 | 90 - 130 | Heavy Profile | 30% | 1x | 160 | .0003 | .0008 | .0016 | .0022 | .0027 | .0033 | .0037 |
| | | 200 - 450 | 100 - 140 | HEM Profile | 10% | 1.5x | 350 | .0005 | .0013 | .0025 | .0033 | .0042 | .0050 | .0057 |
| | **Titanium** Ti 10-2-3, Beta 21S, Ti 5553 | 80 - 120 | 60 - 100 | Full Slotting | 100% | .25x | 100 | .0002 | .0005 | .0011 | .0015 | .0018 | .0022 | .0026 |
| | | 90 - 140 | 80 - 120 | Heavy Profile | 20% | 1x | 120 | .0003 | .0006 | .0014 | .0019 | .0023 | .0028 | .0033 |
| | | 100 - 150 | 80 - 120 | HEM Profile | 8% | 1.5x | 140 | .0004 | .0009 | .0020 | .0028 | .0033 | .0041 | .0048 |

## HXR End Mills
## Cutting Data Recommendations

| ISO Grade | Material / Grade | SFM Hardness | | Application | Recommended Starting Parameters (<32Rc) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | < 32Rc | > 32Rc | | Rad DOC % of DIA | Axial DOC x DIA | SFM Starting (<32Rc) | Chip Load Per Tooth | | | | | | |
| | | | | | | | | 3/8 | 1/2 | 5/8 | 3/4 | 1 | 1-1/4 | |
| S | **Cobalt Base** Haynes 21, 25, L-605, Mar-M302, NASA Co-W-Re, Stellite, Ultimet | 90-160 | 40 - 90 | HEM Profile | 10% | 1.25x | 125 | .0018 | .0023 | .0030 | .0038 | .0045 | .0053 | |
| | | 90-160 | 40 - 90 | HEM Profile | 7% | 1.25x | 125 | .0022 | .0027 | .0035 | .0045 | .0053 | .0063 | |
| | | 70- 140 | 40 - 90 | Finishing | 3% | 2x | 100 | .0032 | .0041 | .0053 | .0067 | .0079 | .0094 | |
| | **Iron Base** A-286, Discaloy Incoloy 800-802, Multimet, 16-25-6 | 100 -160 | 40 - 70 | HEM Profile | 10% | 1.25x | 140 | .0025 | .0031 | .0042 | .0050 | .0058 | .0067 | |
| | | 100 -160 | 40 - 70 | HEM Profile | 7% | 1.25x | 140 | .0029 | .0036 | .0049 | .0059 | .0069 | .0078 | |
| | | 90 - 135 | 40 - 70 | Finishing | 3% | 2x | 110 | .0044 | .0055 | .0073 | .0088 | .0103 | .0117 | |
| | **Nickel Base** Hastelloy, Haynes 242, Inconel 600, 625, 718, Invar, Kovar, Monel, Nimonic, Rene 41, 77, 95, Udimet, Waspaloy | 100 - 150 | 40 - 90 | HEM Profile | 10% | 1.5x | 125 | .0018 | .0025 | .0032 | .0037 | .0043 | .0050 | |
| | | 100 - 150 | 40 - 90 | HEM Profile | 7% | 1.5x | 125 | .0022 | .0029 | .0037 | .0043 | .0051 | .0059 | |
| | | 105 - 180 | 40 - 90 | Finishing | 3% | 2x | 110 | .0032 | .0044 | .0056 | .0064 | .0076 | .0088 | |
| | **Titanium** 6Al-4V, Commercially Pure, Titanium Aluminide | 180 - 350 | 100 - 160 | HEM Profile | 10% | 1.5x | 325 | .0025 | .0033 | .0042 | .0050 | .0057 | .0065 | |
| | | 180 - 350 | 100 - 160 | HEM Profile | 7% | 1.5x | 325 | .0029 | .0039 | .0049 | .0059 | .0067 | .0076 | |
| | | 160 - 300 | 100 - 220 | Finishing | 3% | 2x | 250 | .0044 | .0059 | .0073 | .0088 | .0100 | .0114 | |
| | **Titanium** Ti 10-2-3, Beta 21S, Ti5553 | 120 - 180 | 80 - 140 | HEM Profile | 10% | 1.5x | 150 | .0018 | .0025 | .0030 | .0037 | .0043 | .0050 | |
| | | 120 - 180 | 80 - 140 | HEM Profile | 7% | 1.5x | 150 | .0022 | .0029 | .0035 | .0043 | .0051 | .0059 | |
| | | 80 - 140 | 100 - 120 | Finishing | 3% | 2x | 115 | .0032 | .0044 | .0053 | .0064 | .0076 | .0088 | |

HEM* = High Efficiency Machining

## RXR End Mills
## Cutting Data Recommendations

| ISO Grade | Material / Grade | SFM Hardness | | Application | Recommended Starting Parameters (<32Rc) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | < 32Rc | > 32Rc | | Rad DOC % of DIA | Axial DOC x DIA | SFM Starting (<32Rc) | Chip Load Per Tooth | | | |
| | | | | | | | | 1/2 | 5/8 | 3/4 | 1 | 1-1/4 |
| S | **Cobalt Base** Haynes 21, 25, L-605 Mar-M302, NASA Co-W-Re, Stellite, Ultimet | 70 - 120 | 30 - 70 | Heavy Profile | 10% | 1.5x | 95 | .0027 | .0030 | .0035 | .0040 | .0045 |
| | | 70 - 120 | 30 - 70 | HEM Profile | 5-7% | 1.5x | 95 | .0031 | .0035 | .0041 | .0047 | .0053 |
| | | 55 - 105 | 30 - 70 | Finishing | 3% | 1.5x | 75 | .0047 | .0053 | .0062 | .0070 | .0079 |
| | **Iron Base** A-286, Discaloy, Incoloy 800-802, Multimet, 16-25-6 | 75 - 120 | 30 - 55 | Heavy Profile | 10% | 1.5x | 105 | .0030 | .0035 | .0040 | .0045 | .0050 |
| | | 75 - 120 | 30 - 55 | HEM Profile | 5-7% | 1.5x | 105 | .0035 | .0041 | .0047 | .0053 | .0059 |
| | | 70 - 100 | 30 - 55 | Finishing | 3% | 1.5x | 85 | .0053 | .0062 | .0070 | .0079 | .0088 |
| | **Nickel Base** Hastelloy, Haynes 242, Inconel 600, 625, 718, Invar, Kovar, Monel, Nimonic, Rene 41, 77, 95, Udimet, Waspaloy | 75 - 115 | 30 - 70 | Heavy Profile | 10% | 1.5x | 95 | .0035 | .0042 | .0051 | .0058 | .0066 |
| | | 75 - 115 | 30 - 70 | HEM Profile | 5-7% | 1.5x | 95 | .0041 | .0050 | .0059 | .0069 | .0078 |
| | | 60 - 105 | 75 - 90 | Finishing | 3% | 1.5x | 90 | .0044 | .0053 | .0064 | .0073 | .0085 |

## TRX 5 Flute End Mills
## Cutting Data Recommendations

| ISO Grade | Material / Grade | SFM Hardness | | Application | Recommended Starting Parameters (<32Rc) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | < 32Rc | > 32Rc | | Rad DOC % of DIA | Axial DOC x DIA | SFM Starting (<32Rc) | Chip Load Per Tooth | | | | | |
| | | | | | | | | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1 | 1-1/4 |
| S | **Titanium** 6Al-4V, Commercially Pure, Titanium Aluminide | 160 - 225 | 100 - 160 | Full Slotting | 100% | 1x | 200 | .0011 | .0018 | .0021 | .0025 | .0030 | .0035 | .0040 |
| | | 180 - 300 | 100 - 160 | Heavy Profile | 20% | 1.5x | 230 | .0013 | .0023 | .0026 | .0031 | .0038 | .0044 | .0050 |
| | | 225 - 350 | 100 - 160 | HEM Profile | 7% | 2x | 325 | .0021 | .0035 | .0041 | .0049 | .0059 | .0069 | .0078 |
| | | 180 - 300 | 100 - 220 | Finishing | 2-3% | 3x | 260 | .0034 | .0058 | .0067 | .0080 | .0096 | .0112 | .0128 |
| | **Titanium** Ti 10-2-3, Beta 21S, Ti 5553 | 80 - 110 | 60 - 100 | Full Slotting | 100% | .5x | 90 | .0010 | .0017 | .0021 | .0025 | .0029 | .0034 | .0039 |
| | | 90 - 120 | 80 - 100 | Heavy Profile | 20% | 1x | 95 | .0013 | .0022 | .0026 | .0031 | .0036 | .0043 | .0049 |
| | | 95 - 125 | 80 - 110 | HEM Profile | 12% | 1.5x | 105 | .0015 | .0027 | .0032 | .0038 | .0045 | .0052 | .0060 |
| | | 90 - 130 | 100 - 120 | Finishing | 3% | 2x | 120 | .0032 | .0056 | .0067 | .0080 | .0093 | .0109 | .0125 |

## TRX 7 Flute End Mills
## Cutting Data Recommendations

| ISO Grade | Material | SFM Hardness | | Application | Recommended Starting Parameters | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | < 32Rc | > 32Rc | | Rad DOC % of Dia. | Axial DOC x Dia. | SFM Starting (<32Rc) | Chip Load Per Tooth | | | | |
| | | | | | | | | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
| S | **Titanium** 6Al-4V, Commercially Pure, Titanium Aluminide | 180 - 300 | 100 - 160 | HEM Profile | 10% | 1.5x | 325 | .0030 | .0035 | .0042 | .0050 | .0058 |
| | | 225 - 350 | 100 - 160 | HEM Profile | 7% | 2x | 325 | .0035 | .0041 | .0049 | .0059 | .0069 |
| | | 180 - 300 | 100 - 220 | Finishing | 2-3% | 3x | 260 | .0058 | .0067 | .0080 | .0096 | .0112 |
| | **Titanium** Ti 10-2-3, Beta 21S, Ti 5553 | 90 - 120 | 80 - 100 | HEM Profile | 10% | 1x | 95 | .0028 | .0035 | .0042 | .0048 | .0057 |
| | | 95 - 125 | 80 - 110 | HEM Profile | 7% | 1.5x | 105 | .0033 | .0041 | .0049 | .0057 | .0067 |
| | | 90 - 130 | 100 - 120 | Finishing | 2-3% | 2x | 120 | .0054 | .0067 | .0080 | .0093 | .0109 |

## RMC Series
## Cutting Data Recommendations

| ISO Grade | Material / Grade | Lens Shape | | | | | Barrel Shape | | | | | Conical Taper Shape A&B | | | | | Oval Shape | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SFM | Fz (in) | | | | SFM | Fz (in) | | | | SFM | Fz (in) | | | | SFM | Fz (in) | | | |
| | | | 1/4 | 3/8 | 1/2 | 5/8 | | 1/4 | 3/8 | 1/2 | 5/8 | | 1/4 | 3/8 | 1/2 | 5/8 | | 1/4 | 3/8 | 1/2 | 5/8 |
| P | **Carbon Steel** 10XX, 11XX, 12XX, 15XX | 900 | .0010 | .0015 | .0020 | .0025 | 900 | .0013 | .0019 | .0025 | .0031 | 900 | .0008 | .0011 | .0015 | .0019 | 900 | .0013 | .0019 | .0025 | .0031 |
| | **Alloy Steel** 13XX, 40XX, 41XX, 43XX, 44XX, 46XX, 47XX, 48XX | 800 | .0010 | .0015 | .0020 | .0025 | 825 | .0010 | .0015 | .0020 | .0025 | 825 | .0008 | .0011 | .0015 | .0019 | 825 | .0010 | .0015 | .0020 | .0025 |
| | **Mold & Die Steel** 300M, 4340, 52100, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2 | 650 | .0008 | .0011 | .0015 | .0019 | 675 | .0008 | .0011 | .0015 | .0019 | 675 | .0005 | .0008 | .0010 | .0013 | 675 | .0008 | .0011 | .0015 | .0019 |
| | **Tool Steel** PM STEELS | 600 | .0005 | .0008 | .0010 | .0013 | 650 | .0005 | .0008 | .0010 | .0013 | 650 | .0005 | .0008 | .0010 | .0013 | 650 | .0005 | .0008 | .0010 | .0013 |
| M | **Austenitic Stainless** 301, 302, 303, 304/304L/304H, 316/316L, 317L, 321/321H, 347/347H, Nitronic, 309/309S, 310/310S/310H, 330 | 400 | .0005 | .0008 | .0010 | .0013 | 275 | .0005 | .0008 | .0010 | .0013 | 275 | .0005 | .0008 | .0010 | .0013 | 275 | .0005 | .0008 | .0010 | .0013 |
| | **Martensitic Stainless** 403, 405, 409, 410/410S/410HT, 416/416HT, 420, 422, 430, 440C | 500 | .0005 | .0008 | .0010 | .0013 | 325 | .0005 | .0008 | .0010 | .0013 | 325 | .0005 | .0008 | .0010 | .0013 | 325 | .0005 | .0008 | .0010 | .0013 |
| | **Precipitation Stainless** 13-8 PH, 15-5 PH, 15-7 PH, 17-4 PH, 17-7 PH, S143 | 300 | .0003 | .0004 | .0005 | .0006 | 200 | .0003 | .0004 | .0005 | .0006 | 200 | .0003 | .0004 | .0005 | .0006 | 200 | .0003 | .0004 | .0005 | .0006 |
| K | **Cast Iron Grey** 20A, 25A, 30A, 35A, 40A, 45A, 50A | 1000 | .0013 | .0019 | .0025 | .0031 | 925 | .0013 | .0019 | .0025 | .0031 | 925 | .0010 | .0015 | .0020 | .0025 | 925 | .0013 | .0019 | .0025 | .0031 |
| | **Cast Ductile /Nodular** 40010, 60-40-18, 65-45-12, 32518 | 900 | .0010 | .0015 | .0020 | .0025 | 825 | .0010 | .0015 | .0020 | .0025 | 825 | .0010 | .0015 | .0020 | .0025 | 825 | .0010 | .0015 | .0020 | .0025 |
| N | **Aluminum** | 2300 | .0013 | .0019 | .0025 | .0031 | 1950 | .0013 | .0019 | .0025 | .0031 | 1950 | .0010 | .0015 | .0020 | .0025 | 1950 | .0013 | .0019 | .0025 | .0031 |
| | **Brass / Bronze** | 1900 | .0010 | .0015 | .0020 | .0025 | 1300 | .0010 | .0015 | .0020 | .0025 | 1300 | .0008 | .0011 | .0015 | .0019 | 1300 | .0013 | .0019 | .0025 | .0031 |
| | **Copper Alloys** | 900 | .0010 | .0015 | .0020 | .0025 | 600 | .0010 | .0015 | .0020 | .0025 | 600 | .0010 | .0015 | .0020 | .0025 | 600 | .0010 | .0015 | .0020 | .0025 |
| | **Magnesium** | 1800 | .0018 | .0026 | .0035 | .0044 | 1300 | .0018 | .0026 | .0035 | .0044 | 1300 | .0018 | .0026 | .0035 | .0044 | 1300 | .0018 | .0026 | .0035 | .0044 |
| S | **Cobalt Base** Haynes 21, 25, L-605, Mar-M302, NASA Co-W-Re, Stellite, Ultimet | 250 | .0003 | .0004 | .0005 | .0006 | 100 | .0003 | .0004 | .0005 | .0006 | 100 | .0003 | .0004 | .0005 | .0006 | 100 | .0003 | .0004 | .0005 | .0006 |
| | **Iron Base** A-286, Discaloy, Incoloy 800-802, Multimet, 16-25-6 | 250 | .0003 | .0004 | .0005 | .0006 | 100 | .0003 | .0004 | .0005 | .0006 | 100 | .0003 | .0004 | .0005 | .0006 | 100 | .0003 | .0004 | .0005 | .0006 |
| | **Nickel Base** Hastelloy, Haynes 242, Inconel 600, 625, 718, Kovar, Monel, Nimonic, Rene 41, 77, 95 Udimet, Waspaloy | 250 | .0003 | .0004 | .0005 | .0006 | 100 | .0003 | .0004 | .0005 | .0006 | 100 | .0003 | .0004 | .0005 | .0006 | 100 | .0003 | .0004 | .0005 | .0006 |
| | **Titanium** 6Al-4V, Commercially Pure Aluminide | 500 | .0008 | .0011 | .0015 | .0019 | 325 | .0003 | .0004 | .0005 | .0006 | 325 | .0008 | .0011 | .0015 | .0019 | 325 | .0008 | .0011 | .0015 | .0019 |
| | **Titanium** Ti 0-2-3, Beta 21S, Ti 5553 | 400 | .0005 | .0008 | .0010 | .0013 | 250 | .0005 | .0008 | .0010 | .0013 | 250 | .0005 | .0008 | .0010 | .0013 | 250 | .0005 | .0008 | .0010 | .0013 |

## MDR Ballnose
## Cutting Data Recommendations

| ISO Grade | Material / Grade | Machinability Rating | Application | Recommended Starting Parameters (<32Rc) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Axial DOC | SFM Hardness | | | SFM Starting (<50Rc) | Chip Load Per Tooth | | | | | | | |
| | | | | | < 40Rc | 40-50Rc | > 50Rc | | 1/16 | 3/32 | 1/8 | 3/16 | 1/4 | 3/8 | 1/2 |
| P | **Mold & Die Steel** 300M, 4340, 52100, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2 | 35-65% | Finishing | 3% | 750-1000 | 800-1200 | 800-1200 | 1000 | .0008 | .0012 | .0022 | .0025 | .0030 | .0045 | .0060 |

| RPM |
|---|
| (3.82 x SFM) / tool diameter |

| SFM |
|---|
| RPM x .262 x tool diameter |

| FEED RATE (in / min) |
|---|
| chipload x # flutes x RPM |

| Material Removal Rate ($in^3$ / min) |
|---|
| Feed Rate x ADoC x RDoC |

| Feed / Tooth (in) |
|---|
| Feed Rate / (RPM x # Flutes) |

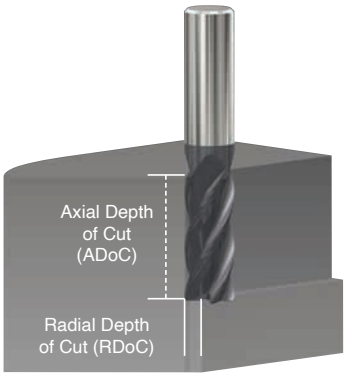
| Required Motor Horsepower |
|---|
| Feed rate x axial doc x radial doc x unit power x machine efficiency % |

**Radial Chip Thinning**

$$\frac{\text{Chipload x (dia/2)}}{\sqrt{(\text{dia x RDoC}) - \text{RDoC}^2}}$$

| Reduce SFM When End Mill is Projecting From the Tool Holder | |
|---|---|
| PROJECTION LENGTH < 2.5 X Ø | REDUCE SPEEDS & FEEDS 0% |
| 2.5 X Ø | 15% |
| 3 X Ø | 20% |
| 4 X Ø | 55% |
| 5 X Ø | 65% |
| 6 X Ø | 75% |

Ramp Angle = 1° - 3°
Reduce chipload by 20% of slotting rates.




Apply radial chip thinning formula when RDoC < 0.5 x tool dia.

See chart for SFM reductions for projection length > 2.5 x tool dia.

# Inquiry Sheet Solid Carbide End Mills

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## Customer Information

| | | | |
|---|---|---|---|
| Company | | Contact | |
| Address | | Phone | |
| | | E-Mail | |
| | | Date | |

## Application

- ☐ Roughing
- ☐ Finishing
- ☐ Corner Milling 
- ☐ Slotting 
- ☐ Circular Milling 
- ☐ Pocket Milling 
- ☐ Dynamic Milling 
- ☐ Other _____

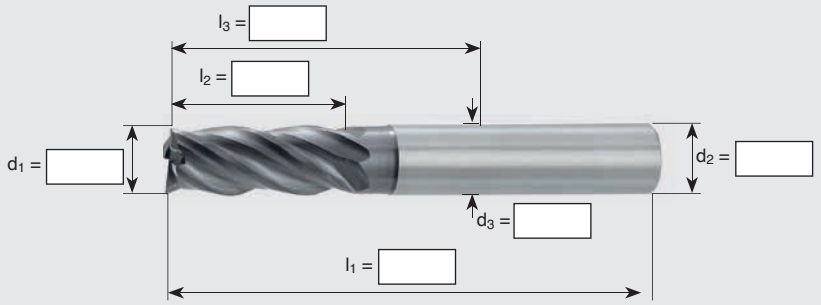
## Machine Information

| | | | |
|---|---|---|---|
| Machine Type | | | |
| Tool Clamping | | | |
| Spindle Position | ☐ Horizontal | ☐ Vertical | ☐ 5-Axis |
| Lubrication | ☐ Oil | ☐ Dry | ☐ Emulsion _____% |
| | ☐ MQL | ☐ Air Pressure | ☐ Dust Collection |

## Workpiece Data

| | |
|---|---|
| Material | |
| Material Grade | |
| Hardness | |
| Depth of Cut | |
| Width of Cut | |

## Dimensions




| | | | |
|---|---|---|---|
| Corner Radius | | Edge Protection | x 45° |
| Roughing Profile | ☐ Yes ☐ No | Chipbreaker | ☐ Yes ☐ No |

## Tool Data

| | |
|---|---|
| Tool similar to | |
| Number of Flutes | |
| Center Cutting | ☐ Yes ☐ No |
| Coating | ☐ ESG ☐ ESR ☐ ZRN<br>☐ TiN ☐ X ☐ N/A<br>☐ Other _____ |
| Shank Type | ☐ Weldon ☐ Straight ☐ Other _____ |
| Coolant Through | ☐ Axial ☐ Radial ☐ None |

## Quantity & Pricing

| | | | |
|---|---|---|---|
| Quantity Needed **(Minimum of 6 pieces)** | | | |
| Target Pricing? | | ☐ Distributor | ☐ End User |

## Notes

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## Customer Information

| | | | |
|---|---|---|---|
| Company | | Contact | |
| Address | | Phone | |
| | | E-Mail | |
| | | Date | |

## Material

| | |
|---|---|
| Material Type | |
| Material Designation | |
| Hardness | |
| Additional Info | |

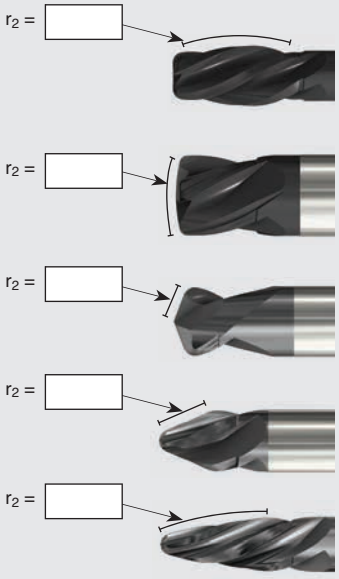
## Machine (5-Axis Required)

| | | |
|---|---|---|
| Spindle Adaptation | | |
| Max. Spindle Speed | | |
| Lubrication | ☐ Oil<br>☐ MQL<br>☐ Dry | ☐ Emulsion _____%<br>☐ Air Pressure<br>☐ Dust Collection |

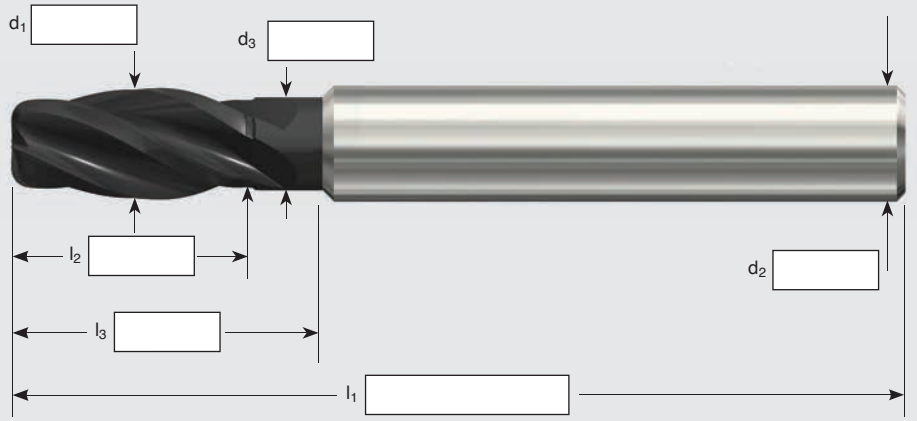
## Tool Data

| | | | |
|---|---|---|---|
| Quantity Breaks **(Minimum 6 Pieces)** | | Coating | ☐ Uncoated<br>☐ ESG<br>☐ ESR<br>_____<br>☐ ZRN<br>☐ TIN<br>☐ Other |

### Face Geometry




### Construction Dimensions




### Type of Shank


## Notes

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