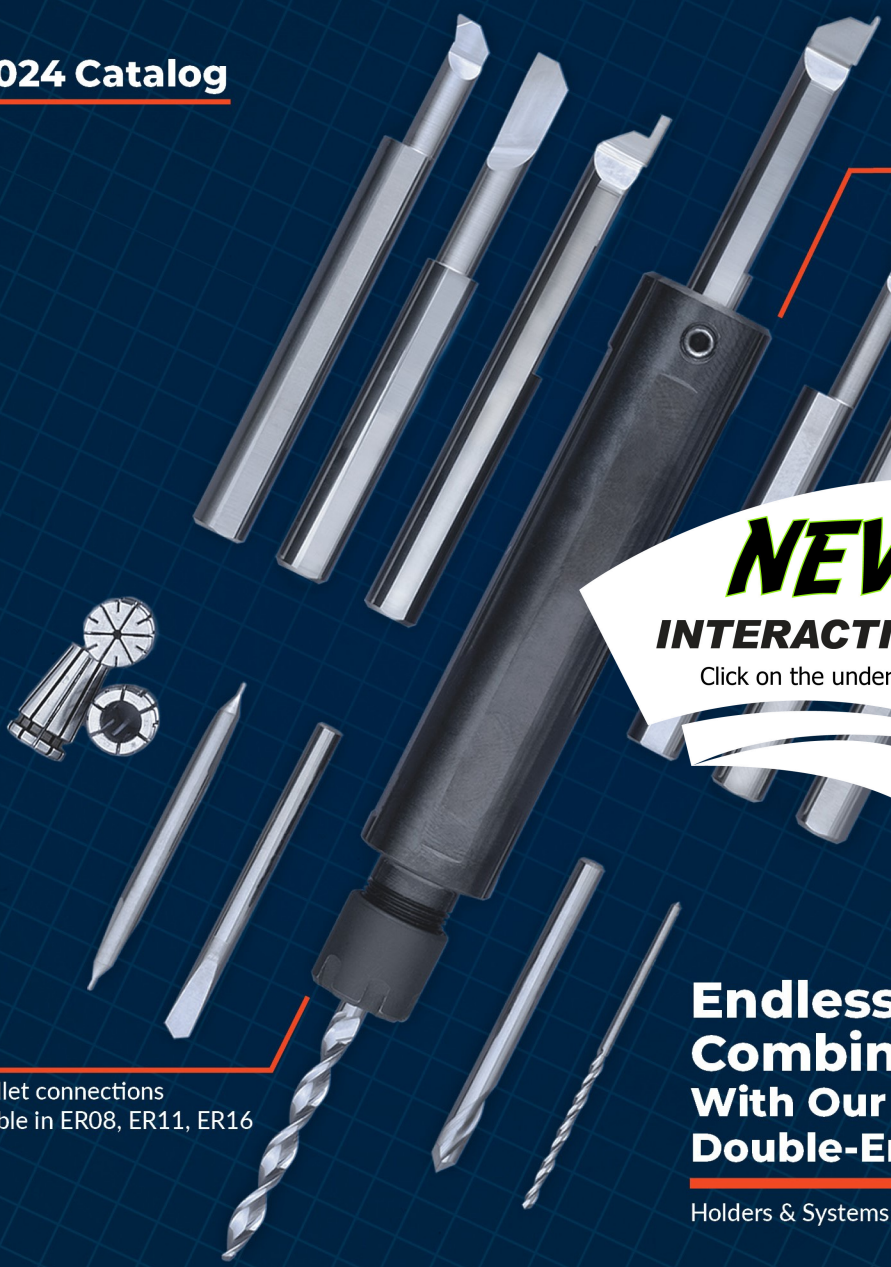
MICRO 100®

Make More With Micro 100

2024 Catalog

Available in Quick Change and Standard



NEW!

INTERACTIVE PDF

Click on the underlined text

ER collet connections available in ER08, ER11, ER16

Endless Combinations With Our NEW Double-Ended Holders

Holders & Systems begins pg 15

MICRO 100®

Your Source for Fully Stocked Turning Tools

Make More with Micro 100

In today's competitive machining industry, the pressure is high for shops to increase metal removal rates, boost productivity, and improve their bottom line. When “making more” is pivotal, you can count on Micro 100 to help you gain a competitive edge and set your shop up for success. From our expansive tool offering and off-the-shelf availability, to our excellent product quality and highly repeatable Micro-Quik Quick Change system, we guarantee you'll Make More with Micro 100 every time you choose us.

Endurance and Quality

Your search for high performance, solid round turning tools stops here! We manufacture an extremely broad selection of tooling for traditional and swiss lathes, designed to take your shop further.

Powerful Performance

With Micro 100, “difficult to machine materials” are easier to work in than ever before. Our products excel at vastly increased speed and feed rates and provide exceptional results, even in the toughest jobs.

Earned Reputation

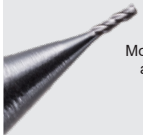
Micro 100's stellar reputation is the result of more than six decades serving the manufacturing industry with high precision, tightly-toleranced turning tools that drive shop productivity.

HARVEY PERFORMANCE COMPANY

HARVEY TOOL

Think Harvey Tool First

More than 29,000 miniature and specialty end mills. Ship today, in your machine tomorrow.



Helical

Let Helical Impress You

Material-optimized high performance carbide end mills. Run faster, push harder, machine smarter.

MICRO 100®

Make More with Micro 100

Exceptional quality turning tools designed for durability and performance in a range of difficult-to-machine materials.

TITAN USA

Trust in Titan USA

Broad assortment of quality, fully stocked cutting tools at exceptional value.

COREHOG

Innovative Tools for Innovative Materials

The industry's most innovative and advanced composite and honeycomb core cutting tools.

VALOR HOLEMAKING

Victory Starts with Valor Holemaking

High performance drills & complementary tooling solutions that revolutionize CNC holemaking.

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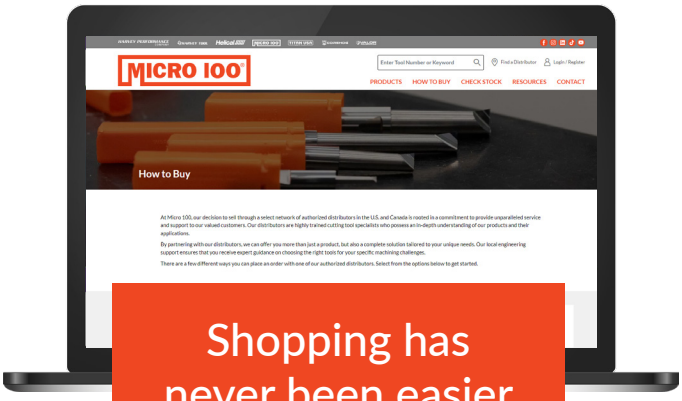

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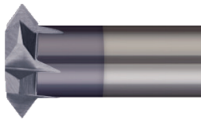

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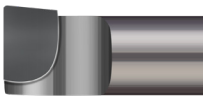

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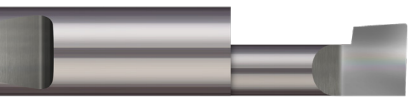

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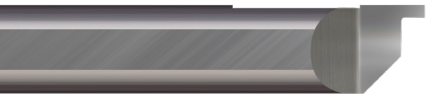

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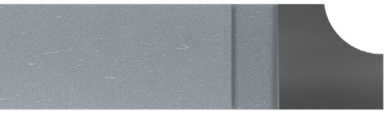

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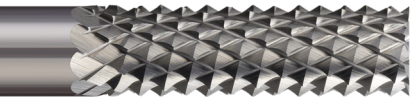

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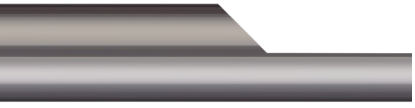

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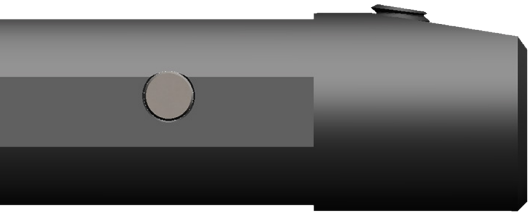
Tool Holders & Systems

Uniquely Designed to Help You **Make More.**



Quick Change Holders & Parts

Benefits & Options on pg 10

A breakthrough tool change system that saves machinists countless hours by allowing for incredibly fast tool changes without sacrificing locational repeatability or machining accuracy.

Standard Holders & Parts

Benefits & Options on pg 12

Designed for use with our standard shank tools in lathe applications, Micro 100's offering of Standard Tool Holders feature 4 alignment flats on the shank, providing added flexibility.

Rotational Holders & Parts

Starts on pg 49

Featuring Solid ER Taper Integrated Holders, this offering eliminates the need for multiple spindle adapters, is designed for Swiss and multi-function lathes, and works with any ER holder or ER spindle in both live and static applications.

Collets

Starts on pg 51

This offering of Collets includes ER Collets, Metric ID ER Collets, and Collet Sets, which are available in ER08, ER11, ER16, ER20, and ER32 Taper Sizes with both standard and metric options.

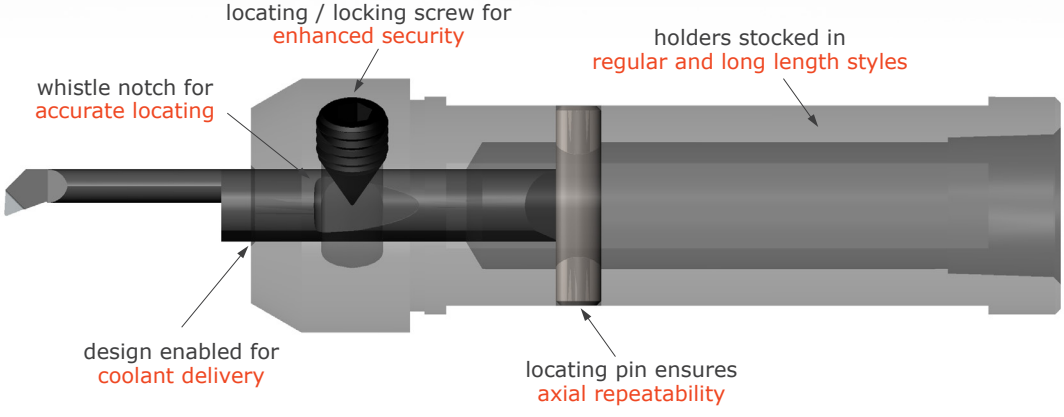
Animations, Benefits, and Details Found Online At
micro100.com/resources/tool-holders

Micro 100 **Micro-Quik**

Micro 100's Micro-Quik is a foolproof system that delivers impressive **radial and axial repeatability, tip-to-tip consistency, and part-to-part accuracy.** It features a whistle notch configuration, proven to enhance axial accuracy over the standard set screw design used by other quick change system manufacturers, to ensure that the tool is always held in location, anchored accurately in place, and pushed completely against the locating mechanism.

In critical accuracy situations, many customers have enjoyed .0002" tool-to-tool repeatability, achieved in fewer than 30 seconds. This is 90% faster than conventional tool change methods, which oftentimes take in excess of 5 minutes, start-to-finish. Because of its simplicity and extremely low margin for error, Micro-Quik is the preferred tool change method of machine shops worldwide, including those employing new and up-and-coming machinists.

How It Works



During tool changes, the precision ground bevel specially engineered on the rear of each Micro 100 quick change tool aligns with a locating pin in the quick change tool holder. The distance from this locational point to the tip of the tool is highly controlled, meaning that our Micro-Quik tooling system ensures a very high degree of tool length and centerline repeatability.

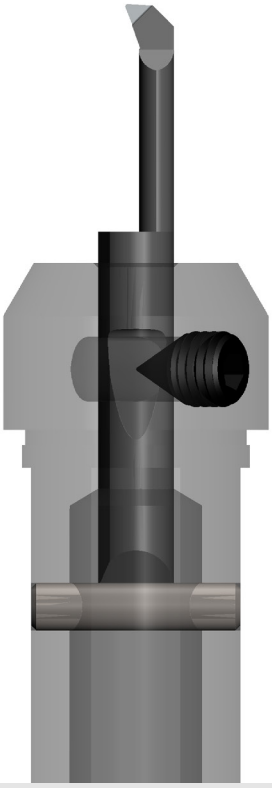
Quick Change Tool Holders

starts on pg 16

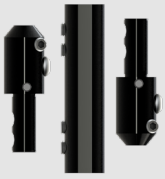
Whistle notch configuration proven to enhance axial accuracy.

Micro 100's offering of quick change tool holders, including our popular headless-style products, deliver unparalleled speed, repeatability, and accuracy. These unique holders are engineered for use in all **Swiss, standard lathe, or multi-function lathe machines** and are designed for ease of installation through the back side of the tool block.

More Than 3,000 Stocked Quick Change Tools Ready for your Quick Change Holders!



Quick Change Reference Guide

	Straight Holder Standard Length QTS / QTSP	Straight Holder Long Length QTSL / QTSPL	Headed Holder Standard Length QTH / QTHM	Headed Holder Long Length QTHL / QTHML	Tool Holder System Double Ended Modular  QDH / QDS / QDSM
	A reliable go-to for maximum machine compatibility and best-in-class coolant delivery options.		"The Original" holder designed to excel in high axial force operations.		Double-ended for use in twin spindle and Y-axis tooling block locations.
	pg 16	pg 18	pg 19	pg 21	pg 27
Coolant Access Type	Plumbed & Ported	Plumbed & Ported	Plumbed	Plumbed	Ported
Headless Holder Design for Easy Machine Access	✓	✓			✓
Adjustable Holder Depth in the Block	✓	✓			✓
Can Be Loaded Through Back of Tooling Block for Ease of Use	✓	✓			✓
Headed Design for Repeatable Holder Replacement			✓	✓	
Long Length for Extended Reach Applications		✓		✓	
Double-Ended for Added Versatility					✓
Locating/locking screw Number/Orientation	1/Top	1/Top	1/Side	1/Side	1/Side

NEW!

Quick Change Holders
Double-Ended

Similar ID

Engineered with similar size quick change ID on opposing ends, this tool holder offering is designed for use in twin spindle machines on both the main and sub side spindle.

Dissimilar ID

Designed to maximize efficiency and reduce set up time in twin spindle machines, these holders feature dissimilar size quick change ID on opposing ends for a larger range of min bore offerings.

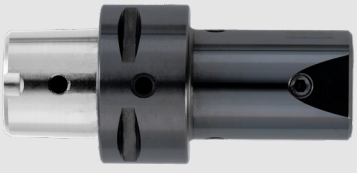
ER

Featuring quick change on one end and ER collet taper on the other end, this double ended holder allows for unmatched repeatability and versatility in twin spindle machines.

Double-Ended Similar ID	Double-Ended Dissimilar ID	Double-Ended ER
QD	**QD**	**QDMR**
Designed for use in twin spindle machines on both the main and sub side spindle.		
pg 23	pg 24	pg 25
✓	✓	✓
✓	✓	✓
✓	✓	✓
✓	✓	✓
2/Top	2/Top	1/Top

Application Specific

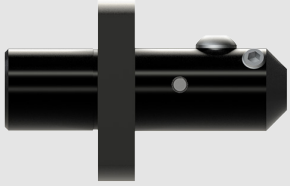
PSC Tool Holder — pg 27



QT

Optimized for machines with PSC / Capto® connections

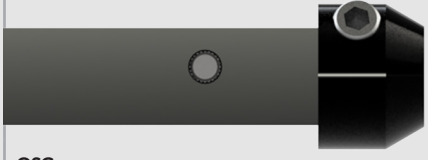
Star Swiss Machine Holders — starts on pg 24



QZST

Designed for Star Swiss Machines

Grinding Holder — pg 28



QSG

Engineered for grinders and some flat and slant bed lathes.

Standard Tool Holders

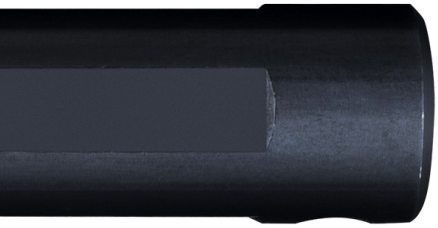
starts on pg 39

Micro 100 fully stocks tool holders for standard shank tool styles in both imperial and metric sizes. Designed for use with our standard shank tools in lathe applications, our standard-style tool holders feature tool engagement and holder orientation flexibility enabled by four alignment flats on its shank.

Expansive Tool Offering for **Standard Holders**

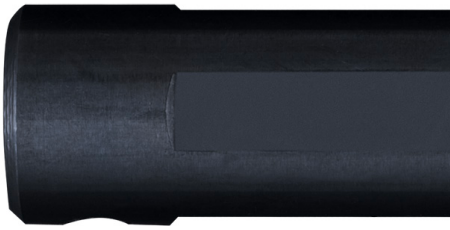
More Than **3,800** Stocked Standard Tools!

- Boring Tools
- Axial Profiling Tools
- Radial Profiling Tools
- Top Rake Chipbreakers
- Grooving Tools
- Face Grooving Tools
- Undercutting Tools
- Threading Tools
- Spotting Drills
- Combined Drill & Countersinks
- Spade Drills
- Chamfer Tools



NEW!

Standard Holders **Double-Ended**



Similar ID

Excellent for operations where a common range of min bore sizes is required, this offering of similar size standard ID holders is designed for use in twin spindle machines.

Dissimilar ID

Designed with dissimilar size standard ID on opposing ends, this tool accommodates operations where a larger range of bore diameters is required.

ER

Featuring a standard ID on one end and ER collet taper on the other, this tool allows for adjustability, while still providing the versatility of operations of an ER collet connection.

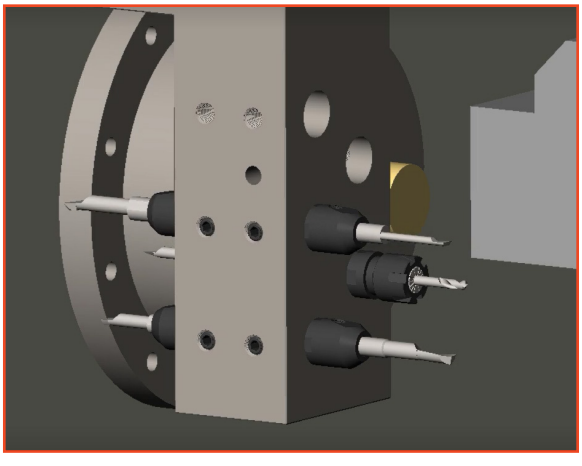
Standard Reference Guide

	Headed Holder Standard Length	Straight Holder Standard Length	Straight Holder Long Length	Double Ended Similar ID	Double Ended Dissimilar ID	Double Ended ER
	TH/THM/THMA	**THS**	**THSL**	**TD**	**TD**	**TDMR**
	pg 39	pg 41	pg 43	pg 44	pg 45	pg 46
Headless Holder Design for Easy Machine Access		✓	✓	✓	✓	✓
Adjustable Holder Depth in the Block		✓	✓	✓	✓	✓
Can Be Loaded Through Back of Tooling Block for Ease of Use		✓	✓	✓	✓	✓
Headed Design for Repeatable Holder Replacement	✓					
Long Length for Extended Reach Applications			✓			
Double-Ended for Added Versatility				✓	✓	✓
Locating/locking screw Number/Orientation	1/Side	1/Top	1/Top	2/Top	2/Top	1/Top

Technical Resources to Help You Make More

Double-Ended Tool Holder Animations

Get to know our new double ended holder with animations on Micro100.com. See how utilizing multiple styles of double-ended holders can significantly reduce set up time by having multiple variations of connections readily accessible in the machine.



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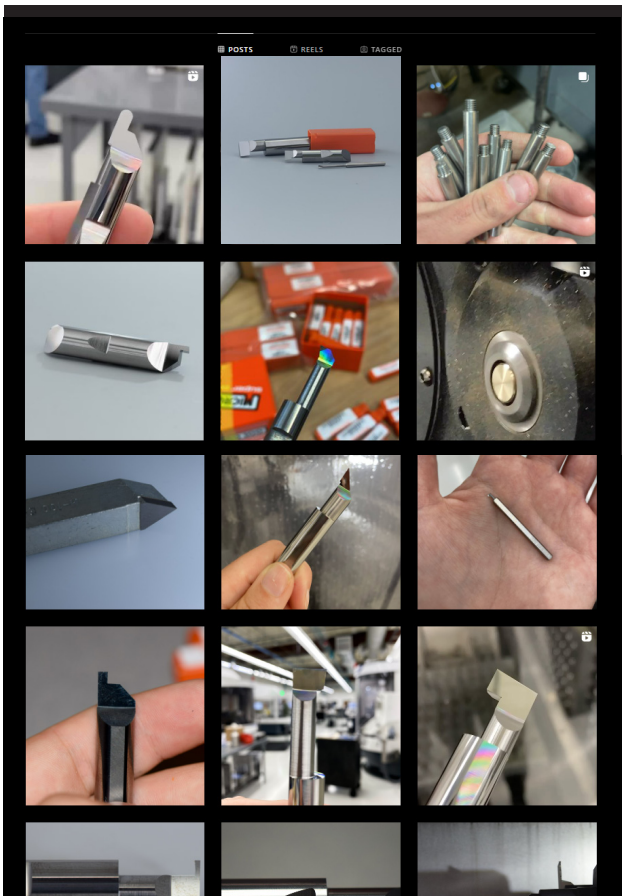

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TOOL HOLDERS & SYSTEMS

Quick Change Holders & Parts

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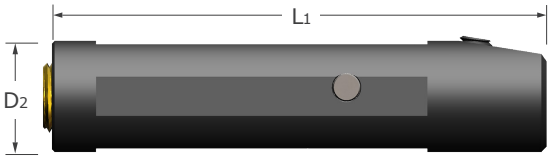
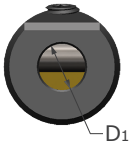
Quick Change Holders

Straight Holder – Standard Length

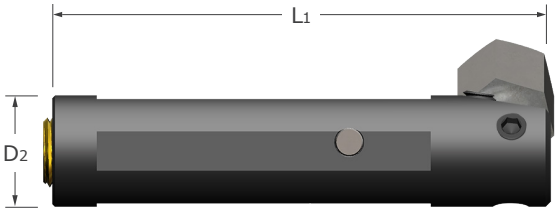
QTS / QTSP

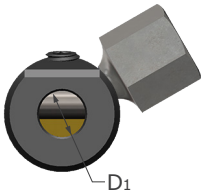
Plumbed QTS





Plumbed & Ported QTSP





- Headless tool holder engineered for maximum versatility in any Swiss, standard lathe, or multi-function lathe
- Standard plumbed and 3 ported options for more enhanced coolant accessibility
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Headless design allows for installation through the back of the tooling block in machines where work envelope is limited
- Top screw orientation for easy access to set screw without interference of adjacent tools
- 4 alignment flats allow for multiple tool engagements and holder orientations
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, locating/locking screw, porting plugs, straight coolant adapter and applicable brass plug
- Precision manufactured in the USA

Internal Diameter	Shank Diameter	Ported Thread	Plumbed Thread	Overall Length	Locating Locking Screw	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	D_2 $^{-.0003"}_{-.0008"}$ $^{-.008mm}_{-.020mm}$			L_1		Tool #	Price
.1875	12 mm	-	1/8-27	2.8	40317	QTS-187-472	142.00
.1875	.5000	-	1/8-27	2.8	40317	QTS-187-500	142.00
.1875	.6250	-	1/8-27	2.8	40317	QTS-187-625	153.90
.1875	16 mm	-	1/8-27	2.8	40317	QTS-187-630	153.90
.1875	.7500	1/4-28 HP	1/8-27	2.8	40316	QTSP-187-750	199.70
.1875	20 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-187-787	199.70
.1875	22 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-187-866	199.70
.1875	25 mm	1/4-28 HP	1/8-27	2.8	40315	QTSP-187-984	199.70
.1875	1.0000	1/4-28 HP	1/8-27	2.8	40315	QTSP-187-1000	199.70

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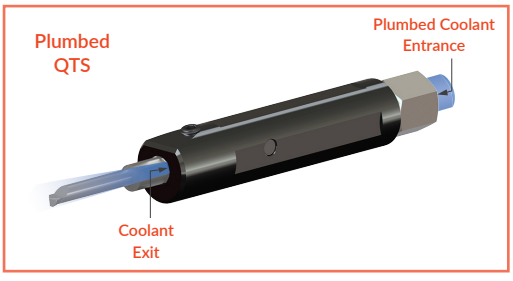
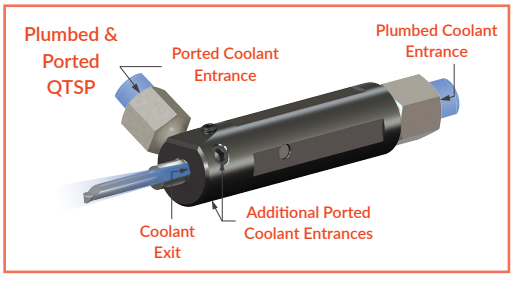




See pg 35-38 for replacement parts and accessories

QTS / QTSP

Quick Change Holders

Straight Holder – Standard Length (cont.)

Continued from previous page

Internal Diameter	Shank Diameter	Ported Thread	Plumbed Thread	Overall Length	Locating Locking Screw	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	D_2 $^{-.0003"}_{-.0008"}$ $^{-.008mm}_{-.020mm}$			L_1		Tool #	Price
.2500	12 mm	-	1/8-27	2.8	40317	QTS-250-472	142.00
.2500	.5000	-	1/8-27	2.8	40317	QTS-250-500	142.00
.2500	.6250	-	1/8-27	2.8	40317	QTS-250-625	153.90
.2500	16 mm	-	1/8-27	2.8	40317	QTS-250-630	153.90
.2500	.7500	1/4-28 HP	1/8-27	2.8	40316	QTSP-250-750	199.70
.2500	20 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-250-787	199.70
.2500	22 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-250-866	199.70
.2500	25 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-250-984	199.70
.2500	1.0000	1/4-28 HP	1/8-27	2.8	40315	QTSP-250-1000	199.70
.3125	.6250	-	1/4-18	2.8	40317	QTS-312-625	153.90
.3125	16 mm	-	1/4-18	2.8	40317	QTS-312-630	153.90
.3125	.7500	-	1/4-18	2.8	40317	QTS-312-750	165.70
.3125	20 mm	-	1/4-18	2.8	40317	QTS-312-787	165.70
.3125	22 mm	1/4-28 HP	1/4-18	2.8	40317	QTSP-312-866	199.70
.3125	25 mm	1/4-28 HP	1/4-18	2.8	40316	QTSP-312-984	199.70
.3125	1.0000	1/4-28 HP	1/4-18	2.8	40316	QTSP-312-1000	199.70
.3750	.6250	-	1/4-18	2.8	40317	QTS-375-625	153.90
.3750	.7500	-	1/4-18	2.8	40317	QTS-375-750	165.70
.3750	20 mm	-	1/4-18	2.8	40317	QTS-375-787	165.70
.3750	22 mm	1/4-28 HP	1/4-18	2.8	40317	QTSP-375-866	199.70
.3750	25 mm	1/4-28 HP	1/4-18	2.8	40316	QTSP-375-984	199.70
.3750	1.0000	1/4-28 HP	1/4-18	2.8	40316	QTSP-375-1000	199.70
.5000	.7500	-	3/8-18	2.8	40317	QTS-500-750	165.70
.5000	1.0000	1/4-28 HP	3/8-18	2.8	40317	QTSP-500-1000	182.60

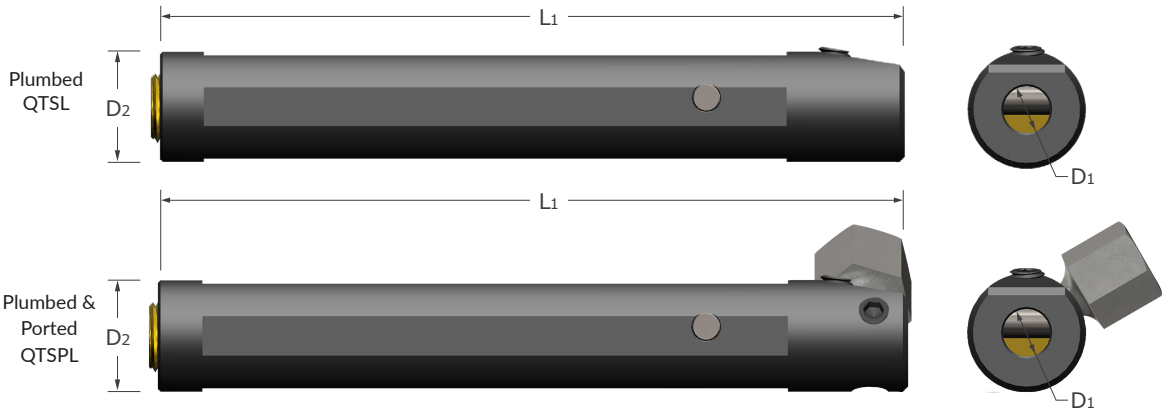
See pg 35-38 for replacement parts and accessories

NEW!

Quick Change Holders

Straight Holder – Long Length

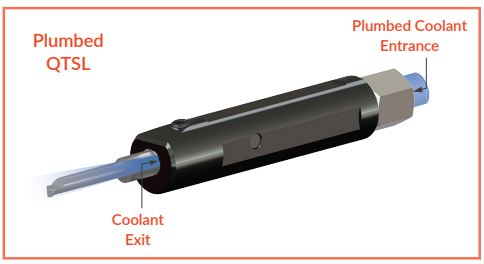
QTSL / QTSPL

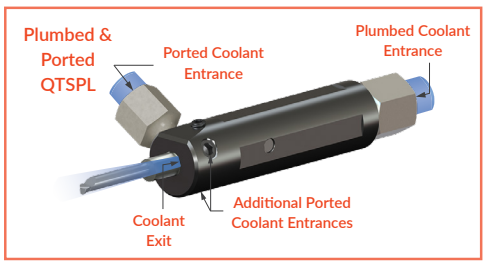


- Quick change, long length tool holder designed for applications requiring an extended reach
- Headless tool holder engineered for maximum versatility in any Swiss, standard lathe, or multi-function lathe
- Standard plumbed and 3 ported options for more enhanced coolant accessibility
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Headless design for installation through the back of the tooling block in machines where work envelope is limited
- Top screw orientation for easy access to set screw without interference of adjacent tools
- 4 alignment flats allow for multiple tool engagements and holder orientations
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, locating/locking screw, porting plugs, straight coolant adapter and applicable brass plug
- Precision manufactured in the USA

Internal Diameter	Shank Diameter	Ported Thread	Plumbed Thread	Overall Length	Locating Locking Screw	Tool Holder		
D_1 $^{+.0005"}_{-.0000"}$	D_2 $^{-.0003"}_{-.0008"}$ $^{-.008mm}_{-.020mm}$			L_1		Tool #	Price	
.1875	.7500	1/4-28 HP	1/8-27	5.8	40316	QTSPL-187-750	245.40	
.1875	20 mm	1/4-28 HP	1/8-27	5.8	40316	QTSPL-187-787	245.40	
.1875	22 mm	1/4-28 HP	1/8-27	5.8	40316	QTSPL-187-866	245.40	
.1875	25 mm	1/4-28 HP	1/8-27	5.8	40315	QTSPL-187-984	245.40	
.1875	1.0000	1/4-28 HP	1/8-27	5.8	40315	QTSPL-187-1000	245.40	
.2500	.7500	1/4-28 HP	1/8-27	5.8	40316	QTSPL-250-750	245.40	
.2500	20 mm	1/4-28 HP	1/8-27	5.8	40316	QTSPL-250-787	245.40	
.2500	22 mm	1/4-28 HP	1/8-27	5.8	40316	QTSPL-250-866	245.40	
.2500	25 mm	1/4-28 HP	1/8-27	5.8	40316	QTSPL-250-984	245.40	
.2500	1.0000	1/4-28 HP	1/8-27	5.8	40315	QTSPL-250-1000	245.40	
.3125	.7500	-	1/4-18	5.8	40317	QTSL-312-750*	205.40	NEW
.3125	22 mm	1/4-28 HP	1/4-18	5.8	40316	QTSPL-312-866	245.40	
.3125	25 mm	1/4-28 HP	1/4-18	5.8	40316	QTSPL-312-984	245.40	
.3125	1.0000	1/4-28 HP	1/4-18	5.8	40316	QTSPL-312-1000	245.40	
.3750	.7500	-	1/4-18	5.8	40317	QTSL-375-750*	205.40	NEW
.3750	22 mm	-	1/4-18	5.8	40317	QTSL-375-866*	205.40	
.3750	25 mm	1/4-28 HP	1/4-18	5.8	40316	QTSPL-375-984	245.40	
.3750	1.0000	1/4-28 HP	1/4-18	5.8	40316	QTSPL-375-1000	245.40	
.5000	.7500	-	3/8-18	5.8	40317	QTSL-500-750*	205.40	NEW
.5000	1.0000	1/4-28 HP	3/8-18	5.8	40316	QTSPL-500-1000	245.40	NEW

*Item not ported



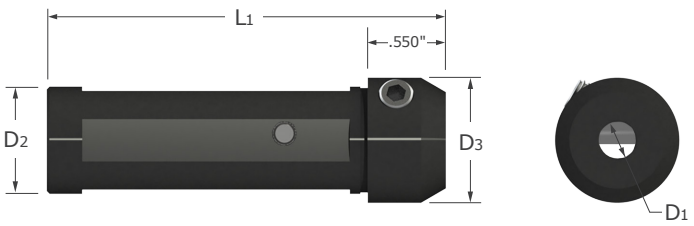


See pg 35-38 for replacement parts and accessories

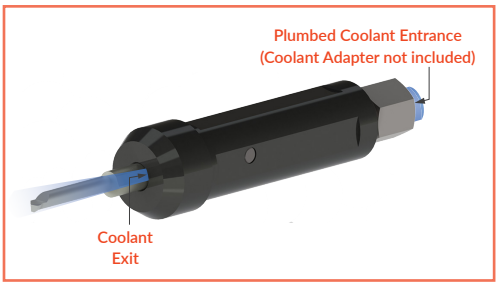
QTH / QTHM

Quick Change Holders

Headed Holder – Standard Length



- Quick change tool holder plumbed for NPT coolant connection and designed for use in lathe applications
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Unique "3 point" locking and locating system ensures axial and radial tool repeatability, tip-to-tip consistency, and part-to-part accuracy
- 4 alignment flats allow for multiple tool engagements and holder orientations
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, QC-1 locating/locking screw
- Precision manufactured in the USA



Internal Diameter	Head Diameter	Plumbed Thread	Shank Diameter	Overall Length	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	D_3 $^{+.003"}_{-.003"}$		D_2 $^{-.0003"}_{-.0008"}$ $^{-.008mm}_{-.020mm}$	L_1	Tool #	Price
.1875	.750	1/8-27 NPT	12 mm	2.8	QTHM-312	130.20
.1875	.750	1/8-27 NPT	.5000	2.8	QTH-85	130.20
.1875	.750	1/8-27 NPT	.6250	2.8	QTH-105	142.00
.1875	.750	1/8-27 NPT	16 mm	2.8	QTHM-316	142.00
.1875	.875	1/4-18 NPT	.7500	2.8	QTH-205	153.90
.1875	.875	1/4-18 NPT	20 mm	2.8	QTHM-320	153.90
.1875	1.062	1/4-18 NPT	22 mm	2.8	QTHM-322	153.90
.1875	1.250	1/4-18 NPT	25 mm	2.8	QTHM-325	153.90
.1875	1.062	1/4-18 NPT	1.0000	2.8	QTH-405	153.90
.1875	-	1/4-18 NPT	1.2500	2.8	QTH-605	153.90
.1875	-	1/4-18 NPT	32 mm	2.8	QTHM-332	153.90
.2500	.750	1/8-27 NPT	12 mm	2.8	QTHM-412	130.20
.2500	.750	1/8-27 NPT	.5000	2.8	QTH-86	130.20
.2500	.750	1/8-27 NPT	.6250	2.8	QTH-106	142.00
.2500	.750	1/8-27 NPT	16 mm	2.8	QTHM-416	142.00
.2500	.875	1/4-18 NPT	.7500	2.8	QTH-206	153.90
.2500	.875	1/4-18 NPT	20 mm	2.8	QTHM-420	153.90
.2500	1.062	1/4-18 NPT	22 mm	2.8	QTHM-422	153.90
.2500	1.250	1/4-18 NPT	25 mm	2.8	QTHM-425	153.90
.2500	1.062	1/4-18 NPT	1.0000	2.8	QTH-406	153.90
.2500	-	1/4-18 NPT	1.2500	2.8	QTH-606	153.90
.2500	-	1/4-18 NPT	32 mm	2.8	QTHM-432	153.90

Continued on next page

See pg 35-38 for replacement parts and accessories

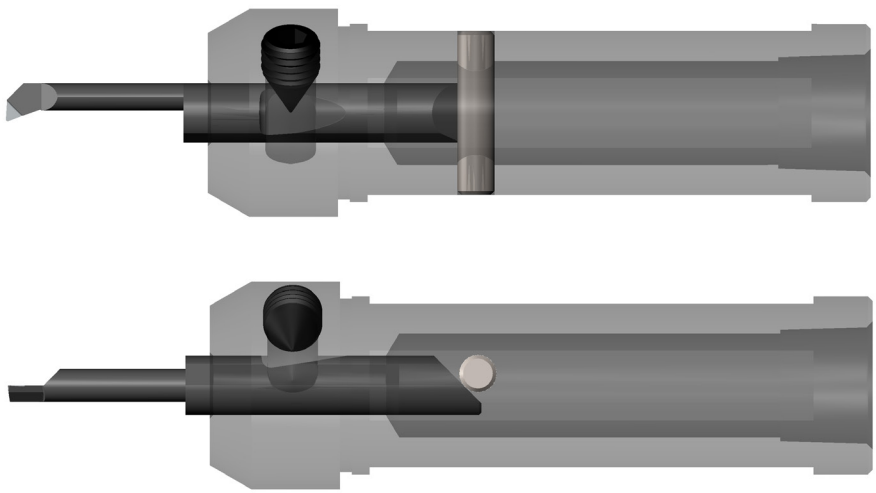
Quick Change Holders

Headed Holder – Standard Length (cont.)

QTH / QTHM

Continued from previous page

Internal Diameter	Head Diameter	Plumbed Thread	Shank Diameter	Overall Length	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	D_3 $^{+.003"}_{-.003"}$		D_2 $^{-.0003"}_{-.0008"}$ $^{-.008mm}_{-.020mm}$	L_1	Tool #	Price
.3125	.875	1/8-27 NPT	.6250	2.8	QTH-107	142.00
.3125	.875	1/8-27 NPT	16 mm	2.8	QTHM-516	142.00
.3125	.875	1/4-18 NPT	.7500	2.8	QTH-207	153.90
.3125	.875	1/4-18 NPT	20 mm	2.8	QTHM-520	153.90
.3125	1.062	1/4-18 NPT	22 mm	2.8	QTHM-522	153.90
.3125	1.250	1/4-18 NPT	25 mm	2.8	QTHM-525	153.90
.3125	1.062	1/4-18 NPT	1.0000	2.8	QTH-407	153.90
.3125	-	1/4-18 NPT	1.2500	2.8	QTH-607	153.90
.3125	-	1/4-18 NPT	32 mm	2.8	QTHM-532	153.90
.3750	1.000	1/8-27 NPT	.6250	2.8	QTH-108	142.00
.3750	1.000	1/8-27 NPT	16 mm	2.8	QTHM-616	142.00
.3750	1.000	1/4-18 NPT	.7500	2.8	QTH-208	153.90
.3750	1.000	1/4-18 NPT	20 mm	2.8	QTHM-620	153.90
.3750	1.062	1/4-18 NPT	22 mm	2.8	QTHM-622	153.90
.3750	1.250	1/4-18 NPT	25 mm	2.8	QTHM-625	153.90
.3750	1.062	1/4-18 NPT	1.0000	2.8	QTH-408	153.90
.3750	-	1/4-18 NPT	1.2500	2.8	QTH-608	153.90
.3750	-	1/4-18 NPT	32 mm	2.8	QTHM-632	153.90
.5000	1.062	1/4-18 NPT	.7500	2.8	QTH-210	153.90
.5000	1.062	1/4-18 NPT	20 mm	2.8	QTHM-820	153.90
.5000	1.062	1/4-18 NPT	22 mm	2.8	QTHM-822	153.90
.5000	1.250	1/4-18 NPT	25 mm	2.8	QTHM-825	153.90
.5000	1.062	1/4-18 NPT	1.0000	2.8	QTH-410	153.90
.5000	-	1/4-18 NPT	1.2500	2.8	QTH-610	153.90
.5000	-	1/4-18 NPT	32 mm	2.8	QTHM-832	153.90



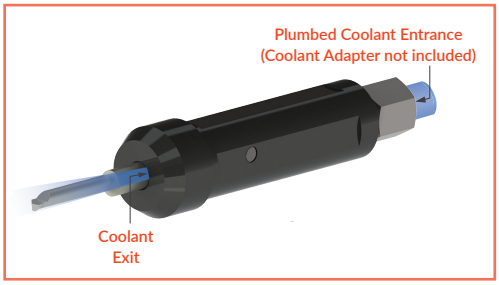
See pg 35-38 for replacement parts and accessories

QTHL / QTHML

Quick Change Holders

Headed Holder – Long Length

- Quick change, long length tool holder designed for applications requiring an extended reach
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Unique “3 point” locking and locating system ensures axial and radial tool repeatability, tip-to-tip consistency, and part-to-part accuracy
- 4 alignment flats allow for multiple tool engagements and holder orientation flexibility
- Holder plumbed for NPT coolant connection
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, QC-1 locating/locking screw
- Precision manufactured in the USA



Internal Diameter	Head Diameter	Plumbed Thread	Shank Diameter	Overall Length	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	D_3 $^{+.003"}_{-.003"}$		D_2 $^{-.0003"}_{-.0008"}$ $^{-.008mm}_{-.020mm}$	L_1	Tool #	Price
.1875	.750	1/8-27 NPT	12 mm	5.8	OTHM-312L	177.50
.1875	.750	1/8-27 NPT	.5000	5.8	OTH-85L	177.50
.1875	.750	1/8-27 NPT	.6250	5.8	OTH-105L	189.40
.1875	.750	1/8-27 NPT	16 mm	5.8	OTHM-316L	189.40
.1875	.875	1/4-18 NPT	.7500	5.8	OTH-205L	201.20
.1875	.875	1/4-18 NPT	20 mm	5.8	OTHM-320L	201.20
.1875	1.062	1/4-18 NPT	22 mm	5.8	OTHM-322L	201.20
.1875	1.062	1/4-18 NPT	1.0000	5.8	OTH-405L	201.20
.1875	1.250	1/4-18 NPT	25 mm	5.8	OTHM-325L	201.20
.1875	-	1/4-18 NPT	1.2500	5.8	OTH-605L	201.20
.1875	-	1/4-18 NPT	32 mm	5.8	OTHM-332L	201.20
.2500	.750	1/8-27 NPT	12 mm	5.8	OTHM-412L	177.50
.2500	.750	1/8-27 NPT	.5000	5.8	OTH-86L	177.50
.2500	.750	1/8-27 NPT	.6250	5.8	OTH-106L	189.40
.2500	.750	1/8-27 NPT	16 mm	5.8	OTHM-416L	189.40
.2500	.875	1/4-18 NPT	.7500	5.8	OTH-206L	201.20
.2500	.875	1/4-18 NPT	20 mm	5.8	OTHM-420L	201.20
.2500	1.062	1/4-18 NPT	22 mm	5.8	OTHM-422L	201.20
.2500	1.062	1/4-18 NPT	1.0000	5.8	OTH-406L	201.20
.2500	1.250	1/4-18 NPT	25 mm	5.8	OTHM-425L	201.20
.2500	-	1/4-18 NPT	1.2500	5.8	OTH-606L	201.20
.2500	-	1/4-18 NPT	32 mm	5.8	OTHM-432L	201.20

Continued on next page

See pg 35-38 for replacement parts and accessories

Quick Change Holders

Headed Holder – Long Length (cont.)

QTHL / QTHML

Continued from previous page

Internal Diameter	Head Diameter	Plumbed Thread	Shank Diameter	Overall Length	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	D_3 $^{+.003"}_{-.003"}$		D_2 $^{-.0003"}_{-.0008"}$ $^{-.008mm}_{-.020mm}$	L_1	Tool #	Price
.3125	.875	1/8-27 NPT	.6250	5.8	OTH-107L	189.40
.3125	.875	1/8-27 NPT	16 mm	5.8	OTHM-516L	189.40
.3125	.875	1/8-27 NPT	.7500	5.8	OTH-207L	201.20
.3125	.875	1/4-18 NPT	20 mm	5.8	OTHM-520L	201.20
.3125	1.062	1/4-18 NPT	22 mm	5.8	OTHM-522L	201.20
.3125	1.062	1/4-18 NPT	1.0000	5.8	OTH-407L	201.20
.3125	1.250	1/4-18 NPT	25 mm	5.8	OTHM-525L	201.20
.3125	-	1/4-18 NPT	1.2500	5.8	OTH-607L	201.20
.3125	-	1/4-18 NPT	32 mm	5.8	OTHM-532L	201.20
.3750	1.000	1/8-27 NPT	.6250	5.8	OTH-108L	189.40
.3750	1.000	1/8-27 NPT	16 mm	5.8	OTHM-616L	189.40
.3750	1.000	1/4-18 NPT	.7500	5.8	OTH-208L	201.20
.3750	1.000	1/4-18 NPT	20 mm	5.8	OTHM-620L	201.20
.3750	1.062	1/4-18 NPT	22 mm	5.8	OTHM-622L	201.20
.3750	1.062	1/4-18 NPT	1.0000	5.8	OTH-408L	201.20
.3750	1.250	1/4-18 NPT	25 mm	5.8	OTHM-625L	201.20
.3750	-	1/4-18 NPT	1.2500	5.8	OTH-608L	201.20
.3750	-	1/4-18 NPT	32 mm	5.8	OTHM-632L	201.20
.5000	1.062	1/4-18 NPT	.7500	5.8	OTH-210L	201.20
.5000	1.062	1/4-18 NPT	20 mm	5.8	OTHM-820L	201.20
.5000	1.062	1/4-18 NPT	22 mm	5.8	OTHM-822L	201.20
.5000	1.062	1/4-18 NPT	1.0000	5.8	OTH-410L	201.20
.5000	1.250	1/4-18 NPT	25 mm	5.8	OTHM-825L	201.20
.5000	-	1/4-18 NPT	1.2500	5.8	OTH-610L	201.20
.5000	-	1/4-18 NPT	32 mm	5.8	OTHM-832L	201.20

See pg 35-38 for replacement parts and accessories

QD

Quick Change Holders
Double-Ended - Similar ID

- Quick change double-ended tool holder allows for access to operations on both the main and sub side spindle
- Similar size quick change ID on opposing ends accommodates operations where common ranges of min bore sizes are required
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Utilizing multiple sizes of double-ended holders reduces set up time by having more shank variations available in the machine at time of set up
- Unique "3 point" locking and locating system ensures repeatability
- 4 alignment flats allow for multiple tool engagement and holder orientation
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, locating/locking screws
- Precision manufactured in the USA

	Internal Diameter	Shank Diameter	Overall Length	Locating Locking Screw	Tool Holder	
	D_1 $^{+.0005"}_{-.0000"}$	D_2 $^{-.0003"}_{-.0008"}$ $^{-.007mm}_{-.020mm}$	L_1		Tool #	Price
NEW	.1875	.5000	2.20	40317	QD-3-500	222.60
NEW	.1875	.5000	3.20	40317	QD1-3-500	232.00
NEW	.1875	.6250	2.20	40317	QD-3-625	232.00
NEW	.1875	.6250	3.20	40317	QD1-3-625	241.40
NEW	.1875	.7500	3.20	40316	QD1-3-750	246.60
NEW	.1875	20 mm	3.20	40316	QD1-3-787	246.60
NEW	.1875	22 mm	3.20	40316	QD1-3-866	251.80
NEW	.1875	25 mm	3.20	40315	QD1-3-984	256.00
NEW	.1875	1.0000	3.20	40315	QD1-3-1000	256.00
NEW	.2500	.5000	3.20	40317	QD1-4-500	232.00
NEW	.2500	.6250	3.20	40317	QD1-4-625	241.40
NEW	.2500	.7500	3.20	40316	QD1-4-750	246.60
NEW	.2500	1.0000	3.20	40315	QD1-4-1000	256.00
NEW	.3125	.6250	3.20	40317	QD1-5-625	241.40
NEW	.3125	.7500	3.20	40317	QD1-5-750	246.60
NEW	.3125	1.0000	3.20	40316	QD1-5-1000	256.00
NEW	.3750	.7500	3.20	40317	QD1-6-750	246.60
NEW	.3750	1.0000	3.20	40316	QD1-6-1000	256.00
NEW	.5000	.7500	3.50	40317	QD2-8-750	246.60
NEW	.5000	1.0000	3.50	40316	QD2-8-1000	256.00

See It in Action

Scan the QR code to see tooling demonstrations to help you make more.

Tech Tip

Utilizing multiple styles of double-ended holders can significantly reduce set up time by having multiple variations of connections readily accessible in the machine.

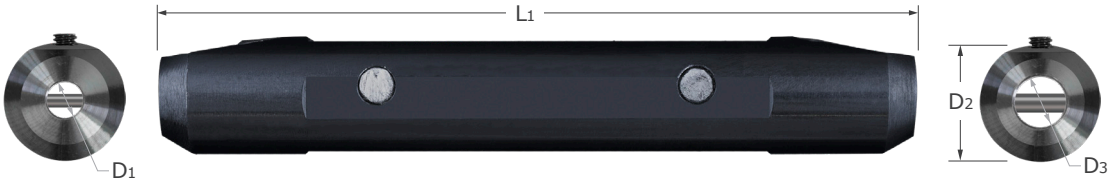
See pg 35-38 for replacement parts and accessories

NEW!

Quick Change Holders

Double-Ended - Dissimilar ID

QD



- Quick change double-ended tool holder allows for access to operations on both the main and sub side spindle
- Dissimilar size quick change ID on opposing ends accommodates operations where a larger range of min bore offerings are required
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Utilizing multiple sizes of double-ended holders reduces set up time by having more shank variations available in the machine at time of set up
- Unique “3 point” locking and locating system ensures repeatability
- 4 alignment flats allow for multiple tool engagement and holder orientation
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, locating/locking screws
- Precision manufactured in the USA

Internal Diameter (Side A)	Internal Diameter (Side B)	Shank Diameter	Overall Length	Locating Locking Screw (Side A)	Locating Locking Screw (Side B)	Tool Holder		
D_1 $^{+.0005"}_{-.0000"}$	D_3 $^{+.0005"}_{-.0000"}$	D_2 $^{-.0003"}_{-.0008"}$ $^{-.007mm}_{-.020mm}$	L_1			Tool #	Price	
.1875	.2500	.5000	3.20	40317	40317	QD1-3-4-500	237.20	NEW
.1875	.2500	.6250	3.20	40317	40317	QD1-3-4-625	246.60	NEW
.1875	.2500	.7500	3.20	40316	40316	QD1-3-4-750	251.80	NEW
.1875	.2500	20 mm	3.20	40316	40316	QD1-3-4-787	251.80	NEW
.1875	.2500	22 mm	3.20	40316	40316	QD1-3-4-866	256.00	NEW
.1875	.2500	25 mm	3.20	40315	40316	QD1-3-4-984	261.30	NEW
.1875	.2500	1.0000	3.20	40315	40315	QD1-3-4-1000	261.30	NEW
.2500	.3125	.6250	3.20	40317	40317	QD1-4-5-625	246.60	NEW
.2500	.3125	.7500	3.20	40316	40317	QD1-4-5-750	251.80	NEW
.2500	.3125	1.0000	3.20	40315	40316	QD1-4-5-1000	261.30	NEW
.3125	.3750	.6250	3.20	40317	40317	QD1-5-6-625	246.60	NEW
.3125	.3750	.7500	3.20	40317	40317	QD1-5-6-750	251.80	NEW
.3125	.3750	1.0000	3.20	40316	40316	QD1-5-6-1000	261.30	NEW
.3750	.5000	.7500	3.20	40317	40317	QD1-6-8-750	251.80	NEW
.3750	.5000	1.0000	3.20	40316	40316	QD1-6-8-1000	261.30	NEW

See It in Action

Scan the QR code to see tooling demonstrations to help you make more.

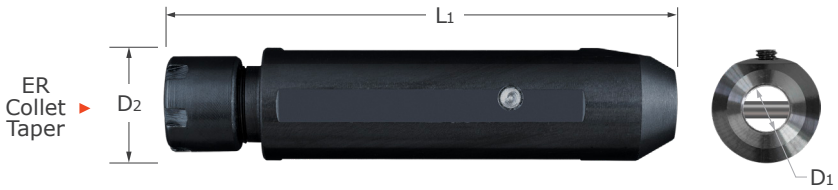
Tech Tip

Utilizing multiple styles of double-ended holders can significantly reduce set up time by having multiple variations of connections readily accessible in the machine.

See pg 35-38 for replacement parts and accessories

QDMR

Quick Change Holders
Double-Ended - Quick Change - ER



- Quick change double-ended tool holder allows for access to operations on both the main and sub side spindle
- Quick change on one end and ER collet taper on the other end allows for the repeatability of a quick change tool, with the versatility of operations that benefit from an ER collet connection
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Utilizing multiple sizes of double-ended holders reduces set up time by having more shank variations available in the machine at time of set up
- Unique "3 point" locking and locating system ensures repeatability
- 4 alignment flats allow for multiple tool engagement and holder orientation
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, locating/locking screw
- Precision manufactured in the USA

	ER Taper Size	Internal Diameter	Shank Diameter	Overall Length	Locating Locking Screw	Tool Holder	
		D_1 +.0005" −.0000"	D_2 −.0003" −.0008" −.007mm −.020mm	L_1		Tool #	Price
NEW	ER8-Mini	.1875	.5000	2.20	40317	QD-MR8-3-500	251.80
NEW		.1875	.5000	3.20	40317	QD1-MR8-3-500	261.30
NEW		.1875	.6250	2.20	40317	QD-MR8-3-625	261.30
NEW		.1875	.6250	3.20	40317	QD1-MR8-3-625	270.70
NEW		.2500	.5000	3.20	40317	QD1-MR8-4-500	261.30
NEW		.2500	.6250	3.20	40317	QD1-MR8-4-625	270.70
NEW		.3125	.6250	3.20	40317	QD1-MR8-5-625	270.70
NEW	ER11-Mini	.1875	.6250	2.20	40317	QD-MR11-3-625	261.30
NEW		.1875	.6250	3.20	40317	QD1-MR11-3-625	270.70
NEW		.1875	.7500	3.20	40316	QD1-MR11-3-750	275.90
NEW		.1875	20 mm	3.20	40316	QD1-MR11-3-787	275.90
NEW		.1875	22 mm	3.20	40316	QD1-MR11-3-866	280.10
NEW		.1875	25 mm	3.20	40315	QD1-MR11-3-984	285.30
NEW		.1875	1.0000	3.20	40315	QD1-MR11-3-1000	285.30
NEW		.2500	.6250	3.20	40317	QD1-MR11-4-625	270.70
NEW		.2500	.7500	3.20	40316	QD1-MR11-4-750	275.90

Continued on next page

See It in Action

Scan the QR code to see tooling demonstrations to help you make more.

Tech Tip

Utilizing multiple styles of double-ended holders can significantly reduce set up time by having multiple variations of connections readily accessible in the machine.

See pg 35-38 for replacement parts and accessories

Quick Change Holders

Double-Ended - Quick Change - ER (cont.)

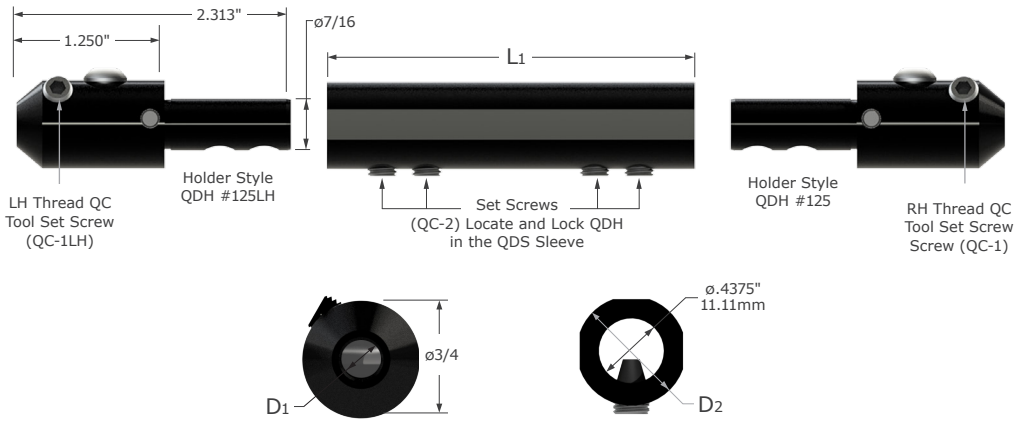
QDMR

Continued from previous page

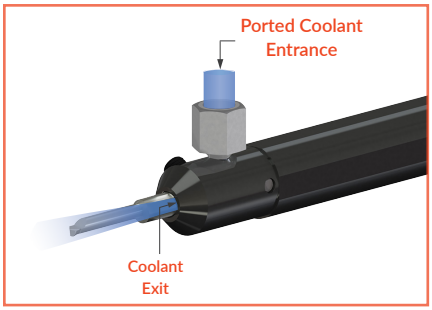
ER Taper Size	Internal Diameter	Shank Diameter	Overall Length	Locating Locking Screw	Tool Holder		
D_1 $^{+.0005"}_{-.0000"}$		D_2 $^{-.0003"}_{-.0008"}$ $^{-.007mm}_{-.020mm}$	L_1		Tool #	Price	
ER11-Mini	.2500	20 mm	3.20	40316	QD1-MR11-4-787	275.90	NEW
	.2500	22 mm	3.20	40316	QD1-MR11-4-866	280.10	NEW
	.2500	25 mm	3.20	40316	QD1-MR11-4-984	285.30	NEW
	.2500	1.0000	3.20	40315	QD1-MR11-4-1000	285.30	NEW
	.3125	.6250	3.20	40317	QD1-MR11-5-625	270.70	NEW
	.3125	.7500	3.20	40317	QD1-MR11-5-750	275.90	NEW
	.3125	1.0000	3.20	40316	QD1-MR11-5-1000	285.30	NEW
	.3750	.6250	3.20	40317	QD1-MR11-6-625	270.70	NEW
	.3750	.7500	3.20	40317	QD1-MR11-6-750	275.90	NEW
	.3750	1.0000	3.20	40316	QD1-MR11-6-1000	285.30	NEW
	.5000	.7500	3.50	40317	QD2-MR11-8-750	275.90	NEW
	.5000	1.0000	3.50	40316	QD2-MR11-8-1000	285.30	NEW
ER16-Mini	.1875	.7500	3.20	40316	QD1-MR16-3-750	275.90	NEW
	.1875	20 mm	3.20	40316	QD1-MR16-3-787	275.90	NEW
	.1875	22 mm	3.20	40316	QD1-MR16-3-866	280.10	NEW
	.1875	25 mm	3.20	40315	QD1-MR16-3-984	285.30	NEW
	.1875	1.0000	3.20	40315	QD1-MR16-3-1000	285.30	NEW
	.2500	.7500	3.20	40316	QD1-MR16-4-750	275.90	NEW
	.2500	20 mm	3.20	40316	QD1-MR16-4-787	275.90	NEW
	.2500	22 mm	3.20	40316	QD1-MR16-4-866	280.10	NEW
	.2500	25 mm	3.20	40316	QD1-MR16-4-984	285.30	NEW
	.2500	1.0000	3.20	40315	QD1-MR16-4-1000	285.30	NEW
	.3125	.7500	3.20	40317	QD1-MR16-5-750	275.90	NEW
	.3125	1.0000	3.20	40316	QD1-MR16-5-1000	285.30	NEW
	.3750	.7500	3.20	40317	QD1-MR16-6-750	275.90	NEW
	.3750	1.0000	3.20	40316	QD1-MR16-6-1000	285.30	NEW
	.5000	.7500	3.50	40317	QD2-MR16-8-750	275.90	NEW
	.5000	1.0000	3.50	40316	QD2-MR16-8-1000	285.30	NEW

QDH / QDS / QDSM

Quick Change Holders
Double Ended Modular



- Quick change tool holder designed for use in twin spindle and Y-axis tooling block locations
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Unique “3 point” locking and locating system ensures axial and radial tool repeatability, tip-to-tip consistency, and part-to-part accuracy
- 4 alignment flats allow for multiple tool engagements and holder orientation flexibility
- Assemble unit prior to installation to reduce setup time
- Left and right holder design orients set screws on the same side as operator for easy access
- Left hand head has left hand threaded set screw
- Coolant delivered via external coolant port
- Heat treated and black oxide coated for durability and corrosion resistance
- Sleeve includes: hex wrench, locating/locking screw
- Tool holder includes: hex wrench, locating/locking screw, porting plug, straight coolant adapter
- Precision manufactured in the USA



Sleeve Diameter	Length of Sleeve	Sleeve		Internal Diameter	Ported Thread	Right Hand Tool Holder		Left Hand Tool Holder	
D2 −.0003" −.0008" −.008mm −.020mm	L1	Tool #	Price	D1 +.0005" −.0000"		Tool #	Price	Tool #	Price
.7500	2.5	QDS-750-2.5	142.60	.1875	1/4-28 HP	QDH-3125	131.30	QDH-3125LH	131.30
				.2500	1/4-28 HP	QDH-4125	131.30	QDH-4125LH	131.30
				.3125	1/4-28 HP	QDH-5125	131.30	QDH-5125LH	131.30
.7500	3.1	QDS-750-3.1	148.30	.1875	1/4-28 HP	QDH-3125	131.30	QDH-3125LH	131.30
				.2500	1/4-28 HP	QDH-4125	131.30	QDH-4125LH	131.30
				.3125	1/4-28 HP	QDH-5125	131.30	QDH-5125LH	131.30
20 mm	64 mm	QDSM-20-64	142.60	.1875	1/4-28 HP	QDH-3125	131.30	QDH-3125LH	131.30
				.2500	1/4-28 HP	QDH-4125	131.30	QDH-4125LH	131.30
				.3125	1/4-28 HP	QDH-5125	131.30	QDH-5125LH	131.30
20 mm	79 mm	QDSM-20-79	148.30	.1875	1/4-28 HP	QDH-3125	131.30	QDH-3125LH	131.30
				.2500	1/4-28 HP	QDH-4125	131.30	QDH-4125LH	131.30
				.3125	1/4-28 HP	QDH-5125	131.30	QDH-5125LH	131.30
22 mm	64 mm	QDSM-22-64	148.30	.1875	1/4-28 HP	QDH-3125	131.30	QDH-3125LH	131.30
				.2500	1/4-28 HP	QDH-4125	131.30	QDH-4125LH	131.30
				.3125	1/4-28 HP	QDH-5125	131.30	QDH-5125LH	131.30

Continued on next page

See pg 35-38 for replacement parts and accessories

Quick Change Holders

Double Ended Modular (cont.)

QDH / QDS / QDSM

Continued from previous page

Sleeve Diameter	Length of Sleeve	Sleeve		Internal Diameter	Ported Thread	Right Hand Tool Holder		Left Hand Tool Holder	
D_2 −.0003" −.0008" −.008mm −.020mm	L_1	Tool #	Price	D_1 +.0005" −.0000"		Tool #	Price	Tool #	Price
22 mm	79 mm	QDSM-22-79	154.00	.1875	1/4-28 HP	QDH-3125	131.30	QDH-3125LH	131.30
				.2500	1/4-28 HP	QDH-4125	131.30	QDH-4125LH	131.30
				.3125	1/4-28 HP	QDH-5125	131.30	QDH-5125LH	131.30
25 mm	64 mm	QDSM-25-64	154.00	.1875	1/4-28 HP	QDH-3125	131.30	QDH-3125LH	131.30
				.2500	1/4-28 HP	QDH-4125	131.30	QDH-4125LH	131.30
				.3125	1/4-28 HP	QDH-5125	131.30	QDH-5125LH	131.30
1.0000	2.500	QDS-1.00-2.5	154.00	.1875	1/4-28 HP	QDH-3125	131.30	QDH-3125LH	131.30
				.2500	1/4-28 HP	QDH-4125	131.30	QDH-4125LH	131.30
				.3125	1/4-28 HP	QDH-5125	131.30	QDH-5125LH	131.30
1.0000	3.100	QDS-1.00-3.1	165.50	.1875	1/4-28 HP	QDH-3125	131.30	QDH-3125LH	131.30
				.2500	1/4-28 HP	QDH-4125	131.30	QDH-4125LH	131.30
					1/4-28 HP	QDH-5125	131.30	QDH-5125LH	131.30

Technical Resources on Micro100.com

Find Simulation Files, Speeds & Feeds, Torque Recommendations, Programs, Blogs, and more at micro100.com/resources

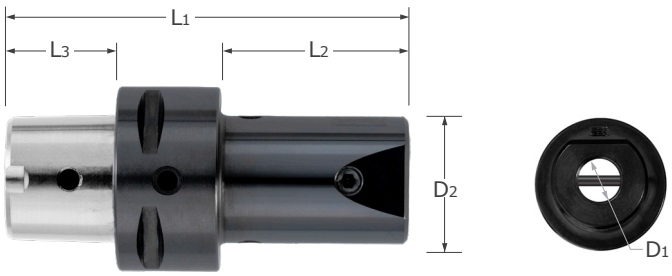
SCAN

See pg 35-38 for replacement parts and accessories

QT

Quick Change Holders

PSC Holders



- PSC holder design combines Capto® compatible connection with proprietary Micro-Quik quick change system
- PSC flange designed for use on lathes with or without an automatic tool changer
- Short head length accommodates smaller work envelopes and provides maximum rigidity
- ID threaded for use with coolant adapter
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Unique “3 point” locking and locating system ensures axial and radial tool repeatability , tip-to-tip consistency, and part-to-part accuracy
- Heat treated for added durability
- Black oxide coated on all non-ground surfaces for corrosion resistance
- Tool holder includes: hex wrench, locating/locking screw

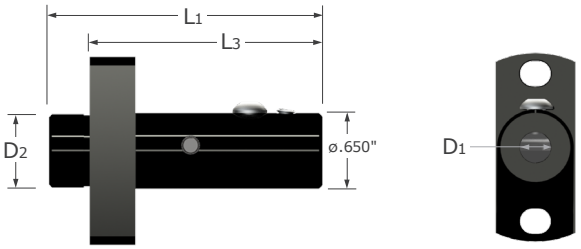
Shank Type	Internal Diameter	Head Length	Head Diameter	Flange Length	Overall Length	Coolant Adapter Thread	Locating Locking Screw	Tool Holder	
	D_1 $^{+.0005"}_{-.0000"}$	L_2	D_2	L_3	L_1			Tool #	Price
C3	.1875	1.134	.866	.591	2.473	M12 x 1.5	40315	QT-187-C3	364.70
C3	.2500	1.340	.866	.591	2.679	M12 x 1.5	40315	QT-250-C3	364.70
C3	.3125	1.309	.866	.591	2.647	M12 x 1.5	40316	QT-312-C3	364.70
C3	.3750	1.278	.866	.591	2.616	M12 x 1.5	40316	QT-375-C3	364.70
C3	.5000	1.528	.984	.591	2.867	M12 x 1.5	40316	QT-500-C3	364.70
C4	.1875	1.134	.866	.787	2.867	M14 x 1.5	40315	QT-187-C4	364.70
C4	.2500	1.340	.866	.787	3.072	M14 x 1.5	40315	QT-250-C4	364.70
C4	.3125	1.309	.866	.787	3.041	M14 x 1.5	40316	QT-312-C4	364.70
C4	.3750	1.278	.866	.787	3.010	M14 x 1.5	40316	QT-375-C4	364.70
C4	.5000	1.528	.984	.787	3.260	M14 x 1.5	40316	QT-500-C4	364.70

See pg 35-38 for replacement parts and accessories

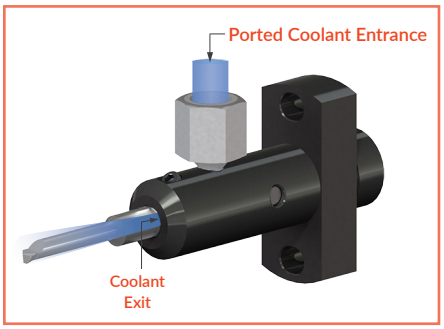
Quick Change Holders

Star Swiss Machines – SR-10J

QZST



- Quick change tool holder designed for use in Star Swiss machine model SR-10J
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Designed for use with .1875", .2500", and .3125" diameter quick change tools
- Qualify with quick change centerline indicating tool (QI)
- Unique "3 point" locking and locating system ensures axial and radial tool repeatability, tip-to-tip consistency, and part-to-part accuracy
- Coolant delivered via external coolant port
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, locating/locking screw, porting plug, straight porting adapter
- Precision manufactured in the USA



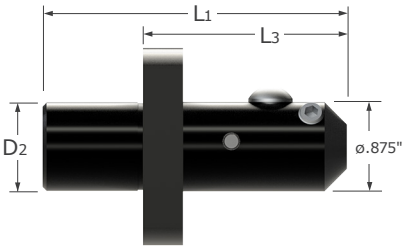
Internal Diameter	Overall Reach	Shank Diameter	Overall Length	Ported Thread	Locating/Locking Screw	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	L_3	D_2	L_1			Tool #	Price
.1875	1.956	16 mm	2.350	1/4-28 HP	40316	QZST-316L-SR10J	284.10
.2500	1.956	16 mm	2.350	1/4-28 HP	40317	QZST-416L-SR10J	284.10
.3125	1.956	16 mm	2.350	1/4-28 HP	40317	QZST-516L-SR10J	284.10

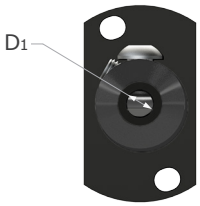
See pg 34 for Centerline Indicating Tool
See pg 35-38 for replacement parts and accessories

QZST

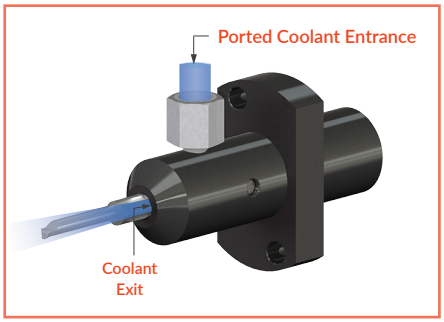
Quick Change Holders

Star Swiss Machines – SR-20





- Quick change tool holder designed for use in Star Swiss machine models SR-20, SB-16, SB-20R, SR-10J, SR-20J/JN, SR-20R, SR-20RIV, SR-32J/JN, SW-12RII, and SV-20R
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Designed for use with .1875", .2500", and .3125" diameter quick change tools
- Qualify with quick change centerline indicating tool (QI)
- Unique "3 point" locking and locating system ensures axial and radial tool repeatability, tip-to-tip consistency, and part-to-part accuracy
- Coolant delivered via external coolant port
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, QC-1 locating/locking screw, porting plug, straight coolant adapter
- Precision manufactured in the USA



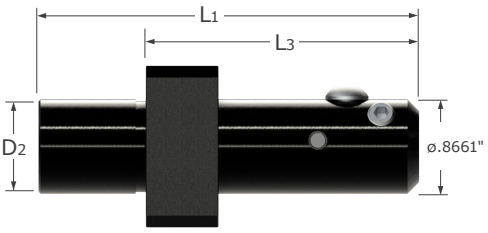
	Internal Diameter	Overall Reach	Shank Diameter	Overall Length	Ported Thread	Tool Holder	
	D_1 $^{+.0005"}_{-.0000"}$	L_3	D_2	L_1		Tool #	Price
	.1875	1.400	22 mm	2.384	1/4-28 HP	QZST-322-SR20	295.50
	.1875	2.000	22 mm	2.984	1/4-28 HP	QZST-322L-SR20	295.50
	.2500	1.400	22 mm	2.384	1/4-28 HP	QZST-422-SR20	295.50
	.2500	2.000	22 mm	2.984	1/4-28 HP	QZST-422L-SR20	295.50
	.3125	1.400	22 mm	2.384	1/4-28 HP	QZST-522-SR20	295.50
	.3125	2.000	22 mm	2.984	1/4-28 HP	QZST-522L-SR20	295.50
NEW	.3750	1.400	22 mm	2.384	1/4-28 HP	QZST-622-SR20	295.50
NEW	.3750	2.000	22 mm	2.984	1/4-28 HP	QZST-622L-SR20	295.50

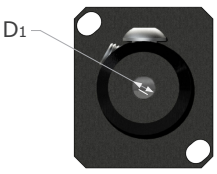
See pg 34 for Centerline Indicating Tool
See pg 35-38 for replacement parts and accessories

Quick Change Holders

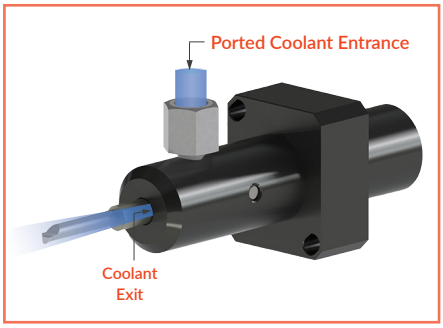
Star Swiss Machines – SR-20RIV

QZST





- Quick change tool holder designed for use in Star Swiss machine models SB-12/20R and SR-20RIV
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Designed for use with .1875", .2500", and .3125" diameter quick change tools
- Qualify with quick change centerline indicating tool (QI)
- Unique "3 point" locking and locating system ensures axial and radial tool repeatability, tip-to-tip consistency, and part-to-part accuracy
- Coolant delivered via external coolant port
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, QC-1 locating/locking screw, porting plug, straight coolant adapter
- Precision manufactured in the USA



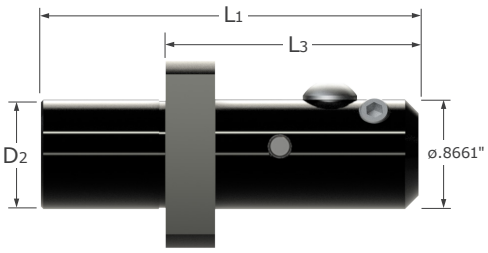
Internal Diameter	Overall Reach	Shank Diameter	Overall Length	Ported Thread	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	L_3	D_2	L_1		Tool #	Price
.1875	2.510	22 mm	3.494	1/4-28 HP	QZST-322L-SR20RIV	295.50
.2500	2.510	22 mm	3.494	1/4-28 HP	QZST-422L-SR20RIV	295.50
.3125	2.510	22 mm	3.494	1/4-28 HP	QZST-522L-SR20RIV	295.50

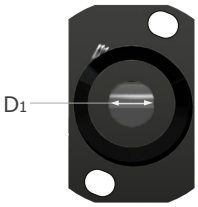
See pg 34 for Centerline Indicating Tool
See pg 35-38 for replacement parts and accessories

QZST

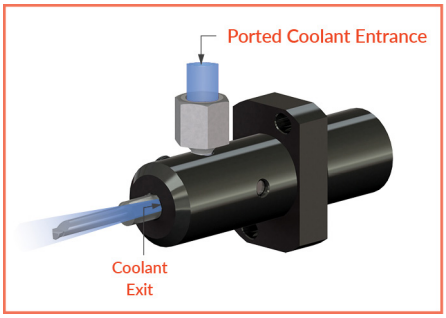
Quick Change Holders

Star Swiss Machines – SW-20





- Quick change tool holder designed for use in Star Swiss machine model SW20
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Designed for use with .1875", .2500", and .3125" diameter quick change tools
- Qualify with quick change centerline indicating tool (QI)
- Unique "3 point" locking and locating system ensures axial and radial tool repeatability, tip-to-tip consistency, and part-to-part accuracy
- Coolant delivered via external coolant port
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, QC-1 locating/locking screw, porting plug, straight coolant adapter
- Precision manufactured in the USA



Internal Diameter	Overall Reach	Shank Diameter	Overall Length	Ported Thread	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	L_3	D_2	L_1		Tool #	Price
.1875	2.000	22 mm	2.984	1/4-28 HP	QZST-322L-SW20	295.50
.2500	2.000	22 mm	2.984	1/4-28 HP	QZST-422L-SW20	295.50
.3125	2.000	22 mm	2.984	1/4-28 HP	QZST-522L-SW20	295.50

See pg 34 for Centerline Indicating Tool
See pg 35-38 for replacement parts and accessories

Quick Change Holders

Grinding Holder – Square

QSG

- Square shank holder designed to enable repeatable grinding of custom tool profiles on quick change blanks
- Optimized for use with proprietary half round (QSP) and full round (QSR) quick change blanks
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, locating/locking screw
- Precision manufactured in the USA

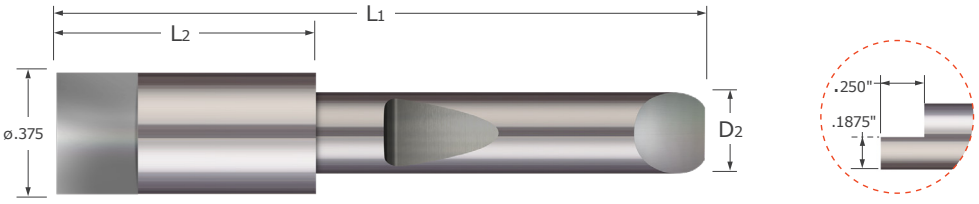
Internal Diameter	Head Diameter	Square Shank	Overall Length	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	D_3 $^{+.005"}_{-.005"}$	A $^{+.0000"}_{-.0010"}$	L_1	Tool #	Price
.1875	.750	.5000	4.8	QSG-187-500	165.50
.1875	1.063	.7500	4.8	QSG-187-750	182.60
.2500	.750	.5000	4.8	QSG-250-500	165.50
.2500	1.063	.7500	4.8	QSG-250-750	182.60
.3125	.875	.5000	4.8	QSG-312-500	165.50
.3125	1.063	.7500	4.8	QSG-312-750	182.60
.3750	1.063	.7500	4.8	QSG-375-750	182.60
.5000	1.063	.7500	4.8	QSG-500-750	182.60

See pg 35-38 for replacement parts and accessories

Quick Change Holders

Centerline Indicating Tool

QI

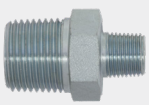
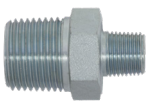


- Designed to accurately indicate centerline when using quick change holders
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Precision ground .375" flat provides a wide area for accurate and easy indicating during set up and post crash
- Precision manufactured in the USA

Shank Diameter	Body Length	Overall Length	Uncoated	
D_2 (h6)	L_2 $^{+.000"}_{-.015"}$	L_1	Tool #	Price
.1875	1.000	2.0	QI-187	123.90
.2500	.800	2.0	QI-250	123.90
.3125	.800	2.0	QI-312	123.90

Quick Change Holder Parts
Coolant Accessories

- Coolant adapters engineered to connect to both high pressure and low pressure with NPT and JIC-4 fitments
- Plumbed and ported accessories can be used together to allow for proper connection
- Sold individually or as packages of 10

	Accessory Type	Compatibility	Coolant Access Type	Holder Thread	Coolant Supply Thread	Single		Package of 10	
						Tool #	Price	Tool #	Price
	Straight Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/8-27 NPT	JIC 4	40301	4.90	41301	40.80
	Straight Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	JIC 4	40302	4.90	41302	40.80
	Straight Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	JIC 4	40303	7.10	41303	56.50
	Straight Coolant Adapter	Fits: QTH, QTHL, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	1/8-27 NPT	40311	7.10	41311	56.50
	Straight Coolant Adapter	Fits: QTH, QTHL, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	1/8-27 NPT	40312	7.10	41312	56.50
	90° Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/8-27 NPT	JIC 4	40304	8.40	41304	67.90
	90° Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	JIC 4	40305	8.40	41305	67.90
	90° Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	JIC 4	40306	8.40	41306	67.90
	90° Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	1/8-27 NPT	40307	11.50	41307	94.60
	NPT Coolant Reducer	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	1/8-27 NPT	40308	4.90	41308	40.80

Continued on next page

Quick Change Holder Parts

Coolant Accessories (cont.)

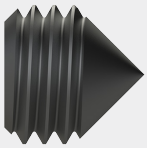
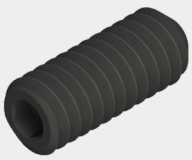
Continued from previous page

	Accessory Type	Compatibility	Coolant Access Type	Holder Thread	Coolant Supply Thread	Single		Package of 10	
						Tool #	Price	Tool #	Price
	NPT Coolant Reducer	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	1/8-27 NPT	40309	7.10	41309	56.50
	Plumbed Plug	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/8-27 NPT	-	40197	3.60	41197	29.40
	Plumbed Plug	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	-	40198	3.60	41198	29.40
	Plumbed Plug	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	-	40221	3.60	41221	29.40
	High Pressure Coolant Fitting	Fits: QZST, QDH, QTSP, QTSPL	Ported	1/4-28 HP	1/8-27 NPT	QN-1	7.10	QN-10	56.50
	1.28" Coolant Extension	Fits: QZST, QDH, QTSP, QTSPL	Ported	1/4-28 HP	1/4-28 HP	40199	6.80	41199	56.50
	45° Coolant Adapter	Fits: QZST, QDH, QTSP, QTSPL	Ported	1/4-28 HP	1/8-27 NPT	40313	7.10	41313	56.50
	90° Coolant Adapter	Fits: QZST, QDH, QTSP, QTSPL	Ported	1/4-28 HP	1/8-27 NPT	40314	7.10	41314	56.50
	Button Head Screw (Port Plug)	Fits: QDH, QZST / Hex Key not stocked for this item	Ported	1/4-28 HP	-	QC-5	1.20	QC-50	10.40
	Port Plug	Fits: QTSP, QTSPL	Ported	1/4-28 HP	-	40278	1.20	41278	9.90
	Hex Wrench	Fits: 40278 Porting Plug	Ported	-	-	40249	1.20	41249	10.40

QC

Quick Change Holder Parts
Accessories

- Hardware and support tools for Micro 100 quick change tool holders
- Sold individually or as packages of 10

	Accessory Type	Compatibility	Single		Package of 10	
			Tool #	Price	Tool #	Price
	Locating / Locking Screw (Right Hand Threads)	Fits: QTH, QTHM, QZST, QSG, QDH Requires: QHT-1 Hex Key	QC-1	4.00	QC-10	28.30
	Locating / Locking Screw	Fits: QDH Requires: QHT-1 Hex Key	QC-1LH	11.50	QC-10LH	101.70
	Locating / Locking Screw	See QTS,QTSP,QTSL,QTSPL tables for compatibility	40208	1.20	41208	9.90
	Locating / Locking Screw	See QTS,QTSP,QTSL,QTSPL tables for compatibility	40215	1.20	41215	9.90
	Locating / Locking Screw	See QTS,QTSP,QTSL,QTSPL tables for compatibility	40216	1.20	41216	9.90
	Locating / Locking Screw	See QTS, QTSP, QTSPL, QTSL, QZST-SR10J tables for compatibility	40317	1.20	41317	9.90
	Locating / Locking Screw	See QTS, QTSP, QTSPL, QTSL, QZST-SR10J tables for compatibility	40316	1.20	41316	9.90
	Locating / Locking Screw	See QTS, QTSP, QTSPL, QTSL, QZST-SR10J tables for compatibility	40315	1.20	41315	9.90
	Locating / Locking Screw	See QTS, QTSP, QTSPL, QTSL, QZST-SR10J tables for compatibility	40279	1.20	41279	9.90

Continued on next page

Quick Change Parts

Accessories (cont.)

QC

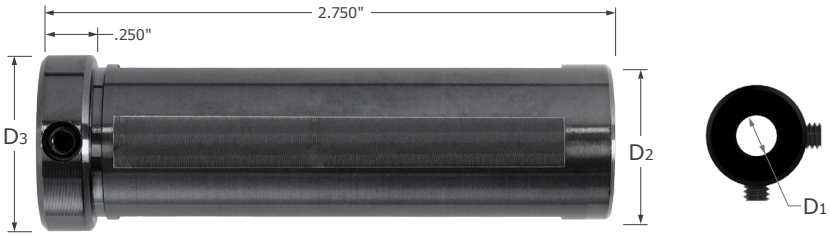
Continued from previous page

	Accessory Type	Compatibility	Single		Package of 10	
			Tool #	Price	Tool #	Price
	(Left Hand Threads) Locating / Locking Screw	Fits: QDS, QDSM Requires: QHT-1 Hex Key	QC-2	4.00	QC-20	28.30
	Locating / Locking Screw	Fits: QZST-SR10J Requires: 3/32" Hex Key	QC-6	1.20	QC-60	10.40
	Hex Wrench	Fits: QC-3, QC-4 Locking Screws	QHK-1	1.20	QHK-10	10.40
	Hex Wrench	Fits: QC-6 Socket Set Screws, 40208, 40215, 40216 Locating / Locking Screws	QHK-2	1.20	QHK-20	10.40
	T Style Handle Hex Wrench	Fits: QC-1, QC-1LH, QC-2 Locating / Locking Screws	QHT-1	6.30	QHT-10	50.80

TH / THM / THMA

Standard Holders

Headed Holders - Standard Length



- Tool Holder optimized for use with Micro100 standard shank tools in turning applications
- Head allows for consistent length when seated against the tooling block.
- 4 alignment flats allow for multiple tool engagements and holder orientations
- Tools can be set at any length in the holder, allowing for maximum rigidity to reduce chatter and harmonics during machining
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, locating/locking screw
- Precision manufactured in the USA

Internal Diameter			Head Diameter	Shank Diameter	Locating Locking Screw	Tool Holder	
D_1 +.0005" −.0000"		decimal equiv.	D_3 +.005" −.005" +.127mm −.127mm	D_2 −.0003" −.0008" −.008mm −.020mm		Tool #	Price
	3 mm	.1181	15 mm	12 mm	40239	THM-312	81.50
	3 mm	.1181	19 mm	16 mm	40239	THM-316	81.50
	3 mm	.1181	25 mm	20 mm	40287	THM-320	89.90
.1250		.1250	15 mm	12 mm	40239	THMA-412	102.40
.1250		.1250	.625	.5000	40211	TH-84	78.30
.1250		.1250	19 mm	16 mm	40239	THMA-416	102.40
.1250		.1250	.750	.6250	40263	TH-104	78.30
.1250		.1250	.875	.7500	40284	TH-204	86.40
.1250		.1250	25 mm	20 mm	40287	THMA-420	89.90
.1250		.1250	27 mm	22 mm	40287	THMA-422	89.90
.1250		.1250	32 mm	25 mm	40286	THMA-425	106.60
.1250		.1250	1.250	1.0000	40285	TH-404	102.50
	4 mm	.1575	15 mm	12 mm	40283	THM-412	81.50
	4 mm	.1575	19 mm	16 mm	40239	THM-416	81.50
	4 mm	.1575	25 mm	20 mm	40287	THM-420	89.90
.1875		.1875	15 mm	12 mm	40283	THMA-512	102.40
.1875		.1875	.625	.5000	40211	TH-85	78.30
.1875		.1875	19 mm	16 mm	40239	THMA-516	102.40
.1875		.1875	.750	.6250	40263	TH-105	78.30
.1875		.1875	.875	.7500	40284	TH-205	86.40
.1875		.1875	25 mm	20 mm	40287	THMA-520	89.90
.1875		.1875	27 mm	22 mm	40287	THMA-522	89.90
.1875		.1875	32 mm	25 mm	40286	THMA-525	106.60
.1875		.1875	1.250	1.0000	40285	TH-405	102.50
	6 mm	.2362	15 mm	12 mm	40283	THM-612	81.50
	6 mm	.2362	19 mm	16 mm	40239	THM-616	81.50
	6 mm	.2362	25 mm	20 mm	40287	THM-620	89.90

Continued on next page

See pg 48 for replacement parts and accessories

Standard Holders

Headed Holders - Standard Length (cont.)

TH / THM / THMA

Continued from previous page

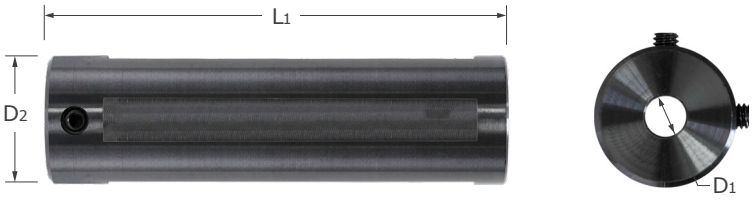
Internal Diameter			Head Diameter	Shank Diameter	Locating Locking Screw	Tool Holder	
D_1 +.0005" −.0000"		decimal equiv.	D_3 +.005" −.005" +.127mm −.127mm	D_2 −.0003" −.0008" −.008mm −.020mm		Tool #	Price
.2500		.2500	15 mm	12 mm	40283	THMA-612	102.40
.2500		.2500	.625	.5000	40211	TH-86	78.30
.2500		.2500	19 mm	16 mm	40239	THMA-616	102.40
.2500		.2500	.750	.6250	40211	TH-106	78.30
.2500		.2500	.875	.7500	40263	TH-206	86.40
.2500		.2500	25 mm	20 mm	40287	THMA-620	89.90
.2500		.2500	27 mm	22 mm	40287	THMA-622	89.90
.2500		.2500	32 mm	25 mm	40286	THMA-625	106.60
.2500		.2500	1.250	1.0000	40285	TH-406	102.50
.3125		.3125	15 mm	12 mm	40283	THMA-712	102.40
.3125		.3125	.625	.5000	40211	TH-87	78.30
.3125		.3125	19 mm	16 mm	40283	THMA-716	102.40
.3125		.3125	.750	.6250	40211	TH-107	78.30
.3125		.3125	.875	.7500	40263	TH-207	86.40
.3125		.3125	25 mm	20 mm	40287	THMA-720	89.90
.3125		.3125	27 mm	22 mm	40287	THMA-722	89.90
.3125		.3125	32 mm	25 mm	40287	THMA-725	106.60
.3125		.3125	1.250	1.0000	40284	TH-407	102.50
	8 mm	.3150	15 mm	12 mm	40283	THM-812	81.50
	8 mm	.3150	19 mm	16 mm	40283	THM-816	81.50
	8 mm	.3150	25 mm	20 mm	40287	THM-820	89.90
.3750		.3750	.625	.5000	40211	TH-88	78.30
.3750		.3750	19 mm	16 mm	40283	THMA-816	102.40
.3750		.3750	.750	.6250	40211	TH-108	78.30
.3750		.3750	.875	.7500	40211	TH-208	86.40
.3750		.3750	25 mm	20 mm	40239	THMA-820	89.90
.3750		.3750	27 mm	22 mm	40287	THMA-822	89.90
.3750		.3750	32 mm	25 mm	40287	THMA-825	106.60
.3750		.3750	1.250	1.0000	40284	TH-408	102.50
	10 mm	.3937	19 mm	16 mm	40283	THM-1016	81.50
	10 mm	.3937	25 mm	20 mm	40239	THM-1020	89.90
	12 mm	.4724	19 mm	16 mm	40283	THM-1216	81.50
	12 mm	.4724	25 mm	20 mm	40283	THM-1220	89.90
.5000		.5000	.875	.7500	40211	TH-210	86.40
.5000		.5000	1.125	1.0000	40284	TH-410	102.50

See pg 48 for replacement parts and accessories

THS

Standard Holders

Straight Holders - Standard Length



- Headless tool holder engineered for maximum versatility in any Swiss, standard lathe, or multi-function lathe
- Tool holder optimized for use with Micro 100 standard shank tools in turning applications
- 4 alignment flats allow for multiple tool engagements and holder orientations
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, locating/locking screw
- Precision manufactured in the USA

Internal Diameter	Shank Diameter	Overall Length	Locating Locking Screw	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	D_2 $^{+.0003"}_{-.0008"}$ $^{+.008mm}_{-.020mm}$	L_1		Tool #	Price
.1250	.5000	2.75	40211	THS-2-500	103.50
.1250	.6250	2.75	40211	THS-2-625	103.50
.1250	16 mm	2.75	40263	THS-2-630	108.70
.1250	.7500	2.75	40263	THS-2-750	108.70
.1250	20 mm	2.75	40263	THS-2-787	108.70
.1250	22 mm	2.75	40284	THS-2-866	108.70
.1250	25 mm	2.75	40284	THS-2-984	113.90
.1250	1.0000	2.75	40284	THS-2-1000	113.90
.1875	.5000	2.75	40211	THS-3-500	103.50
.1875	.6250	2.75	40211	THS-3-625	103.50
.1875	16 mm	2.75	40211	THS-3-630	108.70
.1875	.7500	2.75	40263	THS-3-750	108.70
.1875	20 mm	2.75	40284	THS-3-787	108.70
.1875	22 mm	2.75	40284	THS-3-866	108.70
.1875	25 mm	2.75	40284	THS-3-984	113.90
.1875	1.0000	2.75	40284	THS-3-1000	113.90
.2500	.6250	2.75	40211	THS-4-625	103.50
.2500	16 mm	2.75	40211	THS-4-630	103.50
.2500	.7500	2.75	40211	THS-4-750	108.70
.2500	20 mm	2.75	40211	THS-4-787	108.70
.2500	22 mm	2.75	40263	THS-4-866	108.70
.2500	25 mm	2.75	40284	THS-4-984	108.70
.2500	1.0000	2.75	40284	THS-4-1000	113.90

Continued on next page

See pg 48 for replacement parts and accessories

Standard Holders

Straight Holders - Standard Length (cont.)

THS

Continued from previous page

Internal Diameter	Shank Diameter	Overall Length	Locating Locking Screw	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	D_2 $^{+.0003"}_{-.0008"}$ $^{+.008mm}_{-.020mm}$	L_1		Tool #	Price
.3125	.6250	2.75	40211	THS-5-625	103.50
.3125	16 mm	2.75	40211	THS-5-630	103.50
.3125	.7500	2.75	40211	THS-5-750	108.70
.3125	20 mm	2.75	40211	THS-5-787	108.70
.3125	22 mm	2.75	40263	THS-5-866	108.70
.3125	25 mm	2.75	40284	THS-5-984	108.70
.3125	1.0000	2.75	40284	THS-5-1000	113.90
.3750	.7500	2.75	40211	THS-6-750	108.70
.3750	20 mm	2.75	40211	THS-6-787	108.70
.3750	22 mm	2.75	40211	THS-6-866	108.70
.3750	25 mm	2.75	40263	THS-6-984	113.90
.3750	1.0000	2.75	40263	THS-6-1000	113.90
.5000	25 mm	2.75	40211	THS-8-984	113.90
.5000	1.0000	2.75	40211	THS-8-1000	113.90

Sent Directly to Your Inbox

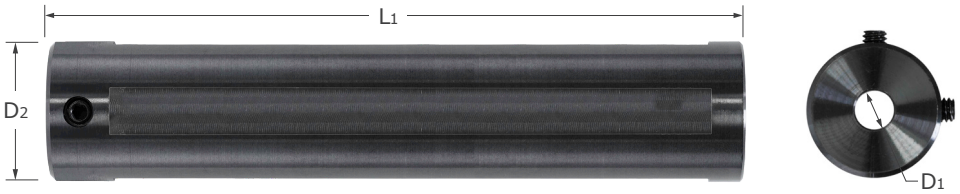
Valuable information about Micro 100 products and technical resources directly to your inbox. Be the first to know of newly-released tools to gain an immediate leg-up on the competition!

See pg 48 for replacement parts and accessories

THSL

Standard Holders

Straight Holders - Long Length



- Long length, headless tool holder designed for applications requiring an extended reach
- Headless tool holder engineered for maximum versatility in any Swiss, standard lathe, or multi-function lathe
- Tool holder optimized for use with Micro 100 standard shank tools in turning applications
- 4 alignment flats allow for multiple tool engagements and holder orientations
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, locating/locking screw
- Precision manufactured in the USA

Internal Diameter	Shank Diameter	Overall Length	Locating Locking Screw	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	D_2 $^{+.0003"}_{-.0008"}$ $^{+.008mm}_{-.020mm}$	L_1		Tool #	Price
.1250	.7500	5.75	40263	THSL-2-750	121.20
.1250	20 mm	5.75	40263	THSL-2-787	121.20
.1250	22 mm	5.75	40284	THSL-2-866	124.40
.1250	1.0000	5.75	40284	THSL-2-1000	127.50
.1875	.7500	5.75	40263	THSL-3-750	121.20
.1875	20 mm	5.75	40284	THSL-3-787	121.20
.1875	22 mm	5.75	40284	THSL-3-866	124.40
.1875	1.0000	5.75	40284	THSL-3-1000	127.50
.2500	.7500	5.75	40211	THSL-4-750	121.20
.2500	20 mm	5.75	40211	THSL-4-787	121.20
.2500	22 mm	5.75	40263	THSL-4-866	124.40
.2500	1.0000	5.75	40284	THSL-4-1000	127.50
.3125	.7500	5.75	40211	THSL-5-750	121.20
.3125	20 mm	5.75	40211	THSL-5-787	121.20
.3125	22 mm	5.75	40263	THSL-5-866	124.40
.3125	1.0000	5.75	40284	THSL-5-1000	127.50
.3750	.7500	5.75	40211	THSL-6-750	121.20
.3750	20 mm	5.75	40211	THSL-6-787	121.20
.3750	22 mm	5.75	40211	THSL-6-866	124.40
.3750	1.0000	5.75	40263	THSL-6-1000	127.50
.5000	1.0000	5.75	40211	THSL-8-1000	127.50

See pg 48 for replacement parts and accessories

NEW!

Standard Holders

Double-Ended - Similar ID

TD

- Standard ID double-ended tool holder allows for access to operations on both the main and sub side spindle
- Similar size standard ID on opposing ends accommodates operations where common range of min bore sizes are required
- Tool holder optimized for use with Micro 100 standard shank tools in turning applications
- Utilizing multiple sizes of double-ended holders reduces set up time by having more shank variations available in the machine at time of set up
- 4 alignment flats allow for multiple tool engagement and holder orientation
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, locating/locking screws
- Precision manufactured in the USA

Internal Diameter	Shank Diameter	Overall Length	Locating Locking Screw	Tool Holder		
D_1 $^{+.0005"}_{-.0000"}$	D_2 $^{-.0003"}_{-.0008"}$	L_1		Tool #	Price	
.1875	.5000	2.20	40211	TD-3-500	193.30	NEW
.1875	.5000	3.20	40211	TD1-3-500	202.70	NEW
.1875	.6250	2.20	40211	TD-3-625	202.70	NEW
.1875	.6250	3.20	40211	TD1-3-625	213.20	NEW
.1875	.7500	3.20	40263	TD1-3-750	217.40	NEW
.1875	1.0000	3.20	40284	TD1-3-1000	226.80	NEW
.2500	.6250	3.20	40211	TD1-4-625	213.20	NEW
.2500	.7500	3.20	40211	TD1-4-750	217.40	NEW
.2500	1.0000	3.20	40263	TD1-4-1000	226.80	NEW
.3125	.6250	3.20	40211	TD1-5-625	213.20	NEW
.3125	.7500	3.20	40211	TD1-5-750	217.40	NEW
.3125	1.0000	3.20	40263	TD1-5-1000	226.80	NEW
.3750	.7500	3.20	40211	TD1-6-750	217.40	NEW
.3750	1.0000	3.20	40263	TD1-6-1000	226.80	NEW
.5000	1.0000	3.50	40211	TD2-8-1000	226.80	NEW

See It in Action

Scan the QR code to see tooling demonstrations to help you make more.

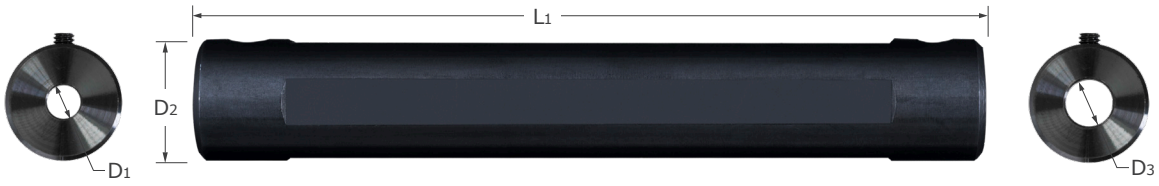
Tech Tip

Utilizing multiple styles of double-ended holders can significantly reduce set up time by having multiple variations of connections readily accessible in the machine.

See pg 48 for replacement parts and accessories

TD

Standard Holders
Double-Ended - Dissimilar ID



- Standard ID double-ended tool holder allows for access to operations on both the main and sub side spindle
- Dissimilar size standard ID on opposing ends accommodates operations where a larger range of min bore offerings are required
- Tool holder optimized for use with Micro 100 standard shank tools in turning applications
- Utilizing multiple sizes of double-ended holders reduces set up time by having more shank variations available in the machine at time of set up
- 4 alignment flats allow for multiple tool engagement and holder orientation
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, locating/locking screws
- Precision manufactured in the USA

	Internal Diameter (Side A)	Internal Diameter (Side B)	Shank Diameter	Overall Length	Locating Locking Screw (Side A)	Locating Locking Screw (Side B)	Tool Holder	
	D_1 $^{+.0005"}_{-.0000"}$	D_3 $^{+.0005"}_{-.0000"}$	D_2 $^{-.0003"}_{-.0008"}$	L_1			Tool #	Price
NEW	.1250	.1875	.5000	2.20	40211	40211	TD-2-3-500	198.60
NEW	.1250	.1875	.5000	3.20	40211	40211	TD1-2-3-500	208.00
NEW	.1250	.1875	.6250	2.20	40211	40211	TD-2-3-625	208.00
NEW	.1250	.1875	.6250	3.20	40211	40211	TD1-2-3-625	217.40
NEW	.1250	.1875	.7500	3.20	40263	40263	TD1-2-3-750	222.60
NEW	.1250	.1875	1.0000	3.20	40284	40284	TD1-2-3-1000	232.00
NEW	.1875	.2500	.6250	2.20	40211	40211	TD-3-4-625	208.00
NEW	.1875	.2500	.6250	3.20	40211	40211	TD1-3-4-625	217.40
NEW	.1875	.2500	.7500	3.20	40263	40211	TD1-3-4-750	222.60
NEW	.1875	.2500	1.0000	3.20	40284	40263	TD1-3-4-1000	232.00
NEW	.2500	.3125	.6250	3.20	40211	40211	TD1-4-5-625	217.40
NEW	.2500	.3125	.7500	3.20	40211	40211	TD1-4-5-750	222.60
NEW	.2500	.3125	1.0000	3.20	40263	40263	TD1-4-5-1000	232.00
NEW	.3125	.3750	.7500	3.20	40211	40211	TD1-5-6-750	222.60
NEW	.3125	.3750	1.0000	3.20	40263	40263	TD1-5-6-1000	232.00
NEW	.3750	.5000	1.0000	3.50	40263	40211	TD2-6-8-1000	232.00

See It in Action

Scan the QR code to see tooling demonstrations to help you make more.

Tech Tip

Utilizing multiple styles of double-ended holders can significantly reduce set up time by having multiple variations of connections readily accessible in the machine.

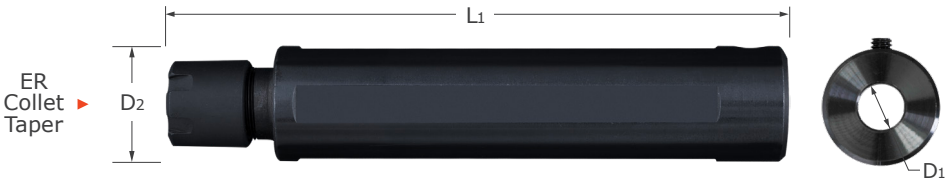
See pg 48 for replacement parts and accessories

NEW!

Standard Holders

Double-Ended - Standard - ER

TDMR



- Standard ID double-ended tool holder allows for access to operations on both the main and sub side spindle
- Standard ID on one and ER collet taper on the other end allows the length adjustability of a standard shank tool, with the versatility of operations that benefit from an ER collet connection
- Tool holder optimized for use with Micro 100 standard shank tools in turning applications
- Utilizing multiple sizes of double-ended holders reduces set up time by having more shank variations available in the machine at time of set up
- 4 alignment flats allow for multiple tool engagement and holder orientation
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, locating/locking screws
- Precision manufactured in the USA

ER Taper Size	Internal Diameter	Shank Diameter	Overall Length	Locating Locking Screw	Tool Holder		
	D_1 $^{+.0005"}_{-.0000"}$	D_2 $^{-.0003"}_{-.0008"}$ $^{-.007mm}_{-.020mm}$	L_1		Tool #	Price	
ER8-Mini	.1250	.5000	2.20	40211	TD-MR8-2-500	222.60	NEW
	.1250	.5000	3.20	40211	TD1-MR8-2-500	232.00	NEW
	.1250	.6250	2.20	40211	TD-MR8-2-625	232.00	NEW
	.1250	.6250	3.20	40211	TD1-MR8-2-625	241.40	NEW
	.1875	.5000	2.20	40211	TD-MR8-3-500	222.60	NEW
	.1875	.5000	3.20	40211	TD1-MR8-3-500	232.00	NEW
	.1875	.6250	2.20	40211	TD-MR8-3-625	232.00	NEW
	.1875	.6250	3.20	40211	TD1-MR8-3-625	241.40	NEW
	.2500	.6250	3.20	40211	TD1-MR8-4-625	241.40	NEW
	.3125	.6250	3.20	40211	TD1-MR8-5-625	241.40	NEW
ER11-Mini	.1250	.6250	2.20	40211	TD-MR11-2-625	232.00	NEW
	.1250	.6250	3.20	40211	TD1-MR11-2-625	241.40	NEW
	.1250	.7500	3.20	40263	TD1-MR11-2-750	246.60	NEW
	.1250	22 mm	3.20	40263	TD1-MR11-2-866	251.80	NEW
	.1250	25 mm	3.20	40284	TD1-MR11-2-984	256.00	NEW
	.1250	1.0000	3.20	40284	TD1-MR11-2-1000	256.00	NEW
	.1875	.6250	2.20	40211	TD-MR11-3-625	232.00	NEW
	.1875	.6250	3.20	40211	TD1-MR11-3-625	241.40	NEW
	.1875	.7500	3.20	40263	TD1-MR11-3-750	246.60	NEW

Continued on next page

See It In Action

Scan the QR code to see tooling demonstrations to help you make more

Tech Tip

Utilizing multiple styles of double-ended holders can significantly reduce set up time by having multiple variations of connections readily accessible in the machine.

See pg 48 for replacement parts and accessories

TDMR

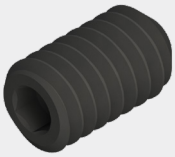
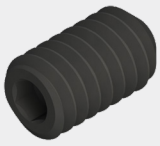
Standard Holders
Double-Ended - Standard - ER (cont.)

Continued from previous page

	ER Taper Size	Internal Diameter	Shank Diameter	Overall Length	Locating Locking Screw	Tool Holder	
	D_1 $^{+.0005"}_{-.0000"}$		D_2 $^{-.0003"}_{-.0008"}$ $^{-.007mm}_{-.020mm}$	L_1		Tool #	Price
NEW	ER11-Mini	.1875	22 mm	3.20	40263	TD1-MR11-3-866	251.80
NEW		.1875	25 mm	3.20	40284	TD1-MR11-3-984	256.00
NEW		.1875	1.0000	3.20	40284	TD1-MR11-3-1000	256.00
NEW		.2500	.6250	3.20	40211	TD1-MR11-4-625	241.40
NEW		.2500	.7500	3.20	40211	TD1-MR11-4-750	246.60
NEW		.2500	1.0000	3.20	40263	TD1-MR11-4-1000	256.00
NEW		.3125	.6250	3.20	40211	TD1-MR11-5-625	241.40
NEW		.3125	.7500	3.20	40211	TD1-MR11-5-750	246.60
NEW		.3125	1.0000	3.20	40263	TD1-MR11-5-1000	256.00
NEW		.3750	.7500	3.20	40211	TD1-MR11-6-750	246.60
NEW		.3750	1.0000	3.20	40263	TD1-MR11-6-1000	256.00
NEW		.5000	1.0000	3.50	40211	TD2-MR11-8-1000	256.00
NEW	ER16-Mini	.1250	.7500	3.20	40263	TD1-MR16-2-750	246.60
NEW		.1250	22 mm	3.20	40263	TD1-MR16-2-866	251.80
NEW		.1250	25 mm	3.20	40284	TD1-MR16-2-984	256.00
NEW		.1250	1.0000	3.20	40284	TD1-MR16-2-1000	256.00
NEW		.1875	.7500	3.20	40263	TD1-MR16-3-750	246.60
NEW		.1875	22 mm	3.20	40263	TD1-MR16-3-866	251.80
NEW		.1875	25 mm	3.20	40284	TD1-MR16-3-984	256.00
NEW		.1875	1.0000	3.20	40284	TD1-MR16-3-1000	256.00
NEW		.2500	.7500	3.20	40211	TD1-MR16-4-750	246.60
NEW		.2500	1.0000	3.20	40263	TD1-MR16-4-1000	256.00
NEW		.3125	.7500	3.20	40211	TD1-MR16-5-750	246.60
NEW		.3125	1.0000	3.20	40263	TD1-MR16-5-1000	256.00
NEW		.3750	.7500	3.20	40211	TD1-MR16-6-750	246.60
NEW		.3750	1.0000	3.20	40263	TD1-MR16-6-1000	256.00
NEW		.5000	1.0000	3.50	40211	TD2-MR16-8-1000	256.00

Standard Parts

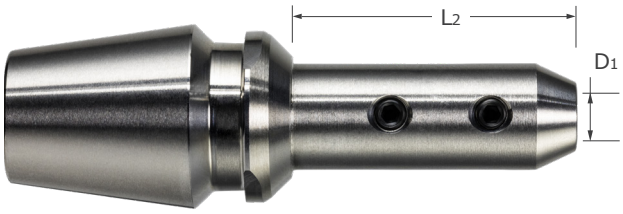
Accessories

Accessory Type	Compatibility	Single		Package of 10	
		Tool #	Price	Tool #	Price
Locating / Locking Screw	See standard holder tables for compatibility page 39-47	40211	1.20	41211	9.90
 Locating / Locking Screw		40263	1.20	41263	9.90
Locating / Locking Screw		40284	1.20	41284	9.90
Locating / Locking Screw		40285	1.20	41285	9.90
Locating / Locking Screw		40283	1.20	41283	9.90
 Locating / Locking Screw		40239	1.20	41239	9.90
Locating / Locking Screw		40287	1.20	41287	9.90
Locating / Locking Screw		40286	1.20	41286	9.90

ERI

Taper Integrated Holders

Solid ER



- Reached ER taper integrated holder that eliminates the need for multiple spindle adapters
- Designed for Swiss and multi-function lathes
- Works with any ER holder or ER spindle in both live and static applications
- Multiple projections available
- Maximum T.I.R. of < .0002”
- Included stop screw allows for quicker tool changes
- Stop screw can be adjusted from either end of the holder

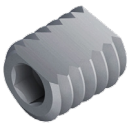
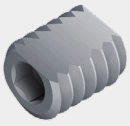
Taper Size	Internal Diameter	Projection	Tool Holder	
	D_1	L_2	Tool #	Price
ER08	.1250	.394	ER08I-2-394	273.40
ER08	.1250	.590	ER08I-2-590	273.40
ER11	.1250	.394	ER11I-2-394	273.40
ER11	.1250	.590	ER11I-2-590	273.40
ER11	.1250	.787	ER11I-2-787	273.40
ER16	.1250	.630	ER16I-2-630	285.90
ER16	.1250	.984	ER16I-2-984	285.90
ER16	.1875	.630	ER16I-3-630	285.90
ER16	.1875	.984	ER16I-3-984	285.90

See pg 50 for replacement parts and accessories

Taper Integrated Holder Parts

Accessories

- Hardware and support tools for Micro 100 ER taper integrated tool holders
- Sold individually or as packages of 10

Accessory Type		Thread Size	Single		Package of 10	
			Tool #	Price	Tool #	Price
	Stop Screw	M6	40810	15.20	41810	135.80
	Stop Screw	M8	40811	18.30	41811	167.20
	Locking Screw	M3	40812	2.30	41812	18.50
	Locking Screw	M4	40813	2.30	41813	18.50

ER

ER Collets
Metric ID

- Collets with metric ID sizes and ranges
- Can be utilized in live or static applications
- Maximum T.I.R. of .0004”
- High polished finish helps resist oxidation

Taper Size	ID	Clamp Range	Tool Holder	
	D_1		Tool #	Price
ER08	1.0 mm	0.5-1.0 mm	ER08-039	21.55
ER08	1.5 mm	1.0-1.5 mm	ER08-059	21.55
ER08	2.0 mm	1.5-2.0 mm	ER08-079	21.55
ER08	2.5 mm	2.0-2.5 mm	ER08-098	21.55
ER08	3.0 mm	2.5-3.0 mm	ER08-118	21.55
ER08	3.5 mm	3.0-3.5 mm	ER08-138	21.55
ER08	4.0 mm	3.5-4.0 mm	ER08-157	21.55
ER08	4.5 mm	4.0-4.5 mm	ER08-177	21.55
ER08	5.0 mm	4.5-5.0 mm	ER08-197	21.55
ER11	1.0 mm	0.5-1.0 mm	ER11-039	18.35
ER11	1.5 mm	1.0-1.5 mm	ER11-059	18.35
ER11	2.0 mm	1.5-2.0 mm	ER11-079	18.35
ER11	2.5 mm	2.0-2.5 mm	ER11-098	18.35
ER11	3.0 mm	2.5-3.0 mm	ER11-118	18.35
ER11	3.5 mm	3.0-3.5 mm	ER11-138	18.35
ER11	4.0 mm	3.5-4.0 mm	ER11-157	18.35
ER11	4.5 mm	4.0-4.5 mm	ER11-177	18.35
ER11	5.0 mm	4.5-5.0 mm	ER11-197	18.35
ER11	5.5 mm	5.0-5.5 mm	ER11-217	18.35
ER11	6.0 mm	5.5-6.0 mm	ER11-236	18.35
ER11	6.5 mm	6.0-6.5 mm	ER11-256	18.35
ER11	7.0 mm	6.5-7.0 mm	ER11-276	18.35
ER16	1.0 mm	0.5-1.0 mm	ER16-039	18.60
ER16	1.5 mm	1.0-1.5 mm	ER16-059	18.60
ER16	2.0 mm	1.5-2.0 mm	ER16-079	18.60
ER16	2.5 mm	1.5-2.5 mm	ER16-098	18.60
ER16	3.0 mm	2.0-3.0 mm	ER16-118	18.60
ER16	3.5 mm	2.5-3.5 mm	ER16-138	18.60
ER16	4.0 mm	3.0-4.0 mm	ER16-157	18.60
ER16	4.5 mm	3.5-4.5 mm	ER16-177	18.60
ER16	5.0 mm	4.0-5.0 mm	ER16-197	18.60
ER16	5.5 mm	4.5-5.5 mm	ER16-217	18.60
ER16	6.0 mm	5.0-6.0 mm	ER16-236	18.60
ER16	6.5 mm	5.5-6.5 mm	ER16-256	18.60
ER16	7.0 mm	6.0-7.0 mm	ER16-276	18.60

Continued on next page

NEW!

ER Collets

Metric ID (cont.)

Continued from previous page

Taper Size	ID	Clamp Range	Tool Holder		
	D_1		Tool #	Price	
ER16	7.5 mm	6.5-7.5 mm	ER16-295	18.60	
ER16	8.0 mm	7.0-8.0 mm	ER16-315	18.60	
ER16	8.5 mm	7.5-8.5 mm	ER16-335	18.60	
ER16	9.0 mm	8.0-9.0 mm	ER16-354	18.60	
ER16	9.5 mm	8.5-9.5 mm	ER16-374	18.60	
ER16	10.0 mm	9.0-10.0 mm	ER16-394	18.60	
ER16	10.5 mm	9.5-10.5 mm	ER16-413	18.60	
ER20	1.0 mm	0.5-1.0 mm	ER20-039	24.00	NEW
ER20	1.5 mm	1.0-1.5 mm	ER20-059	24.00	NEW
ER20	2.0 mm	1.5-2.0 mm	ER20-079	24.00	NEW
ER20	2.5 mm	1.5-2.5 mm	ER20-098	24.00	NEW
ER20	3.0 mm	2.0-3.0 mm	ER20-118	24.00	NEW
ER20	3.5 mm	2.5-3.5 mm	ER20-138	24.00	NEW
ER20	4.0 mm	3.0-4.0 mm	ER20-157	24.00	NEW
ER20	4.5 mm	3.5-4.5 mm	ER20-177	24.00	NEW
ER20	5.0 mm	4.0-5.0 mm	ER20-197	24.00	NEW
ER20	5.5 mm	4.5-5.5 mm	ER20-217	24.00	NEW
ER20	6.0 mm	5.0-6.0 mm	ER20-236	24.00	NEW
ER20	6.5 mm	5.5-6.5 mm	ER20-256	24.00	NEW
ER20	7.0 mm	6.0-7.0 mm	ER20-276	24.00	NEW
ER20	7.5 mm	6.5-7.5 mm	ER20-295	24.00	NEW
ER20	8.0 mm	7.0-8.0 mm	ER20-315	24.00	NEW
ER20	8.5 mm	7.5-8.5 mm	ER20-335	24.00	NEW
ER20	9.0 mm	8.0-9.0 mm	ER20-354	24.00	NEW
ER20	9.5 mm	8.5-9.5 mm	ER20-374	24.00	NEW
ER20	10.0 mm	9.0-10.0 mm	ER20-394	24.00	NEW
ER20	10.5 mm	9.5-10.5 mm	ER20-413	24.00	NEW
ER20	11.0 mm	10.0-11.0 mm	ER20-433	24.00	NEW
ER20	11.5 mm	10.5-11.5 mm	ER20-453	24.00	NEW
ER20	12.0 mm	11.0-12.0 mm	ER20-472	24.00	NEW
ER20	12.5 mm	11.5-12.5 mm	ER20-492	24.00	NEW
ER20	13.0 mm	12.0-13.0 mm	ER20-512	24.00	NEW
ER20	13.5 mm	12.5-13.5 mm	ER20-531	24.00	NEW
ER20	14.0 mm	13.0-14.0 mm	ER20-551	24.00	NEW
ER32	3.0 mm	2.0-3.0 mm	ER32-118	25.50	NEW
ER32	3.5 mm	2.5-3.5 mm	ER32-138	25.50	NEW
ER32	4.0 mm	3.0-4.0 mm	ER32-158	25.50	NEW
ER32	4.5 mm	3.5-4.5 mm	ER32-177	25.50	NEW
ER32	5.0 mm	4.0-5.0 mm	ER32-197	25.50	NEW
ER32	5.5 mm	4.5-5.5 mm	ER32-217	25.50	NEW
ER32	6.0 mm	5.0-6.0 mm	ER32-236	25.50	NEW
ER32	6.5 mm	5.5-6.5 mm	ER32-256	25.50	NEW
ER32	7.0 mm	6.0-7.0 mm	ER32-276	25.50	NEW
ER32	7.5 mm	6.5-7.5 mm	ER32-295	25.50	NEW
ER32	8.0 mm	7.0-8.0 mm	ER32-315	25.50	NEW

Continued on next page

ER

ER Collets
Metric ID (cont.)

Continued from previous page

	Taper Size	ID	Clamp Range	Tool Holder	
		D_1		Tool #	Price
NEW	ER32	8.5 mm	7.5-8.5 mm	ER32-335	25.50
NEW	ER32	9.0 mm	8.0-9.0 mm	ER32-354	25.50
NEW	ER32	9.5 mm	8.5-9.5 mm	ER32-374	25.50
NEW	ER32	10.0 mm	9.0-10.0 mm	ER32-394	25.50
NEW	ER32	10.5 mm	9.5-10.5 mm	ER32-413	25.50
NEW	ER32	11.0 mm	10.0-11.0 mm	ER32-433	25.50
NEW	ER32	11.5 mm	10.5-11.5 mm	ER32-453	25.50
NEW	ER32	12.0 mm	11.0-12.0 mm	ER32-472	25.50
NEW	ER32	12.5 mm	11.5-12.5 mm	ER32-492	25.50
NEW	ER32	13.0 mm	12.0-13.0 mm	ER32-512	25.50
NEW	ER32	13.5 mm	12.5-13.5 mm	ER32-532	25.50
NEW	ER32	14.0 mm	13.0-14.0 mm	ER32-551	25.50
NEW	ER32	14.5 mm	13.5-14.5 mm	ER32-571	25.50
NEW	ER32	15.0 mm	14.0-15.0 mm	ER32-591	25.50
NEW	ER32	15.5 mm	14.5-15.5 mm	ER32-610	25.50
NEW	ER32	16.0 mm	15.0-16.0 mm	ER32-630	25.50
NEW	ER32	16.5 mm	15.5-16.5 mm	ER32-650	25.50
NEW	ER32	17.0 mm	16.0-17.0 mm	ER32-669	25.50
NEW	ER32	17.5 mm	16.5-17.5 mm	ER32-689	25.50
NEW	ER32	18.0 mm	17.0-18.0 mm	ER32-709	25.50
NEW	ER32	18.5 mm	17.5-18.5 mm	ER32-728	25.50
NEW	ER32	19.0 mm	18.0-19.0 mm	ER32-748	25.50
NEW	ER32	19.5 mm	18.5-19.5 mm	ER32-768	25.50
NEW	ER32	20.0 mm	19.0-20.0 mm	ER32-787	25.50
NEW	ER32	21.0 mm	20.0-21.0 mm	ER32-827	25.50

NEW!

ER Collets

Standard ID

ER

- Collets with standard ID sizes and ranges
- Can be utilized in live or static applications
- Maximum T.I.R. of .0004”
- High polished finish helps resist oxidation

Taper Size	ID	Clamp Range	ER Collet		
	D_1		Tool #	Price	
ER08	.0625	.043-.062	ER08-062	21.55	
ER08	.1250	.086-.125	ER08-125	21.55	
ER08	.1875	.148-.187	ER08-187	21.55	
ER11	.0625	043-.062	ER11-062	18.35	
ER11	.0937	.054-.093	ER11-093	18.35	
ER11	.1250	.086-.125	ER11-125	18.35	
ER11	.1562	.117-.156	ER11-156	18.35	
ER11	.1875	.148-.187	ER11-187	18.35	
ER11	.2187	.179-.218	ER11-218	18.35	
ER11	.2500	.211-.250	ER11-250	18.35	
ER11	.2811	.242-.281	ER11-281	18.35	
ER16	.0625	.043-.062	ER16-062	18.60	
ER16	.0937	.054-.093	ER16-093	18.60	
ER16	.1250	.086-.125	ER16-125	18.60	
ER16	.1562	.117-.156	ER16-156	18.60	
ER16	.1875	.148-.187	ER16-187	18.60	
ER16	.2187	.179-.218	ER16-218	18.60	
ER16	.2500	.211-.250	ER16-250	18.60	
ER16	.2811	.242-.281	ER16-281	18.60	
ER16	.3125	.273-.312	ER16-312	18.60	
ER16	.3437	.304-.343	ER16-343	18.60	
ER16	.3750	.336-.375	ER16-375	18.60	
ER16	.4062	.367-.406	ER16-406	18.60	
ER20	.0625	043-.062	ER20-062	24.00	NEW
ER20	.0937	.054-.093	ER20-093	24.00	NEW
ER20	.1250	.086-.125	ER20-125	24.00	NEW
ER20	.1562	.117-.156	ER20-156	24.00	NEW
ER20	.1875	.148-.187	ER20-187	24.00	NEW
ER20	.2187	.179-.218	ER20-218	24.00	NEW
ER20	.2500	.211-.250	ER20-250	24.00	NEW
ER20	.2811	.242-.281	ER20-281	24.00	NEW
ER20	.3125	.273-.312	ER20-312	24.00	NEW
ER20	.3437	.304-.343	ER20-343	24.00	NEW
ER20	.3750	.336-.375	ER20-375	24.00	NEW
ER20	.4062	.367-.406	ER20-406	24.00	NEW
ER20	.4375	.398-.437	ER20-437	24.00	NEW
ER20	.4687	.429-.468	ER20-468	24.00	NEW
ER20	.5000	.461-.500	ER20-500	24.00	NEW

Continued on next page

ER

ER Collets
Standard ID

Continued from previous page

	Taper Size	ID	Clamp Range	ER Collet	
		D_1		Tool #	Price
NEW	ER32	.0625	043-.062	ER32-062	25.50
NEW	ER32	.0937	.054-.093	ER32-093	25.50
NEW	ER32	.1250	.086-.125	ER32-125	25.50
NEW	ER32	.1562	.117-.156	ER32-156	25.50
NEW	ER32	.1875	.148-.187	ER32-187	25.50
NEW	ER32	.2187	.179-.218	ER32-218	25.50
NEW	ER32	.2500	.211-.250	ER32-250	25.50
NEW	ER32	.2811	.242-.281	ER32-281	25.50
NEW	ER32	.3125	.273-.312	ER32-312	25.50
NEW	ER32	.3437	.304-.343	ER32-343	25.50
NEW	ER32	.3750	.336-.375	ER32-375	25.50
NEW	ER32	.4062	.367-.406	ER32-406	25.50
NEW	ER32	.4375	.398-.437	ER32-437	25.50
NEW	ER32	.4687	.429-.468	ER32-468	25.50
NEW	ER32	.5000	.461-.500	ER32-500	25.50
NEW	ER32	.5312	.492-.531	ER32-531	25.50
NEW	ER32	.5625	.523-.562	ER32-562	25.50
NEW	ER32	.5937	.554-.593	ER32-593	25.50
NEW	ER32	.6250	.586-.625	ER32-625	25.50
NEW	ER32	.6562	.617-.656	ER32-656	25.50
NEW	ER32	.6875	.648-.687	ER32-687	25.50
NEW	ER32	.7187	.679-.718	ER32-718	25.50
NEW	ER32	.7500	.711-.750	ER32-750	25.50

NEW!

ER Collets

Metric ID - Metallic Sealed

ERMS

- Steel Sealed to 2000 PSI
- Size specific ID
- Collets with metric ID sizes
- Can be utilized in live or static applications
- Maximum T.I.R. of .0002”
- High polished finish helps resist oxidation

Taper Size	ID	ER Collet		
	D_1	Tool #	Price	
ER11	3.0 mm	ERMS11-118	51.70	NEW
ER11	4.0 mm	ERMS11-157	51.70	NEW
ER11	5.0 mm	ERMS11-197	51.70	NEW
ER11	6.0 mm	ERMS11-236	51.70	NEW
ER11	7.0 mm	ERMS11-276	51.70	NEW
ER16	3.0 mm	ERMS16-118	41.50	NEW
ER16	4.0 mm	ERMS16-157	41.50	NEW
ER16	5.0 mm	ERMS16-197	41.50	NEW
ER16	6.0 mm	ERMS16-236	41.50	NEW
ER16	7.0 mm	ERMS16-276	41.50	NEW
ER16	8.0 mm	ERMS16-315	41.50	NEW
ER16	9.0 mm	ERMS16-354	41.50	NEW
ER16	10.0 mm	ERMS16-394	41.50	NEW
ER20	3.0 mm	ERMS20-118	46.50	NEW
ER20	4.0 mm	ERMS20-157	46.50	NEW
ER20	5.0 mm	ERMS20-197	46.50	NEW
ER20	6.0 mm	ERMS20-236	46.50	NEW
ER20	7.0 mm	ERMS20-276	46.50	NEW
ER20	8.0 mm	ERMS20-315	46.50	NEW
ER20	9.0 mm	ERMS20-354	46.50	NEW
ER20	10.0 mm	ERMS20-394	46.50	NEW
ER20	11.0 mm	ERMS20-433	46.50	NEW
ER20	12.0 mm	ERMS20-472	46.50	NEW
ER20	13.0 mm	ERMS20-512	46.50	NEW
ER32	3.0 mm	ERMS32-118	49.50	NEW
ER32	4.0 mm	ERMS32-157	49.50	NEW
ER32	5.0 mm	ERMS32-197	49.50	NEW
ER32	6.0 mm	ERMS32-236	49.50	NEW
ER32	7.0 mm	ERMS32-276	49.50	NEW
ER32	8.0 mm	ERMS32-315	49.50	NEW
ER32	9.0 mm	ERMS32-354	49.50	NEW
ER32	10.0 mm	ERMS32-394	49.50	NEW
ER32	11.0 mm	ERMS32-433	49.50	NEW
ER32	12.0 mm	ERMS32-472	49.50	NEW
ER32	13.0 mm	ERMS32-512	49.50	NEW
ER32	14.0 mm	ERMS32-551	49.50	NEW
ER32	15.0 mm	ERMS32-591	49.50	NEW
ER32	16.0 mm	ERMS32-630	49.50	NEW
ER32	17.0 mm	ERMS32-669	49.50	NEW
ER32	18.0 mm	ERMS32-709	49.50	NEW
ER32	19.0 mm	ERMS32-748	49.50	NEW
ER32	20.0 mm	ERMS32-787	49.50	NEW

ERMS

ER Collets

Standard ID - Metallic Sealed

- Steel Sealed to 2000 PSI
- Size specific ID
- Collets with standard ID sizes
- Can be utilized in live or static applications
- Maximum T.I.R. of .0002”
- High polished finish helps resist oxidation

	Taper Size	ID	ER Collet	
		D_1	Tool #	Price
NEW	ER11	.1250	ERMS11-125	51.70
NEW	ER11	.1875	ERMS11-187	51.70
NEW	ER11	.2500	ERMS11-250	51.70
NEW	ER16	.1250	ERMS16-125	41.50
NEW	ER16	.1875	ERMS16-187	41.50
NEW	ER16	.2500	ERMS16-250	41.50
NEW	ER16	.3125	ERMS16-312	41.50
NEW	ER16	.3750	ERMS16-375	41.50
NEW	ER20	.1250	ERMS20-125	46.50
NEW	ER20	.1875	ERMS20-187	46.50
NEW	ER20	.2500	ERMS20-250	46.50
NEW	ER20	.3125	ERMS20-312	46.50
NEW	ER20	.3750	ERMS20-375	46.50
NEW	ER20	.5000	ERMS20-500	46.50
NEW	ER32	.2500	ERMS32-250	49.50
NEW	ER32	.3125	ERMS32-312	49.50
NEW	ER32	.3750	ERMS32-375	49.50
NEW	ER32	.5000	ERMS32-500	49.50
NEW	ER32	.6250	ERMS32-625	49.50
NEW	ER32	.7500	ERMS32-750	49.50

NEW!

ER Collets

Sets

ERS/ERM

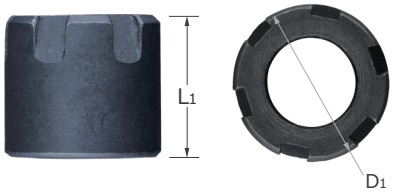
- Collet sets available in either standard or metric ID sizes and ranges
- Can be utilized in live or static applications
- Maximum T.I.R. of .0004”
- High polished finish helps resist oxidation

Taper Size	ID Type	Collet Count	Clamp Range	Set		
	D_1			Tool #	Price	
ER08	Metric	9	0.5-5.0 mm	ER08M-1	184.00	
ER11	Standard	7	.043-.250	ER11S-1	122.00	
ER11	Metric	13	0.5-7.0 mm	ER11M-1	227.00	
ER16	Standard	10	.054-.375	ER16S-1	177.00	
ER16	Metric	10	0.5-10.0 mm	ER16M-1	177.00	
ER20	Standard	12	.117-.500	ER20S-1	274.00	NEW
ER20	Metric	12	1.5-13.0 mm	ER20M-1	274.00	NEW
ER32	Standard	18	.179-.750	ER32S-1	436.00	NEW
ER32	Metric	18	2.0-20 mm	ER32M-1	436.00	NEW

CMR

ER Collets
ER Collet Nuts

- For use where minimal OD is required
- Balanced to 25,000 RPM
- Black oxide with additional coating to reduce torque requirement

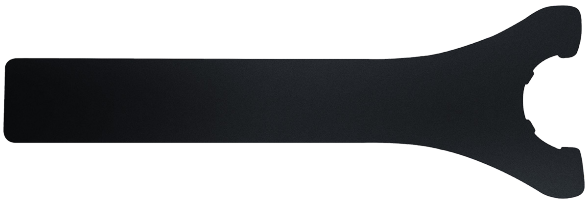


	Taper Size	Nut Type	Nut Diameter	Nut Length	Thread Size	ER Nuts	
			D_1	L_1		Tool #	Price
NEW	ER08	Mini	12 mm	11 mm	M10 x 0.75	CMR08-SW	27.00
NEW	ER11	Mini	16 mm	12 mm	M13 x 0.75	CMR11-SW	28.50
NEW	ER16	Mini	22 mm	18 mm	M19 x 1.0	CMR16-SW	29.50

MRSW

ER Collets
ER Collet Wrenches

- Wrenches utilized for various collet nut connections



	Taper Size	Nut Size	ER Wrenches	
			Tool #	Price
NEW	ER08	Mini	MR08-SW	19.00
NEW	ER11	Mini	MR11-SW	20.00
NEW	ER16	Mini	MR16-SW	21.00

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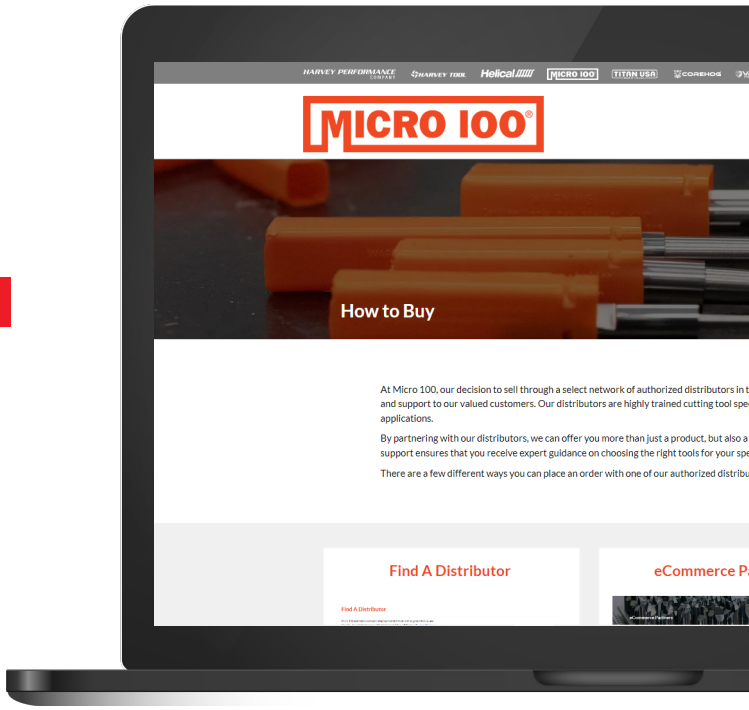

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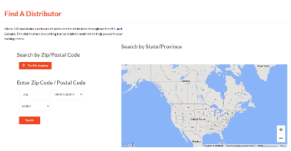

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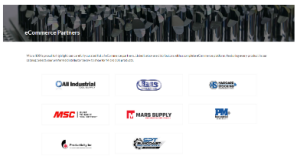

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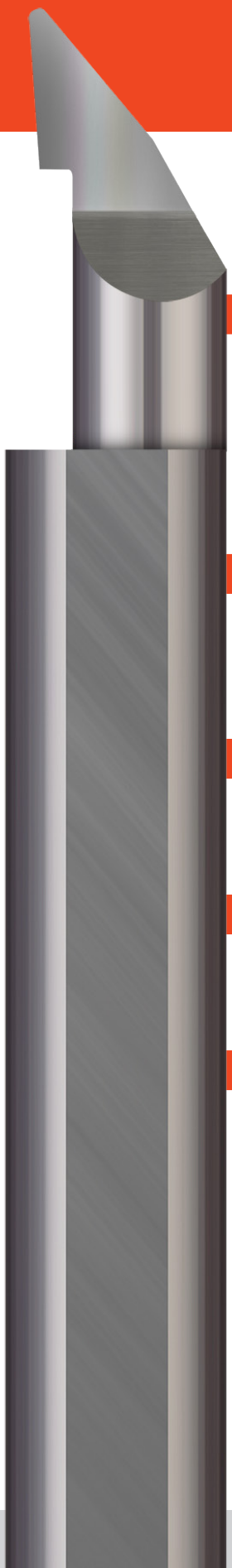
TURNING TOOLS



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Quick Change – Boring Tools

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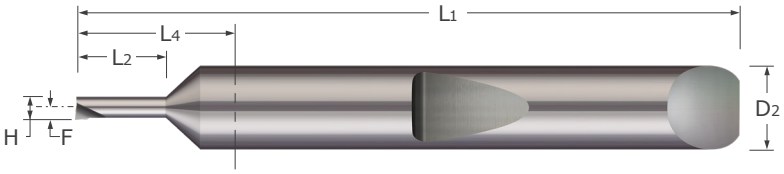
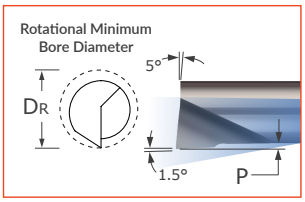
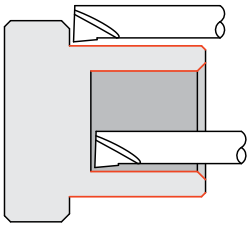
QMBB





- Designed for facing and boring applications in bores .015" and larger
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- On center neck design allows for static and live/rotating applications
- Coolant fed enabled shank design
- Sharp corner profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials ■ Solid carbide ■ CNC ground in the USA



Head Width	Rotational Minimum Bore Dia.	Max. Bore Depth	Projection	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H	DR	L2 +.030" −.000"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.0135	.0150	.050	.0015	.590	.0075	.1875	1.5	QMBB-015050	47.10	QMBB-015050X	51.15
.0135	.0150	.075	.0015	.590	.0075	.1875	1.5	QMBB-015075	47.10	QMBB-015075X	52.10
.0180	.0200	.050	.0020	.590	.0100	.1875	1.5	QMBB-020050	47.10	QMBB-020050X	52.10
.0180	.0200	.075	.0020	.590	.0100	.1875	1.5	QMBB-020075	47.10	QMBB-020075X	51.15
.0180	.0200	.100	.0020	.590	.0100	.1875	1.5	QMBB-020100	47.10	QMBB-020100X	52.10
.0225	.0250	.050	.0025	.590	.0125	.1875	1.5	QMBB-025050	41.50	QMBB-025050X	46.50
.0225	.0250	.075	.0025	.590	.0125	.1875	1.5	QMBB-025075	41.50	QMBB-025075X	46.50
.0225	.0250	.100	.0025	.590	.0125	.1875	1.5	QMBB-025100	41.50	QMBB-025100X	45.35
.0225	.0250	.125	.0025	.590	.0125	.1875	1.5	QMBB-025125	41.50	QMBB-025125X	46.50
.0275	.0300	.075	.0025	.590	.0150	.1875	1.5	QMBB-030075	41.50	QMBB-030075X	46.50
.0275	.0300	.100	.0025	.590	.0150	.1875	1.5	QMBB-030100	41.50	QMBB-030100X	45.35
.0275	.0300	.125	.0025	.590	.0150	.1875	1.5	QMBB-030125	41.50	QMBB-030125X	46.50
.0275	.0300	.150	.0025	.590	.0150	.1875	1.5	QMBB-030150	41.50	QMBB-030150X	46.50
.0320	.0350	.075	.0030	.590	.0175	.1875	1.5	QMBB-035075	41.50	QMBB-035075X	46.50
.0320	.0350	.100	.0030	.590	.0175	.1875	1.5	QMBB-035100	41.50	QMBB-035100X	45.35
.0320	.0350	.150	.0030	.590	.0175	.1875	1.5	QMBB-035150	41.50	QMBB-035150X	45.35
.0320	.0350	.200	.0030	.590	.0175	.1875	1.5	QMBB-035200	41.50	QMBB-035200X	46.50
.0365	.0400	.100	.0035	.590	.0200	.1875	1.5	QMBB-040100	41.50	QMBB-040100X	46.50
.0365	.0400	.150	.0035	.590	.0200	.1875	1.5	QMBB-040150	41.50	QMBB-040150X	45.35
.0365	.0400	.200	.0035	.590	.0200	.1875	1.5	QMBB-040200	41.50	QMBB-040200X	45.35
.0405	.0450	.100	.0045	.590	.0225	.1875	1.5	QMBB-045100	41.50	QMBB-045100X	46.50
.0405	.0450	.150	.0045	.590	.0225	.1875	1.5	QMBB-045150	41.50	QMBB-045150X	45.35
.0405	.0450	.200	.0045	.590	.0225	.1875	1.5	QMBB-045200	41.50	QMBB-045200X	45.35
.0440	.0500	.100	.0060	.590	.0250	.1875	1.5	QMBB-050100	32.40	QMBB-050100X	37.40
.0440	.0500	.150	.0060	.590	.0250	.1875	1.5	QMBB-050150	32.40	QMBB-050150X	35.95
.0440	.0500	.200	.0060	.590	.0250	.1875	1.5	QMBB-050200	32.40	QMBB-050200X	35.95
.0440	.0500	.300	.0060	.590	.0250	.1875	1.5	QMBB-050300	32.40	QMBB-050300X	35.95
.0525	.0600	.150	.0075	.590	.0300	.1875	1.5	QMBB-060150	32.40	QMBB-060150X	35.95
.0525	.0600	.200	.0075	.590	.0300	.1875	1.5	QMBB-060200	32.40	QMBB-060200X	35.95
.0525	.0600	.300	.0075	.590	.0300	.1875	1.5	QMBB-060300	32.40	QMBB-060300X	35.95
.0525	.0600	.400	.0075	.590	.0300	.1875	1.5	QMBB-060400	32.40	QMBB-060400X	35.95
.0525	.0600	.500	.0075	.590	.0300	.1875	1.5	QMBB-060500	32.40	QMBB-060500X	35.95

Continued on next page

See pgs 16-34 for quick change holder options

QMBB

Quick Change – Boring Tools

Right Hand – Sharp - Miniature (cont.)

Continued from previous page

Head Width	Rotational Minimum Bore Dia.	Max. Bore Depth	Projection	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H	D_R	L_2 $^{+.030"}_{-.000"}$	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0625	.0700	.150	.0075	.590	.0350	.1875	1.5	QMBB-070150	32.40	QMBB-070150X	35.95
.0625	.0700	.200	.0075	.590	.0350	.1875	1.5	QMBB-070200	32.40	QMBB-070200X	35.95
.0625	.0700	.300	.0075	.590	.0350	.1875	1.5	QMBB-070300	32.40	QMBB-070300X	35.95
.0625	.0700	.400	.0075	.590	.0350	.1875	1.5	QMBB-070400	32.40	QMBB-070400X	35.95
.0625	.0700	.500	.0075	.590	.0350	.1875	1.5	QMBB-070500	32.40	QMBB-070500X	35.95
.0700	.0800	.150	.0100	.590	.0400	.1875	1.5	QMBB-080150	32.40	QMBB-080150X	35.95
.0700	.0800	.200	.0100	.590	.0400	.1875	1.5	QMBB-080200	32.40	QMBB-080200X	35.95
.0700	.0800	.300	.0100	.590	.0400	.1875	1.5	QMBB-080300	32.40	QMBB-080300X	35.95
.0700	.0800	.500	.0100	.590	.0400	.1875	1.5	QMBB-080500	32.40	QMBB-080500X	35.95
.0700	.0800	.600	.0100	1.090	.0400	.1875	2.0	QMBB-080600	32.40	QMBB-080600X	35.95
.0800	.0900	.200	.0100	.590	.0450	.1875	1.5	QMBB-090200	32.40	QMBB-090200X	37.40
.0800	.0900	.300	.0100	.590	.0450	.1875	1.5	QMBB-090300	32.40	QMBB-090300X	35.95
.0800	.0900	.500	.0100	.590	.0450	.1875	1.5	QMBB-090500	32.40	QMBB-090500X	35.95
.0800	.0900	.700	.0100	1.090	.0450	.1875	2.0	QMBB-090700	32.40	QMBB-090700X	35.95
.0875	.1000	.200	.0125	.590	.0500	.1875	1.5	QMBB-100200	32.40	QMBB-100200X	37.40
.0875	.1000	.300	.0125	.590	.0500	.1875	1.5	QMBB-100300	32.40	QMBB-100300X	35.95
.0875	.1000	.500	.0125	.590	.0500	.1875	1.5	QMBB-100500	32.40	QMBB-100500X	35.95
.0875	.1000	.700	.0125	1.090	.0500	.1875	2.0	QMBB-100700	32.40	QMBB-100700X	35.95
.0875	.1000	.800	.0125	1.090	.0500	.1875	2.0	QMBB-100800	32.40	QMBB-100800X	35.95

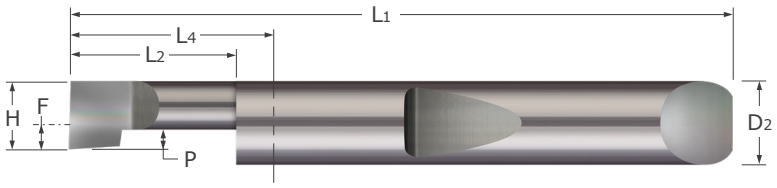
See pgs 16-34 for quick change holder options

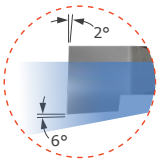
NEW!

Quick Change – Boring Tools

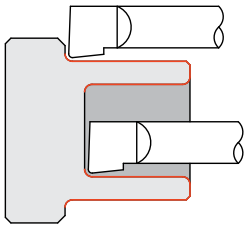
Right Hand – Sharp

QBB





- Designed for facing and boring applications in bores .055" and larger
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Coolant fed enabled shank design
- Sharp corner profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Head Width	Min. Bore Diameter*	Max. Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated		
H		L_2 +.030" −.000"	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	
.0500	.0550	.150	.013	.590	-.0438	.1875	1.5	QBB-050150	32.40	QBB-050150X	35.95	
.0500	.0550	.200	.013	.590	-.0438	.1875	1.5	QBB-050200	32.40	QBB-050200X	35.95	
.0500	.0550	.250	.013	.590	-.0438	.1875	1.5	QBB-050250-000	32.40	QBB-050250-000X	37.40	NEW
.0500	.0550	.300	.013	.590	-.0438	.1875	1.5	QBB-050300	32.40	QBB-050300X	35.95	
.0500	.0550	.400	.013	.590	-.0438	.1875	1.5	QBB-050400	32.40	QBB-050400X	35.95	
.0600	.0700	.150	.015	.590	-.0338	.1875	1.5	QBB-060150	32.40	QBB-060150X	35.95	
.0600	.0700	.200	.015	.590	-.0338	.1875	1.5	QBB-060200	32.40	QBB-060200X	35.95	
.0600	.0700	.250	.015	.590	-.0338	.1875	1.5	QBB-060250-000	32.40	QBB-060250-000X	37.40	NEW
.0600	.0700	.300	.015	.590	-.0338	.1875	1.5	QBB-060300	32.40	QBB-060300X	35.95	
.0600	.0700	.400	.015	.590	-.0338	.1875	1.5	QBB-060400	32.40	QBB-060400X	35.95	
.0600	.0700	.500	.015	.590	-.0338	.1875	1.5	QBB-060500	32.40	QBB-060500X	35.95	
.0700	.0800	.150	.015	.590	-.0238	.1875	1.5	QBB-070150-000	32.40	QBB-070150-000X	37.40	
.0700	.0800	.200	.015	.590	-.0238	.1875	1.5	QBB-070200-000	32.40	QBB-070200-000X	37.40	
.0700	.0800	.300	.015	.590	-.0238	.1875	1.5	QBB-070300-000	32.40	QBB-070300-000X	37.40	
.0800	.0900	.150	.020	.590	-.0138	.1875	1.5	QBB-080150-000	32.40	QBB-080150-000X	37.40	
.0800	.0900	.200	.020	.590	-.0138	.1875	1.5	QBB-080200	32.40	QBB-080200X	35.95	
.0800	.0900	.300	.020	.590	-.0138	.1875	1.5	QBB-080300	32.40	QBB-080300X	35.95	
.0800	.0900	.400	.020	.590	-.0138	.1875	1.5	QBB-080400-000	32.40	QBB-080400-000X	37.40	
.0800	.0900	.500	.020	.590	-.0138	.1875	1.5	QBB-080500	32.40	QBB-080500X	35.95	
.0800	.0900	.600	.020	1.090	-.0138	.1875	2.0	QBB-080600	32.40	QBB-080600X	35.95	
.0900	.1000	.150	.020	.590	-.0038	.1875	1.5	QBB-090150-000	34.40	QBB-090150-000X	39.40	
.0900	.1000	.200	.020	.590	-.0038	.1875	1.5	QBB-090200-000	34.40	QBB-090200-000X	39.40	
.0900	.1000	.300	.020	.590	-.0038	.1875	1.5	QBB-090300-000	34.40	QBB-090300-000X	39.40	
.0900	.1000	.400	.020	.590	-.0038	.1875	1.5	QBB-090400-000	34.40	QBB-090400-000X	39.40	
.0900	.1000	.500	.020	.590	-.0038	.1875	1.5	QBB-090500-000	34.40	QBB-090500-000X	39.40	

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options

See pg 62 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 72-75

QBB

Quick Change – Boring Tools

Right Hand – Sharp (cont.)

Continued from previous page

	Head Width	Min. Bore Diameter*	Max. Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
	H		L_2 $^{+.030"}_{-.000"}$	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	.1000	.1100	.150	.025	.590	.0063	.1875	1.5	QBB-100150-000	34.40	QBB-100150-000X	39.40
	.1000	.1100	.200	.025	.590	.0063	.1875	1.5	QBB-100200	34.40	QBB-100200X	37.95
	.1000	.1100	.300	.025	.590	.0063	.1875	1.5	QBB-100300	34.40	QBB-100300X	37.95
	.1000	.1100	.400	.025	.590	.0063	.1875	1.5	QBB-100400-000	34.40	QBB-100400-000X	39.40
	.1000	.1100	.500	.025	.590	.0063	.1875	1.5	QBB-100500	34.40	QBB-100500X	37.95
	.1000	.1100	.600	.025	1.090	.0063	.1875	2.0	QBB-100600-000	35.80	QBB-100600-000X	40.80
	.1000	.1100	.700	.025	1.090	.0063	.1875	2.0	QBB-100700	34.40	QBB-100700X	37.95
NEW	.1000	.1100	.800	.025	1.090	.0063	.1875	2.0	QBB-100800-000	34.40	QBB-100800-000X	39.40
	.1100	.1220	.150	.028	.590	.0163	.1875	1.5	QBB-110150-000	34.40	QBB-110150-000X	39.40
	.1100	.1220	.200	.028	.590	.0163	.1875	1.5	QBB-110200-000	34.40	QBB-110200-000X	39.40
	.1100	.1220	.300	.028	.590	.0163	.1875	1.5	QBB-110300-000	34.40	QBB-110300-000X	39.05
	.1100	.1220	.400	.028	.590	.0163	.1875	1.5	QBB-110400-000	34.40	QBB-110400-000X	39.40
	.1100	.1220	.500	.028	.590	.0163	.1875	1.5	QBB-110500-000	34.40	QBB-110500-000X	39.40
	.1100	.1220	.600	.028	1.090	.0163	.1875	2.0	QBB-110600-000	35.80	QBB-110600-000X	40.80
	.1100	.1220	.700	.028	1.090	.0163	.1875	2.0	QBB-110700-000	35.80	QBB-110700-000X	40.80
	.1200	.1320	.250	.030	.590	.0263	.1875	1.5	QBB-120250-000	34.40	QBB-120250-000X	39.05
	.1200	.1320	.350	.030	.590	.0263	.1875	1.5	QBB-120350-000	34.40	QBB-120350-000X	39.05
	.1200	.1320	.500	.030	.590	.0263	.1875	1.5	QBB-120500-000	34.40	QBB-120500-000X	39.05
	.1200	.1320	.600	.030	1.090	.0263	.1875	2.0	QBB-120600-000	35.80	QBB-120600-000X	40.80
	.1200	.1320	.700	.030	1.090	.0263	.1875	2.0	QBB-120700-000	35.80	QBB-120700-000X	40.80
	.1200	.1320	.800	.030	1.090	.0263	.1875	2.0	QBB-120800-000	35.80	QBB-120800-000X	40.80
NEW	.1200	.1320	1.000	.030	1.090	.0263	.1875	2.0	QBB-1201000-000	35.80	QBB-1201000-000X	40.80
	.1400	.1520	.250	.035	.590	.0463	.1875	1.5	QBB-140250-000	34.40	QBB-140250-000X	39.05
	.1400	.1520	.400	.035	.590	.0463	.1875	1.5	QBB-140400-000	34.40	QBB-140400-000X	39.05
	.1400	.1520	.500	.035	.590	.0463	.1875	1.5	QBB-140500-000	34.40	QBB-140500-000X	39.05
	.1400	.1520	.600	.035	1.090	.0463	.1875	2.0	QBB-140600-000	35.80	QBB-140600-000X	40.80
	.1400	.1520	.700	.035	1.090	.0463	.1875	2.0	QBB-140700-000	35.80	QBB-140700-000X	40.80
	.1400	.1520	.750	.035	1.090	.0463	.1875	2.0	QBB-140750-000	35.80	QBB-140750-000X	40.80
	.1400	.1520	.800	.035	1.090	.0463	.1875	2.0	QBB-140800-000	35.80	QBB-140800-000X	40.80
	.1400	.1520	.900	.035	1.090	.0463	.1875	2.0	QBB-140900-000	35.80	QBB-140900-000X	40.80
	.1600	.1760	.250	.040	.590	.0663	.1875	1.5	QBB-160250-000	34.40	QBB-160250-000X	39.40
	.1600	.1760	.400	.040	.590	.0663	.1875	1.5	QBB-160400-000	34.40	QBB-160400-000X	39.05
	.1600	.1760	.500	.040	.590	.0663	.1875	1.5	QBB-160500-000	34.40	QBB-160500-000X	39.05
	.1600	.1760	.600	.040	1.090	.0663	.1875	2.0	QBB-160600-000	34.40	QBB-160600-000X	39.05
	.1600	.1760	.750	.040	1.090	.0663	.1875	2.0	QBB-160750-000	35.80	QBB-160750-000X	40.80
	.1600	.1760	.900	.040	1.090	.0663	.1875	2.0	QBB-160900-000	35.80	QBB-160900-000X	40.80
	.1600	.1760	1.000	.040	1.090	.0663	.1875	2.0	QBB-1601000-000	34.40	QBB-1601000-000X	39.05
NEW	.1600	.1760	1.250	.040	1.590	.0663	.1875	2.5	QBB-1601250-000	37.20	QBB-1601250-000X	42.50

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options
See pg 62 for miniature sizes
For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 72-75

NEW!

Quick Change – Boring Tools

Right Hand – Sharp (cont.)

QBB

Continued from previous page

Head Width	Min. Bore Diameter*	Max. Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H		L_2 $^{+.030"}_{-.000"}$	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.1800	.1960	.350	.045	.853	.0550	.2500	2.0	QBB-180350-000	38.60	QBB-180350-000X	44.50
.1800	.1960	.500	.045	.853	.0550	.2500	2.0	QBB-180500-000	38.60	QBB-180500-000X	44.50
.1800	.1960	.600	.045	.853	.0550	.2500	2.0	QBB-180600-000	38.60	QBB-180600-000X	44.50
.1800	.1960	.750	.045	.853	.0550	.2500	2.0	QBB-180750-000	38.60	QBB-180750-000X	44.50
.1800	.1960	.900	.045	1.353	.0550	.2500	2.5	QBB-180900-000	40.00	QBB-180900-000X	46.40
.1800	.1960	1.000	.045	1.353	.0550	.2500	2.5	QBB-1801000-000	40.00	QBB-1801000-000X	46.40
.1800	.1960	1.250	.045	1.353	.0550	.2500	2.5	QBB-1801250-000	40.00	QBB-1801250-000X	46.40
.1800	.1960	1.500	.045	1.853	.0550	.2500	3.0	QBB-1801500-000	41.60	QBB-1801500-000X	47.90
.2000	.2160	.400	.050	.853	.0750	.2500	2.0	QBB-200400-000	38.60	QBB-200400-000X	44.50
.2000	.2160	.500	.050	.853	.0750	.2500	2.0	QBB-200500-000	38.60	QBB-200500-000X	44.50
.2000	.2160	.600	.050	.853	.0750	.2500	2.0	QBB-200600-000	38.60	QBB-200600-000X	44.50
.2000	.2160	.700	.050	.853	.0750	.2500	2.0	QBB-200700-000	38.60	QBB-200700-000X	44.50
.2000	.2160	.750	.050	.853	.0750	.2500	2.0	QBB-200750-000	38.60	QBB-200750-000X	44.50
.2000	.2160	1.000	.050	1.353	.0750	.2500	2.5	QBB-2001000-000	38.60	QBB-2001000-000X	44.90
.2000	.2160	1.300	.050	1.353	.0750	.2500	2.5	QBB-2001300-000	38.60	QBB-2001300-000X	44.90
.2300	.2500	.400	.058	.853	.0738	.3125	2.0	QBB-230400-000	49.50	QBB-230400-000X	56.70
.2300	.2500	.500	.058	.853	.0738	.3125	2.0	QBB-230500-000	49.50	QBB-230500-000X	56.70
.2300	.2500	.600	.058	.853	.0738	.3125	2.0	QBB-230600-000	49.50	QBB-230600-000X	56.70
.2300	.2500	.700	.058	.853	.0738	.3125	2.0	QBB-230700-000	49.50	QBB-230700-000X	56.70
.2300	.2500	.750	.058	.853	.0738	.3125	2.0	QBB-230750-000	49.50	QBB-230750-000X	56.70
.2300	.2500	.800	.058	1.353	.0738	.3125	2.5	QBB-230800-000	50.90	QBB-230800-000X	58.50
.2300	.2500	.900	.058	1.353	.0738	.3125	2.5	QBB-230900-000	50.90	QBB-230900-000X	58.50
.2300	.2500	1.000	.058	1.353	.0738	.3125	2.5	QBB-2301000-000	49.50	QBB-2301000-000X	57.10
.2300	.2500	1.250	.058	1.353	.0738	.3125	2.5	QBB-2301250-000	49.50	QBB-2301250-000X	57.10
.2300	.2500	1.500	.058	1.853	.0738	.3125	3.0	QBB-2301500-000	49.50	QBB-2301500-000X	57.10
.2600	.2800	.500	.065	.853	.1038	.3125	2.0	QBB-260500-000	49.50	QBB-260500-000X	56.70
.2600	.2800	.750	.065	.853	.1038	.3125	2.0	QBB-260750-000	49.50	QBB-260750-000X	56.70
.2600	.2800	1.000	.065	1.353	.1038	.3125	2.5	QBB-2601000-000	50.90	QBB-2601000-000X	58.50
.2600	.2800	1.250	.065	1.353	.1038	.3125	2.5	QBB-2601250-000	50.90	QBB-2601250-000X	58.50
.2900	.3100	.500	.073	.853	.1338	.3125	2.0	QBB-290500-000	49.50	QBB-290500-000X	56.70
.2900	.3100	.600	.073	.853	.1338	.3125	2.0	QBB-290600-000	49.50	QBB-290600-000X	56.70
.2900	.3100	.750	.073	.853	.1338	.3125	2.0	QBB-290750-000	49.50	QBB-290750-000X	56.70
.2900	.3100	.900	.073	1.353	.1338	.3125	2.5	QBB-290900-000	50.90	QBB-290900-000X	58.50
.2900	.3100	1.000	.073	1.353	.1338	.3125	2.5	QBB-2901000-000	50.90	QBB-2901000-000X	58.50
.2900	.3100	1.250	.073	1.353	.1338	.3125	2.5	QBB-2901250-000	50.90	QBB-2901250-000X	58.50
.3200	.3400	.500	.080	.853	.1325	.3750	2.0	QBB-320500-000	67.90	QBB-320500-000X	76.40
.3200	.3400	1.000	.080	1.353	.1325	.3750	2.5	QBB-3201000-000	71.80	QBB-3201000-000X	80.80
.3200	.3400	1.500	.080	1.853	.1325	.3750	3.0	QBB-3201500-000	75.40	QBB-3201500-000X	84.50

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pgs 16-34 for quick change holder options

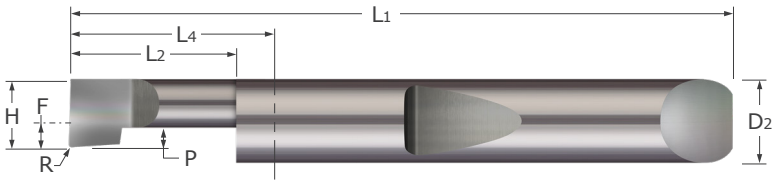
See pg 62 for miniature sizes

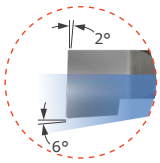
For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 72-75

QBB

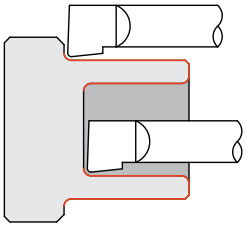
Quick Change – Boring Tools

Right Hand





- Designed for facing and boring applications in bores .055" and larger
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Coolant fed enabled shank design
- Corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



	Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
	H		L2 +.030" −.000"	R +.001" −.001"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
	.0500	.0550	.150	.003	.013	.590	-.0438	.1875	1.5	QBB3-050150	36.20	QBB3-050150X	41.20
	.0500	.0550	.200	.003	.013	.590	-.0438	.1875	1.5	QBB3-050200	36.20	QBB3-050200X	41.20
NEW	.0500	.0550	.250	.003	.013	.590	-.0438	.1875	1.5	QBB3-050250	36.20	QBB3-050250X	41.20
	.0500	.0550	.300	.003	.013	.590	-.0438	.1875	1.5	QBB3-050300	36.20	QBB3-050300X	41.20
	.0500	.0550	.400	.003	.013	.590	-.0438	.1875	1.5	QBB3-050400	36.20	QBB3-050400X	41.20
	.0600	.0700	.150	.003	.015	.590	-.0338	.1875	1.5	QBB3-060150	36.20	QBB3-060150X	41.20
	.0600	.0700	.200	.003	.015	.590	-.0338	.1875	1.5	QBB3-060200	36.20	QBB3-060200X	41.20
NEW	.0600	.0700	.250	.003	.015	.590	-.0338	.1875	1.5	QBB3-060250	36.20	QBB3-060250X	41.20
	.0600	.0700	.300	.003	.015	.590	-.0338	.1875	1.5	QBB3-060300	36.20	QBB3-060300X	41.20
	.0600	.0700	.400	.003	.015	.590	-.0338	.1875	1.5	QBB3-060400	36.20	QBB3-060400X	41.20
	.0600	.0700	.500	.003	.015	.590	-.0338	.1875	1.5	QBB3-060500	36.20	QBB3-060500X	41.20
	.0700	.0800	.150	.003	.015	.590	-.0238	.1875	1.5	QBB3-070150	36.20	QBB3-070150X	41.20
	.0700	.0800	.200	.003	.015	.590	-.0238	.1875	1.5	QBB3-070200	36.20	QBB3-070200X	41.20
	.0700	.0800	.300	.003	.015	.590	-.0238	.1875	1.5	QBB3-070300	36.20	QBB3-070300X	41.20
	.0800	.0900	.150	.003	.020	.590	-.0138	.1875	1.5	QBB3-080150	36.20	QBB3-080150X	41.20
	.0800	.0900	.200	.003	.020	.590	-.0138	.1875	1.5	QBB3-080200	36.20	QBB3-080200X	41.20
	.0800	.0900	.300	.003	.020	.590	-.0138	.1875	1.5	QBB3-080300	36.20	QBB3-080300X	41.20
	.0800	.0900	.400	.003	.020	.590	-.0138	.1875	1.5	QBB3-080400	36.20	QBB3-080400X	41.20
	.0800	.0900	.500	.003	.020	.590	-.0138	.1875	1.5	QBB3-080500	36.20	QBB3-080500X	41.20
	.0800	.0900	.600	.003	.020	1.090	-.0138	.1875	2.0	QBB3-080600	37.60	QBB3-080600X	42.60
	.0900	.1000	.150	.003	.020	.590	-.0038	.1875	1.5	QBB3-090150	36.20	QBB3-090150X	41.20
	.0900	.1000	.200	.003	.020	.590	-.0038	.1875	1.5	QBB3-090200	36.20	QBB3-090200X	41.20
	.0900	.1000	.300	.003	.020	.590	-.0038	.1875	1.5	QBB3-090300	36.20	QBB3-090300X	41.20
	.0900	.1000	.400	.003	.020	.590	-.0038	.1875	1.5	QBB3-090400	36.20	QBB3-090400X	41.20
	.0900	.1000	.500	.003	.020	.590	-.0038	.1875	1.5	QBB3-090500	36.20	QBB3-090500X	41.20

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options
See pg 62 for miniature sizes
For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 72-75

NEW!

Quick Change – Boring Tools

Right Hand (cont.)

QBB

Continued from previous page

Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated		
H		L_2 +.030" −.000"	R +.001" −.001"	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	
.1000	.1100	.150	.003	.025	.590	.0063	.1875	1.5	OBB3-100150	34.40	OBB3-100150X	39.40	
.1000	.1100	.200	.003	.025	.590	.0063	.1875	1.5	OBB3-100200	34.40	OBB3-100200X	39.40	
.1000	.1100	.300	.003	.025	.590	.0063	.1875	1.5	OBB3-100300	34.40	OBB3-100300X	39.40	
.1000	.1100	.400	.003	.025	.590	.0063	.1875	1.5	OBB3-100400	34.40	OBB3-100400X	39.40	
.1000	.1100	.500	.003	.025	.590	.0063	.1875	1.5	OBB3-100500	34.40	OBB3-100500X	39.40	
.1000	.1100	.600	.003	.025	1.090	.0063	.1875	2.0	OBB3-100600	35.80	OBB3-100600X	40.80	
.1000	.1100	.700	.003	.025	1.090	.0063	.1875	2.0	OBB3-100700	35.80	OBB3-100700X	40.80	
.1000	.1100	.800	.003	.025	1.090	.0063	.1875	2.0	OBB3-100800	35.80	OBB3-100800X	40.80	NEW
.1100	.1220	.150	.003	.028	.590	.0163	.1875	1.5	OBB3-110150	34.40	OBB3-110150X	39.40	
.1100	.1220	.200	.003	.028	.590	.0163	.1875	1.5	OBB3-110200	34.40	OBB3-110200X	39.40	
.1100	.1220	.300	.003	.028	.590	.0163	.1875	1.5	OBB-110300	34.40	OBB-110300X	37.95	
.1100	.1220	.400	.003	.028	.590	.0163	.1875	1.5	OBB3-110400	34.40	OBB3-110400X	39.40	
.1100	.1220	.500	.003	.028	.590	.0163	.1875	1.5	OBB-110500	34.40	OBB-110500X	37.95	
.1100	.1220	.600	.003	.028	1.090	.0163	.1875	2.0	OBB3-110600	35.80	OBB3-110600X	40.80	
.1100	.1220	.700	.003	.028	1.090	.0163	.1875	2.0	OBB-110700	34.40	OBB-110700X	37.95	
.1100	.1220	.800	.003	.028	1.090	.0163	.1875	2.0	OBB3-110800	34.40	OBB3-110800X	39.40	NEW
.1200	.1320	.250	.003	.030	.590	.0263	.1875	1.5	OBB-120250	34.40	OBB-120250X	37.95	
.1200	.1320	.250	.005	.030	.590	.0263	.1875	1.5	OBB5-120250	34.40	OBB5-120250X	39.40	
.1200	.1320	.350	.003	.030	.590	.0263	.1875	1.5	OBB-120350	34.40	OBB-120350X	37.95	
.1200	.1320	.350	.005	.030	.590	.0263	.1875	1.5	OBB5-120350	34.40	OBB5-120350X	39.40	
.1200	.1320	.500	.003	.030	.590	.0263	.1875	1.5	OBB-120500	34.40	OBB-120500X	37.95	
.1200	.1320	.500	.005	.030	.590	.0263	.1875	1.5	OBB5-120500	34.40	OBB5-120500X	39.40	
.1200	.1320	.600	.003	.030	1.090	.0263	.1875	2.0	OBB3-120600	35.80	OBB3-120600X	40.80	
.1200	.1320	.600	.005	.030	1.090	.0263	.1875	2.0	OBB5-120600	35.80	OBB5-120600X	40.80	
.1200	.1320	.700	.003	.030	1.090	.0263	.1875	2.0	OBB-120700	34.40	OBB-120700X	37.95	
.1200	.1320	.700	.005	.030	1.090	.0263	.1875	2.0	OBB5-120700	35.80	OBB5-120700X	40.80	
.1200	.1320	.800	.003	.030	1.090	.0263	.1875	2.0	OBB-120800	34.40	OBB-120800X	37.95	
.1200	.1320	.800	.005	.030	1.090	.0263	.1875	2.0	OBB5-120800	35.80	OBB5-120800X	40.80	
.1400	.1520	.250	.003	.035	.590	.0463	.1875	1.5	OBB3-140250	34.40	OBB3-140250X	39.40	
.1400	.1520	.250	.005	.035	.590	.0463	.1875	1.5	OBB5-140250	34.40	OBB5-140250X	39.40	
.1400	.1520	.400	.003	.035	.590	.0463	.1875	1.5	OBB-140400	34.40	OBB-140400X	37.95	
.1400	.1520	.400	.005	.035	.590	.0463	.1875	1.5	OBB5-140400	34.40	OBB5-140400X	39.40	
.1400	.1520	.500	.003	.035	.590	.0463	.1875	1.5	OBB3-140500	34.40	OBB3-140500X	39.40	
.1400	.1520	.500	.005	.035	.590	.0463	.1875	1.5	OBB5-140500	34.40	OBB5-140500X	39.40	
.1400	.1520	.600	.003	.035	1.090	.0463	.1875	2.0	OBB-140600	34.40	OBB-140600X	37.95	
.1400	.1520	.600	.005	.035	1.090	.0463	.1875	2.0	OBB5-140600	35.80	OBB5-140600X	40.80	
.1400	.1520	.700	.003	.035	1.090	.0463	.1875	2.0	OBB3-140700	35.80	OBB3-140700X	40.80	
.1400	.1520	.700	.005	.035	1.090	.0463	.1875	2.0	OBB5-140700	35.80	OBB5-140700X	40.80	
.1400	.1520	.750	.003	.035	1.090	.0463	.1875	2.0	OBB3-140750	35.80	OBB3-140750X	40.80	
.1400	.1520	.750	.005	.035	1.090	.0463	.1875	2.0	OBB5-140750	35.80	OBB5-140750X	40.80	
.1400	.1520	.800	.003	.035	1.090	.0463	.1875	2.0	OBB-140800	34.40	OBB-140800X	37.95	
.1400	.1520	.800	.005	.035	1.090	.0463	.1875	2.0	OBB5-140800	35.80	OBB5-140800X	40.80	
.1400	.1520	.900	.003	.035	1.090	.0463	.1875	2.0	OBB3-140900	35.80	OBB3-140900X	40.80	
.1400	.1520	.900	.005	.035	1.090	.0463	.1875	2.0	OBB5-140900	35.80	OBB5-140900X	40.80	

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options

See pg 62 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 72-75

QBB

Quick Change – Boring Tools
Right Hand (cont.)

Continued from previous page

Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H		L_2 $^{+.030"}_{-.000"}$	R $^{+.001"}_{-.001"}$	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.1600	.1760	.250	.003	.040	.590	.0663	.1875	1.5	QBB3-160250	34.40	QBB3-160250X	39.40
.1600	.1760	.250	.005	.040	.590	.0663	.1875	1.5	QBB5-160250	34.40	QBB5-160250X	39.40
.1600	.1760	.400	.003	.040	.590	.0663	.1875	1.5	QBB-160400	34.40	QBB-160400X	37.95
.1600	.1760	.400	.005	.040	.590	.0663	.1875	1.5	QBB5-160400	34.40	QBB5-160400X	39.40
.1600	.1760	.500	.003	.040	.590	.0663	.1875	1.5	QBB3-160500	34.40	QBB3-160500X	39.40
.1600	.1760	.500	.005	.040	.590	.0663	.1875	1.5	QBB5-160500	34.40	QBB5-160500X	39.40
.1600	.1760	.600	.003	.040	1.090	.0663	.1875	2.0	QBB-160600	34.40	QBB-160600X	37.95
.1600	.1760	.600	.005	.040	1.090	.0663	.1875	2.0	QBB5-160600	35.80	QBB5-160600X	40.80
.1600	.1760	.700	.003	.040	1.090	.0663	.1875	2.0	QBB3-160700	35.80	QBB3-160700X	40.80
.1600	.1760	.700	.005	.040	1.090	.0663	.1875	2.0	QBB5-160700	35.80	QBB5-160700X	40.80
.1600	.1760	.750	.003	.040	1.090	.0663	.1875	2.0	QBB-160750	34.40	QBB-160750X	37.95
.1600	.1760	.750	.005	.040	1.090	.0663	.1875	2.0	QBB5-160750	35.80	QBB5-160750X	40.80
.1600	.1760	.800	.003	.040	1.090	.0663	.1875	2.0	QBB3-160800	35.80	QBB3-160800X	40.80
.1600	.1760	.800	.005	.040	1.090	.0663	.1875	2.0	QBB5-160800	35.80	QBB5-160800X	40.80
.1600	.1760	.900	.003	.040	1.090	.0663	.1875	2.0	QBB3-160900	35.80	QBB3-160900X	40.80
.1600	.1760	.900	.005	.040	1.090	.0663	.1875	2.0	QBB5-160900	35.80	QBB5-160900X	40.80
.1600	.1760	1.000	.003	.040	1.090	.0663	.1875	2.0	QBB-1601000	34.40	QBB-1601000X	37.95
.1600	.1760	1.000	.005	.040	1.090	.0663	.1875	2.0	QBB5-1601000	35.80	QBB5-1601000X	40.80
NEW .1600	.1760	1.250	.003	.040	1.590	.0663	.1875	2.5	QBB3-1601250	37.20	QBB3-1601250X	42.50
.1800	.1960	.350	.005	.045	.853	.0550	.2500	2.0	QBB5-180350	35.80	QBB5-180350X	41.70
.1800	.1960	.500	.005	.045	.853	.0550	.2500	2.0	QBB-180500	37.10	QBB-180500X	43.10
.1800	.1960	.600	.005	.045	.853	.0550	.2500	2.0	QBB5-180600	37.10	QBB5-180600X	43.10
.1800	.1960	.750	.005	.045	.853	.0550	.2500	2.0	QBB-180750	37.10	QBB-180750X	43.10
.1800	.1960	.900	.005	.045	1.353	.0550	.2500	2.5	QBB5-180900	38.50	QBB5-180900X	44.80
.1800	.1960	1.000	.005	.045	1.353	.0550	.2500	2.5	QBB-1801000	37.10	QBB-1801000X	43.15
.1800	.1960	1.250	.005	.045	1.353	.0550	.2500	2.5	QBB-1801250	37.10	QBB-1801250X	43.15
.1800	.1960	1.500	.005	.045	1.853	.0550	.2500	3.0	QBB-1801500	43.60	QBB-1801500X	49.90
.2000	.2160	.400	.005	.050	.853	.0750	.2500	2.0	QBB5-200400	37.10	QBB5-200400X	43.10
.2000	.2160	.500	.005	.050	.853	.0750	.2500	2.0	QBB-200500	37.10	QBB-200500X	43.10
.2000	.2160	.600	.005	.050	.853	.0750	.2500	2.0	QBB5-200600	37.10	QBB5-200600X	43.10
.2000	.2160	.700	.005	.050	.853	.0750	.2500	2.0	QBB5-200700	37.10	QBB5-200700X	43.10
.2000	.2160	.750	.005	.050	.853	.0750	.2500	2.0	QBB-200750	37.10	QBB-200750X	43.10
.2000	.2160	.800	.005	.050	1.353	.0750	.2500	2.5	QBB5-200800	38.50	QBB5-200800X	44.80
.2000	.2160	.900	.005	.050	1.353	.0750	.2500	2.5	QBB5-200900	38.50	QBB5-200900X	44.80
.2000	.2160	1.000	.005	.050	1.353	.0750	.2500	2.5	QBB-2001000	37.10	QBB-2001000X	43.15
.2000	.2160	1.100	.005	.050	1.353	.0750	.2500	2.5	QBB5-2001100	38.50	QBB5-2001100X	44.80
.2000	.2160	1.200	.005	.050	1.353	.0750	.2500	2.5	QBB-2001200	37.10	QBB-2001200X	43.15
.2000	.2160	1.300	.005	.050	1.853	.0750	.2500	3.0	QBB5-2001300	38.50	QBB5-2001300X	44.80
.2000	.2160	1.500	.005	.050	1.853	.0750	.2500	3.0	QBB-2001500	43.60	QBB-2001500X	49.90

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options
See pg 62 for miniature sizes
For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 72-75

NEW!

Quick Change – Boring Tools

Right Hand (cont.)

QBB

Continued from previous page

Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated		
H		L_2 +.030" −.000"	R +.001" −.001"	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	
.2300	.2500	.400	.005	.058	.853	.0738	.3125	2.0	QBB5-230400	49.80	QBB5-230400X	57.00	
.2300	.2500	.500	.005	.058	.853	.0738	.3125	2.0	QBB-230500	49.80	QBB-230500X	56.65	
.2300	.2500	.600	.005	.058	.853	.0738	.3125	2.0	QBB5-230600	49.80	QBB5-230600X	57.00	
.2300	.2500	.700	.005	.058	.853	.0738	.3125	2.0	QBB5-230700	49.80	QBB5-230700X	57.00	
.2300	.2500	.750	.005	.058	.853	.0738	.3125	2.0	QBB-230750	49.80	QBB-230750X	56.65	
.2300	.2500	.800	.005	.058	1.353	.0738	.3125	2.5	QBB5-230800	51.10	QBB5-230800X	58.80	
.2300	.2500	.900	.005	.058	1.353	.0738	.3125	2.5	QBB5-230900	51.10	QBB5-230900X	58.80	
.2300	.2500	1.000	.005	.058	1.353	.0738	.3125	2.5	QBB-2301000	49.80	QBB-2301000X	57.40	
.2300	.2500	1.100	.005	.058	1.353	.0738	.3125	2.5	QBB5-2301100	51.10	QBB5-2301100X	58.80	
.2300	.2500	1.150	.005	.058	1.353	.0738	.3125	2.5	QBB5-2301150	51.10	QBB5-2301150X	58.80	
.2300	.2500	1.200	.005	.058	1.353	.0738	.3125	2.5	QBB5-2301200	51.10	QBB5-2301200X	58.80	
.2300	.2500	1.250	.005	.058	1.353	.0738	.3125	2.5	QBB-2301250	49.80	QBB-2301250X	57.40	
.2300	.2500	1.400	.005	.058	1.853	.0738	.3125	3.0	QBB5-2301400	57.30	QBB5-2301400X	64.90	
.2300	.2500	1.500	.005	.058	1.853	.0738	.3125	3.0	QBB-2301500	57.30	QBB-2301500X	64.90	
.2300	.2500	1.600	.005	.058	1.853	.0738	.3125	3.0	QBB-2301600	57.30	QBB-2301600X	64.90	
.2300	.2500	1.750	.005	.058	1.853	.0738	.3125	3.0	QBB5-2301750	57.30	QBB5-2301750X	64.90	NEW
.2600	.2800	.400	.005	.065	.853	.1038	.3125	2.0	QBB5-260400	49.80	QBB5-260400X	57.00	
.2600	.2800	.500	.005	.065	.853	.1038	.3125	2.0	QBB5-260500	49.80	QBB5-260500X	57.00	
.2600	.2800	.600	.005	.065	.853	.1038	.3125	2.0	QBB5-260600	49.80	QBB5-260600X	57.00	
.2600	.2800	.700	.005	.065	.853	.1038	.3125	2.0	QBB5-260700	49.80	QBB5-260700X	57.00	
.2600	.2800	.750	.005	.065	.853	.1038	.3125	2.0	QBB5-260750	49.80	QBB5-260750X	57.00	
.2600	.2800	.800	.005	.065	1.353	.1038	.3125	2.5	QBB5-260800	51.10	QBB5-260800X	58.80	
.2600	.2800	.900	.005	.065	1.353	.1038	.3125	2.5	QBB5-260900	51.10	QBB5-260900X	58.80	
.2600	.2800	1.000	.005	.065	1.353	.1038	.3125	2.5	QBB5-2601000	51.10	QBB5-2601000X	58.80	
.2600	.2800	1.250	.005	.065	1.353	.1038	.3125	2.5	QBB5-2601250	51.10	QBB5-2601250X	58.80	
.2900	.3100	.500	.005	.073	.853	.1338	.3125	2.0	QBB-290500	49.80	QBB-290500X	56.65	
.2900	.3100	.600	.005	.073	.853	.1338	.3125	2.0	QBB5-290600	49.80	QBB5-290600X	57.00	
.2900	.3100	.750	.005	.073	.853	.1338	.3125	2.0	QBB-290750	49.80	QBB-290750X	56.65	
.2900	.3100	.900	.005	.073	1.353	.1338	.3125	2.5	QBB5-290900	51.10	QBB5-290900X	58.80	
.2900	.3100	1.000	.005	.073	1.353	.1338	.3125	2.5	QBB-2901000	49.80	QBB-2901000X	57.40	
.2900	.3100	1.100	.005	.073	1.353	.1338	.3125	2.5	QBB5-2901100	51.10	QBB5-2901100X	58.80	
.2900	.3100	1.250	.005	.073	1.353	.1338	.3125	2.5	QBB-2901250	49.80	QBB-2901250X	57.40	
.2900	.3100	1.350	.005	.073	1.853	.1338	.3125	3.0	QBB5-2901350	57.30	QBB5-2901350X	64.90	
.2900	.3100	1.500	.005	.073	1.853	.1338	.3125	3.0	QBB-2901500	57.30	QBB-2901500X	64.90	
.2900	.3100	1.600	.005	.073	1.853	.1338	.3125	3.0	QBB5-2901600	57.30	QBB5-2901600X	64.90	
.2900	.3100	1.750	.005	.073	1.853	.1338	.3125	3.0	QBB-2901750	57.30	QBB-2901750X	64.90	
.3200	.3400	.500	.005	.080	.853	.1325	.3750	2.0	QBB-320500	67.90	QBB-320500X	75.45	
.3200	.3400	.600	.005	.080	.853	.1325	.3750	2.0	QBB5-320600	67.90	QBB5-320600X	76.40	
.3200	.3400	.750	.005	.080	.853	.1325	.3750	2.0	QBB-320750	67.90	QBB-320750X	75.45	
.3200	.3400	.900	.005	.080	1.353	.1325	.3750	2.5	QBB5-320900	69.60	QBB5-320900X	78.70	
.3200	.3400	1.000	.005	.080	1.353	.1325	.3750	2.5	QBB-3201000	67.90	QBB-3201000X	77.00	
.3200	.3400	1.100	.005	.080	1.353	.1325	.3750	2.5	QBB5-3201100	69.60	QBB5-3201100X	78.70	
.3200	.3400	1.250	.005	.080	1.353	.1325	.3750	2.5	QBB-3201250	67.90	QBB-3201250X	77.00	
.3200	.3400	1.500	.005	.080	1.853	.1325	.3750	3.0	QBB-3201500	75.40	QBB-3201500X	84.50	

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options

See pg 62 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 72-75

QBB

Quick Change – Boring Tools

Right Hand (cont.)

Continued from previous page

Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.030" −.000"	R +.001" −.001"	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.3200	.3400	1.600	.005	.080	1.853	.1325	.3750	3.0	OBB5-3201600	75.40	OBB5-3201600X	84.50
.3200	.3400	1.800	.005	.080	1.853	.1325	.3750	3.0	OBB-3201800	75.40	OBB-3201800X	84.50
.3200	.3400	2.000	.005	.080	2.353	.1325	.3750	3.5	OBB-3202000	82.20	OBB-3202000X	91.90
.3200	.3400	2.500	.005	.080	2.853	.1325	.3750	4.0	OBB-3202500	86.80	OBB-3202500X	96.50
.3600	.3800	.500	.005	.090	.853	.1725	.3750	2.0	OBB5-360500	67.90	OBB5-360500X	76.40
.3600	.3800	.750	.005	.090	.853	.1725	.3750	2.0	OBB-360750	67.90	OBB-360750X	75.45
.3600	.3800	.900	.005	.090	1.353	.1725	.3750	2.5	OBB5-360900	67.90	OBB5-360900X	77.00
.3600	.3800	1.000	.005	.090	1.353	.1725	.3750	2.5	OBB-3601000	67.90	OBB-3601000X	77.00
.3600	.3800	1.250	.005	.090	1.353	.1725	.3750	2.5	OBB-3601250	67.90	OBB-3601250X	77.00
.3600	.3800	1.500	.005	.090	1.853	.1725	.3750	3.0	OBB-3601500	75.40	OBB-3601500X	84.50
.3600	.3800	1.800	.005	.090	1.853	.1725	.3750	3.0	OBB-3601800	75.40	OBB-3601800X	84.50
.3600	.3800	2.000	.005	.090	2.353	.1725	.3750	3.5	OBB-3602000	82.20	OBB-3602000X	91.90
.3600	.3800	2.500	.005	.090	2.853	.1725	.3750	4.0	OBB-3602500	86.80	OBB-3602500X	96.50
.4100	.4300	.750	.005	.104	1.040	.1600	.5000	2.5	OBB5-410750	94.60	OBB5-410750X	106.90
.4100	.4300	1.000	.005	.104	1.040	.1600	.5000	2.5	OBB5-4101000	94.60	OBB5-4101000X	106.90
.4100	.4300	1.250	.005	.104	1.540	.1600	.5000	3.0	OBB5-4101250	97.00	OBB5-4101250X	109.30
.4100	.4300	1.500	.005	.104	1.540	.1600	.5000	3.0	OBB5-4101500	97.00	OBB5-4101500X	109.30
.4600	.4800	1.000	.005	.115	1.040	.2100	.5000	2.5	OBB-4601000	94.60	OBB-4601000X	106.55
.4600	.4800	1.250	.005	.115	1.540	.2100	.5000	3.0	OBB-4601250	94.60	OBB-4601250X	106.55
.4600	.4800	1.500	.005	.115	1.540	.2100	.5000	3.0	OBB-4601500	94.60	OBB-4601500X	106.55
.4600	.4800	2.000	.005	.115	2.040	.2100	.5000	3.5	OBB-4602000	103.80	OBB-4602000X	117.00
.4600	.4800	2.500	.005	.115	2.540	.2100	.5000	4.0	OBB-4602500	109.80	OBB-4602500X	123.00
.4600	.4800	3.000	.005	.115	3.040	.2100	.5000	4.5	OBB-4603000	115.10	OBB-4603000X	129.30
.4900	.5100	1.000	.005	.123	1.040	.2400	.5000	2.5	OBB-4901000	94.60	OBB-4901000X	106.55
.4900	.5100	1.250	.005	.123	1.540	.2400	.5000	3.0	OBB-4901250	94.60	OBB-4901250X	106.55
.4900	.5100	1.500	.005	.123	1.540	.2400	.5000	3.0	OBB-4901500	94.60	OBB-4901500X	106.55
.4900	.5100	2.000	.005	.123	2.040	.2400	.5000	3.5	OBB-4902000	103.80	OBB-4902000X	117.00
.4900	.5100	2.500	.005	.123	2.540	.2400	.5000	4.0	OBB-4902500	109.80	OBB-4902500X	123.00
.4900	.5100	3.000	.005	.123	3.040	.2400	.5000	4.5	OBB-4903000	115.10	OBB-4903000X	129.30

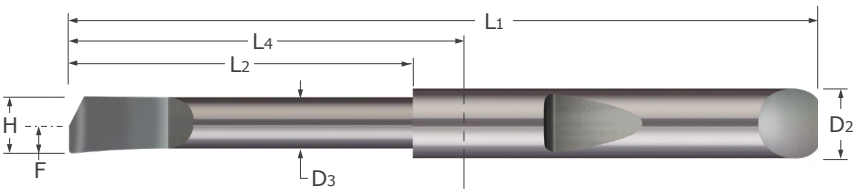
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

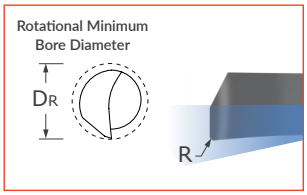
See pgs 16-34 for quick change holder options
See pg 62 for miniature sizes
For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 72-75

Quick Change – Boring Tools

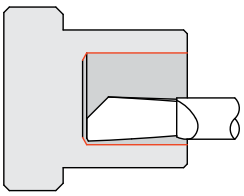
Helical Back Rake – Corner Radius

QHBBC





- Designed for boring applications in bores .030" and larger
- Polished face for improved edge retention and chip evacuation while reducing galling
- Helical grind provides ideal top rake for better chip control and freer cutting
- Well suited for machining plastics
- On center neck design allows for static and live/rotating applications
- Coolant fed enabled shank design
- Corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Solid carbide
- CNC ground in the USA



Head Width	Rotational Min. Bore Diameter	Maximum Bore Depth	Radius	Length From Holder	Neck Diameter	Centerline Offset	Shank Diameter	Overall Length	Uncoated	
H	D_R	L_2 +.050" −.000"	R +.003" −.000"	L_4	D_3 +.000" −.002"	F	D_2 (h6)	L_1	Tool #	Price
.0275	.030	.187	.004	.590	.025	.0150	.1875	1.5	OHBBC-030187-004	34.50
.0275	.030	.250	.004	.590	.025	.0150	.1875	1.5	OHBBC-030250-004	34.50
.0325	.035	.125	.004	.590	.030	.0175	.1875	1.5	OHBBC-035125-004	34.50
.0325	.035	.187	.004	.590	.030	.0175	.1875	1.5	OHBBC-035187-004	34.50
.0325	.035	.250	.004	.590	.030	.0175	.1875	1.5	OHBBC-035250-004	34.50
.0375	.040	.187	.004	.590	.035	.0200	.1875	1.5	OHBBC-040187-004	34.50
.0375	.040	.250	.004	.590	.035	.0200	.1875	1.5	OHBBC-040250-004	34.50
.0375	.040	.312	.004	.590	.035	.0200	.1875	1.5	OHBBC-040312-004	34.50
.0450	.050	.187	.004	.590	.040	.0250	.1875	1.5	OHBBC-050187-004	34.50
.0450	.050	.312	.004	.590	.040	.0250	.1875	1.5	OHBBC-050312-004	34.50
.0450	.050	.375	.004	.590	.040	.0250	.1875	1.5	OHBBC-050375-004	34.50
.0550	.060	.250	.004	.590	.050	.0300	.1875	1.5	OHBBC-060250-004	34.50
.0550	.060	.375	.004	.590	.050	.0300	.1875	1.5	OHBBC-060375-004	34.50
.0550	.060	.500	.004	.590	.050	.0300	.1875	1.5	OHBBC-060500-004	34.50
.0650	.070	.312	.004	.590	.060	.0350	.1875	1.5	OHBBC-070312-004	34.50
.0650	.070	.437	.004	.590	.060	.0350	.1875	1.5	OHBBC-070437-004	34.50
.0650	.070	.562	.004	1.090	.060	.0350	.1875	2.0	OHBBC-070562-004	34.50
.0750	.080	.375	.004	.590	.070	.0400	.1875	1.5	OHBBC-080375-004	34.50
.0750	.080	.500	.004	.590	.070	.0400	.1875	1.5	OHBBC-080500-004	34.50
.0750	.080	.625	.004	1.090	.070	.0400	.1875	2.0	OHBBC-080625-004	34.50
.0850	.090	.375	.004	.590	.080	.0450	.1875	1.5	OHBBC-090375-004	34.50
.0850	.090	.500	.004	.590	.080	.0450	.1875	1.5	OHBBC-090500-004	34.50
.0850	.090	.687	.004	1.090	.080	.0450	.1875	2.0	OHBBC-090687-004	34.50
.0950	.100	.437	.004	.590	.090	.0500	.1875	1.5	OHBBC-100437-004	34.50
.0950	.100	.562	.004	1.090	.090	.0500	.1875	2.0	OHBBC-100562-004	34.50
.0950	.100	.750	.004	1.090	.090	.0500	.1875	2.0	OHBBC-100750-004	34.50
.1100	.120	.500	.004	.590	.100	.0600	.1875	1.5	OHBBC-120500-004	34.50
.1100	.120	.625	.004	1.090	.100	.0600	.1875	2.0	OHBBC-120625-004	34.50
.1100	.120	1.000	.004	1.090	.100	.0600	.1875	2.0	OHBBC-1201000-004	34.50

Continued on next page

See pgs 16-34 for quick change holder options

QHBBC

Quick Change – Boring Tools

Helical Back Rake – Corner Radius (cont.)

Continued from previous page

Head Width	Rotational Min. Bore Diameter	Maximum Bore Depth	Radius	Length From Holder	Neck Diameter	Centerline Offset	Shank Diameter	Overall Length	Uncoated	
H	D_r	L_2 $^{+.050"}_{-.000"}$	R $^{+.003"}_{-.000"}$	L_4	D_3 $^{+.000"}_{-.002"}$	F	D_2 (h6)	L_1	Tool #	Price
.1225	.135	.562	.004	1.090	.110	.0675	.1875	2.0	QHBBC-135562-004	34.50
.1225	.135	.750	.004	1.090	.110	.0675	.1875	2.0	QHBBC-135750-004	34.50
.1225	.135	1.000	.004	1.090	.110	.0675	.1875	2.0	QHBBC-1351000-004	34.50
.1400	.150	.625	.004	1.090	.130	.0750	.1875	2.0	QHBBC-1500625-004	34.50
.1400	.150	1.000	.004	1.090	.130	.0750	.1875	2.0	QHBBC-1501000-004	34.50
.1400	.150	1.250	.004	1.590	.130	.0750	.1875	2.5	QHBBC-1501250-004	34.50
.1700	.180	1.000	.004	1.090	.160	.0900	.1875	2.0	QHBBC-1801000-004	34.50
.1700	.180	1.250	.004	1.590	.160	.0900	.1875	2.5	QHBBC-1801250-004	34.50
.1700	.180	1.500	.004	1.590	.160	.0900	.1875	2.5	QHBBC-1801500-004	34.50
.1975	.210	1.000	.004	1.353	.185	.1050	.2500	2.5	QHBBC-2101000-004	39.00
.1975	.210	1.250	.004	1.353	.185	.1050	.2500	2.5	QHBBC-2101250-004	39.00
.1975	.210	1.500	.004	1.853	.185	.1050	.2500	3.0	QHBBC-2101500-004	39.00
.2275	.240	1.000	.004	1.353	.215	.1200	.2500	2.5	QHBBC-2401000-004	39.00
.2275	.240	1.500	.004	1.853	.215	.1200	.2500	3.0	QHBBC-2401500-004	39.00
.2275	.240	1.750	.004	1.853	.215	.1200	.2500	3.0	QHBBC-2401750-004	39.00
.2750	.300	1.000	.004	1.353	.250	.1500	.3125	2.5	QHBBC-3001000-004	51.40
.2750	.300	1.500	.004	1.853	.250	.1500	.3125	3.0	QHBBC-3001500-004	51.40
.2750	.300	1.750	.004	1.853	.250	.1500	.3125	3.0	QHBBC-3001750-004	51.40
.3400	.360	1.000	.004	1.353	.320	.1800	.3750	2.5	QHBBC-3601000-004	70.00
.3400	.360	1.500	.004	1.853	.320	.1800	.3750	3.0	QHBBC-3601500-004	70.00
.3400	.360	2.000	.004	2.353	.320	.1800	.3750	3.5	QHBBC-3602000-004	87.40
.3400	.360	2.500	.004	2.853	.320	.1800	.3750	4.0	QHBBC-3602500-004	87.40

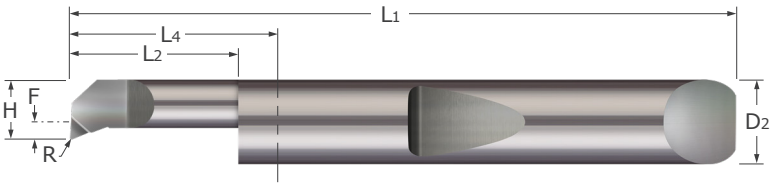
See pgs 16-34 for quick change holder options

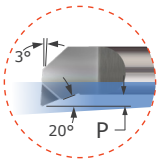
NEW!

Quick Change – Boring Tools

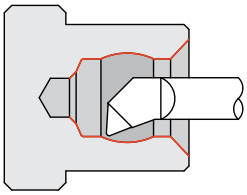
QBT

Top Rake Chipbreaker





- Optimized for finishing operations
- Top rake geometry provides freer cutting
- Polished face for reducing galling
- Coolant fed enabled shank design
- Corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated		
H		L2 +.030" −.000"	R +.0005" −.0005"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	
.0500	.0550	.150	.002	.005	.590	-.0438	.1875	1.5	QBT-050150	34.60	QBT-050150X	39.60	NEW
.0500	.0550	.200	.002	.005	.590	-.0438	.1875	1.5	QBT-050200	34.60	QBT-050200X	38.25	
.0500	.0550	.300	.002	.005	.590	-.0438	.1875	1.5	QBT-050300	34.60	QBT-050300X	39.60	NEW
.0500	.0550	.400	.002	.005	.590	-.0438	.1875	1.5	QBT-050400	34.60	QBT-050400X	38.25	
.0500	.0550	.500	.002	.005	.590	-.0438	.1875	1.5	QBT-050500	34.60	QBT-050500X	38.25	
.0600	.0700	.150	.002	.010	.590	-.0338	.1875	1.5	QBT-060150	34.60	QBT-060150X	39.60	NEW
.0600	.0700	.200	.002	.010	.590	-.0338	.1875	1.5	QBT-060200	34.60	QBT-060200X	38.25	
.0600	.0700	.300	.002	.010	.590	-.0338	.1875	1.5	QBT-060300	34.60	QBT-060300X	39.60	NEW
.0600	.0700	.400	.002	.010	.590	-.0338	.1875	1.5	QBT-060400	34.60	QBT-060400X	38.25	
.0600	.0700	.500	.002	.010	.590	-.0338	.1875	1.5	QBT-060500	34.60	QBT-060500X	38.25	
.0700	.0800	.150	.004	.015	.590	-.0238	.1875	1.5	QBT-070150	34.60	QBT-070150X	39.60	NEW
.0700	.0800	.200	.004	.015	.590	-.0238	.1875	1.5	QBT-070200	34.60	QBT-070200X	38.25	
.0700	.0800	.300	.004	.015	.590	-.0238	.1875	1.5	QBT-070300	34.60	QBT-070300X	39.60	NEW
.0700	.0800	.400	.004	.015	.590	-.0238	.1875	1.5	QBT-070400	34.60	QBT-070400X	38.25	
.0700	.0800	.600	.004	.015	1.090	-.0238	.1875	2.0	QBT-070600	34.60	QBT-070600X	38.25	
.0800	.0900	.150	.004	.015	.590	-.0138	.1875	1.5	QBT4-080150	34.60	QBT4-080150X	39.60	NEW
.0800	.0900	.200	.004	.015	.590	-.0138	.1875	1.5	QBT4-080200	34.60	QBT4-080200X	39.60	NEW
.0800	.0900	.300	.004	.015	.590	-.0138	.1875	1.5	QBT4-080300	34.60	QBT4-080300X	39.60	NEW
.0800	.0900	.400	.004	.015	.590	-.0138	.1875	1.5	QBT4-080400	34.60	QBT4-080400X	39.60	NEW
.0800	.0900	.500	.004	.015	.590	-.0138	.1875	1.5	QBT4-080500	34.60	QBT4-080500X	39.60	NEW
.0800	.0900	.600	.004	.015	1.090	-.0138	.1875	2.0	QBT4-080600	34.60	QBT4-080600X	39.60	NEW
.0900	.1000	.200	.004	.015	.590	-.0038	.1875	1.5	QBT4-090200	34.60	QBT4-090200X	39.60	NEW
.0900	.1000	.300	.004	.015	.590	-.0038	.1875	1.5	QBT4-090300	34.60	QBT4-090300X	39.60	NEW
.0900	.1000	.400	.004	.015	.590	-.0038	.1875	1.5	QBT4-090400	34.60	QBT4-090400X	39.60	NEW
.0900	.1000	.500	.004	.015	.590	-.0038	.1875	1.5	QBT4-090500	34.60	QBT4-090500X	39.60	NEW
.1000	.1100	.200	.004	.015	.590	.0063	.1875	1.5	QBT4-100200	34.60	QBT4-100200X	39.60	NEW
.1000	.1100	.300	.004	.015	.590	.0063	.1875	1.5	QBT4-100300	34.60	QBT4-100300X	39.60	NEW
.1000	.1100	.400	.004	.015	.590	.0063	.1875	1.5	QBT4-100400	34.60	QBT4-100400X	39.60	NEW
.1000	.1100	.500	.004	.015	.590	.0063	.1875	1.5	QBT4-100500	34.60	QBT4-100500X	39.60	NEW
.1000	.1100	.600	.004	.015	1.090	.0063	.1875	2.0	QBT4-100600	34.60	QBT4-100600X	39.60	NEW
.1000	.1100	.700	.004	.015	1.090	.0063	.1875	2.0	QBT4-100700	34.60	QBT4-100700X	39.60	NEW
.1100	.1220	.250	.004	.020	.590	.0163	.1875	1.5	QBT-110250	34.60	QBT-110250X	38.25	
.1100	.1220	.500	.004	.020	.590	.0163	.1875	1.5	QBT-110500	34.60	QBT-110500X	38.25	
.1100	.1220	.750	.004	.020	1.090	.0163	.1875	2.0	QBT-110750	34.60	QBT-110750X	38.25	

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options

QBT

Quick Change – Boring Tools

Top Rake Chipbreaker (cont.)

Continued from previous page

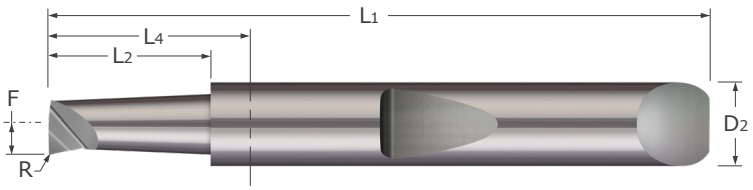
	Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	H		L_2 +.030" −.000"	R +.0005" −.0005"	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	.1200	.1320	.250	.004	.020	.590	.0263	.1875	1.5	QBT-120250	34.60	QBT-120250X	38.25
	.1200	.1320	.375	.004	.020	.590	.0263	.1875	1.5	QBT4-120375	34.60	QBT4-120375X	38.25
	.1200	.1320	.500	.004	.020	.590	.0263	.1875	1.5	QBT-120500	34.60	QBT-120500X	38.25
	.1200	.1320	.750	.004	.020	1.090	.0263	.1875	2.0	QBT-120750	34.60	QBT-120750X	38.25
	.1200	.1320	1.000	.004	.020	1.090	.0263	.1875	2.0	QBT-1201000	34.60	QBT-1201000X	38.25
NEW	.1200	.1320	1.250	.004	.020	1.590	.0263	.1875	2.5	QBT-1201250	37.90	QBT-1201250X	43.20
	.1400	.1520	.250	.004	.025	.590	.0463	.1875	1.5	QBT4-140250	34.60	QBT4-140250X	38.25
	.1400	.1520	.375	.004	.025	.590	.0463	.1875	1.5	QBT4-140375	34.60	QBT4-140375X	38.25
	.1400	.1520	.500	.004	.025	.590	.0463	.1875	1.5	QBT4-140500	34.60	QBT4-140500X	38.25
NEW	.1400	.1520	.750	.004	.025	1.090	.0463	.1875	2.0	QBT-140750	34.60	QBT-140750X	39.60
NEW	.1400	.1520	1.000	.004	.025	1.090	.0463	.1875	2.0	QBT-1401000	34.60	QBT-1401000X	39.60
	.1600	.1760	.375	.006	.025	.590	.0663	.1875	1.5	QBT6-160375	34.60	QBT6-160375X	38.25
	.1600	.1760	.500	.006	.025	.590	.0663	.1875	1.5	QBT-160500	34.60	QBT-160500X	38.25
	.1600	.1760	.750	.006	.025	1.090	.0663	.1875	2.0	QBT-160750	34.60	QBT-160750X	38.25
	.1600	.1760	1.000	.006	.025	1.090	.0663	.1875	2.0	QBT-1601000	34.60	QBT-1601000X	38.25
	.1600	.1760	1.250	.006	.025	1.590	.0663	.1875	2.5	QBT-1601250	34.60	QBT-1601250X	39.35
	.1800	.1960	.375	.006	.030	.853	.0550	.2500	2.0	QBT6-180375	43.30	QBT6-180375X	49.20
	.1800	.1960	.500	.006	.030	.853	.0550	.2500	2.0	QBT-180500	43.30	QBT-180500X	49.20
	.1800	.1960	.750	.006	.030	.853	.0550	.2500	2.0	QBT-180750	43.30	QBT-180750X	49.20
	.1800	.1960	1.000	.006	.030	1.353	.0550	.2500	2.5	QBT-1801000	43.30	QBT-1801000X	49.45
	.1800	.1960	1.250	.006	.030	1.353	.0550	.2500	2.5	QBT-1801250	43.30	QBT-1801250X	49.45
	.1800	.1960	1.500	.006	.030	1.853	.0550	.2500	3.0	QBT-1801500	49.70	QBT-1801500X	56.10
	.2000	.2160	.375	.006	.030	.853	.0750	.2500	2.0	QBT6-200375	43.30	QBT6-200375X	49.20
	.2000	.2160	.600	.006	.030	.853	.0750	.2500	2.0	QBT-200600	43.30	QBT-200600X	49.20
	.2000	.2160	.750	.006	.030	.853	.0750	.2500	2.0	QBT6-200750	43.30	QBT6-200750X	49.20
	.2000	.2160	1.000	.006	.030	1.353	.0750	.2500	2.5	QBT-2001000	43.30	QBT-2001000X	49.45
	.2000	.2160	1.250	.006	.030	1.353	.0750	.2500	2.5	QBT-2001250	43.30	QBT-2001250X	49.45
	.2000	.2160	1.500	.006	.030	1.853	.0750	.2500	3.0	QBT-2001500	49.70	QBT-2001500X	56.10
	.2300	.2500	.500	.004	.040	.853	.0738	.3125	2.0	QBT4-230500	54.00	QBT4-230500X	60.95
	.2300	.2500	.500	.006	.040	.853	.0738	.3125	2.0	QBT6-230500	54.00	QBT6-230500X	60.95
	.2300	.2500	.750	.004	.040	.853	.0738	.3125	2.0	QBT4-230750	54.00	QBT4-230750X	60.95
	.2300	.2500	.750	.006	.040	.853	.0738	.3125	2.0	QBT-230750	54.00	QBT-230750X	60.95
	.2300	.2500	1.100	.006	.040	1.353	.0738	.3125	2.5	QBT-2301100	54.00	QBT-2301100X	61.60
	.2300	.2500	1.300	.006	.040	1.353	.0738	.3125	2.5	QBT-2301300	54.00	QBT-2301300X	61.60
	.2300	.2500	1.600	.006	.040	1.853	.0738	.3125	3.0	QBT-2301600	62.90	QBT-2301600X	70.50
	.2600	.2800	.500	.004	.045	.853	.1038	.3125	2.0	QBT4-260500	54.00	QBT4-260500X	60.95
	.2600	.2800	.500	.006	.045	.853	.1038	.3125	2.0	QBT6-260500	54.00	QBT6-260500X	60.95
	.2600	.2800	.750	.004	.045	.853	.1038	.3125	2.0	QBT4-260750	54.00	QBT4-260750X	60.95
	.2600	.2800	.750	.006	.045	.853	.1038	.3125	2.0	QBT6-260750	54.00	QBT6-260750X	60.95
	.3000	.3200	.750	.006	.050	.853	.1125	.3750	2.0	QBT6-300750	54.00	QBT6-300750X	60.95
	.3000	.3200	1.000	.006	.050	1.353	.1125	.3750	2.5	QBT-3001000	64.90	QBT-3001000X	73.90
	.3000	.3200	1.250	.006	.050	1.353	.1125	.3750	2.5	QBT6-3001250	64.90	QBT6-3001250X	73.90
	.3000	.3200	1.600	.006	.050	1.853	.1125	.3750	3.0	QBT-3001600	72.60	QBT-3001600X	81.60
	.3000	.3200	2.100	.006	.050	2.353	.1125	.3750	3.5	QBT-3002100	79.10	QBT-3002100X	88.80
	.3600	.3800	1.000	.006	.050	1.353	.1725	.3750	2.5	QBT-3601000	64.90	QBT-3601000X	73.90
	.3600	.3800	1.600	.006	.050	1.853	.1725	.3750	3.0	QBT-3601600	72.60	QBT-3601600X	81.60
	.3600	.3800	2.100	.006	.050	2.353	.1725	.3750	3.5	QBT-3602100	79.10	QBT-3602100X	88.80
	.4600	.4800	1.000	.006	.075	1.040	.2100	.5000	2.5	QBT-4601000	98.60	QBT-4601000X	110.90
	.4600	.4800	1.600	.006	.075	2.040	.2100	.5000	3.5	QBT-4601600	98.60	QBT-4601600X	110.75
	.4600	.4800	2.100	.006	.075	2.540	.2100	.5000	4.0	QBT-4602100	104.10	QBT-4602100X	117.30
	.4900	.5100	1.000	.006	.075	1.040	.2400	.5000	2.5	QBT-4901000	98.60	QBT-4901000X	110.90
	.4900	.5100	1.600	.006	.075	2.040	.2400	.5000	3.5	QBT-4901600	98.60	QBT-4901600X	110.75
	.4900	.5100	2.100	.006	.075	2.540	.2400	.5000	4.0	QBT-4902100	104.10	QBT-4902100X	117.30

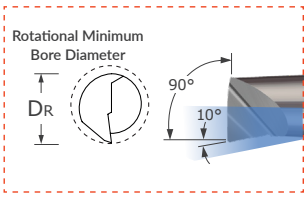
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Quick Change – Boring Tools

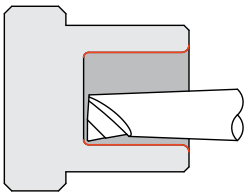
Boring Head Tools

QBM





- Designed for boring applications requiring maximum rigidity
- Tapered neck and top rake geometry for increased performance
- Polished face for reducing galling
- Coolant fed enabled shank design
- Corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



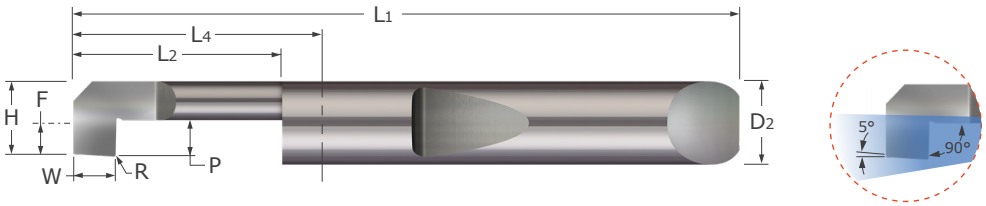
Rotational Minimum Bore Diameter	Maximum Bore Depth	Radius	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_R	L_2 $^{+.030"}_{-.000"}$	$R^{+.001"}_{-.001"}$	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.1180	.500	.003	.853	.0550	.2500	2.0	OBM-118500	37.10	OBM-118500X	43.10
.1180	.750	.003	.853	.0550	.2500	2.0	OBM-118750	37.10	OBM-118750X	43.10
.1500	.500	.003	.853	.0710	.2500	2.0	OBM-150500	37.10	OBM-150500X	43.10
.1500	.750	.003	.853	.0710	.2500	2.0	OBM-150750	37.10	OBM-150750X	43.10
.2000	.500	.008	.853	.0950	.2500	2.0	OBM-200500	37.10	OBM-200500X	43.10
.2000	.750	.008	.853	.0950	.2500	2.0	OBM-200750	37.10	OBM-200750X	43.10
.2000	1.250	.008	1.353	.0950	.2500	2.5	OBM-2001250	37.10	OBM-2001250X	43.15
.2300	.750	.008	.853	.1100	.2500	2.0	OBM-230750	37.10	OBM-230750X	43.10
.2300	1.250	.008	1.353	.1100	.2500	2.5	OBM-2301250	37.10	OBM-2301250X	43.15
.2300	1.500	.008	1.853	.1100	.2500	3.0	OBM-2301500	42.00	OBM-2301500X	48.25
.3000	1.000	.008	1.353	.1450	.3750	2.5	OBM-3001000	67.90	OBM-3001000X	77.00
.3000	1.500	.008	1.853	.1450	.3750	3.0	OBM-3001500	75.40		
.3000	1.750	.008	1.853	.1450	.3750	3.0	OBM-3001750	75.40	OBM-3001750X	84.50
.3600	1.000	.008	1.353	.1750	.3750	2.5	OBM-3601000	67.90		
.3600	1.500	.008	1.853	.1750	.3750	3.0	OBM-3601500	75.40	OBM-3601500X	84.50
.3600	2.000	.008	2.353	.1750	.3750	3.5	OBM-3602000	82.20	OBM-3602000X	91.90
.4600	1.000	.008	1.040	.2250	.5000	2.5	OBM-4601000	94.60	OBM-4601000X	106.90
.4600	1.500	.008	1.540	.2250	.5000	3.0	OBM-4601500	94.60		
.4600	2.000	.008	2.040	.2250	.5000	3.5	OBM-4602000	103.80	OBM-4602000X	117.00
.4600	2.500	.008	2.540	.2250	.5000	4.0	OBM-4602500	109.80	OBM-4602500X	123.00
.4600	3.000	.008	3.040	.2250	.5000	4.5	OBM-4603000	115.10	OBM-4603000X	129.30

See pgs 16-34 for quick change holder options

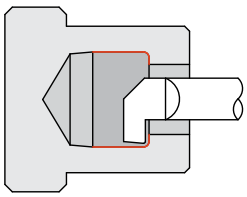
QRB

Quick Change – Boring Tools

Reverse Boring



- Designed to bore from the inside, toward the face of the part
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Coolant fed enabled shank design
- Inside corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Head Width	Min. Bore Dia.*	Max. Bore Depth	Width	Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.015" −.000"	W +.002" −.000"	R +.001" −.001"	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.1560	.1720	.500	.075	.005	.060	.590	.0623	.1875	1.5	QRB-156500	34.40		
.1560	.1720	.750	.075	.005	.060	1.090	.0623	.1875	2.0			QRB-156750X	37.95
.1560	.1720	1.000	.075	.005	.060	1.090	.0623	.1875	2.0			QRB-1561000X	37.95
.1800	.1960	.500	.100	.005	.080	.853	.0550	.2500	2.0	QRB-180500	37.10	QRB-180500X	43.10
.1800	.1960	.750	.100	.005	.080	1.353	.0550	.2500	2.5	QRB-180750	37.10	QRB-180750X	43.15
.1800	.1960	1.000	.100	.005	.080	1.353	.0550	.2500	2.5	QRB-1801000	37.10	QRB-1801000X	43.15
.2000	.2160	.500	.113	.008	.090	.853	.0750	.2500	2.0	QRB-200500	37.10	QRB-200500X	43.10
.2000	.2160	.750	.113	.008	.090	1.353	.0750	.2500	2.5	QRB-200750	37.10	QRB-200750X	43.15
.2000	.2160	1.000	.113	.008	.090	1.353	.0750	.2500	2.5	QRB-2001000	37.10		
.2000	.2160	1.250	.113	.008	.090	1.853	.0750	.2500	3.0	QRB-2001250	43.60		
.2300	.2500	.500	.138	.008	.110	.853	.0738	.3125	2.0	QRB-230500	49.80	QRB-230500X	56.65
.2300	.2500	.750	.138	.008	.110	1.353	.0738	.3125	2.5	QRB-230750	49.80	QRB-230750X	57.40
.2300	.2500	1.000	.138	.008	.110	1.353	.0738	.3125	2.5			QRB-2301000X	57.40
.2300	.2500	1.250	.138	.008	.110	1.853	.0738	.3125	3.0			QRB-2301250X	64.90
.3000	.3200	.500	.138	.008	.110	.853	.1438	.3125	2.0	QRB-300500	49.80		
.3000	.3200	.750	.138	.008	.110	1.353	.1438	.3125	2.5	QRB-300750	49.80	QRB-300750X	56.65
.3000	.3200	1.000	.138	.008	.110	1.353	.1438	.3125	2.5	QRB-3001000	49.80		
.3000	.3200	1.250	.138	.008	.110	1.853	.1438	.3125	3.0	QRB-3001250	57.30	QRB-3001250X	64.90
.3600	.3800	.750	.163	.008	.130	1.353	.1725	.3750	2.5	QRB-360750	67.90		
.3600	.3800	1.000	.163	.008	.130	1.353	.1725	.3750	2.5	QRB-3601000	67.90	QRB-3601000X	77.00
.3600	.3800	1.250	.163	.008	.130	1.853	.1725	.3750	3.0	QRB-3601250	75.40	QRB-3601250X	84.50
.3600	.3800	1.500	.163	.008	.130	1.853	.1725	.3750	3.0	QRB-3601500	75.40	QRB-3601500X	84.50
.4600	.4800	1.000	.200	.008	.160	1.540	.2100	.5000	3.0	QRB-4601000	94.60	QRB-4601000X	106.55
.4600	.4800	1.250	.200	.008	.160	1.540	.2100	.5000	3.0	QRB-4601250	94.60	QRB-4601250X	106.90
.4600	.4800	1.500	.200	.008	.160	2.040	.2100	.5000	3.5	QRB-4601500	103.80	QRB-4601500X	117.00
.4600	.4800	1.800	.200	.008	.160	2.040	.2100	.5000	3.5	QRB-4601800	103.80	QRB-4601800X	117.00
.4900	.5100	1.000	.200	.008	.160	1.540	.2400	.5000	3.0	QRB-4901000	94.60		
.4900	.5100	1.250	.200	.008	.160	1.540	.2400	.5000	3.0	QRB-4901250	94.60	QRB-4901250X	106.90
.4900	.5100	1.500	.200	.008	.160	2.040	.2400	.5000	3.5	QRB-4901500	103.80	QRB-4901500X	117.00
.4900	.5100	1.800	.200	.008	.160	2.040	.2400	.5000	3.5	QRB-4901800	103.80	QRB-4901800X	117.00

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

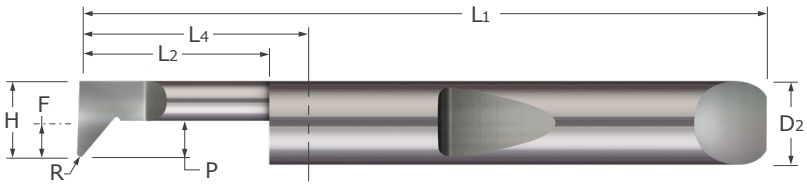
See pgs 16-34 for quick change holder options

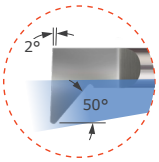
NEW!

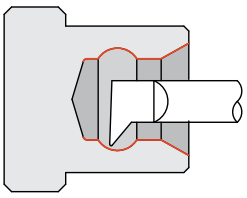
Quick Change – Profiling Tools

Radial Profiling

QPR







- Designed for radial profiling
- Excellent choice for fine finishing
- Can be used in thread relief applications
- Split face geometry provides optimal edge strength
- Coolant fed enabled shank design
- Corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated		
H		L_2 +.030" −.000"	R +.0005" −.0005"	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	
.0500	.0550	.150	.0020	.015	.590	-.0438	.1875	1.5	QPR2-050150	34.60	QPR2-050150X	39.60	NEW
.0500	.0550	.200	.0020	.015	.590	-.0438	.1875	1.5	QPR2-050200	34.60	QPR2-050200X	39.60	NEW
.0600	.0700	.150	.0020	.020	.590	-.0338	.1875	1.5	QPR2-060150	34.60	QPR2-060150X	39.60	NEW
.0600	.0700	.200	.0020	.020	.590	-.0338	.1875	1.5	QPR2-060200	34.60	QPR2-060200X	39.60	NEW
.0700	.0800	.150	.0020	.025	.590	-.0238	.1875	1.5	QPR2-070150	34.60	QPR2-070150X	39.60	NEW
.0700	.0800	.200	.0020	.025	.590	-.0238	.1875	1.5	QPR2-070200	34.60	QPR2-070200X	39.60	NEW
.0700	.0800	.200	.0050	.025	.590	-.0238	.1875	1.5	QPR-070200	34.60	QPR-070200X	38.25	
.0700	.0800	.300	.0020	.025	.590	-.0238	.1875	1.5	QPR2-070300	34.60	QPR2-070300X	39.60	NEW
.0700	.0800	.300	.0050	.025	.590	-.0238	.1875	1.5	QPR-070300	34.60	QPR-070300X	38.25	
.0700	.0800	.500	.0020	.025	.590	-.0238	.1875	1.5	QPR2-070500	34.60	QPR2-070500X	39.60	NEW
.0700	.0800	.500	.0050	.025	.590	-.0238	.1875	1.5	QPR-070500	34.60	QPR-070500X	38.25	
.1000	.1100	.200	.0050	.035	.590	.0063	.1875	1.5	QPR5-100200	34.60	QPR5-100200X	38.25	
.1000	.1100	.300	.0050	.035	.590	.0063	.1875	1.5	QPR5-100300	34.60	QPR5-100300X	38.25	
.1100	.1240	.250	.0050	.040	.590	.0163	.1875	1.5	QPR-110250	34.60	QPR-110250X	38.25	
.1100	.1240	.375	.0050	.040	.590	.0163	.1875	1.5	QPR5-110375	34.60	QPR5-110375X	38.25	
.1100	.1240	.500	.0050	.040	.590	.0163	.1875	1.5	QPR-110500	34.60	QPR-110500X	38.25	
.1200	.1340	.250	.0080	.050	.590	.0263	.1875	1.5	QPR-120250	34.60	QPR-120250X	38.25	
.1200	.1340	.375	.0050	.050	.590	.0263	.1875	1.5	QPR5-120375	34.60	QPR5-120375X	38.25	
.1200	.1340	.375	.0080	.050	.590	.0263	.1875	1.5	QPR8-120375	34.60	QPR8-120375X	38.25	
.1200	.1340	.500	.0080	.050	.590	.0263	.1875	1.5	QPR-120500	34.60	QPR-120500X	38.25	
.1200	.1340	.750	.0050	.050	1.090	.0263	.1875	2.0	QPR5-120750	34.60	QPR5-120750X	38.25	
.1200	.1340	.750	.0080	.050	1.090	.0263	.1875	2.0	QPR-120750	34.60	QPR-120750X	38.25	
.1400	.1540	.375	.0050	.050	.590	.0463	.1875	1.5	QPR5-140375	34.60	QPR5-140375X	38.25	
.1400	.1540	.375	.0080	.050	.590	.0463	.1875	1.5	QPR8-140375	34.60	QPR8-140375X	38.25	
.1400	.1540	.500	.0050	.050	.590	.0463	.1875	1.5	QPR5-140500	34.60	QPR5-140500X	38.25	
.1400	.1540	.500	.0080	.050	.590	.0463	.1875	1.5	QPR8-140500	34.60	QPR8-140500X	38.25	

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options

QPR

Quick Change – Profiling Tools

Radial Profiling (cont.)

Continued from previous page

	Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	H		L_2 $^{+.030"}_{-.000"}$	R $^{+.0005"}_{-.0005"}$	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	.1600	.1780	.375	.0080	.050	.590	.0663	.1875	1.5	QPR8-160375	34.60	QPR8-160375X	38.25
	.1600	.1780	.500	.0080	.050	.590	.0663	.1875	1.5	QPR-160500	34.60	QPR-160500X	38.25
	.1600	.1780	.750	.0080	.050	1.090	.0663	.1875	2.0	QPR-160750	34.60	QPR-160750X	38.25
	.1600	.1780	1.000	.0080	.050	1.090	.0663	.1875	2.0	QPR-1601000	34.60	QPR-1601000X	38.25
	.1800	.1980	.375	.0080	.080	.853	.0550	.2500	2.0	QPR8-180375	43.30	QPR8-180375X	49.20
	.1800	.1980	.500	.0080	.080	.853	.0550	.2500	2.0	QPR-180500	43.30	QPR-180500X	49.20
	.1800	.1980	.750	.0080	.080	.853	.0550	.2500	2.0	QPR-180750	43.30	QPR-180750X	49.20
	.1800	.1980	1.000	.0080	.080	1.353	.0550	.2500	2.5	QPR-1801000	43.30	QPR-1801000X	49.45
	.2000	.2180	.500	.0050	.080	.853	.0750	.2500	2.0	QPR5-200500	43.30	QPR5-200500X	49.20
	.2000	.2180	.500	.0080	.080	.853	.0750	.2500	2.0	QPR8-200500	43.30	QPR8-200500X	49.20
	.2000	.2180	.750	.0050	.080	.853	.0750	.2500	2.0	QPR5-200750	43.30	QPR5-200750X	49.20
	.2000	.2180	.750	.0080	.080	.853	.0750	.2500	2.0	QPR8-200750	43.30	QPR8-200750X	49.20
	.2300	.2520	.500	.0080	.080	.853	.0738	.3125	2.0	QPR8-230500	54.00	QPR8-230500X	60.95
	.2300	.2520	.750	.0080	.080	.853	.0738	.3125	2.0	QPR-230750	54.00	QPR-230750X	60.95
	.2300	.2520	1.000	.0080	.080	1.353	.0738	.3125	2.5	QPR-2301000	54.00	QPR-2301000X	61.60
	.2300	.2520	1.250	.0080	.080	1.353	.0738	.3125	2.5	QPR-2301250	54.00	QPR-2301250X	61.60
NEW	.2300	.2520	1.500	.0080	.080	1.853	.0738	.3125	3.0	QPR-2301500	55.20	QPR-2301500X	62.80
	.2600	.2820	.750	.0080	.090	.853	.1038	.3125	2.0	QPR8-260750	54.00	QPR8-260750X	60.95
	.2600	.2820	1.000	.0080	.090	1.353	.1038	.3125	2.5	QPR8-2601000	54.00	QPR8-2601000X	61.60
	.3000	.3220	.750	.0080	.110	.853	.1438	.3125	2.0	QPR8-300750	54.00	QPR8-300750X	60.95
	.3000	.3220	1.000	.0080	.110	1.353	.1438	.3125	2.5	QPR-3001000	54.00	QPR-3001000X	61.60
	.3000	.3220	1.250	.0080	.110	1.353	.1438	.3125	2.5	QPR-3001250	54.00	QPR-3001250X	61.60
NEW	.3000	.3220	1.500	.0080	.110	1.853	.1438	.3125	3.0	QPR-3001500	55.20	QPR-3001500X	62.80
	.3600	.3820	.750	.0080	.130	.853	.1725	.3750	2.0	QPR8-360750	70.40	QPR8-360750X	78.05
	.3600	.3820	1.000	.0080	.130	1.353	.1725	.3750	2.5	QPR-3601000	70.40	QPR-3601000X	79.40
	.3600	.3820	1.250	.0080	.130	1.353	.1725	.3750	2.5	QPR-3601250	70.40	QPR-3601250X	79.40
NEW	.3600	.3820	1.500	.0080	.130	1.853	.1725	.3750	3.0	QPR-3601500	71.60	QPR-3601500X	80.60
	.4600	.4820	.750	.0080	.150	1.040	.2100	.5000	2.5	QPR8-460750	98.60	QPR8-460750X	110.90
	.4600	.4820	1.000	.0080	.150	1.540	.2100	.5000	3.0	QPR-4601000	98.60	QPR-4601000X	110.90
	.4600	.4820	1.500	.0080	.150	1.540	.2100	.5000	3.0	QPR-4601500	98.60	QPR-4601500X	110.90
	.4600	.4820	1.800	.0080	.150	2.040	.2100	.5000	3.5	QPR-4601800	107.60	QPR-4601800X	120.80
	.4900	.5120	1.000	.0080	.150	1.540	.2400	.5000	3.0	QPR-4901000	98.60	QPR-4901000X	110.90
	.4900	.5120	1.500	.0080	.150	1.540	.2400	.5000	3.0	QPR-4901500	98.60	QPR-4901500X	110.90
	.4900	.5120	1.800	.0080	.150	2.040	.2400	.5000	3.5	QPR-4901800	107.60	QPR-4901800X	120.80

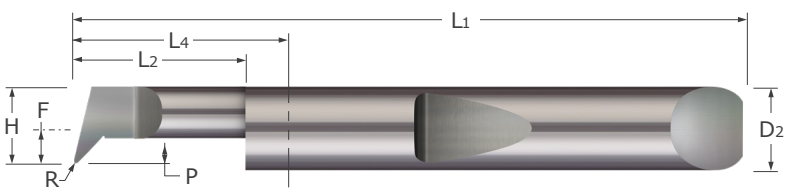
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

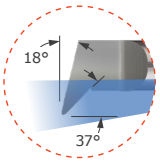
See pgs 16-34 for quick change holder options

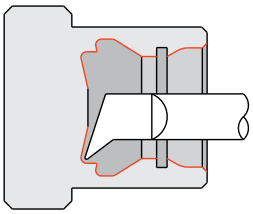
Quick Change – Profiling Tools

Angled Profiling

QPA







- Designed for both radial and axial profiling
- Unique design maximizes tool versatility and part feature creation
- Excellent choice for fine finishing
- Coolant fed enabled shank design
- Corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Head Width	Minimum Bore Dia*	Maximum Bore Depth	Radius	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.030" −.000"	R +.0005" −.0005"	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0500	.0550	.150	.0020	.015	.590	-.0438	.1875	1.5	OPA2-050150	34.60	OPA2-050150X	38.25
.0500	.0550	.200	.0020	.015	.590	-.0438	.1875	1.5	OPA2-050200	34.60	OPA2-050200X	38.25
.0600	.0700	.150	.0020	.020	.590	-.0338	.1875	1.5	OPA2-060150	34.60	OPA2-060150X	38.25
.0600	.0700	.200	.0020	.020	.590	-.0338	.1875	1.5	OPA2-060200	34.60	OPA2-060200X	38.25
.0700	.0800	.150	.0020	.020	.590	-.0238	.1875	1.5	OPA2-070150	34.60	OPA2-070150X	38.25
.0700	.0800	.200	.0020	.020	.590	-.0238	.1875	1.5	OPA2-070200	34.60	OPA2-070200X	38.25
.0800	.0900	.200	.0020	.025	.590	-.0138	.1875	1.5	OPA2-080200	34.60	OPA2-080200X	38.25
.0800	.0900	.300	.0020	.025	.590	-.0138	.1875	1.5	OPA2-080300	34.60	OPA2-080300X	38.25
.0900	.1000	.200	.0020	.030	.590	-.0038	.1875	1.5	OPA2-090200	34.60	OPA2-090200X	38.25
.0900	.1000	.300	.0020	.030	.590	-.0038	.1875	1.5	OPA2-090300	34.60	OPA2-090300X	38.25
.1000	.1100	.200	.0020	.030	.590	.0063	.1875	1.5	OPA2-100200	34.60	OPA2-100200X	38.25
.1000	.1100	.200	.0050	.030	.590	.0063	.1875	1.5	OPA5-100200	34.60	OPA5-100200X	38.25
.1000	.1100	.300	.0020	.030	.590	.0063	.1875	1.5	OPA2-100300	34.60	OPA2-100300X	38.25
.1000	.1100	.300	.0050	.030	.590	.0063	.1875	1.5	OPA5-100300	34.60	OPA5-100300X	38.25
.1100	.1240	.250	.0050	.035	.590	.0163	.1875	1.5	OPA5-110250	34.60	OPA5-110250X	38.25
.1100	.1240	.375	.0050	.035	.590	.0163	.1875	1.5	OPA5-110375	34.60	OPA5-110375X	38.25
.1200	.1340	.250	.0050	.035	.590	.0263	.1875	1.5	OPA5-120250	34.60	OPA5-120250X	38.25
.1200	.1340	.375	.0050	.035	.590	.0263	.1875	1.5	OPA5-120375	34.60	OPA5-120375X	38.25
.1400	.1540	.375	.0050	.040	.590	.0463	.1875	1.5	OPA5-140375	34.60	OPA5-140375X	38.25
.1400	.1540	.500	.0050	.040	.590	.0463	.1875	1.5	OPA5-140500	34.60	OPA5-140500X	38.25
.1600	.1780	.375	.0050	.050	.590	.0663	.1875	1.5	OPA5-160375	34.60	OPA5-160375X	38.25
.1600	.1780	.500	.0050	.050	.590	.0663	.1875	1.5	OPA5-160500	34.60	OPA5-160500X	38.25
.1800	.1980	.375	.0050	.055	.853	.0550	.2500	2.0	OPA5-180375	43.30	OPA5-180375X	49.20
.1800	.1980	.500	.0050	.055	.853	.0550	.2500	2.0	OPA5-180500	43.30	OPA5-180500X	49.20

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options

QPA

Quick Change – Profiling Tools

Angled Profiling (cont.)

Continued from previous page

Head Width	Minimum Bore Dia*	Maximum Bore Depth	Radius	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H		L_2 $^{+.030"}_{-.000"}$	R $^{+.0005"}_{-.0005"}$	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.2000	.2180	.500	.0050	.060	.853	.0750	.2500	2.0	QPA5-200500	43.30	QPA5-200500X	49.20
.2000	.2180	.500	.0080	.060	.853	.0750	.2500	2.0	QPA8-200500	43.30	QPA8-200500X	49.20
.2000	.2180	.750	.0050	.060	.853	.0750	.2500	2.0	QPA5-200750	43.30	QPA5-200750X	49.20
.2000	.2180	.750	.0080	.060	.853	.0750	.2500	2.0	QPA8-200750	43.30	QPA8-200750X	49.20
.2300	.2520	.500	.0080	.070	.853	.0738	.3125	2.0	QPA8-230500	54.00	QPA8-230500X	60.95
.2300	.2520	.750	.0080	.070	.853	.0738	.3125	2.0	QPA8-230750	54.00	QPA8-230750X	60.95
.2600	.2820	.750	.0080	.080	.853	.1038	.3125	2.0	QPA8-260750	54.00	QPA8-260750X	60.95
.2600	.2820	1.000	.0080	.080	1.353	.1038	.3125	2.5	QPA8-2601000	54.00	QPA8-2601000X	61.60
.3000	.3220	.750	.0080	.090	.853	.1438	.3125	2.0	QPA8-300750	54.00	QPA8-300750X	60.95
.3000	.3220	1.000	.0080	.090	1.353	.1438	.3125	2.5	QPA8-3001000	54.00	QPA8-3001000X	61.60
.3600	.3820	.750	.0080	.110	.853	.1725	.3750	2.0	QPA8-360750	70.40	QPA8-360750X	78.90
.3600	.3820	1.000	.0080	.110	1.353	.1725	.3750	2.5	QPA8-3601000	70.40	QPA8-3601000X	79.40
.4100	.4320	.750	.0080	.120	1.040	.1600	.5000	2.5	QPA8-410750	98.60	QPA8-410750X	110.90
.4100	.4320	1.250	.0080	.120	1.540	.1600	.5000	3.0	QPA8-4101250	98.60	QPA8-4101250X	110.90
.4600	.4820	.750	.0080	.140	1.040	.2100	.5000	2.5	QPA8-460750	98.60	QPA8-460750X	110.90
.4600	.4820	1.000	.0080	.140	1.040	.2100	.5000	2.5	QPA8-4601000	98.60	QPA8-4601000X	110.90

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

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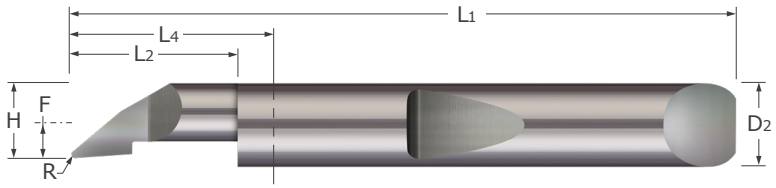
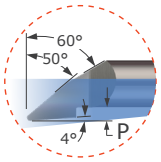
See pgs 16-34 for quick change holder options

Quick Change – Profiling Tools

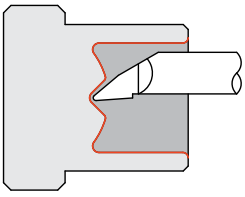
Axial Profiling

QPF





- Designed for both radial and axial profiling
- Unique design maximizes tool versatility and part feature creation
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Coolant fed enabled shank design
- Corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.030" −.000"	R +.0005" −.0005"	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0500	.0550	.150	.0050	.005	.590	-.0438	.1875	1.5	OPF5-050150	34.60	OPF5-050150X	38.25
.0500	.0550	.200	.0050	.005	.590	-.0438	.1875	1.5	OPF-050200	34.60	OPF-050200X	38.25
.0500	.0550	.400	.0050	.005	.590	-.0438	.1875	1.5	OPF-050400	34.60	OPF-050400X	38.25
.0500	.0550	.500	.0050	.005	.590	-.0438	.1875	1.5	OPF-050500	34.60	OPF-050500X	38.25
.0600	.0700	.200	.0050	.005	.590	-.0338	.1875	1.5	OPF-060200	34.60	OPF-060200X	38.25
.0600	.0700	.400	.0050	.005	.590	-.0338	.1875	1.5	OPF-060400	34.60	OPF-060400X	38.25
.0600	.0700	.500	.0050	.005	.590	-.0338	.1875	1.5	OPF-060500	34.60	OPF-060500X	38.25
.0700	.0800	.150	.0050	.010	.590	-.0238	.1875	1.5	OPF5-070150	34.60	OPF5-070150X	38.25
.0700	.0800	.200	.0050	.010	.590	-.0238	.1875	1.5	OPF-070200	34.60	OPF-070200X	38.25
.0700	.0800	.300	.0050	.010	.590	-.0238	.1875	1.5	OPF5-070300	34.60	OPF5-070300X	38.25
.0700	.0800	.400	.0050	.010	.590	-.0238	.1875	1.5	OPF-070400	34.60	OPF-070400X	38.25
.0700	.0800	.500	.0050	.010	.590	-.0238	.1875	1.5	OPF-070500	34.60	OPF-070500X	38.25
.0700	.0800	.600	.0050	.010	1.090	-.0238	.1875	2.0	OPF-070600	34.60	OPF-070600X	38.25
.0800	.0900	.150	.0050	.010	.590	-.0138	.1875	1.5	OPF5-080150	34.60	OPF5-080150X	38.25
.0800	.0900	.200	.0050	.010	.590	-.0138	.1875	1.5	OPF5-080200	34.60	OPF5-080200X	38.25
.0800	.0900	.250	.0050	.010	.590	-.0138	.1875	1.5	OPF5-080250	34.60	OPF5-080250X	38.25
.0900	.1000	.200	.0050	.010	.590	-.0038	.1875	1.5	OPF5-090200	34.60	OPF5-090200X	38.25
.0900	.1000	.300	.0050	.010	.590	-.0038	.1875	1.5	OPF5-090300	34.60	OPF5-090300X	38.25
.1000	.1100	.300	.0050	.015	.590	.0063	.1875	1.5	OPF5-100300	34.60	OPF5-100300X	38.25
.1000	.1100	.400	.0050	.015	.590	.0063	.1875	1.5	OPF5-100400	34.60	OPF5-100400X	38.25
.1100	.1220	.250	.0050	.015	.590	.0163	.1875	1.5	OPF-110250	34.60	OPF-110250X	38.25
.1100	.1220	.375	.0050	.015	.590	.0163	.1875	1.5	OPF5-110375	34.60	OPF5-110375X	38.25
.1100	.1220	.500	.0050	.015	.590	.0163	.1875	1.5	OPF-110500	34.60	OPF-110500X	38.25
.1100	.1220	.750	.0050	.015	1.090	.0163	.1875	2.0	OPF-110750	34.60	OPF-110750X	38.25
.1200	.1320	.250	.0080	.020	.590	.0263	.1875	1.5	OPF-120250	34.60	OPF-120250X	38.25
.1200	.1320	.375	.0050	.020	.590	.0263	.1875	1.5	OPF5-120375	34.60	OPF5-120375X	38.25
.1200	.1320	.500	.0080	.020	.590	.0263	.1875	1.5	OPF-120500	34.60	OPF-120500X	38.25
.1200	.1320	.750	.0080	.020	1.090	.0263	.1875	2.0	OPF-120750	34.60	OPF-120750X	38.25
.1200	.1320	1.000	.0080	.020	1.090	.0263	.1875	2.0	OPF-1201000	34.60	OPF-1201000X	38.25

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options

QPF

Quick Change – Profiling Tools

Axial Profiling (cont.)

Continued from previous page

Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H		L_2 $^{+.030"}_{-.000"}$	R $^{+.0005"}_{-.0005"}$	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.1400	.1520	.375	.0080	.020	.590	.0463	.1875	1.5	QPF8-140375	34.60	QPF8-140375X	38.25
.1400	.1520	.500	.0080	.020	.590	.0463	.1875	1.5	QPF8-140500	34.60	QPF8-140500X	38.25
.1600	.1760	.375	.0080	.030	.590	.0663	.1875	1.5	QPF8-160375	34.60	QPF8-160375X	38.25
.1600	.1760	.500	.0080	.030	.590	.0663	.1875	1.5	QPF-160500	34.60	QPF-160500X	38.25
.1600	.1760	.750	.0080	.030	1.090	.0663	.1875	2.0	QPF-160750	34.60	QPF-160750X	38.25
.1600	.1760	1.000	.0080	.030	1.090	.0663	.1875	2.0	QPF-1601000	34.60	QPF-1601000X	38.25
.1800	.1960	.375	.0080	.030	.853	.0550	.2500	2.0	QPF8-180375	43.30	QPF8-180375X	49.20
.1800	.1960	.500	.0080	.030	.853	.0550	.2500	2.0	QPF-180500	43.30	QPF-180500X	49.20
.1800	.1960	.750	.0080	.030	.853	.0550	.2500	2.0	QPF-180750	43.30	QPF-180750X	49.20
.1800	.1960	1.000	.0080	.030	1.353	.0550	.2500	2.5	QPF-1801000	43.30	QPF-1801000X	49.45
.2000	.2160	.400	.0080	.030	.853	.0750	.2500	2.0	QPF8-200400	43.30	QPF8-200400X	49.20
.2000	.2160	.600	.0080	.030	.853	.0750	.2500	2.0	QPF-200600	43.30	QPF-200600X	49.20
.2000	.2160	.800	.0080	.030	1.353	.0750	.2500	2.5	QPF8-200800	43.30	QPF8-200800X	49.45
.2000	.2160	1.000	.0080	.030	1.353	.0750	.2500	2.5	QPF-2001000	43.30	QPF-2001000X	49.45
.2300	.2500	.750	.0080	.030	.853	.0738	.3125	2.0	QPF-230750	54.00	QPF-230750X	60.95
.2300	.2500	1.000	.0080	.030	1.353	.0738	.3125	2.5	QPF-2301000	54.00	QPF-2301000X	61.60
.2300	.2500	1.100	.0080	.030	1.353	.0738	.3125	2.5			QPF-2301100X	61.60
.2300	.2500	1.250	.0080	.030	1.353	.0738	.3125	2.5	QPF-2301250	54.00	QPF-2301250X	61.60
.2600	.2800	.750	.0080	.030	.853	.1038	.3125	2.5	QPF8-260750	54.00	QPF8-260750X	61.60
.3000	.3200	1.000	.0080	.030	1.353	.1438	.3125	2.5	QPF-3001000	54.00	QPF-3001000X	61.60
.3000	.3200	1.250	.0080	.030	1.353	.1438	.3125	2.5	QPF-3001250	54.00	QPF-3001250X	61.60
.3600	.3800	.750	.0080	.030	.853	.1725	.3750	2.0	QPF8-360750	70.40	QPF8-360750X	78.05
.3600	.3800	1.000	.0080	.030	1.353	.1725	.3750	2.5	QPF-3601000	70.40	QPF-3601000X	79.40
.3600	.3800	1.250	.0080	.030	1.353	.1725	.3750	2.5	QPF-3601250	70.40	QPF-3601250X	79.40
.4100	.4300	.750	.0080	.040	1.040	.1600	.5000	2.5	QPF8-410750	98.60	QPF8-410750X	110.90
.4100	.4300	1.000	.0080	.040	1.040	.1600	.5000	2.5	QPF8-4101000	98.60	QPF8-4101000X	110.90
.4600	.4800	.750	.0080	.050	1.040	.2100	.5000	2.5	QPF8-460750	98.60	QPF8-460750X	110.90
.4600	.4800	1.000	.0080	.050	1.040	.2100	.5000	2.5	QPF-4601000	98.60	QPF-4601000X	110.90
.4600	.4800	1.600	.0080	.050	2.040	.2100	.5000	3.5			QPF-4601600X	113.65
.4900	.5100	1.800	.0080	.050	2.040	.2400	.5000	3.5			QPF-4901800X	113.65

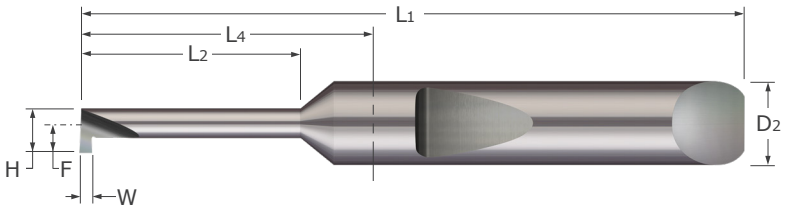
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

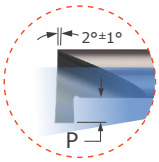
See pgs 16-34 for quick change holder options

Quick Change – Grooving Tools

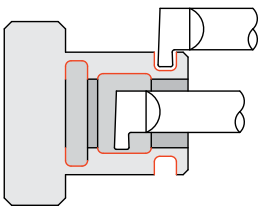
Retaining Ring – Square – Miniature

QMRR





- Designed for generating retaining ring grooves in bores .070" and larger
- Polished face for improved edge retention and chip evacuation while reducing galling
- On-center neck design
- Coolant fed enabled shank design
- Sharp corner profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	H		L2 +.030" −.000"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.010	.0600	.0700	.100	.020	.590	.0400	.1875	1.5	QMRR-010-100-060	48.20	QMRR-010-100-060X	52.25
.010	.0600	.0700	.150	.020	.590	.0400	.1875	1.5	QMRR-010-150-060	48.20	QMRR-010-150-060X	52.25
.010	.0600	.0700	.250	.020	.590	.0400	.1875	1.5	QMRR-010-250-060	48.20	QMRR-010-250-060X	52.25
.015	.0600	.0700	.100	.020	.590	.0400	.1875	1.5	QMRR-015-100-060	48.20	QMRR-015-100-060X	52.25
.015	.0600	.0700	.150	.020	.590	.0400	.1875	1.5	QMRR-015-150-060	48.20	QMRR-015-150-060X	52.25
.015	.0600	.0700	.250	.020	.590	.0400	.1875	1.5	QMRR-015-250-060	48.20	QMRR-015-250-060X	52.25
.015	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMRR-015-250-080	48.20	QMRR-015-250-080X	52.25
.015	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMRR-015-375-080	48.20	QMRR-015-375-080X	52.25
.015	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMRR-015-500-080	48.20		
.015	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMRR-015-250-100	48.20	QMRR-015-250-100X	52.25
.015	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMRR-015-500-100	48.20	QMRR-015-500-100X	52.25
.015	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMRR-015-750-100	48.20	QMRR-015-750-100X	52.25
.017	.1200	.1340	.150	.040	.590	.0800	.1875	1.5	QMRR-017-150-120	48.20	QMRR-017-150-120X	52.25
.017	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMRR-017-250-120	48.20	QMRR-017-250-120X	52.25
.020	.0600	.0700	.100	.020	.590	.0400	.1875	1.5	QMRR-020-100-060	43.30	QMRR-020-100-060X	47.25
.020	.0600	.0700	.150	.020	.590	.0400	.1875	1.5	QMRR-020-150-060	43.30	QMRR-020-150-060X	47.25
.020	.0600	.0700	.250	.020	.590	.0400	.1875	1.5	QMRR-020-250-060	43.30	QMRR-020-250-060X	47.25
.020	.0700	.0800	.100	.020	.590	.0450	.1875	1.5	QMRR-020-100-070	43.30	QMRR-020-100-070X	47.25
.020	.0700	.0800	.150	.020	.590	.0450	.1875	1.5	QMRR-020-150-070	43.30	QMRR-020-150-070X	47.25
.020	.0800	.0900	.150	.025	.590	.0525	.1875	1.5	QMRR-020-150-080	43.30	QMRR-020-150-080X	47.25
.020	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMRR-020-250-080	43.30	QMRR-020-250-080X	47.25
.020	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMRR-020-375-080	43.30	QMRR-020-375-080X	47.25
.020	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMRR-020-500-080	43.30	QMRR-020-500-080X	47.25
.020	.0900	.1000	.150	.025	.590	.0575	.1875	1.5	QMRR-020-150-090	43.30	QMRR-020-150-090X	47.25
.020	.0900	.1000	.250	.025	.590	.0575	.1875	1.5	QMRR-020-250-090	43.30	QMRR-020-250-090X	47.25
.020	.1000	.1100	.150	.030	.590	.0650	.1875	1.5	QMRR-020-150-100	43.30	QMRR-020-150-100X	47.25
.020	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMRR-020-250-100	43.30	QMRR-020-250-100X	47.25
.020	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMRR-020-500-100	43.30	QMRR-020-500-100X	47.25
.020	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMRR-020-750-100	43.30	QMRR-020-750-100X	47.25

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options

QMRR

Quick Change – Grooving Tools

Retaining Ring – Square – Miniature (cont.)

Continued from previous page

Width	Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	H		L_2 +.030" −.000"	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.020	.1200	.1340	.150	.040	.590	.0800	.1875	1.5	QMRR-020-150-120	43.30	QMRR-020-150-120X	47.25
.020	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMRR-020-250-120	43.30	QMRR-020-250-120X	47.25
.020	.1200	.1340	.375	.040	.590	.0800	.1875	1.5	QMRR-020-375-120	43.30	QMRR-020-375-120X	47.25
.020	.1200	.1340	.500	.040	.590	.0800	.1875	1.5	QMRR-020-500-120	43.30	QMRR-020-500-120X	47.25
.020	.1200	.1340	.750	.040	1.090	.0800	.1875	2.0	QMRR-020-750-120	43.30	QMRR-020-750-120X	47.25
.025	.1200	.1340	.150	.040	.590	.0800	.1875	1.5	QMRR-025-150-120	43.30	QMRR-025-150-120X	47.25
.025	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMRR-025-250-120	43.30	QMRR-025-250-120X	47.25
.030	.0700	.0800	.100	.020	.590	.0450	.1875	1.5	QMRR-030-100-070	43.30	QMRR-030-100-070X	47.25
.030	.0700	.0800	.150	.020	.590	.0450	.1875	1.5	QMRR-030-150-070	43.30	QMRR-030-150-070X	47.25
.030	.0800	.0900	.150	.025	.590	.0525	.1875	1.5	QMRR-030-150-080	43.30	QMRR-030-150-080X	47.25
.030	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMRR-030-250-080	43.30	QMRR-030-250-080X	47.25
.030	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMRR-030-375-080	43.30	QMRR-030-375-080X	47.25
.030	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMRR-030-500-080	43.30	QMRR-030-500-080X	47.25
.030	.0900	.1000	.150	.025	.590	.0575	.1875	1.5	QMRR-030-150-090	43.30	QMRR-030-150-090X	47.25
.030	.0900	.1000	.250	.025	.590	.0575	.1875	1.5	QMRR-030-250-090	43.30	QMRR-030-250-090X	47.25
.030	.1000	.1100	.150	.030	.590	.0650	.1875	1.5	QMRR-030-150-100	43.30	QMRR-030-150-100X	47.25
.030	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMRR-030-250-100	43.30	QMRR-030-250-100X	47.25
.030	.1000	.1100	.375	.030	.590	.0650	.1875	1.5	QMRR-030-375-100	43.30	QMRR-030-375-100X	47.25
.030	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMRR-030-500-100	43.30	QMRR-030-500-100X	47.25
.030	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMRR-030-750-100	43.30	QMRR-030-750-100X	47.25
.030	.1200	.1340	.150	.040	.590	.0800	.1875	1.5	QMRR-030-150-120	43.30	QMRR-030-150-120X	47.25
.030	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMRR-030-250-120	43.30	QMRR-030-250-120X	47.25
.030	.1200	.1340	.375	.040	.590	.0800	.1875	1.5	QMRR-030-375-120	43.30	QMRR-030-375-120X	47.25
.030	.1200	.1340	.500	.040	.590	.0800	.1875	1.5	QMRR-030-500-120	43.30	QMRR-030-500-120X	47.25
.030	.1200	.1340	.750	.040	1.090	.0800	.1875	2.0	QMRR-030-750-120	43.30	QMRR-030-750-120X	47.25

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

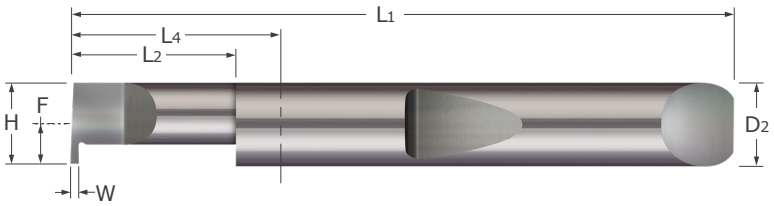
See pgs 16-34 for quick change holder options

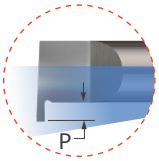
NEW!

Quick Change – Grooving Tools

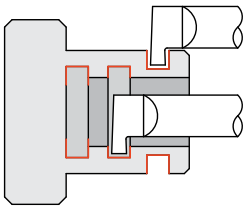
Retaining Ring – Square

QRR





- Designed for generating retaining ring grooves in bores .134" and larger
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Coolant fed enabled shank design
- Sharp corner profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Head Width	Minimum Bore Dia.*	Max. Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	H		L2 +.030" −.000"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.017	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	ORR-017-4	36.80	ORR-017-4X	40.45
.017	.1800	.1980	.375	.030	.590	.0863	.1875	1.5	ORR-017-6	36.80	ORR-017-6X	40.45
.017	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	ORR-017-8	36.80	ORR-017-8X	40.45
.017	.1800	.1980	.625	.030	1.090	.0863	.1875	2.0	ORR-017-10	36.80	ORR-017-10X	40.45
.017	.1800	.1980	.750	.030	1.090	.0863	.1875	2.0	ORR-017-750-180	36.80	ORR-017-750-180X	40.45
.017	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	ORR-017-250-245	43.30	ORR-017-250-245X	49.20
.017	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	ORR-017-375-245	43.30	ORR-017-375-245X	49.20
.020	.1200	.1340	.150	.030	.590	.0263	.1875	1.5	ORR-020-150-120	36.80	ORR-020-150-120X	40.45
.020	.1200	.1340	.250	.030	.590	.0263	.1875	1.5	ORR-020-250-120	36.80	ORR-020-250-120X	40.45
.020	.1400	.1540	.250	.030	.590	.0463	.1875	1.5	ORR-020-250-140	36.80	ORR-020-250-140X	40.45
.020	.1400	.1540	.375	.030	.590	.0463	.1875	1.5	ORR-020-375-140	36.80	ORR-020-375-140X	40.45
.020	.1600	.1780	.250	.030	.590	.0663	.1875	1.5	ORR-020-250-160	36.80	ORR-020-250-160X	40.45
.020	.1600	.1780	.375	.030	.590	.0663	.1875	1.5	ORR-020-375-160	36.80	ORR-020-375-160X	40.45
.020	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	ORR-020-4	36.80	ORR-020-4X	40.45
.020	.1800	.1980	.375	.030	.590	.0863	.1875	1.5	ORR-020-6	36.80	ORR-020-6X	40.45
.020	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	ORR-020-8	36.80	ORR-020-8X	40.45
.020	.1800	.1980	.625	.030	1.090	.0863	.1875	2.0	ORR-020-10	36.80	ORR-020-10X	40.45
.020	.1800	.1980	.750	.030	1.090	.0863	.1875	2.0	ORR-020-750-180	43.30	ORR-020-750-180X	48.20
.020	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	ORR-020-250-245	43.30	ORR-020-250-245X	49.20
.020	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	ORR-020-375-245	43.30	ORR-020-375-245X	49.20
.020	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	ORR-020-500-245	43.30	ORR-020-500-245X	49.20
.020	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	ORR-020-625-245	43.30	ORR-020-625-245X	49.20
.020	.3700	.3920	.625	.050	.853	.1825	.3750	2.0	ORR-020-625-370	70.40	ORR-020-625-370X	78.90
.020	.3700	.3920	1.000	.050	1.353	.1825	.3750	2.5	ORR-020-1000-370	70.40	ORR-020-1000-370X	79.40
.025	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	ORR-025-4	43.30	ORR-025-4X	49.20
.025	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	ORR-025-6	43.30	ORR-025-6X	49.20
.025	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	ORR-025-8	43.30	ORR-025-8X	49.20
.025	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	ORR-025-10	43.30	ORR-025-10X	49.20
.025	.2450	.2670	.750	.050	.853	.1200	.2500	2.0	ORR-025-750-245	43.30	ORR-025-750-245X	49.20

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options
See pg 84 for miniature sizes

QRR

Quick Change – Grooving Tools

Retaining Ring – Square (cont.)

Continued from previous page

	Width	Head Width	Minimum Bore Dia.*	Max. Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	W +.002" −.000"	H		L2 +.030" −.000"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
	.030	.1200	.1340	.150	.030	.590	.0263	.1875	1.5	QRR-030-150-120	36.80	QRR-030-150-120X	40.45
	.030	.1200	.1340	.250	.030	.590	.0263	.1875	1.5	QRR-030-250-120	36.80	QRR-030-250-120X	40.45
	.030	.1400	.1540	.250	.030	.590	.0463	.1875	1.5	QRR-030-250-140	36.80	QRR-030-250-140X	40.45
	.030	.1400	.1540	.375	.030	.590	.0463	.1875	1.5	QRR-030-375-140	36.80	QRR-030-375-140X	40.45
NEW	.030	.1400	.1540	.375	.050	.590	.0463	.1875	1.5	QRR-6757	36.80	QRR-6757X	41.80
	.030	.1600	.1780	.250	.030	.590	.0663	.1875	1.5	QRR-030-250-160	36.80	QRR-030-250-160X	40.45
	.030	.1600	.1780	.375	.030	.590	.0663	.1875	1.5	QRR-030-375-160	36.80	QRR-030-375-160X	40.45
NEW	.030	.1600	.1780	.375	.050	.590	.0663	.1875	1.5	QRR-3565	36.80	QRR-3565X	41.80
	.030	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QRR-030-250-180	36.80	QRR-030-250-180X	40.45
NEW	.030	.1800	.1980	.250	.050	.590	.0863	.1875	1.5	QRR-0495	36.80	QRR-0495X	41.80
	.030	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QRR-030-500-180	36.80	QRR-030-500-180X	40.45
NEW	.030	.1800	.1980	.500	.050	.590	.0863	.1875	1.5	QRR-5911	36.80	QRR-5911X	41.80
	.030	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-030-4	43.30	QRR-030-4X	49.20
	.030	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QRR-030-6	43.30	QRR-030-6X	49.20
	.030	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-030-8	43.30	QRR-030-8X	49.20
	.030	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	QRR-030-10	43.30	QRR-030-10X	49.20
	.030	.2450	.2670	.750	.050	.853	.1200	.2500	2.0	QRR-030-750-245	43.30	QRR-030-750-245X	49.20
	.030	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-030-500-310	54.00	QRR-030-500-310X	60.95
	.030	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-030-750-310	54.00	QRR-030-750-310X	60.95
	.030	.3700	.3920	.625	.050	.853	.1825	.3750	2.0	QRR-030-625-370	70.40	QRR-030-625-370X	78.90
	.030	.3700	.3920	1.000	.050	1.353	.1825	.3750	2.5	QRR-030-1000-370	70.40	QRR-030-1000-370X	79.40
	.033	.3100	.3320	.250	.100	.853	.1538	.3125	2.0	QRR-033-250-310	54.00	QRR-033-250-310X	60.95
	.033	.3100	.3320	.375	.100	.853	.1538	.3125	2.0	QRR-033-6	54.00	QRR-033-6X	60.95
	.033	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-033-8	54.00	QRR-033-8X	60.95
	.033	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-033-12	54.00	QRR-033-12X	60.95
NEW	.038	.2450	.2670	.500	.080	.853	.1200	.2500	2.0	QRR-9076	43.30	QRR-9076X	49.20
	.038	.3100	.3320	.250	.100	.853	.1538	.3125	2.0	QRR-038-250-310	54.00	QRR-038-250-310X	60.95
	.038	.3100	.3320	.375	.100	.853	.1538	.3125	2.0	QRR-038-6	54.00	QRR-038-6X	60.95
	.038	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-038-8	54.00	QRR-038-8X	60.95
	.038	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-038-12	54.00	QRR-038-12X	60.95
	.039	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QRR-039-250-180	36.80	QRR-039-250-180X	40.45
NEW	.039	.1800	.1980	.250	.060	.590	.0863	.1875	1.5	QRR-5824	36.80	QRR-5824X	41.80
	.039	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QRR-039-500-180	36.80	QRR-039-500-180X	40.45
NEW	.039	.1800	.1980	.500	.060	.590	.0863	.1875	1.5	QRR-1828	36.80	QRR-1828X	41.80
	.039	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-039-250-245	43.30	QRR-039-250-245X	49.20
NEW	.039	.2450	.2670	.250	.080	.853	.1200	.2500	2.0	QRR-8363	43.30	QRR-8363X	49.20
	.039	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-039-500-245	43.30	QRR-039-500-245X	49.20
NEW	.039	.2450	.2670	.500	.080	.853	.1200	.2500	2.0	QRR-1774	43.30	QRR-1774X	49.20
	.039	.3700	.3920	.375	.100	.853	.1825	.3750	2.0	QRR-039-375-370	70.40	QRR-039-375-370X	78.05
	.039	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-039-8	70.40	QRR-039-8X	78.05
	.039	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-039-12	70.40	QRR-039-12X	78.05
	.039	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-039-16	70.40	QRR-039-16X	79.40
	.039	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-039-20	70.40	QRR-039-20X	79.40
NEW	.040	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-2122	43.30	QRR-2122X	49.20
NEW	.040	.2450	.2670	.250	.080	.853	.1200	.2500	2.0	QRR-1248	43.30	QRR-1248X	49.20
NEW	.040	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-4112	43.30	QRR-4112X	49.20
NEW	.040	.2450	.2670	.500	.080	.853	.1200	.2500	2.0	QRR-3030	43.30	QRR-3030X	49.20

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options
See pg 84 for miniature sizes

NEW!

Quick Change – Grooving Tools

QRR

Retaining Ring – Square (cont.)

Continued from previous page

Width	Head Width	Minimum Bore Dia.*	Max. Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated		
W +.002" −.000"	H		L2 +.030" −.000"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	
.046	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-046-500-310	54.00	QRR-046-500-310X	60.95	
.046	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-046-750-310	54.00	QRR-046-750-310X	60.95	
.046	.3700	.3920	.375	.100	.853	.1825	.3750	2.0	QRR-046-375-370	70.40	QRR-046-375-370X	78.05	
.046	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-046-8	70.40	QRR-046-8X	78.05	
.046	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-046-12	70.40	QRR-046-12X	78.05	
.046	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-046-16	70.40	QRR-046-16X	79.40	
.046	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-046-20	70.40	QRR-046-20X	79.40	
.055	.2450	.2670	.500	.080	.853	.1200	.2500	2.0	QRR-4257	43.30	QRR-4257X	49.20	NEW
.055	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-055-8	70.40	QRR-055-8X	78.05	
.055	.3700	.3920	.500	.150	.853	.1825	.3750	2.0	QRR-1660	70.40	QRR-1660X	78.90	NEW
.055	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-055-12	70.40	QRR-055-12X	78.05	
.055	.3700	.3920	.750	.150	.853	.1825	.3750	2.0	QRR-5000	70.40	QRR-5000X	78.90	NEW
.055	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-055-16	70.40	QRR-055-16X	79.40	
.055	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-055-20	70.40	QRR-055-20X	79.40	
.059	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-059-8	70.40	QRR-059-8X	78.05	
.059	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-059-12	70.40	QRR-059-12X	78.05	
.059	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-059-16	70.40	QRR-059-16X	79.40	
.059	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-059-20	70.40	QRR-059-20X	79.40	
.062	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QRR-062-250-180	36.80	QRR-062-250-180X	40.45	
.062	.1800	.1980	.250	.070	.590	.0863	.1875	1.5	QRR-7865	36.80	QRR-7865X	41.80	NEW
.062	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QRR-062-500-180	36.80	QRR-062-500-180X	40.45	
.062	.1800	.1980	.500	.070	.590	.0863	.1875	1.5	QRR-4145	36.80	QRR-4145X	41.80	NEW
.062	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-062-250-245	43.30	QRR-062-250-245X	49.20	
.062	.2450	.2670	.250	.090	.853	.1200	.2500	2.0	QRR-6681	43.30	QRR-6681X	49.20	NEW
.062	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-062-500-245	43.30	QRR-062-500-245X	49.20	
.062	.2450	.2670	.500	.090	.853	.1200	.2500	2.0	QRR-2685	43.30	QRR-2685X	49.20	NEW
.062	.2450	.2670	.750	.050	.853	.1200	.2500	2.0	QRR-1198	43.30	QRR-1198X	49.20	NEW
.062	.2450	.2670	.750	.090	.853	.1200	.2500	2.0	QRR-2795	43.30	QRR-2795X	49.20	NEW
.062	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-062-500-310	54.00	QRR-062-500-310X	60.95	
.062	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-062-750-310	54.00	QRR-062-750-310X	60.95	
.062	.3700	.3920	.250	.100	.853	.1825	.3750	2.0	QRR-062-250-370	70.40	QRR-062-250-370X	78.05	
.062	.3700	.3920	.375	.100	.853	.1825	.3750	2.0	QRR-062-375-370	70.40	QRR-062-375-370X	78.05	
.062	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-062-8	70.40	QRR-062-8X	78.05	
.062	.3700	.3920	.500	.150	.853	.1825	.3750	2.0	QRR-0824	70.40	QRR-0824X	78.90	NEW
.062	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-062-12	70.40	QRR-062-12X	78.05	
.062	.3700	.3920	.750	.150	.853	.1825	.3750	2.0	QRR-6068	70.40	QRR-6068X	78.90	NEW
.062	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-062-16	70.40	QRR-062-16X	79.40	
.062	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-062-20	70.40	QRR-062-20X	79.40	
.069	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-069-8	70.40	QRR-069-8X	78.05	
.069	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-069-12	70.40	QRR-069-12X	78.05	
.069	.3700	.3920	.750	.150	.853	.1825	.3750	2.0	QRR-7828	70.40	QRR-7828X	78.90	NEW
.069	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-069-16	70.40	QRR-069-16X	79.40	
.069	.3700	.3920	1.000	.150	1.353	.1825	.3750	2.5	QRR-4609	70.40	QRR-4609X	79.40	NEW
.069	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-069-20	70.40	QRR-069-20X	79.40	
.079	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-079-8	70.40	QRR-079-8X	78.05	
.079	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-079-12	70.40	QRR-079-12X	78.05	
.079	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-079-16	70.40	QRR-079-16X	79.40	
.079	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-079-20	70.40	QRR-079-20X	79.40	

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options
See pg 84 for miniature sizes

QRR

Quick Change – Grooving Tools

Retaining Ring – Square (cont.)

Continued from previous page

	Width	Head Width	Minimum Bore Dia.*	Max. Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	W +.002" −.000"	H		L2 +.030" −.000"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
	.087	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	ORR-087-500-310	54.00	ORR-087-500-310X	60.95
	.087	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	ORR-087-750-310	54.00	ORR-087-750-310X	60.95
	.087	.3700	.3920	.375	.100	.853	.1825	.3750	2.0	ORR-087-375-370	70.40	ORR-087-375-370X	78.05
	.087	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	ORR-087-8	70.40	ORR-087-8X	78.05
NEW	.087	.3700	.3920	.500	.150	.853	.1825	.3750	2.0	ORR-7847	70.40	ORR-7847X	78.90
	.087	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	ORR-087-12	70.40	ORR-087-12X	78.05
NEW	.087	.3700	.3920	.750	.150	.853	.1825	.3750	2.0	ORR-4895	70.40	ORR-4895X	78.90
	.087	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	ORR-087-16	70.40	ORR-087-16X	79.40
	.087	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	ORR-087-20	70.40	ORR-087-20X	79.40
NEW	.093	.4950	.5170	.500	.150	1.040	.2450	.5000	2.5	ORR-7835	98.60	ORR-7835X	110.90
	.093	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	ORR-093-12	98.60	ORR-093-12X	110.90
	.093	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	ORR-093-16	98.60	ORR-093-16X	110.90
	.093	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	ORR-093-20	98.60	ORR-093-20X	110.90
	.093	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	ORR-093-24	98.60	ORR-093-24X	110.90
	.118	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	ORR-118-12	98.60	ORR-118-12X	110.90
	.118	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	ORR-118-16	98.60	ORR-118-16X	110.90
	.118	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	ORR-118-20	98.60	ORR-118-20X	110.90
	.118	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	ORR-118-24	98.60	ORR-118-24X	110.90
	.125	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	ORR-125-750-370	70.40	ORR-125-750-370X	78.05
NEW	.125	.3700	.3920	.750	.150	.853	.1825	.3750	2.0	ORR-3068	70.40	ORR-3068X	78.90
	.125	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	ORR-125-1000-370	70.40	ORR-125-1000-370X	79.40
NEW	.125	.3700	.3920	1.000	.150	1.353	.1825	.3750	2.5	ORR-5586	70.40	ORR-5586X	79.40
	.125	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	ORR-125-1250-370	70.40	ORR-125-1250-370X	79.40
NEW	.125	.3700	.3920	1.250	.150	1.353	.1825	.3750	2.5	ORR-0965	70.40	ORR-0965X	79.40
	.125	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	ORR-125-12	98.60	ORR-125-12X	110.90
NEW	.125	.4950	.5170	.750	.200	1.040	.2450	.5000	2.5	ORR-5199	98.60	ORR-5199X	110.90
	.125	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	ORR-125-16	98.60	ORR-125-16X	110.90
	.125	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	ORR-125-20	98.60	ORR-125-20X	110.90
NEW	.125	.4950	.5170	1.250	.200	1.540	.2450	.5000	3.0	ORR-7934	98.60	ORR-7934X	110.90
	.125	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	ORR-125-24	98.60	ORR-125-24X	110.90
	.156	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	ORR-156-12	98.60	ORR-156-12X	110.90
NEW	.156	.4950	.5170	.750	.200	1.040	.2450	.5000	2.5	ORR-1563	98.60	ORR-1563X	110.90
	.156	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	ORR-156-16	98.60	ORR-156-16X	110.90
	.156	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	ORR-156-20	98.60	ORR-156-20X	110.90
NEW	.156	.4950	.5170	1.250	.200	1.540	.2450	.5000	3.0	ORR-9832	98.60	ORR-9832X	110.90
	.156	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	ORR-156-24	98.60	ORR-156-24X	110.90
	.187	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	ORR-187-12	98.60	ORR-187-12X	110.90
	.187	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	ORR-187-16	98.60	ORR-187-16X	110.90
	.187	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	ORR-187-20	98.60	ORR-187-20X	110.90
	.187	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	ORR-187-24	98.60	ORR-187-24X	110.90
	.236	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	ORR-236-12	98.60	ORR-236-12X	110.90
	.236	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	ORR-236-16	98.60	ORR-236-16X	110.90
	.236	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	ORR-236-20	98.60	ORR-236-20X	110.90
	.236	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	ORR-236-24	98.60	ORR-236-24X	110.90
	.250	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	ORR-250-16	98.60		
	.250	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	ORR-250-20	98.60	ORR-250-20X	110.90
	.250	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	ORR-250-24	98.60	ORR-250-24X	110.90

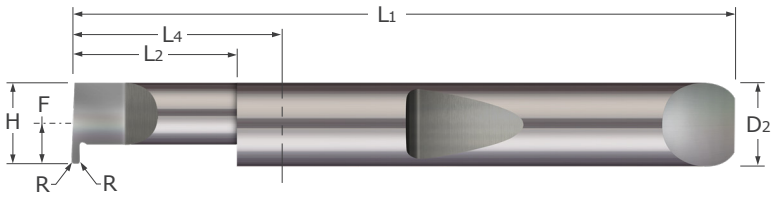
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

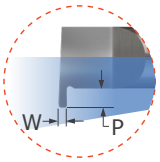
See pgs 16-34 for quick change holder options
See pg 84 for miniature sizes

Quick Change – Grooving Tools

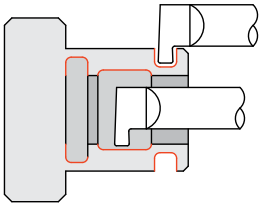
Retaining Ring - Corner Radius - Right Hand

QRRC





- Designed for generating corner radius retaining ring grooves in bores .198" and larger
- Corner radius designed for extended tool life and finished groove profiling
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Coolant fed enabled shank design
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Head Width	Min. Bore Dia.*	Max. Bore Depth	Radius	Proj.	Length From Holder	CntrIn Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
W +.001" −.000"	H		L2 +.030" −.000"	R +.001" −.001"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.017	.1800	.1980	.250	.003	.030	.590	.0863	.1875	1.5	QRRC3-017-250-180	39.80	QRRC3-017-250-180X	43.55
.017	.1800	.1980	.375	.003	.030	.590	.0863	.1875	1.5	QRRC3-017-375-180	39.80	QRRC3-017-375-180X	43.55
.017	.2450	.2670	.250	.003	.050	.853	.1200	.2500	2.0	QRRC3-017-250-245	49.70	QRRC3-017-250-245X	55.70
.017	.2450	.2670	.375	.003	.050	.853	.1200	.2500	2.0	QRRC3-017-375-245	49.70	QRRC3-017-375-245X	55.70
.020	.1800	.1980	.250	.003	.030	.590	.0863	.1875	1.5	QRRC3-020-250-180	39.80	QRRC3-020-250-180X	43.55
.020	.1800	.1980	.375	.003	.030	.590	.0863	.1875	1.5	QRRC3-020-375-180	39.80	QRRC3-020-375-180X	43.55
.020	.2450	.2670	.250	.003	.050	.853	.1200	.2500	2.0	QRRC3-020-250-245	49.70	QRRC3-020-250-245X	55.70
.020	.2450	.2670	.375	.003	.050	.853	.1200	.2500	2.0	QRRC3-020-375-245	49.70	QRRC3-020-375-245X	55.70
.025	.2450	.2670	.250	.003	.050	.853	.1200	.2500	2.0	QRRC3-025-250-245	49.70	QRRC3-025-250-245X	55.70
.025	.2450	.2670	.375	.003	.050	.853	.1200	.2500	2.0	QRRC3-025-375-245	49.70	QRRC3-025-375-245X	55.70
.030	.1800	.1980	.250	.003	.030	.590	.0863	.1875	1.5	QRRC3-030-250-180	39.80	QRRC3-030-250-180X	43.55
.030	.1800	.1980	.500	.003	.030	.590	.0863	.1875	1.5	QRRC3-030-500-180	39.80	QRRC3-030-500-180X	43.55
.030	.2450	.2670	.250	.003	.050	.853	.1200	.2500	2.0	QRRC3-030-250-245	49.70	QRRC3-030-250-245X	55.70
.030	.2450	.2670	.375	.003	.050	.853	.1200	.2500	2.0	QRRC3-030-375-245	49.70	QRRC3-030-375-245X	55.70
.030	.3100	.3320	.500	.003	.100	.853	.1538	.3125	2.0	QRRC3-030-500-310	62.00	QRRC3-030-500-310X	69.20
.030	.3100	.3320	.750	.003	.100	.853	.1538	.3125	2.0	QRRC3-030-750-310	62.00	QRRC3-030-750-310X	69.20
.033	.3100	.3320	.500	.003	.100	.853	.1538	.3125	2.0	QRRC3-033-500-310	62.00	QRRC3-033-500-310X	69.20
.033	.3100	.3320	.750	.003	.100	.853	.1538	.3125	2.0	QRRC3-033-750-310	62.00	QRRC3-033-750-310X	69.20
.038	.3100	.3320	.500	.003	.100	.853	.1538	.3125	2.0	QRRC3-038-500-310	62.00	QRRC3-038-500-310X	69.20
.038	.3100	.3320	.750	.003	.100	.853	.1538	.3125	2.0	QRRC3-038-750-310	62.00	QRRC3-038-750-310X	69.20
W +.002" −.000"	H		L2 +.030" −.000"	R +.001" −.000"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.039	.3700	.3920	.500	.003	.100	.853	.1825	.3750	2.0	QRRC3-039-500-370	78.50	QRRC3-039-500-370X	86.55
.039	.3700	.3920	.750	.003	.100	.853	.1825	.3750	2.0	QRRC3-039-750-370	78.50	QRRC3-039-750-370X	86.55
.039	.3700	.3920	1.000	.003	.100	1.353	.1825	.3750	2.5	QRRC3-039-1000-370	78.50	QRRC3-039-1000-370X	87.60
.062	.3700	.3920	.500	.003	.100	.853	.1825	.3750	2.0	QRRC3-062-500-370	78.50	QRRC3-062-500-370X	86.55
.062	.3700	.3920	.500	.006	.100	.853	.1825	.3750	2.0	QRRC6-062-500-370	78.50	QRRC6-062-500-370X	86.55
.062	.3700	.3920	.750	.003	.100	.853	.1825	.3750	2.0	QRRC3-062-750-370	78.50	QRRC3-062-750-370X	86.55
.062	.3700	.3920	.750	.006	.100	.853	.1825	.3750	2.0	QRRC6-062-750-370	78.50	QRRC6-062-750-370X	87.00
.062	.3700	.3920	1.000	.003	.100	1.353	.1825	.3750	2.5	QRRC3-062-1000-370	78.50	QRRC3-062-1000-370X	87.60
.062	.3700	.3920	1.000	.006	.100	1.353	.1825	.3750	2.5	QRRC6-062-1000-370	78.50	QRRC6-062-1000-370X	87.60

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options

QRRC

Quick Change – Grooving Tools

Retaining Ring - Corner Radius - Right Hand (cont.)

Continued from previous page

Width	Head Width	Min. Bore Dia.*	Max. Bore Depth	Radius	Proj.	Length From Holder	CntrIn Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	H		L_2 +.030" −.000"	R +.001" −.000"	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.087	.3700	.3920	.500	.003	.100	.853	.1825	.3750	2.0	ORRC3-087-500-370	78.50	ORRC3-087-500-370X	86.55
.087	.3700	.3920	.500	.006	.100	.853	.1825	.3750	2.0	ORRC6-087-500-370	78.50	ORRC6-087-500-370X	86.55
.087	.3700	.3920	.750	.003	.100	.853	.1825	.3750	2.0	ORRC3-087-750-370	78.50	ORRC3-087-750-370X	86.55
.087	.3700	.3920	.750	.006	.100	.853	.1825	.3750	2.0	ORRC6-087-750-370	78.50	ORRC6-087-750-370X	86.55
.087	.3700	.3920	1.000	.003	.100	1.353	.1825	.3750	2.5	ORRC3-087-1000-370	78.50	ORRC3-087-1000-370X	87.60
.087	.3700	.3920	1.000	.006	.100	1.353	.1825	.3750	2.5	ORRC6-087-1000-370	78.50	ORRC6-087-1000-370X	87.60
.093	.4950	.5170	.750	.003	.150	1.040	.2450	.5000	2.5	ORRC3-093-750-495	108.00	ORRC3-093-750-495X	120.30
.093	.4950	.5170	.750	.006	.150	1.040	.2450	.5000	2.5	ORRC6-093-750-495	108.00	ORRC6-093-750-495X	120.30
.093	.4950	.5170	1.000	.003	.150	1.040	.2450	.5000	2.5	ORRC3-093-1000-495	108.00	ORRC3-093-1000-495X	120.30
.093	.4950	.5170	1.000	.006	.150	1.040	.2450	.5000	2.5	ORRC6-093-1000-495	108.00	ORRC6-093-1000-495X	120.30
.125	.4950	.5170	.750	.003	.150	1.040	.2450	.5000	2.5	ORRC3-125-750-495	108.00	ORRC3-125-750-495X	120.30
.125	.4950	.5170	.750	.006	.150	1.040	.2450	.5000	2.5	ORRC6-125-750-495	108.00	ORRC6-125-750-495X	120.30
.125	.4950	.5170	1.000	.003	.150	1.040	.2450	.5000	2.5	ORRC3-125-1000-495	108.00	ORRC3-125-1000-495X	120.30
.125	.4950	.5170	1.000	.006	.150	1.040	.2450	.5000	2.5	ORRC6-125-1000-495	108.00	ORRC6-125-1000-495X	120.30

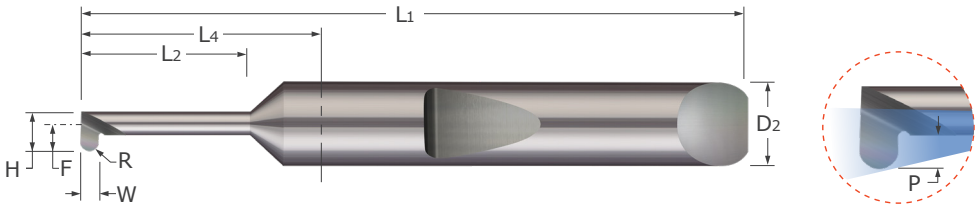
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pgs 16-34 for quick change holder options

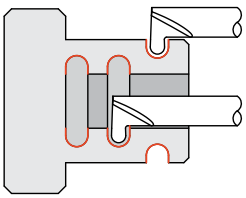
Quick Change – Grooving Tools

Full Radius – Miniature

QMFR



- Designed for generating full radius grooves in bores .090" and larger
- Polished face for improved edge retention and chip evacuation while reducing galling
- On-center neck design
- Coolant fed enabled shank design
- Full radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Radius	Head Width	Mini. Bore Dia.*	Max. Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	R +.001" −.000"	H		L2 +.030" −.000"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.015	.0075	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMFR-015-250-080	48.20	QMFR-015-250-080X	52.25
.015	.0075	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMFR-015-375-080	48.20	QMFR-015-375-080X	52.25
.015	.0075	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMFR-015-500-080	48.20	QMFR-015-500-080X	52.25
.015	.0075	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMFR-015-250-100	48.20	QMFR-015-250-100X	52.25
.015	.0075	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMFR-015-500-100	48.20	QMFR-015-500-100X	52.25
.015	.0075	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMFR-015-750-100	48.20	QMFR-015-750-100X	52.25
.020	.0100	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMFR-020-250-080	43.30	QMFR-020-250-080X	47.25
.020	.0100	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMFR-020-375-080	43.30	QMFR-020-375-080X	47.25
.020	.0100	.0800	.0900	.500	.025	.590	.0525	.1875	1.5			QMFR-020-500-080X	47.25
.020	.0100	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMFR-020-250-100	43.30	QMFR-020-250-100X	47.25
.020	.0100	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMFR-020-500-100	43.30	QMFR-020-500-100X	47.25
.020	.0100	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMFR-020-750-100	43.30	QMFR-020-750-100X	47.25
.020	.0100	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMFR-020-250-120	43.30	QMFR-020-250-120X	47.25
.020	.0100	.1200	.1340	.500	.040	.590	.0800	.1875	1.5	QMFR-020-500-120	43.30	QMFR-020-500-120X	47.25
.020	.0100	.1200	.1340	.750	.040	1.090	.0800	.1875	2.0	QMFR-020-750-120	43.30	QMFR-020-750-120X	47.25
.030	.0150	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMFR-030-250-080	43.30	QMFR-030-250-080X	47.25
.030	.0150	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMFR-030-375-080	43.30	QMFR-030-375-080X	47.25
.030	.0150	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMFR-030-500-080	43.30	QMFR-030-500-080X	47.25
.030	.0150	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMFR-030-250-100	43.30	QMFR-030-250-100X	47.25
.030	.0150	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMFR-030-500-100	43.30	QMFR-030-500-100X	47.25
.030	.0150	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMFR-030-750-100	43.30	QMFR-030-750-100X	47.25
.030	.0150	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMFR-030-250-120	43.30	QMFR-030-250-120X	47.25
.030	.0150	.1200	.1340	.500	.040	.590	.0800	.1875	1.5	QMFR-030-500-120	43.30	QMFR-030-500-120X	47.25
.030	.0150	.1200	.1340	.750	.040	1.090	.0800	.1875	2.0	QMFR-030-750-120	43.30	QMFR-030-750-120X	47.25

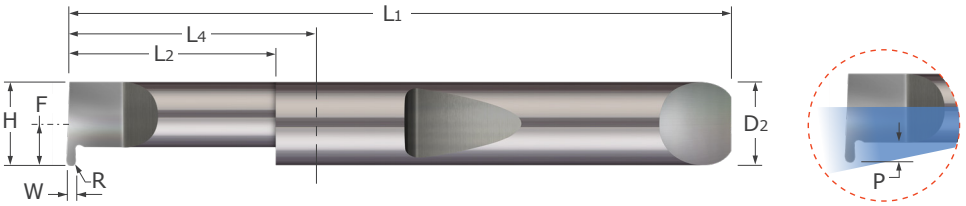
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pgs 16-34 for quick change holder options

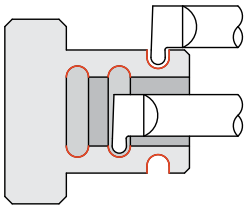
QFR

Quick Change – Grooving Tools

Full Radius



- Designed for generating full radius grooves in bores .198" and larger
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Coolant fed enabled shank design
- Full radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Radius	Head Width	Min. Bore Dia.*	Max. Bore Depth	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	R	H		L2 +.030" −.000"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.017	.0085	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QFR-017-4	39.80	QFR-017-4X	43.55
.017	.0085	.1800	.1980	.375	.030	.590	.0863	.1875	1.5			QFR-017-6X	43.55
.017	.0085	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QFR-017-8	39.80	QFR-017-8X	43.55
.017	.0085	.1800	.1980	.625	.030	1.090	.0863	.1875	2.0	QFR-017-10	39.80	QFR-017-10X	43.55
.020	.0100	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QFR-020-4	39.80	QFR-020-4X	43.55
.020	.0100	.1800	.1980	.375	.030	.590	.0863	.1875	1.5	QFR-020-6	39.80	QFR-020-6X	43.55
.020	.0100	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QFR-020-8	39.80	QFR-020-8X	43.55
.020	.0100	.1800	.1980	.625	.030	1.090	.0863	.1875	2.0	QFR-020-10	39.80	QFR-020-10X	43.55
.025	.0125	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QFR-025-4	49.70	QFR-025-4X	55.70
.025	.0125	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QFR-025-6	49.70	QFR-025-6X	55.70
.025	.0125	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QFR-025-8	49.70	QFR-025-8X	55.70
.025	.0125	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	QFR-025-10	49.70	QFR-025-10X	55.70
.030	.0150	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QFR-030-4	49.70	QFR-030-4X	55.70
.030	.0150	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QFR-030-6	49.70	QFR-030-6X	55.70
.030	.0150	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QFR-030-8	49.70	QFR-030-8X	55.70
.030	.0150	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	QFR-030-10	49.70	QFR-030-10X	55.70
.033	.0165	.3100	.3320	.375	.100	.853	.1538	.3125	2.0	QFR-033-6	62.00	QFR-033-6X	69.20
.033	.0165	.3100	.3320	.500	.100	.853	.1538	.3125	2.0			QFR-033-8X	69.20
.033	.0165	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QFR-033-12	62.00	QFR-033-12X	69.20
.038	.0190	.3100	.3320	.375	.100	.853	.1538	.3125	2.0	QFR-038-6	62.00	QFR-038-6X	69.20
.038	.0190	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QFR-038-8	62.00	QFR-038-8X	69.20
.038	.0190	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QFR-038-12	62.00	QFR-038-12X	69.20
.039	.0195	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-039-8	78.50	QFR-039-8X	86.55
.039	.0195	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-039-12	78.50		
.039	.0195	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-039-16	78.50	QFR-039-16X	87.60
.039	.0195	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-039-20	78.50	QFR-039-20X	87.60
.046	.0230	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-046-8	78.50	QFR-046-8X	86.55
.046	.0230	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-046-12	78.50	QFR-046-12X	87.00
.046	.0230	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-046-20	78.50	QFR-046-20X	87.60
.055	.0275	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-055-8	78.50	QFR-055-8X	86.55
.055	.0275	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-055-12	78.50	QFR-055-12X	87.00
.055	.0275	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-055-16	78.50	QFR-055-16X	87.60
.055	.0275	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-055-20	78.50	QFR-055-20X	87.60
.059	.0295	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-059-8	78.50	QFR-059-8X	86.55
.059	.0295	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-059-12	78.50	QFR-059-12X	87.00
.059	.0295	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-059-16	78.50		
.059	.0295	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-059-20	78.50	QFR-059-20X	87.60

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options

See pg 92 for miniature sizes

NEW!

Quick Change – Grooving Tools

Full Radius (cont.)

QFR

Continued from previous page

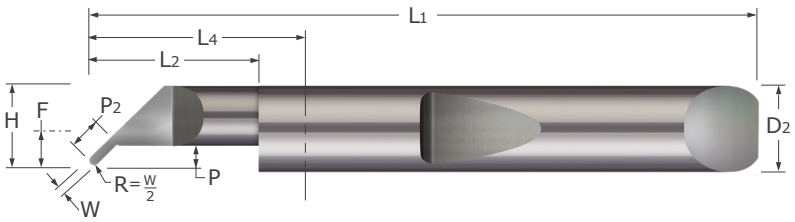
Width	Radius	Head Width	Min. Bore Dia.*	Max. Bore Depth	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated		
W +.002" −.000"	R	H		L2 +.030" −.000"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	
.062	.0310	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	OFR-062-8	78.50	OFR-062-8X	86.55	
.062	.0310	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	OFR-062-12	78.50	OFR-062-12X	86.55	
.062	.0310	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	OFR-062-16	78.50	OFR-062-16X	87.60	
.062	.0310	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	OFR-062-20	78.50	OFR-062-20X	87.60	
.069	.0345	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	OFR-069-8	78.50	OFR-069-8X	86.55	
.069	.0345	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	OFR-069-12	78.50	OFR-069-12X	86.55	
.069	.0345	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	OFR-069-16	78.50	OFR-069-16X	87.60	
.069	.0345	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	OFR-069-20	78.50	OFR-069-20X	87.60	
.079	.0395	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	OFR-079-8	78.50	OFR-079-8X	86.55	
.079	.0395	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	OFR-079-12	78.50	OFR-079-12X	86.55	
.079	.0395	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	OFR-079-16	78.50	OFR-079-16X	87.60	
.079	.0395	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	OFR-079-20	78.50	OFR-079-20X	87.60	
.087	.0435	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	OFR-087-8	78.50	OFR-087-8X	86.55	
.087	.0435	.3700	.3920	.500	.150	.853	.1825	.3750	2.0	OFR-7847	78.50	OFR-7847X	87.00	NEW
.087	.0435	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	OFR-087-12	78.50	OFR-087-12X	87.00	
.087	.0435	.3700	.3920	.750	.150	.853	.1825	.3750	2.0	OFR-4895	78.50	OFR-4895X	87.00	NEW
.087	.0435	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	OFR-087-16	78.50	OFR-087-16X	87.60	
.087	.0435	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	OFR-087-20	78.50	OFR-087-20X	87.60	
.093	.0465	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	OFR-093-12	108.00	OFR-093-12X	120.30	
.093	.0465	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	OFR-093-16	108.00	OFR-093-16X	120.30	
.093	.0465	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	OFR-093-20	108.00	OFR-093-20X	120.30	
.093	.0465	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	OFR-093-24	108.00	OFR-093-24X	120.30	
.118	.0590	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	OFR-118-12	108.00	OFR-118-12X	120.30	
.118	.0590	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	OFR-118-16	108.00	OFR-118-16X	120.30	
.118	.0590	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	OFR-118-20	108.00	OFR-118-20X	120.30	
.118	.0590	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	OFR-118-24	108.00	OFR-118-24X	120.30	
.125	.0625	.3700	.3920	1.000	.150	1.353	.1825	.3750	2.5	OFR-5586	78.50	OFR-5586X	87.60	NEW
.125	.0625	.3700	.3920	1.250	.150	1.353	.1825	.3750	2.5	OFR-0965	78.50	OFR-0965X	87.60	NEW
.125	.0625	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	OFR-125-12	108.00	OFR-125-12X	120.30	
.125	.0625	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	OFR-125-16	108.00	OFR-125-16X	120.30	
.125	.0625	.4950	.5170	1.000	.200	1.040	.2450	.5000	2.5	OFR-7934	108.00	OFR-7934X	120.30	NEW
.125	.0625	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	OFR-125-20	108.00	OFR-125-20X	120.30	
.125	.0625	.4950	.5170	1.250	.200	1.540	.2450	.5000	3.0	OFR-0271	108.00	OFR-0271X	120.30	NEW
.125	.0625	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	OFR-125-24	108.00	OFR-125-24X	120.30	
.156	.0780	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5			OFR-156-12X	120.05	
.156	.0780	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5			OFR-156-16X	120.05	
.156	.0780	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	OFR-156-20	108.00	OFR-156-20X	120.30	
.156	.0780	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	OFR-156-24	108.00	OFR-156-24X	120.30	
.187	.0935	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	OFR-187-12	108.00	OFR-187-12X	120.30	
.187	.0935	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	OFR-187-16	108.00	OFR-187-16X	120.30	
.187	.0935	.4950	.5170	1.000	.200	1.040	.2450	.5000	2.5	OFR-5272	108.00	OFR-5272X	120.30	NEW
.187	.0935	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	OFR-187-20	108.00	OFR-187-20X	120.30	
.187	.0935	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	OFR-187-24	108.00	OFR-187-24X	120.30	
.236	.1180	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	OFR-236-12	108.00	OFR-236-12X	120.30	
.236	.1180	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	OFR-236-16	108.00	OFR-236-16X	120.30	
.236	.1180	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	OFR-236-20	108.00	OFR-236-20X	120.30	
.236	.1180	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	OFR-236-24	108.00	OFR-236-24X	120.30	
.250	.1250	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	OFR-250-12	108.00	OFR-250-12X	120.30	
.250	.1250	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5			OFR-250-16X	120.30	
.250	.1250	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	OFR-250-20	108.00	OFR-250-20X	120.30	
.250	.1250	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0			OFR-250-24X	120.30	

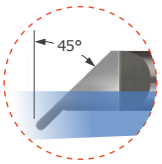
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

QUP

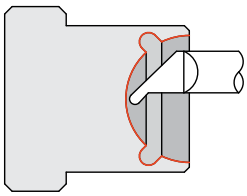
Quick Change – Grooving Tools

Undercutting – Full Radius





- Designed for plunging full radius undercut grooves and profiling
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Full radius profile
- Coolant fed enabled shank design
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



	Width	Projection	Angled Projection	Head Width	Min. Bore Diameter*	Max. Bore Depth	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	W +.002" −.000"	P	P2	H		L2 +.030" −.000"	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
	.020	.050	.0765	.1800	.1980	.375	.590	.0862	.1875	1.5	QUP-18020-6	46.10	QUP-18020-6X	51.10
	.020	.050	.0765	.1800	.1980	.500	.590	.0862	.1875	1.5	QUP-18020-8	46.10	QUP-18020-8X	51.10
	.025	.050	.0780	.1800	.1980	.375	.590	.0862	.1875	1.5	QUP-18025-6	46.10	QUP-18025-6X	51.10
	.025	.050	.0780	.1800	.1980	.500	.590	.0862	.1875	1.5	QUP-18025-8	46.10	QUP-18025-8X	51.10
	.025	.060	.0921	.2400	.2620	.375	.853	.1150	.2500	2.0	QUP-25025-6	49.60	QUP-25025-6X	55.60
	.025	.060	.0921	.2400	.2620	.500	.853	.1150	.2500	2.0	QUP-25025-8	49.60	QUP-25025-8X	55.60
	.030	.050	.0794	.1800	.1980	.375	.590	.0862	.1875	1.5	QUP-18030-6	46.10	QUP-18030-6X	51.10
	.030	.050	.0794	.1800	.1980	.500	.590	.0862	.1875	1.5	QUP-18030-8	46.10	QUP-18030-8X	51.10
	.030	.060	.0936	.2400	.2620	.500	.853	.1150	.2500	2.0	QUP-25030-8	49.60	QUP-25030-8X	55.60
	.030	.060	.0936	.2400	.2620	1.000	1.353	.1150	.2500	2.5	QUP-25030-16	49.60	QUP-25030-16X	56.00
NEW	.039	.050	.0821	.1800	.1980	.375	.590	.0862	.1875	1.5	QUP-18039-6	46.10	QUP-18039-6X	51.10
NEW	.039	.060	.0962	.2400	.2620	.500	.853	.1150	.2500	2.0	QUP-25039-8	49.60	QUP-25039-8X	55.60
NEW	.039	.060	.0962	.2400	.2620	1.000	1.353	.1150	.2500	2.5	QUP-25039-16	49.60	QUP-25039-16X	56.00
NEW	.050	.083	.1320	.3030	.3250	.500	.853	.1467	.3125	2.0	QUP-31050-8	60.30	QUP-31050-8X	67.50
NEW	.050	.083	.1320	.3030	.3250	1.000	1.353	.1467	.3125	2.5	QUP-31050-16	62.30	QUP-31050-16X	70.00
	.062	.083	.1355	.3030	.3250	1.000	1.353	.1467	.3125	2.5	QUP-31062-16	62.30	QUP-31062-16X	69.90
	.062	.095	.1525	.3650	.3870	1.000	1.353	.1775	.3750	2.5	QUP-37062-16	80.20	QUP-37062-16X	89.20
	.062	.125	.1949	.4900	.5120	1.500	1.540	.2400	.5000	3.0	QUP-50062-24	110.70	QUP-50062-24X	123.00

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

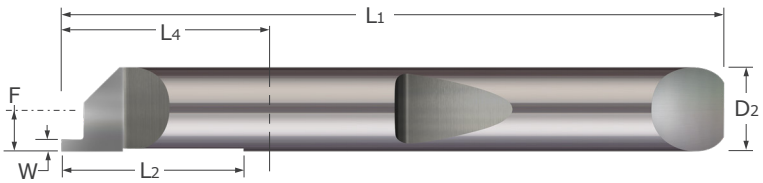
See pgs 16-34 for quick change holder options

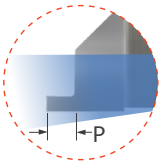
NEW!

Quick Change – Grooving Tools

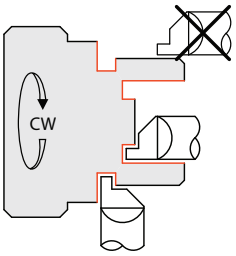
Face Grooving – Square

QFG





- Designed for generating square grooves in the face of the part
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Relief ground along Maximum Bore Depth (L_2) to avoid interference during deep hole applications
- Coolant fed enabled shank design
- Sharp corner profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Projection	Minimum Groove Diameter*	Maximum Bore Depth	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated		
W +.002" −.000"	P +.015" −.000"		L_2	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	
.015	.025	.197	.500	.590	.0938	.1875	1.5	QFG-187-015-025	34.70	QFG-187-015-025X	38.35	
.015	.025	.260	.750	.853	.1250	.2500	2.0	QFG-250-015-025	34.70	QFG-250-015-025X	40.60	
.017	.025	.197	.500	.590	.0938	.1875	1.5	QFG-187-017-025	34.70	QFG-187-017-025X	38.35	
.017	.025	.260	.750	.853	.1250	.2500	2.0	QFG-250-017-025	34.70	QFG-250-017-025X	40.60	
.020	.025	.197	.500	.590	.0938	.1875	1.5	QFG-187-020-025	34.70	QFG-187-020-025X	38.35	
.020	.025	.260	.750	.853	.1250	.2500	2.0	QFG-250-020-025	34.70	QFG-250-020-025X	40.60	
.020	.050	.190	.155	.590	.0860	.1875	1.5	QFG-180-020	34.70	QFG-180-020X	38.35	
.020	.050	.197	.500	.590	.0938	.1875	1.5	QFG-187-020-050	34.70	QFG-187-020-050X	38.35	
.020	.050	.240	.190	.853	.1050	.2500	2.0	QFG-230-020	34.70	QFG-230-020X	40.60	
.020	.050	.260	0.19	.853	.1250	.2500	2.0	QFG-250-020	34.70	QFG-250-020X	40.60	
.025	.025	.197	.500	.590	.0938	.1875	1.5	QFG-187-025-025	34.70	QFG-187-025-025X	38.35	
.025	.025	.260	.750	.853	.1250	.2500	2.0	QFG-250-025-025	34.70	QFG-250-025-025X	40.60	
.025	.050	.197	.500	.590	.0938	.1875	1.5	QFG-187-025-050	34.70	QFG-187-025-050X	38.35	
.025	.050	.260	.750	.853	.1250	.2500	2.0	QFG-250-025-050	34.70	QFG-250-025-050X	40.60	
.030	.050	.190	.155	.590	.0860	.1875	1.5	QFG-180-030	34.70	QFG-180-030X	38.35	
.030	.050	.197	.500	.590	.0938	.1875	1.5	QFG-187-030-050	34.70	QFG-187-030-050X	38.35	
.030	.050	.240	.190	.853	.1050	.2500	2.0	QFG-230-030	34.70	QFG-230-030X	40.60	
.030	.050	.260	.190	.853	.1250	.2500	2.0	QFG-250-030	34.70	QFG-250-030X	40.60	
.030	.050	.322	.225	.853	.1563	.3125	2.0	QFG-312-030	47.40	QFG-312-030X	54.25	
.030	.050	.385	.750	.853	.1875	.3750	2.0	QFG-375-030-050	66.00	QFG-375-030-050X	73.55	
.030	.075	.197	.500	.590	.0938	.1875	1.5	QFG-187-030-075	34.70	QFG-187-030-075X	38.35	
.030	.075	.260	.750	.853	.1250	.2500	2.0	QFG-250-030-075	34.70	QFG-250-030-075X	40.60	
.030	.075	.322	.750	.853	.1563	.3125	2.0	QFG-3098	47.40	QFG-3098X	54.60	NEW
.039	.050	.260	.750	.853	.1250	.2500	2.0	QFG-250-039-050	34.70	QFG-250-039-050X	40.60	
.039	.050	.385	.750	.853	.1875	.3750	2.0	QFG-375-039-050	66.00	QFG-375-039-050X	73.55	
.039	.075	.260	.750	.853	.1250	.2500	2.0	QFG-250-039-075	34.70	QFG-250-039-075X	40.60	
.040	.050	.197	.500	.590	.0938	.1875	1.5	QFG-187-040-050	34.70	QFG-187-040-050X	38.35	
.040	.050	.260	.750	.853	.1250	.2500	2.0	QFG-250-040-050	34.70	QFG-250-040-050X	40.60	
.040	.050	.322	.225	.853	.1563	.3125	2.0	QFG-312-040	47.40	QFG-312-040X	54.25	
.040	.050	.385	.750	.853	.1875	.3750	2.0	QFG-375-040-050	66.00	QFG-375-040-050X	73.55	
.040	.075	.197	.500	.590	.0938	.1875	1.5	QFG-187-040-075	34.70	QFG-187-040-075X	38.35	
.040	.075	.260	.750	.853	.1250	.2500	2.0	QFG-250-040-075	34.70	QFG-250-040-075X	40.60	
.040	.075	.322	.750	.853	.1563	.3125	2.0	QFG-5702	47.40	QFG-5702X	54.60	NEW

*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

Continued on next page

See pgs 16-34 for quick change holder options

QFG

Quick Change – Grooving Tools

Face Grooving – Square (cont.)

Continued from previous page

	Width	Projection	Minimum Groove Diameter*	Maximum Bore Depth	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
	W +.002" −.000"	P +.015" −.000"		L2	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
	.050	.050	.197	.500	.590	.0938	.1875	1.5	OFG-187-050-050	34.70	OFG-187-050-050X	38.35
	.050	.050	.260	.750	.853	.1250	.2500	2.0	OFG-250-050-050	34.70	OFG-250-050-050X	40.60
	.050	.050	.385	.750	.853	.1875	.3750	2.0	OFG-375-050-050	66.00	OFG-375-050-050X	73.55
	.050	.075	.197	.500	.590	.0938	.1875	1.5	OFG-187-050-075	34.70	OFG-187-050-075X	38.35
	.050	.075	.260	.750	.853	.1250	.2500	2.0	OFG-250-050-075	34.70	OFG-250-050-075X	40.60
	.050	.075	.322	.750	.853	.1563	.3125	2.0	OFG-312-050-075	47.40	OFG-312-050-075X	54.25
	.059	.075	.197	.500	.590	.0938	.1875	1.5	OFG-187-059-075	34.70	OFG-187-059-075X	38.35
	.059	.075	.260	.750	.853	.1250	.2500	2.0	OFG-250-059-075	34.70	OFG-250-059-075X	40.60
	.059	.075	.385	.750	.853	.1875	.3750	2.0	OFG-375-059-075	66.00	OFG-375-059-075X	73.55
	.059	.100	.197	.500	.590	.0938	.1875	1.5	OFG-187-059-100	34.70	OFG-187-059-100X	38.35
	.059	.100	.260	.750	.853	.1250	.2500	2.0	OFG-250-059-100	34.70	OFG-250-059-100X	40.60
	.062	.075	.197	.500	.590	.0938	.1875	1.5	OFG-187-062-075	34.70	OFG-187-062-075X	38.35
	.062	.075	.260	.750	.853	.1250	.2500	2.0	OFG-250-062-075	34.70	OFG-250-062-075X	40.60
	.062	.075	.322	.750	.853	.1563	.3125	2.0	OFG-312-062-075	47.40	OFG-312-062-075X	54.25
	.062	.075	.385	.750	.853	.1875	.3750	2.0	OFG-375-062-075	66.00	OFG-375-062-075X	73.55
	.062	.100	.197	.500	.590	.0938	.1875	1.5	OFG-187-062-100	34.70	OFG-187-062-100X	38.35
	.062	.100	.260	.750	.853	.1250	.2500	2.0	OFG-250-062-100	34.70	OFG-250-062-100X	40.60
	.062	.100	.322	.225	.853	.1563	.3125	2.0	OFG-312-062	47.40	OFG-312-062X	54.25
	.062	.100	.385	.260	.853	.1875	.3750	2.0	OFG-375-062	66.00	OFG-375-062X	73.55
	.062	.100	.480	.335	1.040	.2200	.5000	2.5	OFG-470-062	74.80	OFG-470-062X	85.95
	.062	.100	.500	.335	1.040	.2400	.5000	2.5	OFG-490-062	74.80	OFG-490-062X	85.95
	.062	.150	.197	.500	.590	.0938	.1875	1.5	OFG-187-062-150	34.70	OFG-187-062-150X	38.35
	.062	.150	.260	.750	.853	.1250	.2500	2.0	OFG-250-062-150	34.70	OFG-250-062-150X	40.60
	.062	.150	.322	.750	.853	.1563	.3125	2.0	OFG-312-062-150	47.40	OFG-312-062-150X	54.25
	.062	.150	.385	.750	.853	.1875	.3750	2.0	OFG-375-062-150	66.00	OFG-375-062-150X	73.55
NEW	.062	.150	.500	1.450	1.540	.2400	.5000	3.0	OFG-1206	76.40	OFG-1206X	88.70
	.078	.100	.260	.750	.853	.1250	.2500	2.0	OFG-250-078-100	34.70	OFG-250-078-100X	40.60
	.078	.100	.322	.750	.853	.1563	.3125	2.0	OFG-312-078-100	47.40	OFG-312-078-100X	54.25
	.078	.100	.385	.260	.853	.1875	.3750	2.0	OFG-375-078	66.00	OFG-375-078X	73.55
	.078	.100	.480	.335	1.040	.2200	.5000	2.5	OFG-470-078	74.80	OFG-470-078X	85.95
	.078	.100	.500	.335	1.040	.2400	.5000	2.5	OFG-490-078	74.80	OFG-490-078X	85.95
	.093	.100	.385	.260	.853	.1875	.3750	2.0	OFG-375-093	66.00	OFG-375-093X	73.55
	.093	.100	.480	.335	1.040	.2200	.5000	2.5	OFG-470-093	74.80	OFG-470-093X	85.95
	.093	.100	.500	.335	1.040	.2400	.5000	2.5	OFG-490-093	74.80	OFG-490-093X	85.95
	.093	.150	.322	.750	.853	.1563	.3125	2.0	OFG-312-093-150	47.40	OFG-312-093-150X	54.25
	.093	.150	.385	.750	.853	.1875	.3750	2.0	OFG-375-093-150	66.00	OFG-375-093-150X	73.55
	.118	.150	.385	.260	.853	.1875	.3750	2.0	OFG-375-118	66.00	OFG-375-118X	73.55
	.118	.150	.480	.335	1.040	.2200	.5000	2.5	OFG-470-118	74.80	OFG-470-118X	85.95
	.118	.150	.500	.335	1.040	.2400	.5000	2.5	OFG-490-118	74.80	OFG-490-118X	85.95
	.125	.150	.385	.260	.853	.1875	.3750	2.0	OFG-375-125	66.00	OFG-375-125X	73.55
	.125	.150	.480	.335	1.040	.2200	.5000	2.5	OFG-470-125	74.80	OFG-470-125X	85.95
	.125	.150	.500	.335	1.040	.2400	.5000	2.5	OFG-490-125	74.80	OFG-490-125X	85.95
	.125	.250	.385	.750	.853	.1875	.3750	2.0	OFG-375-125-250	66.00	OFG-375-125-250X	73.55
NEW	.125	.250	.500	1.450	1.540	.2400	.5000	3.0	OFG-5017	76.40	OFG-5017X	88.70
	.156	.150	.480	.335	1.040	.2200	.5000	2.5	OFG-470-156	74.80	OFG-470-156X	85.95
	.156	.150	.500	.335	1.040	.2400	.5000	2.5	OFG-490-156	74.80	OFG-490-156X	85.95

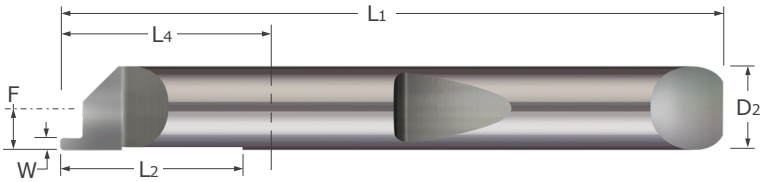
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

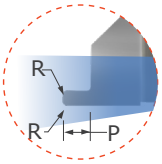
See pgs 16-34 for quick change holder options

Quick Change – Grooving Tools

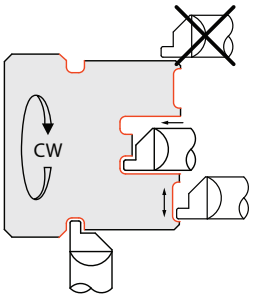
Face Grooving – Corner Radius

QFGC





- Designed for generating corner radius grooves within the face of the part
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Relief ground along Maximum Bore Depth (L_2) to avoid interference during deep hole applications
- Coolant fed enabled shank design
- Corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Projection	Minimum Groove Diameter*	Radius	Maximum Bore Depth	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	P +.015" −.000"		R +.001" −.001"	L_2	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.015	.025	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-015-025	32.00	QFGC3-187-015-025X	36.65
.015	.025	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-015-025	37.30	QFGC3-250-015-025X	43.30
.017	.025	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-017-025	32.00	QFGC3-187-017-025X	36.65
.017	.025	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-017-025	37.30	QFGC3-250-017-025X	43.30
.020	.025	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-020-025	32.00	QFGC3-187-020-025X	36.65
.020	.025	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-020-025	37.30	QFGC3-250-020-025X	43.30
.025	.025	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-025-025	32.00	QFGC3-187-025-025X	36.65
.025	.025	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-025-025	37.30	QFGC3-250-025-025X	43.30
.030	.050	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-030-050	32.00	QFGC3-187-030-050X	36.65
.030	.050	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-030-050	37.30	QFGC3-250-030-050X	43.30
.030	.050	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-312-030-050	49.00	QFGC3-312-030-050X	56.20
.030	.050	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-030-050	66.60	QFGC3-375-030-050X	75.10
.039	.050	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-039-050	32.00	QFGC3-187-039-050X	36.65
.039	.050	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-039-050	37.30	QFGC3-250-039-050X	43.30
.039	.050	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-039-050	66.60	QFGC3-375-039-050X	75.10
.040	.050	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-040-050	32.00	QFGC3-187-040-050X	36.65
.040	.050	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-040-050	37.30	QFGC3-250-040-050X	43.30
.040	.050	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-312-040-050	49.00	QFGC3-312-040-050X	56.20
.040	.050	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-040-050	66.60	QFGC3-375-040-050X	75.10
.050	.050	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-050-050	32.00	QFGC3-187-050-050X	36.65
.050	.050	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-050-050	37.30	QFGC3-250-050-050X	43.30
.050	.050	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-312-050-050	49.00	QFGC3-312-050-050X	56.20
.050	.050	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-050-050	66.60	QFGC3-375-050-050X	75.10
.059	.075	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-059-075	66.60	QFGC3-375-059-075X	75.10

*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

Continued on next page

See pgs 16-34 for quick change holder options

QFGC

Quick Change – Grooving Tools

Face Grooving – Corner Radius (cont.)

Continued from previous page

Width	Projection	Minimum Groove Diameter*	Radius	Maximum Bore Depth	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	P +.015" −.000"		R +.001" −.001"	L_2	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.062	.075	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-062-075	32.00	QFGC3-187-062-075X	36.65
.062	.075	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-062-075	37.30	QFGC3-250-062-075X	43.30
.062	.075	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-312-062-075	49.00	QFGC3-312-062-075X	56.20
.062	.075	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-062-075	66.60	QFGC3-375-062-075X	75.10
.062	.100	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-062-100	32.00	QFGC3-187-062-100X	36.65
.062	.100	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-062-100	37.30	QFGC3-250-062-100X	43.30
.078	.100	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-078-100	37.30	QFGC3-250-078-100X	43.30
.078	.100	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-312-078-100	49.00	QFGC3-312-078-100X	56.20
.078	.100	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-078-100	66.60	QFGC3-375-078-100X	75.10
.093	.100	.385	.006	.750	.853	.1875	.3750	2.0	QFGC6-375-093-100	66.60	QFGC6-375-093-100X	75.10
.093	.150	.322	.006	.750	.853	.1563	.3125	2.0	QFGC6-312-093-150	49.00	QFGC6-312-093-150X	56.20
.118	.150	.385	.006	.750	.853	.1875	.3750	2.0	QFGC6-375-118-150	66.60	QFGC6-375-118-150X	75.10
.125	.100	.385	.006	.750	.853	.1875	.3750	2.0	QFGC6-375-125-100	66.60	QFGC6-375-125-100X	75.10

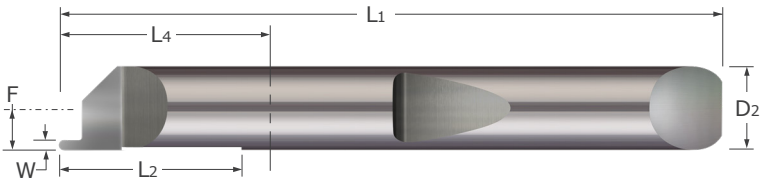
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

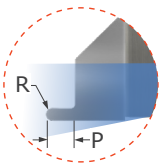
See pgs 16-34 for quick change holder options

Quick Change – Grooving Tools

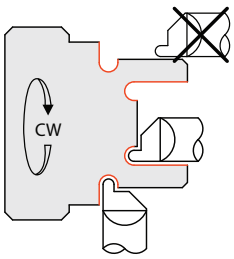
Face Grooving – Full Radius

QFGF





- Designed for generating full radius grooves in the face of the part
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Relief ground along Maximum Bore Depth (L_2) to avoid interference during deep hole applications
- Coolant fed enabled shank design
- Full radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Radius	Projection	Minimum Groove Diameter*	Maximum Bore Depth	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	R	P +.015" −.000"		L_2	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.015	.0075	.025	.197	.500	.590	.0938	.1875	1.5	QFGF-187-015-025	32.20	QFGF-187-015-025X	36.85
.015	.0075	.025	.260	.750	.853	.1250	.2500	2.0	QFGF-250-015-025	36.00	QFGF-250-015-025X	41.90
.017	.0085	.025	.197	.500	.590	.0938	.1875	1.5	QFGF-187-017-025	32.20	QFGF-187-017-025X	36.85
.017	.0085	.025	.260	.750	.853	.1250	.2500	2.0	QFGF-250-017-025	36.00	QFGF-250-017-025X	41.90
.020	.0100	.050	.190	.155	.590	.0860	.1875	1.5	QFGF-180-020	32.20	QFGF-180-020X	36.85
.020	.0100	.050	.197	.500	.590	.0938	.1875	1.5	QFGF-187-020-050	32.20	QFGF-187-020-050X	36.85
.020	.0100	.050	.240	.190	.853	.1050	.2500	2.0	QFGF-230-020	36.00	QFGF-230-020X	41.90
.020	.0100	.050	.260	.190	.853	.1250	.2500	2.0	QFGF-250-020	36.00	QFGF-250-020X	41.90
.025	.0125	.050	.197	.500	.590	.0938	.1875	1.5	QFGF-187-025-050	32.20	QFGF-187-025-050X	36.85
.025	.0125	.050	.260	.750	.853	.1250	.2500	2.0	QFGF-250-025-050	36.00	QFGF-250-025-050X	41.90
.030	.0150	.050	.190	.155	.590	.0860	.1875	1.5	QFGF-180-030	32.20	QFGF-180-030X	36.85
.030	.0150	.050	.197	.500	.590	.0938	.1875	1.5	QFGF-187-030-050	32.20	QFGF-187-030-050X	36.85
.030	.0150	.050	.260	.190	.853	.1250	.2500	2.0	QFGF-250-030	36.00	QFGF-250-030X	41.90
.039	.0195	.075	.197	.500	.590	.0938	.1875	1.5	QFGF-187-039-075	32.20	QFGF-187-039-075X	36.85
.039	.0195	.075	.260	.750	.853	.1250	.2500	2.0	QFGF-250-039-075	36.00	QFGF-250-039-075X	41.90
.040	.0200	.050	.260	.190	.853	.1250	.2500	2.0	QFGF-250-040	36.00	QFGF-250-040X	41.90
.040	.0200	.075	.197	.500	.590	.0938	.1875	1.5	QFGF-187-040-075	32.20	QFGF-187-040-075X	36.85
.040	.0200	.075	.260	.750	.853	.1250	.2500	2.0	QFGF-250-040-075	36.00	QFGF-250-040-075X	41.90
.050	.0250	.050	.322	.225	.853	.1563	.3125	2.0	QFGF-312-050	49.10	QFGF-312-050X	56.30
.050	.0250	.075	.197	.500	.590	.0938	.1875	1.5	QFGF-187-050-075	32.20	QFGF-187-050-075X	36.85
.050	.0250	.075	.260	.750	.853	.1250	.2500	2.0	QFGF-250-050-075	36.00	QFGF-250-050-075X	41.90
.062	.0310	.075	.322	.750	.853	.1563	.3125	2.0	QFGF-312-062-075	49.10	QFGF-312-062-075X	56.30
.062	.0310	.075	.385	.750	.853	.1875	.3750	2.0	QFGF-375-062-075	68.00	QFGF-375-062-075X	76.50
.062	.0310	.100	.197	.500	.590	.0938	.1875	1.5	QFGF-187-062-100	32.20	QFGF-187-062-100X	36.85
.062	.0310	.100	.260	.750	.853	.1250	.2500	2.0	QFGF-250-062-100	36.00	QFGF-250-062-100X	41.90
.062	.0310	.100	.322	.225	.853	.1563	.3125	2.0	QFGF-312-062	49.10	QFGF-312-062X	56.30
.062	.0310	.100	.385	.260	.853	.1875	.3750	2.0	QFGF-375-062	68.00	QFGF-375-062X	76.50
.078	.0390	.100	.385	.260	.853	.1875	.3750	2.0	QFGF-375-078	68.00	QFGF-375-078X	76.50
.093	.0465	.100	.385	.260	.853	.1875	.3750	2.0	QFGF-375-093	68.00	QFGF-375-093X	76.50
.125	.0625	.150	.385	.260	.853	.1875	.3750	2.0	QFGF-375-125	68.00	QFGF-375-125X	76.50

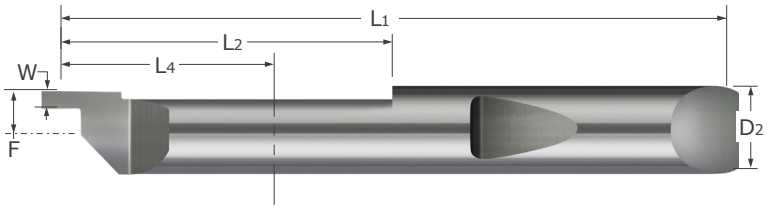
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

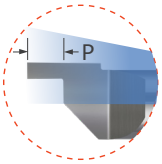
See pgs 16-34 for quick change holder options

QFGI

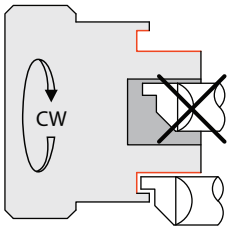
Quick Change – Grooving Tools

Face Grooving – Internal Tooth – Square





- Designed to generate square grooves around a boss in the face of a part for right hand grooving applications (M03) (See Graphic)
- Significantly reduces cycle times, as right hand design allows for multiple tools to be run simultaneously
- Relief ground along Maximum Turn Depth (L_2) to avoid interference during long turning applications
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Coolant fed enabled shank design
- Sharp corner profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Projection	Minimum Groove Diameter*	Maximum Turn Depth	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	P +.015" −.000"		L_2	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.020	.040	.260	.750	.853	.1150	.2500	2.0	QFGI-8240	35.70	QFGI-8240X	41.70
.020	.040	.260	1.250	1.353	.1150	.2500	2.5	QFGI-6198	37.10	QFGI-6198X	43.40
.020	.040	.322	.750	.853	.1463	.3125	2.0	QFGI-9800	48.90	QFGI-9800X	56.10
.020	.040	.322	1.250	1.353	.1463	.3125	2.5	QFGI-6738	50.20	QFGI-6738X	57.80
.030	.060	.260	.750	.853	.1150	.2500	2.0	QFGI-6600	35.70	QFGI-6600X	41.70
.030	.060	.260	1.250	1.353	.1150	.2500	2.5	QFGI-3461	37.10	QFGI-3461X	43.40
.030	.060	.322	.750	.853	.1463	.3125	2.0	QFGI-5774	48.90	QFGI-5774X	56.10
.030	.060	.322	1.250	1.353	.1463	.3125	2.5	QFGI-1413	50.20	QFGI-1413X	57.80
.040	.080	.260	.750	.853	.1150	.2500	2.0	QFGI-6481	35.70	QFGI-6481X	41.70
.040	.080	.260	1.250	1.353	.1150	.2500	2.5	QFGI-9741	37.10	QFGI-9741X	43.40
.040	.080	.322	.750	.853	.1463	.3125	2.0	QFGI-8157	48.90	QFGI-8157X	56.10
.040	.080	.322	1.250	1.353	.1463	.3125	2.5	QFGI-9114	50.20	QFGI-9114X	57.80
.050	.100	.260	.750	.853	.1150	.2500	2.0	QFGI-1311	35.70	QFGI-1311X	41.70
.050	.100	.260	1.250	1.353	.1150	.2500	2.5	QFGI-7516	37.10	QFGI-7516X	43.40
.050	.100	.322	.750	.853	.1463	.3125	2.0	QFGI-5336	48.90	QFGI-5336X	56.10
.050	.100	.322	1.250	1.353	.1463	.3125	2.5	QFGI-9489	50.20	QFGI-9489X	57.80
.062	.125	.322	.750	.853	.1463	.3125	2.0	QFGI-2609	48.90	QFGI-2609X	56.10
.062	.125	.322	1.250	1.353	.1463	.3125	2.5	QFGI-0720	50.20	QFGI-0720X	57.80
.062	.125	.385	.750	.853	.1775	.3750	2.0	QFGI-3852	68.00	QFGI-3852X	76.50
.062	.125	.385	1.250	1.353	.1775	.3750	2.5	QFGI-8466	69.40	QFGI-8466X	78.40
.078	.156	.322	.750	.853	.1463	.3125	2.0	QFGI-4397	48.90	QFGI-4397X	56.10
.078	.156	.322	1.250	1.353	.1463	.3125	2.5	QFGI-3465	50.20	QFGI-3465X	57.80
.078	.156	.385	.750	.853	.1775	.3750	2.0	QFGI-2855	68.00	QFGI-2855X	76.50
.078	.156	.385	1.250	1.353	.1775	.3750	2.5	QFGI-2684	69.40	QFGI-2684X	78.40

*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

Continued on next page

See pgs 16-34 for quick change holder options

Quick Change – Grooving Tools

QFGI

Face Grooving – Internal Tooth – Square (cont.)

Continued from previous page

Width	Projection	Minimum Groove Diameter*	Maximum Turn Depth	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	P +.015" −.000"		L_2	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.093	.187	.322	.750	.853	.1463	.3125	2.0	QFGI-5482	48.90	QFGI-5482X	56.10
.093	.187	.322	1.250	1.353	.1463	.3125	2.5	QFGI-2378	50.20	QFGI-2378X	57.80
.093	.187	.385	.750	.853	.1775	.3750	2.0	QFGI-1641	68.00	QFGI-1641X	76.50
.093	.187	.385	1.250	1.353	.1775	.3750	2.5	QFGI-1707	69.40	QFGI-1707X	78.40
.118	.236	.385	.750	.853	.1775	.3750	2.0	QFGI-4674	68.00	QFGI-4674X	76.50
.118	.236	.385	1.250	1.353	.1775	.3750	2.5	QFGI-2969	69.40	QFGI-2969X	78.40
.118	.236	.510	1.000	1.040	.2400	.5000	2.5	QFGI-6754	77.00	QFGI-6754X	89.30
.118	.236	.510	1.500	1.540	.2400	.5000	3.0	QFGI-3667	78.40	QFGI-3667X	90.70
.125	.250	.385	.750	.853	.1775	.3750	2.0	QFGI-1535	68.00	QFGI-1535X	76.50
.125	.250	.385	1.250	1.353	.1775	.3750	2.5	QFGI-7015	69.40	QFGI-7015X	78.40
.125	.250	.510	1.000	1.040	.2400	.5000	2.5	QFGI-4349	77.00	QFGI-4349X	89.30
.125	.250	.510	1.500	1.540	.2400	.5000	3.0	QFGI-4098	78.40	QFGI-4098X	90.70

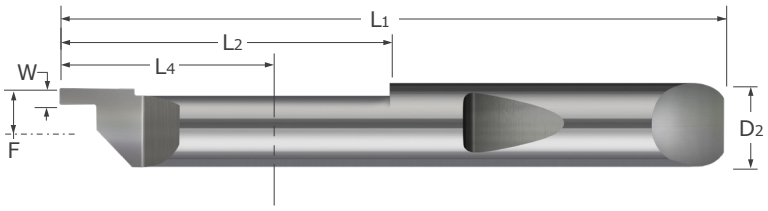
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

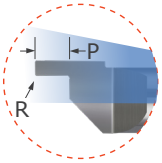
See pgs 16-34 for quick change holder options

QFGIC

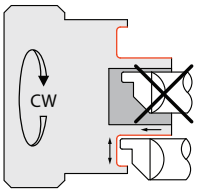
Quick Change – Grooving Tools

Face Grooving – Internal Tooth - Corner Radius





- Designed to generate corner radius grooves around a boss in the face of a part for right hand grooving applications (M03) (See Graphic)
- Significantly reduces cycle times, as right hand design allows for multiple tools to be run simultaneously
- Relief ground along Maximum Turn Depth (L_2) to avoid interference during long turning applications
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Coolant fed enabled shank design
- Corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Radius	Projection	Minimum Groove Diameter*	Maximum Turn Depth	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	R +.001" −.001"	P +.015" −.000"		L_2	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.020	.003	.040	.260	1.250	1.353	.1150	.2500	2.5	QFGIC3-6198	37.80	QFGIC3-6198X	44.20
.020	.003	.040	.322	1.250	1.353	.1463	.3125	2.5	QFGIC3-6738	51.10	QFGIC3-6738X	58.80
.030	.003	.060	.260	1.250	1.353	.1150	.2500	2.5	QFGIC3-3461	37.80	QFGIC3-3461X	44.20
.030	.003	.060	.322	1.250	1.353	.1463	.3125	2.5	QFGIC3-1413	51.10	QFGIC3-1413X	58.80
.040	.003	.080	.260	1.250	1.353	.1150	.2500	2.5	QFGIC3-9741	37.80	QFGIC3-9741X	44.20
.040	.003	.080	.322	1.250	1.353	.1463	.3125	2.5	QFGIC3-9114	51.10	QFGIC3-9114X	58.80
.050	.003	.100	.260	1.250	1.353	.1150	.2500	2.5	QFGIC3-7516	37.80	QFGIC3-7516X	44.20
.050	.003	.100	.322	1.250	1.353	.1463	.3125	2.5	QFGIC3-9489	51.10	QFGIC3-9489X	58.80
.062	.003	.125	.322	1.250	1.353	.1463	.3125	2.5	QFGIC3-0720	51.10	QFGIC3-0720X	58.80
.062	.003	.125	.385	1.250	1.353	.1775	.3750	2.5	QFGIC3-8466	70.70	QFGIC3-8466X	79.70
.078	.003	.156	.322	1.250	1.353	.1463	.3125	2.5	QFGIC3-3465	51.10	QFGIC3-3465X	58.80
.078	.003	.156	.385	1.250	1.353	.1775	.3750	2.5	QFGIC3-2684	70.70	QFGIC3-2684X	79.70
.093	.006	.187	.322	1.250	1.353	.1463	.3125	2.5	QFGIC6-2378	51.10	QFGIC6-2378X	58.80
.093	.006	.187	.385	1.250	1.353	.1775	.3750	2.5	QFGIC6-1707	70.70	QFGIC6-1707X	79.70
.118	.006	.236	.385	1.250	1.353	.1775	.3750	2.5	QFGIC6-2969	70.70	QFGIC6-2969X	79.70
.125	.006	.250	.385	1.250	1.353	.1775	.3750	2.5	QFGIC6-7015	70.70	QFGIC6-7015X	79.70

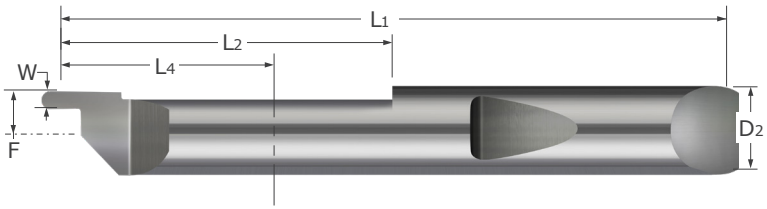
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

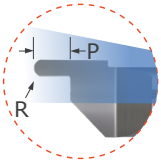
See pgs 16-34 for quick change holder options

Quick Change – Grooving Tools

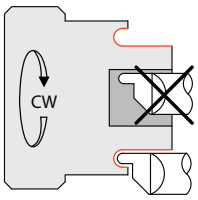
Face Grooving – Internal Tooth - Full Radius

QFGIF





- Designed to generate corner radius grooves around a boss in the face of a part for right hand grooving applications (M03) (See Graphic)
- Significantly reduces cycle times, as right hand design allows for multiple tools to be run simultaneously
- Relief ground along Maximum Turn Depth (L_2) to avoid interference during long turning applications
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Coolant fed enabled shank design
- Full radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Radius	Projection	Minimum Groove Diameter*	Maximum Turn Depth	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	R +.0010" −.0010"	P +.015" −.000"		L_2	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.020	.0100	.040	.260	1.250	1.353	.1150	.2500	2.5	QFGIF-6198	38.50	QFGIF-6198X	44.90
.020	.0100	.040	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-6738	52.20	QFGIF-6738X	59.80
.030	.0150	.060	.260	1.250	1.353	.1150	.2500	2.5	QFGIF-3461	38.50	QFGIF-3461X	44.90
.030	.0150	.060	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-1413	52.20	QFGIF-1413X	59.80
.040	.0200	.080	.260	1.250	1.353	.1150	.2500	2.5	QFGIF-9741	38.50	QFGIF-9741X	44.90
.040	.0200	.080	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-9114	52.20	QFGIF-9114X	59.80
.050	.0250	.100	.260	1.250	1.353	.1150	.2500	2.5	QFGIF-7516	38.50	QFGIF-7516X	44.90
.050	.0250	.100	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-9489	52.20	QFGIF-9489X	59.80
.062	.0310	.125	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-0720	52.20	QFGIF-0720X	59.80
.062	.0310	.125	.385	1.250	1.353	.1775	.3750	2.5	QFGIF-8466	72.00	QFGIF-8466X	81.10
.078	.0390	.156	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-3465	52.20	QFGIF-3465X	59.80
.078	.0390	.156	.385	1.250	1.353	.1775	.3750	2.5	QFGIF-2684	72.00	QFGIF-2684X	81.10
.093	.0465	.187	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-2378	52.20	QFGIF-2378X	59.80
.093	.0465	.187	.385	1.250	1.353	.1775	.3750	2.5	QFGIF-1707	72.00	QFGIF-1707X	81.10
.118	.0590	.236	.385	1.250	1.353	.1775	.3750	2.5	QFGIF-2969	72.00	QFGIF-2969X	81.10
.125	.0625	.250	.385	1.250	1.353	.1775	.3750	2.5	QFGIF-7015	72.00	QFGIF-7015X	81.10

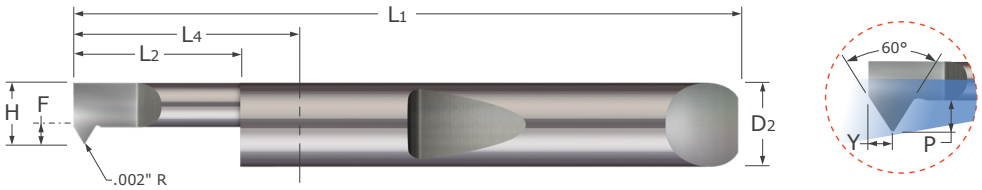
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

See pgs 16-34 for quick change holder options

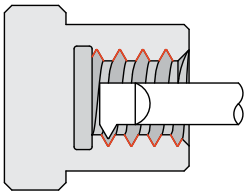
QIT

Quick Change – Threading Tools

UN Threads – Single Point



- Designed for threading in bores .040" and larger
- Able to cut multiple thread pitches (ANSI, UN, & Metric 60°) with one tool
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Tools with a .050" and smaller Head Width have an on-center neck design
- .002" tip radius
- Coolant fed enabled shank design
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



	Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	TPI*	H		L2 +.030" −.000"	Y +.002" −.000"	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
	40-72	.0350	.0400	.075	.012	.015	.590	.0250	.1875	1.5	QIT-035075	50.50	QIT-035075X	54.75
	40-72	.0350	.0400	.100	.012	.015	.590	.0250	.1875	1.5	QIT-035100	50.50	QIT-035100X	54.75
	40-72	.0350	.0400	.150	.012	.015	.590	.0250	.1875	1.5	QIT-035150	50.50	QIT-035150X	54.75
	28-72	.0400	.0450	.075	.015	.020	.590	.0300	.1875	1.5	QIT-040075	50.50	QIT-040075X	54.75
	28-72	.0400	.0450	.150	.015	.020	.590	.0300	.1875	1.5	QIT-040150	50.50	QIT-040150X	54.75
	28-72	.0500	.0550	.100	.015	.020	.590	.0350	.1875	1.5			QIT-050100X	46.65
	28-72	.0500	.0550	.150	.015	.020	.590	.0350	.1875	1.5	QIT-050150	42.70	QIT-050150X	46.65
	28-72	.0500	.0550	.200	.015	.020	.590	.0350	.1875	1.5	QIT-050200	42.70	QIT-050200X	46.65
	28-56	.0600	.0700	.150	.015	.020	.590	-.0337	.1875	1.5	QIT-060150	42.70	QIT-060150X	47.70
	28-56	.0600	.0700	.200	.015	.020	.590	-.0335	.1875	1.5	QIT-060200	42.70	QIT-060200X	46.65
	28-56	.0600	.0700	.250	.015	.020	.590	-.0335	.1875	1.5	QIT-060250	42.70	QIT-060250X	46.65
	28-56	.0600	.0700	.300	.015	.020	.590	-.0335	.1875	1.5	QIT-060300	42.70	QIT-060300X	46.65
NEW	28-56	.0600	.0700	.350	.015	.020	.590	-.0337	.1875	1.5	QIT-060350	42.70	QIT-060350X	47.70
	28-56	.0800	.0900	.200	.015	.020	.590	-.0137	.1875	1.5	QIT-080200	42.70	QIT-080200X	47.70
	28-56	.0800	.0900	.250	.015	.020	.590	-.0135	.1875	1.5	QIT-080250	42.70	QIT-080250X	46.65
	28-56	.0800	.0900	.350	.015	.020	.590	-.0135	.1875	1.5	QIT-080350	42.70	QIT-080350X	46.65
	28-56	.0800	.0900	.500	.015	.020	.590	-.0135	.1875	1.5	QIT-080500	42.70	QIT-080500X	46.65
NEW	28-56	.0800	.0900	.600	.015	.020	1.090	-.0137	.1875	2.0	QIT-080600	42.70	QIT-080600X	47.70
	24-56	.1000	.1100	.250	.018	.025	.590	.0065	.1875	1.5	QIT-100250	42.70	QIT-100250X	46.65
	24-56	.1000	.1100	.350	.018	.025	.590	.0065	.1875	1.5	QIT-100350	42.70	QIT-100350X	46.65
	24-56	.1000	.1100	.500	.018	.025	.590	.0065	.1875	1.5	QIT-100500	42.70	QIT-100500X	46.65
	24-56	.1000	.1100	.600	.018	.025	1.090	.0065	.1875	2.0	QIT-100600	42.70	QIT-100600X	46.65
NEW	24-56	.1000	.1100	.750	.018	.025	1.090	.0062	.1875	2.0	QIT-100750	42.70	QIT-100750X	47.70

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options

NEW!

Quick Change – Threading Tools

UN Threads – Single Point (cont.)

QIT

Continued from previous page

Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
TPI*	H		L_2 +.030" −.000"	Y +.002" −.000"	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
20-56	.1100	.1260	.250	.020	.030	.590	.0165	.1875	1.5	QIT-110250	42.70	QIT-110250X	46.65
20-56	.1100	.1260	.400	.020	.030	.590	.0165	.1875	1.5	QIT-110400	42.70	QIT-110400X	46.65
20-56	.1100	.1260	.500	.020	.030	.590	.0165	.1875	1.5	QIT-110500	42.70	QIT-110500X	46.65
20-56	.1100	.1260	.600	.020	.030	1.090	.0165	.1875	2.0	QIT-110600	42.70	QIT-110600X	46.65
20-56	.1100	.1260	.750	.020	.030	1.090	.0165	.1875	2.0	QIT-110750	42.70	QIT-110750X	46.65
20-56	.1200	.1360	.250	.020	.030	.590	.0265	.1875	1.5	QIT-120250	42.70	QIT-120250X	46.65
20-56	.1200	.1360	.400	.020	.030	.590	.0265	.1875	1.5	QIT-120400	42.70	QIT-120400X	46.65
20-56	.1200	.1360	.500	.020	.030	.590	.0265	.1875	1.5	QIT-120500	42.70	QIT-120500X	46.65
20-56	.1200	.1360	.600	.020	.030	1.090	.0265	.1875	2.0	QIT-120600	42.70	QIT-120600X	46.65
20-56	.1200	.1360	.750	.020	.030	1.090	.0265	.1875	2.0	QIT-120750	42.70	QIT-120750X	46.65
16-56	.1400	.1560	.250	.023	.035	.590	.0465	.1875	1.5	QIT-140250	42.70	QIT-140250X	46.65
16-56	.1400	.1560	.400	.023	.035	.590	.0465	.1875	1.5	QIT-140400	42.70	QIT-140400X	46.65
16-56	.1400	.1560	.500	.023	.035	.590	.0465	.1875	1.5	QIT-140500	42.70	QIT-140500X	46.65
16-56	.1400	.1560	.750	.023	.035	1.090	.0465	.1875	2.0	QIT-140750	42.70	QIT-140750X	46.65
16-56	.1400	.1560	1.000	.023	.035	1.090	.0462	.1875	2.0	QIT-1401000	42.70	QIT-1401000X	47.70
14-56	.1600	.1820	.250	.029	.040	.590	.0665	.1875	1.5	QIT-160250	42.70	QIT-160250X	46.65
14-56	.1600	.1820	.400	.029	.040	.590	.0665	.1875	1.5	QIT-160400	42.70	QIT-160400X	46.65
14-56	.1600	.1820	.500	.029	.040	.590	.0665	.1875	1.5	QIT-160500	42.70	QIT-160500X	46.65
14-56	.1600	.1820	.750	.029	.040	1.090	.0665	.1875	2.0	QIT-160750	42.70	QIT-160750X	46.65
14-56	.1600	.1820	1.000	.029	.040	1.090	.0665	.1875	2.0	QIT-1601000	42.70	QIT-1601000X	46.65
14-56	.1800	.2020	.350	.029	.040	.853	.0550	.2500	2.0	QIT-180350	45.60	QIT-180350X	51.60
14-56	.1800	.2020	.500	.029	.040	.853	.0550	.2500	2.0	QIT-180500	45.60	QIT-180500X	51.60
14-56	.1800	.2020	.750	.029	.040	.853	.0550	.2500	2.0	QIT-180750	45.60	QIT-180750X	51.60
14-56	.1800	.2020	1.000	.029	.040	1.353	.0550	.2500	2.5	QIT-1801000	45.60	QIT-1801000X	52.00
14-56	.1800	.2020	1.125	.029	.040	1.353	.0550	.2500	2.5	QIT-1801125	45.60	QIT-1801125X	52.00
13-56	.2000	.2220	.400	.032	.045	.853	.0750	.2500	2.0	QIT-200400	45.60	QIT-200400X	51.60
13-56	.2000	.2220	.600	.032	.045	.853	.0750	.2500	2.0	QIT-200600	45.60	QIT-200600X	51.60
13-56	.2000	.2220	.750	.032	.045	.853	.0750	.2500	2.0	QIT-200750	45.60	QIT-200750X	51.60
13-56	.2000	.2220	1.000	.032	.045	1.353	.0750	.2500	2.5	QIT-2001000	45.60	QIT-2001000X	52.00
13-56	.2000	.2220	1.125	.032	.045	1.353	.0750	.2500	2.5	QIT-2001125	45.60	QIT-2001125X	52.00
10-48	.2300	.2520	.400	.038	.055	.853	.0735	.3125	2.0	QIT-230400	57.10	QIT-230400X	64.30
10-48	.2300	.2520	.600	.038	.055	.853	.0735	.3125	2.0	QIT-230600	57.10	QIT-230600X	64.30
10-48	.2300	.2520	.750	.038	.055	.853	.0735	.3125	2.0	QIT-230750	57.10	QIT-230750X	64.30
10-48	.2300	.2520	1.000	.038	.055	1.353	.0735	.3125	2.5	QIT-2301000	57.10	QIT-2301000X	64.70
10-48	.2300	.2520	1.250	.038	.055	1.353	.0737	.3125	2.5	QIT-2301250	57.10	QIT-2301250X	64.70
10-48	.2300	.2520	1.500	.038	.055	1.853	.0735	.3125	3.0	QIT-2301500	64.60	QIT-2301500X	72.20
10-48	.2300	.2520	1.750	.038	.055	1.853	.0737	.3125	3.0	QIT-2301750	64.60	QIT-2301750X	72.20 NEW
8-40	.2900	.3120	.500	.046	.070	.853	.1340	.3125	2.0	QIT-290500	57.10	QIT-290500X	64.30
8-40	.2900	.3120	.750	.046	.070	.853	.1340	.3125	2.0	QIT-290750	57.10	QIT-290750X	64.30
8-40	.2900	.3120	1.000	.046	.070	1.353	.1340	.3125	2.5	QIT-2901000	57.10	QIT-2901000X	64.25
8-40	.2900	.3120	1.250	.046	.070	1.353	.1340	.3125	2.5	QIT-2901250	57.10	QIT-2901250X	64.70
8-40	.2900	.3120	1.500	.046	.070	1.853	.1337	.3125	3.0	QIT-2901500	64.60	QIT-2901500X	72.20
8-40	.2900	.3120	1.750	.046	.070	1.853	.1340	.3125	3.0	QIT-2901750	64.60	QIT-2901750X	72.20
8-40	.3200	.3420	.500	.049	.075	.853	.1325	.3750	2.0	QIT-320500	74.40	QIT-320500X	82.15

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options

QIT

Quick Change – Threading Tools

UN Threads – Single Point (cont.)

Continued from previous page

	Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	TPI*	H		L_2 +.030" −.000"	Y +.002" −.000"	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	8-40	.3200	.3420	.750	.049	.075	.853	.1325	.3750	2.0	QIT-320750	74.40	QIT-320750X	82.15
	8-40	.3200	.3420	1.000	.049	.075	1.353	.1325	.3750	2.5	QIT-3201000	74.40	QIT-3201000X	83.40
	8-40	.3200	.3420	1.250	.049	.075	1.353	.1325	.3750	2.5	QIT-3201250	74.40	QIT-3201250X	83.40
	8-40	.3200	.3420	1.500	.049	.075	1.853	.1325	.3750	3.0	QIT-3201500	81.90	QIT-3201500X	90.90
	8-40	.3200	.3420	1.800	.049	.075	1.853	.1325	.3750	3.0	QIT-3201800	81.90	QIT-3201800X	90.90
	7-32	.3600	.3820	.500	.055	.085	.853	.1725	.3750	2.0	QIT-360500	74.40	QIT-360500X	82.15
	7-32	.3600	.3820	.750	.055	.085	.853	.1725	.3750	2.0	QIT-360750	74.40	QIT-360750X	82.15
	7-32	.3600	.3820	1.000	.055	.085	1.353	.1725	.3750	2.5	QIT-3601000	74.40	QIT-3601000X	83.40
	7-32	.3600	.3820	1.250	.055	.085	1.353	.1725	.3750	2.5	QIT-3601250	74.40	QIT-3601250X	83.40
	7-32	.3600	.3820	1.500	.055	.085	1.853	.1725	.3750	3.0	QIT-3601500	81.90	QIT-3601500X	90.90
	7-32	.3600	.3820	1.800	.055	.085	1.853	.1725	.3750	3.0	QIT-3601800	81.90	QIT-3601800X	90.90
NEW	7-32	.3600	.3820	2.000	.055	.085	2.353	.1725	.3750	3.5	QIT-3602000	83.70	QIT-3602000X	93.50
	5-32	.4600	.4820	.750	.078	.120	1.040	.2100	.5000	2.5	QIT-460750	104.30	QIT-460750X	116.60
	5-32	.4600	.4820	1.500	.078	.120	1.540	.2100	.5000	3.0	QIT-4601500	104.30	QIT-4601500X	116.60
	5-32	.4600	.4820	2.000	.078	.120	2.040	.2100	.5000	3.5	QIT-4602000	113.80	QIT-4602000X	126.90
	5-32	.4900	.5120	.750	.078	.120	1.040	.2400	.5000	2.5	QIT-490750	104.30	QIT-490750X	116.60
	5-32	.4900	.5120	1.125	.078	.120	1.540	.2400	.5000	3.0	QIT-4901125	104.30	QIT-4901125X	116.60
	5-32	.4900	.5120	1.500	.078	.120	1.540	.2400	.5000	3.0	QIT-4901500	104.30	QIT-4901500X	116.60
	5-32	.4900	.5120	2.000	.078	.120	2.040	.2400	.5000	3.5	QIT-4902000	113.80	QIT-4902000X	126.90
NEW	5-32	.4900	.5120	2.500	.078	.120	2.540	.2400	.5000	4.0	QIT-4902500	118.20	QIT-4902500X	131.40

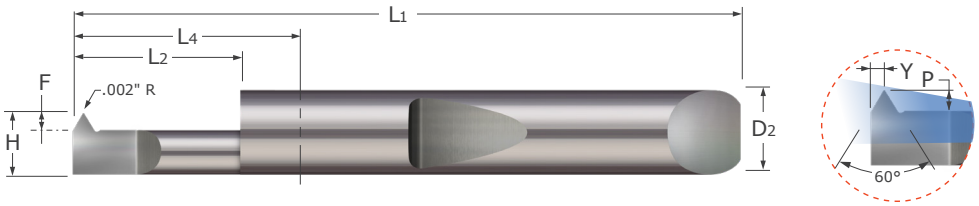
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pgs 16-34 for quick change holder options

Quick Change – Threading Tools

UN Threads – Single Point – Left Hand

QITL



- Designed for threading multiple thread pitches (ANSI, UN, and Metric 60°) in a left hand threading application
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Coolant fed enabled shank design
- Corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
TPI*	H		L_2 $^{+.030"}_{-.000"}$	Y $^{+.002"}_{-.000"}$	P	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
20-56	.1200	.1360	.500	.017	.030	.590	.0262	.1875	1.5	QITL-120500	42.70	QITL-120500X	47.70
16-56	.1400	.1560	.500	.020	.035	.590	.0462	.1875	1.5	QITL-140500	42.70	QITL-140500X	47.70
14-56	.1600	.1820	.400	.023	.040	.590	.0662	.1875	1.5	QITL-160400	42.70	QITL-160400X	47.70
14-56	.1600	.1820	.750	.023	.040	1.090	.0662	.1875	2.0	QITL-160750	43.90	QITL-160750X	48.90
13-56	.2000	.2220	.600	.026	.045	.853	.0750	.2500	2.0	QITL-200600	45.60	QITL-200600X	51.60
13-56	.2000	.2220	1.000	.026	.045	1.353	.0750	.2500	2.5	QITL-2001000	46.80	QITL-2001000X	53.20
10-48	.2300	.2520	.750	.032	.055	.853	.0737	.3125	2.0	QITL-230750	57.10	QITL-230750X	64.30
10-48	.2300	.2520	1.000	.032	.055	1.353	.0737	.3125	2.5	QITL-2301000	58.30	QITL-2301000X	65.90
8-40	.2900	.3120	.750	.040	.070	.853	.1337	.3125	2.0	QITL-290750	57.10	QITL-290750X	64.30
8-40	.2900	.3120	1.250	.040	.070	1.353	.1337	.3125	2.5	QITL-2901250	58.30	QITL-2901250X	65.90
8-40	.3200	.3420	.750	.043	.075	.853	.1325	.3750	2.0	QITL-320750	74.40	QITL-320750X	82.90
8-40	.3200	.3420	1.000	.043	.075	1.353	.1325	.3750	2.5	QITL-3201000	75.50	QITL-3201000X	84.50
7-32	.3600	.3820	.750	.049	.085	.853	.1725	.3750	2.0	QITL-360750	74.40	QITL-360750X	82.90
7-32	.3600	.3820	1.250	.049	.085	1.353	.1725	.3750	2.5	QITL-3601250	75.50	QITL-3601250X	84.50
5-32	.4900	.5120	1.500	.069	.120	1.540	.2400	.5000	3.0	QITL-4901500	105.50	QITL-4901500X	117.80

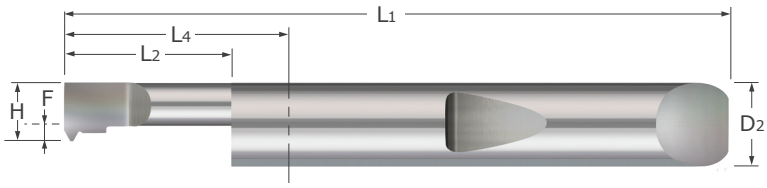
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

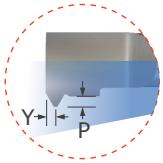
See pgs 16-34 for quick change holder options

QTT

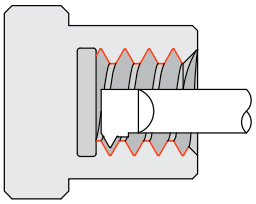
Quick Change – Threading Tools

UN Topping– Single Point





- Designed for threading 60° UN pitches in a right hand topping application
- Topping design generates a controlled thread height with a reduction in burr formation
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Coolant fed enabled shank design
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Thread Size	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	H		L_2 $^{+.030"}_{-.000"}$	Y $^{+.005"}_{-.000"}$	P $^{+.0000"}_{-.0020"}$	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
2-56	.050	.055	.150	.012	.0097	.590	-.0438	.1875	1.5	QTT-000256-015	43.60	QTT-000256-015X	48.60
2-56	.050	.055	.200	.012	.0097	.590	-.0438	.1875	1.5	QTT-000256-020	43.60	QTT-000256-020X	48.60
4-40	.065	.075	.200	.014	.0135	.590	-.0288	.1875	1.5	QTT-000440-020	43.60	QTT-000440-020X	48.60
4-40	.065	.075	.250	.014	.0135	.590	-.0288	.1875	1.5	QTT-000440-025	43.60	QTT-000440-025X	48.60
5-44	.080	.090	.200	.014	.0123	.590	-.0138	.1875	1.5	QTT-000544-020	43.60	QTT-000544-020X	48.60
5-44	.080	.090	.250	.014	.0123	.590	-.0138	.1875	1.5	QTT-000544-025	43.60	QTT-000544-025X	48.60
6-32	.080	.090	.250	.017	.0169	.590	-.0138	.1875	1.5	QTT-000632-025	43.60	QTT-000632-025X	48.60
6-32	.080	.090	.350	.017	.0169	.590	-.0138	.1875	1.5	QTT-000632-035	43.60	QTT-000632-035X	48.60
8-32	.100	.110	.250	.017	.0169	.590	.0063	.1875	1.5	QTT-000832-025	43.60	QTT-000832-025X	48.60
8-32	.100	.110	.350	.017	.0169	.590	.0063	.1875	1.5	QTT-000832-035	43.60	QTT-000832-035X	48.60
10-24	.120	.136	.250	.021	.0226	.590	.0263	.1875	1.5	QTT-001024-025	43.60	QTT-001024-025X	48.60
10-24	.120	.136	.400	.021	.0226	.590	.0263	.1875	1.5	QTT-001024-040	43.60	QTT-001024-040X	48.60
10-32	.120	.136	.250	.017	.0169	.590	.0263	.1875	1.5	QTT-001032-025	43.60	QTT-001032-025X	48.60
10-32	.120	.136	.400	.017	.0169	.590	.0263	.1875	1.5	QTT-001032-040	43.60	QTT-001032-040X	48.60
1/4-20	.160	.182	.400	.024	.0271	.590	.0663	.1875	1.5	QTT-014020-040	43.60	QTT-014020-040X	48.60
1/4-20	.160	.182	.500	.024	.0271	.590	.0663	.1875	1.5	QTT-014020-050	43.60	QTT-014020-050X	48.60
1/4-28	.180	.202	.500	.018	.0193	.853	.0550	.2500	2.0	QTT-014028-050	46.60	QTT-014028-050X	52.50
1/4-28	.180	.202	.750	.018	.0193	.853	.0550	.2500	2.0	QTT-014028-075	46.60	QTT-014028-075X	52.50
5/16-18	.220	.242	.750	.026	.0301	.853	.0638	.3125	2.0	QTT-051618-075	58.30	QTT-051618-075X	65.50
5/16-18	.220	.242	1.000	.026	.0301	1.353	.0638	.3125	2.5	QTT-051618-100	59.40	QTT-051618-100X	67.00
5/16-24	.220	.242	.750	.021	.0226	.853	.0638	.3125	2.0	QTT-051624-075	58.30	QTT-051624-075X	65.50
5/16-24	.220	.242	1.000	.021	.0226	1.353	.0638	.3125	2.5	QTT-051624-100	59.40	QTT-051624-100X	67.00
3/8-16	.280	.302	.750	.028	.0338	.853	.1238	.3125	2.0	QTT-038016-075	58.30	QTT-038016-075X	65.50
3/8-16	.280	.302	1.000	.028	.0338	1.353	.1238	.3125	2.5	QTT-038016-100	59.40	QTT-038016-100X	67.00
3/8-24	.300	.322	.750	.021	.0226	.853	.1438	.3125	2.0	QTT-038024-075	58.30	QTT-038024-075X	65.50

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 16-34 for quick change holder options

Quick Change – Threading Tools

UN Topping– Single Point (cont.)

QTT

Continued from previous page

Thread Size	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	H		L_2 $^{+.030"}_{-.000"}$	Y $^{+.005"}_{-.000"}$	P $^{+.000"}_{-.002"}$	L_4	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
3/8-24	.300	.322	1.000	.021	.0226	1.353	.1438	.3125	2.5	QTT-038024-100	59.40	QTT-038024-100X	67.00
7/16-14	.310	.332	.750	.032	.0387	.853	.1538	.3125	2.0	QTT-071614-075	58.30	QTT-071614-075X	65.50
7/16-14	.310	.332	1.000	.032	.0387	1.353	.1538	.3125	2.5	QTT-071614-100	59.40	QTT-071614-100X	67.00
7/16-20	.350	.372	1.000	.024	.0271	1.353	.1625	.3750	2.5	QTT-071620-100	75.90	QTT-071620-100X	84.90
7/16-20	.350	.372	1.250	.024	.0271	1.353	.1625	.3750	2.5	QTT-071620-125	75.90	QTT-071620-125X	84.90
1/2-13	.380	.402	1.000	.034	.0416	1.040	.1300	.5000	2.5	QTT-012013-100	106.30	QTT-012013-100X	118.60
1/2-13	.380	.402	1.250	.034	.0416	1.540	.1300	.5000	3.0	QTT-012013-125	107.50	QTT-012013-125X	119.80
1/2-20	.410	.432	1.000	.024	.0271	1.040	.1600	.5000	2.5	QTT-012020-100	106.30	QTT-012020-100X	118.60
1/2-20	.410	.432	1.250	.024	.0271	1.540	.1600	.5000	3.0	QTT-012020-125	107.50	QTT-012020-125X	119.80
9/16-12	.410	.432	1.000	.036	.0451	1.040	.1600	.5000	2.5	QTT-091612-100	106.30	QTT-091612-100X	118.60
9/16-12	.410	.432	1.250	.036	.0451	1.540	.1600	.5000	3.0	QTT-091612-125	107.50	QTT-091612-125X	119.80
9/16-18	.460	.482	1.000	.026	.0301	1.040	.2100	.5000	2.5	QTT-091618-100	106.30	QTT-091618-100X	118.60
9/16-18	.460	.482	1.250	.026	.0301	1.540	.2100	.5000	3.0	QTT-091618-125	107.50	QTT-091618-125X	119.80
5/8-11	.490	.512	1.000	.039	.0492	1.040	.2400	.5000	2.5	QTT-058011-100	106.30	QTT-058011-100X	118.60
5/8-11	.490	.512	1.250	.039	.0492	1.540	.2400	.5000	3.0	QTT-058011-125	107.50	QTT-058011-125X	119.80
3/4-16	.490	.512	1.000	.028	.0338	1.040	.2400	.5000	2.5	QTT-034016-100	106.30	QTT-034016-100X	118.60
3/4-16	.490	.512	1.250	.028	.0338	1.540	.2400	.5000	3.0	QTT-034016-125	107.50	QTT-034016-125X	119.80

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

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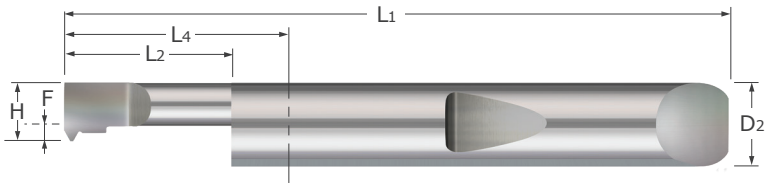
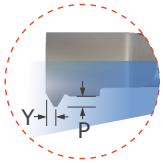
See pgs 16-34 for quick change holder options

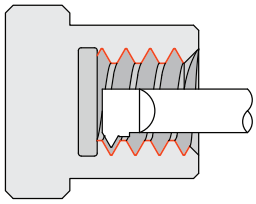
QTMT

Quick Change – Threading Tools

Metric Topping– Single Point







- Designed for threading 60° Metric pitches in a right hand topping application
- Topping design generates a controlled thread height with a reduction in burr formation
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Coolant fed enabled shank design
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Thread Size	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	H		L2 +1.27mm −.000mm	Y +.127mm −.000mm	P +.000mm −.051mm	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
M2.5x0.45	1.50mm	1.70mm	5.00mm	.300mm	.244mm	14.99mm	-0.88mm	.1875	1.5	QTMT-025045-05	43.60	QTMT-025045-05X	48.00
M2.5x0.45	1.50mm	1.70mm	7.00mm	.300mm	.244mm	14.99mm	-0.88mm	.1875	1.5	QTMT-025045-07	43.60	QTMT-025045-07X	48.00
M3x0.50	2.00mm	2.20mm	6.00mm	.319mm	.271mm	14.99mm	-0.38mm	.1875	1.5	QTMT-030050-06	43.60	QTMT-030050-06X	48.00
M3x0.50	2.00mm	2.20mm	8.00mm	.319mm	.271mm	14.99mm	-0.38mm	.1875	1.5	QTMT-030050-08	43.60	QTMT-030050-08X	48.00
M4x0.70	2.50mm	2.70mm	7.00mm	.396mm	.379mm	14.99mm	0.12mm	.1875	1.5	QTMT-040070-07	43.60	QTMT-040070-07X	48.00
M4x0.70	2.50mm	2.70mm	10.00mm	.396mm	.379mm	14.99mm	0.12mm	.1875	1.5	QTMT-040070-10	43.60	QTMT-040070-10X	48.00
M4.5x0.75	3.00mm	3.40mm	6.00mm	.415mm	.406mm	14.99mm	0.62mm	.1875	1.5	QTMT-045075-06	43.60	QTMT-045075-06X	48.00
M4.5x0.75	3.00mm	3.40mm	9.00mm	.415mm	.406mm	14.99mm	0.62mm	.1875	1.5	QTMT-045075-09	43.60	QTMT-045075-09X	48.00
M5x0.80	3.00mm	3.40mm	6.00mm	.434mm	.433mm	14.99mm	0.62mm	.1875	1.5	QTMT-050080-06	43.60	QTMT-050080-06X	48.00
M5x0.80	3.00mm	3.40mm	9.00mm	.434mm	.433mm	14.99mm	0.62mm	.1875	1.5	QTMT-050080-09	43.60	QTMT-050080-09X	48.00
M6x1.00	4.00mm	4.50mm	10.00mm	.511mm	.541mm	14.99mm	1.62mm	.1875	1.5	QTMT-060100-10	43.60	QTMT-060100-10X	48.00
M6x1.00	4.00mm	4.50mm	14.00mm	.511mm	.541mm	27.69mm	1.62mm	.1875	2.0	QTMT-060100-14	44.80	QTMT-060100-14X	49.20
M8x1.25	5.50mm	6.00mm	14.00mm	.607mm	.677mm	21.67mm	1.53mm	.3125	2.0	QTMT-080125-14	58.30	QTMT-080125-14X	62.70
M8x1.25	5.50mm	6.00mm	22.00mm	.607mm	.677mm	34.37mm	1.53mm	.3125	2.5	QTMT-080125-22	59.40	QTMT-080125-22X	63.80
M10x1.50	7.50mm	8.00mm	24.00mm	.703mm	.812mm	34.37mm	3.53mm	.3125	2.5	QTMT-100150-24	59.40	QTMT-100150-24X	63.80
M10x1.50	7.50mm	8.00mm	31.00mm	.703mm	.812mm	34.37mm	3.53mm	.3125	2.5	QTMT-100150-31	59.40	QTMT-100150-31X	63.80
M12x1.75	9.00mm	9.50mm	22.00mm	.804mm	.957mm	34.37mm	4.24mm	.3750	2.5	QTMT-120175-22	75.90	QTMT-120175-22X	80.30
M12x1.75	9.00mm	9.50mm	31.00mm	.804mm	.957mm	34.37mm	4.24mm	.3750	2.5	QTMT-120175-31	75.90	QTMT-120175-31X	80.30
M16x2.00	12.50mm	13.00mm	31.00mm	.896mm	1.085mm	39.12mm	6.15mm	.5000	3.0	QTMT-160200-31	107.50	QTMT-160200-31X	111.90
M16x2.00	12.50mm	13.00mm	44.00mm	.896mm	1.085mm	51.82mm	6.15mm	.5000	3.5	QTMT-160200-44	110.90	QTMT-160200-44X	115.30
M20x2.50	12.50mm	13.00mm	31.00mm	1.086mm	1.353mm	39.12mm	6.15mm	.5000	3.0	QTMT-200250-31	107.50	QTMT-200250-31X	111.90
M20x2.50	12.50mm	13.00mm	44.00mm	1.086mm	1.353mm	51.82mm	6.15mm	.5000	3.5	QTMT-200250-44	110.90	QTMT-200250-44X	115.30

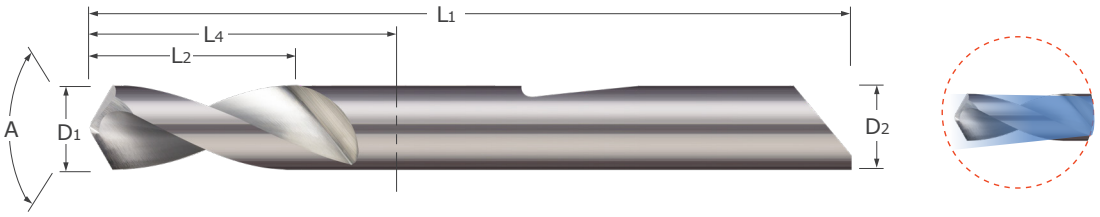
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pgs 16-34 for quick change holder options

Quick Change – Holemaking Tools

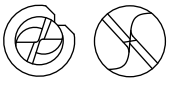
Spotting Drills

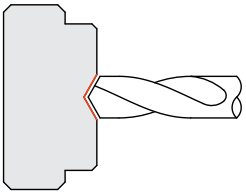
QSPD



- Designed for spot drilling
- Available in 82°, 90°, 120°, and 140° included angles
- Can be utilized for countersinking and chamfering existing holes
- Narrow web thickness allows for spotting small diameter holes
- Point geometry designed for self centering
- Coolant fed enabled shank design
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- 2 flutes
- CNC ground in the USA

Point Geometry Types





Included Angle	Drill Diameter	Flute Length	Web Thickness	Type	Length From Holder	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
A	D_1 +.0000" −.0005"	L_2 +.010" −.000"	+.001" −.001"		L_4	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
82°	.0900	.270	.006	I	.590	.1875	1.5	QSPD-090-082	31.40	QSPD-090-082X	36.40
	.1181	.354	.008	I	.590	.1875	1.5	QSPD-118-082	31.40	QSPD-118-082X	36.40
	.1250	.375	.010	I	.590	.1875	1.5	QSPD-125-082	31.40	QSPD-125-082X	36.40
	.1875	.625	.005	II	1.090	.1875	2.0	QSPD-187-082	31.40	QSPD-187-082X	36.40
	.2500	.750	.005	II	1.353	.2500	2.5	QSPD-250-082	37.00	QSPD-250-082X	43.30
	.3750	1.000	.005	II	1.353	.3750	2.5	QSPD-375-082	49.70	QSPD-375-082X	58.80
	.5000	1.000	.005	II	1.540	.5000	3.0	QSPD-500-082	67.10	QSPD-500-082X	79.30
90°	.0200	.060	.002	I	.590	.1875	1.5			QSPD-020-090X	42.65
	.0250	.075	.002	I	.590	.1875	1.5	QSPD-025-090	36.00		
	.0300	.090	.003	I	.590	.1875	1.5	QSPD-030-090	36.00		
	.0350	.105	.003	I	.590	.1875	1.5			QSPD-035-090X	39.75
	.0400	.120	.004	I	.590	.1875	1.5	QSPD-040-090	31.40	QSPD-040-090X	34.85
	.0450	.135	.004	I	.590	.1875	1.5	QSPD-045-090	31.40		
	.0600	.180	.006	I	.590	.1875	1.5	QSPD-060-090	31.40	QSPD-060-090X	34.85
	.0900	.270	.006	I	.590	.1875	1.5	QSPD-090-090	31.40	QSPD-090-090X	34.85
	.1181	.354	.008	I	.590	.1875	1.5	QSPD-118-090	31.40	QSPD-118-090X	34.85
	.1250	.375	.010	I	.590	.1875	1.5	QSPD-125-090	31.40	QSPD-125-090X	34.85
	.1875	.625	.005	II	1.090	.1875	2.0	QSPD-187-090	31.40	QSPD-187-090X	34.85
	.2500	.750	.005	II	1.353	.2500	2.5	QSPD-250-090	37.00	QSPD-250-090X	42.85
	.3750	1.000	.005	II	1.353	.3750	2.5	QSPD-375-090	49.70	QSPD-375-090X	58.45
	.5000	1.000	.005	II	1.540	.5000	3.0	QSPD-500-090	67.10	QSPD-500-090X	79.30
100°	.0900	.270	.006	I	.590	.1875	1.5	QSPD-090-100	31.40	QSPD-090-100X	36.40
	.1181	.354	.008	I	.590	.1875	1.5	QSPD-118-100	31.40	QSPD-118-100X	36.40
	.1250	.375	.010	I	.590	.1875	1.5	QSPD-125-100	31.40	QSPD-125-100X	36.40
	.1875	.625	.005	II	1.090	.1875	2.0	QSPD-187-100	31.40	QSPD-187-100X	36.40
	.2500	.750	.005	II	1.353	.2500	2.5	QSPD-250-100	37.00	QSPD-250-100X	43.30
	.3750	1.000	.005	II	1.353	.3750	2.5	QSPD-375-100	49.70	QSPD-375-100X	58.80
	.5000	1.000	.005	II	1.540	.5000	3.0	QSPD-500-100	67.10	QSPD-500-100X	79.30

Continued on next page

See pgs 16-34 for quick change holder options

QSPD

Quick Change – Holemaking Tools

Spotting Drills (cont.)

Continued from previous page

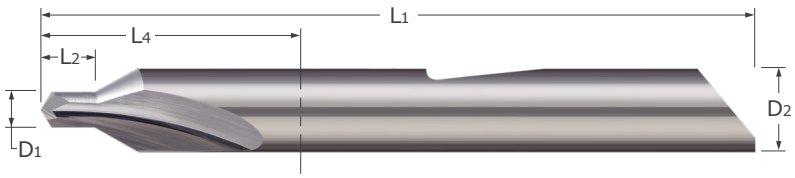
Included Angle	Drill Diameter	Flute Length	Web Thickness	Type	Length From Holder	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
A	D_1 $^{+.0000"}_{-.0005"}$	L_2 $^{+.010"}_{-.000"}$	$^{+.001"}_{-.001"}$		L_4	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	.0150	.045	.002	I	.590	.1875	1.5	QSPD-015-120	40.50	QSPD-015-120X	44.35
	.0200	.060	.002	I	.590	.1875	1.5			QSPD-020-120X	44.35
	.0300	.090	.003	I	.590	.1875	1.5	QSPD-030-120	36.00		
	.0350	.105	.003	I	.590	.1875	1.5	QSPD-035-120	36.00		
	.0400	.120	.004	I	.590	.1875	1.5	QSPD-040-120	31.40	QSPD-040-120X	34.85
	.0450	.135	.004	I	.590	.1875	1.5	QSPD-045-120	31.40	QSPD-045-120X	34.85
	.0500	.150	.005	I	.590	.1875	1.5			QSPD-050-120X	33.55
120°	.0600	.180	.006	I	.590	.1875	1.5	QSPD-060-120	31.40	QSPD-060-120X	34.85
	.0900	.270	.006	I	.590	.1875	1.5	QSPD-090-120	31.40	QSPD-090-120X	34.85
	.1181	.354	.008	I	.590	.1875	1.5	QSPD-118-120	31.40	QSPD-118-120X	36.40
	.1250	.375	.010	I	.590	.1875	1.5	QSPD-125-120	31.40	QSPD-125-120X	34.85
	.1875	.625	.005	II	1.090	.1875	2.0	QSPD-187-120	31.40	QSPD-187-120X	34.85
	.2500	.750	.005	II	1.353	.2500	2.5	QSPD-250-120	37.00	QSPD-250-120X	42.85
	.3750	1.000	.005	II	1.353	.3750	2.5	QSPD-375-120	49.70	QSPD-375-120X	58.45
	.5000	1.000	.005	II	1.540	.5000	3.0	QSPD-500-120	67.10	QSPD-500-120X	79.30
	.0200	.060	.002	I	.590	.1875	1.5			QSPD-020-140X	44.35
	.0250	.075	.002	I	.590	.1875	1.5	QSPD-025-140	36.00		
	.0300	.090	.003	I	.590	.1875	1.5	QSPD-030-140	36.00		
	.0350	.105	.003	I	.590	.1875	1.5	QSPD-035-140	36.00		
	.0400	.120	.004	I	.590	.1875	1.5	QSPD-040-140	31.40		
	.0450	.135	.004	I	.590	.1875	1.5			QSPD-045-140X	34.85
	.0500	.150	.005	I	.590	.1875	1.5	QSPD-050-140	31.40	QSPD-050-140X	34.85
140°	.0600	.180	.006	I	.590	.1875	1.5	QSPD-060-140	31.40	QSPD-060-140X	34.85
	.0900	.270	.006	I	.590	.1875	1.5	QSPD-090-140	31.40	QSPD-090-140X	34.85
	.1181	.354	.008	I	.590	.1875	1.5	QSPD-118-140	31.40	QSPD-118-140X	34.85
	.1250	.375	.010	I	.590	.1875	1.5	QSPD-125-140	31.40	QSPD-125-140X	34.85
	.1875	.625	.005	II	1.090	.1875	2.0	QSPD-187-140	31.40	QSPD-187-140X	34.85
	.2500	.750	.005	II	1.353	.2500	2.5	QSPD-250-140	37.00	QSPD-250-140X	42.85
	.3750	1.000	.005	II	1.353	.3750	2.5	QSPD-375-140	49.70	QSPD-375-140X	58.45
	.5000	1.000	.005	II	1.540	.5000	3.0	QSPD-500-140	67.10	QSPD-500-140X	79.30

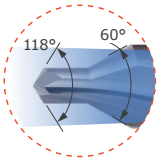
See pgs 16-34 for quick change holder options

Quick Change – Holemaking Tools

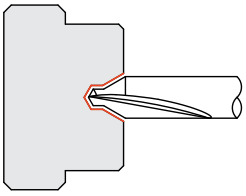
Combined Drill & Countersink Tools

QDC





- Designed for pre-drilling 60° live center holes
- Can be utilized for countersinking and spot drilling
- Coolant fed enabled shank design
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Drill Diameter	Drill Length	Length From Holder	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 $^{+.003"}_{-.000"}$	L_2 $^{+.015"}_{-.000"}$	L_4	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.025	.025	1.090	.1875	2.0	QDC-00	24.80	QDC-00X	28.05
.031	.031	1.090	.1875	2.0	QDC-01	24.80	QDC-01X	28.05
.047	.047	1.090	.1875	2.0	QDC-1	24.80	QDC-1X	28.05

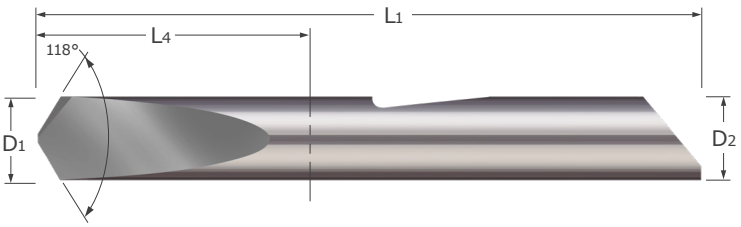
D_1 $^{+.003"}_{-.000"}$	L_2 $^{+.030"}_{-.000"}$	L_4	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.078	.078	1.090	.1875	2.0	QDC-2	24.80	QDC-2X	28.05
.109	.109	1.353	.2500	2.5	QDC-3	43.30	QDC-3X	49.55
.125	.125	1.353	.3125	2.5	QDC-4	57.90	QDC-4X	65.50
.188	.188	1.540	.5000	3.0	QDC-5	87.20	QDC-5X	98.95
.219	.219	1.540	.5000	3.0	QDC-6	87.20	QDC-6X	98.95

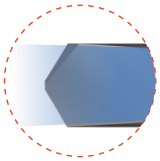
See pgs 16-34 for quick change holder options

QSD

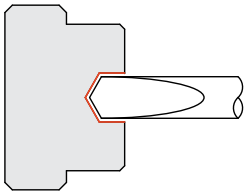
Quick Change – Holemaking Tools

Spade Drills





- Designed for drilling in hardened materials
- Excellent option when requiring holes free of retract marks in non-ferrous materials
- Coolant fed enabled shank design
- Point geometry designed for self-centering
- 118° tip angle
- Coolant fed enabled shank design
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



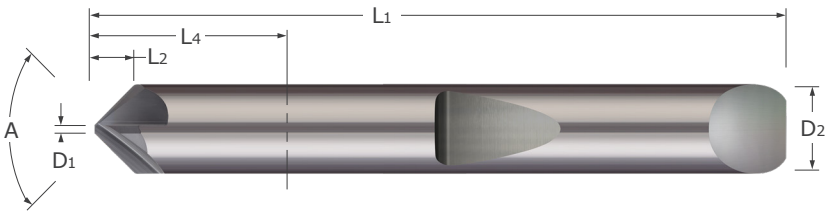
Drill Diameter	Web Thickness	Length From Holder	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0005"	+.001" −.001"	L_4	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0312	.010	.340	.1875	1.25	QSD-031	18.30	QSD-031X	21.25
.0625	.012	.590	.1875	1.50	QSD-062	19.00	QSD-062X	21.95
.0938	.016	.590	.1875	1.50	QSD-093	19.50	QSD-093X	22.55
.1250	.020	.590	.1875	1.50	QSD-125	21.40	QSD-125X	24.55
.1562	.025	1.090	.1875	2.00	QSD-156	23.40		
.1875	.028	1.090	.1875	2.00	QSD-187	27.20	QSD-187X	30.55
.2500	.035	.853	.2500	2.00	QSD-250	36.60	QSD-250X	40.35
.3125	.040	1.353	.3125	2.50	QSD-312	50.70	QSD-312X	54.85
.3750	.046	1.353	.3750	2.50	QSD-375	61.10	QSD-375X	65.75

See pgs 16-34 for quick change holder options

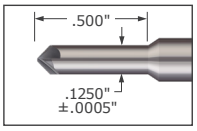
Quick Change – Holemaking Tools

QCS

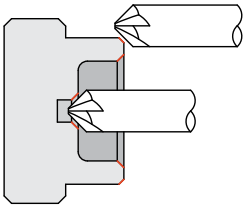
Countersink & Chamfer Tools



- Designed for countersinking and chamfering
- Available in 60°, 82°, 90°, 100°, and 120° included angles
- Tip Diameter (D_1) is non-cutting
- Multi-tooth for greater metal removal rates
- Coolant fed enabled shank design
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



*QCS-125 tools feature a necked down shank



Included Angle	Tip Diameter	Length of Cut	Flutes	Length From Holder	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
A +1° −1°	D1 +.000" −.003"	L2		L4	D2 (h6)	L1	Tool #	Price	Tool #	Price
60°	.030	.082	3	.590	.1875	1.5	QCS-125-060*	35.80	QCS-125-060X*	39.35
	.040	.128	4	1.090	.1875	2.0	QCS-187-060	35.80	QCS-187-060X	39.35
	.050	.173	6	1.353	.2500	2.5	QCS-250-060	40.80	QCS-250-060X	47.05
	.060	.219	6	1.353	.3125	2.5	QCS-312-060	54.80	QCS-312-060X	62.40
	.070	.264	6	1.353	.3750	2.5	QCS-375-060	67.90	QCS-375-060X	77.00
	.080	.364	6	1.540	.5000	3.0	QCS-500-060	94.60	QCS-500-060X	106.90
82°	.030	.055	3	.590	.1875	1.5	QCS-125-082*	35.80	QCS-125-082X*	39.35
	.040	.085	4	1.090	.1875	2.0	QCS-187-082	35.80	QCS-187-082X	39.35
	.050	.115	6	1.353	.2500	2.5	QCS-250-082	40.80	QCS-250-082X	47.10
	.060	.145	6	1.353	.3125	2.5	QCS-312-082	54.80	QCS-312-082X	62.40
	.070	.175	6	1.353	.3750	2.5	QCS-375-082	67.90	QCS-375-082X	77.00
	.080	.242	6	1.540	.5000	3.0	QCS-500-082	94.60	QCS-500-082X	106.90
90°	.030	.047	3	.590	.1875	1.5	QCS-125-090*	35.80	QCS-125-090X*	39.35
	.040	.074	4	1.090	.1875	2.0	QCS-187-090	35.80	QCS-187-090X	39.35
	.050	.100	6	1.353	.2500	2.5	QCS-250-090	40.80	QCS-250-090X	47.05
	.060	.126	6	1.353	.3125	2.5	QCS-312-090	54.80	QCS-312-090X	62.40
	.070	.152	6	1.353	.3750	2.5	QCS-375-090	67.90	QCS-375-090X	77.00
	.080	.210	6	1.540	.5000	3.0	QCS-500-090	94.60	QCS-500-090X	106.90
100°	.030	.040	3	.590	.1875	1.5	QCS-125-100*	35.80	QCS-125-100X*	39.35
	.040	.062	4	1.090	.1875	2.0	QCS-187-100	35.80	QCS-187-100X	39.35
	.050	.084	6	1.353	.2500	2.5	QCS-250-100	40.80	QCS-250-100X	47.05
	.060	.106	6	1.353	.3125	2.5	QCS-312-100	54.80	QCS-312-100X	62.40
	.070	.128	6	1.353	.3750	2.5	QCS-375-100	67.90	QCS-375-100X	77.00
	.080	.176	6	1.540	.5000	3.0	QCS-500-100	94.60	QCS-500-100X	106.90
120°	.030	.027	3	.590	.1875	1.5	QCS-125-120*	35.80	QCS-125-120X*	39.35
	.040	.043	4	1.090	.1875	2.0	QCS-187-120	35.80	QCS-187-120X	39.35
	.050	.058	6	1.353	.2500	2.5	QCS-250-120	40.80	QCS-250-120X	47.10
	.060	.073	6	1.353	.3125	2.5	QCS-312-120	54.80	QCS-312-120X	62.40
	.070	.088	6	1.353	.3750	2.5			QCS-375-120X	77.00
	.080	.121	6	1.540	.5000	3.0	QCS-500-120	94.60	QCS-500-120X	106.90

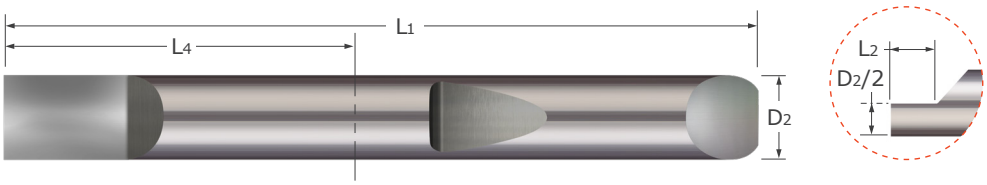
*QCS-125 tools feature a necked down shank

See pgs 16-34 for quick change holder options

QSP

Quick Change – Blanks

Half Round



- Precision ground quick change blank designed for creating custom profiles requiring a split face
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Precision manufactured in the USA

Shank Diameter	Split Length*	Length from Holder	Overall Length	Tool Holder	
D_2 (h6)	L_2 $^{+.005"}_{-.000"}$	L_4	L_1	Tool #	Price
.1875	.375	.590	1.5	QSP-187-1.5	21.90
.1875	.375	1.090	2.0	QSP-187-2.0	23.40
.2500	.375	.853	2.0	QSP-250-2.0	24.90
.2500	.375	1.353	2.5	QSP-250-2.5	27.10
.2500	.375	1.853	3.0	QSP-250-3.0	29.30
.3125	.500	.853	2.0	QSP-312-2.0	33.40
.3125	.500	1.353	2.5	QSP-312-2.5	35.20
.3125	.500	1.853	3.0	QSP-312-3.0	39.40
.3750	.500	.853	2.0	QSP-375-2.0	42.30
.3750	.500	1.353	2.5	QSP-375-2.5	43.80
.3750	.500	1.853	3.0	QSP-375-3.0	47.00
.3750	.500	2.353	3.5	QSP-375-3.5	48.30
.3750	.500	2.853	4.0	QSP-375-4.0	53.60
.5000	.625	1.040	2.5	QSP-500-2.5	59.10
.5000	.625	1.540	3.0	QSP-500-3.0	62.20
.5000	.625	2.040	3.5	QSP-500-3.5	64.70
.5000	.625	2.540	4.0	QSP-500-4.0	68.00
.5000	.625	3.040	4.5	QSP-500-4.5	71.80

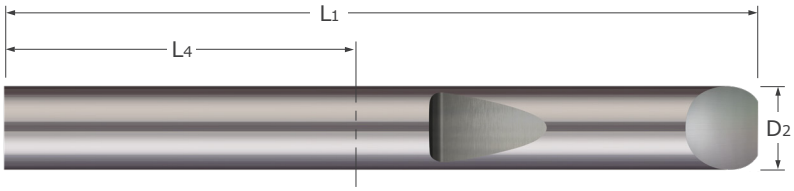
*Centerline +.001" / -.000"

See pgs 16-34 for quick change holder options

Quick Change – Blanks

QSR

Full Round



- Precision ground quick change blank designed for creating custom profiles
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Precision manufactured in the USA

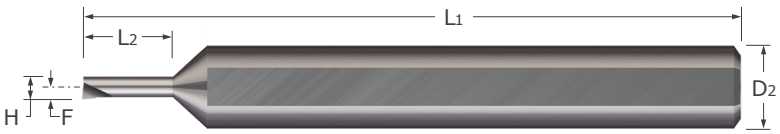
Shank Diameter	Length from Holder	Overall Length	Tool Holder	
D_2 (h6)	L_4	L_1	Tool #	Price
.1875	.590	1.5	QSR-187-1.5	21.90
.1875	1.090	2.0	QSR-187-2.0	23.40
.2500	.853	2.0	QSR-250-2.0	24.90
.2500	1.353	2.5	QSR-250-2.5	27.10
.2500	1.853	3.0	QSR-250-3.0	29.30
.3125	.853	2.0	QSR-312-2.0	33.40
.3125	1.353	2.5	QSR-312-2.5	35.20
.3125	1.853	3.0	QSR-312-3.0	39.40
.3750	.853	2.0	QSR-375-2.0	42.30
.3750	1.353	2.5	QSR-375-2.5	43.80
.3750	1.853	3.0	QSR-375-3.0	47.00
.3750	2.353	3.5	QSR-375-3.5	48.30
.3750	2.853	4.0	QSR-375-4.0	53.60
.5000	1.040	2.5	QSR-500-2.5	59.10
.5000	1.540	3.0	QSR-500-3.0	62.20
.5000	2.040	3.5	QSR-500-3.5	64.70
.5000	2.540	4.0	QSR-500-4.0	68.00
.5000	3.040	4.5	QSR-500-4.5	71.80

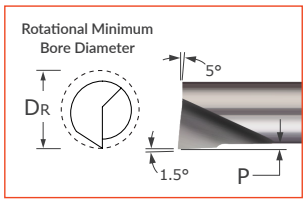
See pgs 16-34 for quick change holder options

MBB / MBBM

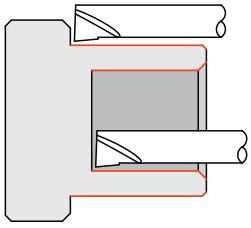
Standard – Boring Tools

Right Hand – Sharp – Miniature





- Designed for facing and boring applications in bores .015" and larger
- Polished face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- On center neck design allows for static and live/rotating applications
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Head Width			Rotational Minimum Bore Diameter	Maximum Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		AlTiN Coated	
H		decimal equiv.	DR	L2 +.010" −.000" +.25mm −.00mm	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.0135		.0135	.015	.050	.0015	.0075	.1250	1.5	MBB-015050	40.70	MBB-015050X	45.10
.0135		.0135	.015	.075	.0015	.0075	.1250	1.5	MBB-015075	40.70	MBB-015075X	45.10
	.45 mm	.0177	0.5 mm	2 mm	.05 mm	.25 mm	3 mm	38 mm	MBBM-005020	32.60		
.0180		.0180	.020	.050	.0020	.0100	.1250	1.5	MBB-020050	40.70	MBB-020050X	45.10
.0180		.0180	.020	.075	.0020	.0100	.1250	1.5	MBB-020075	40.70	MBB-020075X	45.10
.0180		.0180	.020	.100	.0020	.0100	.1250	1.5	MBB-020100	40.70	MBB-020100X	45.10
	.54 mm	.0213	0.6 mm	2.5 mm	.06 mm	.30 mm	3 mm	38 mm	MBBM-006025	32.60		
.0225		.0225	.025	.050	.0025	.0125	.1250	1.5	MBB-025050	35.90	MBB-025050X	40.30
.0225		.0225	.025	.075	.0025	.0125	.1250	1.5	MBB-025075	35.90	MBB-025075X	40.30
.0225		.0225	.025	.100	.0025	.0125	.1250	1.5	MBB-025100	35.90	MBB-025100X	40.25
.0225		.0225	.025	.125	.0025	.0125	.1250	1.5	MBB-025125	35.90	MBB-025125X	40.30
	.63 mm	.0248	0.7 mm	3 mm	.07 mm	.35 mm	3 mm	38 mm	MBBM-007030	32.60		
	.63 mm	.0248	0.7 mm	4 mm	.07 mm	.35 mm	3 mm	38 mm	MBBM-007040	32.60		
.0275		.0275	.030	.075	.0025	.0150	.1250	1.5	MBB-030075	35.90	MBB-030075X	40.30
.0275		.0275	.030	.100	.0025	.0150	.1250	1.5	MBB-030100	35.90	MBB-030100X	40.25
.0275		.0275	.030	.125	.0025	.0150	.1250	1.5	MBB-030125	35.90	MBB-030125X	40.30
.0275		.0275	.030	.150	.0025	.0150	.1250	1.5	MBB-030150	35.90	MBB-030150X	40.30
	.72 mm	.0283	0.8 mm	3 mm	.08 mm	.40 mm	3 mm	38 mm	MBBM-008030	32.60		
	.72 mm	.0283	0.8 mm	4 mm	.08 mm	.40 mm	3 mm	38 mm	MBBM-008040	32.60	MBBM-008040X	37.00
.0320		.0320	.035	.075	.0030	.0175	.1250	1.5	MBB-035075	35.90	MBB-035075X	40.30
.0320		.0320	.035	.100	.0030	.0175	.1250	1.5	MBB-035100	35.90	MBB-035100X	40.25
.0320		.0320	.035	.150	.0030	.0175	.1250	1.5	MBB-035150	35.90	MBB-035150X	40.25
.0320		.0320	.035	.200	.0030	.0175	.1250	1.5	MBB-035200	35.90	MBB-035200X	40.30
	.81 mm	.0317	0.9 mm	4 mm	.09 mm	.45 mm	3 mm	38 mm	MBBM-009040	32.60		
	.81 mm	.0317	0.9 mm	5 mm	.09 mm	0.45 mm	3 mm	38 mm	MBBM-009050	32.60		
	.91 mm	.0357	1 mm	4 mm	.09 mm	0.50 mm	3 mm	38 mm	MBBM-010040	32.60		
.0365		.0365	.040	.100	.0035	.0200	.1250	1.5	MBB-040100	35.90	MBB-040100X	40.25
.0365		.0365	.040	.150	.0035	.0200	.1250	1.5	MBB-040150	35.90	MBB-040150X	40.25
.0365		.0365	.040	.200	.0035	.0200	.1250	1.5	MBB-040200	35.90	MBB-040200X	40.25

Continued on next page

See pgs 39-47 for standard tool holders
See pg 314 for tool set options

Standard – Boring Tools

Right Hand – Sharp – Miniature (cont.)

MBB / MBBM

Continued from previous page

Head Width		Rotational Minimum Bore Diameter	Maximum Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		AlTiN Coated	
H	decimal equiv.	D_R	L_2 +.010" −.000" +.25mm −.00mm	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0405	.0405	.045	.100	.0045	.0225	.1250	1.5	MBB-045100	35.90	MBB-045100X	40.25
.0405	.0405	.045	.150	.0045	.0225	.1250	1.5	MBB-045150	35.90	MBB-045150X	40.25
.0405	.0405	.045	.200	.0045	.0225	.1250	1.5	MBB-045200	35.90	MBB-045200X	40.25
.0440	.0440	.050	.100	.0060	.0250	.1250	1.5	MBB-050100	35.90	MBB-050100X	40.30
.0440	.0440	.050	.150	.0060	.0250	.1250	1.5	MBB-050150	35.90	MBB-050150X	40.25
.0440	.0440	.050	.200	.0060	.0250	.1250	1.5	MBB-050200	35.90	MBB-050200X	40.30
.0440	.0440	.050	.300	.0060	.0250	.1250	1.5	MBB-050300	35.90	MBB-050300X	40.30
.0525	.0525	.060	.150	.0075	.0300	.1250	1.5	MBB-060150	35.90	MBB-060150X	40.25
.0525	.0525	.060	.200	.0075	.0300	.1250	1.5	MBB-060200	35.90	MBB-060200X	40.25
.0525	.0525	.060	.300	.0075	.0300	.1250	1.5	MBB-060300	35.90	MBB-060300X	40.30
.0525	.0525	.060	.400	.0075	.0300	.1250	1.5	MBB-060400	35.90	MBB-060400X	40.30
.0525	.0525	.060	.500	.0075	.0300	.1250	1.5	MBB-060500	35.90	MBB-060500X	40.30
.0625	.0625	.070	.150	.0075	.0350	.1250	1.5	MBB-070150	35.90	MBB-070150X	40.30
.0625	.0625	.070	.200	.0075	.0350	.1250	1.5	MBB-070200	35.90	MBB-070200X	40.25
.0625	.0625	.070	.300	.0075	.0350	.1250	1.5	MBB-070300	35.90	MBB-070300X	40.25
.0625	.0625	.070	.400	.0075	.0350	.1250	1.5	MBB-070400	35.90	MBB-070400X	40.30
.0625	.0625	.070	.500	.0075	.0350	.1250	1.5	MBB-070500	35.90	MBB-070500X	40.30
.0700	.0700	.080	.150	.0100	.0400	.1250	1.5	MBB-080150	35.90	MBB-080150X	40.25
.0700	.0700	.080	.200	.0100	.0400	.1250	1.5	MBB-080200	35.90	MBB-080200X	40.25
.0700	.0700	.080	.300	.0100	.0400	.1250	1.5	MBB-080300	35.90	MBB-080300X	40.30
.0700	.0700	.080	.500	.0100	.0400	.1250	1.5	MBB-080500	35.90	MBB-080500X	40.30
.0700	.0700	.080	.600	.0100	.0400	.1250	1.5	MBB-080600	35.90	MBB-080600X	40.30
.0800	.0800	.090	.200	.0100	.0450	.1250	1.5	MBB-090200	35.90	MBB-090200X	40.30
.0800	.0800	.090	.300	.0100	.0450	.1250	1.5	MBB-090300	35.90	MBB-090300X	40.25
.0800	.0800	.090	.500	.0100	.0450	.1250	1.5	MBB-090500	35.90	MBB-090500X	40.30
.0800	.0800	.090	.700	.0100	.0450	.1250	1.5	MBB-090700	35.90	MBB-090700X	40.30
.0875	.0875	.100	.200	.0125	.0500	.1250	1.5	MBB-100200	35.90	MBB-100200X	40.25
.0875	.0875	.100	.300	.0125	.0500	.1250	1.5	MBB-100300	35.90	MBB-100300X	40.25
.0875	.0875	.100	.500	.0125	.0500	.1250	1.5	MBB-100500	35.90	MBB-100500X	40.30
.0875	.0875	.100	.700	.0125	.0500	.1250	1.5	MBB-100700	35.90	MBB-100700X	40.30
.0875	.0875	.100	.800	.0125	.0500	.1250	2.0	MBB-100800	35.90	MBB-100800X	40.30

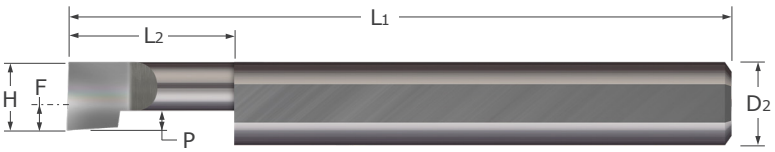
See pgs 39-47 for standard tool holders

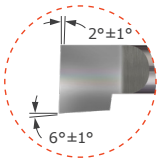
See pg 314 for tool set options

BBS / BBM

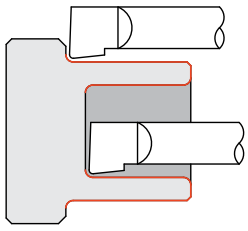
Standard – Boring Tools

Right Hand – Sharp





- Designed for facing and boring applications in bores .044" and larger
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- Coating options provide added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



	Head Width		Min. Bore Dia*	Max. Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
	H	decimal equiv.	L2 +.050" −.000" +1.24mm −.00mm		P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price
	1 mm	.0394	1.12 mm	4 mm	.25 mm	-1 mm	4 mm	50 mm	BBM-040104	25.80	BBM-040104G	29.25	BBM-040104X	30.15
	1 mm	.0394	1.12 mm	6 mm	.25 mm	-1 mm	4 mm	50 mm	BBM-040106	25.80	BBM-040106G	29.25	BBM-040106X	30.15
	1 mm	.0394	1.12 mm	8 mm	.25 mm	-1 mm	4 mm	50 mm	BBM-040108	25.80	BBM-040108G	29.25	BBM-040108X	30.15
	.050	.0500	.0550	.150	.012	-.0125	.1250	1.5	BB-050150S	26.30	BB-050150SG	29.55	BB-050150SX	30.25
	.050	.0500	.0550	.200	.012	-.0125	.1250	1.5	BB-050200S	26.30	BB-050200SG	29.55	BB-050200SX	30.25
NEW	.050	.0500	.0550	.250	.012	-.0125	.1250	1.5	BB-050250S	26.30	BB-050250SG	29.40	BB-050250SX	30.50
	.050	.0500	.0550	.300	.012	-.0125	.1250	1.5	BB-050300S	26.30	BB-050300SG	29.55	BB-050300SX	30.25
	.050	.0500	.0550	.400	.012	-.0125	.1250	1.5	BB-050400S	26.30	BB-050400SG	29.55	BB-050400SX	30.25
	.060	.0600	.0700	.150	.015	-.0025	.1250	1.5	BB-060150S	26.30	BB-060150SG	29.55	BB-060150SX	30.25
	.060	.0600	.0700	.200	.015	-.0025	.1250	1.5	BB-060200S	26.30	BB-060200SG	29.55	BB-060200SX	30.25
NEW	.060	.0600	.0700	.250	.015	-.0025	.1250	1.5	BB-060250S	26.30	BB-060250SG	29.40	BB-060250SX	30.50
	.060	.0600	.0700	.300	.015	-.0025	.1250	1.5	BB-060300S	26.30	BB-060300SG	29.55	BB-060300SX	30.25
	.060	.0600	.0700	.400	.015	-.0025	.1250	1.5	BB-060400S	26.30	BB-060400SG	29.55	BB-060400SX	30.25
	.060	.0600	.0700	.500	.015	-.0025	.1250	1.5	BB-060500S	26.30	BB-060500SG	29.55	BB-060500SX	30.25
	.070	.0700	.0800	.150	.015	.0075	.1250	1.5	BB-070150S	26.30			BB-070150SX	30.25
	.070	.0700	.0800	.200	.015	.0075	.1250	1.5	BB-070200S	26.30			BB-070200SX	30.25
	.070	.0700	.0800	.300	.015	.0075	.1250	1.5	BB-070300S	26.30			BB-070300SX	30.25
	2 mm	.0787	2.25 mm	4 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040204	25.80	BBM-040204G	29.25	BBM-040204X	30.15
	2 mm	.0787	2.25 mm	6 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040206	25.80	BBM-040206G	29.25	BBM-040206X	30.15
	2 mm	.0787	2.25 mm	8 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040208	25.80	BBM-040208G	29.25		
	2 mm	.0787	2.25 mm	10 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040210	25.80			BBM-040210X	30.15
	2 mm	.0787	2.25 mm	13 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040213	25.80	BBM-040213G	29.25	BBM-040213X	30.15
	.080	.0800	.0900	.150	.020	.0175	.1250	1.5	BB-080150S	26.30	BB-080150SG	29.55	BB-080150SX	30.25
	.080	.0800	.0900	.200	.020	.0175	.1250	1.5	BB-080200S	26.30	BB-080200SG	29.55	BB-080200SX	30.25
	.080	.0800	.0900	.300	.020	.0175	.1250	1.5	BB-080300S	26.30	BB-080300SG	29.55	BB-080300SX	30.25
	.080	.0800	.0900	.400	.020	.0175	.1250	1.5	BB-080400S	26.30	BB-080400SG	29.55	BB-080400SX	30.25
	.080	.0800	.0900	.500	.020	.0175	.1250	1.5	BB-080500S	26.30	BB-080500SG	29.55	BB-080500SX	30.25
	.080	.0800	.0900	.600	.020	.0175	.1250	1.5	BB-080600S	26.30	BB-080600SG	29.55	BB-080600SX	30.25

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

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See pgs 39-47 for standard tool holders

NEW!

Standard – Boring Tools

Right Hand – Sharp (cont.)

BBS / BBM

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Head Width		Min. Bore Dia*	Max. Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated		
H	decimal equiv.	L2 +.050" −.000" +1.24mm −.00mm		P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price	
.090	.0900	.1000	.150	.020	.0275	.1250	1.5	BB-090150S	26.30	BB-090150SG	30.65	BB-090150SX	30.70	
.090	.0900	.1000	.200	.020	.0275	.1250	1.5	BB-090200S	26.30	BB-090200SG	30.65	BB-090200SX	30.70	
.090	.0900	.1000	.300	.020	.0275	.1250	1.5	BB-090300S	26.30			BB-090300SX	30.25	
.090	.0900	.1000	.400	.020	.0275	.1250	1.5	BB-090400S	26.30	BB-090400SG	30.65	BB-090400SX	30.70	
.090	.0900	.1000	.500	.020	.0275	.1250	1.5	BB-090500S	26.30	BB-090500SG	30.65	BB-090500SX	30.70	
.100	.1000	.1100	.150	.025	.0375	.1250	1.5	BB-100150S	26.30	BB-100150SG	29.55	BB-100150SX	30.25	
.100	.1000	.1100	.200	.025	.0375	.1250	1.5	BB-100200S	26.30	BB-100200SG	29.55	BB-100200SX	30.25	
.100	.1000	.1100	.300	.025	.0375	.1250	1.5	BB-100300S	26.30	BB-100300SG	29.55	BB-100300SX	30.25	
.100	.1000	.1100	.400	.025	.0375	.1250	1.5	BB-100400S	26.30	BB-100400SG	29.55	BB-100400SX	30.25	
.100	.1000	.1100	.500	.025	.0375	.1250	1.5	BB-100500S	26.30	BB-100500SG	29.55	BB-100500SX	30.25	
.100	.1000	.1100	.600	.025	.0375	.1250	1.5	BB-100600S	26.30	BB-100600SG	29.55	BB-100600SX	30.25	
.100	.1000	.1100	.700	.025	.0375	.1250	1.5	BB-100700S	26.30	BB-100700SG	29.55	BB-100700SX	30.25	
.100	.1000	.1100	.800	.025	.0375	.1250	2.0	BB-100800S	27.30	BB-100800SG	30.50	BB-100800SX	31.80	NEW
.110	.1100	.1220	.150	.027	.0475	.1250	1.5	BB-110150S	26.30	BB-110150SG	29.55	BB-110150SX	30.25	
.110	.1100	.1220	.200	.027	.0475	.1250	1.5	BB-110200S	26.30	BB-110200SG	29.55	BB-110200SX	30.25	
.110	.1100	.1220	.300	.027	.0475	.1250	1.5	BB-110300S	26.30	BB-110300SG	29.55	BB-110300SX	30.25	
.110	.1100	.1220	.400	.027	.0475	.1250	1.5	BB-110400S	26.30	BB-110400SG	29.55	BB-110400SX	30.25	
.110	.1100	.1220	.500	.027	.0475	.1250	1.5	BB-110500S	26.30	BB-110500SG	29.55	BB-110500SX	30.25	
.110	.1100	.1220	.600	.027	.0475	.1250	1.5	BB-110600S	26.30	BB-110600SG	29.55	BB-110600SX	30.25	
.110	.1100	.1220	.700	.027	.0475	.1250	1.5	BB-110700S	26.30	BB-110700SG	29.55	BB-110700SX	30.25	
3 mm	.1181	3.3 mm	8 mm	.75 mm	1 mm	4 mm	50 mm	BBM-040308	25.80			BBM-040308X	30.15	
3 mm	.1181	3.3 mm	10 mm	.75 mm	1 mm	4 mm	50 mm	BBM-040310	25.80	BBM-040310G	29.25			
3 mm	.1181	3.3 mm	13 mm	.75 mm	1 mm	4 mm	50 mm	BBM-040313	25.80	BBM-040313G	29.25	BBM-040313X	30.15	
3 mm	.1181	3.3 mm	15 mm	.75 mm	1 mm	4 mm	50 mm	BBM-040315	25.80	BBM-040315G	29.25	BBM-040315X	30.15	
3 mm	.1181	3.3 mm	20 mm	.75 mm	1 mm	4 mm	50 mm	BBM-040320	25.80	BBM-040320G	29.25	BBM-040320X	30.15	
.120	.1200	.1320	.250	.030	.0263	.1875	2.0	BB-120250S	28.10	BB-120250SG	31.65	BB-120250SX	32.55	
.120	.1200	.1320	.350	.030	.0263	.1875	2.0	BB-120350S	28.10	BB-120350SG	31.65	BB-120350SX	32.55	
.120	.1200	.1320	.500	.030	.0263	.1875	2.0	BB-120500S	28.10	BB-120500SG	31.65	BB-120500SX	32.55	
.120	.1200	.1320	.600	.030	.0263	.1875	2.0	BB-120600S	28.10	BB-120600SG	31.65	BB-120600SX	32.55	
.120	.1200	.1320	.700	.030	.0263	.1875	2.0	BB-120700S	28.10	BB-120700SG	31.65	BB-120700SX	32.55	
.120	.1200	.1320	.800	.030	.0263	.1875	2.0	BB-120800S	28.10	BB-120800SG	31.65	BB-120800SX	32.55	
.120	.1200	.1320	1.000	.030	.0263	.1875	2.0	BB-1201000S	28.10	BB-1201000SG	31.70	BB-1201000SX	33.20	NEW
.140	.1400	.1520	.250	.035	.0463	.1875	2.0	BB-140250S	28.10	BB-140250SG	31.65	BB-140250SX	32.55	
.140	.1400	.1520	.400	.035	.0463	.1875	2.0	BB-140400S	28.10	BB-140400SG	31.65	BB-140400SX	32.55	
.140	.1400	.1520	.500	.035	.0463	.1875	2.0	BB-140500S	28.10	BB-140500SG	31.65	BB-140500SX	32.55	
.140	.1400	.1520	.600	.035	.0463	.1875	2.0	BB-140600S	28.10	BB-140600SG	31.65	BB-140600SX	32.55	
.140	.1400	.1520	.700	.035	.0463	.1875	2.0	BB-140700S	28.10			BB-140700SX	32.55	
.140	.1400	.1520	.750	.035	.0463	.1875	2.0	BB-140750S	28.10	BB-140750SG	31.65	BB-140750SX	32.55	
.140	.1400	.1520	.800	.035	.0463	.1875	2.0	BB-140800S	28.10	BB-140800SG	31.65	BB-140800SX	32.55	
.140	.1400	.1520	.900	.035	.0463	.1875	2.0	BB-140900S	28.10	BB-140900SG	33.05	BB-140900SX	33.10	
4 mm	.1575	4.4 mm	8 mm	1 mm	2 mm	4 mm	50 mm	BBM-040408	25.80			BBM-040408X	30.15	
4 mm	.1575	4.4 mm	10 mm	1 mm	2 mm	4 mm	50 mm	BBM-040410	25.80	BBM-040410G	29.25	BBM-040410X	30.15	
4 mm	.1575	4.4 mm	15 mm	1 mm	2 mm	4 mm	50 mm	BBM-040415	25.80	BBM-040415G	29.25	BBM-040415X	30.15	
4 mm	.1575	4.4 mm	20 mm	1 mm	2 mm	4 mm	50 mm	BBM-040420	25.80	BBM-040420G	29.25			
4 mm	.1575	4.4 mm	25 mm	1 mm	2 mm	4 mm	50 mm	BBM-040425	25.80			BBM-040425X	30.15	

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

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See pgs 39-47 for standard tool holders

BBS / BBM

Standard – Boring Tools

Right Hand – Sharp (cont.)

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	Head Width		Min. Bore Dia*	Max. Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
	H	decimal equiv.	L2	+.050" −.000" +1.24mm −.00mm	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price
	.160	.1600	.1760	.250	.040	.0663	.1875	2.0	BB-160250S	28.10	BB-160250SG	31.65	BB-160250SX	32.55
	.160	.1600	.1760	.400	.040	.0663	.1875	2.0	BB-160400S	28.10	BB-160400SG	31.65	BB-160400SX	32.55
	.160	.1600	.1760	.500	.040	.0663	.1875	2.0	BB-160500S	28.10	BB-160500SG	31.65	BB-160500SX	32.55
	.160	.1600	.1760	.600	.040	.0663	.1875	2.0	BB-160600S	28.10	BB-160600SG	31.65	BB-160600SX	32.55
	.160	.1600	.1760	.750	.040	.0663	.1875	2.0	BB-160750S	28.10	BB-160750SG	31.65	BB-160750SX	32.55
	.160	.1600	.1760	.900	.040	.0663	.1875	2.0	BB-160900S	28.10	BB-160900SG	31.65	BB-160900SX	32.55
	.160	.1600	.1760	1.000	.040	.0663	.1875	2.0	BB-1601000S	28.10	BB-1601000SG	31.65	BB-1601000SX	32.55
NEW	.160	.1600	.1760	1.250	.040	.0663	.1875	2.5	BB-1601250S	29.10	BB-1601250SG	32.70	BB-1601250SX	34.20
	.180	.1800	.1960	.350	.045	.0550	.2500	2.5	BB-180350S	30.30	BB-180350SG	35.35	BB-180350SX	36.70
	.180	.1800	.1960	.500	.045	.0550	.2500	2.5	BB-180500S	30.30	BB-180500SG	35.35	BB-180500SX	36.70
	.180	.1800	.1960	.600	.045	.0550	.2500	2.5	BB-180600S	30.30	BB-180600SG	35.35	BB-180600SX	36.70
	.180	.1800	.1960	.750	.045	.0550	.2500	2.5	BB-180750S	30.30	BB-180750SG	35.35	BB-180750SX	36.70
	.180	.1800	.1960	.900	.045	.0550	.2500	2.5	BB-180900S	30.30	BB-180900SG	35.35	BB-180900SX	36.70
	.180	.1800	.1960	1.000	.045	.0550	.2500	2.5	BB-1801000S	30.30	BB-1801000SG	35.35	BB-1801000SX	36.70
	.180	.1800	.1960	1.100	.045	.0550	.2500	2.5	BB-1801100S	30.30	BB-1801100SG	35.35	BB-1801100SX	36.70
	.180	.1800	.1960	1.250	.045	.0550	.2500	2.5	BB-1801250S	30.30	BB-1801250SG	35.35	BB-1801250SX	36.70
	.180	.1800	.1960	1.500	.045	.0550	.2500	2.5	BB-1801500S	30.30	BB-1801500SG	35.35	BB-1801500SX	36.70
	5 mm	.1969	5.4 mm	10 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060510	28.90	BBM-060510G	33.85		
	5 mm	.1969	5.4 mm	15 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060515	28.90	BBM-060515G	33.85		
	5 mm	.1969	5.4 mm	20 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060520	28.90	BBM-060520G	33.85	BBM-060520X	35.20
	5 mm	.1969	5.4 mm	25 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060525	28.90				
	5 mm	.1969	5.4 mm	28 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060528	28.90	BBM-060528G	33.85	BBM-060528X	35.20
	.200	.2000	.2160	.400	.050	.0750	.2500	2.5	BB-200400S	30.30	BB-200400SG	35.35	BB-200400SX	36.70
	.200	.2000	.2160	.500	.050	.0750	.2500	2.5	BB-200500S	30.30	BB-200500SG	35.35	BB-200500SX	36.70
	.200	.2000	.2160	.600	.050	.0750	.2500	2.5	BB-200600S	30.30	BB-200600SG	35.35	BB-200600SX	36.70
	.200	.2000	.2160	.700	.050	.0750	.2500	2.5	BB-200700S	30.30	BB-200700SG	35.35	BB-200700SX	36.70
	.200	.2000	.2160	.800	.050	.0750	.2500	2.5	BB-200800S	30.30	BB-200800SG	35.35	BB-200800SX	36.70
	.200	.2000	.2160	.900	.050	.0750	.2500	2.5	BB-200900S	30.30	BB-200900SG	35.35	BB-200900SX	36.70
	.200	.2000	.2160	1.000	.050	.0750	.2500	2.5	BB-2001000S	30.30	BB-2001000SG	35.35	BB-2001000SX	36.70
	.200	.2000	.2160	1.100	.050	.0750	.2500	2.5	BB-2001100S	30.30			BB-2001100SX	36.70
	.200	.2000	.2160	1.200	.050	.0750	.2500	2.5	BB-2001200S	30.30				
	.200	.2000	.2160	1.300	.050	.0750	.2500	2.5	BB-2001300S	30.30			BB-2001300SX	36.70

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

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See pgs 39-47 for standard tool holders

NEW!

Standard – Boring Tools

Right Hand – Sharp (cont.)

BBS / BBM

Continued from previous page

Head Width		Min. Bore Dia*	Max. Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
H	decimal equiv.	L_2 +.050" −.000" +1.24mm −.00mm		P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	Tool #	Price
.230	.2300	.2500	.400	.057	.0738	.3125	2.5	BB-230400S	41.60	BB-230400SG	48.95	BB-230400SX	49.20
.230	.2300	.2500	.500	.057	.0738	.3125	2.5	BB-230500S	41.60	BB-230500SG	48.95	BB-230500SX	49.20
.230	.2300	.2500	.600	.057	.0738	.3125	2.5	BB-230600S	41.60	BB-230600SG	48.95	BB-230600SX	49.20
.230	.2300	.2500	.700	.057	.0738	.3125	2.5	BB-230700S	41.60	BB-230700SG	48.95	BB-230700SX	49.20
.230	.2300	.2500	.800	.057	.0738	.3125	2.5	BB-230800S	41.60	BB-230800SG	48.95	BB-230800SX	49.20
.230	.2300	.2500	.900	.057	.0738	.3125	2.5	BB-230900S	41.60	BB-230900SG	48.95	BB-230900SX	49.20
.230	.2300	.2500	1.000	.057	.0738	.3125	2.5	BB-2301000S	41.60	BB-2301000SG	48.95	BB-2301000SX	49.20
.230	.2300	.2500	1.100	.057	.0738	.3125	2.5	BB-2301100S	41.60	BB-2301100SG	48.95	BB-2301100SX	49.20
.230	.2300	.2500	1.150	.057	.0738	.3125	2.5	BB-2301150S	41.60	BB-2301150SG	48.95	BB-2301150SX	49.20
.230	.2300	.2500	1.200	.057	.0738	.3125	2.5	BB-2301200S	41.60	BB-2301200SG	48.95	BB-2301200SX	49.20
.230	.2300	.2500	1.250	.057	.0738	.3125	2.5	BB-2301250S	41.60	BB-2301250SG	48.95	BB-2301250SX	49.20
.230	.2300	.2500	1.400	.057	.0738	.3125	2.5	BB-2301400S	41.60	BB-2301400SG	48.95	BB-2301400SX	49.20
.230	.2300	.2500	1.500	.057	.0738	.3125	2.5	BB-2301500S	41.60	BB-2301500SG	48.95	BB-2301500SX	49.20
.230	.2300	.2500	1.600	.057	.0738	.3125	2.5	BB-2301600S	41.60	BB-2301600SG	48.95	BB-2301600SX	49.20
6 mm	.2362	6.5 mm	10 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060610	28.90	BBM-060610G	33.85		
6 mm	.2362	6.5 mm	15 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060615	28.90	BBM-060615G	33.85		
6 mm	.2362	6.5 mm	20 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060620	28.90			BBM-060620X	35.20
6 mm	.2362	6.5 mm	25 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060625	28.90	BBM-060625G	33.85	BBM-060625X	35.20
6 mm	.2362	6.5 mm	30 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060630	28.90	BBM-060630G	33.85		
6 mm	.2362	6.5 mm	35 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060635	28.90	BBM-060635G	33.85		
6 mm	.2362	6.5 mm	38 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060638	28.90	BBM-060638G	33.85	BBM-060638X	35.20
.260	.2600	.2800	.500	.065	.1038	.3125	2.5	BB-260500S	41.60	BB-260500SG	49.05	BB-260500SX	49.20
.260	.2600	.2800	.750	.065	.1038	.3125	2.5	BB-260750S	41.60	BB-260750SG	49.05	BB-260750SX	49.20
.260	.2600	.2800	1.000	.065	.1038	.3125	2.5	BB-2601000S	41.60	BB-2601000SG	49.05	BB-2601000SX	49.20
.260	.2600	.2800	1.250	.065	.1038	.3125	2.5	BB-2601250S	41.60	BB-2601250SG	49.05	BB-2601250SX	49.20
7 mm	.2755	7.5 mm	15 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080715	39.40	BBM-080715G	46.65	BBM-080715X	48.40
7 mm	.2755	7.5 mm	20 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080720	39.40				
7 mm	.2755	7.5 mm	25 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080725	39.40				
7 mm	.2755	7.5 mm	32 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080732	39.40	BBM-080732G	46.65		
7 mm	.2755	7.5 mm	38 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080738	39.40	BBM-080738G	46.65		
7 mm	.2755	7.5 mm	46 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080746	39.40	BBM-080746G	46.65	BBM-080746X	48.40
.290	.2900	.3100	.500	.072	.1338	.3125	2.5	BB-290500S	41.60	BB-290500SG	48.95	BB-290500SX	49.20
.290	.2900	.3100	.600	.072	.1338	.3125	2.5	BB-290600S	41.60	BB-290600SG	48.95	BB-290600SX	49.20
.290	.2900	.3100	.750	.072	.1338	.3125	2.5	BB-290750S	41.60	BB-290750SG	48.95	BB-290750SX	49.20
.290	.2900	.3100	.900	.072	.1338	.3125	2.5	BB-290900S	41.60	BB-290900SG	48.95	BB-290900SX	49.20
.290	.2900	.3100	1.000	.072	.1338	.3125	2.5	BB-2901000S	41.60	BB-2901000SG	48.95	BB-2901000SX	49.20
.290	.2900	.3100	1.100	.072	.1338	.3125	2.5	BB-2901100S	41.60	BB-2901100SG	48.95	BB-2901100SX	49.20
.290	.2900	.3100	1.250	.072	.1338	.3125	2.5	BB-2901250S	41.60	BB-2901250SG	48.95	BB-2901250SX	49.20
.290	.2900	.3100	1.350	.072	.1338	.3125	2.5	BB-2901350S	41.60	BB-2901350SG	48.95		
.290	.2900	.3100	1.500	.072	.1338	.3125	2.5	BB-2901500S	41.60	BB-2901500SG	48.95	BB-2901500SX	49.20
.290	.2900	.3100	1.600	.072	.1338	.3125	2.5	BB-2901600S	41.60	BB-2901600SG	48.95	BB-2901600SX	49.20
.290	.2900	.3100	1.750	.072	.1338	.3125	2.5	BB-2901750S	41.60	BB-2901750SG	48.95	BB-2901750SX	49.20

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

BBS / BBM

Standard – Boring Tools

Right Hand – Sharp (cont.)

Continued from previous page

Head Width		Min. Bore Dia*	Max. Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
H	decimal equiv.	L2 +.050" −.000" +1.24mm −.00mm		P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price
8 mm	.3150	8.5 mm	13 mm	2 mm	4 mm	8 mm	63 mm	BBM-080813	39.40	BBM-080813G	46.65	BBM-080813X	48.40
8 mm	.3150	8.5 mm	20 mm	2 mm	4 mm	8 mm	63 mm	BBM-080820	39.40	BBM-080820G	46.65		
8 mm	.3150	8.5 mm	25 mm	2 mm	4 mm	8 mm	63 mm	BBM-080825	39.40	BBM-080825G	46.65	BBM-080825X	48.40
8 mm	.3150	8.5 mm	32 mm	2 mm	4 mm	8 mm	63 mm	BBM-080832	39.40	BBM-080832G	46.65		
8 mm	.3150	8.5 mm	38 mm	2 mm	4 mm	8 mm	63 mm	BBM-080838	39.40	BBM-080838G	46.65	BBM-080838X	48.40
8 mm	.3150	8.5 mm	46 mm	2 mm	4 mm	8 mm	63 mm	BBM-080846	39.40	BBM-080846G	46.65		
8 mm	.3150	8.5 mm	50 mm	2 mm	4 mm	8 mm	63 mm	BBM-080850	39.40	BBM-080850G	46.65		
.320	.3200	.3400	.500	.080	.1325	.3750	2.5	BB-320500S	57.20	BB-320500SG	65.15	BB-320500SX	66.20
.320	.3200	.3400	.600	.080	.1325	.3750	2.5	BB-320600S	57.20	BB-320600SG	65.15	BB-320600SX	66.20
.320	.3200	.3400	.750	.080	.1325	.3750	2.5	BB-320750S	57.20	BB-320750SG	65.15	BB-320750SX	66.20
.320	.3200	.3400	.900	.080	.1325	.3750	2.5	BB-320900S	57.20				
.320	.3200	.3400	1.000	.080	.1325	.3750	2.5	BB-3201000S	57.20	BB-3201000SG	65.15	BB-3201000SX	66.20
.320	.3200	.3400	1.100	.080	.1325	.3750	2.5	BB-3201100S	57.20	BB-3201100SG	65.15		
.320	.3200	.3400	1.250	.080	.1325	.3750	2.5	BB-3201250S	57.20	BB-3201250SG	65.15	BB-3201250SX	66.20
.320	.3200	.3400	1.500	.080	.1325	.3750	2.5	BB-3201500S	57.20	BB-3201500SG	65.15	BB-3201500SX	66.20
.320	.3200	.3400	1.600	.080	.1325	.3750	2.5	BB-3201600S	57.20	BB-3201600SG	65.15	BB-3201600SX	66.20
.320	.3200	.3400	1.800	.080	.1325	.3750	2.5	BB-3201800S	57.20	BB-3201800SG	65.15	BB-3201800SX	66.20
.320	.3200	.3400	2.000	.080	.1325	.3750	4.0	BB-3202000S	73.50	BB-3202000SG	83.05	BB-3202000SX	83.20
.320	.3200	.3400	2.500	.080	.1325	.3750	4.0	BB-3202500S	73.50	BB-3202500SG	83.05	BB-3202500SX	83.20
.320	.3200	.3400	3.000	.080	.1325	.3750	4.0	BB-3203000S	73.50			BB-3203000SX	83.20
9 mm	.3543	9.5 mm	25 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100925	59.70	BBM-100925G	67.85		
9 mm	.3543	9.5 mm	32 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100932	59.70	BBM-100932G	67.85		
9 mm	.3543	9.5 mm	38 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100938	59.70	BBM-100938G	67.85		
9 mm	.3543	9.5 mm	46 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100946	59.70	BBM-100946G	67.85		
9 mm	.3543	9.5 mm	50 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100950	59.70				
.360	.3600	.3800	.500	.090	.1725	.3750	2.5	BB-360500S	57.20	BB-360500SG	65.15	BB-360500SX	66.20
.360	.3600	.3800	.600	.090	.1725	.3750	2.5	BB-360600S	57.20	BB-360600SG	65.15	BB-360600SX	66.20
.360	.3600	.3800	.750	.090	.1725	.3750	2.5	BB-360750S	57.20	BB-360750SG	65.15	BB-360750SX	66.20
.360	.3600	.3800	.900	.090	.1725	.3750	2.5	BB-360900S	57.20	BB-360900SG	65.15	BB-360900SX	66.20
.360	.3600	.3800	1.000	.090	.1725	.3750	2.5	BB-3601000S	57.20	BB-3601000SG	65.15	BB-3601000SX	66.20
.360	.3600	.3800	1.150	.090	.1725	.3750	2.5	BB-3601150S	57.20	BB-3601150SG	65.15	BB-3601150SX	66.20
.360	.3600	.3800	1.250	.090	.1725	.3750	2.5	BB-3601250S	57.20	BB-3601250SG	65.15	BB-3601250SX	66.20
.360	.3600	.3800	1.500	.090	.1725	.3750	2.5	BB-3601500S	57.20	BB-3601500SG	65.15	BB-3601500SX	66.20
.360	.3600	.3800	1.600	.090	.1725	.3750	2.5	BB-3601600S	57.20	BB-3601600SG	65.15	BB-3601600SX	66.20
.360	.3600	.3800	1.800	.090	.1725	.3750	2.5	BB-3601800S	57.20	BB-3601800SG	65.15	BB-3601800SX	66.20
.360	.3600	.3800	2.000	.090	.1725	.3750	4.0	BB-3602000S	73.50	BB-3602000SG	83.05	BB-3602000SX	83.20
.360	.3600	.3800	2.500	.090	.1725	.3750	4.0	BB-3602500S	73.50	BB-3602500SG	83.05		
.360	.3600	.3800	3.000	.090	.1725	.3750	4.0	BB-3603000S	73.50			BB-3603000SX	83.20
10 mm	.3937	10.5 mm	15 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101015	59.70	BBM-101015G	67.85		
10 mm	.3937	10.5 mm	20 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101020	59.70	BBM-101020G	67.85		
10 mm	.3937	10.5 mm	25 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101025	59.70	BBM-101025G	67.85		
10 mm	.3937	10.5 mm	32 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101032	59.70	BBM-101032G	67.85		
10 mm	.3937	10.5 mm	38 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101038	59.70	BBM-101038G	67.85		
10 mm	.3937	10.5 mm	50 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101050	59.70	BBM-101050G	67.85	BBM-101050X	69.95

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

NEW!

Standard – Boring Tools

Right Hand – Sharp (cont.)

BBS / BBM

Continued from previous page

Head Width		Min. Bore Dia*	Max. Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
H	decimal equiv.	L2 +.050" −.000" +1.24mm −.00mm		P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price
11 mm	.4331	11.5 mm	15 mm	2.75 mm	5 mm	12 mm	83 mm	BBM-121115	75.30				
11 mm	.4331	11.5 mm	38 mm	2.75 mm	5 mm	12 mm	83 mm	BBM-121138	75.30				
11 mm	.4331	11.5 mm	50 mm	2.75 mm	5 mm	12 mm	83 mm	BBM-121150	75.30	BBM-121150G	86.45		
12 mm	.4724	12.5 mm	20 mm	3 mm	6 mm	12 mm	83 mm	BBM-121220	75.30				
12 mm	.4724	12.5 mm	32 mm	3 mm	6 mm	12 mm	83 mm	BBM-121232	75.30	BBM-121232G	86.45		
12 mm	.4724	12.5 mm	46 mm	3 mm	6 mm	12 mm	83 mm	BBM-121246	75.30	BBM-121246G	86.45		
12 mm	.4724	12.5 mm	60 mm	3 mm	6 mm	12 mm	83 mm	BBM-121260	75.30	BBM-121260G	86.45		
.490	.4900	.5100	.750	.122	.2400	.5000	3.0	BB-490750S	80.30	BB-490750SG	90.15	BB-490750SX	92.60
.490	.4900	.5100	1.000	.122	.2400	.5000	3.0	BB-4901000S	80.30			BB-4901000SX	92.60
.490	.4900	.5100	1.250	.122	.2400	.5000	3.0	BB-4901250S	80.30			BB-4901250SX	92.60
.490	.4900	.5100	1.500	.122	.2400	.5000	3.0	BB-4901500S	80.30			BB-4901500SX	92.60
.490	.4900	.5100	2.000	.122	.2400	.5000	4.0	BB-4902000S	88.10	BB-4902000SG	99.75	BB-4902000SX	101.30
.490	.4900	.5100	2.500	.122	.2400	.5000	4.0	BB-4902500S	88.10	BB-4902500SG	99.75	BB-4902500SX	101.30
.490	.4900	.5100	2.750	.122	.2400	.5000	4.0	BB-4902750S	88.10	BB-4902750SG	99.75	BB-4902750SX	101.30
.490	.4900	.5100	3.000	.122	.2400	.5000	6.0	BB-4903000S	111.20				
.490	.4900	.5100	3.500	.122	.2400	.5000	6.0	BB-4903500S	111.20			BB-4903500SX	126.50
.490	.4900	.5100	4.000	.122	.2400	.5000	6.0	BB-4904000S	111.20			BB-4904000SX	126.50
.490	.4900	.5100	4.500	.122	.2400	.5000	6.0	BB-4904500S	111.20				

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Technical Resources on Micro100.com

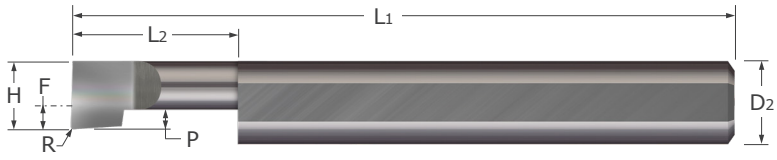
Find Simulation Files, Speeds & Feeds, Torque Recommendations, Programs, Blogs, and more at micro100.com/resources

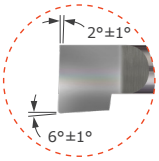
SCAN

See pgs 39-47 for standard tool holders

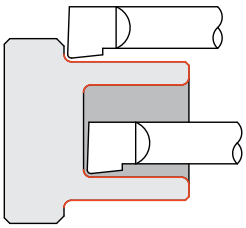
BB

Standard – Boring Tools
Right Hand





- Designed for facing and boring applications in bores .055" and larger
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Corner radius profile
- Lockdown flat automatically locates tool on center
- Coating options provide added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



	Head Width	Minimum Bore Dia.*	Max. Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
	H		L_2 +.050" −.000"	R +.003" −.000"	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	Tool #	Price
	.050	.055	.150	.003	.012	-.0125	.1250	1.5	BB-050150	28.00	BB-050150G	31.25	BB-050150X	31.95
	.050	.055	.200	.003	.012	-.0125	.1250	1.5	BB-050200	28.00	BB-050200G	31.25	BB-050200X	31.95
NEW	.050	.055	.250	.003	.012	-.0125	.1250	1.5	BB3-050250	28.00	BB3-050250G	31.10	BB3-050250X	32.20
	.050	.055	.300	.003	.012	-.0125	.1250	1.5	BB-050300	28.00	BB-050300G	31.25	BB-050300X	31.95
	.050	.055	.400	.003	.012	-.0125	.1250	1.5	BB-050400	28.00	BB-050400G	31.25	BB-050400X	31.95
	.060	.070	.150	.003	.015	-.0025	.1250	1.5	BB-060150	28.00	BB-060150G	31.25	BB-060150X	31.95
	.060	.070	.200	.003	.015	-.0025	.1250	1.5	BB-060200	28.00	BB-060200G	31.25	BB-060200X	31.95
NEW	.060	.070	.250	.003	.015	-.0025	.1250	1.5	BB3-060250	28.00	BB3-060250G	31.10	BB3-060250X	32.20
	.060	.070	.300	.003	.015	-.0025	.1250	1.5	BB-060300	28.00	BB-060300G	31.25	BB-060300X	31.95
	.060	.070	.400	.003	.015	-.0025	.1250	1.5	BB-060400	28.00	BB-060400G	31.25	BB-060400X	31.95
	.060	.070	.500	.003	.015	-.0025	.1250	1.5	BB-060500	28.00	BB-060500G	31.25	BB-060500X	31.95
	.070	.080	.150	.003	.015	.0075	.1250	1.5	BB-070150	28.00			BB-070150X	31.95
	.070	.080	.200	.003	.015	.0075	.1250	1.5	BB-070200	28.00			BB-070200X	31.95
	.070	.080	.300	.003	.015	.0075	.1250	1.5	BB-070300	28.00			BB-070300X	31.95
	.080	.090	.150	.003	.020	.0175	.1250	1.5	BB-080150	28.00	BB-080150G	31.25	BB-080150X	31.95
	.080	.090	.200	.003	.020	.0175	.1250	1.5	BB-080200	28.00	BB-080200G	31.25	BB-080200X	31.95
	.080	.090	.300	.003	.020	.0175	.1250	1.5	BB-080300	28.00	BB-080300G	31.25	BB-080300X	31.95
	.080	.090	.400	.003	.020	.0175	.1250	1.5	BB-080400	28.00	BB-080400G	31.25	BB-080400X	31.95
	.080	.090	.500	.003	.020	.0175	.1250	1.5	BB-080500	28.00	BB-080500G	31.25	BB-080500X	31.95
	.080	.090	.600	.003	.020	.0175	.1250	1.5	BB-080600	28.00	BB-080600G	31.25	BB-080600X	31.95
	.090	.100	.150	.003	.020	.0275	.1250	1.5	BB3-090150	28.00	BB3-090150G	32.35	BB3-090150X	32.40
	.090	.100	.200	.003	.020	.0275	.1250	1.5	BB3-090200	28.00	BB3-090200G	32.35	BB3-090200X	32.40
	.090	.100	.300	.003	.020	.0275	.1250	1.5	BB-090300	28.00			BB-090300X	31.95
	.090	.100	.400	.003	.020	.0275	.1250	1.5	BB3-090400	28.00	BB3-090400G	32.35	BB3-090400X	32.40
	.090	.100	.500	.003	.020	.0275	.1250	1.5	BB3-090500	28.00	BB3-090500G	32.35	BB3-090500X	32.40
	.100	.110	.150	.003	.025	.0375	.1250	1.5	BB-100150	28.00	BB-100150G	31.25	BB-100150X	31.95
	.100	.110	.200	.003	.025	.0375	.1250	1.5	BB-100200	28.00	BB-100200G	31.25	BB-100200X	31.95
	.100	.110	.300	.003	.025	.0375	.1250	1.5	BB-100300	28.00	BB-100300G	31.25	BB-100300X	31.95
	.100	.110	.400	.003	.025	.0375	.1250	1.5	BB-100400	28.00	BB-100400G	31.25	BB-100400X	31.95
	.100	.110	.500	.003	.025	.0375	.1250	1.5	BB-100500	28.00	BB-100500G	31.25	BB-100500X	31.95
	.100	.110	.600	.003	.025	.0375	.1250	1.5	BB-100600	28.00	BB-100600G	31.25	BB-100600X	31.95
	.100	.110	.700	.003	.025	.0375	.1250	1.5	BB-100700	28.00	BB-100700G	31.25	BB-100700X	31.95
NEW	.100	.110	.800	.003	.025	.0375	.1250	2.0	BB3-100800	29.40	BB3-100800G	32.60	BB3-100800X	33.90

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

NEW!

Standard – Boring Tools

Right Hand (cont.)

BB

Continued from previous page

Head Width	Minimum Bore Dia.*	Max. Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated		
H		L_2 $^{+.050"}_{-.000"}$	R $^{+.003"}_{-.000"}$	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	Tool #	Price	
.110	.122	.150	.003	.027	.0475	.1250	1.5	BB-110150	28.00	BB-110150G	31.25	BB-110150X	31.95	
.110	.122	.200	.003	.027	.0475	.1250	1.5	BB-110200	28.00	BB-110200G	31.25	BB-110200X	31.95	
.110	.122	.300	.003	.027	.0475	.1250	1.5	BB-110300	28.00	BB-110300G	31.25	BB-110300X	31.95	
.110	.122	.400	.003	.027	.0475	.1250	1.5	BB-110400	28.00	BB-110400G	31.25	BB-110400X	31.95	
.110	.122	.500	.003	.027	.0475	.1250	1.5	BB-110500	28.00	BB-110500G	31.25	BB-110500X	31.95	
.110	.122	.600	.003	.027	.0475	.1250	1.5	BB-110600	28.00	BB-110600G	31.25	BB-110600X	31.95	
.110	.122	.700	.003	.027	.0475	.1250	1.5	BB-110700	28.00	BB-110700G	31.25	BB-110700X	31.95	
.110	.122	.800	.003	.027	.0475	.1250	2.0	BB3-110800	29.40	BB3-110800G	32.60	BB3-110800X	33.90	NEW
H		L_2 $^{+.050"}_{-.000"}$	R $^{+.002"}_{-.000"}$	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	Tool #	Price	
.120	.132	.250	.003	.030	.0263	.1875	2.0	BB3-120250	29.70	BB3-120250G	34.65	BB3-120250X	34.70	
.120	.132	.250	.006	.030	.0263	.1875	2.0	BB-120250	29.70	BB-120250G	33.35	BB-120250X	34.25	
.120	.132	.350	.003	.030	.0263	.1875	2.0	BB3-120350	29.70	BB3-120350G	34.65	BB3-120350X	34.70	
.120	.132	.350	.006	.030	.0263	.1875	2.0	BB-120350	29.70	BB-120350G	33.35	BB-120350X	34.25	
.120	.132	.500	.003	.030	.0263	.1875	2.0	BB3-120500	29.70	BB3-120500G	34.65	BB3-120500X	34.70	
.120	.132	.500	.006	.030	.0263	.1875	2.0	BB-120500	29.70	BB-120500G	33.35	BB-120500X	34.25	
.120	.132	.600	.003	.030	.0263	.1875	2.0	BB3-120600	29.70	BB3-120600G	34.65	BB3-120600X	34.70	
.120	.132	.600	.006	.030	.0263	.1875	2.0	BB-120600	29.70	BB-120600G	33.35	BB-120600X	34.25	
.120	.132	.700	.003	.030	.0263	.1875	2.0	BB3-120700	29.70	BB3-120700G	34.65	BB3-120700X	34.70	
.120	.132	.700	.006	.030	.0263	.1875	2.0	BB-120700	29.70	BB-120700G	33.35	BB-120700X	34.25	
.120	.132	.800	.003	.030	.0263	.1875	2.0	BB3-120800	29.70	BB3-120800G	34.65	BB3-120800X	34.70	
.120	.132	.800	.006	.030	.0263	.1875	2.0	BB-120800	29.70	BB-120800G	33.35	BB-120800X	34.25	
.140	.152	.250	.003	.035	.0463	.1875	2.0	BB3-140250	29.70	BB3-140250G	34.65	BB3-140250X	34.70	
.140	.152	.250	.006	.035	.0463	.1875	2.0	BB-140250	29.70	BB-140250G	33.35	BB-140250X	34.25	
.140	.152	.400	.003	.035	.0463	.1875	2.0	BB3-140400	29.70	BB3-140400G	34.65	BB3-140400X	34.70	
.140	.152	.400	.006	.035	.0463	.1875	2.0	BB-140400	29.70	BB-140400G	33.35	BB-140400X	34.25	
.140	.152	.500	.003	.035	.0463	.1875	2.0	BB3-140500	29.70	BB3-140500G	34.65	BB3-140500X	34.70	
.140	.152	.500	.006	.035	.0463	.1875	2.0	BB-140500	29.70	BB-140500G	33.35	BB-140500X	34.25	
.140	.152	.600	.003	.035	.0463	.1875	2.0	BB3-140600	29.70	BB3-140600G	34.65	BB3-140600X	34.70	
.140	.152	.600	.006	.035	.0463	.1875	2.0	BB-140600	29.70	BB-140600G	33.35	BB-140600X	34.25	
.140	.152	.700	.003	.035	.0463	.1875	2.0	BB3-140700	29.70	BB3-140700G	34.70	BB3-140700X	34.70	
.140	.152	.700	.006	.035	.0463	.1875	2.0	BB-140700	29.70	BB-140700G	33.35	BB-140700X	34.25	
.140	.152	.750	.003	.035	.0463	.1875	2.0	BB3-140750	29.70	BB3-140750G	34.65	BB3-140750X	34.70	
.140	.152	.750	.006	.035	.0463	.1875	2.0	BB-140750	29.70	BB-140750G	33.35	BB-140750X	34.25	
.140	.152	.800	.003	.035	.0463	.1875	2.0	BB3-140800	29.70	BB3-140800G	34.65	BB3-140800X	34.70	
.140	.152	.800	.006	.035	.0463	.1875	2.0	BB-140800	29.70	BB-140800G	33.35	BB-140800X	34.25	
.140	.152	.900	.003	.035	.0463	.1875	2.0	BB3-140900	29.70	BB3-140900G	34.65	BB3-140900X	34.70	
.140	.152	.900	.006	.035	.0463	.1875	2.0	BB6-140900	29.70	BB6-140900G	34.65	BB6-140900X	34.70	
.160	.176	.250	.003	.040	.0663	.1875	2.0	BB3-160250	29.70	BB3-160250G	34.65	BB3-160250X	34.70	
.160	.176	.250	.006	.040	.0663	.1875	2.0	BB-160250	29.70	BB-160250G	33.35	BB-160250X	34.25	
.160	.176	.400	.003	.040	.0663	.1875	2.0	BB3-160400	29.70	BB3-160400G	34.65	BB3-160400X	34.70	
.160	.176	.400	.006	.040	.0663	.1875	2.0	BB-160400	29.70	BB-160400G	33.35	BB-160400X	34.25	
.160	.176	.500	.003	.040	.0663	.1875	2.0	BB3-160500	29.70	BB3-160500G	34.65	BB3-160500X	34.70	
.160	.176	.500	.006	.040	.0663	.1875	2.0	BB-160500	29.70	BB-160500G	33.35	BB-160500X	34.25	
.160	.176	.600	.003	.040	.0663	.1875	2.0	BB3-160600	29.70	BB3-160600G	34.70	BB3-160600X	34.70	
.160	.176	.600	.006	.040	.0663	.1875	2.0	BB-160600	29.70	BB-160600G	33.35	BB-160600X	34.25	
.160	.176	.700	.003	.040	.0663	.1875	2.0	BB3-160700	29.70	BB3-160700G	34.65	BB3-160700X	34.70	

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

BB

Standard – Boring Tools

Right Hand (cont.)

Continued from previous page

	Head Width	Minimum Bore Dia.*	Max. Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
	H		L_2 +.050" −.000"	R +.002" −.000"	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	Tool #	Price
	.160	.176	.700	.006	.040	.0663	.1875	2.0	BB6-160700	29.70	BB6-160700G	34.70	BB6-160700X	34.70
	.160	.176	.750	.003	.040	.0663	.1875	2.0	BB3-160750	29.70	BB3-160750G	34.65	BB3-160750X	34.70
	.160	.176	.750	.006	.040	.0663	.1875	2.0	BB-160750	29.70	BB-160750G	33.35	BB-160750X	34.25
	.160	.176	.800	.003	.040	.0663	.1875	2.0	BB3-160800	29.70	BB3-160800G	34.70	BB3-160800X	34.70
	.160	.176	.800	.006	.040	.0663	.1875	2.0	BB6-160800	29.70	BB6-160800G	34.70	BB6-160800X	34.70
	.160	.176	.900	.003	.040	.0663	.1875	2.0	BB3-160900	29.70	BB3-160900G	34.65	BB3-160900X	34.70
	.160	.176	.900	.006	.040	.0663	.1875	2.0	BB-160900	29.70	BB-160900G	33.35	BB-160900X	34.25
	.160	.176	1.000	.003	.040	.0663	.1875	2.0	BB3-1601000	29.70	BB3-1601000G	34.65	BB3-1601000X	34.70
	.160	.176	1.000	.006	.040	.0663	.1875	2.0	BB-1601000	29.70	BB-1601000G	33.35	BB-1601000X	34.25
NEW	.160	.176	1.250	.006	.040	.0663	.1875	2.5	BB6-1601250	31.10	BB6-1601250G	34.70	BB6-1601250X	36.20
	.180	.196	.350	.006	.045	.0550	.2500	2.5	BB-180350	32.10	BB-180350G	37.25	BB-180350X	38.40
	.180	.196	.500	.006	.045	.0550	.2500	2.5	BB-180500	32.10	BB-180500G	37.25	BB-180500X	38.40
	.180	.196	.600	.006	.045	.0550	.2500	2.5	BB-180600	32.10	BB-180600G	37.25	BB-180600X	38.40
	.180	.196	.750	.006	.045	.0550	.2500	2.5	BB-180750	32.10	BB-180750G	37.25	BB-180750X	38.40
	.180	.196	.900	.006	.045	.0550	.2500	2.5	BB-180900	32.10	BB-180900G	37.25	BB-180900X	38.40
	.180	.196	1.000	.006	.045	.0550	.2500	2.5	BB-1801000	32.10	BB-1801000G	37.25	BB-1801000X	38.40
	.180	.196	1.100	.006	.045	.0550	.2500	2.5	BB-1801100	32.10	BB-1801100G	37.25	BB-1801100X	38.40
	.180	.196	1.250	.006	.045	.0550	.2500	2.5	BB-1801250	32.10	BB-1801250G	37.25	BB-1801250X	38.40
	.180	.196	1.500	.006	.045	.0550	.2500	2.5	BB-1801500	32.10	BB-1801500G	37.25	BB-1801500X	38.40
	.200	.216	.400	.006	.050	.0750	.2500	2.5	BB-200400	32.10	BB-200400G	37.25	BB-200400X	38.40
	.200	.216	.500	.006	.050	.0750	.2500	2.5	BB-200500	32.10	BB-200500G	37.25	BB-200500X	38.40
	.200	.216	.600	.006	.050	.0750	.2500	2.5	BB-200600	32.10	BB-200600G	37.25	BB-200600X	38.40
	.200	.216	.700	.006	.050	.0750	.2500	2.5	BB-200700	32.10	BB-200700G	37.25	BB-200700X	38.40
	.200	.216	.750	.006	.050	.0750	.2500	2.5	BB6-200750	32.10	BB6-200750G	38.35	BB6-200750X	38.40
	.200	.216	.800	.006	.050	.0750	.2500	2.5	BB-200800	32.10	BB-200800G	37.25	BB-200800X	38.40
	.200	.216	.900	.006	.050	.0750	.2500	2.5	BB-200900	32.10	BB-200900G	37.25	BB-200900X	38.40
	.200	.216	1.000	.006	.050	.0750	.2500	2.5	BB-2001000	32.10	BB-2001000G	37.25	BB-2001000X	38.40
	.200	.216	1.100	.006	.050	.0750	.2500	2.5	BB-2001100	32.10			BB-2001100X	38.40
	.200	.216	1.200	.006	.050	.0750	.2500	2.5	BB-2001200	32.10	BB-2001200G	37.25	BB-2001200X	38.40
	.200	.216	1.300	.006	.050	.0750	.2500	2.5	BB-2001300	32.10	BB-2001300G	37.25	BB-2001300X	38.40
	.200	.216	1.500	.006	.050	.0750	.2500	2.5	BB6-2001500	32.10	BB6-2001500G	38.35	BB6-2001500X	38.40
	.230	.250	.400	.006	.057	.0738	.3125	2.5	BB-230400	43.10	BB-230400G	50.45	BB-230400X	50.70
	.230	.250	.500	.006	.057	.0738	.3125	2.5	BB-230500	43.10	BB-230500G	50.45	BB-230500X	50.70
	.230	.250	.600	.006	.057	.0738	.3125	2.5	BB-230600	43.10	BB-230600G	50.45	BB-230600X	50.70
	.230	.250	.700	.006	.057	.0738	.3125	2.5	BB-230700	43.10	BB-230700G	50.45	BB-230700X	50.70
	.230	.250	.750	.006	.057	.0738	.3125	2.5	BB6-230750	43.10	BB6-230750G	50.55	BB6-230750X	50.70
	.230	.250	.800	.006	.057	.0738	.3125	2.5	BB-230800	43.10	BB-230800G	50.45	BB-230800X	50.70
	.230	.250	.900	.006	.057	.0738	.3125	2.5	BB-230900	43.10	BB-230900G	50.45	BB-230900X	50.70
	.230	.250	1.000	.006	.057	.0738	.3125	2.5	BB-2301000	43.10	BB-2301000G	50.45	BB-2301000X	50.70
	.230	.250	1.100	.006	.057	.0738	.3125	2.5	BB-2301100	43.10	BB-2301100G	50.45	BB-2301100X	50.70
	.230	.250	1.150	.006	.057	.0738	.3125	2.5	BB-2301150	43.10	BB-2301150G	50.45	BB-2301150X	50.70
	.230	.250	1.200	.006	.057	.0738	.3125	2.5	BB-2301200	43.10	BB-2301200G	50.45	BB-2301200X	50.70
	.230	.250	1.250	.006	.057	.0738	.3125	2.5	BB-2301250	43.10	BB-2301250G	50.45	BB-2301250X	50.70
	.230	.250	1.400	.006	.057	.0738	.3125	2.5	BB-2301400	43.10	BB-2301400G	50.45	BB-2301400X	50.70
	.230	.250	1.500	.006	.057	.0738	.3125	2.5	BB-2301500	43.10	BB-2301500G	50.45	BB-2301500X	50.70
	.230	.250	1.600	.006	.057	.0738	.3125	2.5	BB-2301600	43.10	BB-2301600G	50.45	BB-2301600X	50.70
NEW	.230	.250	1.750	.006	.057	.0738	.3125	3.0	BB6-2301750	44.40	BB6-2301750G	50.00	BB6-2301750X	52.00

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

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See pgs 39-47 for standard tool holders

NEW!

Standard – Boring Tools

Right Hand (cont.)

BB

Continued from previous page

Head Width	Minimum Bore Dia.*	Max. Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated		
H		L_2 $^{+.050"}_{-.000"}$	R $^{+.002"}_{-.000"}$	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	Tool #	Price	
.260	.280	.400	.006	.065	.1038	.3125	2.5	BB6-260400	43.10	BB6-260400G	50.55	BB6-260400X	50.70	
.260	.280	.500	.006	.065	.1038	.3125	2.5	BB6-260500	43.10	BB6-260500G	50.55	BB6-260500X	50.70	
.260	.280	.600	.006	.065	.1038	.3125	2.5	BB6-260600	43.10	BB6-260600G	50.55	BB6-260600X	50.70	
.260	.280	.700	.006	.065	.1038	.3125	2.5	BB6-260700	43.10	BB6-260700G	50.55	BB6-260700X	50.70	
.260	.280	.750	.006	.065	.1038	.3125	2.5	BB6-260750	43.10	BB6-260750G	50.55	BB6-260750X	50.70	
.260	.280	.800	.006	.065	.1038	.3125	2.5	BB6-260800	43.10	BB6-260800G	50.55	BB6-260800X	50.70	
.260	.280	.900	.006	.065	.1038	.3125	2.5	BB6-260900	43.10	BB6-260900G	50.55	BB6-260900X	50.70	
.260	.280	1.000	.006	.065	.1038	.3125	2.5	BB6-2601000	43.10	BB6-2601000G	50.55	BB6-2601000X	50.70	
.260	.280	1.250	.006	.065	.1038	.3125	2.5	BB6-2601250	43.10	BB6-2601250G	50.55	BB6-2601250X	50.70	
.290	.310	.500	.006	.072	.1338	.3125	2.5	BB-290500	43.10	BB-290500G	50.45	BB-290500X	50.70	
.290	.310	.600	.006	.072	.1338	.3125	2.5	BB-290600	43.10	BB-290600G	50.45	BB-290600X	50.70	
.290	.310	.750	.006	.072	.1338	.3125	2.5	BB-290750	43.10	BB-290750G	50.45	BB-290750X	50.70	
.290	.310	.900	.006	.072	.1338	.3125	2.5	BB-290900	43.10	BB-290900G	50.45	BB-290900X	50.70	
.290	.310	1.000	.006	.072	.1338	.3125	2.5	BB-2901000	43.10	BB-2901000G	50.45	BB-2901000X	50.70	
.290	.310	1.100	.006	.072	.1338	.3125	2.5	BB-2901100	43.10	BB-2901100G	50.45	BB-2901100X	50.70	
.290	.310	1.250	.006	.072	.1338	.3125	2.5	BB-2901250	43.10	BB-2901250G	50.45	BB-2901250X	50.70	
.290	.310	1.350	.006	.072	.1338	.3125	2.5	BB-2901350	43.10	BB-2901350G	50.45	BB-2901350X	50.70	
.290	.310	1.500	.006	.072	.1338	.3125	2.5	BB-2901500	43.10	BB-2901500G	50.45	BB-2901500X	50.70	
.290	.310	1.600	.006	.072	.1338	.3125	2.5	BB-2901600	43.10	BB-2901600G	50.45	BB-2901600X	50.70	
.290	.310	1.750	.006	.072	.1338	.3125	2.5	BB-2901750	43.10	BB-2901750G	50.45	BB-2901750X	50.70	
.290	.310	2.000	.006	.072	.1338	.3125	3.0	BB6-2902000	44.40	BB6-2902000G	50.00	BB6-2902000X	52.20	NEW
.320	.340	.500	.006	.080	.1325	.3750	2.5	BB-320500	58.80	BB-320500G	66.75	BB-320500X	67.80	
.320	.340	.600	.006	.080	.1325	.3750	2.5	BB-320600	58.80	BB-320600G	66.75	BB-320600X	67.80	
.320	.340	.750	.006	.080	.1325	.3750	2.5	BB-320750	58.80	BB-320750G	66.75	BB-320750X	67.80	
.320	.340	.900	.006	.080	.1325	.3750	2.5	BB-320900	58.80	BB-320900G	66.75	BB-320900X	67.80	
.320	.340	1.000	.006	.080	.1325	.3750	2.5	BB-3201000	58.80	BB-3201000G	66.75	BB-3201000X	67.80	
.320	.340	1.100	.006	.080	.1325	.3750	2.5	BB-3201100	58.80	BB-3201100G	66.75	BB-3201100X	67.80	
.320	.340	1.250	.006	.080	.1325	.3750	2.5	BB-3201250	58.80	BB-3201250G	66.75	BB-3201250X	67.80	
.320	.340	1.500	.006	.080	.1325	.3750	2.5	BB-3201500	58.80	BB-3201500G	66.75	BB-3201500X	67.80	
.320	.340	1.600	.006	.080	.1325	.3750	2.5	BB-3201600	58.80	BB-3201600G	66.75	BB-3201600X	67.80	
.320	.340	1.800	.006	.080	.1325	.3750	2.5	BB-3201800	58.80	BB-3201800G	66.75	BB-3201800X	67.80	
.320	.340	2.000	.006	.080	.1325	.3750	4.0	BB-3202000	75.10	BB-3202000G	84.75	BB-3202000X	84.90	
.320	.340	2.500	.006	.080	.1325	.3750	4.0	BB-3202500	75.10	BB-3202500G	84.75	BB-3202500X	84.90	
.320	.340	3.000	.006	.080	.1325	.3750	4.0	BB-3203000	75.10			BB-3203000X	84.90	
.360	.380	.500	.006	.090	.1725	.3750	2.5	BB-360500	58.80	BB-360500G	66.75	BB-360500X	67.80	
.360	.380	.600	.006	.090	.1725	.3750	2.5	BB-360600	58.80	BB-360600G	66.75	BB-360600X	67.80	
.360	.380	.750	.006	.090	.1725	.3750	2.5	BB-360750	58.80	BB-360750G	66.75	BB-360750X	67.80	
.360	.380	.900	.006	.090	.1725	.3750	2.5	BB-360900	58.80	BB-360900G	66.75	BB-360900X	67.80	
.360	.380	1.000	.006	.090	.1725	.3750	2.5	BB-3601000	58.80	BB-3601000G	66.75	BB-3601000X	67.80	
.360	.380	1.150	.006	.090	.1725	.3750	2.5	BB-3601150	58.80	BB-3601150G	66.75	BB-3601150X	67.80	
.360	.380	1.250	.006	.090	.1725	.3750	2.5	BB-3601250	58.80	BB-3601250G	66.75	BB-3601250X	67.80	
.360	.380	1.500	.006	.090	.1725	.3750	2.5	BB-3601500	58.80	BB-3601500G	66.75	BB-3601500X	67.80	
.360	.380	1.600	.006	.090	.1725	.3750	2.5	BB-3601600	58.80	BB-3601600G	66.75	BB-3601600X	67.80	
.360	.380	1.800	.006	.090	.1725	.3750	2.5	BB-3601800	58.80	BB-3601800G	66.75	BB-3601800X	67.80	
.360	.380	2.000	.006	.090	.1725	.3750	4.0	BB-3602000	75.10	BB-3602000G	84.75	BB-3602000X	84.90	
.360	.380	2.500	.006	.090	.1725	.3750	4.0	BB-3602500	75.10	BB-3602500G	84.75	BB-3602500X	84.90	
.360	.380	3.000	.006	.090	.1725	.3750	4.0	BB-3603000	75.10	BB-3603000G	84.75	BB-3603000X	84.90	

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

BB

Standard – Boring Tools
Right Hand (cont.)

Continued from previous page

Head Width	Minimum Bore Dia.*	Max. Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
H		L_2 $^{+.050"}_{-.000"}$	R $^{+.002"}_{-.000"}$	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	Tool #	Price
.410	.430	.750	.006	.104	.1600	.5000	3.0	BB6-410750	81.90	BB6-410750G	93.95	BB6-410750X	94.20
.410	.430	1.000	.006	.104	.1600	.5000	3.0	BB6-4101000	81.90	BB6-4101000G	93.95	BB6-4101000X	94.20
.410	.430	1.250	.006	.104	.1600	.5000	3.0	BB6-4101250	81.90	BB6-4101250G	93.95	BB6-4101250X	94.20
.410	.430	1.500	.006	.104	.1600	.5000	3.0	BB6-4101500	81.90	BB6-4101500G	93.95	BB6-4101500X	94.20
.460	.480	1.000	.006	.115	.2100	.5000	3.0	BB6-4601000	81.90	BB6-4601000G	93.95	BB6-4601000X	94.20
.460	.480	1.500	.006	.115	.2100	.5000	3.0	BB6-4601500	81.90	BB6-4601500G	93.95	BB6-4601500X	94.20
.460	.480	2.000	.006	.115	.2100	.5000	3.0	BB6-4602000	81.90	BB6-4602000G	93.95	BB6-4602000X	94.20
.490	.510	.750	.006	.122	.2400	.5000	3.0	BB-490750	81.90	BB-490750G	91.85	BB-490750X	94.20
.490	.510	1.000	.006	.122	.2400	.5000	3.0	BB-4901000	81.90	BB-4901000G	91.85	BB-4901000X	94.20
.490	.510	1.250	.006	.122	.2400	.5000	3.0	BB-4901250	81.90	BB-4901250G	91.85	BB-4901250X	94.20
.490	.510	1.500	.006	.122	.2400	.5000	3.0	BB-4901500	81.90			BB-4901500X	94.20
.490	.510	2.000	.006	.122	.2400	.5000	4.0	BB-4902000	89.80	BB-4902000G	101.45	BB-4902000X	102.90
.490	.510	2.500	.006	.122	.2400	.5000	4.0	BB-4902500	89.80	BB-4902500G	101.45	BB-4902500X	102.90
.490	.510	2.750	.006	.122	.2400	.5000	4.0	BB-4902750	89.80	BB-4902750G	101.45	BB-4902750X	102.90
.490	.510	3.000	.006	.122	.2400	.5000	6.0	BB-4903000	112.70	BB-4903000G	127.75	BB-4903000X	128.00
.490	.510	3.500	.006	.122	.2400	.5000	6.0	BB-4903500	112.70			BB-4903500X	128.00
.490	.510	4.000	.006	.122	.2400	.5000	6.0	BB-4904000	112.70			BB-4904000X	128.00
.490	.510	4.500	.006	.122	.2400	.5000	6.0	BB-4904500	112.70			BB-4904500X	128.00

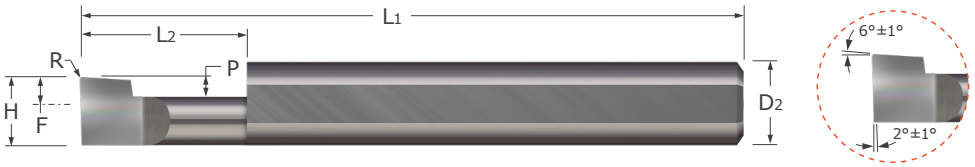
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pgs 39-47 for standard tool holders

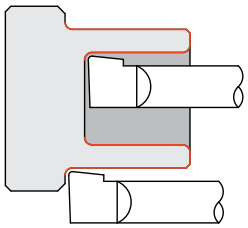
Standard – Boring Tools

Left Hand

BBL



- Designed for left hand facing and boring applications
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Corner radius profile
- Lockdown flat automatically locates tool on center
- Coating options provide added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
H		L2 +.050" −.000"	R +.003" −.000"	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price
.050	.055	.150	.003	.012	-.0125	.1250	1.5	BBL-050150	28.00			BBL-050150X	31.95
.050	.055	.200	.003	.012	-.0125	.1250	1.5	BBL-050200	28.00				
.050	.055	.400	.003	.012	-.0125	.1250	1.5	BBL-050400	28.00			BBL-050400X	31.95
.060	.070	.150	.003	.015	-.0025	.1250	1.5	BBL-060150	28.00				
.060	.070	.200	.003	.015	-.0025	.1250	1.5	BBL-060200	28.00			BBL-060200X	31.95
.060	.070	.300	.003	.015	-.0025	.1250	1.5	BBL-060300	28.00			BBL-060300X	31.95
.080	.090	.150	.003	.020	.0175	.1250	1.5			BBL-080150G	31.25		
.080	.090	.200	.003	.020	.0175	.1250	1.5	BBL-080200	28.00			BBL-080200X	31.95
.080	.090	.300	.003	.020	.0175	.1250	1.5	BBL-080300	28.00				
.080	.090	.400	.003	.020	.0175	.1250	1.5	BBL-080400	28.00	BBL-080400G	31.25	BBL-080400X	31.95
.080	.090	.500	.003	.020	.0175	.1250	1.5	BBL-080500	28.00	BBL-080500G	31.25	BBL-080500X	31.95
.100	.110	.150	.003	.025	.0375	.1250	1.5	BBL-100150	28.00				
.100	.110	.300	.003	.025	.0375	.1250	1.5			BBL-100300G	31.25		
.100	.110	.500	.003	.025	.0375	.1250	1.5	BBL-100500	28.00	BBL-100500G	31.25	BBL-100500X	31.95
.100	.110	.600	.003	.025	.0375	.1250	1.5	BBL-100600	28.00				
.100	.110	.700	.003	.025	.0375	.1250	1.5	BBL-100700	28.00			BBL-100700X	31.95
.110	.122	.150	.003	.027	.0475	.1250	1.5	BBL-110150	28.00			BBL-110150X	31.95
.110	.122	.200	.003	.027	.0475	.1250	1.5			BBL-110200G	31.25		
.110	.122	.300	.003	.027	.0475	.1250	1.5	BBL-110300	28.00				
.110	.122	.400	.003	.027	.0475	.1250	1.5	BBL-110400	28.00				
.110	.122	.600	.003	.027	.0475	.1250	1.5	BBL-110600	28.00				
.110	.122	.700	.003	.027	.0475	.1250	1.5	BBL-110700	28.00				

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

BBL

Standard – Boring Tools
Left Hand (cont.)

Continued from previous page

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
H		L_2 $^{+.050"}_{-.000"}$	R $^{+.002"}_{-.000"}$	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	Tool #	Price
.120	.132	.250	.006	.030	.0263	.1875	2.0	BBL-120250	29.70			BBL-120250X	34.25
.120	.132	.500	.006	.030	.0263	.1875	2.0	BBL-120500	29.70			BBL-120500X	34.25
.120	.132	.600	.006	.030	.0263	.1875	2.0	BBL-120600	29.70			BBL-120600X	34.25
.120	.132	.700	.006	.030	.0263	.1875	2.0	BBL-120700	29.70				
.140	.152	.250	.006	.035	.0463	.1875	2.0	BBL-140250	29.70	BBL-140250G	33.35	BBL-140250X	34.25
.140	.152	.400	.006	.035	.0463	.1875	2.0					BBL-140400X	34.25
.140	.152	.500	.006	.035	.0463	.1875	2.0	BBL-140500	29.70			BBL-140500X	34.25
.140	.152	.600	.006	.035	.0463	.1875	2.0	BBL-140600	29.70				
.140	.152	.700	.006	.035	.0463	.1875	2.0	BBL-140700	29.70				
.140	.152	.800	.006	.035	.0463	.1875	2.0	BBL-140800	29.70				
.160	.176	.500	.006	.040	.0663	.1875	2.0	BBL-160500	29.70			BBL-160500X	34.25
.160	.176	.600	.006	.040	.0663	.1875	2.0	BBL-160600	29.70			BBL-160600X	34.25
.160	.176	.750	.006	.040	.0663	.1875	2.0	BBL-160750	29.70				
.160	.176	.900	.006	.040	.0663	.1875	2.0	BBL-160900	29.70	BBL-160900G	33.35	BBL-160900X	34.25
.160	.176	1.000	.006	.040	.0663	.1875	2.0	BBL-1601000	29.70			BBL-1601000X	34.25
.180	.196	.350	.006	.045	.0550	.2500	2.5	BBL-180350	32.10			BBL-180350X	38.40
.180	.196	.500	.006	.045	.0550	.2500	2.5	BBL-180500	32.10			BBL-180500X	38.40
.180	.196	.600	.006	.045	.0550	.2500	2.5	BBL-180600	32.10	BBL-180600G	37.25	BBL-180600X	38.40
.180	.196	.750	.006	.045	.0550	.2500	2.5	BBL-180750	32.10	BBL-180750G	37.25		
.180	.196	.900	.006	.045	.0550	.2500	2.5	BBL-180900	32.10			BBL-180900X	38.40
.180	.196	1.000	.006	.045	.0550	.2500	2.5	BBL-1801000	32.10			BBL-1801000X	38.40
.180	.196	1.100	.006	.045	.0550	.2500	2.5	BBL-1801100	32.10				
.180	.196	1.500	.006	.045	.0550	.2500	2.5	BBL-1801500	32.10			BBL-1801500X	38.40
.200	.216	.400	.006	.050	.0750	.2500	2.5	BBL-200400	32.10	BBL-200400G	37.25	BBL-200400X	38.40
.200	.216	.500	.006	.050	.0750	.2500	2.5	BBL-200500	32.10			BBL-200500X	38.40
.200	.216	.600	.006	.050	.0750	.2500	2.5	BBL-200600	32.10	BBL-200600G	37.25		
.200	.216	.700	.006	.050	.0750	.2500	2.5	BBL-200700	32.10			BBL-200700X	38.40
.200	.216	.800	.006	.050	.0750	.2500	2.5	BBL-200800	32.10	BBL-200800G	37.25	BBL-200800X	38.40
.200	.216	1.000	.006	.050	.0750	.2500	2.5	BBL-2001000	32.10			BBL-2001000X	38.40
.200	.216	1.100	.006	.050	.0750	.2500	2.5	BBL-2001100	32.10				
.200	.216	1.200	.006	.050	.0750	.2500	2.5	BBL-2001200	32.10				
.200	.216	1.300	.006	.050	.0750	.2500	2.5	BBL-2001300	32.10				
.230	.250	.600	.006	.057	.0738	.3125	2.5	BBL-230600	43.10	BBL-230600G	50.70	BBL-230600X	50.70
.230	.250	.700	.006	.057	.0738	.3125	2.5	BBL-230700	43.10				
.230	.250	.800	.006	.057	.0738	.3125	2.5	BBL-230800	43.10			BBL-230800X	50.70
.230	.250	.900	.006	.057	.0738	.3125	2.5	BBL-230900	43.10			BBL-230900X	50.70
.230	.250	1.000	.006	.057	.0738	.3125	2.5	BBL-2301000	43.10			BBL-2301000X	50.70
.230	.250	1.200	.006	.057	.0738	.3125	2.5	BBL-2301200	43.10			BBL-2301200X	50.70
.230	.250	1.250	.006	.057	.0738	.3125	2.5	BBL-2301250	43.10				
.230	.250	1.500	.006	.057	.0738	.3125	2.5	BBL-2301500	43.10			BBL-2301500X	50.70
.230	.250	1.600	.006	.057	.0738	.3125	2.5	BBL-2301600	43.10			BBL-2301600X	50.70

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

Standard – Boring Tools

Left Hand (cont.)

BBL

Continued from previous page

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
H		L_2 $^{+.050"}_{-.000"}$	R $^{+.002"}_{-.000"}$	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	Tool #	Price
.290	.310	.500	.006	.072	.1338	.3125	2.5	BBL-290500	43.10				
.290	.310	.600	.006	.072	.1338	.3125	2.5					BBL-290600X	50.70
.290	.310	.750	.006	.072	.1338	.3125	2.5	BBL-290750	43.10				
.290	.310	.900	.006	.072	.1338	.3125	2.5	BBL-290900	43.10				
.290	.310	1.000	.006	.072	.1338	.3125	2.5	BBL-2901000	43.10			BBL-2901000X	50.70
.290	.310	1.100	.006	.072	.1338	.3125	2.5	BBL-2901100	43.10				
.290	.310	1.250	.006	.072	.1338	.3125	2.5	BBL-2901250	43.10				
.290	.310	1.350	.006	.072	.1338	.3125	2.5	BBL-2901350	43.10				
.290	.310	1.500	.006	.072	.1338	.3125	2.5	BBL-2901500	43.10			BBL-2901500X	50.70
.320	.340	.600	.006	.080	.1325	.3750	2.5	BBL-320600	58.80	BBL-320600G	66.75		
.320	.340	.750	.006	.080	.1325	.3750	2.5	BBL-320750	58.80			BBL-320750X	67.80
.320	.340	1.000	.006	.080	.1325	.3750	2.5	BBL-3201000	58.80			BBL-3201000X	67.80
.320	.340	1.500	.006	.080	.1325	.3750	2.5	BBL-3201500	58.80			BBL-3201500X	67.80
.320	.340	1.800	.006	.080	.1325	.3750	2.5	BBL-3201800	58.80				
.320	.340	2.000	.006	.080	.1325	.3750	4.0	BBL-3202000	75.10			BBL-3202000X	84.90
.320	.340	2.500	.006	.080	.1325	.3750	4.0	BBL-3202500	75.10				
.320	.340	3.000	.006	.080	.1325	.3750	4.0					BBL-3203000X	84.90
.360	.380	.750	.006	.090	.1725	.3750	2.5	BBL-360750	58.80			BBL-360750X	67.80
.360	.380	.900	.006	.090	.1725	.3750	2.5	BBL-360900	58.80				
.360	.380	1.000	.006	.090	.1725	.3750	2.5	BBL-3601000	58.80				
.360	.380	1.500	.006	.090	.1725	.3750	2.5	BBL-3601500	58.80				
.360	.380	1.600	.006	.090	.1725	.3750	2.5	BBL-3601600	58.80				
.360	.380	1.800	.006	.090	.1725	.3750	2.5	BBL-3601800	58.80				
.360	.380	2.500	.006	.090	.1725	.3750	4.0	BBL-3602500	75.10				
.360	.380	3.000	.006	.090	.1725	.3750	4.0	BBL-3603000	75.10			BBL-3603000X	84.90
.490	.510	1.500	.006	.122	.2400	.5000	3.0	BBL-4901500	81.90			BBL-4901500X	94.20
.490	.510	3.500	.006	.122	.2400	.5000	6.0	BBL-4903500	112.70				
.490	.510	4.000	.006	.122	.2400	.5000	6.0	BBL-4904000	112.70				
.490	.510	4.500	.006	.122	.2400	.5000	6.0	BBL-4904500	112.70				

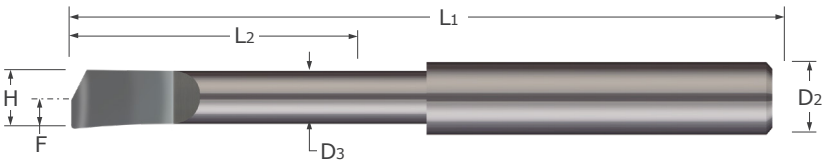
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

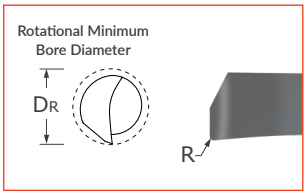
See pgs 39-47 for standard tool holders

HBBC

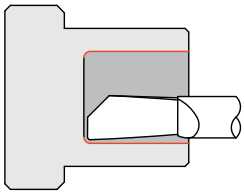
Standard – Boring Tools

Helical Back Rake – Corner Radius





- Designed for boring applications in bores .030" and larger
- Polished face for improved edge retention and chip evacuation while reducing galling
- Helical grind provides ideal top rake for better chip control and freer cutting
- Well suited for machining plastics
- On center neck design allows for static and live/rotating applications
- Lockdown flat automatically locates tool on center
- Corner radius profile
- Solid carbide
- CNC ground in the USA



Head Width	Rotational Minimum Bore Diameter	Maximum Bore Depth	Radius	Neck Diameter	Centerline Offset	Shank Diameter	Overall Length	Uncoated	
H	D_R	L_2 $^{+.032"}_{-.000"}$	R $^{+.001"}_{-.001"}$	D_3 $^{+.000"}_{-.002"}$	F	D_2 (h6)	L_1	Tool #	Price
.0275	.030	.187	.004	.025	.0150	.1250	1.5	HBBC-030187-004	37.20
.0275	.030	.250	.004	.025	.0150	.1250	1.5	HBBC-030250-004	37.20
.0325	.035	.125	.004	.030	.0175	.1250	1.5	HBBC-035125-004	29.10
.0325	.035	.187	.004	.030	.0175	.1250	1.5	HBBC-035187-004	29.10
.0325	.035	.250	.004	.030	.0175	.1250	1.5	HBBC-035250-004	29.10
.0375	.040	.187	.004	.035	.0200	.1250	1.5	HBBC-040187-004	29.10
.0375	.040	.250	.004	.035	.0200	.1250	1.5	HBBC-040250-004	29.10
.0375	.040	.312	.004	.035	.0200	.1250	1.5	HBBC-040312-004	29.10
.0450	.050	.187	.004	.040	.0250	.1250	1.5	HBBC-050187-004	29.10
.0450	.050	.312	.004	.040	.0250	.1250	1.5	HBBC-050312-004	29.10
.0450	.050	.375	.004	.040	.0250	.1250	1.5	HBBC-050375-004	29.10
.0550	.060	.250	.004	.050	.0300	.1250	1.5	HBBC-060250-004	29.10
.0550	.060	.375	.004	.050	.0300	.1250	1.5	HBBC-060375-004	29.10
.0550	.060	.500	.004	.050	.0300	.1250	1.5	HBBC-060500-004	29.10
.0650	.070	.312	.004	.060	.0350	.1250	1.5	HBBC-070312-004	29.10
.0650	.070	.437	.004	.060	.0350	.1250	1.5	HBBC-070437-004	29.10
.0650	.070	.562	.004	.060	.0350	.1250	1.5	HBBC-070562-004	29.10
.0750	.080	.375	.004	.070	.0400	.1250	1.5	HBBC-080375-004	29.10
.0750	.080	.500	.004	.070	.0400	.1250	1.5	HBBC-080500-004	29.10
.0750	.080	.625	.004	.070	.0400	.1250	1.5	HBBC-080625-004	29.10
.0850	.090	.375	.004	.080	.0450	.1250	1.5	HBBC-090375-004	29.10
.0850	.090	.500	.004	.080	.0450	.1250	1.5	HBBC-090500-004	29.10
.0850	.090	.687	.004	.080	.0450	.1250	1.5	HBBC-090687-004	29.10
.0950	.100	.437	.004	.090	.0500	.1250	1.5	HBBC-100437-004	29.10
.0950	.100	.562	.004	.090	.0500	.1250	1.5	HBBC-100562-004	29.10
.0950	.100	.750	.004	.090	.0500	.1250	1.5	HBBC-100750-004	29.10

Continued on next page

See pgs 39-47 for standard tool holders

Standard – Boring Tools

Helical Back Rake – Corner Radius (cont.)

HBBC

Continued from previous page

Head Width	Rotational Minimum Bore Diameter	Maximum Bore Depth	Radius	Neck Diameter	Centerline Offset	Shank Diameter	Overall Length	Uncoated	
H	D_R	L_2 $^{+.032"}_{-.000"}$	R $^{+.001"}_{-.001"}$	D_3 $^{+.000"}_{-.002"}$	F	D_2 (h6)	L_1	Tool #	Price
.1100	.120	.500	.004	.100	.0600	.1250	1.5	HBBC-120500-004	29.10
.1100	.120	.625	.004	.100	.0600	.1250	1.5	HBBC-120625-004	29.10
.1100	.120	1.000	.004	.100	.0600	.1250	1.5	HBBC-1201000-004	29.10
.1225	.135	.562	.004	.110	.0675	.1875	2.0	HBBC-135562-004	31.30
.1225	.135	.750	.004	.110	.0675	.1875	2.0	HBBC-135750-004	31.30
.1225	.135	1.000	.004	.110	.0675	.1875	2.0	HBBC-1351000-004	31.30
.1400	.150	.625	.004	.130	.0750	.1875	2.0	HBBC-150625-004	31.30
.1400	.150	1.000	.004	.130	.0750	.1875	2.0	HBBC-1501000-004	31.30
.1400	.150	1.250	.004	.130	.0750	.1875	2.0	HBBC-1501250-004	31.30
.1700	.180	1.000	.004	.160	.0900	.1875	2.0	HBBC-1801000-004	31.30
.1700	.180	1.250	.004	.160	.0900	.1875	2.0	HBBC-1801250-004	31.30
.1700	.180	1.500	.004	.160	.0900	.1875	2.0	HBBC-1801500-004	31.30
.1975	.210	1.000	.004	.185	.1050	.2500	2.5	HBBC-2101000-004	33.70
.1975	.210	1.250	.004	.185	.1050	.2500	2.5	HBBC-2101250-004	33.70
.1975	.210	1.500	.004	.185	.1050	.2500	2.5	HBBC-2101500-004	33.70
.2275	.240	1.000	.004	.215	.1200	.2500	2.5	HBBC-2401000-004	33.70
.2275	.240	1.500	.004	.215	.1200	.2500	2.5	HBBC-2401500-004	33.70
.2275	.240	1.750	.004	.215	.1200	.2500	2.5	HBBC-2401750-004	33.70
.2750	.300	1.000	.004	.250	.1500	.3125	2.5	HBBC-3001000-004	45.50
.2750	.300	1.500	.004	.250	.1500	.3125	2.5	HBBC-3001500-004	45.50
.2750	.300	1.750	.004	.250	.1500	.3125	2.5	HBBC-3001750-004	45.50
.3400	.360	1.000	.004	.320	.1800	.3750	2.5	HBBC-3601000-004	62.50
.3400	.360	1.500	.004	.320	.1800	.3750	2.5	HBBC-3601500-004	62.50
.3400	.360	2.000	.004	.320	.1800	.3750	4.0	HBBC-3602000-004	79.90
.3400	.360	2.500	.004	.320	.1800	.3750	4.0	HBBC-3602500-004	79.90

Technical Resources on Micro100.com

Find Simulation Files, Speeds & Feeds, Torque Recommendations, Programs, Blogs, and more at micro100.com/resources

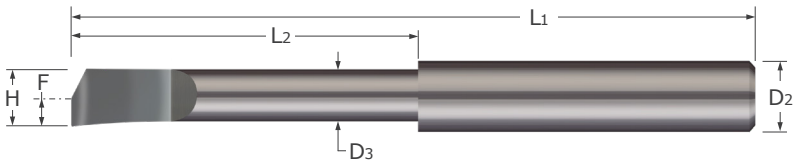
SCAN

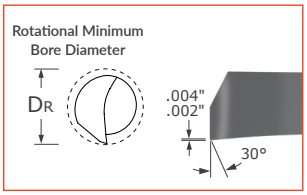
See pgs 39-47 for standard tool holders

HBB / HBM

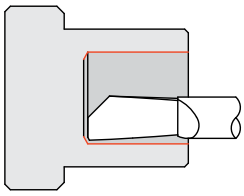
Standard – Boring Tools

Helical Back Rake





- Designed for boring applications in bores .020" and larger
- Polished face for improved edge retention and chip evacuation while reducing galling
- Helical grind provides ideal top rake for better chip control and freer cutting
- Uncoated variant ideal for plastics
- On center neck design allows for static and live/rotating applications
- Cylindrical shank (no set screw flat)
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Head Width			Rotational Min. Bore Diameter	Max. Bore Depth	Neck Diameter	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H		decimal equiv.	DR	L2 +.032" −.000" +.81 mm −.00 mm	D3 +.000" −.002" +.00 mm −.05 mm	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.0175		.0175	.020	.063	.015	.0100	.1250	1.5	HBB-020062	35.60	HBB-020062X	39.85
	0.45 mm	.0177	0.5 mm	2 mm	0.4 mm	0.25 mm	3 mm	38 mm	HBM-005002	32.30		
.0225		.0225	.025	.125	.020	.0125	.1250	1.5	HBB-025125	35.60	HBB-025125X	40.00
	0.65 mm	.0256	0.7 mm	3 mm	0.6 mm	0.35 mm	3 mm	38 mm	HBM-007003	32.30		
.0275		.0275	.030	.188	.025	.0150	.1250	1.5	HBB-030187	35.60	HBB-030187X	39.85
	0.75 mm	.0295	0.8 mm	4 mm	0.7 mm	0.40 mm	3 mm	38 mm	HBM-008004	32.30		
.0325		.0325	.035	.125	.030	.0175	.1250	1.5	HBB-035125	27.40		
.0325		.0325	.035	.188	.030	.0175	.1250	1.5	HBB-035187	27.40	HBB-035187X	31.45
	0.90 mm	.0354	1.0 mm	6 mm	0.8 mm	0.50 mm	3 mm	38 mm	HBM-010006	25.00		
.0375		.0375	.040	.188	.035	.0200	.1250	1.5	HBB-040187	27.40	HBB-040187X	31.45
.0375		.0375	.040	.250	.035	.0200	.1250	1.5	HBB-040250	27.40	HBB-040250X	31.45
.0450		.0450	.050	.313	.040	.0250	.1250	1.5	HBB-050312	27.40	HBB-050312X	31.45
	1.35 mm	.0531	1.5 mm	9 mm	1.2 mm	0.75 mm	3 mm	38 mm	HBM-015009	25.00		
.0550		.0550	.060	.375	.050	.0300	.1250	1.5	HBB-060375	27.40	HBB-060375X	31.45
	1.63 mm	.0642	1.75 mm	10 mm	1.5 mm	0.875 mm	3 mm	38 mm	HBM-017510	25.00		
.0650		.0650	.070	.438	.060	.0350	.1250	1.5	HBB-070437	27.40	HBB-070437X	31.45
.0750		.0750	.080	.500	.070	.0400	.1250	1.5	HBB-080500	27.40	HBB-080500X	31.45
	2.05 mm	.0807	2.26 mm	12 mm	1.9 mm	1.13 mm	3 mm	38 mm	HBM-022512	25.00		
.0850		.0850	.090	.500	.080	.0450	.1250	1.5	HBB-090500	27.40	HBB-090500X	31.45
.0950		.0950	.100	.563	.090	.0500	.1250	1.5	HBB-100562	27.40	HBB-100562X	31.45
	2.58 mm	.1016	2.75 mm	14 mm	2.4 mm	1.375 mm	3 mm	38 mm	HBM-027514	25.00		
	2.75 mm	.1083	3.0 mm	16 mm	2.5 mm	1.50 mm	4 mm	50 mm	HBM-030016	25.80		

Continued on next page

See pgs 39-47 for standard tool holders

Standard – Boring Tools

Helical Back Rake (cont.)

HBB / HBM

Continued from previous page

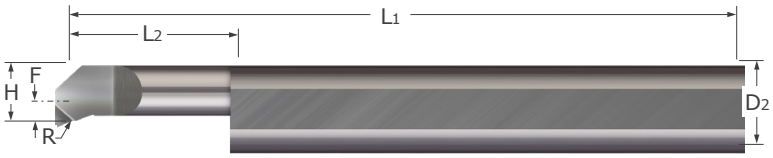
Head Width			Rotational Min. Bore Diameter	Max. Bore Depth	Neck Diameter	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H		decimal equiv.	D_R	L_2 +.032" −.000" +.81 mm −.00 mm	D_3 +.000" −.002" +.00 mm −.05 mm	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.1100		.1100	.120	.625	.100	.0600	.1250	1.5	HBB-120625	27.40	HBB-120625X	31.45
.1100		.1100	.120	1.000	.100	.0600	.1250	1.5	HBB-1201000	27.40	HBB-1201000X	31.45
.1225		.1225	.135	.750	.110	.0675	.1875	2.0	HBB-135750	29.40	HBB-135750X	33.85
.1225		.1225	.135	1.000	.110	.0675	.1875	2.0	HBB-1351000	29.40	HBB-1351000X	33.85
.1400		.1400	.150	1.000	.130	.0750	.1875	2.0	HBB-1501000	29.40	HBB-1501000X	33.85
.1400		.1400	.150	1.250	.130	.0750	.1875	2.0	HBB-1501250	29.40	HBB-1501250X	33.85
	3.65 mm	.1437	4.0 mm	25 mm	3.3 mm	2.00 mm	6 mm	57 mm			HBM-040025X	39.80
	4.15 mm	.1634	4.5 mm	30 mm	3.8 mm	2.25 mm	6 mm	57 mm	HBM-045030	28.90		
.1700		.1700	.180	1.000	.160	.0900	.1875	2.0	HBB-1801000	29.40	HBB-1801000X	33.85
.1700		.1700	.180	1.250	.160	.0900	.1875	2.0	HBB-1801250	29.40	HBB-1801250X	33.85
.1700		.1700	.180	1.500	.160	.0900	.1875	2.0	HBB-1801500	29.40	HBB-1801500X	33.85
.1975		.1975	.210	1.000	.185	.1050	.2500	2.5	HBB-2101000	31.80	HBB-2101000X	38.20
.1975		.1975	.210	1.250	.185	.1050	.2500	2.5	HBB-2101250	31.80	HBB-2101250X	38.20
.1975		.1975	.210	1.500	.185	.1050	.2500	2.5	HBB-2101500	31.80	HBB-2101500X	38.20
	5.15 mm	.2028	5.5 mm	35 mm	4.7 mm	2.75 mm	6 mm	57 mm	HBM-055035	28.90		
.2275		.2275	.240	1.000	.215	.1200	.2500	2.5	HBB-2401000	31.80	HBB-2401000X	38.20
.2275		.2275	.240	1.500	.215	.1200	.2500	2.5	HBB-2401500	31.80	HBB-2401500X	38.20
.2275		.2275	.240	1.750	.215	.1200	.2500	2.5	HBB-2401750	31.80	HBB-2401750X	38.20
.2750		.2750	.300	1.000	.250	.1500	.3125	2.5	HBB-3001000	43.50	HBB-3001000X	51.10
.2750		.2750	.300	1.500	.250	.1500	.3125	2.5	HBB-3001500	43.50	HBB-3001500X	51.10
.2750		.2750	.300	1.750	.250	.1500	.3125	2.5	HBB-3001750	43.50	HBB-3001750X	51.10
.3400		.3400	.360	1.000	.320	.1800	.3750	2.5	HBB-3601000	60.40		
.3400		.3400	.360	1.500	.320	.1800	.3750	2.5	HBB-3601500	60.40	HBB-3601500X	69.40
.3400		.3400	.360	2.000	.320	.1800	.3750	4.0	HBB-3602000	77.80	HBB-3602000X	87.50
.3400		.3400	.360	2.250	.320	.1800	.3750	4.0	HBB-3602250	77.80		
.3400		.3400	.360	2.500	.320	.1800	.3750	4.0	HBB-3602500	77.80	HBB-3602500X	87.50
.4600		.4600	.480	2.500	.440	.2400	.5000	4.0	HBB-4802500	93.30		
.4600		.4600	.480	3.000	.440	.2400	.5000	4.0	HBB-4803000	93.30		

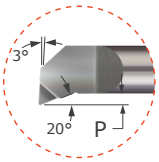
See pgs 39-47 for standard tool holders

PBT

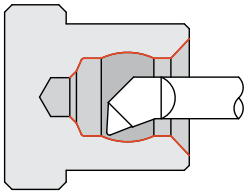
Standard – Boring Tools

Top Rake Chipbreaker





- Optimized for finishing operations
- Top rake geometry provides freer cutting
- Polished face for reducing galling
- Corner radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.030" −.000"	R +.003" −.000"	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0500	.0550	.150	.002	.005	-.0125	.1250	1.5	PBT2-050150	29.30	PBT2-050150X	33.45
.0500	.0550	.200	.002	.005	-.0125	.1250	1.5	PBT2-050200	29.30	PBT2-050200X	33.45
.0500	.0550	.400	.002	.005	-.0125	.1250	1.5	PBT2-050400	29.30	PBT2-050400X	33.45
.0500	.0550	.500	.002	.005	-.0125	.1250	1.5	PBT2-050500	29.30	PBT2-050500X	33.45
.0600	.0700	.150	.002	.010	-.0025	.1250	1.5	PBT2-060150	29.30	PBT2-060150X	33.45
.0600	.0700	.200	.002	.010	-.0025	.1250	1.5	PBT2-060200	29.30	PBT2-060200X	33.45
.0600	.0700	.400	.002	.010	-.0025	.1250	1.5	PBT2-060400	29.30	PBT2-060400X	33.45
.0600	.0700	.500	.002	.010	-.0025	.1250	1.5	PBT2-060500	29.30	PBT2-060500X	33.70
.0700	.0800	.150	.002	.015	.0075	.1250	1.5	PBT2-070150	28.60	PBT2-070150X	32.75
.0700	.0800	.200	.002	.015	.0075	.1250	1.5	PBT2-070200	28.60	PBT2-070200X	32.75
.0700	.0800	.400	.002	.015	.0075	.1250	1.5	PBT2-070400	28.60	PBT2-070400X	32.75
.0700	.0800	.600	.002	.015	.0075	.1250	1.5	PBT2-070600	28.60	PBT2-070600X	32.75
.0800	.0900	.200	.002	.015	.0175	.1250	1.5	PBT2-080200	28.60	PBT2-080200X	33.00
.0800	.0900	.400	.002	.015	.0175	.1250	1.5	PBT2-080400	28.60	PBT2-080400X	32.75
.0900	.1000	.200	.002	.015	.0275	.1250	1.5	PBT2-090200	28.60	PBT2-090200X	33.00
.0900	.1000	.400	.002	.015	.0275	.1250	1.5	PBT2-090400	28.60	PBT2-090400X	33.00
.1000	.1100	.200	.002	.015	.0375	.1250	1.5	PBT2-100200	28.60	PBT2-100200X	33.00
.1000	.1100	.400	.002	.015	.0375	.1250	1.5	PBT2-100400	28.60	PBT2-100400X	32.75
.1100	.1220	.250	.004	.020	.0475	.1250	1.5	PBT4-110250	28.60	PBT4-110250X	32.75
.1100	.1220	.500	.004	.020	.0475	.1250	1.5	PBT4-110500	28.60	PBT4-110500X	32.75
.1100	.1220	.750	.004	.020	.0475	.1250	1.5	PBT4-110750	28.60	PBT4-110750X	32.75
.1200	.1320	.250	.004	.020	.0263	.1875	2.0	PBT-120250	29.80	PBT-120250X	34.45
.1200	.1320	.375	.004	.020	.0263	.1875	2.0	PBT4-120375	29.80	PBT4-120375X	34.45
.1200	.1320	.500	.004	.020	.0263	.1875	2.0	PBT-120500	29.80	PBT-120500X	34.45
.1200	.1320	.750	.004	.020	.0263	.1875	2.0	PBT-120750	29.80	PBT-120750X	34.45
.1200	.1320	1.000	.004	.020	.0263	.1875	2.0	PBT-1201000	29.80	PBT-1201000X	34.45
.1400	.1520	.250	.002	.025	.0463	.1875	2.0	PBT2-140250	29.80	PBT2-140250X	34.45
.1400	.1520	.250	.004	.025	.0463	.1875	2.0	PBT4-140250	29.80	PBT4-140250X	34.45
.1400	.1520	.375	.002	.025	.0463	.1875	2.0	PBT2-140375	29.80	PBT2-140375X	34.45
.1400	.1520	.375	.004	.025	.0463	.1875	2.0	PBT4-140375	29.80	PBT4-140375X	34.45
.1400	.1520	.500	.002	.025	.0463	.1875	2.0	PBT2-140500	29.80	PBT2-140500X	34.45
.1400	.1520	.500	.004	.025	.0463	.1875	2.0	PBT4-140500	29.80	PBT4-140500X	34.45

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

Standard – Boring Tools

Top Rake Chipbreaker (cont.)

PBT

Continued from previous page

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.030" −.000"	R +.003" −.000"	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.1600	.1760	.375	.006	.025	.0663	.1875	2.0	PBT6-160375	29.80	PBT6-160375X	34.45
.1600	.1760	.500	.006	.025	.0663	.1875	2.0	PBT-160500	29.80	PBT-160500X	34.45
.1600	.1760	.750	.006	.025	.0663	.1875	2.0	PBT-160750	29.80	PBT-160750X	34.45
.1600	.1760	1.000	.006	.025	.0663	.1875	2.0	PBT6-1601000	29.80	PBT6-1601000X	34.45
.1600	.1760	1.250	.006	.025	.0663	.1875	2.0	PBT6-1601250	29.80	PBT6-1601250X	34.45
.1800	.1960	.375	.006	.030	.0550	.2500	2.5	PBT6-180375	38.20	PBT6-180375X	44.60
.1800	.1960	.500	.006	.030	.0550	.2500	2.5	PBT-180500	38.20	PBT-180500X	44.60
.1800	.1960	.750	.006	.030	.0550	.2500	2.5	PBT6-180750	38.20	PBT6-180750X	44.60
.1800	.1960	1.000	.006	.030	.0550	.2500	2.5	PBT-1801000	38.20	PBT-1801000X	44.60
.1800	.1960	1.250	.006	.030	.0550	.2500	2.5	PBT6-1801250	38.20	PBT6-1801250X	44.60
.1800	.1960	1.500	.006	.030	.0550	.2500	2.5	PBT6-1801500	38.20	PBT6-1801500X	44.60
.2000	.2160	.375	.006	.030	.0750	.2500	2.5	PBT6-200375	38.20	PBT6-200375X	44.60
.2000	.2160	.600	.006	.030	.0750	.2500	2.5	PBT-200600	38.20	PBT-200600X	44.60
.2000	.2160	.750	.006	.030	.0750	.2500	2.5	PBT6-200750	38.20	PBT6-200750X	44.60
.2000	.2160	1.000	.006	.030	.0750	.2500	2.5	PBT-2001000	38.20	PBT-2001000X	44.60
.2000	.2160	1.250	.006	.030	.0750	.2500	2.5	PBT6-2001250	38.20	PBT6-2001250X	44.60
.2000	.2160	1.500	.006	.030	.0750	.2500	2.5	PBT6-2001500	38.20	PBT6-2001500X	44.60
.2300	.2500	.500	.004	.040	.0738	.3125	2.5	PBT4-230500	47.20	PBT4-230500X	54.80
.2300	.2500	.500	.006	.040	.0738	.3125	2.5	PBT6-230500	47.20	PBT6-230500X	54.80
.2300	.2500	.750	.004	.040	.0738	.3125	2.5	PBT4-230750	47.20	PBT4-230750X	54.80
.2300	.2500	.750	.006	.040	.0738	.3125	2.5	PBT-230750	47.20	PBT-230750X	54.80
.2300	.2500	1.100	.006	.040	.0738	.3125	2.5	PBT6-2301100	47.20	PBT6-2301100X	54.80
.2300	.2500	1.300	.006	.040	.0738	.3125	2.5	PBT6-2301300	47.20	PBT6-2301300X	54.80
.2300	.2500	1.600	.006	.040	.0738	.3125	3.0	PBT-2301600	56.10	PBT-2301600X	63.70
.2600	.2800	.500	.004	.045	.1038	.3125	2.5	PBT4-260500	47.20	PBT4-260500X	54.80
.2600	.2800	.500	.006	.045	.1038	.3125	2.5	PBT6-260500	47.20	PBT6-260500X	54.80
.2600	.2800	.750	.004	.045	.1038	.3125	2.5	PBT4-260750	47.20	PBT4-260750X	54.80
.2600	.2800	.750	.006	.045	.1038	.3125	2.5	PBT6-260750	47.20	PBT6-260750X	54.80
.3000	.3200	.750	.006	.050	.1125	.3750	2.5	PBT6-300750	57.10	PBT6-300750X	66.10
.3000	.3200	1.000	.006	.050	.1125	.3750	2.5	PBT-3001000	57.10	PBT-3001000X	66.10
.3000	.3200	1.250	.006	.050	.1125	.3750	2.5	PBT6-3001250	57.10	PBT6-3001250X	66.10
.3000	.3200	1.600	.006	.050	.1125	.3750	3.0	PBT6-3001600	57.10	PBT6-3001600X	66.10
.3000	.3200	2.100	.006	.050	.1125	.3750	3.5	PBT6-3002100	57.10	PBT6-3002100X	66.80

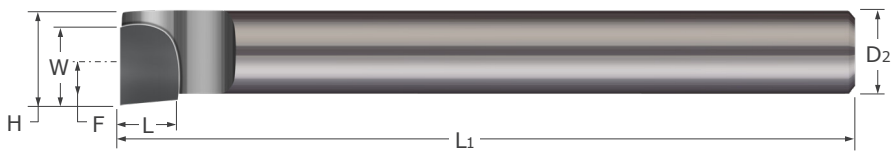
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

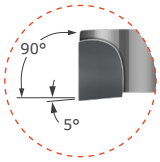
See pgs 39-47 for standard tool holders

TBB

Standard – Boring Tools

Right Hand – Brazed – Sharp





- Designed for right hand facing and boring applications in bores .320" and larger
- Long shank enables flexible reach options (preset at any length)
- Sharp corner profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- CNC ground in the USA

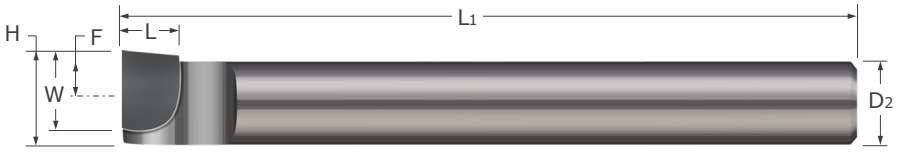
Head Width	Width	Length	Centerline Offset	Shank Diameter	Overall Length	Brazed Style	
H	W	L	F	D_2 $^{+.000"}_{-.003"}$	L_1	Tool #	Price
.320	.250	.188	.195	.2500	4.0	TBB-250	25.20
.413	.313	.250	.257	.3125	5.0	TBB-312	26.30
.463	.313	.250	.276	.3750	6.0	TBB-375	28.20
.625	.500	.250	.375	.5000	7.0	TBB-500	35.10
.795	.500	.250	.483	.6250	8.0	TBB-625	38.00
.935	.625	.250	.560	.7500	9.0	TBB-750	39.20
1.233	.750	.375	.733	1.0000	10.0	TBB-001	47.80

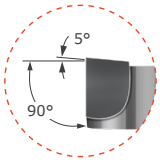
See pgs 39-47 for standard tool holders
See pg 318 for tool set options

TBBL

Standard – Boring Tools

Left Hand – Brazed – Sharp





- Designed for left hand facing and boring applications in bores .320" and larger
- Long shank enables flexible reach options (preset at any length)
- Sharp corner profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- CNC ground in the USA

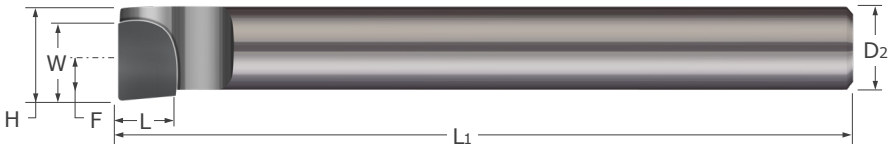
Head Width	Width	Length	Centerline Offset	Shank Diameter	Overall Length	Brazed Style	
H	W	L	F	D_2 $^{+.000"}_{-.003"}$	L_1	Tool #	Price
.320	.250	.188	.195	.2500	4.0	TBBL-250	24.50
.413	.313	.250	.257	.3125	5.0	TBBL-312	25.20
.463	.313	.250	.276	.3750	6.0	TBBL-375	27.00
.625	.500	.250	.375	.5000	7.0	TBBL-500	35.00
.795	.500	.250	.483	.6250	8.0	TBBL-625	37.40
.935	.625	.250	.560	.7500	9.0	TBBL-750	38.30
1.233	.750	.375	.733	1.0000	10.0	TBBL-001	47.80

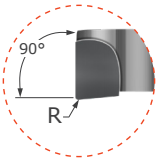
See pgs 39-47 for standard tool holders
See pg 318 for tool set options

Standard – Boring Tools

Right Hand – Brazed – Corner Radius

TBBC





- Designed for right hand facing and boring applications in bores .320" and larger
- Long shank enables flexible reach options (preset at any length)
- Corner radius profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- CNC ground in the USA

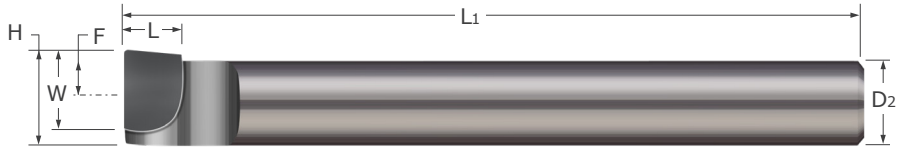
Head Width	Radius	Width	Length	Centerline Offset	Shank Diameter	Overall Length	Brazed Style	
H	R +.001" −.001"	W	L	F	D2 +.0000" −.0030"	L1	Tool #	Price
.320	.008	.250	.188	.195	.2500	4.0	TBBC-250-008	27.10
.413	.008	.313	.250	.257	.3125	5.0	TBBC-312-008	28.20
.463	.008	.313	.250	.276	.3750	6.0	TBBC-375-008	30.10
.625	.008	.500	.250	.375	.5000	7.0	TBBC-500-008	37.00
.795	.008	.500	.250	.483	.6250	8.0	TBBC-625-008	39.90
.935	.008	.625	.250	.560	.7500	9.0	TBBC-750-008	41.10
1.233	.008	.750	.375	.733	1.0000	10.0	TBBC-001-008	47.80

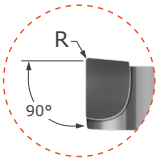
See pgs 39-47 for standard tool holders

Standard – Boring Tools

Left Hand – Brazed – Corner Radius

TBBCL





- Designed for left hand facing and boring applications in bores .320" and larger
- Long shank enables flexible reach options (preset at any length)
- Corner radius profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- CNC ground in the USA

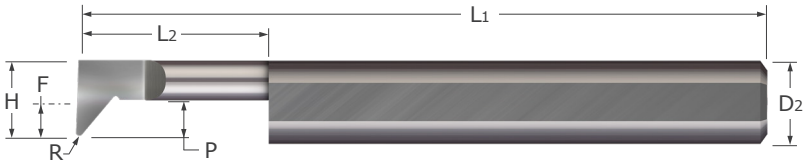
Head Width	Radius	Width	Length	Centerline Offset	Shank Diameter	Overall Length	Brazed Style	
H	R +.001" −.001"	W	L	F	D2 +.0000" −.0030"	L1	Tool #	Price
.320	.008	.250	.188	.195	.2500	4.0	TBBCL-250-008	27.10
.413	.008	.313	.250	.257	.3125	5.0	TBBCL-312-008	28.20
.463	.008	.313	.250	.276	.3750	6.0	TBBCL-375-008	30.10
.625	.008	.500	.250	.375	.5000	7.0	TBBCL-500-008	37.00
.795	.008	.500	.250	.483	.6250	8.0	TBBCL-625-008	39.90
.935	.008	.625	.250	.560	.7500	9.0	TBBCL-750-008	41.10
1.233	.008	.750	.375	.733	1.0000	10.0	TBBCL-001-008	47.80

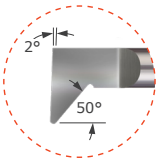
See pgs 39-47 for standard tool holders

PR

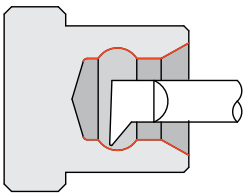
Standard – Profiling Tools

Radial Profiling





- Designed for radial profiling
- Excellent choice for fine finishing
- Can be used in thread relief applications
- Split face geometry provides optimal edge strength
- Corner radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.050" −.000"	R +.002" −.000"	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0500	.0550	.150	.002	.015	-.0125	.1250	1.5	PR2-050150	29.40	PR2-050150X	33.55
.0500	.0550	.200	.002	.015	-.0125	.1250	1.5	PR2-050200	29.40	PR2-050200X	33.55
.0600	.0700	.150	.002	.020	-.0025	.1250	1.5	PR2-060150	29.40	PR2-060150X	33.55
.0600	.0700	.200	.002	.020	-.0025	.1250	1.5	PR2-060200	29.40	PR2-060200X	33.55
.0700	.0800	.150	.002	.025	.0075	.1250	1.5	PR2-070150	28.70	PR2-070150X	32.85
.0700	.0800	.200	.002	.025	.0075	.1250	1.5	PR2-070200	28.70	PR2-070200X	32.85
.0700	.0800	.200	.005	.025	.0075	.1250	1.5	PR-070200	28.70	PR-070200X	32.85
.0700	.0800	.300	.002	.025	.0075	.1250	1.5	PR2-070300	28.70	PR2-070300X	32.85
.0700	.0800	.500	.002	.025	.0075	.1250	1.5	PR2-070500	28.70	PR2-070500X	32.85
.0700	.0800	.500	.005	.025	.0075	.1250	1.5	PR-070500	28.70	PR-070500X	32.85
.0800	.0900	.200	.002	.030	.0175	.1250	1.5	PR2-080200	28.70	PR2-080200X	32.85
.0800	.0900	.300	.002	.030	.0175	.1250	1.5	PR2-080300	28.70	PR2-080300X	32.85
.0900	.1000	.200	.002	.030	.0275	.1250	1.5	PR2-090200	28.70	PR2-090200X	33.10
.0900	.1000	.300	.002	.030	.0275	.1250	1.5	PR2-090300	28.70	PR2-090300X	32.85
.1000	.1100	.200	.002	.035	.0375	.1250	1.5	PR2-100200	28.70	PR2-100200X	32.85
.1000	.1100	.200	.005	.035	.0375	.1250	1.5	PR5-100200	28.70	PR5-100200X	33.10
.1000	.1100	.300	.002	.035	.0375	.1250	1.5	PR2-100300	28.70	PR2-100300X	32.85
.1000	.1100	.300	.005	.035	.0375	.1250	1.5	PR5-100300	28.70	PR5-100300X	32.85
.1100	.1240	.250	.005	.040	.0475	.1250	1.5	PR-110250	28.70	PR-110250X	32.85
.1100	.1240	.375	.005	.040	.0475	.1250	1.5	PR5-110375	28.70	PR5-110375X	32.85
.1100	.1240	.500	.005	.040	.0475	.1250	1.5	PR5-110500	28.70	PR5-110500X	32.85
.1200	.1340	.250	.008	.050	.0263	.1875	2.0	PR-120250	29.90	PR-120250X	34.55
.1200	.1340	.375	.005	.050	.0263	.1875	2.0	PR5-120375	29.90	PR5-120375X	34.55
.1200	.1340	.375	.008	.050	.0263	.1875	2.0	PR8-120375	29.90	PR8-120375X	34.55
.1200	.1340	.500	.008	.050	.0263	.1875	2.0	PR-120500	29.90	PR-120500X	34.55
.1200	.1340	.750	.005	.050	.0263	.1875	2.0	PR5-120750	29.90	PR5-120750X	34.55
.1200	.1340	.750	.008	.050	.0263	.1875	2.0	PR8-120750	29.90	PR8-120750X	34.55

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

Standard – Profiling Tools

Radial Profiling (cont.)

PR

Continued from previous page

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.050" −.000"	R +.002" −.000"	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.1400	.1540	.375	.005	.050	.0463	.1875	2.0	PR5-140375	29.90	PR5-140375X	34.55
.1400	.1540	.375	.008	.050	.0463	.1875	2.0	PR8-140375	29.90	PR8-140375X	34.55
.1400	.1540	.500	.005	.050	.0463	.1875	2.0	PR5-140500	29.90	PR5-140500X	34.55
.1400	.1540	.500	.008	.050	.0463	.1875	2.0	PR8-140500	29.90	PR8-140500X	34.55
.1600	.1780	.375	.008	.050	.0663	.1875	2.0	PR8-160375	29.90	PR8-160375X	34.55
.1600	.1780	.500	.008	.050	.0663	.1875	2.0	PR-160500	29.90	PR-160500X	34.55
.1600	.1780	.750	.008	.050	.0663	.1875	2.0	PR8-160750	29.90	PR8-160750X	34.55
.1600	.1780	1.000	.008	.050	.0663	.1875	2.0	PR8-1601000	29.90	PR8-1601000X	34.55
.1800	.1980	.375	.008	.080	.0550	.2500	2.5	PR8-180375	38.30	PR8-180375X	44.60
.1800	.1980	.500	.008	.080	.0550	.2500	2.5	PR-180500	38.30	PR-180500X	44.60
.1800	.1980	.750	.008	.080	.0550	.2500	2.5	PR-180750	38.30	PR-180750X	44.60
.1800	.1980	1.000	.008	.080	.0550	.2500	2.5	PR8-1801000	38.30	PR8-1801000X	44.60
.2000	.2180	.500	.005	.080	.0750	.2500	2.5	PR5-200500	38.30	PR5-200500X	44.60
.2000	.2180	.500	.008	.080	.0750	.2500	2.5	PR8-200500	38.30	PR8-200500X	44.60
.2000	.2180	.750	.005	.080	.0750	.2500	2.5	PR5-200750	38.30	PR5-200750X	44.60
.2000	.2180	.750	.008	.080	.0750	.2500	2.5	PR8-200750	38.30	PR8-200750X	44.60
.2300	.2520	.500	.008	.080	.0738	.3125	2.5	PR8-230500	47.20	PR8-230500X	54.80
.2300	.2520	.750	.008	.080	.0738	.3125	2.5	PR-230750	47.20	PR-230750X	54.80
.2300	.2520	1.000	.008	.080	.0738	.3125	2.5	PR-2301000	47.20	PR-2301000X	54.80
.2300	.2520	1.250	.008	.080	.0738	.3125	2.5	PR8-2301250	47.20	PR8-2301250X	54.80
.2600	.2820	.750	.008	.090	.1038	.3125	2.5	PR8-260750	47.20	PR8-260750X	54.80
.2600	.2820	1.000	.008	.090	.1038	.3125	2.5	PR8-2601000	47.20	PR8-2601000X	54.80
.3000	.3220	.750	.008	.110	.1438	.3125	2.5	PR8-300750	47.20	PR8-300750X	54.80
.3000	.3220	1.000	.008	.110	.1438	.3125	2.5	PR-3001000	47.20	PR-3001000X	54.80
.3000	.3220	1.250	.008	.110	.1438	.3125	2.5	PR-3001250	47.20	PR-3001250X	54.80
.3600	.3820	.750	.008	.130	.1725	.3750	2.5	PR8-360750	61.20	PR8-360750X	70.30
.3600	.3820	1.000	.008	.130	.1725	.3750	2.5	PR-3601000	61.20	PR-3601000X	70.30
.3600	.3820	1.250	.008	.130	.1725	.3750	2.5	PR-3601250	61.20	PR-3601250X	70.30
.4600	.4820	.750	.008	.150	.2100	.5000	3.0	PR8-460750	84.40	PR8-460750X	96.60
.4600	.4820	1.000	.008	.150	.2100	.5000	3.0	PR8-4601000	84.40	PR8-4601000X	96.60

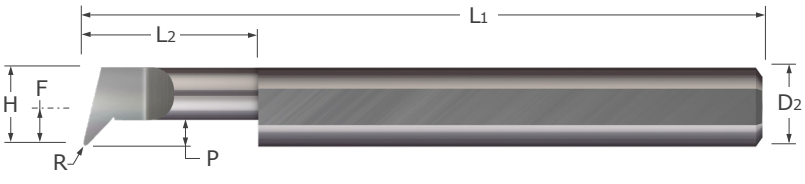
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pgs 39-47 for standard tool holders

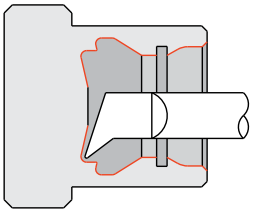
PA

Standard – Profiling Tools

Angled Profiling



- Designed for both radial and axial profiling
- Unique design maximizes tool versitilty and part feature creation
- Excellent choice for fine finishing
- Corner radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.030" −.000"	R +.0005" −.0005"	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0500	.0550	.150	.0020	.015	-.0125	.1250	1.5	PA2-050150	29.40	PA2-050150X	33.55
.0500	.0550	.200	.0020	.015	-.0125	.1250	1.5	PA2-050200	29.40	PA2-050200X	33.55
.0600	.0700	.150	.0020	.020	-.0025	.1250	1.5	PA2-060150	29.40	PA2-060150X	33.80
.0600	.0700	.200	.0020	.020	-.0025	.1250	1.5	PA2-060200	29.40	PA2-060200X	33.80
.0700	.0800	.150	.0020	.020	.0075	.1250	1.5	PA2-070150	28.70	PA2-070150X	32.85
.0700	.0800	.200	.0020	.020	.0075	.1250	1.5	PA2-070200	28.70	PA2-070200X	32.85
.0800	.0900	.200	.0020	.025	.0175	.1250	1.5	PA2-080200	28.70	PA2-080200X	33.10
.0800	.0900	.300	.0020	.025	.0175	.1250	1.5	PA2-080300	28.70	PA2-080300X	32.85
.0900	.1000	.200	.0020	.030	.0275	.1250	1.5	PA2-090200	28.70	PA2-090200X	32.85
.0900	.1000	.300	.0020	.030	.0275	.1250	1.5	PA2-090300	28.70	PA2-090300X	33.10
.1000	.1100	.200	.0020	.030	.0375	.1250	1.5	PA2-100200	28.70	PA2-100200X	33.10
.1000	.1100	.200	.0050	.030	.0375	.1250	1.5	PA5-100200	28.70	PA5-100200X	32.85
.1000	.1100	.300	.0020	.030	.0375	.1250	1.5	PA2-100300	28.70	PA2-100300X	32.85
.1000	.1100	.300	.0050	.030	.0375	.1250	1.5	PA5-100300	28.70	PA5-100300X	32.85
.1100	.1240	.250	.0050	.035	.0475	.1250	1.5	PA5-110250	28.70	PA5-110250X	32.85
.1100	.1240	.375	.0050	.035	.0475	.1250	1.5	PA5-110375	28.70	PA5-110375X	32.85
.1200	.1340	.250	.0050	.035	.0263	.1875	2.0	PA5-120250	29.90	PA5-120250X	34.55
.1200	.1340	.375	.0050	.035	.0263	.1875	2.0	PA5-120375	29.90	PA5-120375X	34.55
.1400	.1540	.375	.0050	.040	.0463	.1875	2.0	PA5-140375	29.90	PA5-140375X	34.55
.1400	.1540	.500	.0050	.040	.0463	.1875	2.0	PA5-140500	29.90	PA5-140500X	34.55
.1600	.1780	.375	.0050	.050	.0663	.1875	2.0	PA5-160375	29.90	PA5-160375X	34.55
.1600	.1780	.500	.0050	.050	.0663	.1875	2.0	PA5-160500	29.90	PA5-160500X	34.55
.1800	.1980	.375	.0050	.055	.0550	.2500	2.5	PA5-180375	38.30	PA5-180375X	44.60
.1800	.1980	.500	.0050	.055	.0550	.2500	2.5	PA5-180500	38.30	PA5-180500X	44.60

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

Standard – Profiling Tools

Angled Profiling (cont.)

PA

Continued from previous page

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H		L_2 $^{+.030"}_{-.000"}$	R $^{+.0005"}_{-.0005"}$	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.2000	.2180	.500	.0050	.060	.0750	.2500	2.5	PA5-200500	38.30	PA5-200500X	44.60
.2000	.2180	.500	.0080	.060	.0750	.2500	2.5	PA8-200500	38.30	PA8-200500X	44.60
.2000	.2180	.750	.0050	.060	.0750	.2500	2.5	PA5-200750	38.30	PA5-200750X	44.60
.2000	.2180	.750	.0080	.060	.0750	.2500	2.5	PA8-200750	38.30	PA8-200750X	44.60
.2300	.2520	.500	.0080	.070	.0738	.3125	2.5	PA8-230500	47.20	PA8-230500X	54.80
.2300	.2520	.750	.0080	.070	.0738	.3125	2.5	PA8-230750	47.20	PA8-230750X	54.80
.2600	.2820	.750	.0080	.080	.1038	.3125	2.5	PA8-260750	47.20	PA8-260750X	54.80
.2600	.2820	1.000	.0080	.080	.1038	.3125	2.5	PA8-2601000	47.20	PA8-2601000X	54.80
.3000	.3220	.750	.0080	.090	.1438	.3125	2.5	PA8-300750	47.20	PA8-300750X	54.80
.3000	.3220	1.000	.0080	.090	.1438	.3125	2.5	PA8-3001000	47.20	PA8-3001000X	54.80
.3600	.3820	.750	.0080	.110	.1725	.3750	2.5	PA8-360750	61.20	PA8-360750X	70.30
.3600	.3820	1.000	.0080	.110	.1725	.3750	2.5	PA8-3601000	61.20	PA8-3601000X	70.30
.4100	.4320	.750	.0080	.120	.1600	.5000	3.0	PA8-410750	85.70	PA8-410750X	98.00
.4100	.4320	1.250	.0080	.120	.1600	.5000	3.0	PA8-4101250	85.70	PA8-4101250X	98.00
.4600	.4820	.750	.0080	.140	.2100	.5000	3.0	PA8-460750	85.70	PA8-460750X	98.00
.4600	.4820	1.000	.0080	.140	.2100	.5000	3.0	PA8-4601000	85.70	PA8-4601000X	98.00

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

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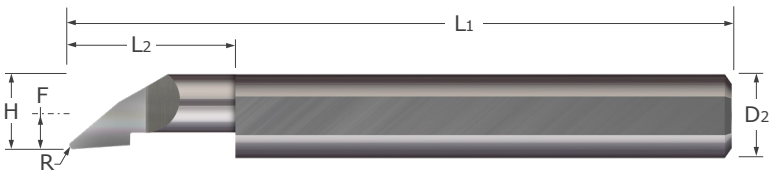
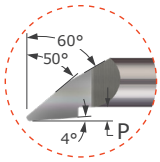
See pgs 39-47 for standard tool holders

PF

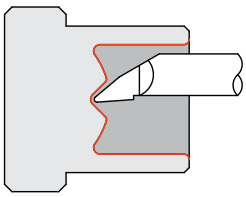
Standard – Profiling Tools

Axial Profiling





- Designed for both radial and axial profiling
- Unique design maximizes tool versatility and part feature creation
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Coolant fed enabled shank design
- Corner radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.050" −.000"	R +.002" −.000"	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0500	.0550	.150	.005	.005	-.0125	.1250	1.5	PF5-050150	29.40	PF5-050150X	33.55
.0500	.0550	.200	.005	.005	-.0125	.1250	1.5	PF5-050200	29.40	PF5-050200X	33.55
.0600	.0700	.200	.005	.005	-.0025	.1250	1.5	PF5-060200	29.40	PF5-060200X	33.55
.0600	.0700	.250	.005	.005	-.0025	.1250	1.5	PF5-060250	28.70	PF5-060250X	32.85
.0700	.0800	.200	.005	.010	.0075	.1250	1.5	PF-070200	28.70	PF-070200X	33.10
.0700	.0800	.400	.005	.010	.0075	.1250	1.5	PF-070400	28.70	PF-070400X	32.85
.0700	.0800	.500	.005	.010	.0075	.1250	1.5	PF-070500	28.70	PF-070500X	32.85
.0800	.0900	.150	.005	.010	.0175	.1250	1.5	PF5-080150	28.70	PF5-080150X	32.85
.0800	.0900	.200	.005	.010	.0175	.1250	1.5	PF5-080200	28.70	PF5-080200X	33.10
.0800	.0900	.250	.005	.010	.0175	.1250	1.5	PF5-080250	28.70	PF5-080250X	33.10
.0900	.1000	.200	.005	.010	.0275	.1250	1.5	PF5-090200	28.70	PF5-090200X	32.85
.0900	.1000	.300	.005	.010	.0275	.1250	1.5	PF5-090300	28.70	PF5-090300X	33.10
.1000	.1100	.300	.005	.015	.0375	.1250	1.5	PF5-100300	28.70	PF5-100300X	32.85
.1000	.1100	.400	.005	.015	.0375	.1250	1.5	PF5-100400	28.70	PF5-100400X	32.85
.1100	.1220	.250	.005	.015	.0475	.1250	1.5	PF-110250	28.70	PF-110250X	32.85
.1100	.1220	.375	.005	.015	.0475	.1250	1.5	PF5-110375	28.70	PF5-110375X	32.85
.1100	.1220	.500	.005	.015	.0475	.1250	1.5	PF-110500	28.70	PF-110500X	32.85
.1100	.1220	.750	.005	.015	.0475	.1250	1.5	PF-110750	28.70	PF-110750X	32.85
.1200	.1320	.250	.005	.020	.0263	.1875	2.0	PF5-120250	29.90	PF5-120250X	34.55
.1200	.1320	.250	.008	.020	.0263	.1875	2.0	PF-120250	29.90	PF-120250X	34.55
.1200	.1320	.375	.005	.020	.0263	.1875	2.0	PF5-120375	29.90	PF5-120375X	34.55
.1200	.1320	.375	.008	.020	.0263	.1875	2.0	PF8-120375	29.90	PF8-120375X	34.55
.1200	.1320	.500	.008	.020	.0263	.1875	2.0	PF-120500	29.90	PF-120500X	34.55
.1200	.1320	.750	.008	.020	.0263	.1875	2.0	PF-120750	29.90	PF-120750X	34.55
.1400	.1520	.375	.008	.020	.0463	.1875	2.0	PF8-140375	29.90	PF8-140375X	34.55
.1400	.1520	.500	.008	.020	.0463	.1875	2.0	PF8-140500	29.90	PF8-140500X	34.55

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

Standard – Profiling Tools

Axial Profiling (cont.)

PF

Continued from previous page

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H		L_2 $^{+.050"}_{-.000"}$	R $^{+.002"}_{-.000"}$	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.1600	.1760	.375	.008	.030	.0663	.1875	2.0	PF8-160375	29.90	PF8-160375X	34.55
.1600	.1760	.500	.008	.030	.0663	.1875	2.0	PF-160500	29.90	PF-160500X	34.55
.1600	.1760	.750	.008	.030	.0663	.1875	2.0	PF-160750	29.90	PF-160750X	34.55
.1800	.1960	.375	.008	.030	.0550	.2500	2.5	PF8-180375	38.30	PF8-180375X	44.60
.1800	.1960	.500	.008	.030	.0550	.2500	2.5	PF-180500	38.30	PF-180500X	44.60
.1800	.1960	.750	.008	.030	.0550	.2500	2.5	PF-180750	38.30	PF-180750X	44.60
.1800	.1960	1.000	.008	.030	.0550	.2500	2.5	PF-1801000	38.30	PF-1801000X	44.60
.2000	.2160	.400	.008	.030	.0750	.2500	2.5	PF8-200400	38.30	PF8-200400X	44.60
.2000	.2160	.600	.008	.030	.0750	.2500	2.5	PF-200600	38.30	PF-200600X	44.60
.2000	.2160	.800	.008	.030	.0750	.2500	2.5	PF8-200800	38.30	PF8-200800X	44.60
.2000	.2160	1.000	.008	.030	.0750	.2500	2.5	PF-2001000	38.30	PF-2001000X	44.60
.2300	.2500	.500	.008	.030	.0738	.3125	2.5	PF8-230500	47.20	PF8-230500X	54.80
.2300	.2500	.750	.008	.030	.0738	.3125	2.5	PF-230750	47.20	PF-230750X	54.80
.2300	.2500	1.000	.008	.030	.0738	.3125	2.5	PF-2301000	47.20	PF-2301000X	54.80
.2300	.2500	1.250	.008	.030	.0738	.3125	2.5	PF-2301250	47.20	PF-2301250X	54.80
.2600	.2800	.750	.008	.030	.1038	.3125	2.5	PF8-260750	47.20	PF8-260750X	54.80
.3000	.3200	1.000	.008	.030	.1438	.3125	2.5	PF-3001000	47.20	PF-3001000X	54.80
.3600	.3800	.750	.008	.030	.1725	.3750	2.5	PF8-360750	61.20	PF8-360750X	70.30
.3600	.3800	1.000	.008	.030	.1725	.3750	2.5	PF-3601000	61.20	PF-3601000X	70.30
.4100	.4300	.750	.008	.040	.1600	.5000	3.0	PF8-410750	84.40	PF8-410750X	96.60
.4100	.4300	1.000	.008	.040	.1600	.5000	3.0	PF8-4101000	84.40	PF8-4101000X	96.60
.4600	.4800	.750	.008	.050	.2100	.5000	3.0	PF8-460750	84.40	PF8-460750X	96.60
.4600	.4800	1.000	.008	.050	.2100	.5000	3.0	PF8-4601000	84.40	PF8-4601000X	96.60

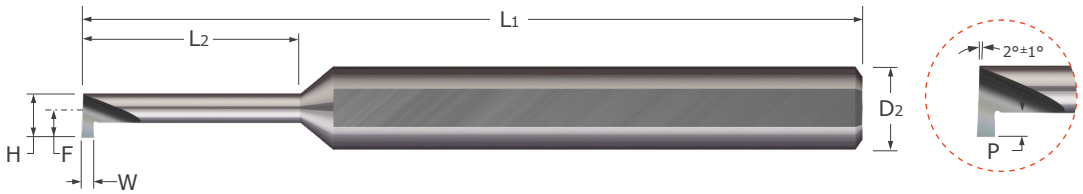
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

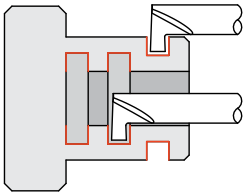
See pgs 39-47 for standard tool holders

MRR

Standard – Grooving Tools

Retaining Ring – Square – Right Hand – Miniature





- Designed for generating retaining ring grooves in bores .070" and larger
- Polished face for improved edge retention and chip evacuation while reducing galling
- On-center neck design
- Coolant fed enabled shank design
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Width	Head Width	Min. Bore Diameter*	Maximum Bore Depth	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.001" −.000"	H		L2 +.030" −.000"	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.015	.0600	.0700	.150	.020	.0400	.1250	1.5	MRR-015-150-060	33.20	MRR-015-150-060X	37.45
.015	.0600	.0700	.250	.020	.0400	.1250	1.5	MRR-015-250-060	33.20	MRR-015-250-060X	37.45
.020	.0600	.0700	.150	.020	.0400	.1250	1.5	MRR-020-150-060	33.20	MRR-020-150-060X	37.45
.020	.0600	.0700	.250	.020	.0400	.1250	1.5	MRR-020-250-060	33.20	MRR-020-250-060X	37.45
.020	.0700	.0800	.100	.020	.0450	.1250	1.5	MRR-020-100-070	33.20	MRR-020-100-070X	37.45
.020	.0700	.0800	.150	.020	.0450	.1250	1.5	MRR-020-150-070	33.20	MRR-020-150-070X	37.45
.020	.0800	.0900	.150	.025	.0525	.1250	1.5	MRR-020-150-080	33.20	MRR-020-150-080X	37.45
.020	.0800	.0900	.250	.025	.0525	.1250	1.5	MRR-020-250-080	33.20	MRR-020-250-080X	37.45
.020	.0900	.1000	.150	.025	.0575	.1250	1.5	MRR-020-150-090	33.20	MRR-020-150-090X	37.45
.020	.0900	.1000	.250	.025	.0575	.1250	1.5	MRR-020-250-090	33.20	MRR-020-250-090X	37.45
.020	.1000	.1100	.150	.030	.0650	.1875	2.0	MRR-020-150-100	35.10	MRR-020-150-100X	39.85
.020	.1000	.1100	.250	.030	.0650	.1875	2.0	MRR-020-250-100	35.10	MRR-020-250-100X	39.85
.020	.1200	.1340	.150	.040	.0800	.1875	2.0	MRR-020-150-120	35.10	MRR-020-150-120X	39.85
.020	.1200	.1340	.250	.040	.0800	.1875	2.0	MRR-020-250-120	35.10	MRR-020-250-120X	39.85
.030	.0700	.0800	.100	.020	.0450	.1250	1.5	MRR-030-100-070	33.20	MRR-030-100-070X	37.45
.030	.0700	.0800	.150	.020	.0450	.1250	1.5	MRR-030-150-070	33.20	MRR-030-150-070X	37.45
.030	.0800	.0900	.150	.025	.0525	.1250	1.5	MRR-030-150-080	33.20	MRR-030-150-080X	37.45
.030	.0800	.0900	.250	.025	.0525	.1250	1.5	MRR-030-250-080	33.20	MRR-030-250-080X	37.45
.030	.0900	.1000	.150	.025	.0575	.1250	1.5	MRR-030-150-090	33.20	MRR-030-150-090X	37.45
.030	.0900	.1000	.250	.025	.0575	.1250	1.5	MRR-030-250-090	33.20	MRR-030-250-090X	37.45
.030	.1000	.1100	.150	.030	.0650	.1875	2.0	MRR-030-150-100	35.10	MRR-030-150-100X	39.85
.030	.1000	.1100	.250	.030	.0650	.1875	2.0	MRR-030-250-100	35.10	MRR-030-250-100X	39.85
.030	.1200	.1340	.150	.040	.0800	.1875	2.0	MRR-030-150-120	35.10	MRR-030-150-120X	39.85
.030	.1200	.1340	.250	.040	.0800	.1875	2.0	MRR-030-250-120	35.10	MRR-030-250-120X	39.85

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

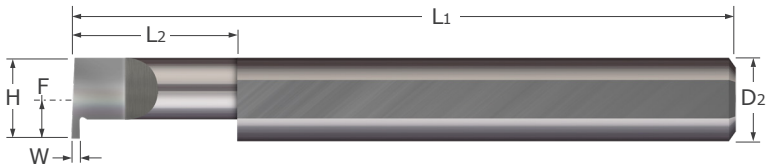
See pgs 39-47 for standard tool holders

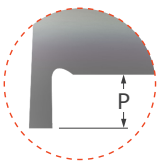
NEW!

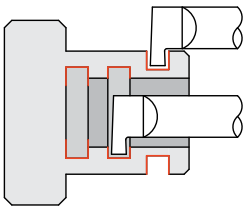
Standard – Grooving Tools

Retaining Ring – Square – Right Hand

RR / RRM







- Designed for generating retaining ring grooves
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- Coating options provide added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Width		Head Width	Min. Bore Dia*	Max. Bore Depth	Proj.	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
W +.001" −.000" +.025mm −.000mm	dec. equiv.	H		L2 +.050" −.000" +1.25mm −.00mm	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price
0.3 mm	.0118	3 mm	3.35 mm	10 mm	0.60 mm	1.5 mm	4 mm	50 mm	RRM-030-10	31.60			RRM-030-10X	36.25
0.3 mm	.0118	3 mm	3.35 mm	15 mm	0.60 mm	1.5 mm	4 mm	50 mm	RRM-030-15	31.60			RRM-030-15X	36.25
0.4 mm	.0157	4 mm	4.45 mm	10 mm	0.80 mm	2 mm	4 mm	50 mm	RRM-040-10	31.60			RRM-040-10X	36.25
0.4 mm	.0157	4 mm	4.45 mm	15 mm	0.80 mm	2 mm	4 mm	50 mm	RRM-040-15	31.60			RRM-040-15X	36.25
0.4 mm	.0157	4 mm	4.45 mm	20 mm	0.80 mm	2 mm	4 mm	50 mm	RRM-040-20	31.60	RRM-040-20G	35.35	RRM-040-20X	36.25
.017	.0170	.187	.205	.250	.030	.0937	.1875	2.0	RR-017-250-187	34.40			RR-017-250-187X	39.05
.017	.0170	.187	.205	.375	.030	.0937	.1875	2.0	RR-017-375-187	34.40			RR-017-375-187X	39.30
.017	.0170	.187	.205	.500	.030	.0937	.1875	2.0	RR-017-500-187	34.40			RR-017-500-187X	39.30
.017	.0170	.187	.205	.625	.030	.0937	.1875	2.0	RR-017-625-187	34.40			RR-017-625-187X	39.05
.017	.0170	.250	.272	.250	.050	.1250	.2500	2.5	RR-017-4	37.40			RR-017-4X	43.80
.017	.0170	.250	.272	.375	.050	.1250	.2500	2.5	RR-017-6	37.40			RR-017-6X	43.80
.017	.0170	.250	.272	.500	.050	.1250	.2500	2.5	RR-017-8	37.40			RR-017-8X	43.80
.017	.0170	.250	.272	.625	.050	.1250	.2500	2.5	RR-017-10	37.40			RR-017-10X	43.80
0.5 mm	.0200	6 mm	6.55 mm	10 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-050-10	36.80	RRM-050-10G	42.15	RRM-050-10X	43.10
0.5 mm	.0200	6 mm	6.55 mm	20 mm	1.24 mm	3 mm	6 mm	57 mm					RRM-050-20X	43.10
0.5 mm	.0200	6 mm	6.55 mm	25 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-050-25	36.80	RRM-050-25G	42.15	RRM-050-25X	43.10
.020	.0200	.120	.134	.150	.030	.0262	.1875	2.0	RR-020-150-120	34.40			RR-020-150-120X	39.05
.020	.0200	.120	.134	.250	.030	.0262	.1875	2.0	RR-020-250-120	34.40			RR-020-250-120X	39.05
.020	.0200	.140	.154	.250	.030	.0462	.1875	2.0	RR-020-250-140	34.40			RR-020-250-140X	39.05
.020	.0200	.140	.154	.375	.030	.0462	.1875	2.0	RR-020-375-140	34.40			RR-020-375-140X	39.05
.020	.0200	.160	.178	.250	.030	.0662	.1875	2.0	RR-020-250-160	34.40			RR-020-250-160X	39.30
.020	.0200	.160	.178	.375	.030	.0662	.1875	2.0	RR-020-375-160	34.40			RR-020-375-160X	39.05
.020	.0200	.187	.205	.250	.030	.0937	.1875	2.0	RR-020-250-187	34.40			RR-020-250-187X	39.05
.020	.0200	.187	.205	.375	.030	.0937	.1875	2.0	RR-020-375-187	34.40			RR-020-375-187X	39.05
.020	.0200	.187	.205	.500	.030	.0937	.1875	2.0	RR-020-500-187	34.40			RR-020-500-187X	39.05
.020	.0200	.187	.205	.625	.030	.0937	.1875	2.0	RR-020-625-187	34.40			RR-020-625-187X	39.05
.020	.0200	.250	.272	.250	.050	.1250	.2500	2.5	RR-020-250-250	37.40			RR-020-250-250X	43.80
.020	.0200	.250	.272	.375	.050	.1250	.2500	2.5	RR-020-375-250	37.40			RR-020-375-250X	43.80
.020	.0200	.250	.272	.500	.050	.1250	.2500	2.5	RR-020-500-250	37.40			RR-020-500-250X	43.80
.020	.0200	.250	.272	.625	.050	.1250	.2500	2.5	RR-020-625-250	37.40			RR-020-625-250X	43.80

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

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See pgs 39-47 for standard tool holders

RR / RRM

Standard – Grooving Tools

Retaining Ring – Square – Right Hand (cont.)

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	Width		Head Width	Min. Bore Dia*	Max. Bore Depth	Proj.	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
	W +.001" −.000" +.025mm −.000mm	dec. equiv.	H		L2 +.050" −.000" +1.25mm −.00mm	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price
	.025	.0250	.250	.272	.250	.050	.1250	.2500	2.5	RR-025-4	37.40			RR-025-4X	43.80
	.025	.0250	.250	.272	.375	.050	.1250	.2500	2.5	RR-025-6	37.40			RR-025-6X	43.80
	.025	.0250	.250	.272	.500	.050	.1250	.2500	2.5	RR-025-8	37.40			RR-025-8X	43.80
	.025	.0250	.250	.272	.625	.050	.1250	.2500	2.5	RR-025-10	37.40			RR-025-10X	43.80
	.025	.0250	.250	.272	.750	.050	.1250	.2500	2.5	RR-025-750-250	37.40			RR-025-750-250X	43.80
	.025	.0250	.250	.272	1.000	.050	.1250	.2500	2.5	RR-025-1000-250	37.40			RR-025-1000-250X	43.80
	0.7 mm	.0280	6 mm	6.55 mm	10 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-070-10	36.80			RRM-070-10X	43.10
	0.7 mm	.0280	6 mm	6.55 mm	15 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-070-15	36.80				
	0.7 mm	.0280	6 mm	6.55 mm	20 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-070-20	36.80				
	0.7 mm	.0280	6 mm	6.55 mm	25 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-070-25	36.80	RRM-070-25G	42.15	RRM-070-25X	43.10
	.029	.0290	.250	.272	.250	.050	.1250	.2500	2.5	RR-029-250-250	37.40			RR-029-250-250X	43.80
	.029	.0290	.250	.272	.500	.050	.1250	.2500	2.5	RR-029-500-250	37.40			RR-029-500-250X	43.80
	.030	.0300	.120	.134	.150	.030	.0262	.1875	2.0	RR-030-150-120	34.40			RR-030-150-120X	39.05
	.030	.0300	.120	.134	.250	.030	.0262	.1875	2.0	RR-030-250-120	34.40			RR-030-250-120X	39.05
	.030	.0300	.140	.154	.250	.030	.0462	.1875	2.0	RR-030-250-140	34.40			RR-030-250-140X	39.05
	.030	.0300	.140	.154	.375	.030	.0462	.1875	2.0	RR-030-375-140	34.40			RR-030-375-140X	39.05
NEW	.030	.0300	.140	.154	.375	.050	.0462	.1875	2.0	RR-6757	34.40			RR-6757X	39.30
	.030	.0300	.160	.178	.250	.030	.0662	.1875	2.0	RR-030-250-160	34.40			RR-030-250-160X	39.05
	.030	.0300	.160	.178	.375	.030	.0662	.1875	2.0	RR-030-375-160	34.40			RR-030-375-160X	39.05
NEW	.030	.0300	.160	.178	.375	.050	.0662	.1875	2.0	RR-3565	34.40			RR-3565X	39.30
	.030	.0300	.187	.205	.250	.030	.0937	.1875	2.0	RR-030-250-187	34.40			RR-030-250-187X	39.05
NEW	.030	.0300	.187	.205	.250	.050	.0937	.1875	2.0	RR-0495	34.40			RR-0495X	39.30
	.030	.0300	.187	.205	.500	.030	.0937	.1875	2.0	RR-030-500-187	34.40			RR-030-500-187X	39.05
NEW	.030	.0300	.187	.205	.500	.050	.0937	.1875	2.0	RR-5911	34.40			RR-5911X	39.30
	.030	.0300	.250	.272	.250	.050	.1250	.2500	2.5	RR-030-4	37.40			RR-030-4X	43.80
	.030	.0300	.250	.272	.375	.050	.1250	.2500	2.5	RR-030-6	37.40			RR-030-6X	43.80
	.030	.0300	.250	.272	.500	.050	.1250	.2500	2.5	RR-030-8	37.40			RR-030-8X	43.80
	.030	.0300	.250	.272	.625	.050	.1250	.2500	2.5	RR-030-10	37.40			RR-030-10X	43.80
	.030	.0300	.250	.272	.750	.050	.1250	.2500	2.5	RR-030-750-250	37.40			RR-030-750-250X	43.80
	.030	.0300	.250	.272	1.000	.050	.1250	.2500	2.5	RR-030-1000-250	37.40			RR-030-1000-250X	43.80
	.030	.0300	.312	.334	.500	.100	.1562	.3125	2.5	RR-030-500-312	46.70			RR-030-500-312X	54.30
	.030	.0300	.312	.334	.750	.100	.1562	.3125	2.5	RR-030-750-312	46.70			RR-030-750-312X	54.30
	.031	.0310	.250	.272	.250	.050	.1250	.2500	2.5	RR-031-250-250	37.40			RR-031-250-250X	43.80
	.031	.0310	.250	.272	.500	.050	.1250	.2500	2.5	RR-031-500-250	37.40			RR-031-500-250X	43.80
	0.8 mm	.0310	6 mm	6.55 mm	15 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-080-15	36.80	RRM-080-15G	42.15	RRM-080-15X	43.10
	0.8 mm	.0310	6 mm	6.55 mm	25 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-080-25	36.80	RRM-080-25G	42.15	RRM-080-25X	43.10
	.033	.0330	.312	.334	.250	.100	.1562	.3125	2.5	RR-033-4	46.70			RR-033-4X	54.30
	.033	.0330	.312	.334	.375	.100	.1562	.3125	2.5	RR-033-6	46.70			RR-033-6X	54.30
	.033	.0330	.312	.334	.500	.100	.1562	.3125	2.5	RR-033-8	46.70			RR-033-8X	54.30

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

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See pgs 39-47 for standard tool holders

NEW!

Standard – Grooving Tools

Retaining Ring – Square – Right Hand (cont.)

RR / RRM

Continued from previous page

Width W +.001" −.000"	dec. equiv. +.025mm −.000mm	Head Width H	Min. Bore Dia*	Max. Bore Depth L2 +.050" −.000" +1.25mm −.00mm	Proj. P	Centerline Offset F	Shank Dia. D2 (h6)	OAL L1	Uncoated Tool #	Price	TiN Coated Tool #	Price	AlTiN Coated Tool #	Price	
.033	.0330	.312	.334	.750	.100	.1562	.3125	2.5	RR-033-12	46.70			RR-033-12X	54.30	
.033	.0330	.312	.334	1.000	.100	.1562	.3125	2.5	RR-033-1000-312	46.70			RR-033-1000-312X	54.30	
.033	.0330	.312	.334	1.250	.100	.1562	.3125	2.5	RR-033-1250-312	46.70			RR-033-1250-312X	54.30	
0.9 mm	.0350	8 mm	8.55 mm	20 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-090-20	44.30					
0.9 mm	.0350	8 mm	8.55 mm	30 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-090-30	44.30			RRM-090-30X	53.40	
.038	.0380	.250	.272	.250	.050	.1250	.2500	2.5	RR-038-250-250	37.40			RR-038-250-250X	43.80	
.038	.0380	.250	.272	.500	.050	.1250	.2500	2.5	RR-038-500-250	37.40			RR-038-500-250X	43.80	
.038	.0380	.250	.272	.500	.080	.1250	.2500	2.5	RR-9076	37.40			RR-9076X	43.80	NEW
.038	.0380	.312	.334	.250	.100	.1562	.3125	2.5	RR-038-4	46.70			RR-038-4X	54.30	
.038	.0380	.312	.334	.375	.100	.1562	.3125	2.5	RR-038-6	46.70			RR-038-6X	54.30	
.038	.0380	.312	.334	.500	.100	.1562	.3125	2.5	RR-038-8	46.70			RR-038-8X	54.30	
.038	.0380	.312	.334	.750	.100	.1562	.3125	2.5	RR-038-12	46.70			RR-038-12X	54.30	
.038	.0380	.312	.334	1.000	.100	.1562	.3125	2.5	RR-038-1000-312	46.70			RR-038-1000-312X	54.30	
.038	.0380	.312	.334	1.250	.100	.1562	.3125	2.5	RR-038-1250-312	46.70			RR-038-1250-312X	54.30	

Width W +.002" −.000"	dec. equiv. +.050mm −.000mm	H		L2 +.050" −.000" +1.25mm −.00mm	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price	
.039	.0390	.187	.205	.250	.030	.0937	.1875	2.0	RR-039-250-187	34.40			RR-039-250-187X	39.05	
.039	.0390	.187	.205	.250	.060	.0937	.1875	2.0	RR-5824	34.40			RR-5824X	39.30	NEW
.039	.0390	.187	.205	.500	.030	.0937	.1875	2.0	RR-039-500-187	34.40			RR-039-500-187X	39.05	
.039	.0390	.187	.205	.500	.060	.0937	.1875	2.0	RR-1828	34.40			RR-1828X	39.30	NEW
.039	.0390	.250	.272	.250	.050	.1250	.2500	2.5	RR-039-250-250	37.40			RR-039-250-250X	43.80	
.039	.0390	.250	.272	.250	.080	.1250	.2500	2.5	RR-8363	37.40			RR-8363X	43.80	NEW
.039	.0390	.250	.272	.500	.050	.1250	.2500	2.5	RR-039-500-250	37.40			RR-039-500-250X	43.80	
.039	.0390	.250	.272	.500	.080	.1250	.2500	2.5	RR-1774	37.40			RR-1774X	43.80	NEW
.039	.0390	.375	.397	.250	.100	.1875	.3750	2.5	RR-039-4	60.80					
.039	.0390	.375	.397	.375	.100	.1875	.3750	2.5	RR-039-6	60.80			RR-039-6X	69.90	
.039	.0390	.375	.397	.500	.100	.1875	.3750	2.5	RR-039-8	60.80			RR-039-8X	69.90	
.039	.0390	.375	.397	.750	.100	.1875	.3750	2.5	RR-039-12	60.80			RR-039-12X	69.90	
.039	.0390	.375	.397	1.000	.100	.1875	.3750	2.5	RR-039-16	60.80			RR-039-16X	69.90	
.039	.0390	.375	.397	1.250	.100	.1875	.3750	2.5	RR-039-20	60.80			RR-039-20X	69.90	
.039	.0390	.375	.397	1.500	.100	.1875	.3750	2.5	RR-039-1500-375	60.80			RR-039-1500-375X	69.90	
1 mm	.0390	8 mm	8.55 mm	10 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-100-10	44.30			RRM-100-10X	53.40	
1 mm	.0390	8 mm	8.55 mm	20 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-100-20	44.30			RRM-100-20X	53.40	
1 mm	.0390	8 mm	8.55 mm	40 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-100-40	44.30			RRM-100-40X	53.40	
.040	.0400	.250	.272	.250	.050	.1250	.2500	2.5	RR-040-250-250	37.40			RR-040-250-250X	43.80	
.040	.0400	.250	.272	.250	.080	.1250	.2500	2.5	RR-1248	37.40			RR-1248X	43.80	NEW
.040	.0400	.250	.272	.500	.050	.1250	.2500	2.5	RR-040-500-250	37.40			RR-040-500-250X	43.80	
.040	.0400	.250	.272	.500	.080	.1250	.2500	2.5	RR-3030	37.40			RR-3030X	43.80	NEW
1.1 mm	.0430	8 mm	8.55 mm	10 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-110-10	44.30			RRM-110-10X	53.40	
1.1 mm	.0430	8 mm	8.55 mm	20 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-110-20	44.30			RRM-110-20X	53.40	
1.1 mm	.0430	8 mm	8.55 mm	40 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-110-40	44.30			RRM-110-40X	53.40	

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

RR / RRM

Standard – Grooving Tools

Retaining Ring – Square – Right Hand (cont.)

Continued from previous page

	Width W +.002" −.000" dec. equiv. +.050mm −.000mm		Head Width H	Min. Bore Dia*	Max. Bore Depth L2 +.050" −.000" +1.25mm −.00mm	Proj. P	Centerline Offset F	Shank Dia. D2 (h6)	OAL L1	Uncoated Tool #	Uncoated Price	TiN Coated Tool #	TiN Coated Price	AlTiN Coated Tool #	AlTiN Coated Price
	.046	.0460	.312	.334	.500	.100	.1562	.3125	2.5	RR-046-500-312	46.70			RR-046-500-312X	54.30
	.046	.0460	.312	.334	.750	.100	.1562	.3125	2.5	RR-046-750-312	46.70			RR-046-750-312X	54.30
	.046	.0460	.375	.397	.250	.100	.1875	.3750	2.5	RR-046-4	60.80			RR-046-4X	69.90
	.046	.0460	.375	.397	.375	.100	.1875	.3750	2.5	RR-046-6	60.80			RR-046-6X	69.90
	.046	.0460	.375	.397	.500	.100	.1875	.3750	2.5	RR-046-8	60.80			RR-046-8X	69.90
	.046	.0460	.375	.397	.750	.100	.1875	.3750	2.5	RR-046-12	60.80			RR-046-12X	69.90
	.046	.0460	.375	.397	1.000	.100	.1875	.3750	2.5	RR-046-16	60.80			RR-046-16X	69.90
	.046	.0460	.375	.397	1.250	.100	.1875	.3750	2.5	RR-046-20	60.80			RR-046-20X	69.90
	1.2 mm	.0470	10 mm	10.55 mm	20 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-120-20	62.40				
	1.2 mm	.0470	10 mm	10.55 mm	40 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-120-40	62.40	RRM-120-40G	70.65		
	1.3 mm	.0510	10 mm	10.55 mm	30 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-130-30	62.40				
	1.3 mm	.0510	10 mm	10.55 mm	40 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-130-40	62.40				
	.055	.0550	.250	.272	.250	.050	.1250	.2500	2.5	RR-055-250-250	37.40			RR-055-250-250X	43.80
	.055	.0550	.250	.272	.500	.050	.1250	.2500	2.5	RR-055-500-250	37.40			RR-055-500-250X	43.80
NEW	.055	.0550	.250	.272	.500	.080	.1250	.2500	2.5	RR-4257	37.40			RR-4257X	43.80
	.055	.0550	.375	.397	.250	.100	.1875	.3750	2.5	RR-055-4	60.80			RR-055-4X	69.90
	.055	.0550	.375	.397	.375	.100	.1875	.3750	2.5	RR-055-6	60.80			RR-055-6X	69.90
	.055	.0550	.375	.397	.500	.100	.1875	.3750	2.5	RR-055-8	60.80			RR-055-8X	69.90
NEW	.055	.0550	.375	.397	.500	.150	.1875	.3750	2.5	RR-1660	60.80			RR-1660X	69.90
	.055	.0550	.375	.397	.750	.100	.1875	.3750	2.5	RR-055-12	60.80			RR-055-12X	69.90
NEW	.055	.0550	.375	.397	.750	.150	.1875	.3750	2.5	RR-5000	60.80			RR-5000X	69.90
	.055	.0550	.375	.397	1.000	.100	.1875	.3750	2.5	RR-055-16	60.80			RR-055-16X	69.90
	.055	.0550	.375	.397	1.250	.100	.1875	.3750	2.5	RR-055-20	60.80			RR-055-20X	69.90
	.055	.0550	.375	.397	1.500	.100	.1870	.3750	2.5	RR-055-1500-375	60.80			RR-055-1500-375X	69.90
	.056	.0560	.250	.272	.250	.050	.1250	.2500	2.5	RR-056-250-250	37.40			RR-056-250-250X	43.80
	.056	.0560	.250	.272	.500	.050	.1250	.2500	2.5	RR-056-500-250	37.40			RR-056-500-250X	43.80
	.059	.0590	.375	.397	.500	.100	.1870	.3750	2.5	RR-059-500-375	60.80			RR-059-500-375X	69.90
	.059	.0590	.375	.397	1.000	.100	.1870	.3750	2.5	RR-059-1000-375	60.80			RR-059-1000-375X	69.90
	.062	.0620	.187	.205	.250	.030	.0937	.1875	2.0	RR-062-250-187	34.40			RR-062-250-187X	39.05
NEW	.062	.0620	.187	.205	.250	.070	.0937	.1875	2.0	RR-7865	34.40			RR-7865X	39.30
	.062	.0620	.187	.205	.500	.030	.0937	.1875	2.0	RR-062-500-187	34.40			RR-062-500-187X	39.05
NEW	.062	.0620	.187	.205	.500	.070	.0937	.1875	2.0	RR-4145	34.40			RR-4145X	39.30
	.062	.0620	.250	.272	.250	.050	.1250	.2500	2.5	RR-062-250-250	37.40			RR-062-250-250X	43.80
NEW	.062	.0620	.250	.272	.250	.090	.1250	.2500	2.5	RR-6681	37.40			RR-6681X	43.80
	.062	.0620	.250	.272	.500	.050	.1250	.2500	2.5	RR-062-500-250	37.40			RR-062-500-250X	43.80
NEW	.062	.0620	.250	.272	.500	.090	.1250	.2500	2.5	RR-2685	37.40			RR-2685X	43.80
	.062	.0620	.250	.272	.750	.050	.1250	.2500	2.5	RR-062-750-250	37.40			RR-062-750-250X	43.80
NEW	.062	.0620	.250	.272	.750	.090	.1250	.2500	2.5	RR-2795	37.40			RR-2795X	43.80
	.062	.0620	.312	.334	.500	.100	.1562	.3125	2.5	RR-062-500-312	46.70			RR-062-500-312X	54.30
	.062	.0620	.312	.334	.750	.100	.1562	.3125	2.5	RR-062-750-312	46.70			RR-062-750-312X	54.30
	.062	.0620	.312	.334	1.000	.100	.1562	.3125	2.5	RR-062-1000-312	46.70			RR-062-1000-312X	54.30

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

NEW!

Standard – Grooving Tools

Retaining Ring – Square – Right Hand (cont.)

RR / RRM

Continued from previous page

Width		Head Width	Min. Bore Dia*	Max. Bore Depth	Proj.	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated		
W +.002" −.000" +.050mm −.000mm	dec. equiv.	H		L2 +.050" −.000" +1.25mm −.00mm	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price	
.062	.0620	.375	.397	.250	.100	.1875	.3750	2.5	RR-062-4	60.80			RR-062-4X	69.90	
.062	.0620	.375	.397	.375	.100	.1875	.3750	2.5	RR-062-6	60.80			RR-062-6X	69.90	
.062	.0620	.375	.397	.500	.100	.1875	.3750	2.5	RR-062-8	60.80			RR-062-8X	69.90	
.062	.0620	.375	.397	.500	.150	.1875	.3750	2.5	RR-0824	60.80			RR-0824X	69.90	NEW
.062	.0620	.375	.397	.750	.100	.1875	.3750	2.5	RR-062-12	60.80			RR-062-12X	69.90	
.062	.0620	.375	.397	.750	.150	.1875	.3750	2.5	RR-6068	60.80			RR-6068X	69.90	NEW
.062	.0620	.375	.397	1.000	.100	.1875	.3750	2.5	RR-062-16	60.80			RR-062-16X	69.90	
.062	.0620	.375	.397	1.250	.100	.1875	.3750	2.5	RR-062-20	60.80			RR-062-20X	69.90	
.062	.0620	.375	.397	1.500	.100	.1875	.3750	2.5	RR-062-1500-375	60.80			RR-062-1500-375X	69.90	
1.6 mm	.0630	10 mm	10.55 mm	30 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-160-30	62.40					
1.6 mm	.0630	10 mm	10.55 mm	40 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-160-40	62.40					
.069	.0690	.375	.397	.375	.100	.1875	.3750	2.5	RR-069-6	60.80			RR-069-6X	69.90	
.069	.0690	.375	.397	.500	.100	.1875	.3750	2.5	RR-069-8	60.80			RR-069-8X	69.90	
.069	.0690	.375	.397	.750	.100	.1875	.3750	2.5	RR-069-12	60.80			RR-069-12X	69.90	
.069	.0690	.375	.397	.750	.150	.1875	.3750	2.5	RR-7828	60.80			RR-7828X	69.90	NEW
.069	.0690	.375	.397	1.000	.100	.1875	.3750	2.5	RR-069-16	60.80			RR-069-16X	69.90	
.069	.0690	.375	.397	1.000	.150	.1875	.3750	2.5	RR-4609	60.80			RR-4609X	69.90	NEW
.069	.0690	.375	.397	1.250	.100	.1875	.3750	2.5	RR-069-20	60.80			RR-069-20X	69.90	
1.8 mm	.0710	10 mm	10.55 mm	10 mm	2.74 mm	5 mm	10 mm	72 mm			RRM-180-10G	70.65			
.079	.0790	.375	.397	.500	.100	.1875	.3750	2.5	RR-079-500-375	60.80			RR-079-500-375X	69.90	
.079	.0790	.375	.397	1.000	.100	.1875	.3750	2.5	RR-079-1000-375	60.80			RR-079-1000-375X	69.90	
2 mm	.0790	10 mm	10.55 mm	20 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-200-20	62.40	RRM-200-20G	70.65			
2 mm	.0790	10 mm	10.55 mm	30 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-200-30	62.40	RRM-200-30G	70.65	RRM-200-30X	72.65	
.087	.0870	.250	.272	.250	.050	.1250	.2500	2.5	RR-087-250-250	37.40			RR-087-250-250X	43.80	
.087	.0870	.250	.272	.500	.050	.1250	.2500	2.5	RR-087-500-250	37.40			RR-087-500-250X	43.80	
.087	.0870	.250	.272	.750	.050	.1250	.2500	2.5	RR-087-750-250	37.40			RR-087-750-250X	43.80	
.087	.0870	.312	.334	.500	.100	.1562	.3125	2.5	RR-087-500-312	46.70			RR-087-500-312X	54.30	
.087	.0870	.312	.334	.750	.100	.1562	.3125	2.5	RR-087-750-312	46.70			RR-087-750-312X	54.30	
.087	.0870	.375	.397	.250	.100	.1875	.3750	2.5	RR-087-4	60.80			RR-087-4X	69.90	
.087	.0870	.375	.397	.375	.100	.1875	.3750	2.5	RR-087-6	60.80			RR-087-6X	69.90	
.087	.0870	.375	.397	.500	.100	.1875	.3750	2.5	RR-087-8	60.80			RR-087-8X	69.90	
.087	.0870	.375	.397	.500	.150	.1875	.3750	2.5	RR-7847	60.80			RR-7847X	69.90	NEW
.087	.0870	.375	.397	.750	.100	.1875	.3750	2.5	RR-087-12	60.80			RR-087-12X	69.90	
.087	.0870	.375	.397	.750	.150	.1875	.3750	2.5	RR-4895	60.80			RR-4895X	69.90	NEW
.087	.0870	.375	.397	1.000	.100	.1875	.3750	2.5	RR-087-16	60.80			RR-087-16X	69.90	
.087	.0870	.375	.397	1.250	.100	.1875	.3750	2.5	RR-087-20	60.80			RR-087-20X	69.90	
.087	.0870	.375	.397	1.500	.100	.1875	.3750	2.5	RR-087-1500-375	60.80			RR-087-1500-375X	69.90	
.093	.0930	.375	.397	.750	.100	.1875	.3750	2.5	RR-093-750-375	60.80			RR-093-750-375X	69.90	
.093	.0930	.375	.397	1.000	.100	.1875	.3750	2.5	RR-093-1000-375	60.80			RR-093-1000-375X	69.90	
.093	.0930	.375	.397	1.250	.100	.1875	.3750	2.5	RR-093-1250-375	60.80			RR-093-1250-375X	69.90	
.093	.0930	.500	.522	.500	.150	.2500	.5000	3.0	RR-093-8	85.30			RR-093-8X	97.60	
.093	.0930	.500	.522	.750	.150	.2500	.5000	3.0	RR-093-12	85.30			RR-093-12X	97.60	
.093	.0930	.500	.522	1.000	.150	.2500	.5000	3.0	RR-093-16	85.30			RR-093-16X	97.60	

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

RR / RRM

Standard – Grooving Tools

Retaining Ring – Square – Right Hand (cont.)

Continued from previous page

	Width		Head Width	Min. Bore Dia*	Max. Bore Depth	Proj.	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
	W +.002" −.000" +.050mm −.000mm	dec. equiv.	H		L2 +.050" −.000" +1.25mm −.00mm	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price
	.093	.0930	.500	.522	1.250	.150	.2500	.5000	3.0	RR-093-20	85.30			RR-093-20X	97.60
	.093	.0930	.500	.522	1.500	.150	.2500	.5000	3.0	RR-093-24	85.30			RR-093-24X	97.60
	.093	.0930	.500	.522	1.750	.150	.2500	.5000	3.0	RR-093-1750-500	85.30			RR-093-1750-500X	97.60
	3 mm	.1180	12 mm	12.55 mm	20 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-300-20	79.90				
	3 mm	.1180	12 mm	12.55 mm	30 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-300-30	79.90			RRM-300-30X	93.10
	3 mm	.1180	12 mm	12.55 mm	40 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-300-40	79.90	RRM-300-40G	91.25		
	.125	.1250	.375	.397	.750	.100	.1875	.3750	2.5	RR-125-750-375	60.80			RR-125-750-375X	69.90
NEW	.125	.1250	.375	.397	.750	.150	.1875	.3750	2.5	RR-3068	60.80			RR-3068X	69.90
	.125	.1250	.375	.397	1.000	.100	.1875	.3750	2.5	RR-125-1000-375	60.80			RR-125-1000-375X	69.90
NEW	.125	.1250	.375	.397	1.000	.150	.1875	.3750	2.5	RR-5586	60.80			RR-5586X	69.90
	.125	.1250	.375	.397	1.250	.100	.1875	.3750	2.5	RR-125-1250-375	60.80			RR-125-1250-375X	69.90
NEW	.125	.1250	.375	.397	1.250	.150	.1875	.3750	2.5	RR-0965	60.80			RR-0965X	69.90
	.125	.1250	.500	.522	.500	.150	.2500	.5000	3.0	RR-125-8	85.30			RR-125-8X	97.60
	.125	.1250	.500	.522	.750	.150	.2500	.5000	3.0	RR-125-12	85.30			RR-125-12X	97.60
NEW	.125	.1250	.500	.522	.750	.200	.2500	.5000	3.0	RR-5199	85.30			RR-5199X	97.60
	.125	.1250	.500	.522	1.000	.150	.2500	.5000	3.0	RR-125-16	85.30			RR-125-16X	97.60
	.125	.1250	.500	.522	1.250	.150	.2500	.5000	3.0	RR-125-20	85.30			RR-125-20X	97.60
NEW	.125	.1250	.500	.522	1.250	.200	.2500	.5000	3.0	RR-7934	85.30			RR-7934X	97.60
	.125	.1250	.500	.522	1.500	.150	.2500	.5000	3.0	RR-125-24	85.30			RR-125-24X	97.60
	.125	.1250	.500	.522	1.750	.150	.2500	.5000	3.0	RR-125-1750-500	85.30			RR-125-1750-500X	97.60
	.156	.1560	.500	.522	.750	.150	.2500	.5000	3.0	RR-156-12	85.30				
NEW	.156	.1560	.500	.522	.750	.200	.2500	.5000	3.0	RR-1563	85.30			RR-1563X	97.60
	.156	.1560	.500	.522	1.000	.150	.2500	.5000	3.0	RR-156-16	85.30			RR-156-16X	97.60
	.156	.1560	.500	.522	1.250	.150	.2500	.5000	3.0	RR-156-20	85.30			RR-156-20X	97.60
NEW	.156	.1560	.500	.522	1.250	.200	.2500	.5000	3.0	RR-9832	85.30			RR-9832X	97.60
	.156	.1560	.500	.522	1.500	.150	.2500	.5000	3.0	RR-156-24	85.30			RR-156-24X	97.60
	4 mm	.1570	12 mm	12.55 mm	20 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-400-20	79.90				
	4 mm	.1570	12 mm	12.55 mm	30 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-400-30	79.90				
	4 mm	.1570	12 mm	12.55 mm	50 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-400-50	79.90	RRM-400-50G	91.25	RRM-400-50X	93.10
	.187	.1870	.500	.522	.750	.150	.2500	.5000	3.0	RR-187-12	85.30			RR-187-12X	97.60
	.187	.1870	.500	.522	1.000	.150	.2500	.5000	3.0	RR-187-16	85.30			RR-187-16X	97.60
	.187	.1870	.500	.522	1.250	.150	.2500	.5000	3.0	RR-187-20	85.30				
	.187	.1870	.500	.522	1.500	.150	.2500	.5000	3.0	RR-187-24	85.30			RR-187-24X	97.60
	5 mm	.1970	12 mm	12.55 mm	20 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-500-20	79.90				
	5 mm	.1970	12 mm	12.55 mm	50 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-500-50	79.90			RRM-500-50X	93.10
	6 mm	.2360	12 mm	12.55 mm	20 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-600-20	79.90				
	6 mm	.2360	12 mm	12.55 mm	50 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-600-50	79.90				
	.250	.2500	.500	.522	.750	.150	.2500	.5000	3.0	RR-250-12	85.30				
	.250	.2500	.500	.522	1.000	.150	.2500	.5000	3.0	RR-250-16	85.30			RR-250-16X	97.60
	.250	.2500	.500	.522	1.250	.150	.2500	.5000	3.0	RR-250-20	85.30			RR-250-20X	97.60
	.250	.2500	.500	.522	1.500	.150	.2500	.5000	3.0	RR-250-24	85.30				

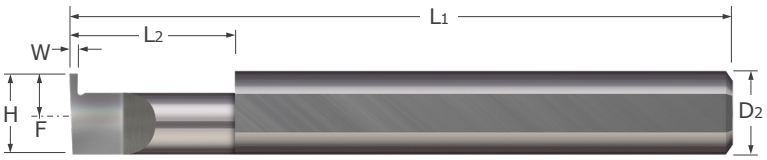
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

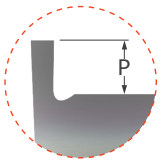
See pgs 39-47 for standard tool holders

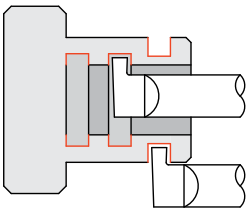
Standard – Grooving Tools

Retaining Ring – Square – Left Hand

RRL







- Designed for generating retaining ring grooves in a left hand turning application
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Width	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.001" −.000"	H		L2 +.050" −.000"	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.017	.250	.272	.250	.050	.1250	.2500	2.5	RRL-017-4	37.40	RRL-017-4X	43.80
.017	.250	.272	.500	.050	.1250	.2500	2.5	RRL-017-8	37.40	RRL-017-8X	43.80
.025	.250	.272	.250	.050	.1250	.2500	2.5	RRL-025-4	37.40	RRL-025-4X	43.80
.025	.250	.272	.500	.050	.1250	.2500	2.5	RRL-025-8	37.40		
.030	.250	.272	.250	.050	.1250	.2500	2.5	RRL-030-4	37.40	RRL-030-4X	43.80
.030	.250	.272	.375	.050	.1250	.2500	2.5	RRL-030-6	37.40	RRL-030-6X	43.80
.030	.250	.272	.500	.050	.1250	.2500	2.5	RRL-030-8	37.40	RRL-030-8X	43.80
.030	.250	.272	.625	.050	.1250	.2500	2.5	RRL-030-10	37.40	RRL-030-10X	43.80
.033	.312	.334	.250	.100	.1562	.3125	2.5	RRL-033-4	46.70	RRL-033-4X	54.30
.033	.312	.334	.375	.100	.1562	.3125	2.5	RRL-033-6	46.70		
.033	.312	.334	.750	.100	.1562	.3125	2.5	RRL-033-12	46.70		
.038	.312	.334	.250	.100	.1562	.3125	2.5	RRL-038-4	46.70		
.038	.312	.334	.375	.100	.1562	.3125	2.5	RRL-038-6	46.70		
.038	.312	.334	.500	.100	.1562	.3125	2.5	RRL-038-8	46.70	RRL-038-8X	54.30
.038	.312	.334	.750	.100	.1562	.3125	2.5	RRL-038-12	46.70	RRL-038-12X	54.30

W +.002" −.000"	H		L2 +.050" −.000"	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.039	.375	.397	.250	.100	.1875	.3750	2.5	RRL-039-4	60.80	RRL-039-4X	69.90
.039	.375	.397	.500	.100	.1875	.3750	2.5	RRL-039-8	60.80	RRL-039-8X	69.90
.039	.375	.397	.750	.100	.1875	.3750	2.5	RRL-039-12	60.80		
.046	.375	.397	.250	.100	.1875	.3750	2.5	RRL-046-4	60.80	RRL-046-4X	69.90
.046	.375	.397	.375	.100	.1875	.3750	2.5	RRL-046-6	60.80		
.046	.375	.397	.750	.100	.1875	.3750	2.5	RRL-046-12	60.80	RRL-046-12X	69.90
.046	.375	.397	1.000	.100	.1875	.3750	2.5	RRL-046-16	60.80	RRL-046-16X	69.90
.046	.375	.397	1.250	.100	.1875	.3750	2.5	RRL-046-20	60.80	RRL-046-20X	69.90
.055	.375	.397	.250	.100	.1875	.3750	2.5	RRL-055-4	60.80		
.055	.375	.397	.500	.100	.1875	.3750	2.5	RRL-055-8	60.80		
.055	.375	.397	.750	.100	.1875	.3750	2.5	RRL-055-12	60.80		
.055	.375	.397	1.000	.100	.1875	.3750	2.5	RRL-055-16	60.80		

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

RRL

Standard – Grooving Tools

Retaining Ring – Left Hand (cont.)

Continued from previous page

Width	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W $^{+.002"}_{-.000"}$	H		L_2 $^{+.050"}_{-.000"}$	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.062	.375	.397	.250	.100	.1875	.3750	2.5	RRL-062-4	60.80		
.062	.375	.397	.500	.100	.1875	.3750	2.5	RRL-062-8	60.80	RRL-062-8X	69.90
.062	.375	.397	.750	.100	.1875	.3750	2.5	RRL-062-12	60.80	RRL-062-12X	69.90
.062	.375	.397	1.250	.100	.1875	.3750	2.5	RRL-062-20	60.80		
.069	.375	.397	.250	.100	.1875	.3750	2.5	RRL-069-4	60.80		
.069	.375	.397	.500	.100	.1875	.3750	2.5	RRL-069-8	60.80		
.069	.375	.397	1.000	.100	.1875	.3750	2.5	RRL-069-16	60.80	RRL-069-16X	69.90
.069	.375	.397	1.250	.100	.1875	.3750	2.5	RRL-069-20	60.80		
.087	.375	.397	.375	.100	.1875	.3750	2.5	RRL-087-6	60.80		
.087	.375	.397	.500	.100	.1875	.3750	2.5	RRL-087-8	60.80	RRL-087-8X	69.90
.087	.375	.397	.750	.100	.1875	.3750	2.5	RRL-087-12	60.80	RRL-087-12X	69.90
.087	.375	.397	1.000	.100	.1875	.3750	2.5	RRL-087-16	60.80		
.087	.375	.397	1.250	.100	.1875	.3750	2.5	RRL-087-20	60.80	RRL-087-20X	69.90
.093	.500	.522	.750	.150	.2500	.5000	3.0	RRL-093-12	85.30	RRL-093-12X	97.60
.093	.500	.522	1.000	.150	.2500	.5000	3.0	RRL-093-16	85.30	RRL-093-16X	97.60
.093	.500	.522	1.500	.150	.2500	.5000	3.0	RRL-093-24	85.30	RRL-093-24X	97.60
.125	.500	.522	.500	.150	.2500	.5000	3.0	RRL-125-8	85.30	RRL-125-8X	97.60
.125	.500	.522	.750	.150	.2500	.5000	3.0	RRL-125-12	85.30		
.125	.500	.522	1.000	.150	.2500	.5000	3.0	RRL-125-16	85.30		
.125	.500	.522	1.500	.150	.2500	.5000	3.0	RRL-125-24	85.30	RRL-125-24X	97.60
.156	.500	.522	.500	.150	.2500	.5000	3.0	RRL-156-8	85.30		
.187	.500	.522	.750	.150	.2500	.5000	3.0	RRL-187-12	85.30		
.187	.500	.522	1.000	.150	.2500	.5000	3.0	RRL-187-16	85.30		
.187	.500	.522	1.250	.150	.2500	.5000	3.0	RRL-187-20	85.30		
.250	.500	.522	.500	.150	.2500	.5000	3.0	RRL-250-8	85.30		
.250	.500	.522	.750	.150	.2500	.5000	3.0	RRL-250-12	85.30		
.250	.500	.522	1.000	.150	.2500	.5000	3.0	RRL-250-16	85.30		
.250	.500	.522	1.250	.150	.2500	.5000	3.0	RRL-250-20	85.30		

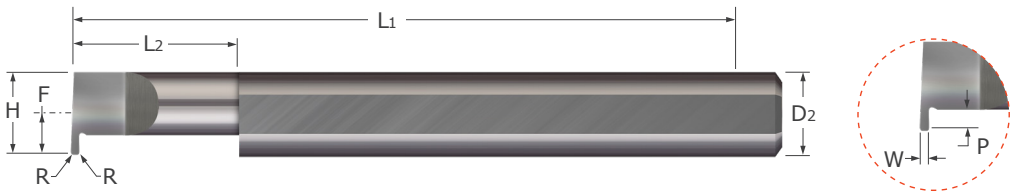
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

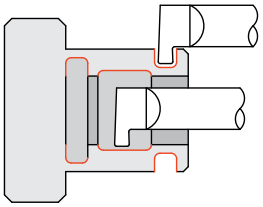
See pgs 39-47 for standard tool holders

Standard – Grooving Tools

Retaining Ring – Corner Radius – Right Hand

RRC





- Designed for generating corner radius retaining ring grooves in bores .205" and larger
- Corner radius designed for extended tool life, and finished groove profiling
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Coolant fed enabled shank design
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Width	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.001" −.000"	H		L2 +.050" −.000"	R +.001" −.001"	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.017	.187	.205	.250	.003	.030	.0937	.1875	2.0	RRC3-017-250-187	39.90	RRC3-017-250-187X	44.85
.017	.187	.205	.375	.003	.030	.0937	.1875	2.0	RRC3-017-375-187	39.90	RRC3-017-375-187X	44.85
.017	.250	.272	.250	.003	.050	.1250	.2500	2.5	RRC3-017-250-250	43.00	RRC3-017-250-250X	49.40
.017	.250	.272	.375	.003	.050	.1250	.2500	2.5	RRC3-017-375-250	43.00	RRC3-017-375-250X	49.40
.020	.187	.205	.250	.003	.030	.0937	.1875	2.0	RRC3-020-250-187	39.90	RRC3-020-250-187X	44.85
.020	.187	.205	.375	.003	.030	.0937	.1875	2.0	RRC3-020-375-187	39.90	RRC3-020-375-187X	44.85
.020	.250	.272	.250	.003	.050	.1250	.2500	2.5	RRC3-020-250-250	43.00	RRC3-020-250-250X	49.40
.020	.250	.272	.375	.003	.050	.1250	.2500	2.5	RRC3-020-375-250	43.00	RRC3-020-375-250X	49.40
.025	.250	.272	.250	.003	.050	.1250	.2500	2.5	RRC3-025-250-250	43.00	RRC3-025-250-250X	49.40
.025	.250	.272	.375	.003	.050	.1250	.2500	2.5	RRC3-025-375-250	43.00	RRC3-025-375-250X	49.40
.030	.187	.205	.250	.003	.030	.0937	.1875	2.0	RRC3-030-250-187	39.90	RRC3-030-250-187X	44.85
.030	.187	.205	.500	.003	.030	.0937	.1875	2.0	RRC3-030-500-187	39.90	RRC3-030-500-187X	44.85
.030	.250	.272	.250	.003	.050	.1250	.2500	2.5	RRC3-030-250-250	43.00	RRC3-030-250-250X	49.40
.030	.250	.272	.375	.003	.050	.1250	.2500	2.5	RRC3-030-375-250	43.00	RRC3-030-375-250X	49.40
.030	.312	.334	.500	.003	.100	.1562	.3125	2.5	RRC3-030-500-312	53.70	RRC3-030-500-312X	61.30
.030	.312	.334	.750	.003	.100	.1562	.3125	2.5	RRC3-030-750-312	53.70	RRC3-030-750-312X	61.30
.033	.312	.334	.500	.003	.100	.1562	.3125	2.5	RRC3-033-500-312	53.70	RRC3-033-500-312X	61.30
.033	.312	.334	.750	.003	.100	.1562	.3125	2.5	RRC3-033-750-312	53.70	RRC3-033-750-312X	61.30
.038	.312	.334	.500	.003	.100	.1562	.3125	2.5	RRC3-038-500-312	53.70	RRC3-038-500-312X	61.30
.038	.312	.334	.750	.003	.100	.1562	.3125	2.5	RRC3-038-750-312	53.70	RRC3-038-750-312X	61.30
W +.002" −.000"	H		L2 +.050" −.000"	R +.001" −.001"	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.039	.375	.397	.500	.003	.100	.1875	.3750	2.5	RRC3-039-500-375	68.00	RRC3-039-500-375X	77.00
.039	.375	.397	.750	.003	.100	.1875	.3750	2.5	RRC3-039-750-375	68.00	RRC3-039-750-375X	77.00
.039	.375	.397	1.000	.003	.100	.1875	.3750	2.5	RRC3-039-1000-375	68.00	RRC3-039-1000-375X	77.00
.062	.375	.397	.500	.003	.100	.1875	.3750	2.5	RRC3-062-500-375	68.00	RRC3-062-500-375X	77.00
.062	.375	.397	.500	.006	.100	.1875	.3750	2.5	RRC6-062-500-375	68.00	RRC6-062-500-375X	77.00
.062	.375	.397	.750	.003	.100	.1875	.3750	2.5	RRC3-062-750-375	68.00	RRC3-062-750-375X	77.00

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

RRC

Standard – Grooving Tools

Retaining Ring – Corner Radius – Right Hand (cont.)

Continued from previous page

Width	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	H		L2 +.050" −.000"	R +.001" −.001"	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.062	.375	.397	.750	.006	.100	.1875	.3750	2.5	RRC6-062-750-375	68.00	RRC6-062-750-375X	77.00
.062	.375	.397	1.000	.003	.100	.1875	.3750	2.5	RRC3-062-1000-375	68.00	RRC3-062-1000-375X	77.00
.062	.375	.397	1.000	.006	.100	.1875	.3750	2.5	RRC6-062-1000-375	68.00	RRC6-062-1000-375X	77.00
.087	.375	.397	.500	.003	.100	.1875	.3750	2.5	RRC3-087-500-375	68.00	RRC3-087-500-375X	77.00
.087	.375	.397	.500	.006	.100	.1875	.3750	2.5	RRC6-087-500-375	68.00	RRC6-087-500-375X	77.00
.087	.375	.397	.750	.003	.100	.1875	.3750	2.5	RRC3-087-750-375	68.00	RRC3-087-750-375X	77.00
.087	.375	.397	.750	.006	.100	.1875	.3750	2.5	RRC6-087-750-375	68.00	RRC6-087-750-375X	77.00
.087	.375	.397	1.000	.003	.100	.1875	.3750	2.5	RRC3-087-1000-375	68.00	RRC3-087-1000-375X	77.00
.087	.375	.397	1.000	.006	.100	.1875	.3750	2.5	RRC6-087-1000-375	68.00	RRC6-087-1000-375X	77.00
.093	.500	.522	.750	.003	.150	.2500	.5000	3.0	RRC3-093-750-500	93.40	RRC3-093-750-500X	105.70
.093	.500	.522	.750	.006	.150	.2500	.5000	3.0	RRC6-093-750-500	93.40	RRC6-093-750-500X	105.70
.093	.500	.522	1.000	.003	.150	.2500	.5000	3.0	RRC3-093-1000-500	93.40	RRC3-093-1000-500X	105.70
.093	.500	.522	1.000	.006	.150	.2500	.5000	3.0	RRC6-093-1000-500	93.40	RRC6-093-1000-500X	105.70
.125	.500	.522	.750	.003	.150	.2500	.5000	3.0	RRC3-125-750-500	93.40	RRC3-125-750-500X	105.70
.125	.500	.522	.750	.006	.150	.2500	.5000	3.0	RRC6-125-750-500	93.40	RRC6-125-750-500X	105.70
.125	.500	.522	1.000	.003	.150	.2500	.5000	3.0	RRC3-125-1000-500	93.40	RRC3-125-1000-500X	105.70
.125	.500	.522	1.000	.006	.150	.2500	.5000	3.0	RRC6-125-1000-500	93.40	RRC6-125-1000-500X	105.70

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

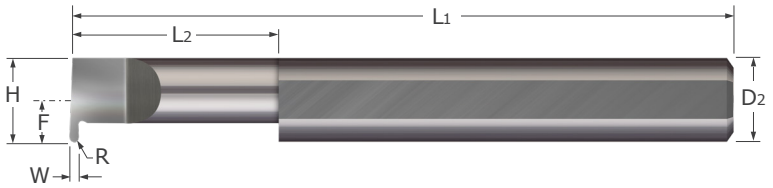
See pgs 39-47 for standard tool holders

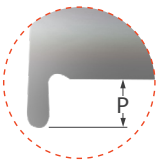
NEW!

Standard – Grooving Tools

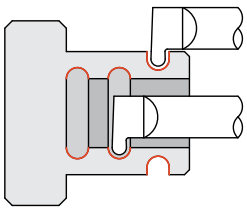
Full Radius

FR





- Designed for generating full radius grooves
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Full radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Radius	Head Width	Min. Bore Dia*	Max. Bore Depth	Proj.	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	R	H		L2 +.050" −.000"	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.017	.0085	.187	.205	.250	.030	.0937	.1875	2.0	FR-017-4-187	39.90	FR-017-4-187X	44.85
.017	.0085	.187	.205	.375	.030	.0937	.1875	2.0	FR-017-6-187	39.90	FR-017-6-187X	44.85
.017	.0085	.187	.205	.500	.030	.0937	.1875	2.0	FR-017-8-187	39.90	FR-017-8-187X	44.85
.017	.0085	.187	.205	.625	.030	.0937	.1875	2.0	FR-017-10-187	39.90	FR-017-10-187X	44.85
.017	.0085	.250	.272	.250	.050	.1250	.2500	2.5	FR-017-4	43.00	FR-017-4X	49.40
.017	.0085	.250	.272	.375	.050	.1250	.2500	2.5	FR-017-6	43.00	FR-017-6X	49.40
.017	.0085	.250	.272	.500	.050	.1250	.2500	2.5	FR-017-8	43.00	FR-017-8X	49.40
.017	.0085	.250	.272	.625	.050	.1250	.2500	2.5	FR-017-10	43.00	FR-017-10X	49.40
.020	.0100	.187	.205	.250	.030	.0937	.1875	2.0	FR-020-4-187	39.90	FR-020-4-187X	44.85
.020	.0100	.187	.205	.375	.030	.0937	.1875	2.0	FR-020-6-187	39.90	FR-020-6-187X	44.85
.020	.0100	.187	.205	.500	.030	.0937	.1875	2.0	FR-020-8-187	39.90	FR-020-8-187X	44.85
.020	.0100	.187	.205	.625	.030	.0937	.1875	2.0	FR-020-10-187	39.90	FR-020-10-187X	44.85
.025	.0125	.250	.272	.250	.050	.1250	.2500	2.5	FR-025-4	43.00	FR-025-4X	49.40
.025	.0125	.250	.272	.375	.050	.1250	.2500	2.5	FR-025-6	43.00	FR-025-6X	49.40
.025	.0125	.250	.272	.500	.050	.1250	.2500	2.5	FR-025-8	43.00	FR-025-8X	49.40
.025	.0125	.250	.272	.625	.050	.1250	.2500	2.5	FR-025-10	43.00	FR-025-10X	49.40
.030	.0150	.250	.272	.250	.050	.1250	.2500	2.5	FR-030-4	43.00	FR-030-4X	49.40
.030	.0150	.250	.272	.375	.050	.1250	.2500	2.5	FR-030-6	43.00	FR-030-6X	49.40
.030	.0150	.250	.272	.500	.050	.1250	.2500	2.5	FR-030-8	43.00	FR-030-8X	49.40
.030	.0150	.250	.272	.625	.050	.1250	.2500	2.5	FR-030-10	43.00	FR-030-10X	49.40
.033	.0165	.312	.334	.250	.100	.1562	.3125	2.5	FR-033-4	53.70	FR-033-4X	61.30
.033	.0165	.312	.334	.375	.100	.1562	.3125	2.5	FR-033-6	53.70	FR-033-6X	61.30
.033	.0165	.312	.334	.500	.100	.1562	.3125	2.5	FR-033-8	53.70	FR-033-8X	61.30
.033	.0165	.312	.334	.625	.100	.1562	.3125	2.5	FR-033-10	53.70	FR-033-10X	61.30
.038	.0190	.312	.334	.250	.100	.1562	.3125	2.5	FR-038-4	53.70	FR-038-4X	61.30
.038	.0190	.312	.334	.375	.100	.1562	.3125	2.5	FR-038-6	53.70	FR-038-6X	61.30
.038	.0190	.312	.334	.500	.100	.1562	.3125	2.5	FR-038-8	53.70	FR-038-8X	61.30
.038	.0190	.312	.334	.625	.100	.1562	.3125	2.5	FR-038-10	53.70	FR-038-10X	61.30
.039	.0195	.375	.397	.250	.100	.1875	.3750	2.5	FR-039-4	68.00	FR-039-4X	77.00
.039	.0195	.375	.397	.375	.100	.1875	.3750	2.5	FR-039-6	68.00	FR-039-6X	77.00
.039	.0195	.375	.397	.500	.100	.1875	.3750	2.5	FR-039-8	68.00	FR-039-8X	77.00
.039	.0195	.375	.397	.750	.100	.1875	.3750	2.5	FR-039-12	68.00	FR-039-12X	77.00
.039	.0195	.375	.397	1.000	.100	.1875	.3750	2.5	FR-039-16	68.00	FR-039-16X	77.00
.039	.0195	.375	.397	1.250	.100	.1875	.3750	2.5	FR-039-20	68.00	FR-039-20X	77.00

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

FR

Standard – Grooving Tools
Full Radius (cont.)

Continued from previous page

	Width	Radius	Head Width	Min. Bore Dia*	Max. Bore Depth	Proj.	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
	W +.002" −.000"	R	H		L2 +.050" −.000"	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
	.046	.0230	.375	.397	.250	.100	.1875	.3750	2.5	FR-046-4	68.00		
	.046	.0230	.375	.397	.375	.100	.1875	.3750	2.5	FR-046-6	68.00	FR-046-6X	77.00
	.046	.0230	.375	.397	.500	.100	.1875	.3750	2.5	FR-046-8	68.00	FR-046-8X	77.00
	.046	.0230	.375	.397	.750	.100	.1875	.3750	2.5	FR-046-12	68.00	FR-046-12X	77.00
	.046	.0230	.375	.397	1.000	.100	.1875	.3750	2.5	FR-046-16	68.00	FR-046-16X	77.00
	.046	.0230	.375	.397	1.250	.100	.1875	.3750	2.5	FR-046-20	68.00	FR-046-20X	77.00
	.055	.0275	.375	.397	.250	.100	.1875	.3750	2.5	FR-055-4	68.00	FR-055-4X	77.00
	.055	.0275	.375	.397	.375	.100	.1875	.3750	2.5	FR-055-6	68.00		
	.055	.0275	.375	.397	.500	.100	.1875	.3750	2.5	FR-055-8	68.00	FR-055-8X	77.00
	.055	.0275	.375	.397	.750	.100	.1875	.3750	2.5	FR-055-12	68.00	FR-055-12X	77.00
	.055	.0275	.375	.397	1.000	.100	.1875	.3750	2.5	FR-055-16	68.00	FR-055-16X	77.00
	.055	.0275	.375	.397	1.250	.100	.1875	.3750	2.5	FR-055-20	68.00		
	.062	.0310	.375	.397	.250	.100	.1875	.3750	2.5	FR-062-4	68.00	FR-062-4X	77.00
	.062	.0310	.375	.397	.375	.100	.1875	.3750	2.5	FR-062-6	68.00	FR-062-6X	77.00
	.062	.0310	.375	.397	.500	.100	.1875	.3750	2.5	FR-062-8	68.00	FR-062-8X	77.00
	.062	.0310	.375	.397	.750	.100	.1875	.3750	2.5	FR-062-12	68.00	FR-062-12X	77.00
	.062	.0310	.375	.397	1.000	.100	.1875	.3750	2.5	FR-062-16	68.00	FR-062-16X	77.00
	.062	.0310	.375	.397	1.250	.100	.1875	.3750	2.5	FR-062-20	68.00	FR-062-20X	77.00
	.069	.0345	.375	.397	.250	.100	.1875	.3750	2.5	FR-069-4	68.00	FR-069-4X	77.00
	.069	.0345	.375	.397	.375	.100	.1875	.3750	2.5	FR-069-6	68.00		
	.069	.0345	.375	.397	.500	.100	.1875	.3750	2.5	FR-069-8	68.00	FR-069-8X	77.00
	.069	.0345	.375	.397	.750	.100	.1875	.3750	2.5	FR-069-12	68.00	FR-069-12X	77.00
	.069	.0345	.375	.397	1.000	.100	.1875	.3750	2.5	FR-069-16	68.00	FR-069-16X	77.00
	.069	.0345	.375	.397	1.250	.100	.1875	.3750	2.5	FR-069-20	68.00		
	.087	.0435	.375	.397	.250	.100	.1875	.3750	2.5	FR-087-4	68.00	FR-087-4X	77.00
	.087	.0435	.375	.397	.375	.100	.1875	.3750	2.5	FR-087-6	68.00	FR-087-6X	77.00
	.087	.0435	.375	.397	.500	.100	.1875	.3750	2.5	FR-087-8	68.00	FR-087-8X	77.00
NEW	.087	.0435	.375	.397	.500	.150	.1875	.3750	2.5	FR-7847	68.00	FR-7847X	77.00
	.087	.0435	.375	.397	.750	.100	.1875	.3750	2.5	FR-087-12	68.00	FR-087-12X	77.00
NEW	.087	.0435	.375	.397	.750	.150	.1875	.3750	2.5	FR-4895	68.00	FR-4895X	77.00
	.087	.0435	.375	.397	1.000	.100	.1875	.3750	2.5	FR-087-16	68.00	FR-087-16X	77.00
	.087	.0435	.375	.397	1.250	.100	.1875	.3750	2.5	FR-087-20	68.00	FR-087-20X	77.00
	.093	.0465	.500	.522	.500	.150	.2500	.5000	3.0	FR-093-8	93.40	FR-093-8X	105.70
	.093	.0465	.500	.522	.750	.150	.2500	.5000	3.0	FR-093-12	93.40	FR-093-12X	105.70
	.093	.0465	.500	.522	1.000	.150	.2500	.5000	3.0	FR-093-16	93.40	FR-093-16X	105.70
	.093	.0465	.500	.522	1.250	.150	.2500	.5000	3.0	FR-093-20	93.40	FR-093-20X	105.70
	.093	.0465	.500	.522	1.500	.150	.2500	.5000	3.0	FR-093-24	93.40	FR-093-24X	105.70
NEW	.125	.0625	.375	.397	1.000	.150	.1875	.3750	2.5	FR-5586	68.00	FR-5586X	77.00
NEW	.125	.0625	.375	.397	1.250	.150	.1875	.3750	2.5	FR-0965	68.00	FR-0965X	77.00
	.125	.0625	.500	.522	.500	.150	.2500	.5000	3.0	FR-125-8	93.40	FR-125-8X	105.70
	.125	.0625	.500	.522	.750	.150	.2500	.5000	3.0	FR-125-12	93.40	FR-125-12X	105.70
	.125	.0625	.500	.522	1.000	.150	.2500	.5000	3.0	FR-125-16	93.40	FR-125-16X	105.70
NEW	.125	.0625	.500	.522	1.000	.200	.2500	.5000	3.0	FR-7934	93.40	FR-7934X	105.70
	.125	.0625	.500	.522	1.250	.150	.2500	.5000	3.0	FR-125-20	93.40	FR-125-20X	105.70
NEW	.125	.0625	.500	.522	1.250	.200	.2500	.5000	3.0	FR-0271	93.40	FR-0271X	105.70
	.125	.0625	.500	.522	1.500	.150	.2500	.5000	3.0	FR-125-24	93.40	FR-125-24X	105.70
	.187	.0935	.500	.522	.500	.150	.2500	.5000	3.0			FR-187-8X	105.70
	.187	.0935	.500	.522	.750	.150	.2500	.5000	3.0	FR-187-12	93.40		
	.187	.0935	.500	.522	1.000	.150	.2500	.5000	3.0	FR-187-16	93.40		
NEW	.187	.0935	.500	.522	1.000	.200	.2500	.5000	3.0	FR-5272	93.40	FR-5272X	105.70
	.187	.0935	.500	.522	1.250	.150	.2500	.5000	3.0	FR-187-20	93.40		
	.187	.0935	.500	.522	1.500	.150	.2500	.5000	3.0	FR-187-24	93.40	FR-187-24X	105.70

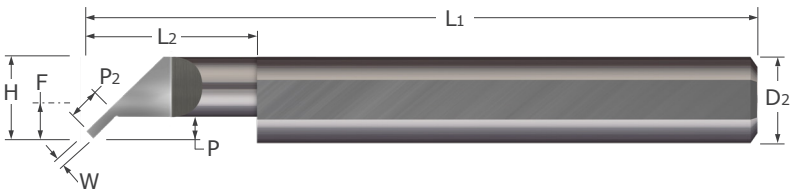
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

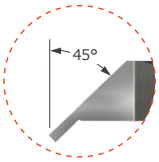
See pgs 39-47 for standard tool holders

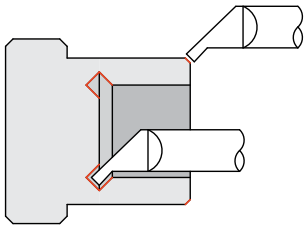
Standard – Grooving Tools

Undercutting – Square

UC







- Designed for plunging square undercut grooves
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

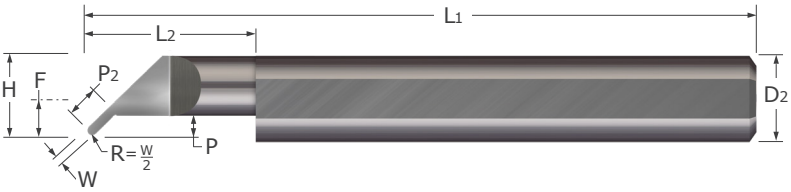
Width	Projection	Angled Projection	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	P	P2	H		L2 +.050" −.000"	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.030	.060	.080	.240	.262	.500	.1150	.2500	2.5	UC-25030-8	38.80	UC-25030-8X	45.20
.050	.083	.120	.303	.325	.500	.1467	.3125	2.5	UC-31050-8	48.40	UC-31050-8X	56.00
.062	.083	.120	.303	.325	1.000	.1467	.3125	2.5	UC-31062-16	48.40	UC-31062-16X	56.00
.062	.083	.120	.303	.325	1.250	.1467	.3125	2.5	UC-31062-20	48.40	UC-31062-20X	56.00
.062	.095	.130	.365	.387	1.000	.1775	.3750	2.5	UC-37062-16	63.80	UC-37062-16X	72.80
.062	.125	.180	.490	.512	1.000	.2400	.5000	3.0	UC-50062-16	89.40	UC-50062-16X	101.60
.062	.125	.180	.490	.512	1.500	.2400	.5000	3.0	UC-50062-24	89.40		
.093	.095	.130	.365	.387	1.000	.1775	.3750	2.5	UC-37093-16	63.80	UC-37093-16X	72.80
.093	.125	.180	.490	.512	1.500	.2400	.5000	3.0	UC-50093-24	89.40	UC-50093-24X	101.60
.125	.095	.130	.365	.387	1.000	.1775	.3750	2.5	UC-37125-16	63.80	UC-37125-16X	72.80
.125	.095	.130	.365	.387	1.250	.1775	.3750	2.5	UC-37125-20	63.80		
.125	.125	.180	.490	.512	1.000	.2400	.5000	3.0	UC-50125-16	89.40		
.125	.125	.180	.490	.512	1.500	.2400	.5000	3.0	UC-50125-24	89.40	UC-50125-24X	101.60

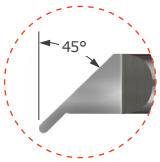
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pgs 39-47 for standard tool holders

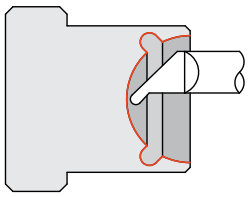
UP

Standard – Grooving Tools
Undercutting – Full Radius





- Designed for plunging full radius undercut grooves and profiling
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Full radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



	Width	Projection	Angled Projection	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
	W +.002" −.000"	P	P2	H		L2 +.050" −.000"	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
	.020	.050	.077	.180	.198	.375	.0862	.1875	2.0	UP-18020-6	41.50	UP-18020-6X	46.40
	.020	.050	.077	.180	.198	.500	.0862	.1875	2.0	UP-18020-8	41.50	UP-18020-8X	46.40
	.025	.050	.078	.180	.198	.375	.0862	.1875	2.0	UP-18025-6	41.50	UP-18025-6X	46.40
	.025	.050	.078	.180	.198	.500	.0862	.1875	2.0	UP-18025-8	41.50	UP-18025-8X	46.40
	.025	.060	.092	.240	.262	.375	.1150	.2500	2.5	UP-25025-6	44.60	UP-25025-6X	51.00
	.025	.060	.092	.240	.262	.500	.1150	.2500	2.5	UP-25025-8	44.60	UP-25025-8X	51.00
	.030	.050	.079	.180	.198	.375	.0862	.1875	2.0	UP-18030-6	41.50	UP-18030-6X	46.40
	.030	.050	.079	.180	.198	.500	.0862	.1875	2.0	UP-18030-8	41.50	UP-18030-8X	46.40
	.030	.060	.094	.240	.262	.500	.1150	.2500	2.5	UP-25030-8	44.60	UP-25030-8X	51.00
	.030	.060	.094	.240	.262	1.000	.1150	.2500	2.5	UP-25030-16	44.60	UP-25030-16X	51.00
NEW	.039	.050	.082	.180	.198	.375	.0862	.1875	2.0	UP-18039-6	41.50	UP-18039-6X	46.40
NEW	.039	.060	.096	.240	.262	.500	.1150	.2500	2.5	UP-25039-8	44.60	UP-25039-8X	51.00
NEW	.039	.060	.096	.240	.262	1.000	.1150	.2500	2.5	UP-25039-16	44.60	UP-25039-16X	51.00
	.050	.083	.132	.303	.325	.500	.1467	.3125	2.5	UP-31050-8	55.50	UP-31050-8X	63.10
	.050	.083	.132	.303	.325	1.000	.1467	.3125	2.5	UP-31050-16	55.50	UP-31050-16X	63.10
	.062	.083	.136	.303	.325	1.000	.1467	.3125	2.5	UP-31062-16	55.50	UP-31062-16X	63.10
	.062	.083	.136	.303	.325	1.250	.1467	.3125	2.5	UP-31062-20	55.50	UP-31062-20X	63.10
	.062	.095	.153	.365	.387	1.000	.1775	.3750	2.5	UP-37062-16	71.00	UP-37062-16X	80.00
	.062	.095	.153	.365	.387	1.250	.1775	.3750	2.5	UP-37062-20	71.00	UP-37062-20X	80.00
	.062	.125	.195	.490	.512	1.000	.2400	.5000	3.0	UP-50062-16	98.00	UP-50062-16X	110.20
	.062	.125	.195	.490	.512	1.500	.2400	.5000	3.0	UP-50062-24	98.00	UP-50062-24X	110.20
	.093	.095	.162	.365	.387	1.000	.1775	.3750	2.5	UP-37093-16	71.00	UP-37093-16X	80.00
	.093	.125	.204	.490	.512	1.000	.2400	.5000	3.0	UP-50093-16	98.00	UP-50093-16X	110.20
	.093	.125	.204	.490	.512	1.500	.2400	.5000	3.0	UP-50093-24	98.00	UP-50093-24X	110.20
	.125	.095	.171	.365	.387	1.000	.1775	.3750	2.5	UP-37125-16	71.00	UP-37125-16X	80.00
	.125	.095	.171	.365	.387	1.250	.1775	.3750	2.5	UP-37125-20	71.00	UP-37125-20X	80.00
	.125	.125	.213	.490	.512	1.000	.2400	.5000	3.0	UP-50125-16	98.00	UP-50125-16X	110.20
	.125	.125	.213	.490	.512	1.500	.2400	.5000	3.0	UP-50125-24	98.00	UP-50125-24X	110.20

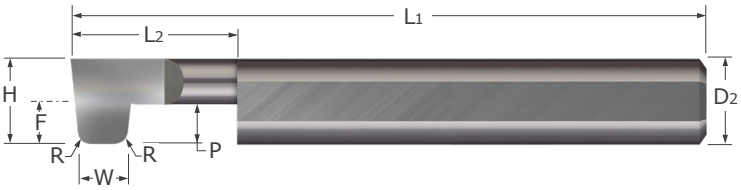
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

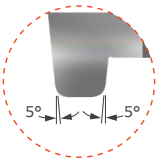
See pgs 39-47 for standard tool holders

Standard – Grooving Tools

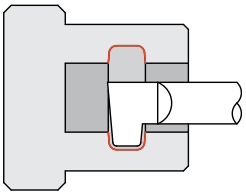
O-Ring Grooving

OR





- Designed for creating O-ring grooves
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	H		L2 +.050" −.000"	R +.010" −.000"	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.096	.250	.272	.500	.010	.100	.1250	.2500	2.5	OR-096-8	37.40	OR-096-8X	43.80
.141	.250	.272	.562	.35	.100	.1250	.2500	2.5	OR-141-9	37.40		
.144	.250	.272	.625	.035	.100	.1250	.2500	2.5	OR-144-10	37.40		
.174	.375	.397	.750	.010	.115	.1875	.3750	2.5	OR-174-12	61.40	OR-174-12X	70.50
.208	.375	.397	.812	.035	.115	.1875	.3750	2.5	OR-208-13	61.40	OR-208-13X	70.50
.241	.375	.397	.938	.035	.115	.1875	.3750	2.5	OR-241-15	61.40		

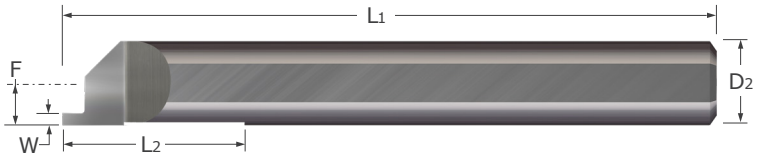
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

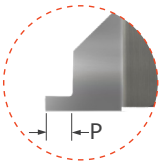
See pgs 39-47 for standard tool holders

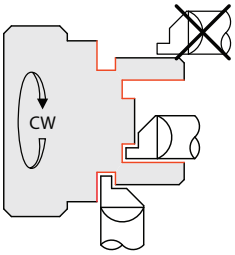
FG

Standard – Grooving Tools

Face Grooving – Square







- Designed for generating square grooves in the face of the part
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Relief ground along Maximum Bore Depth (L_2) to avoid interference during deep hole applications
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials ■ Solid carbide ■ CNC ground in the USA

	Width	Projection	Minimum Groove Diameter*	Maximum Bore Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
	W +.002" −.000"	P +.015" −.000"		L_2	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	.015	.025	.197	.750	.0937	.1875	2.0	FG-187-015-025	26.90	FG-187-015-025X	31.45
	.015	.025	.260	1.000	.1250	.2500	2.5	FG-250-015-025	30.00	FG-250-015-025X	36.40
	.017	.025	.197	.750	.0937	.1875	2.0	FG-187-017-025	26.90	FG-187-017-025X	31.45
	.017	.025	.260	1.000	.1250	.2500	2.5	FG-250-017-025	30.00	FG-250-017-025X	36.40
	.020	.025	.135	.375	.0625	.1250	1.5	FG-125-020-025	26.10	FG-125-020-025X	30.05
	.020	.025	.197	.750	.0937	.1875	2.0	FG-187-020-025	26.90	FG-187-020-025X	31.45
	.020	.025	.260	1.000	.1250	.2500	2.5	FG-250-020-025	30.00	FG-250-020-025X	36.40
	.020	.050	.190	.155	.0862	.1875	2.0	FG-180-020	26.90	FG-180-020X	31.45
	.020	.050	.197	.750	.0937	.1875	2.0	FG-187-020-050	26.90	FG-187-020-050X	31.45
	.020	.050	.240	.215	.1200	.2500	2.5	FG-230-020	30.00	FG-230-020X	34.65
	.020	.050	.260	.215	.1250	.2500	2.5	FG-250-020	30.00	FG-250-020X	36.40
	.025	.025	.135	.375	.0625	.1250	1.5	FG-125-025-025	26.10	FG-125-025-025X	30.05
	.025	.025	.197	.750	.0937	.1875	2.0	FG-187-025-025	26.90	FG-187-025-025X	31.45
	.025	.025	.260	1.000	.1250	.2500	2.5	FG-250-025-025	30.00	FG-250-025-025X	36.40
	.025	.050	.197	.750	.0937	.1875	2.0	FG-187-025-050	26.90	FG-187-025-050X	31.45
	.025	.050	.260	1.000	.1250	.2500	2.5	FG-250-025-050	30.00	FG-250-025-050X	36.40
	.030	.050	.135	.375	.0625	.1250	1.5	FG-125-030-050	26.10	FG-125-030-050X	30.05
	.030	.050	.190	.155	.0862	.1875	2.0	FG-180-030	26.90	FG-180-030X	31.90
	.030	.050	.197	.750	.0937	.1875	2.0	FG-187-030-050	26.90	FG-187-030-050X	31.45
	.030	.050	.260	.215	.1250	.2500	2.5	FG-250-030	30.00	FG-250-030X	36.40
	.030	.050	.322	.240	.1563	.3125	2.5	FG-312-030	41.00	FG-312-030X	48.70
	.030	.050	.385	.275	.1875	.3750	2.5	FG-375-030	57.20	FG-375-030X	66.20
	.030	.075	.197	.750	.0937	.1875	2.0	FG-187-030-075	26.90	FG-187-030-075X	31.45
	.030	.075	.260	1.000	.1250	.2500	2.5	FG-250-030-075	30.00	FG-250-030-075X	36.40
NEW	.030	.075	.322	1.125	.1563	.3125	2.5	FG-4363	41.00	FG-4363X	48.70
	.039	.050	.197	.750	.0937	.1875	2.0	FG-187-039-050	26.90	FG-187-039-050X	31.45
	.039	.050	.260	1.000	.1250	.2500	2.5	FG-250-039-050	30.00	FG-250-039-050X	36.40
	.039	.050	.385	1.250	.1875	.3750	2.5	FG-375-039-050	57.20	FG-375-039-050X	66.20
	.039	.075	.197	.750	.0937	.1875	2.0	FG-187-039-075	26.90	FG-187-039-075X	31.45
	.039	.075	.260	1.000	.1250	.2500	2.5	FG-250-039-075	30.00	FG-250-039-075X	36.40
	.040	.050	.197	.750	.0937	.1875	2.0	FG-187-040-050	26.90	FG-187-040-050X	31.45
	.040	.050	.260	.215	.1250	.2500	2.5	FG-250-040	30.00	FG-250-040X	36.40
	.040	.050	.322	.240	.1563	.3125	2.5	FG-312-040	41.00	FG-312-040X	48.70
	.040	.050	.385	1.250	.1875	.3750	2.5	FG-375-040-050	57.20	FG-375-040-050X	66.20
	.040	.075	.197	.750	.0937	.1875	2.0	FG-187-040-075	26.90	FG-187-040-075X	31.45
	.040	.075	.260	1.000	.1250	.2500	2.5	FG-250-040-075	30.00	FG-250-040-075X	36.40
NEW	.040	.075	.322	1.125	.1563	.3125	2.5	FG-4322	41.00	FG-4322X	48.70

*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

Continued on next page

See pgs 39-47 for standard tool holders

Standard – Grooving Tools

Face Grooving – Square (cont.)

FG

Continued from previous page

Width	Projection	Minimum Groove Diameter*	Maximum Bore Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated		
W +.002" −.000"	P +.015" −.000"		L2	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	
.050	.050	.197	.750	.0937	.1875	2.0	FG-187-050-050	26.90	FG-187-050-050X	31.45	
.050	.050	.260	.215	.1250	.2500	2.5	FG-250-050	30.00	FG-250-050X	36.40	
.050	.050	.322	.240	.1563	.3125	2.5	FG-312-050	41.00	FG-312-050X	48.70	
.050	.050	.385	1.250	.1875	.3750	2.5	FG-375-050-050	57.20	FG-375-050-050X	66.20	
.050	.075	.197	.750	.0937	.1875	2.0	FG-187-050-075	26.90	FG-187-050-075X	31.45	
.050	.075	.260	1.000	.1250	.2500	2.5	FG-250-050-075	30.00	FG-250-050-075X	36.40	
.050	.075	.322	1.125	.1563	.3125	2.5	FG-312-050-075	41.00	FG-312-050-075X	48.70	
.059	.075	.197	.750	.0937	.1875	2.0	FG-187-059-075	26.90	FG-187-059-075X	31.45	
.059	.075	.260	1.000	.1250	.2500	2.5	FG-250-059-075	30.00	FG-250-059-075X	36.40	
.059	.075	.385	1.250	.1875	.3750	2.5	FG-375-059-075	57.20	FG-375-059-075X	66.20	
.059	.100	.197	.750	.0937	.1875	2.0	FG-187-059-100	26.90	FG-187-059-100X	31.45	
.059	.100	.260	1.000	.1250	.2500	2.5	FG-250-059-100	30.00	FG-250-059-100X	36.40	
.062	.075	.197	.750	.0937	.1875	2.0	FG-187-062-075	26.90	FG-187-062-075X	31.45	
.062	.075	.260	1.000	.1250	.2500	2.5	FG-250-062-075	30.00	FG-250-062-075X	36.40	
.062	.075	.322	.250	.1563	.3125	2.5	FG-312-062	41.00	FG-312-062X	48.70	
.062	.075	.385	.285	.1875	.3750	2.5	FG-375-062	57.20	FG-375-062X	66.20	
.062	.075	.510	.350	.2500	.5000	3.0	FG-500-062	64.60	FG-500-062X	76.90	
.062	.075	.635	.410	.3125	.6250	3.5	FG-625-062	105.40			
.062	.100	.197	.750	.0937	.1875	2.0	FG-187-062-100	26.90	FG-187-062-100X	31.45	
.062	.100	.260	1.000	.1250	.2500	2.5	FG-250-062-100	30.00	FG-250-062-100X	36.40	
.062	.100	.322	1.125	.1563	.3125	2.5	FG-312-062-100	41.00	FG-312-062-100X	48.70	
.062	.100	.385	1.250	.1875	.3750	2.5	FG-375-062-100	57.20	FG-375-062-100X	66.20	
.062	.100	.510	1.250	.2500	.5000	3.0	FG-4909	64.60	FG-4909X	76.90	NEW
.062	.150	.197	.750	.0937	.1875	2.0	FG-187-062-150	26.90	FG-187-062-150X	31.45	
.062	.150	.260	1.000	.1250	.2500	2.5	FG-250-062-150	30.00	FG-250-062-150X	36.40	
.062	.150	.322	1.125	.1563	.3125	2.5	FG-312-062-150	41.00	FG-312-062-150X	48.70	
.062	.150	.385	1.250	.1875	.3750	2.5	FG-375-062-150	57.20	FG-375-062-150X	66.20	
.062	.150	.510	1.250	.2500	.5000	3.0	FG-2828	64.60	FG-2828X	76.90	NEW
.078	.100	.260	1.000	.1250	.2500	2.5	FG-250-078-100	30.00	FG-250-078-100X	36.40	
.078	.100	.322	1.125	.1563	.3125	2.5	FG-312-078-100	41.00	FG-312-078-100X	48.70	
.078	.100	.385	.300	.1875	.3750	2.5	FG-375-078	57.20	FG-375-078X	66.20	
.093	.100	.385	.320	.1875	.3750	2.5	FG-375-093	57.20	FG-375-093X	66.20	
.093	.100	.510	.375	.2500	.5000	3.0	FG-500-093	64.60	FG-500-093X	76.90	
.093	.100	.635	.430	.3125	.6250	3.5	FG-625-093	105.40	FG-625-093X	120.60	
.093	.100	.760	.475	.3750	.7500	4.0	FG-750-093	167.60			
.093	.150	.322	1.125	.1563	.3125	2.5	FG-312-093-150	41.00	FG-312-093-150X	48.70	
.093	.150	.385	1.250	.1875	.3750	2.5	FG-375-093-150	57.20	FG-375-093-150X	66.20	
.118	.150	.385	1.250	.1875	.3750	2.5	FG-375-118-150	57.20	FG-375-118-150X	66.20	
.125	.100	.385	.320	.1875	.3750	2.5	FG-375-125	57.20	FG-375-125X	66.20	
.125	.100	.510	.350	.2500	.5000	3.0	FG-500-125	64.60	FG-500-125X	76.90	
.125	.100	.760	.475	.3750	.7500	4.0	FG-750-125	167.60	FG-750-125X	185.80	
.125	.200	.385	1.250	.1875	.3750	2.5	FG-375-125-200	57.20	FG-375-125-200X	66.20	
.125	.200	.510	1.250	.2500	.5000	3.0	FG-3140	64.60	FG-3140X	76.90	NEW
.125	.250	.385	1.250	.1875	.3750	2.5	FG-0531	57.20	FG-0531X	66.20	NEW
.156	.100	.510	.375	.2500	.5000	3.0	FG-500-156	64.60	FG-500-156X	76.90	
.156	.100	.635	.430	.3125	.6250	3.5	FG-625-156	105.40	FG-625-156X	120.60	
.156	.100	.760	.475	.3750	.7500	4.0	FG-750-156	167.60			
.156	.200	.510	1.250	.2500	.5000	3.0	FG-5610	64.60	FG-5610X	76.90	NEW
.187	.150	.635	.480	.3125	.6250	3.5	FG-625-187	105.40	FG-625-187X	120.60	
.187	.150	.760	.525	.3750	.7500	4.0	FG-750-187	167.60	FG-750-187X	185.80	
.250	.250	.760	.625	.3750	.7500	4.0	FG-750-250	167.60			

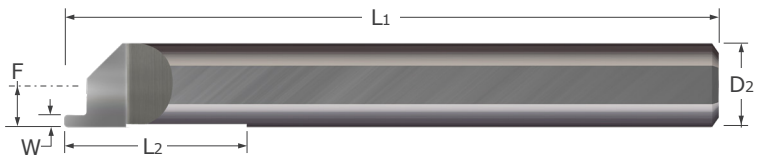
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

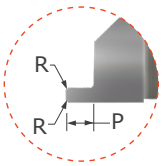
See pgs 39-47 for standard tool holders

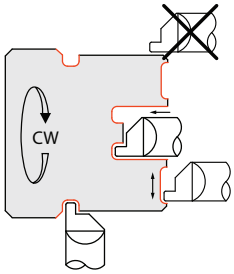
FGC

Standard – Grooving Tools

Face Grooving – Corner Radius







- Designed for generating corner radius grooves in the face of the part
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Relief ground along Maximum Bore Depth (L_2) to avoid interference during deep hole applications
- Corner radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide ■ CNC ground in the USA

Width	Projection	Minimum Groove Diameter*	Radius	Maximum Bore Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	P +.015" −.000"		R +.001" −.001"	L_2	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.015	.025	.197	.003	.750	.0938	.1875	2.0	FGC3-187-015-025	28.90	FGC3-187-015-025X	33.45
.015	.025	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-015-025	32.00	FGC3-250-015-025X	38.30
.017	.025	.197	.003	.750	.0938	.1875	2.0	FGC3-187-017-025	28.90	FGC3-187-017-025X	33.45
.017	.025	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-017-025	32.00	FGC3-250-017-025X	38.30
.020	.025	.135	.003	.375	.0625	.1250	1.5	FGC3-125-020-025	28.00	FGC3-125-020-025X	31.95
.020	.025	.197	.003	.750	.0938	.1875	2.0	FGC3-187-020-025	28.90	FGC3-187-020-025X	33.45
.020	.025	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-020-025	32.00	FGC3-250-020-025X	38.30
.025	.025	.135	.003	.375	.0625	.1250	1.5	FGC3-125-025-025	28.00	FGC3-125-025-025X	31.95
.025	.025	.197	.003	.750	.0938	.1875	2.0	FGC3-187-025-025	28.90	FGC3-187-025-025X	33.45
.025	.025	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-025-025	32.00	FGC3-250-025-025X	38.30
.030	.050	.135	.003	.375	.0625	.1250	1.5	FGC3-125-030-050	28.00	FGC3-125-030-050X	31.95
.030	.050	.197	.003	.750	.0938	.1875	2.0	FGC3-187-030-050	28.90	FGC3-187-030-050X	33.45
.030	.050	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-030-050	32.00	FGC3-250-030-050X	38.30
.030	.050	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-030-050	43.00	FGC3-312-030-050X	50.60
.030	.050	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-030-050	59.00	FGC3-375-030-050X	68.00
.039	.050	.197	.003	.750	.0938	.1875	2.0	FGC3-187-039-050	28.90	FGC3-187-039-050X	33.45
.039	.050	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-039-050	32.00	FGC3-250-039-050X	38.30
.039	.050	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-039-050	59.00	FGC3-375-039-050X	68.00
.040	.050	.197	.003	.750	.0938	.1875	2.0	FGC3-187-040-050	28.90	FGC3-187-040-050X	33.45
.040	.050	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-040-050	32.00	FGC3-250-040-050X	38.30
.040	.050	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-040-050	43.00	FGC3-312-040-050X	50.60
.040	.050	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-040-050	59.00	FGC3-375-040-050X	68.00
.050	.050	.197	.003	.750	.0938	.1875	2.0	FGC3-187-050-050	28.90	FGC3-187-050-050X	33.45
.050	.050	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-050-050	32.00	FGC3-250-050-050X	38.30
.050	.050	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-050-050	43.00	FGC3-312-050-050X	50.60
.050	.050	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-050-050	59.00	FGC3-375-050-050X	68.00
.059	.075	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-059-075	59.00	FGC3-375-059-075X	68.00

*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

Continued on next page

See pgs 39-47 for standard tool holders

Standard – Grooving Tools

Face Grooving – Corner Radius (cont.)

FGC

Continued from previous page

Width	Projection	Minimum Groove Diameter*	Radius	Maximum Bore Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	P +.015" −.000"		R +.001" −.001"	L_2	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.062	.075	.197	.003	.750	.0938	.1875	2.0	FGC3-187-062-075	28.90	FGC3-187-062-075X	33.45
.062	.075	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-062-075	32.00	FGC3-250-062-075X	38.30
.062	.075	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-062-075	43.00	FGC3-312-062-075X	50.60
.062	.075	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-062-075	59.00	FGC3-375-062-075X	68.00
.062	.100	.197	.003	.750	.0938	.1875	2.0	FGC3-187-062-100	28.90	FGC3-187-062-100X	33.45
.062	.100	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-062-100	32.00	FGC3-250-062-100X	38.30
.078	.100	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-078-100	32.00	FGC3-250-078-100X	38.30
.078	.100	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-078-100	43.00	FGC3-312-078-100X	50.60
.078	.100	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-078-100	59.00	FGC3-375-078-100X	68.00
.093	.100	.385	.006	1.250	.1875	.3750	2.5	FGC6-375-093-100	59.00	FGC6-375-093-100X	68.00
.093	.150	.322	.006	1.125	.1563	.3125	2.5	FGC6-312-093-150	43.00	FGC6-312-093-150X	50.60
.118	.150	.385	.006	1.250	.1875	.3750	2.5	FGC6-375-118-150	59.00	FGC6-375-118-150X	68.00
.125	.100	.385	.006	1.250	.1875	.3750	2.5	FGC6-375-125-100	59.00	FGC6-375-125-100X	68.00

*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

Check Real-Time Availability of Up to 50 Tools at Once

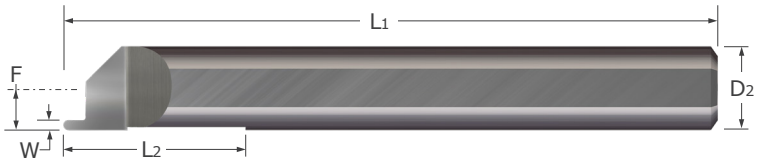
On Micro100.com/check-stock

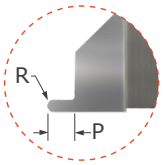
See pgs 39-47 for standard tool holders

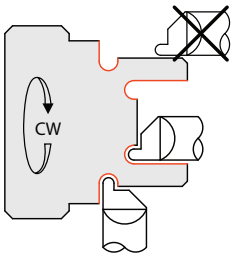
FGF

Standard – Grooving Tools

Face Grooving – Full Radius







- Designed for generating full radius grooves in the face of the part
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Relief ground along Maximum Bore Depth (L_2) to avoid interference during deep hole applications
- Full radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Width	Radius	Projection	Minimum Groove Diameter*	Maximum Bore Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	R	P +.030" −.000"		L_2	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.015	.0075	.025	.197	.750	.0937	.1875	2.0	FGF-187-015-025	27.60	FGF-187-015-025X	31.95
.015	.0075	.025	.260	1.000	.1250	.2500	2.5	FGF-250-015-025	31.00	FGF-250-015-025X	37.30
.017	.0085	.025	.197	.750	.0937	.1875	2.0	FGF-187-017-025	27.60	FGF-187-017-025X	31.95
.017	.0085	.025	.260	1.000	.1250	.2500	2.5	FGF-250-017-025	31.00	FGF-250-017-025X	37.30
.020	.0100	.050	.135	.375	.0625	.1250	1.5	FGF-125-020-050	26.60	FGF-125-020-050X	30.65
.020	.0100	.050	.190	.180	.0860	.1875	2.0	FGF-180-020	27.60	FGF-180-020X	31.95
.020	.0100	.050	.197	.750	.0937	.1875	2.0	FGF-187-020-050	27.60	FGF-187-020-050X	31.95
.020	.0100	.050	.240	.230	.1050	.2500	2.5	FGF-230-020	31.00	FGF-230-020X	37.30
.020	.0100	.050	.260	.230	.1250	.2500	2.5	FGF-250-020	31.00	FGF-250-020X	37.30
.025	.0125	.050	.135	.375	.0625	.1250	1.5	FGF-125-025-050	26.60	FGF-125-025-050X	30.65
.025	.0125	.050	.197	.750	.0937	.1875	2.0	FGF-187-025-050	27.60	FGF-187-025-050X	31.95
.025	.0125	.050	.260	1.000	.1250	.2500	2.5	FGF-250-025-050	31.00	FGF-250-025-050X	37.30
.030	.0150	.050	.135	.375	.0625	.1250	1.5	FGF-125-030-050	26.60	FGF-125-030-050X	30.65
.030	.0150	.050	.190	.180	.0860	.1875	2.0	FGF-180-030	27.60	FGF-180-030X	31.95
.030	.0150	.050	.197	.750	.0937	.1875	2.0	FGF-187-030-050	27.60	FGF-187-030-050X	31.95
.030	.0150	.050	.260	.230	.1250	.2500	2.5	FGF-250-030	31.00	FGF-250-030X	37.30
.039	.0195	.075	.197	.750	.0937	.1875	2.0	FGF-187-039-075	27.60	FGF-187-039-075X	31.95
.039	.0195	.075	.260	1.000	.1250	.2500	2.5	FGF-250-039-075	31.00	FGF-250-039-075X	37.30
.040	.0200	.050	.260	.230	.1250	.2500	2.5	FGF-250-040	31.00	FGF-250-040X	37.30
.040	.0200	.075	.197	.750	.0937	.1875	2.0	FGF-187-040-075	27.60	FGF-187-040-075X	31.95
.040	.0200	.075	.260	1.000	.1250	.2500	2.5	FGF-250-040-075	31.00	FGF-250-040-075X	37.30
.050	.0250	.050	.322	.255	.1563	.3125	2.5	FGF-312-050	42.30	FGF-312-050X	49.90
.050	.0250	.075	.197	.750	.0937	.1875	2.0	FGF-187-050-075	27.60	FGF-187-050-075X	31.95
.050	.0250	.075	.260	1.000	.1250	.2500	2.5	FGF-250-050-075	31.00	FGF-250-050-075X	37.30
.050	.0250	.075	.322	1.125	.1563	.3125	2.5	FGF-312-050-075	42.30	FGF-312-050-075X	49.90
.062	.0310	.075	.322	.280	.1563	.3125	2.5	FGF-312-062	42.30	FGF-312-062X	49.90
.062	.0310	.075	.385	.315	.1875	.3750	2.5	FGF-375-062	58.80	FGF-375-062X	67.80
.062	.0310	.100	.197	.750	.0937	.1875	2.0	FGF-187-062-100	27.60	FGF-187-062-100X	31.95
.062	.0310	.100	.260	1.000	.1250	.2500	2.5	FGF-250-062-100	31.00	FGF-250-062-100X	37.30
.062	.0310	.100	.322	1.125	.1563	.3125	2.5	FGF-312-062-100	42.30	FGF-312-062-100X	49.90
.062	.0310	.100	.385	1.250	.1875	.3750	2.5	FGF-375-062-100	58.80	FGF-375-062-100X	67.80
.078	.0390	.100	.385	.335	.1875	.3750	2.5	FGF-375-078	58.80	FGF-375-078X	67.80
.093	.0465	.100	.385	.335	.1875	.3750	2.5	FGF-375-093	58.80	FGF-375-093X	67.80
.125	.0625	.100	.385	.335	.1875	.3750	2.5	FGF-375-125	58.80	FGF-375-125X	67.80

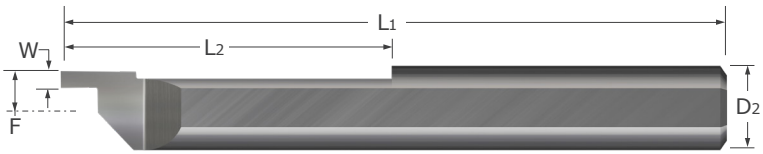
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

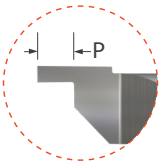
See pgs 39-47 for standard tool holders

Standard – Grooving Tools

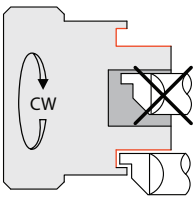
FGI

Face Grooving – Internal Tooth – Square





- Designed to generate square grooves around a boss in the face of a part for right hand grooving applications (M03) (See Graphic)
- Significantly reduces cycle times, as right hand design allows for multiple tools to be run simultaneously
- Relief ground along Maximum Turn Depth (L_2) to avoid interference during long turning applications
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Projection	Minimum Groove Diameter*	Maximum Turn Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	P +.015" −.000"		L_2	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.020	.040	.260	.750	.1150	.2500	2.5	FGI-8240	31.20	FGI-8240X	37.50
.020	.040	.260	1.250	.1150	.2500	2.5	FGI-6198	31.20	FGI-6198X	37.50
.020	.040	.322	.750	.1463	.3125	2.5	FGI-9800	42.60	FGI-9800X	50.20
.020	.040	.322	1.250	.1463	.3125	2.5	FGI-6738	42.60	FGI-6738X	50.20
.030	.060	.260	.750	.1150	.2500	2.5	FGI-6600	31.20	FGI-6600X	37.50
.030	.060	.260	1.250	.1150	.2500	2.5	FGI-3461	31.20	FGI-3461X	37.50
.030	.060	.322	.750	.1463	.3125	2.5	FGI-5774	42.60	FGI-5774X	50.20
.030	.060	.322	1.250	.1463	.3125	2.5	FGI-1413	42.60	FGI-1413X	50.20
.040	.080	.260	.750	.1150	.2500	2.5	FGI-6481	31.20	FGI-6481X	37.50
.040	.080	.260	1.250	.1150	.2500	2.5	FGI-9741	31.20	FGI-9741X	37.50
.040	.080	.322	.750	.1463	.3125	2.5	FGI-8157	42.60	FGI-8157X	50.20
.040	.080	.322	1.250	.1463	.3125	2.5	FGI-9114	42.60	FGI-9114X	50.20
.050	.100	.260	.750	.1150	.2500	2.5	FGI-1311	31.20	FGI-1311X	37.50
.050	.100	.260	1.250	.1150	.2500	2.5	FGI-7516	31.20	FGI-7516X	37.50
.050	.100	.322	.750	.1463	.3125	2.5	FGI-5336	42.60	FGI-5336X	50.20
.050	.100	.322	1.250	.1463	.3125	2.5	FGI-9489	42.60	FGI-9489X	50.20
.062	.125	.322	.750	.1463	.3125	2.5	FGI-2609	42.60	FGI-2609X	50.20
.062	.125	.322	1.250	.1463	.3125	2.5	FGI-0720	42.60	FGI-0720X	50.20
.062	.125	.385	.750	.1775	.3750	2.5	FGI-3852	59.30	FGI-3852X	68.40
.062	.125	.385	1.250	.1775	.3750	2.5	FGI-8466	59.30	FGI-8466X	68.40
.078	.156	.322	.750	.1463	.3125	2.5	FGI-4397	42.60	FGI-4397X	50.20
.078	.156	.322	1.250	.1463	.3125	2.5	FGI-3465	42.60	FGI-3465X	50.20
.078	.156	.385	.750	.1775	.3750	2.5	FGI-2855	59.30	FGI-2855X	68.40
.078	.156	.385	1.250	.1775	.3750	2.5	FGI-2684	59.30	FGI-2684X	68.40
.093	.187	.322	.750	.1463	.3125	2.5	FGI-5482	42.60	FGI-5482X	50.20
.093	.187	.322	1.250	.1463	.3125	2.5	FGI-2378	42.60	FGI-2378X	50.20
.093	.187	.385	.750	.1775	.3750	2.5	FGI-1641	59.30	FGI-1641X	68.40
.093	.187	.385	1.250	.1775	.3750	2.5	FGI-1707	59.30	FGI-1707X	68.40

*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

Continued on next page

See pgs 39-47 for standard tool holders

FGI

Standard – Grooving Tools

Face Grooving – Internal Tooth – Square (cont.)

Continued from previous page

Width	Projection	Minimum Groove Diameter*	Maximum Turn Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	P +.015" −.000"		L_2	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.118	.236	.385	.750	.1775	.3750	2.5	FGI-4674	59.30	FGI-4674X	68.40
.118	.236	.385	1.250	.1775	.3750	2.5	FGI-2969	59.30	FGI-2969X	68.40
.118	.236	.510	1.000	.2400	.5000	3.0	FGI-6754	67.10	FGI-6754X	79.40
.118	.236	.510	1.500	.2400	.5000	3.0	FGI-3667	67.10	FGI-3667X	79.40
.125	.250	.385	.750	.1775	.3750	2.5	FGI-1535	59.30	FGI-1535X	68.40
.125	.250	.385	1.250	.1775	.3750	2.5	FGI-7015	59.30	FGI-7015X	68.40
.125	.250	.510	1.000	.2400	.5000	3.0	FGI-4349	67.10	FGI-4349X	79.40
.125	.250	.510	1.500	.2400	.5000	3.0	FGI-4098	67.10	FGI-4098X	79.40

*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

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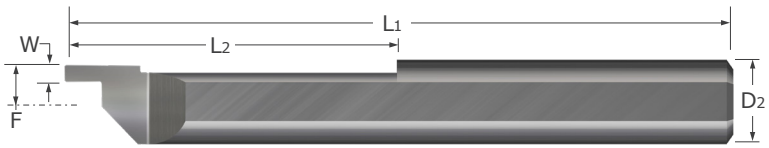
SCAN

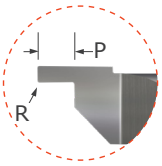
See pgs 39-47 for standard tool holders

Standard – Grooving Tools

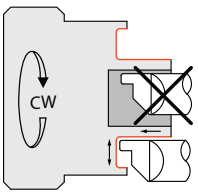
FGIC

Face Grooving – Internal Tooth – Corner Radius





- Designed to generate corner radius grooves around a boss in the face of a part for right hand grooving applications (M03) (See Graphic)
- Significantly reduces cycle times, as right hand design allows for multiple tools to be run simultaneously
- Relief ground along Maximum Turn Depth (L_2) to avoid interference during long turning applications
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Corner radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Radius	Projection	Minimum Groove Diameter*	Maximum Turn Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	R +.0010" −.0010"	P +.015" −.000"		L_2	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.020	.003	.040	.260	1.250	.1150	.2500	2.5	FGIC3-6198	31.70	FGIC3-6198X	38.10
.020	.003	.040	.322	1.250	.1463	.3125	2.5	FGIC3-6738	43.30	FGIC3-6738X	50.90
.030	.003	.060	.260	1.250	.1150	.2500	2.5	FGIC3-3461	31.70	FGIC3-3461X	38.10
.030	.003	.060	.322	1.250	.1463	.3125	2.5	FGIC3-1413	43.30	FGIC3-1413X	50.90
.040	.003	.080	.260	1.250	.1150	.2500	2.5	FGIC3-9741	31.70	FGIC3-9741X	38.10
.040	.003	.080	.322	1.250	.1463	.3125	2.5	FGIC3-9114	43.30	FGIC3-9114X	50.90
.050	.003	.100	.260	1.250	.1150	.2500	2.5	FGIC3-7516	31.70	FGIC3-7516X	38.10
.050	.003	.100	.322	1.250	.1463	.3125	2.5	FGIC3-9489	43.30	FGIC3-9489X	50.90
.062	.003	.125	.322	1.250	.1463	.3125	2.5	FGIC3-0720	43.30	FGIC3-0720X	50.90
.062	.003	.125	.385	1.250	.1775	.3750	2.5	FGIC3-8466	60.30	FGIC3-8466X	69.30
.078	.003	.156	.322	1.250	.1463	.3125	2.5	FGIC3-3465	43.30	FGIC3-3465X	50.90
.078	.003	.156	.385	1.250	.1775	.3750	2.5	FGIC3-2684	60.30	FGIC3-2684X	69.30
.093	.006	.187	.322	1.250	.1463	.3125	2.5	FGIC6-2378	43.30	FGIC6-2378X	50.90
.093	.006	.187	.385	1.250	.1775	.3750	2.5	FGIC6-1707	60.30	FGIC6-1707X	69.30
.118	.006	.236	.385	1.250	.1775	.3750	2.5	FGIC6-2969	60.30	FGIC6-2969X	69.30
.125	.006	.250	.385	1.250	.1775	.3750	2.5	FGIC6-7015	60.30	FGIC6-7015X	69.30

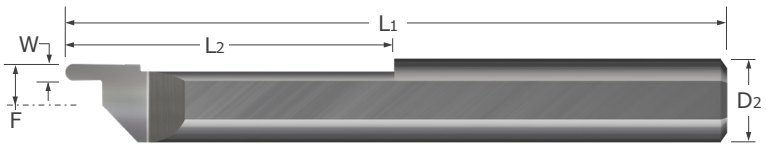
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

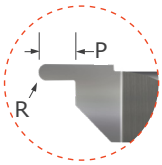
See pgs 39-47 for standard tool holders

FGIF

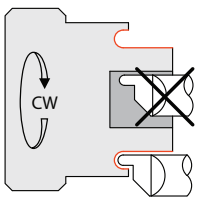
Standard – Grooving Tools

Face Grooving – Internal Tooth – Full Radius





- Designed to generate full radius grooves around a boss in the face of a part for right hand grooving applications (M03) (See Graphic)
- Significantly reduces cycle times, as right hand design allows for multiple tools to be run simultaneously
- Relief ground along Maximum Turn Depth (L_2) to avoid interference during long turning applications
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Full radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Width	Radius	Projection	Minimum Groove Diameter*	Maximum Turn Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	R +.0010" −.0010"	P +.015" −.000"		L_2	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.020	.0100	.040	.260	1.250	.1150	.2500	2.5	FGIF-6198	32.10	FGIF-6198X	38.40
.020	.0100	.040	.322	1.250	.1463	.3125	2.5	FGIF-6738	43.80	FGIF-6738X	51.40
.030	.0150	.060	.260	1.250	.1150	.2500	2.5	FGIF-3461	32.10	FGIF-3461X	38.40
.030	.0150	.060	.322	1.250	.1463	.3125	2.5	FGIF-1413	43.80	FGIF-1413X	51.40
.040	.0200	.080	.260	1.250	.1150	.2500	2.5	FGIF-9741	32.10	FGIF-9741X	38.40
.040	.0200	.080	.322	1.250	.1463	.3125	2.5	FGIF-9114	43.80	FGIF-9114X	51.40
.050	.0250	.100	.260	1.250	.1150	.2500	2.5	FGIF-7516	32.10	FGIF-7516X	38.40
.050	.0250	.100	.322	1.250	.1463	.3125	2.5	FGIF-9489	43.80	FGIF-9489X	51.40
.062	.0310	.125	.322	1.250	.1463	.3125	2.5	FGIF-0720	43.80	FGIF-0720X	51.40
.062	.0310	.125	.385	1.250	.1775	.3750	2.5	FGIF-8466	61.10	FGIF-8466X	70.10
.078	.0390	.156	.322	1.250	.1463	.3125	2.5	FGIF-3465	43.80	FGIF-3465X	51.40
.078	.0390	.156	.385	1.250	.1775	.3750	2.5	FGIF-2684	61.10	FGIF-2684X	70.10
.093	.0465	.187	.322	1.250	.1463	.3125	2.5	FGIF-2378	43.80	FGIF-2378X	51.40
.093	.0465	.187	.385	1.250	.1775	.3750	2.5	FGIF-1707	61.10	FGIF-1707X	70.10
.118	.0590	.236	.385	1.250	.1775	.3750	2.5	FGIF-2969	61.10	FGIF-2969X	70.10
.125	.0625	.250	.385	1.250	.1775	.3750	2.5	FGIF-7015	61.10	FGIF-7015X	70.10

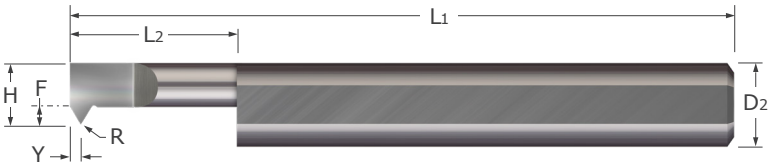
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

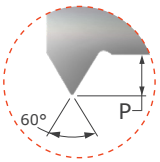
See pgs 39-47 for standard tool holders

NEW!

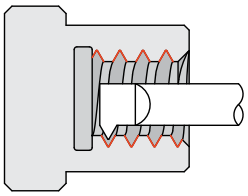
Standard – Threading Tools

UN Threads – Single Point – Right Hand





- Designed for threading multiple thread pitches (ANSI, UN, and Metric 60°)
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Corner radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Radius	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated		
TPI	H		L_2 +.050" −.000"	Y +.010" −.000"	P	R +.001" −.000"	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	
40-72	.040	.045	.075	.009	.015	.001	-.0225	.1250	1.5	IT-040075	43.70	IT-040075X	48.10	
40-72	.040	.045	.100	.009	.015	.001	-.0225	.1250	1.5	IT-040100	43.70	IT-040100X	48.10	
40-72	.040	.045	.150	.009	.015	.001	-.0225	.1250	1.5	IT-040150	43.70	IT-040150X	48.10	
28-72	.050	.055	.100	.012	.020	.001	-.0125	.1250	1.5	IT-050100	43.70	IT-050100X	48.10	
28-72	.050	.055	.150	.012	.020	.001	-.0125	.1250	1.5	IT-050150	43.70	IT-050150X	48.10	
28-72	.050	.055	.200	.012	.020	.001	-.0125	.1250	1.5	IT-050200	43.70	IT-050200X	48.10	
28-72	.050	.055	.250	.012	.020	.001	-.0125	.1250	1.5	IT-050250	43.70	IT-050250X	48.10	NEW
28-56	.060	.070	.150	.012	.020	.001	-.0025	.1250	1.5	IT-060150	38.10	IT-060150X	42.50	
28-56	.060	.070	.200	.012	.020	.001	-.0025	.1250	1.5	IT-060200	38.10	IT-060200X	42.50	
28-56	.060	.070	.250	.012	.020	.001	-.0025	.1250	1.5	IT-060250	38.10	IT-060250X	42.50	
28-56	.060	.070	.300	.012	.020	.001	-.0025	.1250	1.5	IT-060300	38.10	IT-060300X	42.50	
28-56	.060	.070	.350	.012	.020	.001	-.0025	.1250	1.5	IT-060350	38.10	IT-060350X	42.50	NEW
28-56	.080	.090	.200	.012	.020	.002	.0175	.1250	1.5	IT-080200	34.70	IT-080200X	39.10	
28-56	.080	.090	.250	.012	.020	.002	.0175	.1250	1.5	IT-080250	34.70	IT-080250X	38.95	
28-56	.080	.090	.350	.012	.020	.002	.0175	.1250	1.5	IT-080350	34.70	IT-080350X	38.95	
28-56	.080	.090	.500	.012	.020	.002	.0175	.1250	1.5	IT-080500	34.70	IT-080500X	38.95	
28-56	.080	.090	.600	.012	.020	.002	.0175	.1250	2.0	IT-080600	35.90	IT-080600X	40.30	NEW
24-56	.100	.110	.250	.014	.025	.002	.0375	.1250	1.5	IT-100250	34.70	IT-100250X	38.95	
24-56	.100	.110	.350	.014	.025	.002	.0375	.1250	1.5	IT-100350	34.70	IT-100350X	38.95	
24-56	.100	.110	.500	.014	.025	.002	.0375	.1250	1.5	IT-100500	34.70	IT-100500X	38.95	
24-56	.100	.110	.600	.014	.025	.002	.0375	.1250	1.5	IT-100600	34.70	IT-100600X	38.95	
24-56	.100	.110	.750	.014	.025	.002	.0375	.1250	2.0	IT-100750	35.90	IT-100750X	40.30	NEW
20-56	.110	.126	.250	.017	.030	.002	.0475	.1250	1.5	IT-110250	34.70	IT-110250X	39.10	
20-56	.110	.126	.400	.017	.030	.002	.0475	.1250	1.5	IT-110400	34.70	IT-110400X	39.10	
20-56	.110	.126	.500	.017	.030	.002	.0475	.1250	1.5	IT-110500	34.70	IT-110500X	39.10	
20-56	.110	.126	.600	.017	.030	.002	.0475	.1250	1.5	IT-110600	34.70	IT-110600X	39.10	
20-56	.110	.126	.750	.017	.030	.002	.0475	.1250	2.0	IT-110750	35.90	IT-110750X	40.30	
20-56	.120	.136	.250	.017	.030	.002	.0263	.1875	2.0	IT-120250	37.00	IT-120250X	41.75	
20-56	.120	.136	.400	.017	.030	.002	.0263	.1875	2.0	IT-120400	37.00	IT-120400X	41.75	

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders
See pg 317 for tool set options

IT

Standard – Threading Tools

UN Threads – Single Point – Right Hand (cont.)

Continued from previous page

Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Radius	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
TPI	H		L_2 +.050" −.000"	Y +.010" −.000"	P	R +.001" −.001"	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
20-56	.120	.136	.500	.017	.030	.002	.0263	.1875	2.0	IT-120500	37.00	IT-120500X	41.75
20-56	.120	.136	.600	.017	.030	.002	.0263	.1875	2.0	IT-120600	37.00	IT-120600X	41.75
20-56	.120	.136	.750	.017	.030	.002	.0263	.1875	2.0	IT-120750	37.00	IT-120750X	41.75
16-56	.140	.156	.250	.020	.035	.002	.0463	.1875	2.0	IT-140250	37.00	IT-140250X	41.75
16-56	.140	.156	.400	.020	.035	.002	.0463	.1875	2.0	IT-140400	37.00	IT-140400X	41.75
16-56	.140	.156	.500	.020	.035	.002	.0463	.1875	2.0	IT-140500	37.00	IT-140500X	41.75
16-56	.140	.156	.750	.020	.035	.002	.0463	.1875	2.0	IT-140750	37.00	IT-140750X	41.75
16-56	.140	.156	.875	.020	.035	.002	.0463	.1875	2.0	IT-140875	37.00	IT-140875X	42.00
14-56	.160	.182	.250	.023	.040	.002	.0663	.1875	2.0	IT-160250	37.00	IT-160250X	41.75
14-56	.160	.182	.400	.023	.040	.002	.0663	.1875	2.0	IT-160400	37.00	IT-160400X	41.75
14-56	.160	.182	.500	.023	.040	.002	.0663	.1875	2.0	IT-160500	37.00	IT-160500X	41.75
14-56	.160	.182	.750	.023	.040	.002	.0663	.1875	2.0	IT-160750	37.00	IT-160750X	41.75
14-56	.160	.182	1.000	.023	.040	.002	.0663	.1875	2.0	IT-1601000	37.00	IT-1601000X	41.75
14-56	.180	.202	.350	.023	.040	.002	.0550	.2500	2.5	IT-180350	39.40	IT-180350X	45.80
14-56	.180	.202	.500	.023	.040	.002	.0550	.2500	2.5	IT-180500	39.40	IT-180500X	45.80
14-56	.180	.202	.750	.023	.040	.002	.0550	.2500	2.5	IT-180750	39.40	IT-180750X	45.80
14-56	.180	.202	1.000	.023	.040	.002	.0550	.2500	2.5	IT-1801000	39.40	IT-1801000X	45.80
14-56	.180	.202	1.125	.023	.040	.002	.0550	.2500	2.5	IT-1801125	39.40	IT-1801125X	45.80
13-56	.200	.222	.400	.026	.045	.002	.0750	.2500	2.5	IT-200400	39.40	IT-200400X	45.80
13-56	.200	.222	.600	.026	.045	.002	.0750	.2500	2.5	IT-200600	39.40	IT-200600X	45.80
13-56	.200	.222	.750	.026	.045	.002	.0750	.2500	2.5	IT-200750	39.40	IT-200750X	45.80
13-56	.200	.222	1.000	.026	.045	.002	.0750	.2500	2.5	IT-2001000	39.40	IT-2001000X	45.80
13-56	.200	.222	1.125	.026	.045	.002	.0750	.2500	2.5	IT-2001125	39.40	IT-2001125X	45.80
10-48	.230	.252	.400	.032	.055	.002	.0738	.3125	2.5	IT-230400	49.40	IT-230400X	57.00
10-48	.230	.252	.600	.032	.055	.002	.0738	.3125	2.5	IT-230600	49.40	IT-230600X	57.00
10-48	.230	.252	.750	.032	.055	.002	.0738	.3125	2.5	IT-230750	49.40	IT-230750X	57.00
10-48	.230	.252	1.000	.032	.055	.002	.0738	.3125	2.5	IT-2301000	49.40	IT-2301000X	57.00
10-48	.230	.252	1.250	.032	.055	.002	.0738	.3125	2.5	IT-2301250	49.40	IT-2301250X	57.00
10-48	.230	.252	1.500	.032	.055	.002	.0738	.3125	2.5	IT-2301500	49.40	IT-2301500X	57.00
NEW 10-48	.230	.252	1.750	.032	.055	.002	.0738	.3125	3.0	IT-2301750	50.40	IT-2301750X	58.00
8-40	.290	.312	.500	.040	.070	.002	.1338	.3125	2.5	IT-290500	49.40	IT-290500X	57.00
8-40	.290	.312	.750	.040	.070	.002	.1338	.3125	2.5	IT-290750	49.40	IT-290750X	57.00
8-40	.290	.312	1.000	.040	.070	.002	.1338	.3125	2.5	IT-2901000	49.40	IT-2901000X	57.00
8-40	.290	.312	1.250	.040	.070	.002	.1338	.3125	2.5	IT-2901250	49.40	IT-2901250X	57.00
8-40	.290	.312	1.500	.040	.070	.002	.1338	.3125	2.5	IT-2901500	49.40	IT-2901500X	57.00
8-40	.290	.312	1.750	.040	.070	.002	.1338	.3125	2.5	IT-2901750	49.40	IT-2901750X	57.00
8-40	.320	.342	.500	.043	.075	.002	.1325	.3750	2.5	IT-320500	64.30	IT-320500X	73.40
8-40	.320	.342	.750	.043	.075	.002	.1325	.3750	2.5	IT-320750	64.30	IT-320750X	73.40
8-40	.320	.342	1.000	.043	.075	.002	.1325	.3750	2.5	IT-3201000	64.30	IT-3201000X	73.40
8-40	.320	.342	1.250	.043	.075	.002	.1325	.3750	2.5	IT-3201250	64.30	IT-3201250X	73.40
8-40	.320	.342	1.500	.043	.075	.002	.1325	.3750	2.5	IT-3201500	64.30	IT-3201500X	73.40
8-40	.320	.342	1.750	.043	.075	.002	.1325	.3750	3.0	IT-3201750	65.90	IT-3201750X	74.90
8-40	.320	.342	1.800	.043	.075	.002	.1325	.3750	2.5	IT-3201800	64.30	IT-3201800X	73.40

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders
See pg 317 for tool set options

NEW!

Standard – Threading Tools

IT

UN Threads – Single Point – Right Hand (cont.)

Continued from previous page

Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Radius	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated		
TPI	H		L_2 $^{+.050"}_{-.000"}$	Y $^{+.010"}_{-.000"}$	P	R $^{+.001"}_{-.001"}$	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price	
7-32	.360	.382	.500	.049	.085	.002	.1725	.3750	2.5	IT-360500	64.30	IT-360500X	73.40	
7-32	.360	.382	.750	.049	.085	.002	.1725	.3750	2.5	IT-360750	64.30	IT-360750X	73.40	
7-32	.360	.382	1.000	.049	.085	.002	.1725	.3750	2.5	IT-3601000	64.30	IT-3601000X	73.40	
7-32	.360	.382	1.250	.049	.085	.002	.1725	.3750	2.5	IT-3601250	64.30	IT-3601250X	73.40	
7-32	.360	.382	1.500	.049	.085	.002	.1725	.3750	2.5	IT-3601500	64.30	IT-3601500X	73.40	
7-32	.360	.382	1.750	.049	.085	.002	.1725	.3750	3.0	IT-3601750	65.90	IT-3601750X	74.90	
7-32	.360	.382	1.800	.049	.085	.002	.1725	.3750	3.0	IT-3601800	64.30	IT-3601800X	73.40	
7-32	.360	.382	2.000	.049	.085	.002	.1725	.3750	4.0	IT-3602000	66.90	IT-3602000X	76.60	NEW
5-32	.460	.482	.750	.069	.120	.002	.2100	.5000	3.0	IT-460750	65.90	IT-460750X	78.20	
5-32	.460	.482	1.500	.069	.120	.002	.2100	.5000	3.0	IT-4601500	65.90	IT-4601500X	78.20	
5-32	.460	.482	2.000	.069	.120	.002	.2100	.5000	3.0	IT-4602000	90.20	IT-4602000X	102.50	
5-32	.490	.512	.750	.069	.120	.002	.2400	.5000	3.0	IT-490750	90.20	IT-490750X	102.50	
5-32	.490	.512	1.125	.069	.120	.002	.2400	.5000	3.0	IT-4901125	90.20	IT-4901125X	102.50	
5-32	.490	.512	1.500	.069	.120	.002	.2400	.5000	3.0	IT-4901500	90.20	IT-4901500X	102.50	
5-32	.490	.512	2.000	.069	.120	.002	.2400	.5000	3.0	IT-4902000	90.20	IT-4902000X	102.50	
5-32	.490	.512	2.500	.069	.120	.002	.2400	.5000	4.0	IT-4902500	92.30	IT-4902500X	105.50	NEW

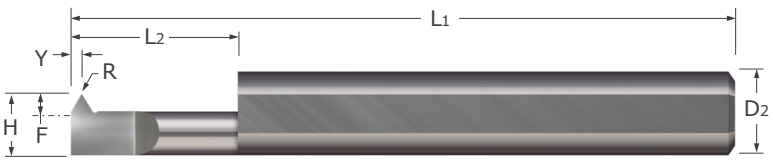
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

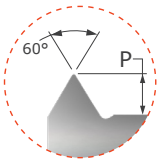
See pgs 39-47 for standard tool holders
See pg 317 for tool set options

ITL

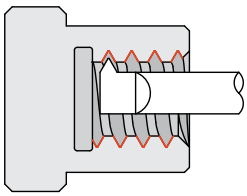
Standard – Threading Tools

UN Threads – Single Point – Left Hand





- Designed for threading multiple thread pitches (ANSI, UN, and Metric 60°) in a left hand threading application
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Corner radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide ■ CNC ground in the USA



Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Radius	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
TPI	H		L_2 $^{+.050"}_{-.000"}$	Y $^{+.010"}_{-.000"}$	P	R $^{+.001"}_{-.000"}$	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
40-72	.040	.045	.075	.009	.015	.001	-.0225	.1250	1.5	ITL-040075	43.70		
40-72	.040	.045	.150	.009	.015	.001	-.0225	.1250	1.5	ITL-040150	43.70		
28-72	.050	.055	.200	.012	.020	.001	-.0125	.1250	1.5	ITL-050200	43.70	ITL-050200X	48.10
28-56	.060	.070	.200	.012	.020	.001	-.0025	.1250	1.5	ITL-060200	38.10		
28-56	.060	.070	.250	.012	.020	.001	-.0025	.1250	1.5	ITL-060250	38.10	ITL-060250X	42.50
28-56	.060	.070	.300	.012	.020	.001	-.0025	.1250	1.5	ITL-060300	38.10	ITL-060300X	42.50
28-56	.080	.090	.250	.012	.020	.002	.0175	.1250	1.5	ITL-080250	34.70	ITL-080250X	38.95
28-56	.080	.090	.350	.012	.020	.002	.0175	.1250	1.5	ITL-080350	34.70	ITL-080350X	38.95
28-56	.080	.090	.500	.012	.020	.002	.0175	.1250	1.5	ITL-080500	34.70	ITL-080500X	38.95
24-56	.100	.110	.250	.014	.025	.002	.0375	.1250	1.5	ITL-100250	34.70	ITL-100250X	38.95
24-56	.100	.110	.350	.014	.025	.002	.0375	.1250	1.5	ITL-100350	34.70	ITL-100350X	38.95
24-56	.100	.110	.500	.014	.025	.002	.0375	.1250	1.5	ITL-100500	34.70	ITL-100500X	38.95
24-56	.100	.110	.600	.014	.025	.002	.0375	.1250	1.5	ITL-100600	34.70	ITL-100600X	38.95
20-56	.120	.136	.250	.017	.030	.002	.0263	.1875	2.0	ITL-120250	37.00	ITL-120250X	41.75
20-56	.120	.136	.400	.017	.030	.002	.0263	.1875	2.0	ITL-120400	37.00	ITL-120400X	41.75
20-56	.120	.136	.500	.017	.030	.002	.0263	.1875	2.0	ITL-120500	37.00	ITL-120500X	41.75
20-56	.120	.136	.600	.017	.030	.002	.0263	.1875	2.0	ITL-120600	37.00		
20-56	.120	.136	.750	.017	.030	.002	.0263	.1875	2.0	ITL-120750	37.00	ITL-120750X	41.75
16-56	.140	.156	.250	.020	.035	.002	.0463	.1875	2.0	ITL-140250	37.00	ITL-140250X	41.75
16-56	.140	.156	.400	.020	.035	.002	.0463	.1875	2.0	ITL-140400	37.00	ITL-140400X	41.75
16-56	.140	.156	.500	.020	.035	.002	.0463	.1875	2.0	ITL-140500	37.00		
16-56	.140	.156	.750	.020	.035	.002	.0463	.1875	2.0	ITL-140750	37.00	ITL-140750X	41.75

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

Standard – Threading Tools

UN Threads – Single Point – Left Hand (cont.)

ITL

Continued from previous page

Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Radius	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
TPI	H		L_2 $^{+.050"}_{-.000"}$	Y $^{+.010"}_{-.000"}$	P	R $^{+.001"}_{-.001"}$	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
14-56	.160	.182	.250	.023	.040	.002	.0663	.1875	2.0	ITL-160250	37.00	ITL-160250X	41.75
14-56	.160	.182	.400	.023	.040	.002	.0663	.1875	2.0	ITL-160400	37.00		
14-56	.160	.182	.500	.023	.040	.002	.0663	.1875	2.0	ITL-160500	37.00	ITL-160500X	41.75
14-56	.160	.182	.750	.023	.040	.002	.0663	.1875	2.0	ITL-160750	37.00	ITL-160750X	41.75
14-56	.180	.202	.350	.023	.040	.002	.0550	.2500	2.5	ITL-180350	39.40	ITL-180350X	45.80
14-56	.180	.202	.500	.023	.040	.002	.0550	.2500	2.5	ITL-180500	39.40	ITL-180500X	45.80
14-56	.180	.202	.750	.023	.040	.002	.0550	.2500	2.5	ITL-180750	39.40	ITL-180750X	45.80
14-56	.180	.202	1.000	.023	.040	.002	.0550	.2500	2.5	ITL-1801000	39.40	ITL-1801000X	45.80
13-56	.200	.222	.400	.026	.045	.002	.0750	.2500	2.5	ITL-200400	39.40	ITL-200400X	45.80
13-56	.200	.222	.600	.026	.045	.002	.0750	.2500	2.5	ITL-200600	39.40	ITL-200600X	45.80
13-56	.200	.222	.750	.026	.045	.002	.0750	.2500	2.5	ITL-200750	39.40	ITL-200750X	45.80
13-56	.200	.222	1.000	.026	.040	.002	.0750	.2500	2.5	ITL-2001000	39.40	ITL-2001000X	45.80
10-48	.230	.252	.400	.032	.055	.002	.0738	.3125	2.5	ITL-230400	49.40	ITL-230400X	57.00
10-48	.230	.252	.600	.032	.055	.002	.0738	.3125	2.5	ITL-230600	49.40	ITL-230600X	57.00
10-48	.230	.252	.750	.032	.055	.002	.0738	.3125	2.5	ITL-230750	49.40	ITL-230750X	57.00
10-48	.230	.252	1.000	.032	.055	.002	.0738	.3125	2.5	ITL-2301000	49.40	ITL-2301000X	57.00
8-40	.290	.312	.500	.040	.070	.002	.1338	.3125	2.5	ITL-290500	49.40	ITL-290500X	57.00
8-40	.290	.312	.750	.040	.070	.002	.1338	.3125	2.5	ITL-290750	49.40	ITL-290750X	57.00
8-40	.290	.312	1.000	.040	.070	.002	.1338	.3125	2.5	ITL-2901000	49.40	ITL-2901000X	57.00
8-40	.290	.312	1.250	.040	.070	.002	.1338	.3125	2.5	ITL-2901250	49.40	ITL-2901250X	57.00
8-40	.320	.342	.500	.043	.075	.002	.1325	.3750	2.5	ITL-320500	64.30	ITL-320500X	73.40
8-40	.320	.342	.750	.043	.075	.002	.1325	.3750	2.5	ITL-320750	64.30	ITL-320750X	73.40
8-40	.320	.342	1.000	.043	.075	.002	.1325	.3750	2.5	ITL-3201000	64.30	ITL-3201000X	73.40
8-40	.320	.342	1.250	.043	.075	.002	.1325	.3750	2.5	ITL-3201250	64.30	ITL-3201250X	73.40
7-32	.360	.382	.500	.049	.085	.002	.1725	.3750	2.5	ITL-360500	64.30	ITL-360500X	73.40
7-32	.360	.382	.750	.049	.085	.002	.1725	.3750	2.5	ITL-360750	64.30	ITL-360750X	73.40
7-32	.360	.382	1.000	.049	.085	.002	.1725	.3750	2.5	ITL-3601000	64.30	ITL-3601000X	73.40
7-32	.360	.382	1.250	.049	.085	.002	.1725	.3750	2.5	ITL-3601250	64.30	ITL-3601250X	73.40
7-32	.360	.382	1.800	.049	.085	.002	.1725	.3750	2.5	ITL-3601800	64.30	ITL-3601800X	73.40
5-32	.490	.512	.750	.069	.120	.002	.2400	.5000	3.0	ITL-490750	90.20	ITL-490750X	102.50
5-32	.490	.512	1.500	.069	.120	.002	.2400	.5000	3.0	ITL-4901500	90.20	ITL-4901500X	102.50
5-32	.490	.512	2.000	.069	.120	.002	.2400	.5000	3.0	ITL-4902000	90.20	ITL-4902000X	102.50

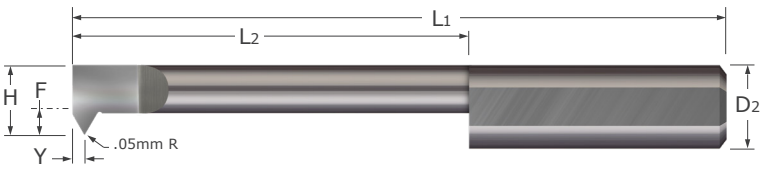
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

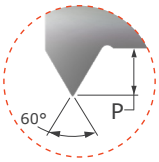
See pgs 39-47 for standard tool holders

ITM

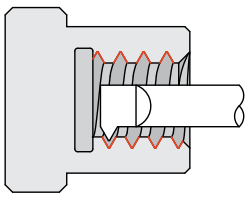
Standard – Threading Tools

Metric Shank – Single Point – Right Hand





- Designed for threading multiple thread pitches (ANSI, UN, & Metric 60°)
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Corner radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Pitch	Head Width	Minimum Bore Diameter*	Max. Bore Depth	Point Offset	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
	H		$L2^{+1.24mm}_{-0.00mm}$	$Y^{+.25mm}_{-.00mm}$	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price
.75-2.0 mm	4.60 mm	5.15 mm	13 mm	0.71 mm	1.22 mm	1.6 mm	6 mm	57 mm	ITM-064613	38.90	ITM-064613G	44.35	ITM-064613X	45.30
.75-2.0 mm	4.60 mm	5.15 mm	25 mm	0.71 mm	1.22 mm	1.6 mm	6 mm	57 mm	ITM-064625	38.90			ITM-064625X	45.30
.75-2.0 mm	5.10 mm	5.65 mm	15 mm	0.76 mm	1.32 mm	2.1 mm	6 mm	57 mm	ITM-065115	38.90			ITM-065115X	45.30
.75-2.0 mm	5.10 mm	5.65 mm	28 mm	0.76 mm	1.32 mm	2.1 mm	6 mm	57 mm	ITM-065128	38.90			ITM-065128X	45.30
.75-2.5 mm	5.80 mm	6.35 mm	15 mm	0.86 mm	1.50 mm	1.8 mm	8 mm	63 mm	ITM-085815	47.00			ITM-085815X	56.00
.75-2.5 mm	5.80 mm	6.35 mm	25 mm	0.86 mm	1.50 mm	1.8 mm	8 mm	63 mm	ITM-085825	47.00			ITM-085825X	56.00
.75-2.5 mm	5.80 mm	6.35 mm	38 mm	0.86 mm	1.50 mm	1.8 mm	8 mm	63 mm	ITM-085838	47.00			ITM-085838X	56.00
.75-3.5 mm	7.40 mm	7.95 mm	20 mm	1.09 mm	1.91 mm	3.4 mm	8 mm	63 mm	ITM-087420	47.00	ITM-087420G	54.45		
.75-3.5 mm	7.40 mm	7.95 mm	32 mm	1.09 mm	1.91 mm	3.4 mm	8 mm	63 mm	ITM-087432	47.00			ITM-087432X	56.00
.75-3.5 mm	7.40 mm	7.95 mm	46 mm	1.09 mm	1.91 mm	3.4 mm	8 mm	63 mm	ITM-087446	47.00	ITM-087446G	54.45	ITM-087446X	56.00
1.0-3.5 mm	9.60 mm	10.15 mm	20 mm	1.40 mm	2.41 mm	4.6 mm	10 mm	72 mm	ITM-109620	65.90				
1.0-3.5 mm	11.40 mm	11.95 mm	50 mm	1.85 mm	3.23 mm	5.4 mm	12 mm	83 mm	ITM-121150	84.50				

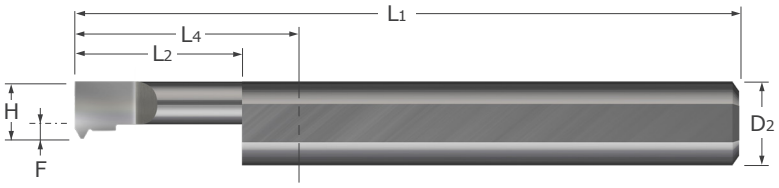
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

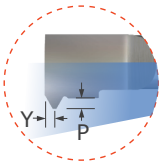
See pgs 39-47 for standard tool holders

Standard – Threading Tools

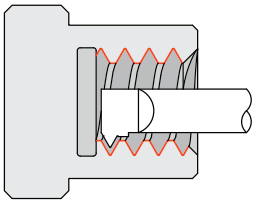
TT

UN Topping – Single Point





- Designed for threading 60° UN pitches in a right hand topping application
- Topping design generates a controlled thread height with a reduction in burr formation
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Corner radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Threads Size	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	H		L2 +.050" −.000"	Y +.005" −.000"	P +.0000" −.0020"	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
2-56	.050	.055	.150	.012	.0097	-.0125	.1250	1.5	TT-000256-015	44.50	TT-000256-015X	49.00
2-56	.050	.055	.200	.012	.0097	-.0125	.1250	1.5	TT-000256-020	44.50	TT-000256-020X	49.00
4-40	.065	.075	.200	.014	.0135	.0025	.1250	1.5	TT-000440-020	44.50	TT-000440-020X	49.00
4-40	.065	.075	.250	.014	.0135	.0025	.1250	1.5	TT-000440-025	35.30	TT-000440-025X	39.70
5-44	.080	.090	.200	.014	.0123	.0175	.1250	1.5	TT-000544-020	35.30	TT-000544-020X	39.70
5-44	.080	.090	.250	.014	.0123	.0175	.1250	1.5	TT-000544-025	35.30	TT-000544-025X	39.70
6-32	.080	.090	.250	.017	.0169	.0175	.1250	1.5	TT-000632-025	35.30	TT-000632-025X	39.70
6-32	.080	.090	.350	.017	.0169	.0175	.1250	1.5	TT-000632-035	35.30	TT-000632-035X	39.70
8-32	.100	.110	.250	.017	.0169	.0375	.1250	1.5	TT-000832-025	35.30	TT-000832-025X	39.70
8-32	.100	.110	.350	.017	.0169	.0375	.1250	1.5	TT-000832-035	35.30	TT-000832-035X	39.70
10-24	.120	.136	.250	.021	.0226	.0263	.1875	1.5	TT-001024-025	37.70	TT-001024-025X	42.70
10-24	.120	.136	.400	.021	.0226	.0263	.1875	1.5	TT-001024-040	37.70	TT-001024-040X	42.70
10-32	.120	.136	.250	.017	.0169	.0263	.1875	1.5	TT-001032-025	37.70	TT-001032-025X	42.70
10-32	.120	.136	.400	.017	.0169	.0263	.1875	1.5	TT-001032-040	37.70	TT-001032-040X	42.70
1/4-20	.160	.182	.400	.024	.0271	.0663	.1875	1.5	TT-014020-040	37.70	TT-014020-040X	42.70
1/4-20	.160	.182	.500	.024	.0271	.0663	.1875	1.5	TT-014020-050	37.70	TT-014020-050X	42.70
1/4-28	.180	.202	.500	.018	.0193	.0550	.2500	2.0	TT-014028-050	40.30	TT-014028-050X	46.20
1/4-28	.180	.202	.750	.018	.0193	.0550	.2500	2.0	TT-014028-075	40.30	TT-014028-075X	46.20
5/16-18	.220	.242	.750	.026	.0301	.0638	.3125	2.0	TT-051618-075	50.40	TT-051618-075X	57.60
5/16-18	.220	.242	1.000	.026	.0301	.0638	.3125	2.0	TT-051618-100	50.40	TT-051618-100X	57.60
5/16-24	.220	.242	.750	.021	.0226	.0638	.3125	2.0	TT-051624-075	50.40	TT-051624-075X	57.60
5/16-24	.220	.242	1.000	.021	.0226	.0638	.3125	2.0	TT-051624-100	50.40	TT-051624-100X	57.60
3/8-16	.280	.302	.750	.028	.0338	.1238	.3125	2.0	TT-038016-075	50.40	TT-038016-075X	57.60
3/8-16	.280	.302	1.000	.028	.0338	.1238	.3125	2.0	TT-038016-100	50.40	TT-038016-100X	57.60
3/8-24	.300	.322	.750	.021	.0226	.1438	.3125	2.0	TT-038024-075	50.40	TT-038024-075X	57.60
3/8-24	.300	.322	1.000	.021	.0226	.1438	.3125	2.0	TT-038024-100	50.40	TT-038024-100X	57.60

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

TT

Standard – Threading Tools

UN Topping – Single Point (cont.)

Continued from previous page

Threads Size	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	H		L_2 $^{+.050"}_{-.000"}$	Y $^{+.005"}_{-.000"}$	P $^{+.000"}_{-.002"}$	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
7/16-14	.310	.332	.750	.032	.0387	.1538	.3125	2.0	TT-071614-075	50.40	TT-071614-075X	57.60
7/16-14	.310	.332	1.000	.032	.0387	.1538	.3125	2.0	TT-071614-100	50.40	TT-071614-100X	57.60
7/16-20	.350	.372	1.000	.024	.0271	.1625	.3750	2.0	TT-071620-100	65.70	TT-071620-100X	74.20
7/16-20	.350	.372	1.250	.024	.0271	.1625	.3750	2.5	TT-071620-125	65.70	TT-071620-125X	74.70
1/2-13	.380	.402	1.000	.034	.0416	.1300	.5000	3.0	TT-012013-100	92.00	TT-012013-100X	104.30
1/2-13	.380	.402	1.250	.034	.0416	.1300	.5000	3.0	TT-012013-125	92.00	TT-012013-125X	104.30
1/2-20	.410	.432	1.000	.024	.0271	.1600	.5000	3.0	TT-012020-100	92.00	TT-012020-100X	104.30
1/2-20	.410	.432	1.250	.024	.0271	.1600	.5000	3.0	TT-012020-125	92.00	TT-012020-125X	104.30
9/16-12	.410	.432	1.000	.036	.0451	.1600	.5000	3.0	TT-091612-100	92.00	TT-091612-100X	104.30
9/16-12	.410	.432	1.250	.036	.0451	.1600	.5000	3.0	TT-091612-125	92.00	TT-091612-125X	104.30
9/16-18	.460	.482	1.000	.026	.0301	.2100	.5000	3.0	TT-091618-100	92.00	TT-091618-100X	104.30
9/16-18	.460	.482	1.250	.026	.0301	.2100	.5000	3.0	TT-091618-125	92.00	TT-091618-125X	104.30
5/8-11	.490	.512	1.000	.039	.0492	.2400	.5000	3.0	TT-058011-100	92.00	TT-058011-100X	104.30
5/8-11	.490	.512	1.250	.039	.0492	.2400	.5000	3.0	TT-058011-125	92.00	TT-058011-125X	104.30
3/4-16	.490	.512	1.000	.028	.0338	.2400	.5000	3.0	TT-034016-100	92.00	TT-034016-100X	104.30
3/4-16	.490	.512	1.250	.028	.0338	.2400	.5000	3.0	TT-034016-125	92.00	TT-034016-125X	104.30

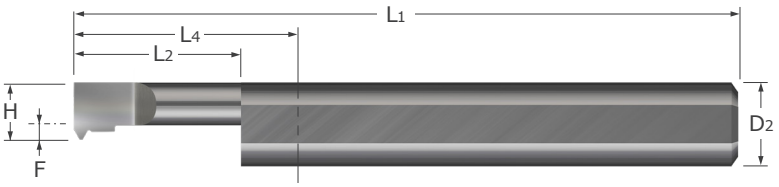
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

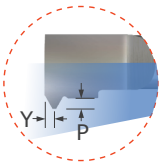
See pgs 39-47 for standard tool holders

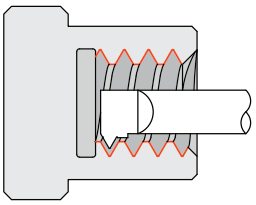
Standard – Threading Tools

Metric Topping – Single Point

TMT







- Designed for threading 60° Metric pitches in a right hand topping application
- Topping design generates a controlled thread height with a reduction in burr formation
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

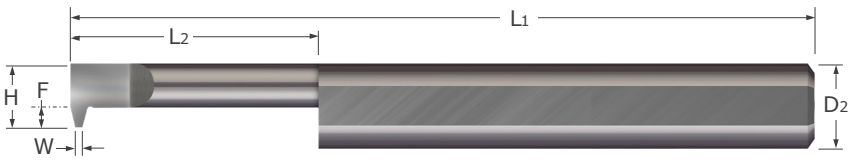
Threads Size	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	H		L_2 +1.27mm −.000mm	Y +.127mm −.000mm	P +.000mm −.051mm	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
M2.5x0.45	1.50 mm	1.70 mm	5.00 mm	.300 mm	.244 mm	-0.09 mm	.1250	1.5	TMT-025045-05	44.50	TMT-025045-05X	49.00
M2.5x0.45	1.50 mm	1.70 mm	7.00 mm	.300 mm	.244 mm	-0.09 mm	.1250	1.5	TMT-025045-07	44.50	TMT-025045-07X	49.00
M3x0.50	2.00 mm	2.20 mm	6.00 mm	.319 mm	.271 mm	0.41 mm	.1250	1.5	TMT-030050-06	35.30	TMT-030050-06X	39.70
M3x0.50	2.00 mm	2.20 mm	8.00 mm	.319 mm	.271 mm	0.41 mm	.1250	1.5	TMT-030050-08	35.30	TMT-030050-08X	39.70
M4x0.70	2.50 mm	2.70 mm	7.00 mm	.396 mm	.379 mm	0.91 mm	.1250	1.5	TMT-040070-07	35.30	TMT-040070-07X	39.70
M4x0.70	2.50 mm	2.70 mm	10.00 mm	.396 mm	.379 mm	0.91 mm	.1250	1.5	TMT-040070-10	35.30	TMT-040070-10X	39.70
M4.5x0.75	3.00 mm	3.40 mm	6.00 mm	.415 mm	.406 mm	0.62 mm	.1875	1.5	TMT-045075-06	37.70	TMT-045075-06X	42.10
M4.5x0.75	3.00 mm	3.40 mm	9.00 mm	.415 mm	.406 mm	0.62 mm	.1875	1.5	TMT-045075-09	37.70	TMT-045075-09X	42.10
M5x0.80	3.00 mm	3.40 mm	6.00 mm	.434 mm	.433 mm	0.62 mm	.1875	1.5	TMT-050080-06	37.70	TMT-050080-06X	42.10
M5x0.80	3.00 mm	3.40 mm	9.00 mm	.434 mm	.433 mm	0.62 mm	.1875	1.5	TMT-050080-09	37.70	TMT-050080-09X	42.10
M6x1.00	4.00 mm	4.50 mm	10.00 mm	.511 mm	.541 mm	1.62 mm	.1875	1.5	TMT-060100-10	37.70	TMT-060100-10X	42.10
M6x1.00	4.00 mm	4.50 mm	14.00 mm	.511 mm	.541 mm	1.62 mm	.1875	2.0	TMT-060100-14	38.90	TMT-060100-14X	43.30
M8x1.25	5.50 mm	6.00 mm	14.00 mm	.607 mm	.677 mm	1.53 mm	.3125	2.0	TMT-080125-14	50.40	TMT-080125-14X	54.80
M8x1.25	5.50 mm	6.00 mm	22.00 mm	.607 mm	.677 mm	1.53 mm	.3125	2.0	TMT-080125-22	50.40	TMT-080125-22X	54.80
M10x1.50	7.50 mm	8.00 mm	24.00 mm	.703 mm	.812 mm	3.53 mm	.3125	2.0	TMT-100150-24	50.40	TMT-100150-24X	54.80
M10x1.50	7.50 mm	8.00 mm	31.00 mm	.703 mm	.812 mm	3.53 mm	.3125	2.5	TMT-100150-31	50.40	TMT-100150-31X	54.80
M12x1.75	9.00 mm	9.50 mm	22.00 mm	.804 mm	.957 mm	4.24 mm	.3750	2.0	TMT-120175-22	65.70	TMT-120175-22X	70.10
M12x1.75	9.00 mm	9.50 mm	31.00 mm	.804 mm	.957 mm	4.24 mm	.3750	2.5	TMT-120175-31	66.80	TMT-120175-31X	71.30
M16x2.00	12.50 mm	13.00 mm	31.00 mm	.896 mm	1.085 mm	6.15 mm	.5000	3.0	TMT-160200-31	92.00	TMT-160200-31X	96.40
M16x2.00	12.50 mm	13.00 mm	44.00 mm	.896 mm	1.085 mm	6.15 mm	.5000	3.0	TMT-160200-44	92.00	TMT-160200-44X	96.40
M20x2.50	12.50 mm	13.00 mm	31.00 mm	1.086 mm	1.353 mm	6.15 mm	.5000	3.0	TMT-200250-31	92.00	TMT-200250-31X	96.40
M20x2.50	12.50 mm	13.00 mm	44.00 mm	1.086 mm	1.353 mm	6.15 mm	.5000	3.0	TMT-200250-44	92.00	TMT-200250-44X	96.40

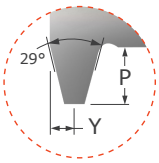
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pgs 39-47 for standard tool holders

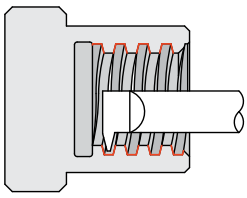
IAT

Standard – Threading Tools
ACME Threads





- Designed for cutting pitch-specific ACME threads
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Flat	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
TPI	H		L_2 $^{+.050"}_{-.000"}$	Y	P	W $^{+.000"}_{-.005"}$	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
16	.165	.187	.400	.035	.045	.021	.0400	.2500	2.5	IAT2-400-16	39.40		
16	.165	.187	.600	.024	.050	.021	.0400	.2500	2.5	IAT2-600-16	39.40		
16	.165	.187	.750	.035	.045	.021	.0400	.2500	2.5	IAT2-750-16	39.40		
16	.165	.187	1.000	.035	.045	.021	.0400	.2500	2.5	IAT2-1000-16	39.40		
16	.200	.222	.400	.035	.045	.021	.0750	.2500	2.5	IAT-400-16	39.40	IAT-400-16X	45.80
16	.200	.222	.600	.024	.045	.021	.0750	.2500	2.5	IAT-600-16	39.40	IAT-600-16X	45.80
16	.200	.222	.750	.035	.045	.021	.0750	.2500	2.5	IAT-750-16	39.40	IAT-750-16X	45.80
16	.200	.222	1.000	.035	.045	.021	.0750	.2500	2.5	IAT-1000-16	39.40	IAT-1000-16X	45.80
14	.219	.241	.500	.043	.070	.024	.0627	.3125	2.5	IAT2-500-14	48.80		
14	.219	.241	.750	.030	.070	.024	.0627	.3125	2.5	IAT2-750-14	48.80		
14	.219	.241	1.000	.043	.070	.024	.0627	.3125	2.5	IAT2-1000-14	48.80		
14	.219	.241	1.250	.043	.070	.024	.0627	.3125	2.5	IAT2-1250-14	48.80		
14	.255	.277	.500	.043	.070	.024	.0988	.3125	2.5	IAT-500-14	48.80	IAT-500-14X	56.40
14	.255	.277	.750	.030	.070	.024	.0988	.3125	2.5	IAT-750-14	48.80	IAT-750-14X	56.40
14	.255	.277	1.000	.043	.070	.024	.0988	.3125	2.5	IAT-1000-14	48.80	IAT-1000-14X	56.40
14	.255	.277	1.250	.043	.070	.024	.0988	.3125	2.5	IAT-1250-14	48.80	IAT-1250-14X	56.40
12	.269	.291	.750	.049	.085	.028	.0815	.3750	2.5	IAT2-750-12	64.30		
12	.269	.291	1.000	.036	.085	.028	.0815	.3750	2.5	IAT2-1000-12	64.30		
12	.269	.291	1.250	.049	.085	.028	.0815	.3750	2.5	IAT2-1250-12	64.30		
12	.269	.291	1.800	.049	.085	.028	.0815	.3750	4.0	IAT2-1800-12	64.30		
12	.360	.382	.750	.049	.085	.028	.1725	.3750	2.5	IAT-750-12	64.30	IAT-750-12X	73.40
12	.360	.382	1.000	.036	.085	.028	.1725	.3750	2.5	IAT-1000-12	64.30	IAT-1000-12X	73.40
12	.360	.382	1.250	.049	.085	.028	.1725	.3750	2.5	IAT-1250-12	64.30	IAT-1250-12X	73.40
12	.360	.382	1.800	.049	.085	.028	.1725	.3750	2.5	IAT-1800-12	64.30	IAT-1800-12X	73.40
10	.378	.400	.750	.060	.120	.032	.1280	.5000	3.0	IAT2-750-10	90.20		
10	.378	.400	1.500	.060	.120	.032	.1280	.5000	3.0	IAT2-1500-10	90.20		
10	.378	.400	2.000	.060	.120	.032	.1280	.5000	3.0	IAT2-2000-10	90.20		
10	.490	.512	.750	.060	.120	.032	.2400	.5000	3.0	IAT-750-10	90.20	IAT-750-10X	102.50
10	.490	.512	1.500	.060	.120	.032	.2400	.5000	3.0	IAT-1500-10	90.20	IAT-1500-10X	102.50
10	.490	.512	2.000	.060	.120	.032	.2400	.5000	3.0	IAT-2000-10	90.20	IAT-2000-10X	102.50

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Continued on next page

See pgs 39-47 for standard tool holders

Standard – Threading Tools

ACME Threads (cont.)

IAT

Continued from previous page

Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Flat	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
TPI	H		L_2 $^{+.050"}_{-.000"}$	Y	P	W $^{+.000"}_{-.005"}$	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
8	.478	.500	.750	.064	.120	.041	.2280	.5000	3.0	IAT2-750-8	90.20		
8	.478	.500	1.500	.064	.120	.041	.2280	.5000	3.0	IAT2-1500-8	90.20		
8	.478	.500	2.000	.064	.120	.041	.2280	.5000	3.0	IAT2-2000-8	90.20		
8	.490	.512	.750	.064	.120	.041	.2400	.5000	3.0	IAT-750-8	90.20	IAT-750-8X	102.50
8	.490	.512	1.500	.064	.120	.041	.2400	.5000	3.0	IAT-1500-8	90.20	IAT-1500-8X	102.50
8	.490	.512	2.000	.064	.120	.041	.2400	.5000	3.0	IAT-2000-8	90.20	IAT-2000-8X	102.50
6	.490	.512	.750	.072	.120	.057	.2400	.5000	3.0	IAT-750-6	90.20	IAT-750-6X	102.50
6	.490	.512	1.500	.072	.120	.057	.2400	.5000	3.0	IAT-1500-6	90.20	IAT-1500-6X	102.50
6	.490	.512	2.000	.072	.120	.057	.2400	.5000	3.0	IAT-2000-6	90.20	IAT-2000-6X	102.50
5	.490	.512	1.500	.078	.120	.069	.2400	.5000	3.0	IAT-1500-5	90.20	IAT-1500-5X	102.50
5	.490	.512	2.000	.078	.120	.069	.2400	.5000	3.0	IAT-2000-5	90.20	IAT-2000-5X	102.50

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Technical Resources on Micro100.com

Find Simulation Files, Speeds & Feeds, Torque Recommendations, Programs, Blogs, and more at micro100.com/resources

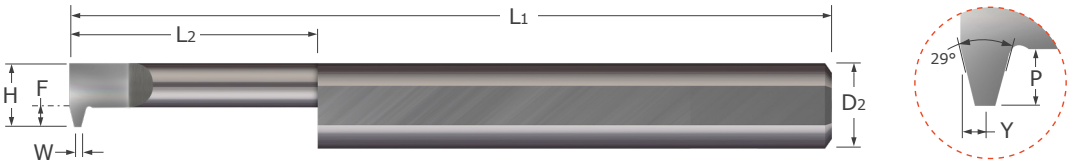
SCAN

See pgs 39-47 for standard tool holders

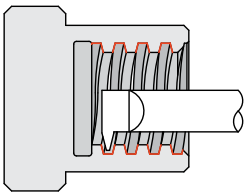
SAT

Standard – Threading Tools

Stub ACME Threads



- Designed for cutting pitch-specific stub ACME threads
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Flat	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
TPI	H		L_2 $^{+.050"}_{-.000"}$	Y	P	W $^{+.000"}_{-.005"}$	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
16	.200	.222	.400	.024	.045	.024	.0750	.2500	2.5	SAT-400-16	39.40		
16	.200	.222	.600	.024	.045	.024	.0750	.2500	2.5	SAT-600-16	39.40	SAT-600-16X	45.80
16	.200	.222	.750	.024	.045	.024	.0750	.2500	2.5	SAT-750-16	39.40	SAT-750-16X	45.80
16	.200	.222	1.000	.024	.045	.024	.0750	.2500	2.5	SAT-1000-16	39.40	SAT-1000-16X	45.80
14	.235	.257	.500	.045	.070	.028	.0788	.3125	2.5	SAT-500-14	48.80	SAT-500-14X	56.40
14	.235	.257	.750	.045	.070	.028	.0788	.3125	2.5	SAT-750-14	48.80	SAT-750-14X	56.40
14	.235	.257	1.000	.045	.070	.028	.0788	.3125	2.5	SAT-1000-14	48.80	SAT-1000-14X	56.40
14	.235	.257	1.750	.045	.070	.028	.0788	.3125	2.5	SAT-1750-14	48.80	SAT-1750-14X	56.40
12	.360	.382	.500	.051	.085	.033	.1725	.3750	2.5	SAT-500-12	64.30		
12	.360	.382	.750	.051	.085	.033	.1725	.3750	2.5	SAT-750-12	64.30	SAT-750-12X	73.40
12	.360	.382	1.000	.051	.085	.033	.1725	.3750	2.5	SAT-1000-12	64.30	SAT-1000-12X	73.40
12	.360	.382	1.250	.051	.085	.033	.1725	.3750	2.5	SAT-1250-12	64.30	SAT-1250-12X	73.40
12	.360	.382	1.800	.051	.085	.033	.1725	.3750	2.5	SAT-1800-12	64.30	SAT-1800-12X	73.40
10	.490	.512	.750	.062	.120	.037	.2400	.5000	3.0	SAT-750-10	90.20	SAT-750-10X	102.50
10	.490	.512	1.500	.062	.120	.037	.2400	.5000	3.0	SAT-1500-10	90.20	SAT-1500-10X	102.50
10	.490	.512	2.000	.062	.120	.037	.2400	.5000	3.0	SAT-2000-10	90.20		
9	.490	.512	2.000	.052	.120	.042	.2400	.5000	3.0	SAT-2000-9	90.20	SAT-2000-9X	102.50
8	.490	.512	.750	.068	.120	.048	.2400	.5000	3.0	SAT-750-8	90.20		
8	.490	.512	1.500	.068	.120	.048	.2400	.5000	3.0	SAT-1500-8	90.20	SAT-1500-8X	102.50
8	.490	.512	2.000	.068	.120	.048	.2400	.5000	3.0	SAT-2000-8	90.20	SAT-2000-8X	102.50
7	.490	.512	.750	.059	.120	.055	.2400	.5000	3.0	SAT-750-7	90.20		
7	.490	.512	2.000	.059	.120	.055	.2400	.5000	3.0	SAT-2000-7	90.20	SAT-2000-7X	102.50
6	.490	.512	2.000	.076	.120	.065	.2400	.5000	3.0	SAT-2000-6	90.20	SAT-2000-6X	102.50
5	.490	.512	.750	.083	.120	.079	.2400	.5000	3.0	SAT-750-5	90.20		
5	.490	.512	1.500	.083	.120	.079	.2400	.5000	3.0	SAT-1500-5	90.20	SAT-1500-5X	102.50
5	.490	.512	2.000	.083	.120	.079	.2400	.5000	3.0	SAT-2000-5	90.20	SAT-2000-5X	102.50

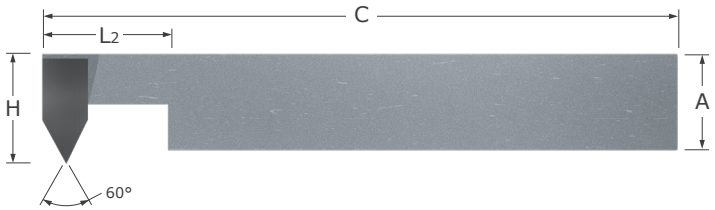
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pgs 39-47 for standard tool holders

Standard – Threading Tools

IDRT

UN Threads – Right Hand – Brazed



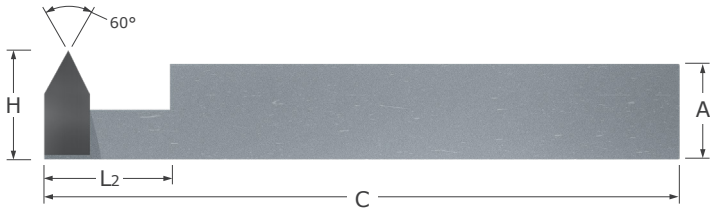
- Designed for threading multiple thread pitches (ANSI, UN and Metric 60°)
- Designed for single point threading where a square shank tool is required in .450" bores and larger
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- CNC ground in the USA

Head Width	Maximum Bore Depth	Square Shank	Overall Length	Brazed Style	
H	L_2 $^{+.050"}_{-.000"}$	A $^{+.0000"}_{-.0030"}$	C	Tool #	Price
.450	.615	.3750	2.50	IDRT-60	57.10
.450	1.115	.3750	2.50	IDRT-61	57.10
.575	.875	.5000	3.52	IDRT-80	57.60
.575	1.395	.5000	3.52	IDRT-81	53.00

Standard – Threading Tools

IDLT

UN Threads – Left Hand – Brazed



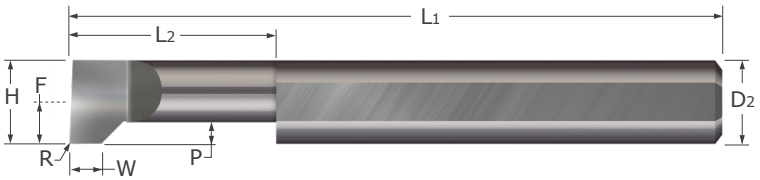
- Designed for threading multiple thread pitches (ANSI, UN, and Metric 60°) in a left hand threading application
- Designed for single point threading where a square shank tool is required in .450" bores and larger
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- CNC ground in the USA

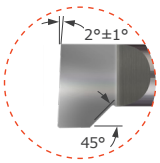
Head Width	Maximum Bore Depth	Square Shank	Overall Length	Brazed Style	
H	L_2 $^{+.050"}_{-.000"}$	A $^{+.0000"}_{-.0030"}$	C	Tool #	Price
.450	.615	.3750	2.50	IDLT-60	57.10
.450	1.115	.3750	2.50	IDLT-61	57.10
.575	.875	.5000	3.52	IDLT-80	57.60
.575	1.395	.5000	3.52	IDLT-81	57.60

LTR

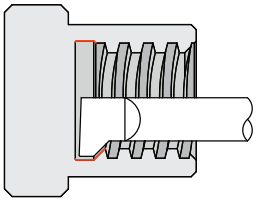
Standard – Threading Tools

Thread Relief Tools





- Designed for plunging thread relief at the bottom of a thread
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split face geometry provides optimal edge strength
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Flat	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.050" −.000"	W +.002" −.002"	R +.002" −.000"	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.094	.104	.250	.049	.002	.040	.0315	.1250	1.5	LTR-094-4	28.70	LTR-094-4X	32.85
.094	.104	.375	.049	.002	.040	.0315	.1250	1.5	LTR-094-6	28.70	LTR-094-6X	32.85
.125	.139	.375	.063	.002	.040	.0625	.1250	1.5	LTR-125-6	28.70	LTR-125-6X	32.85
.125	.139	.500	.063	.002	.040	.0625	.1250	1.5	LTR-125-8	28.70	LTR-125-8X	32.85

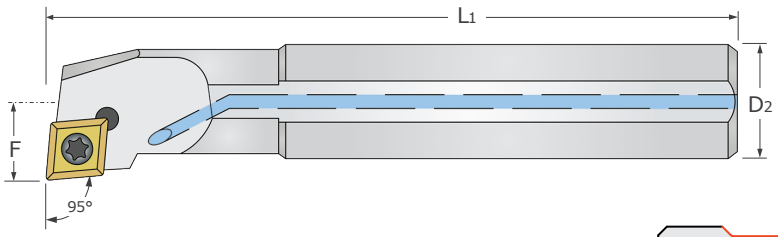
H		L_2 +.050" −.000"	W +.002" −.002"	R +.002" −.002"	P	F	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.156	.174	.375	.063	.005	.040	.0625	.1875	2.0	LTR-156-6	33.00	LTR-156-6X	37.65
.156	.174	.500	.063	.005	.040	.0625	.1875	2.0	LTR-156-8	33.00	LTR-156-8X	37.65
.187	.205	.375	.078	.005	.040	.0938	.1875	2.0	LTR-187-6	33.00	LTR-187-6X	37.65
.187	.205	.500	.078	.005	.040	.0938	.1875	2.0	LTR-187-8	33.00	LTR-187-8X	37.65
.187	.205	.750	.078	.005	.040	.0938	.1875	2.0	LTR-187-12	33.00	LTR-187-12X	37.65
.187	.205	1.000	.078	.005	.040	.0938	.1875	2.0	LTR-187-16	33.00	LTR-187-16X	37.65
.250	.272	.500	.094	.005	.050	.1250	.2500	2.5	LTR-250-8	39.40	LTR-250-8X	45.80
.250	.272	.750	.094	.005	.050	.1250	.2500	2.5	LTR-250-12	39.40	LTR-250-12X	45.80
.250	.272	1.000	.094	.005	.050	.1250	.2500	2.5	LTR-250-16	39.40	LTR-250-16X	45.80
.250	.272	1.250	.094	.005	.050	.1250	.2500	2.5	LTR-250-20	39.40	LTR-250-20X	45.80
.312	.334	.750	.094	.005	.075	.1563	.3125	2.5	LTR-312-12	49.40	LTR-312-12X	57.00
.312	.334	1.250	.094	.005	.075	.1563	.3125	2.5	LTR-312-20	49.40	LTR-312-20X	57.00
.375	.397	.750	.125	.005	.100	.1875	.3750	2.5	LTR-375-12	65.00	LTR-375-12X	74.10
.375	.397	1.250	.125	.005	.100	.1875	.3750	2.5	LTR-375-20	65.00	LTR-375-20X	74.10
.500	.522	1.000	.156	.010	.125	.2500	.5000	3.0	LTR-500-16	92.10	LTR-500-16X	104.40
.500	.522	1.500	.156	.010	.125	.2500	.5000	3.0	LTR-500-24	92.10	LTR-500-24X	104.40

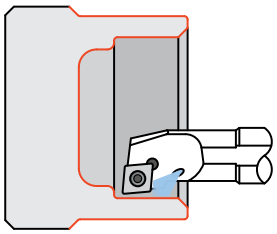
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pgs 39-47 for standard tool holders

Indexable – Boring Bars

Boring – Coolant Through – Right Hand





- Coolant through boring bar for right hand boring and facing with 5° approach (lead) angle
- Made from precision ground heat treated steel
- Coolant through design for improved chip removal
- Insert not included

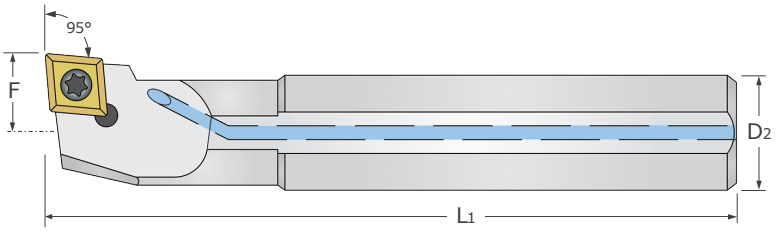
Minimum Bore Diameter*	Centerline Offset	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
	F	D2	L1			Tool #	Price
.330	.177	.2500	3.1	50-1100	A04F SCLCR 2	20-0821	81.40
.380	.197	.3125	3.9	50-1100	A05H SCLCR 2	20-0823	83.50
.490	.275	.3750	4.5	50-1100	A06J SCLCR 2	20-0825	87.20
.630	.354	.5000	4.9	50-1100	A08K SCLCR 2	20-0827	90.80
.630	.354	.5000	4.9	50-1105	A08K SCLCR 3	20-0850	94.40
.775	.433	.6250	5.9	50-1100	A10M SCLCR 2	20-0829	97.00
.775	.433	.6250	5.9	50-1105	A10M SCLCR 3	20-0852	100.70
.925	.511	.7500	7.1	50-1105	A12Q SCLCR 3	20-0854	109.00

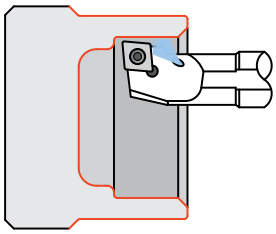
*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

See pg 328 for indexable insert accessories
See pgs 320-325 for tool set options

Indexable – Boring Bars

Boring – Coolant Through – Left Hand





- Coolant through boring bar for left hand boring & facing with 5° approach (lead) angle
- Made from precision ground heat treated steel
- Coolant through design for improved chip removal
- Insert not included

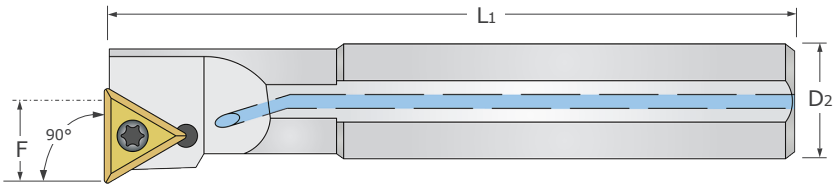
Minimum Bore Diameter*	Centerline Offset	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
	F	D2	L1			Tool #	Price
.330	.177	.2500	3.1	50-1100	A04F SCLCL 2	20-0822	81.40
.380	.197	.3125	3.9	50-1100	A05H SCLCL 2	20-0824	83.50
.490	.275	.3750	4.5	50-1100	A06J SCLCL 2	20-0826	87.20
.630	.354	.5000	4.9	50-1100	A08K SCLCL 2	20-0828	90.80
.630	.354	.5000	4.9	50-1105	A08K SCLCL 3	20-0851	94.40
.775	.433	.6250	5.9	50-1100	A10M SCLCL 2	20-0830	97.00
.775	.433	.6250	5.9	50-1105	A10M SCLCL 3	20-0853	100.70
.925	.511	.7500	7.1	50-1105	A12Q SCLCL 3	20-0855	109.00

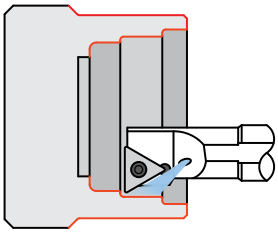
*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

See pg 328 for indexable insert accessories
See pgs 320-325 for tool set options

Indexable – Boring Bars

Facing – Coolant Through – Right Hand





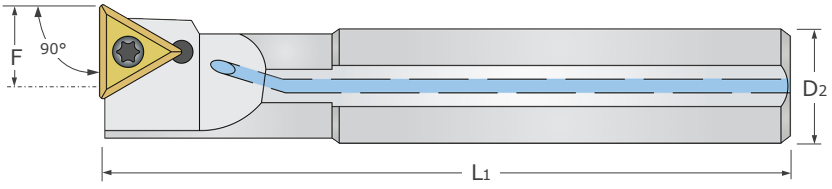
- Coolant through boring bar for left hand boring and facing with 0° approach (lead) angle, which allows for deeper roughing passes
- Made from precision ground heat treated steel
- Coolant through design for improved chip removal
- Insert not included

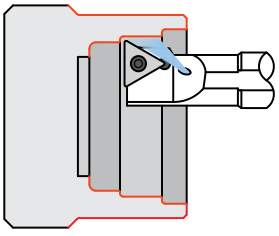
Minimum Bore Diameter*	Centerline Offset	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
	F	D2	L1			Tool #	Price
.490	.275	.3750	4.3	50-1300	A06J STFCR 2	20-1031	85.00
.633	.354	.5000	4.9	50-1300	A08K STFCR 2	20-1033	90.00
.775	.433	.6250	5.9	50-1300	A10M STFCR 2	20-1035	91.20

*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

Indexable – Boring Bars

Facing – Coolant Through – Left Hand





- Coolant through boring bar for left hand boring and facing with 0° approach (lead) angle, which allows for deeper roughing passes
- Made from precision ground heat treated steel
- Coolant through design for improved chip removal
- Insert not included

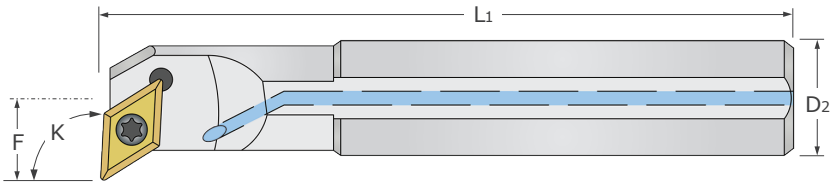
Minimum Bore Diameter*	Centerline Offset	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
	F	D2	L1			Tool #	Price
.490	.275	.3750	4.3	50-1300	A06J STFCL 2	20-1032	85.00
.633	.354	.5000	4.9	50-1300	A08K STFCL 2	20-1034	90.00
.775	.433	.6250	5.9	50-1300	A10M STFCL 2	20-1036	91.20

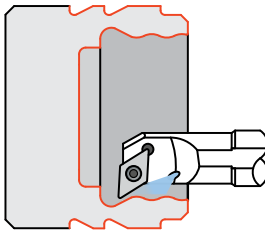
*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

See pg 328 for indexable insert accessories
See pgs 320-325 for tool set options

Indexable – Boring Bars

Profiling – Coolant Through – Right Hand





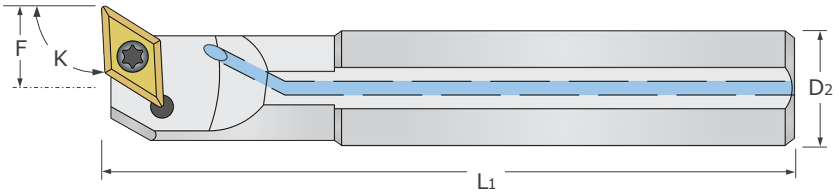
- Coolant through boring bar for right hand boring, facing, and profiling
- Made from precision ground heat treated steel
- Coolant through design for improved chip removal
- Insert not included

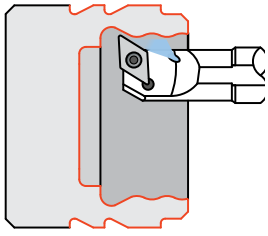
Minimum Bore Diameter*	Centerline Offset	K Angle	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
	F	K	D2	L1			Tool #	Price
.563	.197	107.5°	.3125	3.9	50-1200	A05H SDQCR 2	20-0901	81.80
.622	.275	93°	.3750	4.5	50-1200	A06J SDUCR 2	20-0931	85.00
.732	.354	93°	.5000	4.9	50-1200	A08K SDUCR 2	20-0933	90.00
.868	.433	93°	.6250	5.9	50-1200	A10M SDUCR 2	20-0935	91.20

*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

Indexable – Boring Bars

Profiling – Coolant Through – Left Hand





- Coolant through boring bar for left hand boring, facing, and profiling
- Made from precision ground heat treated steel
- Coolant through design for improved chip removal
- Insert not included

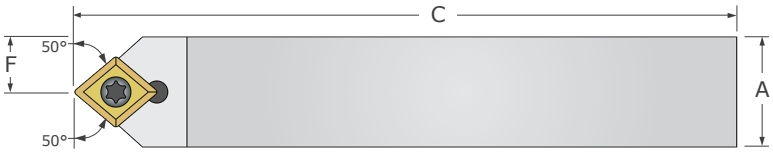
Minimum Bore Diameter*	Centerline Offset	K Angle	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
	F	K	D2	L1			Tool #	Price
.563	.197	107.5°	.3125	3.9	50-1200	A05H SDQCL 2	20-0902	81.80
.622	.275	93°	.3750	4.5	50-1200	A06J SDUCL 2	20-0932	85.00
.732	.354	93°	.5000	4.9	50-1200	A08K SDUCL 2	20-0934	90.00
.868	.433	93°	.6250	5.9	50-1200	A10M SDUCL 2	20-0936	91.20

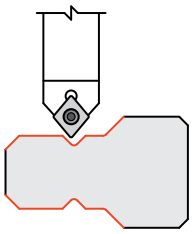
*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

See pg 328 for indexable insert accessories
See pgs 320-325 for tool set options

Indexable – Tool Holders

Chamfering & Turning – Style SCMCN



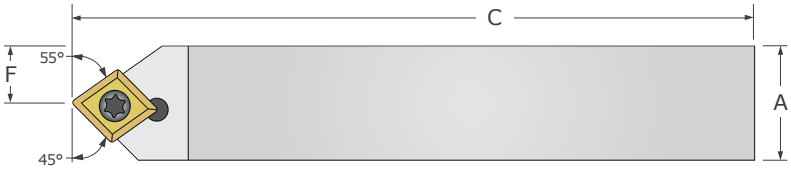


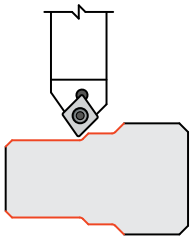
- Turning, profiling, and chamfering insertable holder utilizing 50° right hand and 50° left hand cutting edges
- Made from precision ground heat treated steel
- Insert not included

Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	Price
.157	.2500	2.4	50-1100	SCMCN 0404 D2	10-3311	44.40
.157	.3125	2.4	50-1100	SCMCN 0505 D2	10-3312	48.10
.189	.3750	2.8	50-1100	SCMCN 0606 E2	10-3313	54.10
.250	.5000	3.2	50-1100	SCMCN 0808 F2	10-3314	59.20
.315	.6250	3.9	50-1100	SCMCN 1010 H2	10-3315	65.60

Indexable – Tool Holders

Chamfering & Turning – Style SCSCR





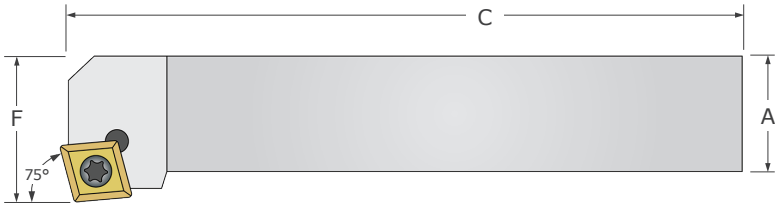
- Chamfering, profiling, and turning holder utilizing the 45° right hand or 55° left hand cutting edges
- Made from precision ground heat treated steel
- Insert not included

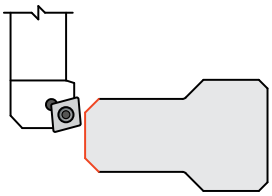
Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	Price
.157	.2500	2.4	50-1100	SCSCR 0404 D2	10-3351	44.40
.157	.3125	2.4	50-1100	SCSCR 0505 D2	10-3353	48.10
.189	.3750	2.8	50-1100	SCSCR 0606 E2	10-3355	54.10
.250	.5000	3.2	50-1100	SCSCR 0808 F2	10-3357	59.20
.315	.6250	3.9	50-1100	SCSCR 1010 H2	10-3359	65.60
.390	.7500	4.9	50-1100	SCSCR 1212 J3	10-3365	77.10

See pg 328 for indexable insert accessories
See pgs 320-325 for tool set options

Indexable – Tool Holders

Facing & Turning – Axial – Right Hand – Style SCKCR





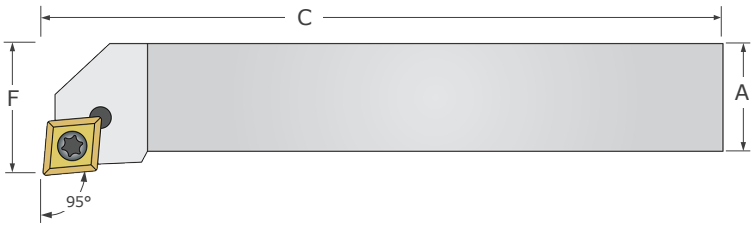
- 75° facing and chamfering holder utilizing 100° unused left hand cutting edge of insert
- Made from precision ground heat treated steel
- Insert not included

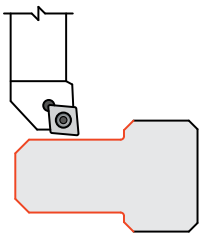
Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	Price
.394	.2500	2.4	50-1100	SCKCR 0404 D2	10-3211	44.40
.394	.3125	2.4	50-1100	SCKCR 0505 D2	10-3212	48.10
.472	.3750	2.8	50-1100	SCKCR 0606 E2	10-3213	54.10
.630	.5000	3.2	50-1100	SCKCR 0808 F2	10-3215	59.20
.787	.6250	3.9	50-1100	SCKCR 1010 H2	10-3217	65.60

See pg 328 for indexable insert accessories
See pgs 320-325 for tool set options

Indexable – Tool Holders

Facing & Turning – Radial – Right Hand – Style SCLCR



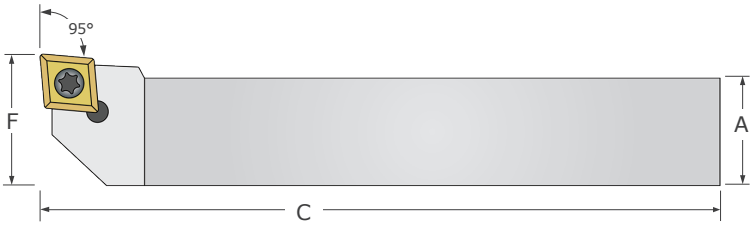


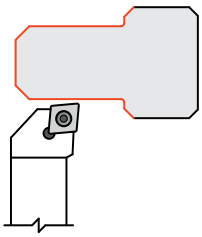
- Turning and facing indexable right hand holder with 95° approach
- Made from precision ground heat treated steel
- Insert not included

Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	Price
.394	.2500	2.4	50-1100	SCLCR 0404 D2	10-3231	44.40
.394	.3125	2.4	50-1100	SCLCR 0404 D2	10-3233	48.10
.472	.3750	2.8	50-1100	SCLCR 0606 E2	10-3235	54.10
.628	.5000	3.2	50-1100	SCLCR 0808 F2	10-3237	59.20
.787	.6250	3.9	50-1100	SCLCR 1010 H2	10-3241	65.60
1.000	.7500	4.9	50-1105	SCLCR 1212 J3	10-3251	77.10

Indexable – Tool Holders

Facing & Turning – Radial – Left Hand – Style SCLCL





- Turning and facing indexable left hand holder with 95° approach
- Made from precision ground heat treated steel
- Insert not included

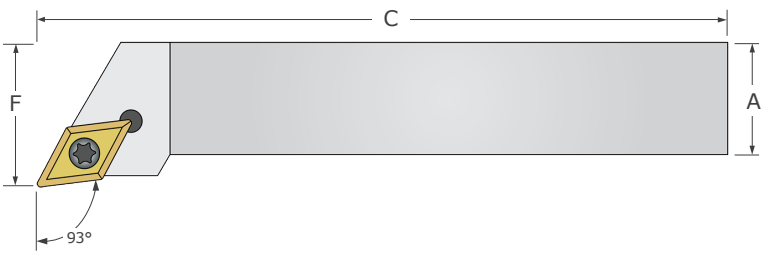
Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	Price
.394	.2500	2.4	50-1100	SCLCL 0404 D2	10-3232	44.40
.394	.3125	2.4	50-1100	SCLCL 0505 D2	10-3234	48.10
.472	.3750	2.8	50-1100	SCLCL 0606 E2	10-3236	54.10
.600	.5000	3.2	50-1100	SCLCL 0808 F2	10-3238	59.20
.787	.6250	3.9	50-1100	SCLCL 1010 H2	10-3242	65.60
1.000	.7500	4.9	50-1105	SCLCL 1212 J3	10-3252	77.10

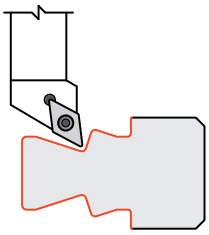
See pg 328 for indexable insert accessories

See pgs 320-325 for tool set options

Indexable – Tool Holders

Facing & Turning – Radial – Right Hand – Style SDJCR



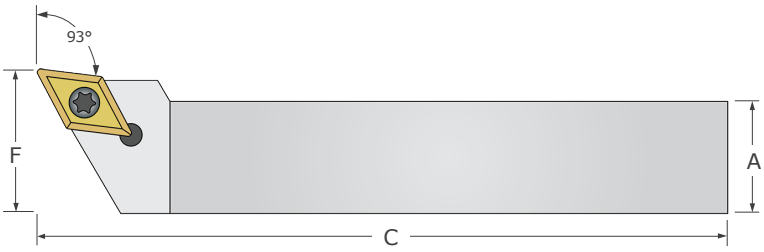


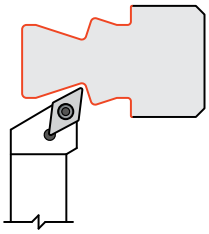
- Turning and profiling right hand holder
- Made from precision ground heat treated steel
- Insert not included

Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	Price
.394	.3125	3.9	50-1200	SDJCR 0505 H2	10-3641	54.10
.472	.3750	3.9	50-1200	SDJCR 0606 H2	10-3651	63.30
.629	.5000	3.9	50-1200	SDJCR 0808H2	10-3653	66.70
.787	.6250	3.9	50-1200	SDJCR 1010 H2	10-3615	74.00

Indexable – Tool Holders

Facing & Turning – Radial – Left Hand – Style SDJCL





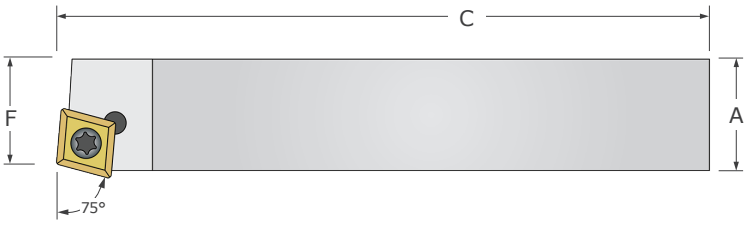
- Turning and profiling left hand holder
- Made from precision ground heat treated steel
- Insert not included

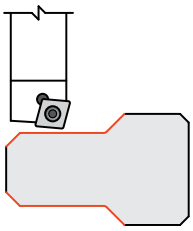
Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	Price
.394	.3125	3.9	50-1200	SDJCL 0505 H2	10-3642	54.10
.472	.3750	3.9	50-1200	SDJCL 0606 H2	10-3652	63.30
.629	.7500	3.9	50-1200	SDJCL 0808H2	10-3654	66.70
.787	.6250	3.9	50-1200	SDJCL 1010 H2	10-3616	74.00

See pg 328 for indexable insert accessories
See pgs 320-325 for tool set options

Indexable – Tool Holders

Facing & Turning – Radial – Right Hand – Style SCBCR



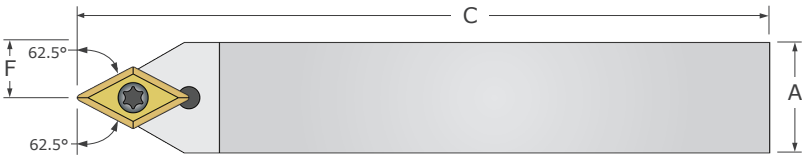


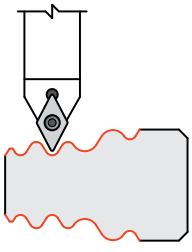
- Right hand 75° turning holder utilizing 100° unused right hand cutting edge of insert for turning and chamfering
- Made from precision ground heat treated steel
- Insert not included

Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	Price
.267	.3125	2.4	50-1100	SCBCR 0505 D2	10-3153	48.10
.330	.3750	2.8	50-1100	SCBCR 0606 E2	10-3155	54.10
.460	.5000	3.2	50-1100	SCBCR 0808 F2	10-3157	59.20

Indexable – Tool Holders

Profiling – Style SDNCN





- 55° indexable turning and profiling holder
- Neutral design allows for right and left hand turning and profiling applications
- Made from precision ground heat treated steel
- Insert not included

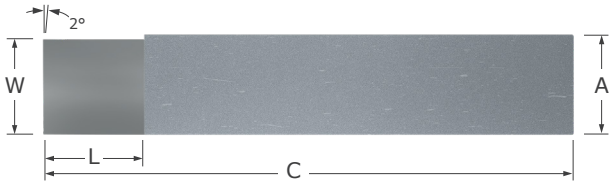
Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	Price
.157	.3125	3.9	50-1200	SDNCN 0505 H2	10-3761	54.10
.189	.3750	3.9	50-1200	SDNCN 0606 H2	10-3762	63.30
.250	.5000	3.9	50-1200	SDNCN 0808 H2	10-3763	66.70
.313	.6250	3.9	50-1200	SDNCN 1010 H2	10-3764	74.00

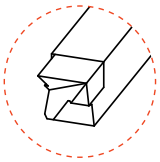
See pg 328 for indexable insert accessories
See pgs 320-325 for tool set options

BT

Brazed – Box Turning Tools

BT Style





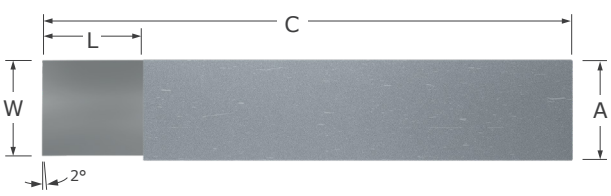
- Designed to be used for outside diameter (OD) turning with roller box turning attachments in automatic screw machines and turret lathes
- Ground to provide high metal removal rates improved finish and concentricity, when used in conjunction with a properly adjusted roller box turning attachment
- Solid carbide tipped with zinc coated hardened steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

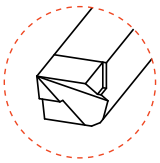
Width	Length	Square Shank	Overall Length	BT Style	
W +.040" −.000"	L	A +.0000" −.0100"	C	Tool #	Price
.200	.185	.2500	1.50	BT-4	34.40
.263	.185	.3125	1.75	BT-5	40.40
.325	.310	.3750	2.00	BT-6	36.40
.388	.310	.4375	2.25	BT-7	58.80
.450	.375	.5000	2.50	BT-8	39.70
.513	.375	.5625	2.75	BT-9	70.80
.575	.500	.6250	3.00	BT-10	61.50

BTL

Brazed – Box Turning Tools

BTL Style





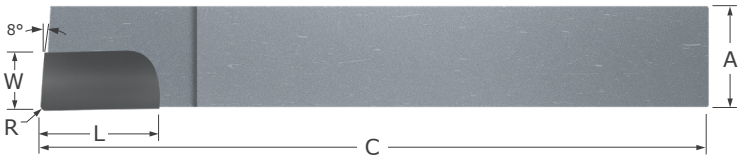
- Designed to be used for left hand outside diameter (OD) turning with roller box turning attachments in automatic screw machines and turret lathes
- Ground to provide high metal removal rates, improved finish, and concentricity when used in conjunction with a properly adjusted roller box turning attachment
- Solid carbide tipped with zinc coated hardened steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Length	Square Shank	Overall Length	BTL Style	
W +.040" −.000"	L	A +.0000" −.0100"	C	Tool #	Price
.200	.185	.2500	1.50	BTL-4	56.50
.263	.185	.3125	1.75	BTL-5	56.60
.325	.310	.3750	2.00	BTL-6	58.90
.388	.310	.4375	2.25	BTL-7	59.50
.450	.375	.5000	2.50	BTL-8	59.00
.513	.375	.5625	2.75	BTL-9	71.10
.575	.500	.6250	3.00	BTL-10	75.50

Brazed – Forming Tools

AR Style

AR



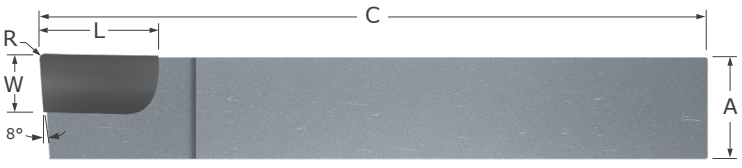
- Designed for right hand turning and facing in lathe applications
- Ground with side rake to provide a positive cutting action and better chip evacuation
- Corner radius profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Width	Length	Square Shank	Overall Length	AR Style	
R	W	L	A $^{+.0000"}_{-.0050"}$	C	Tool #	Price
.015	.170	.250	.2500	2.00	AR-4	21.05
.015	.233	.312	.3125	2.25	AR-5	22.25
.015	.240	.500	.3750	2.50	AR-6	12.40
.015	.233	.500	.4375	3.00	AR-7	23.05
.015	.235	.625	.5000	3.50	AR-8	14.50
.015	.360	.750	.6250	4.00	AR-10	24.00
.015	.420	.812	.7500	4.50	AR-12	33.50

Brazed – Forming Tools

AL Style

AL

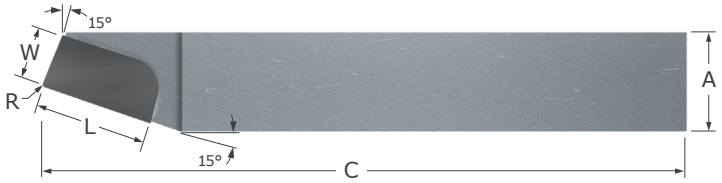


- Designed for left hand turning and facing on the outside diameter (OD) in lathe applications
- Ground with side rake to provide a positive cutting action and better chip evacuation
- Corner radius profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Width	Length	Square Shank	Overall Length	AL Style	
R	W	L	A $^{+.0000"}_{-.0050"}$	C	Tool #	Price
.015	.170	.250	.2500	2.00	AL-4	21.05
.015	.233	.312	.3125	2.25	AL-5	22.25
.015	.240	.500	.3750	2.50	AL-6	12.40
.015	.233	.500	.4375	3.00	AL-7	23.05
.015	.235	.625	.5000	3.50	AL-8	14.50
.015	.360	.750	.6250	4.00	AL-10	24.00
.015	.420	.812	.7500	4.50	AL-12	33.50

BR

Brazed – Forming Tools
BR Style

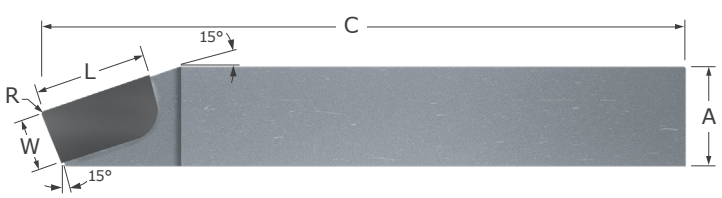


- Designed with a 15° side cutting edge angle for right hand turning in lathe applications
- Ground with side rake to provide a positive cutting action and better chip evacuation
- Side cutting edge angle allow for higher feed rates
- Corner radius profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Width	Length	Square Shank	Overall Length	BR Style	
R	W	L	A $^{+.0000"}_{-.0050"}$	C	Tool #	Price
.015	.250	.500	.3750	2.5	BR-6	14.00
.015	.250	.500	.4375	3.0	BR-7	17.10
.015	.250	.625	.5000	3.5	BR-8	14.20
.015	.375	.750	.6250	4.0	BR-10	25.30
.015	.438	.813	.7500	4.5	BR-12	35.10

BL

Brazed – Forming Tools
BL Style



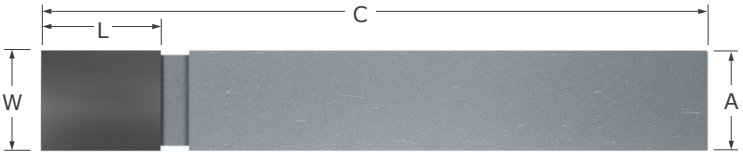
- Designed with a 15° side cutting edge angle for right hand turning in lathe applications
- Ground with side rake to provide a positive cutting action and better chip evacuation
- Side cutting edge angle allow for higher feed rates
- Corner radius profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Width	Length	Square Shank	Overall Length	BL Style	
R	W	L	A $^{+.0000"}_{-.0050"}$	C	Tool #	Price
.015	.250	.500	.3750	2.5	BL-6	14.10
.015	.250	.500	.4375	3.0	BL-7	17.30
.015	.250	.625	.5000	3.5	BL-8	16.20
.015	.375	.750	.6250	4.0	BL-10	25.30
.015	.438	.813	.7500	4.5	BL-12	40.20

Brazed – Forming Tools

C

C Style



- Neutral design allows for right and left hand modifications
- First choice when modifying or making specials
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Length	Square Shank	Overall Length	C Style	
W	L	A +.0000" −.0050"	C	Tool #	Price
.235	.250	.2500	6.00	C-250	31.90
.235	.250	.2500	2.00	C-4	12.00
.281	.375	.2812	6.00	C-281	48.30
.312	.375	.3125	6.00	C-312	26.80
.313	.375	.3125	2.25	C-5	13.50
.375	.500	.3750	2.50	C-6	13.80
.375	.500	.3750	6.00	C-375	22.30
.437	.500	.4375	6.00	C-437	40.20
.438	.500	.4375	3.00	C-7	19.90
.500	.500	.5000	3.50	C-8	17.10
.500	.500	.5000	6.00	C-500	27.30
.625	.625	.6250	4.00	C-10	29.70
.750	.750	.7500	4.00	C-750	58.30
.750	.750	.7500	4.50	C-12	35.70

Brazed

Brazed – Forming Tools

CRT

CRT Style – Full Radius (Concave)

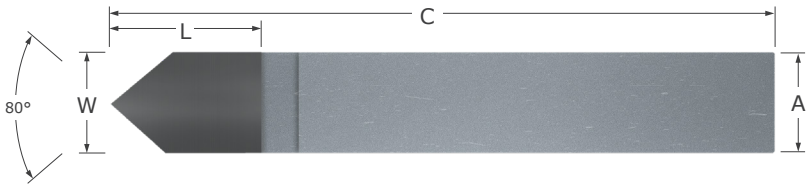
- Designed for forming a convex radius on the outside diameter (OD) of a part
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Width	Square Shank	Overall Length	CRT Style	
R +.0005" −.0005"	W +.004" −.004"	A +.0000" −.0050"	C	Tool #	Price
.0312	.067	.3750	2.5	CRT-1	52.40
.0625	.129	.3750	2.5	CRT-2	52.40
.0938	.192	.3750	2.5	CRT-3	52.40
.1250	.254	.5000	3.5	CRT-4	60.20
.1875	.379	.5000	3.5	CRT-6	64.80
.2500	.504	.7500	4.5	CRT-8	94.60

D

Brazed – Forming Tools

D Style



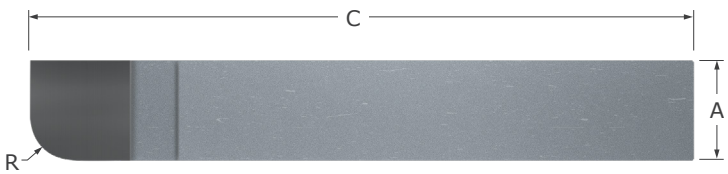
- Designed as a multi-functional tool for a manual lathe
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Length	Square Shank	Overall Length	D Style	
W	L	A $^{+.0000"}_{-.0030"}$	C	Tool #	Price
.2500	.313	.2500	2.00	D-4	11.30
.3125	.375	.3125	2.25	D-5	14.60
.3750	.500	.3750	2.50	D-6	26.05
.4375	.500	.4375	3.00	D-7	17.50
.5000	.500	.5000	3.50	D-8	13.70
.6250	.625	.6250	4.00	D-10	24.40
.7500	.725	.7500	4.50	D-12	32.50

RXD

Brazed – Forming Tools

90° Radius Convex – Right Hand



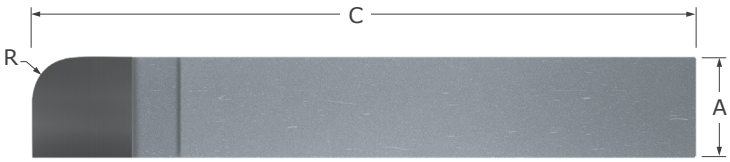
- Designed for forming a concave radius
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Square Shank	Overall Length	Brazed	
R $^{+.0005"}_{-.0005"}$	A $^{+.0000"}_{-.0050"}$	C	Tool #	Price
.0312	.3750	2.5	RXD-1	51.70
.0625	.3750	2.5	RXD-2	51.70
.0938	.3750	2.5	RXD-3	51.70
.1250	.3750	2.5	RXD-4	51.70
.1562	.3750	2.5	RXD-5	51.70
.1875	.3750	2.5	RXD-6	51.70
.2188	.3750	2.5	RXD-7	51.70
.2500	.3750	2.5	RXD-8	51.70
.2812	.5000	3.5	RXD-9	56.30
.4062	.7500	4.5	RXD-13	63.40
.4688	.7500	4.5	RXD-15	63.40
.5000	.7500	4.5	RXD-16	63.40

Brazed – Forming Tools

90° Radius Convex – Left Hand

RXL



- Designed for forming a concave radius
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Square Shank	Overall Length	Brazed	
R $^{+.0005"}_{-.0005"}$	A $^{+.0000"}_{-.0050"}$	C	Tool #	Price
.0312	.3750	2.5	RXL-1	51.70
.0625	.3750	2.5	RXL-2	51.69
.0938	.3750	2.5	RXL-3	51.70
.1562	.3750	2.5	RXL-5	51.70
.2188	.3750	2.5	RXL-7	51.70
.2812	.5000	3.5	RXL-9	56.29
.3125	.5000	3.5	RXL-10	64.60
.3438	.5000	3.5	RXL-11	64.60
.4062	.7500	4.5	RXL-13	63.40
.4688	.7500	4.5	RXL-15	63.40
.5000	.7500	4.5	RXL-16	63.40

RAD

Brazed – Forming Tools

90° Radius Concave – Right Hand

- Right hand tool designed for forming a convex radius
- Tangential 5° blend angles aid in providing a burr-free transition
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Square Shank	Overall Length	Brazed	
R $^{+.0005"}_{-.0005"}$	A $^{+.0000"}_{-.0050"}$	C	Tool #	Price
.0312	.3750	2.5	RAD-1	51.70
.0625	.3750	2.5	RAD-2	51.70
.0938	.3750	2.5	RAD-3	51.70
.1250	.3750	2.5	RAD-4	51.70
.1562	.3750	2.5	RAD-5	51.70
.1875	.3750	2.5	RAD-6	51.70
.2188	.3750	2.5	RAD-7	51.70
.2500	.3750	2.5	RAD-8	51.70
.2812	.5000	3.5	RAD-9	56.30
.3125	.5000	3.5	RAD-10	56.30
.3438	.5000	3.5	RAD-11	56.30
.3750	.5000	3.5	RAD-12	56.30
.4062	.7500	4.5	RAD-13	63.40
.4375	.7500	4.5	RAD-14	63.40
.4688	.7500	4.5	RAD-15	63.40
.5000	.7500	4.5	RAD-16	63.40

See pg 319 for tool set options

Brazed – Forming Tools

90° Radius Concave – Left Hand

RAL

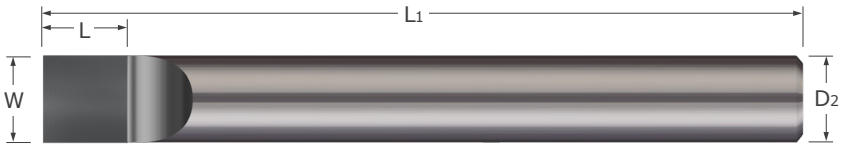
- Left hand tool designed for forming a convex radius
- Tangential 5° blend angles
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

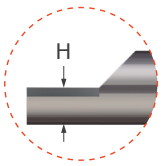
Radius	Square Shank	Overall Length	Brazed	
$R^{+.0005"}_{-.0005"}$	$A^{+.0000"}_{-.0050"}$	C	Tool #	Price
.0312	.3750	2.5	RAL-1	51.70
.0625	.3750	2.5	RAL-2	51.70
.0938	.3750	2.5	RAL-3	51.70
.1250	.3750	2.5	RAL-4	51.70
.1562	.3750	2.5	RAL-5	51.70
.1875	.3750	2.5	RAL-6	51.70
.2188	.3750	2.5	RAL-7	51.70
.2500	.3750	2.5	RAL-8	51.70
.2812	.5000	3.5	RAL-9	56.30
.3125	.5000	3.5	RAL-10	56.30
.3438	.5000	3.5	RAL-11	56.30
.3750	.5000	3.5	RAL-12	56.30
.4062	.7500	4.5	RAL-13	63.40
.4375	.7500	4.5	RAL-14	63.40
.4688	.7500	4.5	RAL-15	63.40
.5000	.7500	4.5	RAL-16	63.40

TRG

Brazed – Forming Tools

Round Shank





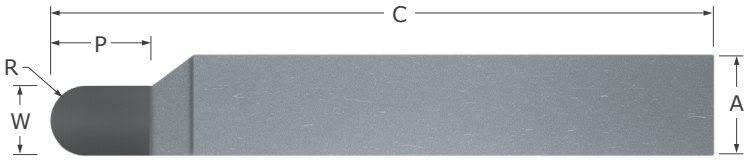
- Carbide tipped design allows for modification into a round shank special
- Carbide is mounted .031" above centerline to allow for grinding
- Neutral design allows for right and left hand modifications
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Length	Split Height	Shank Diameter	Overall Length	Brazed	
W +.0000" −.0050"	L +.031" −.031"	H +.000" −.010"	D2 +.0000" −.0030"	L1	Tool #	Price
.2500	.253	.156	.2500	2.5	TRG-4	29.00
.3125	.375	.187	.3125	3.0	TRG-5	30.90
.3750	.500	.219	.3750	3.5	TRG-6	33.50
.4375	.500	.250	.4375	4.0	TRG-7	36.40
.5000	.500	.281	.5000	5.0	TRG-8	36.40
.6250	.625	.344	.6250	6.0	TRG-10	45.70

FRT

Brazed – Grooving Tools

FRT Style – Full Radius (Convex)



- Designed for generating a concave radius on the outside diameter (OD) of a part
- Available in industry standard shank sizes
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Ground in the USA

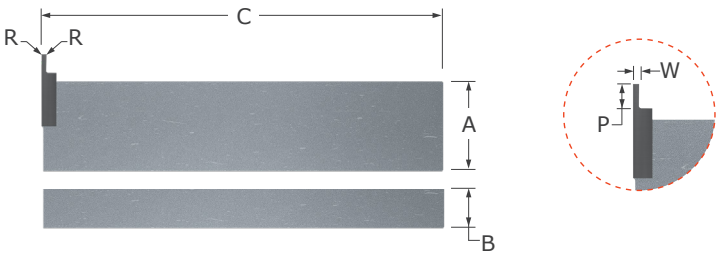
Radius	Width	Projection	Square Shank	Overall Length	Brazed	
R +.0005" −.0005"	W +.001" −.001"	P +.015" −.015"	A +.0000" −.0050"	C	Tool #	Price
.0312	.063	1.000	.3750	2.5	FRT-1	54.90

R +.0005" −.0005"	W +.001" −.001"	P +.031" −.031"	A +.0000" −.0050"	C	Tool #	Price
.0625	.125	.375	.3750	2.5	FRT-2	54.90
.0938	.188	.375	.3750	2.5	FRT-3	54.90
.1250	.250	.375	.3750	2.5	FRT-4	54.90
.1563	.313	.375	.3750	2.5	FRT-5	54.90
.1875	.375	.500	.5000	3.5	FRT-6	67.90
.2500	.500	.500	.5000	3.5	FRT-8	67.90
.3125	.625	.625	.6250	4.0	FRT-10	90.30
.3750	.750	.750	.7500	4.5	FRT-12	99.10

Brazed – Grooving Tools

GR Style – Square

GR



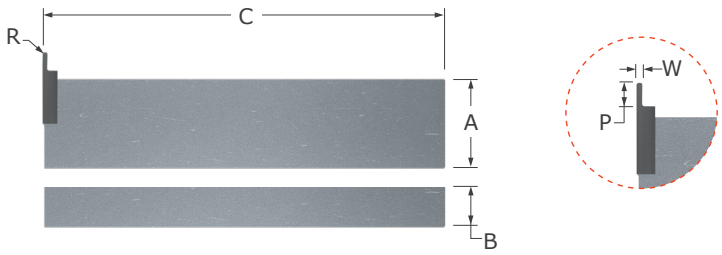
- Designed for plunging outside diameter (OD) grooves when the tool is held parallel to the axis
- Square profile with .003" corner radius for added strength
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Projection	Radius	Shank Width	Shank Height	Overall Length	GR Style	
W +.002" −.000"	P +.000" −.030"	R (max)	A +.0000" −.0050"	B +.0000" −.0050"	C	Tool #	Price
.012	.030	.003	.7500	.3750	4.0	GR-012002	48.00
.018	.060	.003	.7500	.3750	4.0	GR-018002	48.00
.022	.090	.003	.7500	.3750	4.0	GR-022002	48.00
.028	.090	.003	.7500	.3750	4.0	GR-028002	48.00
.038	.120	.003	.7500	.3750	4.0	GR-038002	48.00
.040	.150	.003	.7500	.3750	4.0	GR-040002	48.00
.046	.150	.003	.7500	.3750	4.0	GR-046002	48.00
.054	.180	.003	.7500	.3750	4.0	GR-054002	48.00
.060	.210	.003	.7500	.3750	4.0	GR-060002	48.00
.072	.240	.003	.7500	.3750	4.0	GR-072002	48.00
.080	.270	.003	.7500	.3750	4.0	GR-080002	48.00
.086	.270	.003	.7500	.3750	4.0	GR-086002	48.00
.090	.300	.003	.7500	.3750	4.0	GR-090002	48.00
.096	.300	.003	.7500	.3750	4.0	GR-096002	48.00
.102	.400	.003	.7500	.3750	4.0	GR-102002	48.00
.114	.400	.003	.7500	.3750	4.0	GR-114002	48.00
.120	.400	.003	.7500	.3750	4.0	GR-120002	48.00
.122	.400	.003	.7500	.3750	4.0	GR-122002	48.00

GR-F

Brazed – Grooving Tools

GR Style – Full Radius



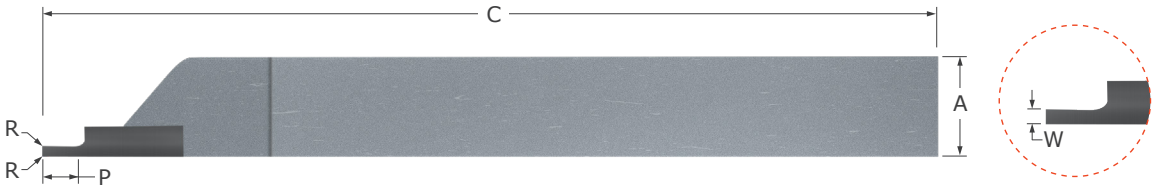
- Designed for plunging full radius outside diameter (OD) grooves when the tool is held parallel to the axis
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Width	Projection	Shank Width	Shank Height	Overall Length	GR-F Style	
R +.001" −.000"	W +.002" −.000"	P +.000" −.030"	A +.0000" −.0050"	B +.0000" −.0050"	C	Tool #	Price
.006	.012	.030	.7500	.3750	4.0	GR-012F	50.10
.009	.018	.060	.7500	.3750	4.0	GR-018F	50.10
.011	.022	.090	.7500	.3750	4.0	GR-022F	50.10
.019	.038	.120	.7500	.3750	4.0	GR-038F	50.10
.027	.054	.180	.7500	.3750	4.0	GR-054F	50.10
.030	.060	.210	.7500	.3750	4.0	GR-060F	50.10
.034	.068	.210	.7500	.3750	4.0	GR-068F	50.10
.036	.072	.240	.7500	.3750	4.0	GR-072F	50.10
.040	.080	.270	.7500	.3750	4.0	GR-080F	50.10
.043	.086	.270	.7500	.3750	4.0	GR-086F	50.10
.045	.090	.300	.7500	.3750	4.0	GR-090F	50.10
.048	.096	.300	.7500	.3750	4.0	GR-096F	50.10
.057	.114	.400	.7500	.3750	4.0	GR-114F	50.10
.060	.120	.400	.7500	.3750	4.0	GR-120F	50.10
.061	.122	.400	.7500	.3750	4.0	GR-122F	50.10

Brazed – Grooving Tools

GS Style – Square

GS



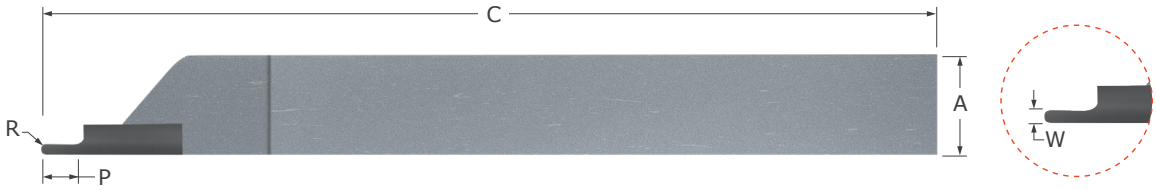
- Designed for plunging grooves when on the outside diameter of a part
- Square profile with .003" corner radius for added strength
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Projection	Radius	Square Shank	Overall Length	GS Style	
W +.002" −.000"	P +.000" −.030"	R (max)	A +.0000" −.0050"	C	Tool #	Price
.012	.030	.003	.3750	3.0	GS-012002	39.00
.018	.060	.003	.3750	3.0	GS-018002	39.00
.022	.090	.003	.3750	3.0	GS-022002	39.00
.028	.090	.003	.3750	3.0	GS-028002	39.00
.038	.120	.003	.3750	3.0	GS-038002	39.00
.040	.150	.003	.3750	3.0	GS-040002	39.00
.046	.150	.003	.3750	3.0	GS-046002	39.00
.054	.180	.003	.3750	3.0	GS-054002	39.00
.060	.210	.003	.3750	3.0	GS-060002	39.00
.068	.210	.003	.3750	3.0	GS-068002	39.00
.072	.240	.003	.3750	3.0	GS-072002	39.00
.080	.270	.003	.3750	3.0	GS-080002	39.00
.086	.270	.003	.3750	3.0	GS-086002	39.00
.090	.300	.003	.3750	3.0	GS-090002	39.00
.096	.300	.003	.3750	3.0	GS-096002	39.00
.102	.400	.003	.3750	3.0	GS-102002	39.00
.114	.400	.003	.3750	3.0	GS-114002	39.00
.120	.400	.003	.3750	3.0	GS-120002	39.00
.122	.400	.003	.3750	3.0	GS-122002	39.00

GS-F

Brazed – Grooving Tools

GS Style – Full Radius



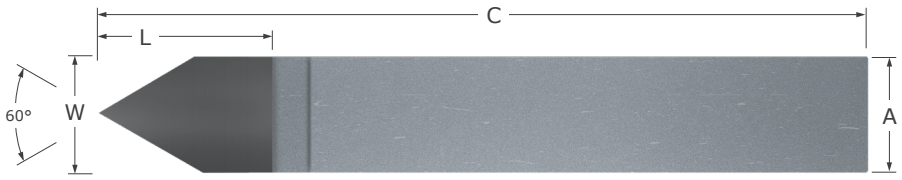
- Designed for generating full radius outside diameter (OD) grooves
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Width	Projection	Square Shank	Overall Length	GS-F Style	
R +.001" −.000"	W +.002" −.000"	P +.000" −.030"	A +.0000" −.0050"	C	Tool #	Price
.006	.012	.030	.3750	3.0	GS-012F	43.10
.009	.018	.060	.3750	3.0	GS-018F	43.10
.011	.022	.090	.3750	3.0	GS-022F	43.10
.014	.028	.090	.3750	3.0	GS-028F	43.10
.019	.038	.120	.3750	3.0	GS-038F	43.10
.020	.040	.150	.3750	3.0	GS-040F	43.10
.023	.046	.150	.3750	3.0	GS-046F	43.10
.027	.054	.180	.3750	3.0	GS-054F	43.10
.030	.060	.210	.3750	3.0	GS-060F	43.10
.034	.068	.210	.3750	3.0	GS-068F	43.10
.036	.072	.240	.3750	3.0	GS-072F	43.10
.040	.080	.270	.3750	3.0	GS-080F	43.10
.045	.090	.300	.3750	3.0	GS-090F	43.10
.048	.096	.300	.3750	3.0	GS-096F	43.10
.060	.120	.400	.3750	3.0	GS-120F	43.10

Brazed – Threading Tools

E

E Style



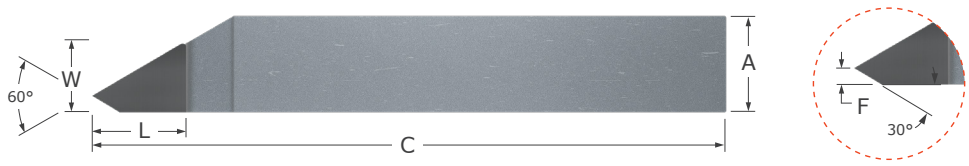
- Designed for outside diameter (OD) general purpose threading
- Neutral design allows for right and left hand threading applications
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Length	Square Shank	Overall Length	E Style	
W	L	A $^{+.0000"}_{-.0050"}$	C	Tool #	Price
.3125	.363	.3125	2.25	E-5	15.70
.3750	.568	.3750	2.50	E-6	12.40
.5000	.568	.5000	3.50	E-8	13.50
.6250	.653	.6250	4.00	E-10	24.80
.7500	.778	.7500	4.50	E-12	28.70

Brazed – Threading Tools

ER

ER Style



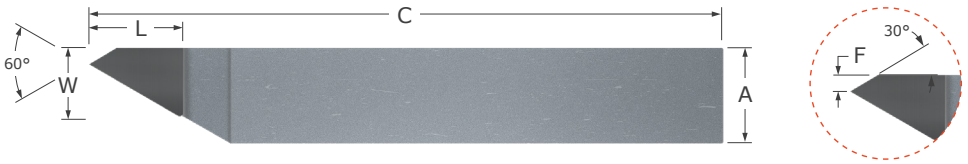
- Designed for right hand threading on the outside diameter (OD), close to a shoulder
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Point Offset	Width	Length	Square Shank	Overall Length	ER Style	
F $^{+.010"}_{-.010"}$	W	L	A $^{+.0000"}_{-.0050"}$	C	Tool #	Price
.063	.266	.360	.3750	2.50	ER-6	14.20
.063	.270	.360	.3125	2.25	ER-5	14.80
.094	.444	.610	.6250	4.00	ER-10	23.80
.094	.446	.610	.5000	3.50	ER-8	16.90
.125	.558	.750	.7500	4.50	ER-12	36.70

EL

Brazed – Threading Tools

EL Style



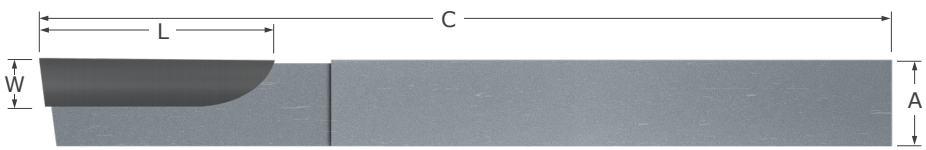
- Designed for left hand threading on the outside diameter (OD), close to a shoulder
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Point Offset	Width	Length	Square Shank	Overall Length	EL Style	
$F^{+.010"}_{-.010"}$	W	L	$A^{+.0000"}_{-.0050"}$	C	Tool #	Price
.063	.266	.360	.3750	2.50	EL-6	14.90
.063	.270	.360	.3125	2.25	EL-5	14.70
.094	.444	.610	.6250	4.00	EL-10	23.80
.094	.446	.610	.5000	3.50	EL-8	17.70
.125	.558	.750	.7500	4.50	EL-12	39.90

RT / LT

Brazed – Screw Machining Tools

Turning



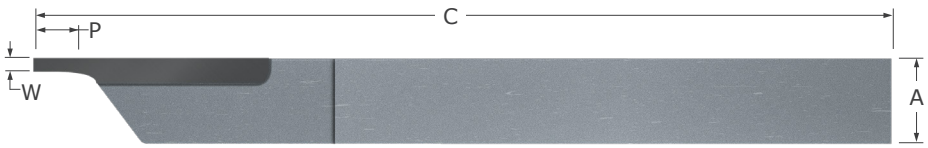
- Designed for general purpose turning; RT for right hand and LT for left hand
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Length	Square Shank	Overall Length	Right Hand		Left Hand	
W	L	$A^{+.0000"}_{-.0050"}$	C	Tool #	Price	Tool #	Price
.128	1.075	.2500	6.0	RT-250	48.90	LT-250	46.50
.174	1.200	.2812	6.0	RT-281	48.90	LT-281	42.90
.188	1.200	.3750	6.0	RT-375	19.00	LT-375	37.90
.190	1.200	.3125	6.0	RT-312	36.70	LT-312	18.20
.253	1.345	.5000	6.0	RT-500	24.60	LT-500	30.50
.260	1.345	.4375	6.0	RT-437	44.50	LT-437	39.60
.263	1.345	.6250	4.0	RT-625	43.90	LT-625	42.00
.263	1.345	.7500	4.0	RT-750	47.70	LT-750	46.20

Brazed – Screw Machine Tools

Cut Off

RC / LC



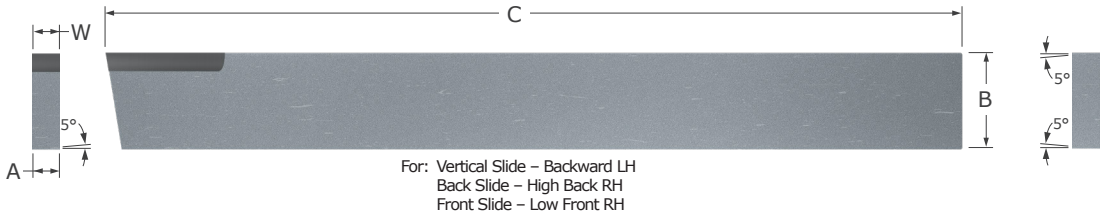
- Designed for cut off applications; RC for right hand and LC for left hand
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Projection	Square Shank	Overall Length	Right Hand		Left Hand	
W +.000" −.005"	P (min)	A +.0000" −.0050"	C	Tool #	Price	Tool #	Price
.040	.120	.2500	6.0	RC-250040	51.00	LC-250040	50.20
.040	.120	.2812	6.0	RC-281040	51.60	LC-281040	52.60
.040	.120	.3125	6.0	RC-312040	33.30	LC-312040	36.60
.040	.120	.3750	6.0	RC-375040	20.60	LC-375040	37.60
.060	.180	.2500	6.0	RC-250060	51.20	LC-250060	29.50
.060	.180	.2812	6.0	RC-281060	51.60	LC-281060	52.60
.060	.180	.3125	6.0	RC-312060	22.50	LC-312060	23.20
.060	.180	.3750	6.0	RC-375060	19.70	LC-375060	24.80
.060	.180	.4375	6.0	RC-437060	39.80	LC-437060	38.40
.060	.180	.5000	6.0	RC-500060	24.30	LC-500060	24.50
.060	.180	.6250	4.0	RC-625060	31.90	LC-625060	38.00
.060	.180	.7500	4.0	RC-750060	44.70	LC-750060	44.70
.080	.240	.2812	6.0	RC-281080	51.20	LC-281080	36.90
.080	.240	.3125	6.0	RC-312080	30.80	LC-312080	20.50
.080	.240	.3750	6.0	RC-375080	19.70	LC-375080	29.30
.080	.240	.4375	6.0	RC-437080	39.80	LC-437080	42.60
.080	.240	.5000	6.0	RC-500080	24.40	LC-500080	24.60
.080	.240	.6250	4.0	RC-625080	33.80	LC-625080	40.80
.080	.240	.7500	4.0	RC-750080	45.00	LC-750080	47.40
.100	.300	.2812	6.0	RC-281100	51.60	LC-281100	26.80
.100	.300	.3125	6.0	RC-312100	35.90	LC-312100	20.50
.100	.300	.3750	6.0	RC-375100	20.20	LC-375100	27.00
.100	.300	.4375	6.0	RC-437100	40.30	LC-437100	45.40
.100	.300	.5000	6.0	RC-500100	24.40	LC-500100	25.40
.100	.300	.6250	4.0	RC-625100	32.40	LC-625100	33.80
.100	.300	.7500	4.0	RC-750100	37.90	LC-750100	46.90
.120	.360	.3750	6.0	RC-375120	22.40	LC-375120	33.80
.120	.360	.4375	6.0	RC-437120	40.30	LC-437120	39.40
.120	.360	.5000	6.0	RC-500120	24.00	LC-500120	26.20
.125	.375	.6250	4.0	RC-625125	32.40	LC-625125	42.40
.125	.375	.7500	4.0	RC-750125	39.30	LC-750125	47.10
.187	.561	.6250	4.0	RC-625187	42.30	LC-625187	42.30
.187	.561	.7500	4.0	RC-750187	47.40	LC-750187	47.60

CR

Brazed – Cut Off Tools

CR Style



For: Vertical Slide – Backward LH
Back Slide – High Back RH
Front Slide – Low Front RH

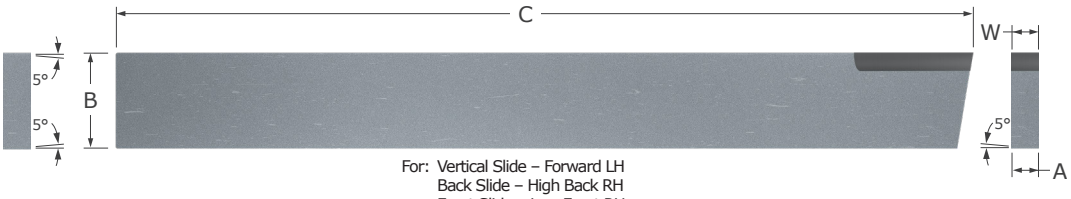
- Right hand cut-off blades for Brown & Sharpe automatic screw machines
- Designed for use in Pratt & Whitney holders and dovetail slot holders
- Carbide tipped with hardened and precision ground steel blade
- Ground in the USA

Width	Shank Width	Shank Height	Overall Length	CR Style	
W +.0000" −.0050"	A +.0000" −.0050"	B +.0000" −.0050"	C	Tool #	Price
.0781	.0580	.5000	4.5	CR-101	79.20
.0938	.0730	.5000	4.5	CR-102	62.10
.0938	.0730	.6875	5.0	CR-104	87.90
.0938	.0730	.8125	6.0	CR-108	98.70
.0938	.0730	1.0000	6.0	CR-113	126.60
.1250	.1050	.5000	4.5	CR-103	60.20
.1250	.1050	.6875	5.0	CR-105	83.30
.1250	.1050	.8125	6.0	CR-109	72.90
.1562	.1360	.6875	5.0	CR-106	88.00
.1562	.1360	.8125	6.0	CR-110	142.50
.1875	.1670	.6875	5.0	CR-107	91.80
.1875	.1670	.8125	6.0	CR-111	143.40

Brazed – Cut Off Tools

CL Style

CL



For: Vertical Slide – Forward LH
Back Slide – High Back RH
Front Slide – Low Front RH

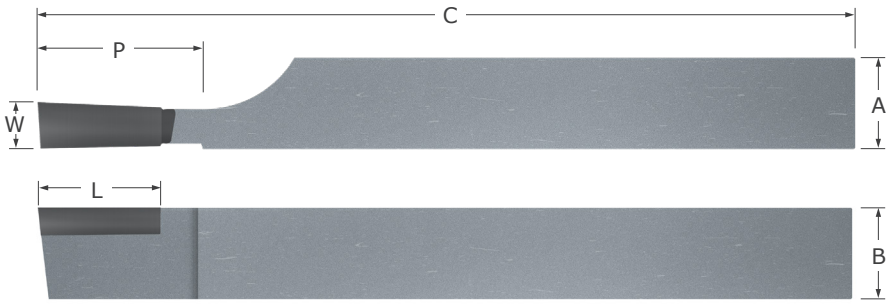
- Left hand cut-off blades for Brown & Sharpe automatic screw machines
- Designed for use in Pratt & Whitney holders and dovetail slot holders
- Carbide tipped with hardened and precision ground steel blade
- Ground in the USA

Width	Shank Width	Shank Height	Overall Length	CL Style	
W +.0000" −.0050"	A +.0000" −.0050"	B +.0000" −.0050"	C	Tool #	Price
.0781	.0580	.5000	4.5	CL-101	79.50
.0938	.0730	.5000	4.5	CL-102	80.30
.0938	.0730	.6875	5.0	CL-104	93.60
.0938	.0730	.8125	6.0	CL-108	107.70
.0938	.0730	1.0000	6.0	CL-113	93.10
.1250	.1050	.5000	4.5	CL-103	82.20
.1250	.1050	.6875	5.0	CL-105	101.40
.1250	.1050	.8125	6.0	CL-109	102.70
.1562	.1360	.6875	5.0	CL-106	97.00
.1562	.1360	.8125	6.0	CL-110	135.10
.1875	.1670	.6875	5.0	CL-107	100.69
.1875	.1670	.8125	6.0	CL-111	93.10

CT

Brazed – Cut Off Tools

CT Style



- Designed for cut-off with a 5° front clearance to reduce cut-off burr
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Projection	Length	Shank Width	Shank Height	Overall Length	CT Style	
W $^{+.000"}_{-.005"}$	P $^{+.062"}_{-.000"}$	L	A $^{+.0000"}_{-.0100"}$	B $^{+.0000"}_{-.0100"}$	C	Tool #	Price
.187	.813	.750	.5000	1.0000	5.0	CT-122	31.80
.250	1.000	.750	.5000	1.0000	5.0	CT-121	35.40
.312	1.000	.500	.5000	1.0000	5.0	CT-120	46.10
.375	1.250	.500	.6250	1.2500	5.0	CT-130	47.00
.375	1.250	.625	.7500	1.5000	6.0	CT-140	51.20

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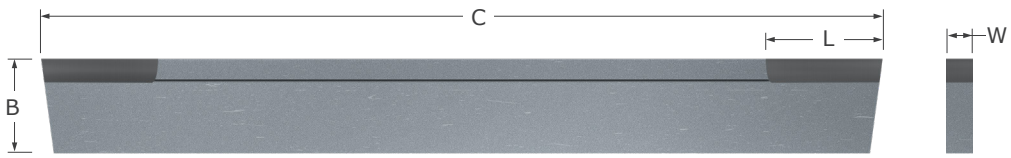
Brazed – Cut Off Tools

T Style – Regular



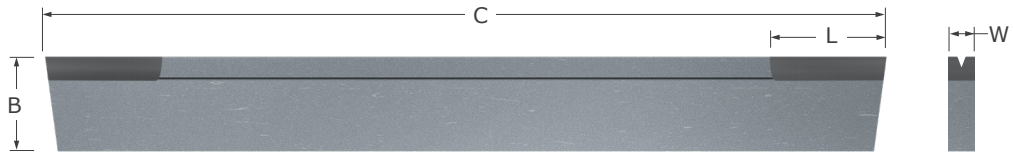
- Double end " T" style cut-off tool that is parallel ground to help achieve a straighter cut
- Tops are hollow ground to help curl the chip to center for better evacuation
- Carbide tipped with hardened and precision ground steel blade
- Ground in the USA

Width	Length	Shank Height	Overall Length	T Style	
W $^{+.001"}_{-.001"}$	L	B	C	Tool #	Price
.062	.750	.5000	4.5	T-100	78.50
.078	.750	.5000	4.5	T-101	79.70
.093	.750	.5000	4.5	T-102	76.30
.093	.750	.6875	5.0	T-104	84.50
.125	.750	.5000	4.5	T-103	75.30
.125	.750	.6875	5.0	T-105	83.50
.125	.750	.7500	5.0	T-108	86.40
.125	.750	.8750	6.0	T-111	95.00
.156	.750	.6875	5.0	T-106	102.50
.156	.750	.7500	5.0	T-109	91.10
.156	.750	.8750	6.0	T-112	94.80
.187	.750	.6875	5.0	T-107	105.80
.187	.750	.7500	5.0	T-110	85.00
.187	.750	.8750	6.0	T-113	110.80
.187	.750	1.1250	6.0	T-116	114.70

T-V

Brazed – Cut Off Tools

T Style – V-Groove



- Double ended "T" style cut-off tool that is parallel ground to help achieve a straighter cut
- Tops are hollow ground to help curl the chip to center for better evacuation
- Additional V-groove ground into the top of the tool forces the chip into a " W" form to pull the chip to center resulting in better surface finish and chip evacuation
- Carbide tipped with hardened and precision ground steel blade
- Ground in the USA

Width	Length	Shank Height	Overall Length	Brazed Style	
W +.001" −.001"	L	B	C	Tool #	Price
.062	.760	.5000	4.5	T-100-V	81.70
.078	.760	.5000	4.5	T-101-V	82.90
.093	.760	.5000	4.5	T-102-V	79.50
.093	.760	.6875	5.0	T-104-V	87.60
.125	.750	.5000	4.5	T-103-V	78.50
.125	.760	.6875	5.0	T-105-V	86.60
.125	.750	.7500	5.0	T-108-V	89.50
.125	.750	.8750	6.0	T-111-V	98.10
.156	.750	.6875	5.0	T-106-V	105.60
.156	.750	.7500	5.0	T-109-V	94.20
.156	.750	.8750	6.0	T-112-V	98.00
.187	.750	.6875	5.0	T-107-V	108.90
.187	.750	.7500	5.0	T-110-V	88.10
.187	.750	.8750	6.0	T-113-V	113.90
.187	.750	1.1250	6.0	T-116-V	117.90

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HOLEMAKING & THREADING TOOLS

Drills 220

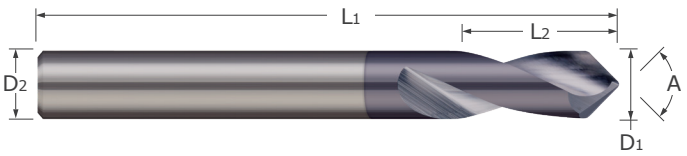
Combined Drill & Countersink 225

Thread Mill Cutters 226

Drills

Spotting & Centering Drill

SPD



- Optimized for spotting and chamfering applications
- Available in 82°, 90°, 100°, 120°, and 140° included point angles
- Can be utilized for countersinking and chamfering existing holes
- Maximum drill depth not to exceed included angle
- Solid carbide
- CNC ground in the USA
- 2 flutes

Included Angle	Drill Diameter	Flute Length	Shank Diameter	Overall Length	Uncoated		AlTiN	
A $^{+1°}_{-1°}$	D_1 $^{+.0000"}_{-.0005"}$	L_2 $^{+.031"}_{-.031"}$	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
82°	.0937	.279	.1250	1.5	SPD-093-082	25.50	SPD-093-082X	29.90
	.1250	.375	.1250	1.5	SPD-125-082	25.50	SPD-125-082X	29.90
	.1875	.625	.1875	2.0	SPD-187-082	26.70	SPD-187-082X	31.60
	.2500	.750	.2500	2.5	SPD-250-082	27.50	SPD-250-082X	34.25
	.3125	.750	.3125	2.5	SPD-312-082	32.10	SPD-312-082X	40.15
	.3750	1.000	.3750	2.5	SPD-375-082	40.40	SPD-375-082X	49.95
	.5000	1.000	.5000	2.5	SPD-500-082	60.20	SPD-500-082X	73.15
	.6250	1.125	.6250	3.0	SPD1-625-082	107.40	SPD1-625-082X	121.70
	.7500	1.125	.7500	2.5	SPD-750-082	161.40		
	.7500	1.125	.7500	3.0	SPD1-750-082	162.90	SPD1-750-082X	179.90
90°	.0937	.279	.1250	1.5	SPD-093-090	25.50	SPD-093-090X	29.90
	.1250	.375	.1250	1.5	SPD-125-090	25.50	SPD-125-090X	29.90
	.1875	.625	.1875	2.0	SPD-187-090	26.70	SPD-187-090X	31.60
	.2500	.750	.2500	2.5	SPD-250-090	27.50	SPD-250-090X	34.25
	.3125	.750	.3125	2.5	SPD-312-090	32.10	SPD-312-090X	40.15
	.3750	1.000	.3750	2.5	SPD-375-090	40.40	SPD-375-090X	49.95
	.5000	1.000	.5000	2.5	SPD-500-090	60.20	SPD-500-090X	73.15
	.6250	1.125	.6250	3.0	SPD1-625-090	107.40	SPD1-625-090X	121.70
	.7500	1.125	.7500	2.5	SPD-750-090	161.40		
	.7500	1.125	.7500	3.0	SPD1-750-090	162.90	SPD1-750-090X	179.90
	1.0000	1.250	1.0000	2.5	SPD-001-090	244.60		
	1.0000	1.250	1.0000	3.0	SPD1-001-090	247.00		
100°	.0937	.279	.1250	1.5	SPD-093-100	25.50	SPD-093-100X	29.90
	.1250	.375	.1250	1.5	SPD-125-100	25.50	SPD-125-100X	29.90
	.1875	.625	.1875	2.0	SPD-187-100	26.70	SPD-187-100X	31.60
	.2500	.750	.2500	2.5	SPD-250-100	27.50	SPD-250-100X	34.25
	.3125	.750	.3125	2.5	SPD-312-100	32.10	SPD-312-100X	40.15
	.3750	1.000	.3750	2.5	SPD-375-100	40.40	SPD-375-100X	49.95
	.5000	1.000	.5000	2.5	SPD-500-100	60.20	SPD-500-100X	73.15
	.6250	1.125	.6250	2.5	SPD-625-100	106.40		
	.6250	1.125	.6250	3.0	SPD1-625-100	107.40	SPD1-625-100X	121.70
	.7500	1.125	.7500	3.0	SPD1-750-100	162.90	SPD1-750-100X	179.90
	1.0000	1.250	1.0000	3.0	SPD1-001-100	247.00		

Continued on next page

SPD

Drills

Spotting & Centering Drill (cont.)

Continued from previous page

Included Angle	Drill Diameter	Flute Length	Shank Diameter	Overall Length	Uncoated		AlTiN	
A $^{+1°}_{-1°}$	D_1 $^{+.0000"}_{-.0005"}$	L_2 $^{+.031"}_{-.031"}$	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
120°	.0937	.279	.1250	1.5	SPD-093-120	25.50	SPD-093-120X	29.90
	.1250	.375	.1250	1.5	SPD-125-120	25.50	SPD-125-120X	29.90
	.1875	.625	.1875	2.0	SPD-187-120	26.70	SPD-187-120X	31.60
	.2500	.750	.2500	2.5	SPD-250-120	27.50	SPD-250-120X	34.25
	.3125	.750	.3125	2.5	SPD-312-120	32.10	SPD-312-120X	40.15
	.3750	1.000	.3750	2.5	SPD-375-120	40.40	SPD-375-120X	49.95
	.5000	1.000	.5000	2.5	SPD-500-120	60.20	SPD-500-120X	73.15
	.6250	1.125	.6250	3.0	SPD1-625-120	107.40	SPD1-625-120X	121.70
	.7500	1.125	.7500	2.5	SPD-750-120	161.40		
	.7500	1.125	.7500	3.0	SPD1-750-120	162.90	SPD1-750-120X	179.90
140°	.0937	.279	.1250	1.5	SPD-093-140	25.50	SPD-093-140X	29.90
	.1250	.375	.1250	1.5	SPD-125-140	25.50	SPD-125-140X	29.90
	.1875	.625	.1875	2.0	SPD-187-140	26.70	SPD-187-140X	31.60
	.2500	.750	.2500	2.5	SPD-250-140	27.80	SPD-250-140X	34.10
	.3125	.750	.3125	2.5	SPD-312-140	32.40	SPD-312-140X	40.00
	.3750	1.000	.3750	2.5	SPD-375-140	40.80	SPD-375-140X	49.80
	.5000	1.000	.5000	2.5	SPD-500-140	60.70	SPD-500-140X	73.00

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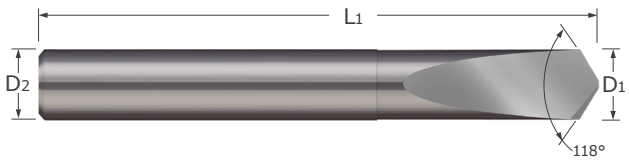
Drills

Spade Drill

SD

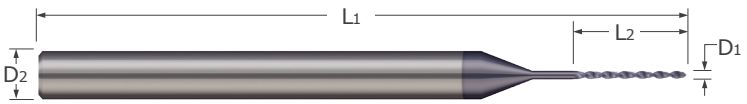


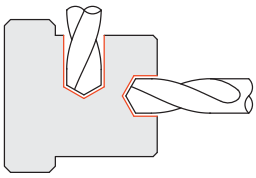
- Designed for drilling in hardened materials
- Excellent option when requiring holes free of retract marks in non-ferrous materials
- Solid carbide
- CNC ground in the USA

Drill Diameter	Web Thickness	Shank Diameter	Overall Length	Uncoated	
D_1 $^{+.0000''}_{-.0005''}$	$^{+.002''}_{-.002''}$	D_2 (h6)	L_1	Tool #	Price
.0312	.010	.0312	1.25	SD-031	15.50
.0625	.012	.0625	1.50	SD-062	16.10
.0937	.016	.0938	1.50	SD-093	16.50
.1250	.020	.1250	1.50	SD-125	18.10
.1562	.025	.1562	2.00	SD-156	19.80
.1875	.028	.1875	2.00	SD-187	23.10
.2188	.030	.2188	2.00	SD-218	27.10
.2500	.035	.2500	2.00	SD-250	31.10
.3125	.040	.3125	2.50	SD-312	43.00
.3750	.046	.3750	2.50	SD-375	51.80
.4375	.050	.4375	2.50	SD-437	59.40
.5000	.060	.5000	2.50	SD-500	72.50

DR

Drills
Miniature





- 1/8" common shank for ease of use in Taper Integrated Holders
- For tools .020" and smaller, there is an intermediate neck diameter as pictured
- 130° drill point
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC Ground in Germany

Drill Diameter inch	Drill Diameter wire	Drill Diameter metric	Flute Length	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" ** −.0003"			L_2	D_2	L_1	Tool #	Price	Tool #	Price
.0039	#102	.100 mm	.026	.1250	1.5	DR01-0039*	28.00		
.0051	#99	.130 mm	.056	.1250	1.5	DR02-0051	27.30		
.0059	#97	.150 mm	.066	.1250	1.5	DR02-0059	25.40		
.0071	#94		.106	.1250	1.5	DR02-0071	23.20		
.0079	#92	.200 mm	.160	.1250	1.5	DR02-0079	19.40	DR02-0079X	23.80
.0091	#89		.160	.1250	1.5	DR02-0091	18.90	DR02-0091X	23.30
.0098		.250 mm	.160	.1250	1.5	DR02-0098	18.90	DR02-0098X	23.30
.0100	#87		.160	.1250	1.5	DR02-0100	18.90	DR02-0100X	23.30
.0110	#85		.160	.1250	1.5	DR02-0110	18.90	DR02-0110X	23.30
.0118		.300 mm	.180	.1250	1.5	DR02-0118	18.90	DR02-0118X	23.30
.0120	#83		.230	.1250	1.5	DR02-0120	17.10	DR02-0120X	21.50
.0130	#81		.230	.1250	1.5	DR02-0130	17.10	DR02-0130X	21.50
.0135	#80		.270	.1250	1.5	DR02-0135	16.70	DR02-0135X	21.10
.0145	#79		.270	.1250	1.5	DR02-0145	16.70	DR02-0145X	21.10
.0157		.400 mm	.270	.1250	1.5	DR02-0157	16.70	DR02-0157X	21.10
.0160	#78		.270	.1250	1.5	DR02-0160	16.70	DR02-0160X	21.10
.0180	#77		.270	.1250	1.5	DR02-0180	15.50	DR02-0180X	19.90
.0197		.500 mm	.275	.1250	1.5	DR02-0197	15.50	DR02-0197X	19.90
.0200	#76		.275	.1250	1.5	DR02-0200	15.50	DR02-0200X	19.90
.0210	#75		.275	.1250	1.5	DR02-0210	15.50	DR02-0210X	19.90
.0225	#74		.275	.1250	1.5	DR02-0225	15.50	DR02-0225X	19.90
.0236		.600 mm	.275	.1250	1.5	DR02-0236	15.50	DR02-0236X	19.90
.0240	#73		.275	.1250	1.5	DR02-0240	15.50	DR02-0240X	19.90
.0250	#72		.275	.1250	1.5	DR02-0250	15.50	DR02-0250X	19.90
.0260	#71		.275	.1250	1.5	DR02-0260	15.50	DR02-0260X	19.90
.0276		.700 mm	.335	.1250	1.5	DR02-0276	15.50	DR02-0276X	19.90
.0280	#70		.335	.1250	1.5	DR02-0280	15.50	DR02-0280X	19.90
.0292	#69		.335	.1250	1.5	DR02-0292	15.50	DR02-0292X	19.90
.0310	#68		.395	.1250	1.5	DR02-0310	14.50	DR02-0310X	18.90
.0312			.395	.1250	1.5	DR02-0312	14.50	DR02-0312X	18.90
.0315		.800 mm	.395	.1250	1.5	DR02-0315	14.50	DR02-0315X	18.90
.0320	#67		.395	.1250	1.5	DR02-0320	14.50	DR02-0320X	18.90
.0330	#66		.395	.1250	1.5	DR02-0330	14.50	DR02-0330X	18.90
.0350	#65		.395	.1250	1.5	DR02-0350	14.50	DR02-0350X	18.90

* Total overhang from shank transition is .250" ** Tolerance for AlTiN coating is +.002"/-.0003" *** Tolerance for AlTiN coating is +.0002/-.0005

Continued on next page

Taper Integrated holders can be found on pg 49

Drills

Miniature (cont.)

DR

Continued from previous page

Drill Diameter inch	wire	metric	Flute Length	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" ** −.0003"			L_2	D_2	L_1	Tool #	Price	Tool #	Price
.0354		.900 mm	.395	.1250	1.5	DR02-0354	14.50	DR02-0354X	18.90
.0360	#64		.395	.1250	1.5	DR02-0360	14.50	DR02-0360X	18.90
.0370	#63		.395	.1250	1.5	DR02-0370	14.50	DR02-0370X	18.90
.0380	#62		.395	.1250	1.5	DR02-0380	14.50	DR02-0380X	18.90
.0390	#61		.395	.1250	1.5	DR02-0390	14.50	DR02-0390X	18.90
.0394		1.000 mm	.395	.1250	1.5	DR02-0394	14.50	DR02-0394X	18.90
.0400	#60		.395	.1250	1.5	DR02-0400	14.50	DR02-0400X	18.90
.0410	#59		.395	.1250	1.5	DR02-0410	14.50	DR02-0410X	18.90
.0420	#58		.395	.1250	1.5	DR02-0420	14.50	DR02-0420X	18.90
.0430	#57		.395	.1250	1.5	DR02-0430	14.50	DR02-0430X	18.90
.0433		1.100 mm	.395	.1250	1.5	DR02-0433	14.50	DR02-0433X	18.90
.0440			.395	.1250	1.5	DR02-0440	14.50	DR02-0440X	18.90
.0469			.395	.1250	1.5	DR02-0469	14.50	DR02-0469X	18.90
.0472		1.200 mm	.395	.1250	1.5	DR02-0472	14.50	DR02-0472X	18.90
.0500		1.270 mm	.395	.1250	1.5	DR02-0500	14.50	DR02-0500X	18.90
.0512		1.300 mm	.413	.1250	1.5	DR01-0512	14.50	DR01-0512X	18.90
.0520	#55		.413	.1250	1.5	DR01-0520	14.50	DR01-0520X	18.90
.0550	#54		.413	.1250	1.5	DR01-0550	14.50	DR01-0550X	18.90
.0571		1.450 mm	.413	.1250	1.5	DR01-0571	14.50	DR01-0571X	18.90
.0591		1.500 mm	.413	.1250	1.5	DR01-0591	14.50	DR01-0591X	18.90
.0625			.413	.1250	1.5	DR01-0625	14.50	DR01-0625X	18.90
D_1 +.0000" *** −.0005"		decimal equiv.	L_2	D_2	L_1	Tool #	Price	Tool #	Price
.0635	#52		.413	.1250	1.5	DR01-0635	14.50	DR01-0635X	18.90
.0670	#51		.413	.1250	1.5	DR01-0670	14.50	DR01-0670X	18.90
.0700	#50		.413	.1250	1.5	DR01-0700	14.50	DR01-0700X	18.90
.0730	#49		.413	.1250	1.5	DR01-0730	14.50	DR01-0730X	18.90
.0760	#48		.413	.1250	1.5	DR01-0760	14.50	DR01-0760X	18.90
.0781			.413	.1250	1.5	DR01-0781	14.50	DR01-0781X	18.90
.0787		2.000 mm	.413	.1250	1.5	DR01-0787	14.50	DR01-0787X	18.90
.0810	#46		.413	.1250	1.5	DR01-0810	14.50	DR01-0810X	18.90
.0860	#44		.413	.1250	1.5	DR01-0860	14.50	DR01-0860X	18.90
.0890	#43		.413	.1250	1.5	DR01-0890	14.50	DR01-0890X	18.90
.0938			.413	.1250	1.5	DR01-0938	14.50	DR01-0938X	18.90
.0960	#41		.413	.1250	1.5	DR01-0960	14.50	DR01-0960X	18.90
.0980	#40		.413	.1250	1.5	DR01-0980	14.50	DR01-0980X	18.90
.0995	#39		.413	.1250	1.5	DR01-0995	14.50	DR01-0995X	18.90
.1065	#36		.413	.1250	1.5	DR01-1065	14.50	DR01-1065X	18.90
.1094			.413	.1250	1.5	DR01-1094	14.50	DR01-1094X	18.90
.1110	#34		.413	.1250	1.5	DR01-1110	14.50	DR01-1110X	18.90
.1130	#33		.413	.1250	1.5	DR01-1130	14.50	DR01-1130X	18.90
.1181		3.000 mm	.413	.1250	1.5	DR01-1181	14.50	DR01-1181X	18.90
.1200	#31		.413	.1250	1.5	DR01-1200	14.50	DR01-1200X	18.90
.1250			.413	.1250	1.5	DR01-1250	14.50	DR01-1250X	18.90

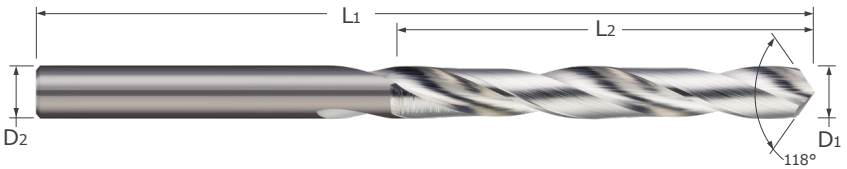
* Total overhang from shank transition is .250" ** Tolerance for AlTiN coating is +.002"/-.0003" *** Tolerance for AlTiN coating is +.0002/-.0005

Taper Integrated holders can be found on pg 49

DR

Drills

Jobber Length Drills

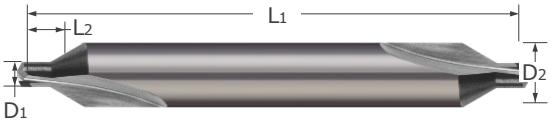


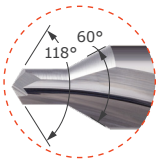
- 118° included point jobber drills can be used for general purpose drilling
- Solid carbide
- CNC ground in the USA

Drill Diameter	Flute Length	Shank Diameter	Overall Length	Uncoated	
D_1 $^{+.0000''}_{-.0005''}$	L_2 $^{+.062''}_{-.062''}$	D_2 (h6)	L_1	Tool #	Price
.0312	.500	.0312	1.25	DR-031-2	13.90
.0469	.750	.0469	1.50	DR-046-2	18.30
.0625	.750	.0625	1.50	DR-062-2	18.70
.1094	1.250	.1094	2.25	DR-109-2	23.70
.1250	1.250	.1250	2.25	DR-125-2	25.10
.1875	1.625	.1875	2.75	DR-187-2	36.80
.2500	2.000	.2500	3.25	DR-250-2	54.70
.3125	2.375	.3125	3.75	DR-312-2	72.70

DC / DCM

Combined Drill & Countersinks





- Designed for predrilling 60° live center holes
- Can be utilized for countersinking and spot drilling
- Double-ended for quicker tool changes
- Solid carbide
- CNC ground in the USA

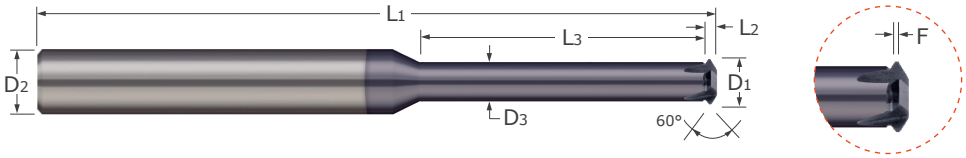
Drill Diameter			Drill Length	Shank Diameter	Overall Length	Uncoated	
D_1 +.0030" −.0000"	+.08 mm −.00 mm	decimal equiv.	L_2	D_2 (h6)	L_1	Tool #	Price
.0250		.0250	.030	.1250	1.500	DC-00	27.50
.0312		.0312	.038	.1250	1.500	DC-01	27.50
	0.8 mm	.0320	1.1 mm	3.15 mm	35 mm	DCM-008	26.50
	1.0 mm	.0390	1.3 mm	3.15 mm	35 mm	DCM-010	26.50
.0469		.0469	.047	.1250	1.500	DC-1	27.50
	1.25 mm	.0490	1.6 mm	3.15 mm	35 mm	DCM-013	26.50
.0781		.0781	.078	.1875	1.875	DC-2	43.30
	2.5 mm	.0980	3.1 mm	6.3 mm	45 mm	DCM-025	46.50
.1094		.1094	.109	.2500	2.000	DC-3	48.40
	3.15 mm	.1240	3.9 mm	8 mm	50 mm	DCM-032	62.20
.1250		.1250	.125	.3125	2.125	DC-4	64.70
.1875		.1875	.188	.4375	2.750	DC-5	97.50
.2188		.2188	.219	.5000	3.000	DC-6	124.90

See pg 325 for tool set options

Thread Milling Cutters

Single Form – UN Threads

TM



- Mills internal and external 60° UN threads
- Single thread form designed to mill common pitch sizes
- Single form design reduces tool pressure for deep thread milling applications
- Mills right hand and left hand threads
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

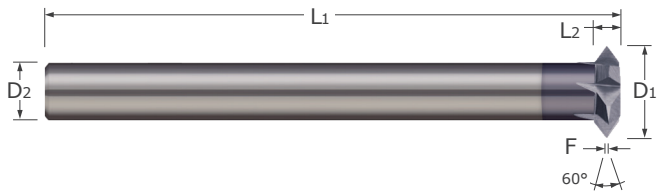
Threads Per Inch	Cutter Diameter	Neck Length	Neck Diameter	Flat	Cutter Width	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
TPI	D_1 $^{+.000"}_{-.005"}$	L_3 $^{+.015"}_{-.000"}$	D_3	F $^{+.0010"}_{-.0000"}$	L_2		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
56 - 80	.060	.250	.030	SHARP	.017	2	.1250	1.5	TM-060-4	70.50	TM-060-4X	72.85
56 - 80	.060	.375	.030	SHARP	.017	2	.1250	1.5	TM-060-6	70.50	TM-060-6X	72.85
40 - 64	.080	.250	.035	SHARP	.026	2	.1250	1.5	TM-080-4	66.20	TM-080-4X	68.65
40 - 64	.080	.500	.035	SHARP	.026	2	.1250	1.5	TM-080-8	66.20	TM-080-8X	68.65
32 - 64	.100	.375	.050	SHARP	.029	2	.1250	1.5	TM-100-6	57.10	TM-100-6X	59.75
32 - 64	.100	.500	.050	SHARP	.029	2	.1250	1.5	TM-100-8	57.10		
32 - 64	.100	.625	.050	SHARP	.029	2	.1250	2.0	TM-100-10	57.10	TM-100-10X	59.75
32 - 56	.120	.375	.070	.0010	.030	3	.1875	2.0	TM-120-6	67.50	TM-120-6X	70.45
32 - 56	.120	.500	.070	.0010	.030	3	.1875	2.0	TM-120-8	67.50	TM-120-8X	70.45
32 - 56	.120	.625	.070	.0010	.030	3	.1875	2.0	TM-120-10	67.50	TM-120-10X	70.45
24 - 56	.140	.500	.075	.0010	.038	3	.1875	2.0	TM-140-8	67.50	TM-140-8X	70.45
24 - 56	.140	.750	.075	.0010	.038	3	.1875	2.0	TM-140-12	67.50	TM-140-12X	70.45
18 - 56	.180	.500	.090	.0015	.055	4	.2500	2.5	TM-180-8	79.40	TM-180-8X	84.65
18 - 56	.180	.750	.090	.0015	.055	4	.2500	2.5	TM-180-12	79.40	TM-180-12X	84.65
18 - 56	.180	1.000	.090	.0015	.055	4	.2500	2.5	TM-180-16	79.40	TM-180-16X	84.65
16 - 48	.240	1.500	.150	.0015	.055	4	.3125	3.5	TM-250-24	88.60	TM-250-24X	97.15
14 - 48	.250	1.000	.100	.0015	.065	4	.2500	2.5	TM-250-16	79.40	TM-250-16X	84.65
16 - 48	.250	1.125	.150	.0015	.060	4	.2500	2.5	TM-250-18	79.40	TM-250-18X	84.65
14 - 40	.290	1.000	.170	.0020	.071	4	.3750	4.0	TM-290-16	98.50	TM-290-16X	108.65
12 - 32	.360	1.000	.210	.0020	.085	4	.3750	4.0	TM-360-16	98.50	TM-360-16X	108.65
11 - 32	.490	1.000	.300	.0020	.095	5	.5000	4.0	TM-490-16	113.80	TM-490-16X	125.35
11 - 32	.490	1.250	.300	.0020	.095	5	.5000	4.0	TM-490-20	113.80	TM-490-20X	125.35
10 - 32	.600	1.000	.420	.0020	.100	6	.6250	4.0	TM-600-16	141.50	TM-600-16X	155.35
10 - 32	.600	1.250	.420	.0020	.100	6	.6250	4.0	TM-600-20	141.50	TM-600-20X	155.35

TPI	D_1 $^{+.000"}_{-.005"}$	L_3 $^{+.015"}_{-.000"}$	D_3	F $^{+.0030"}_{-.0000"}$	L_2		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
5 - 12	.720	1.250	.360	.0045	.200	6	.7500	4.0	TM-720-20	162.50	TM-720-20X	178.45
5 - 12	.720	2.000	.360	.0045	.200	6	.7500	4.0	TM-720-32	162.50	TM-720-32X	178.45
5 - 12	.720	2.500	.360	.0045	.200	6	.7500	4.0	TM-720-40	162.50	TM-720-40X	178.45

TM

Thread Milling Cutters

Single Form – UN Threads – Reduced Shank



- Mills internal and external 60° threads
- Single thread form designed to mill common UN and metric pitch sizes
- Single form design reduces tool pressure for deep thread milling applications
- Reduced shank design can be chucked at any depth
- Mills right hand and left hand threads
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Carbide head brazed to carbide shank
- CNC ground in the USA

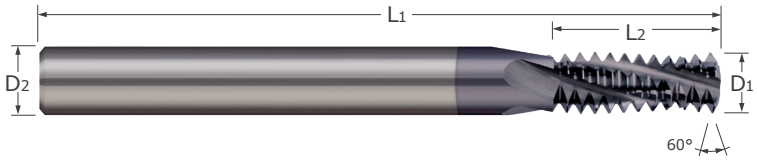
Threads Per Inch	Cutter Diameter	Flat	Cutter Width	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
TPI	D_1 $^{+.000"}_{-.005"}$	F $^{+.0030"}_{-.0000"}$	L_2 $^{+.005"}_{-.005"}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
12-32	.375	.0020	.093	4	.2500	2.59	TM-375*	88.10	TM-375X*	93.25
11-32	.500	.0020	.125	5	.3125	2.63	TM-500*	107.20	TM-500X*	114.55
7-16	.750	.0040	.156	6	.3750	2.65	TM-750	133.00	TM-750X	140.05
5-12	1.000	.0045	.187	7	.5000	3.20	TM-001	173.70	TM-001X	182.05

* Reduced Neck

Thread Milling Cutters

Multi-Form – UN Threads

TM



- Mills internal and external 60° UN threads
- Able to cut larger threads of the same pitch
- 100% thread form creates superior threads vs. tapping
- Mills right and left hand threads
- Helical flutes
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

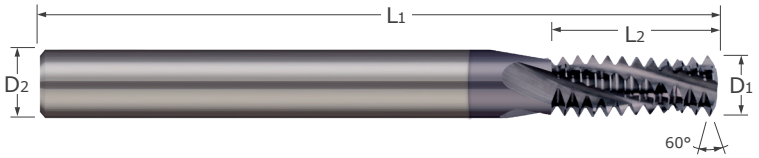
Thread Size	Cutter Diameter	Length of Cut*	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
	D_1 $^{+.0005"}_{-.0005"}$	L_2 $^{+.0500"}_{-.0000"}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
4-40	.0800	.1875	2	.2500	2.0			TM-112-40X	155.05
6-32	.1000	.2500	2	.2500	2.0	TM-138-32	151.80	TM-138-32X	154.05
8-32	.1150	.2500	3	.2500	2.0			TM-164-32X	155.05
10-24	.1200	.3125	3	.2500	2.0	TM-190-24	158.40	TM-190-24X	160.55
10-28	.1200	.3125	3	.2500	2.0			TM-190-28X	160.55
10-32	.1200	.3125	3	.2500	2.0	TM-190-32	158.40	TM-190-32X	160.55
1/4-20	.1800	.5000	3	.2500	2.5	TM-250-20	165.30	TM-250-20X	169.75
1/4-28	.1800	.5000	3	.2500	2.5	TM-250-28	165.30	TM-250-28X	169.75
5/16-18	.2350	.6250	3	.2500	2.5	TM-312-18	181.10	TM-312-18X	185.35
5/16-24	.2350	.6250	3	.2500	2.5			TM-312-24X	185.35
3/8-16	.2850	.7500	4	.3125	2.5	TM-375-16	218.40	TM-375-16X	226.35
3/8-24	.2850	.7500	4	.3125	2.5	TM-375-24	218.40	TM-375-24X	226.35
7/16-14	.3050	.7500	4	.3125	2.5	TM-437-14	218.40	TM-437-14X	226.00
7/16-20	.3350	.8750	4	.3750	3.0	TM-437-20	229.40	TM-437-20X	235.55
1/2-13	.3500	.8750	4	.3750	3.0	TM-500-13	229.40	TM-500-13X	235.55
9/16-12	.3700	.8750	4	.3750	3.0			TM-562-12X	235.55
9/16-18	.3700	.8750	4	.3750	3.0	TM-562-18	229.40	TM-562-18X	235.55
5/8-11	.4700	1.2500	4	.5000	4.0			TM-625-11X	274.45
3/4-10	.4950	1.2500	4	.5000	4.0	TM-750-10	262.70	TM-750-10X	272.85
3/4-12	.4950	1.2500	4	.5000	4.0	TM-750-12	262.70	TM-750-12X	272.85
3/4-16	.4950	1.2500	4	.5000	4.0	TM-750-16	262.70	TM-750-16X	272.85
7/8-14	.4900	1.2500	4	.5000	4.0	TM-875-14	263.70	TM-875-14X	273.85
7/8-9	.6200	1.3750	4	.6250	4.0			TM-875-09X	293.25
1-8	.6200	1.3750	4	.6250	4.0	TM-001-08	282.90	TM-001-08X	298.20

* Length of cut measured to last full tooth.

TM

Thread Milling Cutters

Multi-Form – NPT Threads



- Mills internal and external 60° NPT threads
- 100% thread form creates superior threads vs. tapping
- Mills right hand and left hand threads
- Helical flutes
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

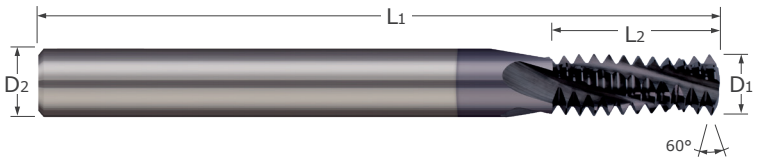
Thread Size	Major Cutter Diameter	Length of Cut*	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
	D_1 $^{+.0005"}_{-.0005"}$	L_2 $^{+.050"}_{-.000"}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
1/16 & 1/8-27 NPT	.2450	.437	3	.2500	2.5	TM-27NPT	181.70	TM-27NPTX	185.95
1/4 & 3/8-18 NPT	.3050	.625	4	.3125	3.0	TM-18NPT	219.00	TM-18NPTX	226.95
1/2 & 3/4-14 NPT	.4950	.875	4	.5000	4.0	TM-14NPT	220.60	TM-14NPTX	231.05
1 & 2-11.5 NPT	.6200	1.125	4	.6250	4.0	TM-11NPT	293.80	TM-11NPTX	306.15

* Length of cut measured to last full tooth.

TM

Thread Milling Cutters

Multi-Form – NPTF Threads



- Mills internal and external 60° NPTF threads
- 100% thread form creates superior threads vs. tapping
- Mills right hand and left hand threads
- Helical flutes
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

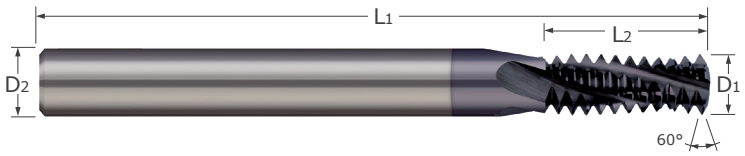
Thread Size	Major Cutter Diameter	Length of Cut*	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
	D_1 $^{+.0005"}_{-.0005"}$	L_2 $^{+.030"}_{-.000"}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
1/16 & 1/8-27 NPT	.2450	.437	3	.2500	2.5	TM-27NPTF	206.50	TM-27NPTFX	210.55
1/4 & 3/8-18 NPT	.3050	.625	4	.3125	3.0			TM-18NPTFX	241.25
1/2 & 3/4-14 NPT	.4950	.875	4	.5000	4.0	TM-14NPTF	253.90		
1 & 2-11.5 NPT	.6200	1.125	4	.6250	4.0			TM-11NPTFX	350.85

* Length of cut measured to last full tooth.

Thread Milling Cutters

Multi-Form – Metric Threads

TMM



- Mills internal and external 60° metric thread
- Able to cut larger threads of the same pitch
- 100% thread form creates superior threads vs. tapping
- Mills right hand threads
- Helical flutes
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

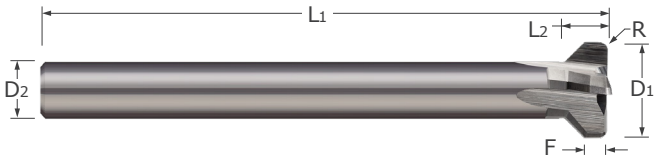
Thread Size	Cutter Diameter	Length of Cut*	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
	D_1 (h8)	L_2 $^{+1.3\ mm}_{-0.0\ mm}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
M4.5x0.75	3.00 mm	6 mm	3	6 mm	57 mm	TMM-045075	150.10	TMM-045075X	154.75
M5.0x0.80	3.00 mm	8 mm	3	6 mm	57 mm			TMM-050080X	154.75
M6.0x1.00	4.30 mm	12 mm	3	6 mm	57 mm			TMM-060100X	171.85
M8.0x0.75	6.00 mm	16 mm	3	6 mm	57 mm	TMM-080075	209.90	TMM-080075X	213.95
M8.0x1.25	6.00 mm	16 mm	3	6 mm	57 mm			TMM-080125X	213.95
M10.0x1.50	7.62 mm	20 mm	4	8 mm	100 mm			TMM-100150X	244.05
M12.0x1.00	9.15 mm	22 mm	4	10 mm	100 mm			TMM-120100X	246.65
M12.0x1.75	9.15 mm	22 mm	4	10 mm	100 mm			TMM-120175X	246.65
M18.0x1.50	11.94 mm	32 mm	4	12 mm	100 mm			TMM-180150X	305.05
M20.0x2.50	11.94 mm	32 mm	4	12 mm	100 mm			TMM-200250X	305.05
M24.0x3.00	15.75 mm	35 mm	4	16 mm	100 mm	TMM-240300	339.80		

* Length of cut measured to last full tooth.

Thread Milling Cutters

Thread Relief Cutter

MTR



- Designed for milling thread relief at the bottom of a thread
- Relief operation typically done before threading to avoid thread form damage
- Chamfer eliminates burrs and partial threads at last thread
- Carbide head brazed to carbide shank
- CNC ground in the USA

Cutter Diameter	Cutter Width	Flat	Radius	Flutes	Shank Diameter	Overall Length	Uncoated	
D_1 $^{+.000''}_{-.005''}$	L_2 $^{+.015''}_{-.015''}$	F $^{+.000''}_{-.005''}$	R $^{+.002''}_{-.002''}$		D_2 (h6)	L_1	Tool #	Price
.375	.141	.075	.010	4	.2500	2.64	MTR-375	89.60
.500	.195	.100	.010	5	.3125	2.72	MTR-500	109.30
.750	.250	.125	.015	6	.3750	2.75	MTR-750	135.60
1.000	.250	.125	.015	7	.5000	3.25	MTR-001	176.90

MILLING TOOLS

End Mills

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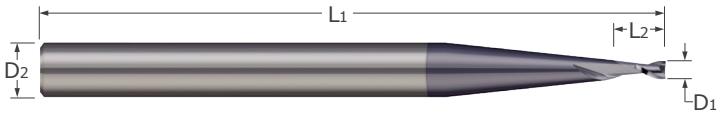
End Mills – Square

2 Flute – Stub & Standard – Miniature

RME / RMEM
SME / AMRM



- Designed for general purpose micromachining
- Cutter diameter down to .005"
- 30° helix ■ Center cutting ■ Square profile
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide ■ CNC ground in the USA

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 +.0005" −.0005"	+.00 mm −.02 mm	decimal equiv.	L2 +.010" −.000" +.25 mm −.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
.0050		.0050	.007	2	.1250	1.5	SME-005-2	53.20	SME-005-2X	55.75
.0060		.0060	.009	2	.1250	1.5	SME-006-2	53.20	SME-006-2X	55.75
.0070		.0070	.010	2	.1250	1.5	SME-007-2	45.10	SME-007-2X	47.75
	0.2 mm	.0079	0.4 mm	2	3 mm	38 mm	RMEM-002-2	37.50	RMEM-002-2X	40.25
	0.2 mm	.0079	0.4 mm	2	4 mm	50 mm			AMRM-002-2X	43.85
.0080		.0080	.012	2	.1250	1.5	SME-008-2	45.10	SME-008-2X	47.75
.0090		.0090	.013	2	.1250	1.5	SME-009-2	41.00	SME-009-2X	43.65
.0100		.0100	.015	2	.1250	1.5	SME-010-2	41.00	SME-010-2X	43.65
.0100		.0100	.030	2	.1250	1.5	RME-010-2	42.80	RME-010-2X	45.55
.0110		.0110	.016	2	.1250	1.5	SME-011-2	37.00		
.0110		.0110	.033	2	.1250	1.5			RME-011-2X	41.45
	0.3 mm	.0118	0.9 mm	2	3 mm	38 mm	RMEM-003-2	32.30	RMEM-003-2X	35.05
	0.3 mm	.0118	0.9 mm	2	4 mm	50 mm	AMRM-003-2	35.50	AMRM-003-2X	38.75
.0120		.0120	.018	2	.1250	1.5	SME-012-2	37.00	SME-012-2X	39.75
.0120		.0120	.036	2	.1250	1.5	RME-012-2	38.80	RME-012-2X	41.45
.0130		.0130	.019	2	.1250	1.5	SME-013-2	31.50	SME-013-2X	34.25
.0130		.0130	.039	2	.1250	1.5	RME-013-2	33.00	RME-013-2X	35.65
.0140		.0140	.021	2	.1250	1.5	SME-014-2	31.50	SME-014-2X	34.25
.0140		.0140	.042	2	.1250	1.5	RME-014-2	33.00	RME-014-2X	35.65
.0150		.0150	.022	2	.1250	1.5	SME-015-2	25.10	SME-015-2X	27.95
.0150		.0150	.045	2	.1250	1.5	RME-015-2	26.10	RME-015-2X	28.95
	0.4 mm	.0157	1.2 mm	2	3 mm	38 mm	RMEM-004-2	23.70		
	0.4 mm	.0157	1.2 mm	2	4 mm	50 mm	AMRM-004-2	27.00		
.0160		.0160	.024	2	.1250	1.5	SME-016-2	25.10	SME-016-2X	27.95
.0160		.0160	.048	2	.1250	1.5	RME-016-2	26.10	RME-016-2X	28.95
.0170		.0170	.025	2	.1250	1.5	SME-017-2	25.10	SME-017-2X	27.95
.0170		.0170	.051	2	.1250	1.5	RME-017-2	26.10	RME-017-2X	28.95
.0180		.0180	.027	2	.1250	1.5	SME-018-2	25.10	SME-018-2X	27.95
.0180		.0180	.054	2	.1250	1.5	RME-018-2	26.10	RME-018-2X	28.95
.0190		.0190	.028	2	.1250	1.5	SME-019-2	25.10		
.0190		.0190	.057	2	.1250	1.5			RME-019-2X	28.95
	0.5 mm	.0197	1.5 mm	2	3 mm	38 mm	RMEM-005-2	21.90	RMEM-005-2X	24.75
	0.5 mm	.0197	1.5 mm	2	4 mm	50 mm	AMRM-005-2	23.70		

*.0005" / .013 mm max TIR

Continued on next page

RME / RMEM
SME / AMRM

End Mills – Square

2 Flute – Stub & Standard – Miniature (cont.)

Continued from previous page

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0005" −.0005"	+.00 mm −.02 mm	decimal equiv.	L_2 +.010" −.000" +.25 mm −.00 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0200		.0200	.030	2	.1250	1.5	SME-020-2	23.10	SME-020-2X	25.95
.0200		.0200	.060	2	.1250	1.5	RME-020-2	24.10	RME-020-2X	26.95
.0210		.0210	.063	2	.1250	1.5			RME-021-2X	26.95
.0220		.0220	.033	2	.1250	1.5	SME-022-2	23.10	SME-022-2X	25.95
.0220		.0220	.066	2	.1250	1.5	RME-022-2	24.10	RME-022-2X	26.95
.0230		.0230	.034	2	.1250	1.5	SME-023-2	23.10	SME-023-2X	25.95
.0230		.0230	.069	2	.1250	1.5	RME-023-2	24.10	RME-023-2X	26.95
	0.6 mm	.0236	1.8 mm	2	3 mm	38 mm	RMEM-006-2	21.90	RMEM-006-2X	24.75
.0240		.0240	.036	2	.1250	1.5	SME-024-2	23.10		
.0240		.0240	.072	2	.1250	1.5	RME-024-2	24.10	RME-024-2X	26.95
.0250		.0250	.037	2	.1250	1.5	SME-025-2	23.10	SME-025-2X	25.95
.0250		.0250	.075	2	.1250	1.5	RME-025-2	24.10	RME-025-2X	26.95
.0270		.0270	.040	2	.1250	1.5	SME-027-2	20.30	SME-027-2X	23.15
.0270		.0270	.081	2	.1250	1.5	RME-027-2	20.40	RME-027-2X	23.25
	0.7 mm	.0276	2.1 mm	2	3 mm	38 mm	RMEM-007-2	19.60	RMEM-007-2X	22.55
	0.7 mm	.0276	2.1 mm	2	4 mm	50 mm			AMRM-007-2X	24.65
.0280		.0280	.042	2	.1250	1.5			SME-028-2X	23.15
.0280		.0280	.084	2	.1250	1.5	RME-028-2	20.40	RME-028-2X	23.25
.0290		.0290	.043	2	.1250	1.5	SME-029-2	20.30	SME-029-2X	23.15
.0290		.0290	.087	2	.1250	1.5	RME-029-2	20.40	RME-029-2X	23.25
.0300		.0300	.045	2	.1250	1.5	SME-030-2	20.30	SME-030-2X	23.15
.0300		.0300	.090	2	.1250	1.5	RME-030-2	20.40	RME-030-2X	23.25
.0310		.0310	.047	2	.1250	1.5	SME-031-2	20.30	SME-031-2X	23.15
	0.8 mm	.0315	2.4 mm	2	3 mm	38 mm	RMEM-008-2	19.60	RMEM-008-2X	22.55
	0.8 mm	.0315	2.4 mm	2	4 mm	50 mm	AMRM-008-2	21.20		
.0320		.0320	.096	2	.1250	1.5	RME-032-2	20.40	RME-032-2X	23.25
.0340		.0340	.102	2	.1250	1.5			RME-034-2X	23.25
.0350		.0350	.105	2	.1250	1.5	RME-035-2	20.40	RME-035-2X	23.25
	0.9 mm	.0354	2.7 mm	2	3 mm	38 mm	RMEM-009-2	19.60	RMEM-009-2X	22.55
	0.9 mm	.0354	2.7 mm	2	4 mm	50 mm			AMRM-009-2X	24.65
	1 mm	.0394	3 mm	2	3 mm	38 mm	RMEM-010-2	19.60	RMEM-010-2X	22.55
	1 mm	.0394	3 mm	2	4 mm	50 mm	AMRM-010-2	21.20	AMRM-010-2X	24.65
.0400		.0400	.060	2	.1250	1.5	SME-040-2	20.30	SME-040-2X	23.15
.0400		.0400	.120	2	.1250	1.5	RME-040-2	20.40	RME-040-2X	23.25
	1.1 mm	.0433	3.3 mm	2	3 mm	38 mm	RMEM-011-2	19.60	RMEM-011-2X	22.55
	1.1 mm	.0433	3.3 mm	2	4 mm	50 mm	AMRM-011-2	21.20		
.0450		.0450	.068	2	.1250	1.5	SME-045-2	20.30	SME-045-2X	23.15
.0450		.0450	.135	2	.1250	1.5			RME-045-2X	23.25
	1.2 mm	.0472	3.8 mm	2	3 mm	38 mm	RMEM-012-2	19.60	RMEM-012-2X	22.55
	1.2 mm	.0472	3.8 mm	2	4 mm	50 mm	AMRM-012-2	21.20	AMRM-012-2X	24.65
.0500		.0500	.075	2	.1250	1.5	SME-050-2	20.30	SME-050-2X	23.15

*.0005" / .013 mm max TIR

Continued on next page

End Mills – Square

2 Flute – Stub & Standard – Miniature (cont.)

RME / RMEM
SME / AMRM

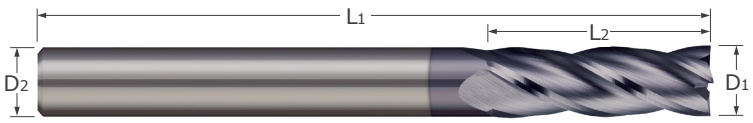
Continued from previous page

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0005" −.0005"	D_1 +.00 mm −.02 mm	D_1 decimal equiv.	L_2 +.010" −.000" +.25 mm −.00 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0500		.0500	.150	2	.1250	1.5	RME-050-2	20.40	RME-050-2X	23.25
	1.3 mm	.0512	3.9 mm	2	3 mm	38 mm	RMEM-013-2	19.60	RMEM-013-2X	22.55
	1.3 mm	.0512	3.9 mm	2	4 mm	50 mm	AMRM-013-2	21.20	AMRM-013-2X	24.65
	1.4 mm	.0551	4.2 mm	2	3 mm	38 mm	RMEM-014-2	19.60	RMEM-014-2X	22.55
	1.5 mm	.0591	4.2 mm	2	3 mm	38 mm	RMEM-015-2	19.60	RMEM-015-2X	22.55
	1.5 mm	.0591	4.2 mm	2	4 mm	50 mm	AMRM-015-2	21.20	AMRM-015-2X	24.65
	1.6 mm	.0630	4.8 mm	2	3 mm	38 mm	RMEM-016-2	18.10		
	1.6 mm	.0630	4.8 mm	2	4 mm	50 mm	AMRM-016-2	21.20	AMRM-016-2X	24.65
	1.7 mm	.0669	5.1 mm	2	3 mm	38 mm	RMEM-017-2	18.10	RMEM-017-2X	21.05
	1.7 mm	.0669	5.1 mm	2	4 mm	50 mm			AMRM-017-2X	24.65
	1.8 mm	.0709	5.3 mm	2	3 mm	38 mm	RMEM-018-2	18.10		
	1.8 mm	.0709	5.3 mm	2	4 mm	50 mm	AMRM-018-2	21.20	AMRM-018-2X	24.65
	1.9 mm	.0748	5.7 mm	2	3 mm	38 mm	RMEM-019-2	18.10	RMEM-019-2X	21.05
	1.9 mm	.0748	5.7 mm	2	4 mm	50 mm	AMRM-019-2	21.20	AMRM-019-2X	24.65
	2 mm	.0787	6 mm	2	3 mm	38 mm	RMEM-020-2	18.10		
	2 mm	.0787	6 mm	2	4 mm	50 mm	AMRM-020-2	21.20	AMRM-020-2X	24.65
	2.5 mm	.0984	8 mm	2	3 mm	38 mm	RMEM-025-2	18.10		
	2.5 mm	.0984	8 mm	2	4 mm	50 mm			AMRM-025-2X	24.65
	3 mm	.1181	9 mm	2	4 mm	50 mm			AMRM-030-2X	24.65

*.0005" / .013 mm max TIR

GEM / GEMM
SEM / AEMM

End Mills – Square
2, 3, 4 Flute



- Designed for general purpose machining
- 30° helix ■ Center cutting ■ Square profile
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide ■ CNC ground in the USA

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0020"	(h9)	decimal equiv.	L_2 +.030" −.000" +.78 mm −.00 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0312		.0312	.063	2	.1250	1.5	SEM-031-02	17.40	SEM-031-02X	20.35
.0312		.0312	.063	3	.1250	1.5	SEM-031-03	17.40		
.0312		.0312	.063	4	.1250	1.5	SEM-031-04	17.40	SEM-031-04X	20.35
.0312		.0312	.078	2	.1250	1.5	GEM-031-2	18.30	GEM-031-2X	21.15
.0312		.0312	.078	3	.1250	1.5	GEM-031-3	18.30	GEM-031-3X	21.15
.0312		.0312	.078	4	.1250	1.5	GEM-031-4	18.30	GEM-031-4X	21.15
	1 mm	.0394	3 mm	2	3 mm	38 mm	GEMM-010-2	17.50	GEMM-010-2X	20.45
	1 mm	.0394	3 mm	3	3 mm	38 mm	GEMM-010-3	17.50	GEMM-010-3X	20.45
	1 mm	.0394	3 mm	4	3 mm	38 mm	GEMM-010-4	17.50		
	1 mm	.0394	4 mm	2	4 mm	50 mm			AEMM-010-2X	24.65
	1 mm	.0394	4 mm	3	4 mm	50 mm	AEMM-010-3	21.20	AEMM-010-3X	24.65
	1 mm	.0394	4 mm	4	4 mm	50 mm	AEMM-010-4	21.20	AEMM-010-4X	24.65
.0469		.0469	.094	2	.1250	1.5	SEM-046-02	17.40	SEM-046-02X	20.35
.0469		.0469	.094	3	.1250	1.5	SEM-046-03	17.40	SEM-046-03X	20.35
.0469		.0469	.094	4	.1250	1.5	SEM-046-04	17.40	SEM-046-04X	20.35
.0469		.0469	.109	2	.1250	1.5	GEM-046-2	18.30	GEM-046-2X	21.15
.0469		.0469	.109	3	.1250	1.5	GEM-046-3	18.30	GEM-046-3X	21.15
.0469		.0469	.109	4	.1250	1.5	GEM-046-4	18.30	GEM-046-4X	21.15
	1.5 mm	.0591	4 mm	2	4 mm	50 mm	AEMM-015-2	21.20		
	1.5 mm	.0591	4 mm	3	4 mm	50 mm	AEMM-015-3	21.20	AEMM-015-3X	24.65
	1.5 mm	.0591	4 mm	4	4 mm	50 mm	AEMM-015-4	21.20	AEMM-015-4X	24.65
.0625		.0625	.125	2	.1250	1.5	SEM-062-02	15.80	SEM-062-02X	18.75
.0625		.0625	.125	3	.1250	1.5	SEM-062-03	15.80	SEM-062-03X	18.75
.0625		.0625	.125	4	.1250	1.5	SEM-062-04	15.80	SEM-062-04X	18.75
.0625		.0625	.188	2	.1250	1.5	GEM-062-2	16.70	GEM-062-2X	19.65
.0625		.0625	.188	3	.1250	1.5	GEM-062-3	16.70	GEM-062-3X	19.65
.0625		.0625	.188	4	.1250	1.5	GEM-062-4	16.70	GEM-062-4X	19.65
.0781		.0781	.156	2	.1250	1.5	SEM-078-02	15.80	SEM-078-02X	18.75
.0781		.0781	.156	3	.1250	1.5	SEM-078-03	15.80	SEM-078-03X	18.75
.0781		.0781	.156	4	.1250	1.5	SEM-078-04	15.80	SEM-078-04X	18.75
.0781		.0781	.188	2	.1250	1.5	GEM-078-2	16.70	GEM-078-2X	19.65
.0781		.0781	.188	3	.1250	1.5	GEM-078-3	16.70	GEM-078-3X	19.65
.0781		.0781	.188	4	.1250	1.5	GEM-078-4	16.70	GEM-078-4X	19.65
	2 mm	.0787	5 mm	2	4 mm	50 mm	AEMM-020-2	21.20	AEMM-020-2X	24.65
	2 mm	.0787	5 mm	3	4 mm	50 mm	AEMM-020-3	21.20	AEMM-020-3X	24.65
	2 mm	.0787	5 mm	4	4 mm	50 mm	AEMM-020-4	21.20	AEMM-020-4X	24.65
	2 mm	.0787	6 mm	2	3 mm	38 mm	GEMM-020-2	15.90	GEMM-020-2X	18.85
	2 mm	.0787	6 mm	3	3 mm	38 mm			GEMM-020-3X	18.85
	2 mm	.0787	7 mm	4	3 mm	38 mm	GEMM-020-4	15.90	GEMM-020-4X	18.85

*.0005" / .013 mm max TIR

Continued on next page

End Mills – Square

2, 3, 4 Flute (cont.)

GEM / GEMM
SEM / AEMM

Continued from previous page

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0020"	(h9)	decimal equiv.	L_2 +.030" −.000" +.78 mm −.00 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0938		.0938	.188	2	.1250	1.5	SEM-093-02	15.80	SEM-093-02X	18.75
.0938		.0938	.188	3	.1250	1.5	SEM-093-03	15.80	SEM-093-03X	18.75
.0938		.0938	.188	4	.1250	1.5	SEM-093-04	15.80	SEM-093-04X	18.75
.0938		.0938	.375	2	.1250	1.5	GEM-093-2	16.70	GEM-093-2X	19.65
.0938		.0938	.375	3	.1250	1.5	GEM-093-3	16.70	GEM-093-3X	19.65
.0938		.0938	.375	4	.1250	1.5	GEM-093-4	16.70	GEM-093-4X	19.65
	2.5 mm	.0984	6 mm	2	4 mm	50 mm	AEMM-025-2	21.20	AEMM-025-2X	24.65
	2.5 mm	.0984	6 mm	3	4 mm	50 mm	AEMM-025-3	21.20	AEMM-025-3X	24.65
	2.5 mm	.0984	6 mm	4	4 mm	50 mm	AEMM-025-4	21.20	AEMM-025-4X	24.65
.1094		.1094	.188	2	.1250	1.5	SEM-109-02	15.80	SEM-109-02X	18.75
.1094		.1094	.188	3	.1250	1.5	SEM-109-03	15.80	SEM-109-03X	18.75
.1094		.1094	.188	4	.1250	1.5	SEM-109-04	15.80	SEM-109-04X	18.75
.1094		.1094	.375	2	.1250	1.5	GEM-109-2	16.70	GEM-109-2X	19.65
.1094		.1094	.375	3	.1250	1.5	GEM-109-3	16.70	GEM-109-3X	19.65
.1094		.1094	.375	4	.1250	1.5	GEM-109-4	16.70	GEM-109-4X	19.65
	3 mm	.1181	7 mm	2	3 mm	38 mm	GEMM-030-2	14.20	GEMM-030-2X	17.15
	3 mm	.1181	7 mm	3	3 mm	38 mm	GEMM-030-3	14.20	GEMM-030-3X	17.15
	3 mm	.1181	8 mm	4	3 mm	38 mm	GEMM-030-4	14.20	GEMM-030-4X	17.15
	3 mm	.1181	8 mm	2	6 mm	57 mm	AEMM-030-2	26.60	AEMM-030-2X	32.35
	3 mm	.1181	8 mm	3	6 mm	57 mm	AEMM-030-3	26.60		
	3 mm	.1181	8 mm	4	6 mm	57 mm	AEMM-030-4	26.60	AEMM-030-4X	32.35
.1250		.1250	.250	2	.1250	1.5	SEM-125-02	14.10	SEM-125-02X	17.05
.1250		.1250	.250	3	.1250	1.5	SEM-125-03	14.10	SEM-125-03X	17.05
.1250		.1250	.250	4	.1250	1.5	SEM-125-04	14.10	SEM-125-04X	17.05
.1250		.1250	.500	2	.1250	1.5	GEM-125-2	14.90	GEM-125-2X	17.85
.1250		.1250	.500	3	.1250	1.5	GEM-125-3	14.90	GEM-125-3X	17.85
.1250		.1250	.500	4	.1250	1.5	GEM-125-4	14.90	GEM-125-4X	17.85
	3.5 mm	.1378	10 mm	2	6 mm	57 mm			AEMM-035-2X	32.35
	3.5 mm	.1378	10 mm	3	6 mm	57 mm	AEMM-035-3	26.60	AEMM-035-3X	32.35
	3.5 mm	.1378	10 mm	4	6 mm	57 mm	AEMM-035-4	26.60	AEMM-035-4X	32.35
.1406		.1406	.250	2	.1875	1.5	SEM-140-02	22.50	SEM-140-02X	25.85
.1406		.1406	.250	3	.1875	1.5	SEM-140-03	22.50	SEM-140-03X	25.85
.1406		.1406	.250	4	.1875	1.5	SEM-140-04	22.50	SEM-140-04X	25.85
.1406		.1406	.500	2	.1875	2.0	GEM-140-2	23.60	GEM-140-2X	26.95
.1406		.1406	.500	3	.1875	2.0	GEM-140-3	23.60	GEM-140-3X	26.95
.1406		.1406	.500	4	.1875	2.0	GEM-140-4	23.60	GEM-140-4X	26.95
.1562		.1562	.313	2	.1875	1.5	SEM-156-02	22.50	SEM-156-02X	25.85
.1562		.1562	.313	3	.1875	1.5	SEM-156-03	22.50		
.1562		.1562	.313	4	.1875	1.5	SEM-156-04	22.50	SEM-156-04X	25.85
.1562		.1562	.563	2	.1875	2.0	GEM-156-2	23.60	GEM-156-2X	26.95
.1562		.1562	.563	3	.1875	2.0	GEM-156-3	23.60	GEM-156-3X	26.95
.1562		.1562	.563	4	.1875	2.0	GEM-156-4	23.60	GEM-156-4X	26.95
	4 mm	.1575	8 mm	2	4 mm	50 mm	GEMM-040-2	21.20		
	4 mm	.1575	8 mm	3	4 mm	50 mm	GEMM-040-3	21.20		
	4 mm	.1575	11 mm	4	4 mm	50 mm	GEMM-040-4	21.20	GEMM-040-4X	24.65
	4 mm	.1575	11 mm	2	6 mm	57 mm	AEMM-040-2	26.60	AEMM-040-2X	32.35
	4 mm	.1575	11 mm	3	6 mm	57 mm	AEMM-040-3	26.60	AEMM-040-3X	32.35
	4 mm	.1575	11 mm	4	6 mm	57 mm	AEMM-040-4	26.60	AEMM-040-4X	32.35

*.0005" / .013 mm max TIR

Continued on next page

GEM / GEMM
SEM / AEMM

End Mills – Square
2, 3, 4 Flute (cont.)

Continued from previous page

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0020"	(h9)	decimal equiv.	L_2 +.030" −.000" +.78 mm −.00 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.1719		.1719	.313	3	.1875	1.5	SEM-171-03	22.50	SEM-171-03X	25.85
.1719		.1719	.313	4	.1875	1.5	SEM-171-04	22.50	SEM-171-04X	25.85
.1719		.1719	.625	2	.1875	2.0	GEM-171-2	23.60	GEM-171-2X	26.95
.1719		.1719	.625	4	.1875	2.0	GEM-171-4	23.60	GEM-171-4X	26.95
	4.5 mm	.1772	11 mm	3	6 mm	57 mm			AEMM-045-3X	32.35
	4.5 mm	.1772	11 mm	4	6 mm	57 mm	AEMM-045-4	26.60	AEMM-045-4X	32.35
.1875		.1875	.375	2	.1875	1.5	SEM-187-02	22.50	SEM-187-02X	25.85
.1875		.1875	.375	3	.1875	1.5	SEM-187-03	22.50	SEM-187-03X	25.85
.1875		.1875	.375	4	.1875	1.5	SEM-187-04	22.50	SEM-187-04X	25.85
.1875		.1875	.625	2	.1875	2.0	GEM-187-2	23.60	GEM-187-2X	26.95
.1875		.1875	.625	3	.1875	2.0	GEM-187-3	23.60	GEM-187-3X	26.95
.1875		.1875	.625	4	.1875	2.0	GEM-187-4	23.60	GEM-187-4X	26.95
	5 mm	.1969	10 mm	2	6 mm	57 mm	GEMM-050-2	22.70		
	5 mm	.1969	13 mm	4	6 mm	57 mm	GEMM-050-4	22.70	GEMM-050-4X	26.05
	5 mm	.1969	16 mm	2	6 mm	57 mm	AEMM-050-2	26.60	AEMM-050-2X	32.35
	5 mm	.1969	16 mm	3	6 mm	57 mm			AEMM-050-3X	32.35
	5 mm	.1969	16 mm	4	6 mm	57 mm	AEMM-050-4	26.60	AEMM-050-4X	32.35
.2031		.2031	.375	3	.2500	2.0	SEM-203-03	27.90	SEM-203-03X	31.35
.2031		.2031	.375	4	.2500	2.0	SEM-203-04	27.90	SEM-203-04X	31.35
.2031		.2031	.625	2	.2500	2.5	GEM-203-2	29.50		
.2031		.2031	.625	4	.2500	2.5	GEM-203-4	29.50	GEM-203-4X	35.25
	5.5 mm	.2165	16 mm	2	6 mm	57 mm	AEMM-055-2	26.60		
	5.5 mm	.2165	16 mm	4	6 mm	57 mm	AEMM-055-4	26.60	AEMM-055-4X	32.35
.2187		.2187	.438	4	.2500	2.0	SEM-218-04	27.90	SEM-218-04X	31.35
.2187		.2187	.625	2	.2500	2.5	GEM-218-2	29.50	GEM-218-2X	35.25
.2187		.2187	.625	4	.2500	2.5	GEM-218-4	29.50		
.2344		.2344	.438	4	.2500	2.0	SEM-234-04	27.90	SEM-234-04X	31.35
	6 mm	.2362	10 mm	2	6 mm	57 mm	GEMM-060-2	26.60	GEMM-060-2X	32.35
	6 mm	.2362	10 mm	3	6 mm	57 mm	GEMM-060-3	26.60		
	6 mm	.2362	13 mm	4	6 mm	57 mm	GEMM-060-4	26.60	GEMM-060-4X	32.35
	6 mm	.2362	16 mm	2	6 mm	57 mm	AEMM-060-2	26.60	AEMM-060-2X	32.35
	6 mm	.2362	16 mm	3	6 mm	57 mm	AEMM-060-3	26.60	AEMM-060-3X	32.35
	6 mm	.2362	16 mm	4	6 mm	57 mm	AEMM-060-4	26.60	AEMM-060-4X	32.35
.2500		.2500	.500	2	.2500	2.0	SEM-250-02	27.90	SEM-250-02X	31.35
.2500		.2500	.500	3	.2500	2.0	SEM-250-03	27.90	SEM-250-03X	31.35
.2500		.2500	.500	4	.2500	2.0	SEM-250-04	27.90	SEM-250-04X	31.35
.2500		.2500	.750	2	.2500	2.5	GEM-250-2	29.50	GEM-250-2X	35.25
.2500		.2500	.750	3	.2500	2.5	GEM-250-3	29.50	GEM-250-3X	35.25
.2500		.2500	.750	4	.2500	2.5	GEM-250-4	29.50	GEM-250-4X	35.25
.2656		.2656	.500	4	.3125	2.0	SEM-265-04	30.90	SEM-265-04X	38.35
	7 mm	.2756	22 mm	3	8 mm	63 mm			AEMM-070-3X	40.95
	7 mm	.2756	22 mm	4	8 mm	63 mm	AEMM-070-4	33.00	AEMM-070-4X	40.95
.2812		.2812	.500	4	.3125	2.0	SEM-281-04	30.90	SEM-281-04X	38.35

*.0005" / .013 mm max TIR

Continued on next page

End Mills – Square

2, 3, 4 Flute (cont.)

GEM / GEMM
SEM / AEMM

Continued from previous page

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0030"	(h9)	decimal equiv.	L_2 +.030" −.000" +.78 mm −.00 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.2812		.2812	.750	2	.3125	2.5	GEM-281-2	34.30	GEM-281-2X	42.25
.2812		.2812	.750	3	.3125	2.5	GEM-281-3	34.30	GEM-281-3X	42.25
.2812		.2812	.750	4	.3125	2.5	GEM-281-4	34.30	GEM-281-4X	42.25
.3125		.3125	.500	2	.3125	2.0	SEM-312-02	30.90	SEM-312-02X	38.35
.3125		.3125	.500	4	.3125	2.0	SEM-312-04	30.90	SEM-312-04X	38.35
.3125		.3125	.813	2	.3125	2.5	GEM-312-2	34.30	GEM-312-2X	42.25
.3125		.3125	.813	4	.3125	2.5	GEM-312-4	34.30	GEM-312-4X	42.25
	8 mm	.3150	16 mm	2	8 mm	63 mm	GEMM-080-2	33.00	GEMM-080-2X	40.95
	8 mm	.3150	19 mm	4	8 mm	63 mm	GEMM-080-4	33.00		
	8 mm	.3150	22 mm	2	8 mm	63 mm	AEMM-080-2	33.00		
	8 mm	.3150	22 mm	3	8 mm	63 mm	AEMM-080-3	33.00	AEMM-080-3X	40.95
	8 mm	.3150	22 mm	4	8 mm	63 mm	AEMM-080-4	33.00	AEMM-080-4X	40.95
.3281		.3281	.500	2	.3750	2.0	SEM-328-02	36.90	SEM-328-02X	43.65
.3281		.3281	.500	3	.3750	2.0			SEM-328-03X	43.65
.3281		.3281	.500	4	.3750	2.0	SEM-328-04	36.90		
.3750		.3750	.625	2	.3750	2.0	SEM-375-02	36.90	SEM-375-02X	42.95
.3750		.3750	.625	3	.3750	2.0	SEM-375-03	36.90	SEM-375-03X	42.95
.3750		.3750	.625	4	.3750	2.0	SEM-375-04	36.90	SEM-375-04X	42.95
.3750		.3750	.875	2	.3750	2.5	GEM-375-2	38.90	GEM-375-2X	46.85
.3750		.3750	.875	3	.3750	2.5	GEM-375-3	38.90	GEM-375-3X	46.85
.3750		.3750	.875	4	.3750	2.5	GEM-375-4	38.90	GEM-375-4X	46.85
.3906		.3906	.625	4	.4375	2.5	SEM-390-04	55.20	SEM-390-04X	64.75
	10 mm	.3937	19 mm	2	10 mm	72 mm	GEMM-100-2	38.80	GEMM-100-2X	46.75
	10 mm	.3937	19 mm	3	10 mm	72 mm	GEMM-100-3	38.80	GEMM-100-3X	46.75
	10 mm	.3937	22 mm	4	10 mm	72 mm			GEMM-100-4X	46.75
	10 mm	.3937	25 mm	2	10 mm	72 mm	AEMM-100-2	38.80	AEMM-100-2X	46.75
	10 mm	.3937	25 mm	3	10 mm	72 mm	AEMM-100-3	38.80	AEMM-100-3X	46.75
	10 mm	.3937	25 mm	4	10 mm	72 mm	AEMM-100-4	38.80	AEMM-100-4X	46.75
	11 mm	.4331	30 mm	3	12 mm	83 mm	AEMM-110-3	61.90		
.4375		.4375	1.000	4	.4375	2.5	GEM-437-4	61.30	GEM-437-4X	70.75
	12 mm	.4724	22 mm	2	12 mm	83 mm	GEMM-120-2	61.90	GEMM-120-2X	73.85
	12 mm	.4724	22 mm	3	12 mm	83 mm	GEMM-120-3	61.90		
	12 mm	.4724	30 mm	2	12 mm	83 mm	AEMM-120-2	61.90	AEMM-120-2X	73.85
	12 mm	.4724	30 mm	3	12 mm	83 mm	AEMM-120-3	61.90		
	12 mm	.4724	30 mm	4	12 mm	83 mm	AEMM-120-4	61.90	AEMM-120-4X	73.85
.5000		.5000	.625	2	.5000	2.5	SEM-500-02	60.90	SEM-500-02X	70.05
.5000		.5000	.625	3	.5000	2.5	SEM-500-03	60.90	SEM-500-03X	70.05
.5000		.5000	.625	4	.5000	2.5	SEM-500-04	60.90	SEM-500-04X	70.05
.5000		.5000	1.000	2	.5000	3.0	GEM-500-2	67.60	GEM-500-2X	76.95
.5000		.5000	1.000	3	.5000	3.0	GEM-500-3	67.60	GEM-500-3X	76.95
.5000		.5000	1.000	4	.5000	3.0	GEM-500-4	67.60	GEM-500-4X	76.95
.5000		.5000	1.250	4	.5000	3.5			GEM-5125-4X	79.05
	14 mm	.5512	26 mm	4	14 mm	83 mm	GEMM-140-4	71.80		
	14 mm	.5512	35 mm	2	14 mm	83 mm			AEMM-140-2X	85.05
	14 mm	.5512	35 mm	3	14 mm	83 mm	AEMM-140-3	71.80		
	14 mm	.5512	35 mm	4	14 mm	83 mm	AEMM-140-4	71.80	AEMM-140-4X	85.05

*.0005" / .013 mm max TIR

Continued on next page

GEM / GEMM
SEM / AEMM

End Mills – Square
2, 3, 4 Flute (cont.)

Continued from previous page

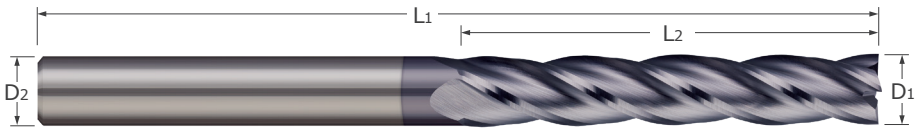
Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0030"	(h9)	decimal equiv.	L_2 +.030" −.000" +.78 mm −.00 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.5625		.5625	1.250	2	.5625	3.5	GEM-562-2	103.70		
.5625		.5625	1.250	4	.5625	3.5	GEM-562-4	103.70		
.6250		.6250	1.250	4	.6250	3.5	GEM-625-4	119.20	GEM-625-4X	133.25
	16 mm	.6299	32 mm	4	16 mm	92 mm	GEMM-160-4	114.60		
	16 mm	.6299	35 mm	3	16 mm	92 mm			AEMM-160-3X	128.65
	16 mm	.6299	35 mm	4	16 mm	92 mm	AEMM-160-4	114.60	AEMM-160-4X	128.65
	18 mm	.7087	26 mm	2	18 mm	92 mm	GEMM-180-2	154.00		
	18 mm	.7087	26 mm	3	18 mm	92 mm			GEMM-180-3X	169.95
	18 mm	.7087	32 mm	4	18 mm	92 mm	GEMM-180-4	154.00		
	18 mm	.7087	45 mm	3	18 mm	92 mm			AEMM-180-3X	169.95
.7500		.7500	1.500	2	.7500	4.0	GEM-750-2	181.80		
.7500		.7500	1.500	4	.7500	4.0	GEM-750-4	181.80	GEM-750-4X	197.45
	20 mm	.7874	32 mm	3	20 mm	104 mm			GEMM-200-3X	219.30
	20 mm	.7874	38 mm	4	20 mm	104 mm	GEMM-200-4	195.70		
	20 mm	.7874	45 mm	2	20 mm	104 mm			AEMM-200-2X	219.30
	20 mm	.7874	45 mm	3	20 mm	104 mm			AEMM-200-3X	219.30
.8750		.8750	1.500	4	.8750	4.0	GEM-875-4	251.90		
	25 mm	.9843	50 mm	2	25 mm	127 mm			AEMM-250-2X	258.35
	25 mm	.9843	50 mm	3	25 mm	127 mm	AEMM-250-3	232.80	AEMM-250-3X	258.35
	25 mm	.9843	50 mm	4	25 mm	127 mm			AEMM-250-4X	258.35
1.0000		1.0000	1.500	4	1.0000	4.0	GEM-001-4	275.30		

*.0005" / .013 mm max TIR

End Mills – Square

2, 3, 4 Flute – Long Flute

GEL / GELM / AELM



- Long flutes for deep pocket milling and long length peripheral milling
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- 30° helix
- Center cutting
- Square profile
- Solid carbide
- CNC ground in the USA

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" −.0020"	(h9)	decimal equiv.	L2 +.031" −.000" +.79 mm −.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
	3 mm	.1181	15 mm	4	6 mm	75 mm	AELM-030-4	33.30		
	4 mm	.1575	20 mm	2	6 mm	75 mm			AELM-040-2X	39.05
	4 mm	.1575	25 mm	2	4 mm	75 mm			GELM-040-2X	29.25
	6 mm	.2362	25 mm	3	6 mm	75 mm	GELM-060-3	37.10		
	6 mm	.2362	25 mm	4	6 mm	75 mm	GELM-060-4	37.10		

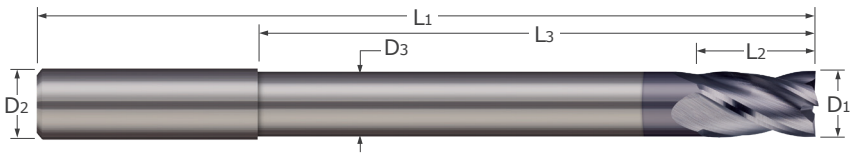
D1 +.0000" −.0030"	(h9)	decimal equiv.	L2 +.031" −.000" +.79 mm −.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
	8 mm	.3150	30 mm	3	8 mm	75 mm	GELM-080-3	44.70		
	8 mm	.3150	40 mm	2	8 mm	100 mm	AELM-080-2	58.50		
.3750		.3750	1.750	2	.3750	4.0	GEL-375-2	55.00		
	10 mm	.3937	38 mm	3	10 mm	100 mm			GELM-100-3X	66.15
	12 mm	.4724	55 mm	4	12 mm	130 mm	AELM-120-4	96.60		
	14 mm	.5512	60 mm	2	14 mm	140 mm			AELM-140-2X	163.30
	16 mm	.6299	65 mm	4	16 mm	150 mm			AELM-160-4X	175.35
	18 mm	.7087	75 mm	2	18 mm	150 mm			GELM-180-2X	228.40
	20 mm	.7874	75 mm	2	20 mm	150 mm			AELM-200-2X	309.90
	25 mm	.9843	75 mm	2	25 mm	150 mm			GELM-250-2X	371.55
	25 mm	.9843	75 mm	3	25 mm	150 mm	GELM-250-3	344.40		
	25 mm	.9843	75 mm	4	25 mm	150 mm			GELM-250-4X	371.55

*.0005" / .013 mm max TIR

GLR / GLRM

End Mills – Square

2 & 4 Flute – Reduced Neck



- Long reach design for deep cavities
- Reduced neck diameter to avoid heeling
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- 30° helix
- Center cutting
- Square profile
- Solid carbide
- CNC ground in the USA

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0020"	(h9)	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	L_3 +.015" −.015" +.38 mm −.38 mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	4 mm	.1575	8 mm	30 mm	3.5 mm	2	6 mm	75 mm			GLRM-040-2X	46.25

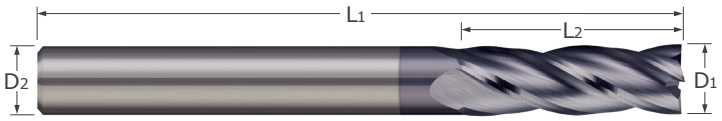
D_1 +.0000" −.0030"	(h9)	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	L_3 +.015" −.015" +.38 mm −.38 mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	10 mm	.3937	18 mm	65 mm	9.5 mm	2	10 mm	120 mm	GLRM-100-2	65.10	GLRM-100-2X	76.55
	16 mm	.6299	30 mm	100 mm	15.5 mm	2	16 mm	150 mm			GLRM-160-2X	201.90

*.0005" / .013 mm max TIR

End Mills – Square

2, 3, 4, 6 Flute – NC Tolerance

EMS / EMSM



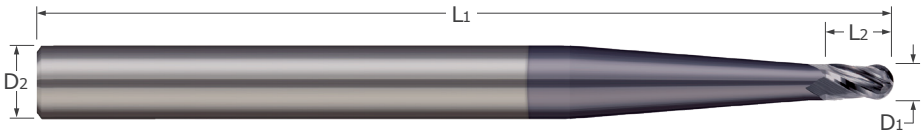
- General purpose end mill with .001" plus tolerance on the cutting diameter
- Weldon flat featured on sizes 3/8" and larger
- 30° helix ■ Center cutting ■ Square profile
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide ■ CNC ground in the USA

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 +.0010" −.0000"	+.03 mm −.00 mm	decimal equiv.	L2 +.030" −.000" +.78 mm −.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
.0312		.0312	.078	2	.1250	1.5	EMS-031-2	22.00		
.0312		.0312	.078	3	.1250	1.5	EMS-031-3	22.00	EMS-031-3X	24.85
.0312		.0312	.078	4	.1250	1.5	EMS-031-4	22.00	EMS-031-4X	24.85
.0625		.0625	.188	2	.1250	1.5	EMS-062-2	20.00	EMS-062-2X	22.85
.0625		.0625	.188	3	.1250	1.5	EMS-062-3	20.00	EMS-062-3X	22.85
.0625		.0625	.188	4	.1250	1.5	EMS-062-4	20.00	EMS-062-4X	22.85
.0938		.0938	.375	3	.1250	1.5	EMS-093-3	20.00	EMS-093-3X	22.85
.0938		.0938	.375	4	.1250	1.5	EMS-093-4	20.00	EMS-093-4X	22.85
	3 mm	.1181	15 mm	2	3 mm	38 mm	EMSM-030-2	15.60		
	3 mm	.1181	15 mm	4	3 mm	38 mm	EMSM-030-4	15.60		
.1250		.1250	.500	2	.1250	1.5	EMS-125-2	17.80	EMS-125-2X	20.75
.1250		.1250	.500	3	.1250	1.5	EMS-125-3	17.80	EMS-125-3X	20.75
.1250		.1250	.500	4	.1250	1.5	EMS-125-4	17.80	EMS-125-4X	20.75
.1562		.1562	.563	2	.1875	2.0	EMS-156-2	28.20		
.1562		.1562	.563	4	.1875	2.0	EMS-156-4	28.20	EMS-156-4X	31.45
	4 mm	.1575	18 mm	2	4 mm	50 mm	EMSM-040-2	23.30	EMSM-040-2X	26.65
.1875		.1875	.625	2	.1875	2.0	EMS-187-2	28.20		
.1875		.1875	.625	4	.1875	2.0	EMS-187-4	28.20	EMS-187-4X	31.45
.2187		.2187	.625	3	.2500	2.5	EMS-218-3	35.40		
	6 mm	.2362	18 mm	4	6 mm	57 mm	EMSM-060-4	29.40	EMSM-060-4X	35.15
.2500		.2500	.750	2	.2500	2.5	EMS-250-2	35.40		
.2500		.2500	.750	3	.2500	2.5	EMS-250-3	35.40	EMS-250-3X	41.05
.2500		.2500	.750	4	.2500	2.5	EMS-250-4	35.40	EMS-250-4X	41.05
.3125		.3125	.813	4	.3125	2.5	EMS-312-4	41.10	EMS-312-4X	49.05
	8 mm	.3150	22 mm	3	8 mm	63 mm	EMSM-080-3	36.20		
.3750		.3750	.875	2	.3750	2.5	EMS-375-2	46.70	EMS-375-2X	54.55
.3750		.3750	.875	3	.3750	2.5	EMS-375-3	46.70		
.3750		.3750	.875	4	.3750	2.5	EMS-375-4	46.70	EMS-375-4X	54.55
	10 mm	.3937	25 mm	3	10 mm	72 mm	EMSM-100-3	42.70		
	12 mm	.4724	30 mm	3	12 mm	83 mm	EMSM-120-3	68.00		
.5000		.5000	1.000	2	.5000	3.0	EMS-500-2	80.80	EMS-500-2X	90.05
.5000		.5000	1.000	3	.5000	3.0	EMS-500-3	80.80	EMS-500-3X	90.05
.5000		.5000	1.000	4	.5000	3.0	EMS-500-4	80.80	EMS-500-4X	90.05
.6250		.6250	1.250	4	.6250	3.5	EMS-625-4	143.00		
	16 mm	.6299	35 mm	3	16 mm	92 mm	EMSM-160-3	126.10		
.7500		.7500	1.500	2	.7500	4.0	EMS-750-2	218.10		
.7500		.7500	1.500	4	.7500	4.0	EMS-750-4	218.10		
	20 mm	.7874	45 mm	4	20 mm	104 mm	EMSM-200-4	215.30		
1.0000		1.0000	2.500	3	1.0000	5.0	EMS-001-3	330.20		
1.0000		1.0000	2.500	6	1.0000	5.0	EMS-001-6	330.20		

*.0005" / .013 mm max TIR

BMR / BMRM / BMS
BMSM / BEM / BEMM

End Mills – Ball
2, 3, 4 Flute – Stub & Standard



- Designed for general purpose machining
- 30° helix
- Center cutting
- Ball profile
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 +.0005" −.0005"	+.00 mm −.02 mm	decimal equiv.	L2		D2 (h6)	L1	Tool #	Price	Tool #	Price
.0100		.0100	.015	2	.1250	1.5	BMS-010-2	47.10	BMS-010-2X	49.75
.0100		.0100	.030	2	.1250	1.5	BMR-010-2	49.20	BMR-010-2X	51.75
.0110		.0110	.033	2	.1250	1.5	BMR-011-2	44.70	BMR-011-2X	47.35
	0.3 mm	.0118	0.5 mm	2	3 mm	38 mm	BMSM-003-2	35.50	BMSM-003-2X	38.25
.0120		.0120	.018	2	.1250	1.5			BMS-012-2X	45.25
.0120		.0120	.036	2	.1250	1.5	BMR-012-2	44.70	BMR-012-2X	47.35
.0130		.0130	.019	2	.1250	1.5	BMS-013-2	36.20	BMS-013-2X	38.95
.0130		.0130	.039	2	.1250	1.5			BMR-013-2X	40.75
.0140		.0140	.021	2	.1250	1.5	BMS-014-2	36.20	BMS-014-2X	38.95
.0140		.0140	.042	2	.1250	1.5	BMR-014-2	38.00		
.0150		.0150	.022	2	.1250	1.5	BMS-015-2	28.90	BMS-015-2X	31.65
.0150		.0150	.045	2	.1250	1.5	BMR-015-2	30.00	BMR-015-2X	32.75
	0.4 mm	.0157	0.6 mm	2	3 mm	38 mm	BMSM-004-2	26.20	BMSM-004-2X	29.05
.0160		.0160	.024	2	.1250	1.5	BMS-016-2	28.90	BMS-016-2X	31.65
.0160		.0160	.048	2	.1250	1.5	BMR-016-2	30.00	BMR-016-2X	32.75
.0180		.0180	.027	2	.1250	1.5	BMS-018-2	28.90	BMS-018-2X	31.65
.0180		.0180	.054	2	.1250	1.5	BMR-018-2	30.00		
.0190		.0190	.028	2	.1250	1.5	BMS-019-2	28.90	BMS-019-2X	31.65
.0190		.0190	.057	2	.1250	1.5	BMR-019-2	30.00		
	0.5 mm	.0197	0.8 mm	2	3 mm	38 mm	BMSM-005-2	24.20	BMSM-005-2X	27.05
	0.5 mm	.0197	1.5 mm	2	4 mm	50 mm	BMRM-005-2	26.50	BMRM-005-2X	29.75
.0200		.0200	.030	2	.1250	1.5	BMS-020-2	26.60	BMS-020-2X	29.45
.0200		.0200	.060	2	.1250	1.5	BMR-020-2	27.90	BMR-020-2X	30.65
.0210		.0210	.063	2	.1250	1.5	BMR-021-2	27.90		
.0220		.0220	.033	2	.1250	1.5			BMS-022-2X	29.45
.0220		.0220	.066	2	.1250	1.5	BMR-022-2	27.90	BMR-022-2X	30.65
.0230		.0230	.034	2	.1250	1.5	BMS-023-2	26.60	BMS-023-2X	29.45
.0230		.0230	.069	2	.1250	1.5	BMR-023-2	27.90	BMR-023-2X	30.65
	0.6 mm	.0236	0.9 mm	2	3 mm	38 mm	BMSM-006-2	24.20		
.0240		.0240	.072	2	.1250	1.5	BMR-024-2	27.90	BMR-024-2X	30.65
.0250		.0250	.037	2	.1250	1.5	BMS-025-2	26.60	BMS-025-2X	29.45
.0250		.0250	.075	2	.1250	1.5	BMR-025-2	27.90	BMR-025-2X	30.65
.0260		.0260	.039	2	.1250	1.5			BMS-026-2X	27.05
.0260		.0260	.078	2	.1250	1.5	BMR-026-2	25.40	BMR-026-2X	28.25
.0270		.0270	.081	2	.1250	1.5	BMR-027-2	25.40	BMR-027-2X	28.25
	0.7 mm	.0276	1.1 mm	2	3 mm	38 mm	BMSM-007-2	23.00		
	0.7 mm	.0276	2.1 mm	2	4 mm	50 mm	BMRM-007-2	26.50		

*.0005" / .013 mm max TIR

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End Mills – Ball

2, 3, 4 Flute – Stub & Standard (cont.)

BMR / BMRM / BMS
BMSM / BEM / BEMM

Continued from previous page

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0005" −.0005"	+.00 mm −.02 mm	decimal equiv.	L_2		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0280		.0280	.042	2	.1250	1.5	BMS-028-2	24.20	BMS-028-2X	27.05
.0280		.0280	.084	2	.1250	1.5	BMR-028-2	25.40	BMR-028-2X	28.25
.0300		.0300	.045	2	.1250	1.5	BMS-030-2	24.20	BMS-030-2X	27.05
.0300		.0300	.090	2	.1250	1.5	BMR-030-2	25.40	BMR-030-2X	28.25
.0310		.0310	.047	2	.1250	1.5	BMS-031-2	24.20	BMS-031-2X	27.05
.0310		.0310	.093	2	.1250	1.5	BMR-031-2	25.40	BMR-031-2X	28.25
D_1 +.0000" −.0020"	+.00 mm −.02 mm	decimal equiv.	L_2		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0313		.0313	.078	2	.1250	1.5	BEM-031-02	21.10	BEM-031-02X	23.95
.0313		.0313	.078	3	.1250	1.5	BEM-031-03	21.10	BEM-031-03X	23.95
.0313		.0313	.078	4	.1250	1.5	BEM-031-04	21.10	BEM-031-04X	23.95
	0.8 mm	.0315	1.2 mm	2	3 mm	38 mm	BMSM-008-2	23.00	BMSM-008-2X	25.95
.0320		.0320	.048	2	.1250	1.5	BMS-032-2	24.20	BMS-032-2X	27.05
.0320		.0320	.096	2	.1250	1.5	BMR-032-2	25.40	BMR-032-2X	28.25
.0330		.0330	.050	2	.1250	1.5			BMS-033-2X	27.05
.0340		.0340	.051	2	.1250	1.5	BMS-034-2	24.20		
.0350		.0350	.053	2	.1250	1.5	BMS-035-2	24.20	BMS-035-2X	27.05
.0350		.0350	.105	2	.1250	1.5	BMR-035-2	25.40	BMR-035-2X	28.25
	0.9 mm	.0354	1.4 mm	2	3 mm	38 mm	BMSM-009-2	23.00	BMSM-009-2X	25.95
	0.9 mm	.0354	2.7 mm	2	4 mm	50 mm	BMRM-009-2	26.50	BMRM-009-2X	29.75
	1 mm	.0394	1.5 mm	2	3 mm	38 mm	BMSM-010-2	22.50	BMSM-010-2X	25.35
	1 mm	.0394	1.5 mm	4	3 mm	38 mm	BMSM-010-4	22.50	BMSM-010-4X	25.35
	1 mm	.0394	3 mm	2	4 mm	50 mm	BMRM-010-2	24.40	BMRM-010-2X	27.65
	1 mm	.0394	3 mm	4	4 mm	50 mm			BMRM-010-4X	27.65
.0400		.0400	.060	2	.1250	1.5	BMS-040-2	24.20	BMS-040-2X	27.05
.0400		.0400	.120	2	.1250	1.5	BMR-040-2	25.40	BMR-040-2X	28.25
	1.1 mm	.0433	3.3 mm	2	4 mm	50 mm			BMRM-011-2X	27.65
	1.1 mm	.0433	3.3 mm	4	4 mm	50 mm	BMRM-011-4	24.40	BMRM-011-4X	27.65
.0450		.0450	.135	2	.1250	1.5	BMR-045-2	25.40	BMR-045-2X	28.25
.0468		.0468	.109	2	.1250	1.5	BEM-046-02	21.10	BEM-046-02X	23.95
.0468		.0468	.109	3	.1250	1.5	BEM-046-03	21.10	BEM-046-03X	23.95
.0468		.0468	.109	4	.1250	1.5	BEM-046-04	21.10	BEM-046-04X	23.95
.0500		.0500	.075	2	.1250	1.5	BMS-050-2	24.20	BMS-050-2X	27.05
.0500		.0500	.150	2	.1250	1.5	BMR-050-2	25.40	BMR-050-2X	28.25
	1.4 mm	.0551	2.1 mm	2	3 mm	38 mm	BMSM-014-2	22.50	BMSM-014-2X	25.35
	1.5 mm	.0591	2.3 mm	2	3 mm	38 mm	BMSM-015-2	22.50	BMSM-015-2X	25.35
	1.5 mm	.0591	4.2 mm	2	4 mm	50 mm	BMRM-015-2	24.40	BMRM-015-2X	27.65
	1.5 mm	.0591	4.2 mm	4	4 mm	50 mm	BMRM-015-4	24.40	BMRM-015-4X	27.65
.0625		.0625	.188	2	.1250	1.5	BEM-062-02	19.00	BEM-062-02X	21.95
.0625		.0625	.188	3	.1250	1.5	BEM-062-03	19.00	BEM-062-03X	21.95
.0625		.0625	.188	4	.1250	1.5	BEM-062-04	19.00	BEM-062-04X	21.95
	1.6 mm	.0630	2.4 mm	2	3 mm	38 mm	BMSM-016-2	20.70	BMSM-016-2X	23.55
	1.6 mm	.0630	4.8 mm	2	4 mm	50 mm	BMRM-016-2	24.40	BMRM-016-2X	27.65
	1.7 mm	.0669	2.5 mm	4	3 mm	38 mm			BMSM-017-4X	23.55
	1.8 mm	.0709	2.7 mm	2	3 mm	38 mm	BMSM-018-2	20.70	BMSM-018-2X	23.55
	1.8 mm	.0709	5.3 mm	2	4 mm	50 mm			BMRM-018-2X	27.65

*.0005" / .013 mm max TIR

Continued on next page

BMR / BMRM / BMS
BMSM / BEM / BEMM

End Mills – Ball

2, 3, 4 Flute – Stub & Standard (cont.)

Continued from previous page

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0020"	+.00 mm −.02 mm	decimal equiv.	L_2		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	1.9 mm	.0748	2.8 mm	2	3 mm	38 mm			BMSM-019-2X	23.55
	1.9 mm	.0748	2.8 mm	4	3 mm	38 mm	BMSM-019-4	20.70	BMSM-019-4X	23.55
.0781		.0781	.188	2	.1250	1.5	BEM-078-02	19.00	BEM-078-02X	21.95
.0781		.0781	.188	3	.1250	1.5	BEM-078-03	19.00	BEM-078-03X	21.95
.0781		.0781	.188	4	.1250	1.5	BEM-078-04	19.00	BEM-078-04X	21.95
	2 mm	.0787	3 mm	2	3 mm	38 mm	BMSM-020-2	20.70	BMSM-020-2X	23.55
	2 mm	.0787	6 mm	2	4 mm	50 mm	BMRM-020-2	24.40	BMRM-020-2X	27.65
	2 mm	.0787	6 mm	4	4 mm	50 mm			BMRM-020-4X	27.65
.0937		.0937	.375	2	.1250	1.5	BEM-093-02	19.00	BEM-093-02X	21.95
.0937		.0937	.375	3	.1250	1.5	BEM-093-03	19.00	BEM-093-03X	21.95
.0937		.0937	.375	4	.1250	1.5	BEM-093-04	19.00	BEM-093-04X	21.95
	2.5 mm	.0984	3.8 mm	2	3 mm	38 mm	BMSM-025-2	20.70	BMSM-025-2X	23.55
.1093		.1093	.375	2	.1250	1.5	BEM-109-02	19.00		
	3 mm	.1181	15 mm	2	3 mm	38 mm	BEMM-030-2	15.60		
	3 mm	.1181	15 mm	3	3 mm	38 mm	BEMM-030-3	15.60	BEMM-030-3X	18.55
	3 mm	.1181	15 mm	4	3 mm	38 mm	BEMM-030-4	15.60	BEMM-030-4X	18.55
	3 mm	.1181	9 mm	2	4 mm	50 mm	BMRM-030-2	24.40	BMRM-030-2X	27.65
	3 mm	.1181	9 mm	4	4 mm	50 mm			BMRM-030-4X	27.65
.1250		.1250	.500	2	.1250	1.5	BEM-125-02	17.00	BEM-125-02X	19.95
.1250		.1250	.500	3	.1250	1.5	BEM-125-03	17.00	BEM-125-03X	19.95
.1250		.1250	.500	4	.1250	1.5	BEM-125-04	17.00	BEM-125-04X	19.95
	3.5 mm	.1378	10.5 mm	2	4 mm	50 mm			BMRM-035-2X	27.65
.1562		.1562	.563	2	.1875	2.0	BEM-156-02	27.00	BEM-156-02X	30.35
.1562		.1562	.563	3	.1875	2.0	BEM-156-03	27.00	BEM-156-03X	30.35
.1562		.1562	.563	4	.1875	2.0	BEM-156-04	27.00	BEM-156-04X	30.35
	4 mm	.1575	18 mm	2	4 mm	50 mm	BEMM-040-2	23.30	BEMM-040-2X	26.65
	4 mm	.1575	18 mm	3	4 mm	50 mm	BEMM-040-3	23.30	BEMM-040-3X	26.65
	4 mm	.1575	18 mm	4	4 mm	50 mm	BEMM-040-4	23.30	BEMM-040-4X	26.65
.1719		.1719	.625	2	.1875	2.0			BEM-171-02X	30.35
.1875		.1875	.625	2	.1875	2.0	BEM-187-02	27.00	BEM-187-02X	30.35
.1875		.1875	.625	3	.1875	2.0	BEM-187-03	27.00	BEM-187-03X	30.35
.1875		.1875	.625	4	.1875	2.0	BEM-187-04	27.00	BEM-187-04X	30.35
.2031		.2031	.625	3	.2500	2.5			BEM-203-03X	39.55
.2187		.2187	.625	2	.2500	2.5	BEM-218-02	33.90	BEM-218-02X	39.55
.2187		.2187	.625	4	.2500	2.5	BEM-218-04	33.90	BEM-218-04X	39.55
.2343		.2343	.750	3	.2500	2.5	BEM-234-03	33.90		
	6 mm	.2362	18 mm	4	6 mm	57 mm	BEMM-060-4	29.40	BEMM-060-4X	35.15
.2500		.2500	.750	2	.2500	2.5	BEM-250-02	33.90	BEM-250-02X	39.55
.2500		.2500	.750	3	.2500	2.5	BEM-250-03	33.90	BEM-250-03X	39.55
.2500		.2500	.750	4	.2500	2.5	BEM-250-04	33.90	BEM-250-04X	39.55
.2812		.2812	.750	4	.3125	2.5	BEM-281-04	39.40	BEM-281-04X	47.45
.3125		.3125	.813	2	.3125	2.5	BEM-312-02	39.40	BEM-312-02X	47.45
.3125		.3125	.813	4	.3125	2.5	BEM-312-04	39.40	BEM-312-04X	47.45
	8 mm	.3150	22 mm	2	8 mm	63 mm	BEMM-080-2	36.20	BEMM-080-2X	44.15
.3750		.3750	.875	2	.3750	2.5	BEM-375-02	44.80	BEM-375-02X	52.65
.3750		.3750	.875	3	.3750	2.5	BEM-375-03	44.80	BEM-375-03X	52.65
.3750		.3750	.875	4	.3750	2.5	BEM-375-04	44.80	BEM-375-04X	52.65

*.0005" / .013 mm max TIR

Continued on next page

End Mills – Ball

2, 3, 4 Flute – Stub & Standard (cont.)

BMR / BMRM / BMS
BMSM / BEM / BEMM

Continued from previous page

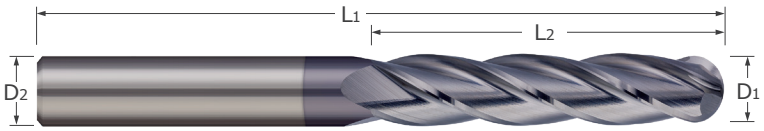
Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0020"	+.00 mm −.02 mm	decimal equiv.	L_2		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	10 mm	.3937	25 mm	2	10 mm	72 mm	BEMM-100-2	42.70	BEMM-100-2X	50.55
	10 mm	.3937	25 mm	3	10 mm	72 mm	BEMM-100-3	42.70	BEMM-100-3X	50.55
	10 mm	.3937	25 mm	4	10 mm	72 mm	BEMM-100-4	42.70	BEMM-100-4X	50.55
.4370		.4370	1.000	2	.4375	2.5			BEM-437-02X	80.70
	12 mm	.4724	30 mm	3	12 mm	83 mm			BEMM-120-3X	79.95
	12 mm	.4724	30 mm	4	12 mm	83 mm	BEMM-120-4	68.00	BEMM-120-4X	79.95
.5000		.5000	1.000	3	.5000	3.0	BEM-500-03	77.50	BEM-500-03X	86.75
.5000		.5000	1.000	4	.5000	3.0	BEM-500-04	77.50	BEM-500-04X	86.75
.6250		.6250	1.250	4	.6250	3.5	BEM-625-04	137.10	BEM-625-04X	150.85
	16 mm	.6299	35 mm	3	16 mm	92 mm			BEMM-160-3X	140.05
.6875		.6875	1.375	2	.7500	4.0	BEM-687-02	168.70		
.6875		.6875	1.375	3	.7500	4.0	BEM-687-03	168.70		
.6875		.6875	1.375	4	.7500	4.0	BEM-687-04	168.70		
	18 mm	.7087	45 mm	2	18 mm	92 mm			BEMM-180-2X	185.25
	20 mm	.7874	45 mm	4	20 mm	104 mm	BEMM-200-4	215.30		
.8750		.8750	1.500	2	.8750	4.0	BEM-875-02	289.60		

*.0005" / .013 mm max TIR

BEL / BELM

End Mills – Ball

2, 3, 4 Flute – Long Flute



- Long reach for deep pocket milling and long length peripheral milling
- 30° helix
- Center cutting
- Ball profile
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

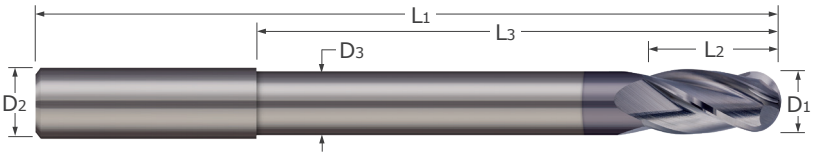
Cutter Diameter*	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 (h9)	L_2 +.79 mm −.00 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
10 mm	38 mm	4	10 mm	100 mm	BELM-100-4	62.20		
14 mm	75 mm	4	14 mm	150 mm	BELM-140-4	135.30		
18 mm	75 mm	4	18 mm	150 mm	BELM-180-4	227.80		
25 mm	75 mm	2	25 mm	150 mm			BELM-250-2X	392.20
25 mm	75 mm	4	25 mm	150 mm	BELM-250-4	361.60	BELM-250-4X	392.20

*.013 mm max TIR

End Mills – Ball

2, 3, 4 Flute – Reduced Neck

BLR / BLRM
SFBM / MMBM



- Long reach for deep pocket milling
- SFBM and MMBM manufactured to improved cutter diameter tolerance (h8) for mold making
- 30° helix
- Center cutting
- Ball profile
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

Cutter Diameter*		Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0020" (h6)	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	L_3 +.015" −.015" +.38 mm −.38 mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
0.2 mm	.0078	0.3 mm	0.3 mm	-	2	6 mm	57 mm	SFBM-002-0	75.40	SFBM-002-0X	80.75
0.3 mm	.0118	0.3 mm	3.0 mm	0.28 mm	2	4 mm	50 mm	MMBM-003-3	57.40	MMBM-003-3X	60.45
0.3 mm	.0118	0.4 mm	0.4 mm	0.4 mm	2	6 mm	57 mm			SFBM-003-0X	72.60
0.3 mm	.0118	0.4 mm	1.0 mm	0.25 mm	2	6 mm	57 mm	SFBM-003-1	66.60		
0.4 mm	.0157	0.4 mm	3.0 mm	0.38 mm	2	4 mm	50 mm	MMBM-004-3	49.40	MMBM-004-3X	52.45
0.4 mm	.0157	0.4 mm	8.0 mm	0.38 mm	2	4 mm	50 mm	MMBM-004-8	49.40	MMBM-004-8X	52.45
0.4 mm	.0157	0.5 mm	1.2 mm	0.35 mm	2	6 mm	57 mm			SFBM-004-1X	70.80
0.5 mm	.0197	0.5 mm	5.0 mm	0.48 mm	2	4 mm	50 mm	MMBM-005-5	43.50	MMBM-005-5X	46.65
0.5 mm	.0197	0.5 mm	10.0 mm	0.48 mm	2	4 mm	50 mm	MMBM-005-10	43.50	MMBM-005-10X	46.65
0.5 mm	.0197	0.6 mm	1.6 mm	0.45 mm	2	6 mm	57 mm			SFBM-005-1X	67.80
0.6 mm	.0236	0.6 mm	12.0 mm	0.58 mm	2	4 mm	50 mm			MMBM-006-12X	46.65
0.6 mm	.0236	0.6 mm	5.0 mm	0.58 mm	2	4 mm	50 mm	MMBM-006-5	43.50	MMBM-006-5X	46.65
0.7 mm	.0276	0.7 mm	5.0 mm	0.68 mm	2	4 mm	50 mm	MMBM-007-5	43.50		
0.8 mm	.0315	0.8 mm	5.0 mm	0.78 mm	2	4 mm	50 mm			MMBM-008-5X	40.55
0.8 mm	.0315	0.8 mm	5.2 mm	0.75 mm	2	6 mm	57 mm			SFBM-008-5X	64.55
0.8 mm	.0315	0.8 mm	8.0 mm	0.75 mm	2	6 mm	57 mm			SFBM-008-8X	69.85
0.8 mm	.0315	0.8 mm	10.0 mm	0.78 mm	2	4 mm	50 mm	MMBM-008-10	37.40		
1.0 mm	.0394	1.3 mm	3.3 mm	0.95 mm	2	6 mm	57 mm			SFBM-010-3X	61.35
1.0 mm	.0394	1.0 mm	6.0 mm	0.95 mm	2	6 mm	57 mm	MMBM-010-6	41.00	MMBM-010-6X	46.55
1.0 mm	.0394	1.0 mm	11.0 mm	0.95 mm	2	6 mm	57 mm	MMBM-010-11	41.00	MMBM-010-11X	46.55
1.0 mm	.0394	1.0 mm	12.0 mm	0.95 mm	2	6 mm	57 mm			MMBM-010-12X	46.55
1.0 mm	.0394	1.0 mm	15.0 mm	0.95 mm	2	6 mm	57 mm			MMBM-010-15X	46.55
1.0 mm	.0394	1.0 mm	20.0 mm	0.95 mm	2	6 mm	57 mm	MMBM-010-20	41.00	MMBM-010-20X	46.55
1.2 mm	.0472	1.2 mm	7.0 mm	1.15 mm	2	6 mm	57 mm			MMBM-012-7X	46.55
1.2 mm	.0472	1.2 mm	15.0 mm	1.15 mm	2	6 mm	57 mm	MMBM-012-15	41.00	MMBM-012-15X	46.55
1.2 mm	.0472	1.2 mm	20.0 mm	1.15 mm	2	6 mm	57 mm	MMBM-012-20	41.00		
1.5 mm	.0591	1.5 mm	7.0 mm	1.45 mm	2	6 mm	57 mm	MMBM-015-7	41.00	MMBM-015-7X	46.55
1.5 mm	.0591	1.5 mm	9.5 mm	1.45 mm	2	6 mm	57 mm	SFBM-015-9	53.20	SFBM-015-9X	58.65
1.5 mm	.0591	1.5 mm	15.0 mm	1.45 mm	2	6 mm	57 mm	MMBM-015-15	41.00	MMBM-015-15X	46.55
1.5 mm	.0591	1.5 mm	20.0 mm	1.45 mm	2	6 mm	57 mm			MMBM-015-20X	46.55

*.0005" / .013 mm max TIR. SFBM and MMBM tools held to h8 tolerance

Continued on next page

BLR / BLRM
SFBM / MMBM

End Mills – Ball

2, 3, 4 Flute – Reduced Neck (cont.)

Continued from previous page

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0020"	(h6)	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	L_3 +.015" −.015" +.38 mm −.38 mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	2.0 mm	.0787	2.0 mm	7.0 mm	1.9 mm	2	6 mm	57 mm	MMBM-020-7	41.00	MMBM-020-7X	46.55
	2.0 mm	.0787	2.0 mm	15.0 mm	1.9 mm	2	6 mm	57 mm	MMBM-020-15	41.00	MMBM-020-15X	46.55
	2.0 mm	.0787	2.0 mm	20.0 mm	1.9 mm	2	6 mm	57 mm	MMBM-020-20	41.00	MMBM-020-20X	46.55
	2.0 mm	.0787	2.5 mm	9.5 mm	1.95 mm	2	6 mm	57 mm	SFBM-020-9	51.10	SFBM-020-9X	56.65
	2.0 mm	.0787	5.0 mm	15.0 mm	1.5 mm	4	6 mm	57 mm			BLRM-020-4X	40.45
	3.0 mm	.1181	3.0 mm	12.0 mm	2.9 mm	2	6 mm	57 mm			MMBM-030-12X	46.55
	3.0 mm	.1181	3.0 mm	15.0 mm	2.9 mm	2	6 mm	57 mm	MMBM-030-15	41.00	MMBM-030-15X	46.55
	3.0 mm	.1181	4.0 mm	8.0 mm	2.9 mm	2	6 mm	57 mm	SFBM-030-8	45.70	SFBM-030-8X	51.35
	3.0 mm	.1181	4.0 mm	15.0 mm	2.9 mm	2	6 mm	57 mm	SFBM-030-15	49.00	SFBM-030-15X	54.55
	3.0 mm	.1181	8.0 mm	30.0 mm	2.5 mm	2	6 mm	75 mm	BLRM-030-2	36.80	BLRM-030-2X	42.45
	3.0 mm	.1181	8.0 mm	30.0 mm	2.5 mm	4	6 mm	75 mm	BLRM-030-4	36.80		
	4.0 mm	.1575	4.0 mm	15.0 mm	3.8 mm	2	6 mm	57 mm	MMBM-040-15	41.00	MMBM-040-15X	46.55
	4.0 mm	.1575	5.0 mm	10.0 mm	3.9 mm	2	6 mm	57 mm			SFBM-040-10X	51.35
	4.0 mm	.1575	8.0 mm	30.0 mm	3.5 mm	2	6 mm	75 mm	BLRM-040-2	36.80	BLRM-040-2X	42.45
	4.0 mm	.1575	8.0 mm	30.0 mm	3.5 mm	4	6 mm	75 mm	BLRM-040-4	36.80	BLRM-040-4X	42.45

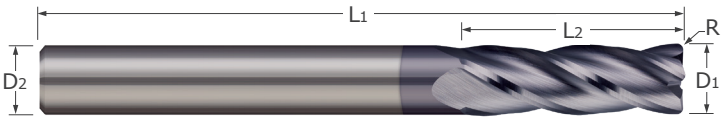
D_1 +.0000" −.0030"	(h6)	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	L_3 +.030" −.030" +.38 mm −.38 mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.1875		.1875	.375	2.00	.1675	2	.1875	3.0			BLR-187-2X	47.85
.1875		.1875	.375	2.00	.1675	4	.1875	3.0			BLR-187-4X	47.85
	5 mm	.1969	6.0 mm	11.0 mm	4.9 mm	2	6 mm	57 mm			SFBM-050-11X	48.95
	6 mm	.2362	7.5 mm	12.2 mm	5.9 mm	2	6 mm	57 mm	SFBM-060-12	42.80	SFBM-060-12X	48.35
	6 mm	.2362	12.0 mm	50.0 mm	5.5 mm	4	6 mm	100 mm			BLRM-060-4X	52.75
	6 mm	.2362	12.0 mm	50.0 mm	5.5 mm	3	6 mm	100 mm			BLRM-060-3X	52.75
.2500		.2500	.500	2.50	.2300	2	.2500	4.0	BLR-250-2	52.40	BLR-250-2X	57.85
.2500		.2500	.500	2.50	.2300	4	.2500	4.0	BLR-250-4	52.40	BLR-250-4X	57.85
	8 mm	.3150	14.0 mm	50.0 mm	7.5 mm	2	8 mm	100 mm	BLRM-080-2	64.50	BLRM-080-2X	70.85
	8 mm	.3150	14.0 mm	50.0 mm	7.5 mm	4	8 mm	100 mm			BLRM-080-4X	70.85
.3750		.3750	.750	2.75	.3550	4	.3750	4.0	BLR-375-4	69.50	BLR-375-4X	79.20
	10 mm	.3937	18.0 mm	65.0 mm	9.5 mm	4	10 mm	120 mm	BLRM-100-4	72.40	BLRM-100-4X	83.65
.4375		.4375	1.000	4.50	.4175	2	.4375	6.0	BLR-437-2	104.90		
	12 mm	.4724	22.0 mm	80.0 mm	11.5 mm	2	12 mm	130 mm	BLRM-120-2	101.40		
	12 mm	.4724	22.0 mm	80.0 mm	11.5 mm	3	12 mm	130 mm			BLRM-120-3X	115.15
	12 mm	.4724	22.0 mm	80.0 mm	11.5 mm	4	12 mm	130 mm			BLRM-120-4X	115.15
.5000		.5000	1.000	4.50	.4800	2	.5000	6.0	BLR-500-2	119.90	BLR-500-2X	135.85
.5000		.5000	1.000	4.50	.4800	4	.5000	6.0	BLR-500-4	119.90		
.6250		.6250	1.250	4.50	.6050	2	.6250	6.0	BLR-625-2	212.50		
	16 mm	.6299	30.0 mm	100.0 mm	15.5 mm	4	16 mm	150 mm	BLRM-160-4	179.10		
	20 mm	.7874	38.0 mm	100.0 mm	19.5 mm	3	20 mm	150 mm	BLRM-200-3	293.00	BLRM-200-3X	318.60
	20 mm	.7874	38.0 mm	100.0 mm	19.5 mm	2	20 mm	150 mm			BLRM-200-2X	318.60

*.0005" / .013 mm max TIR. SFBM and MMBM tools held to h8 tolerance

End Mills – Corner Radius

2, 3, 4 Flute

AECM / GEC



- Designed for general purpose machining
- 30° helix
- Center cutting
- Corner radius profile
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

Cutter Diameter*			Length of Cut	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" −.0020"	(h9)	decimal equiv.	L2 +.031" −.000" +.79 mm −.00 mm	R +.0000" −.0005" +.000 mm −.013 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
.0312		.0312	.078	.005	2	.1250	1.5	GEC-031-2-005	21.10		
.0312		.0312	.078	.005	3	.1250	1.5	GEC-031-3-005	21.10	GEC-031-3-005X	23.95
.0312		.0312	.078	.005	4	.1250	1.5			GEC-031-4-005X	23.95
	1 mm	.0394	4 mm	0.1 mm	4	4 mm	50 mm			AECM-0101-4X	26.55
	1 mm	.0394	4 mm	0.2 mm	4	4 mm	50 mm			AECM-0102-4X	26.55
.0625		.0625	.188	.005	2	.1250	1.5	GEC-062-2-005	19.00		
.0625		.0625	.188	.005	3	.1250	1.5			GEC-062-3-005X	21.95
.0625		.0625	.188	.005	4	.1250	1.5	GEC-062-4-005	19.00	GEC-062-4-005X	21.95
.0625		.0625	.188	.010	3	.1250	1.5	GEC-062-3-010	19.00	GEC-062-3-010X	21.95
.0625		.0625	.188	.010	4	.1250	1.5	GEC-062-4-010	19.00	GEC-062-4-010X	21.95
	2 mm	.0787	5 mm	0.2 mm	4	4 mm	50 mm			AECM-0202-4X	26.55
	2 mm	.0787	5 mm	0.5 mm	4	4 mm	50 mm			AECM-0205-4X	26.55
.0938		.0938	.375	.005	4	.1250	1.5			GEC-093-4-005X	21.95
.0938		.0938	.375	.010	2	.1250	1.5	GEC-093-2-010	19.00		
.0938		.0938	.375	.010	3	.1250	1.5	GEC-093-3-010	19.00	GEC-093-3-010X	21.95
.0938		.0938	.375	.010	4	.1250	1.5			GEC-093-4-010X	21.95
	3 mm	.1181	8 mm	0.5 mm	4	6 mm	57 mm			AECM-0305-4X	35.05
.1250		.1250	.500	.010	3	.1250	1.5	GEC-125-3-010	19.00	GEC-125-3-010X	21.95
.1250		.1250	.500	.010	4	.1250	1.5	GEC-125-4-010	19.00	GEC-125-4-010X	21.95
.1250		.1250	.500	.020	2	.1250	1.5			GEC-125-2-020X	21.95
.1250		.1250	.500	.020	3	.1250	1.5	GEC-125-3-020	19.00	GEC-125-3-020X	21.95
.1250		.1250	.500	.020	4	.1250	1.5	GEC-125-4-020	19.00	GEC-125-4-020X	21.95
	4 mm	.1575	11 mm	0.2 mm	4	6 mm	57 mm			AECM-0402-4X	35.05
	4 mm	.1575	11 mm	0.5 mm	4	6 mm	57 mm			AECM-0405-4X	35.05
.1875		.1875	.625	.010	4	.1875	2.0			GEC-187-4-010X	30.35
.1875		.1875	.625	.020	3	.1875	2.0	GEC-187-3-020	27.00		
.1875		.1875	.625	.030	2	.1875	2.0	GEC-187-2-030	27.00		
.1875		.1875	.625	.030	3	.1875	2.0	GEC-187-3-030	27.00	GEC-187-3-030X	30.35
.1875		.1875	.625	.030	4	.1875	2.0			GEC-187-4-030X	30.35
	6 mm	.2362	16 mm	0.3 mm	4	6 mm	57 mm	AECM-0603-4	29.40	AECM-0603-4X	35.05
	6 mm	.2362	16 mm	0.5 mm	4	6 mm	57 mm	AECM-0605-4	29.40	AECM-0605-4X	35.05
	6 mm	.2362	16 mm	1.0 mm	4	6 mm	57 mm			AECM-0610-4X	35.05

*.0005" / .013 mm max TIR

Continued on next page

AECM / GEC

End Mills – Corner Radius

2, 3, 4 Flute (cont.)

Continued from previous page

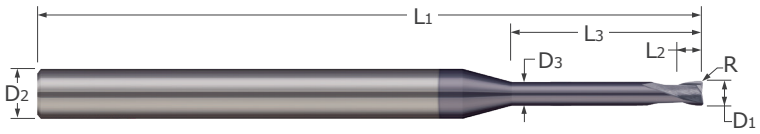
Cutter Diameter*			Length of Cut	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0020"	(h9)	decimal equiv.	L_2 +.031" −.000" +.79 mm −.00 mm	R +.0000" −.0005" +.000 mm −.013 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.2500		.2500	.750	.010	4	.2500	2.5	GEC-250-4-010	33.90	GEC-250-4-010X	39.55
.2500		.2500	.750	.020	2	.2500	2.5	GEC-250-2-020	33.90		
.2500		.2500	.750	.020	3	.2500	2.5			GEC-250-3-020X	39.55
.2500		.2500	.750	.020	4	.2500	2.5			GEC-250-4-020X	39.55
.2500		.2500	.750	.030	3	.2500	2.5	GEC-250-3-030	33.90	GEC-250-3-030X	39.55
.2500		.2500	.750	.030	4	.2500	2.5	GEC-250-4-030	33.90	GEC-250-4-030X	39.55
D_1 +.0000" −.0030"	(h9)	decimal equiv.	L_2 +.031" −.000" +.79 mm −.00 mm	R +.0000" −.0005" +.000 mm −.013 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.3125		.3125	.813	.010	2	.3125	2.5	GEC-312-2-010	39.40	GEC-312-2-010X	47.45
.3125		.3125	.813	.010	4	.3125	2.5	GEC-312-4-010	39.40	GEC-312-4-010X	47.45
.3125		.3125	.813	.020	2	.3125	2.5	GEC-312-2-020	39.40		
	8 mm	.3150	22 mm	1.0 mm	2	8 mm	63 mm	AECM-0810-2	36.20		
.3750		.3750	.875	.010	2	.3750	2.5	GEC-375-2-010	44.80		
.3750		.3750	.875	.010	4	.3750	2.5	GEC-375-4-010	44.80	GEC-375-4-010X	52.65
.3750		.3750	.875	.030	3	.3750	2.5	GEC-375-3-030	44.80	GEC-375-3-030X	52.65
.3750		.3750	.875	.030	4	.3750	2.5			GEC-375-4-030X	52.65
	10 mm	.3937	25 mm	0.5 mm	4	10 mm	72 mm	AECM-1005-4	42.70		
	10 mm	.3937	25 mm	1.5 mm	4	10 mm	72 mm	AECM-1015-4	42.70		
	12 mm	.4724	30 mm	0.5 mm	4	12 mm	83 mm	AECM-1205-4	68.10		
	12 mm	.4724	30 mm	1.5 mm	2	12 mm	83 mm			AECM-1215-2X	80.70
	12 mm	.4724	30 mm	1.5 mm	3	12 mm	83 mm			AECM-1215-3X	80.70
	12 mm	.4724	30 mm	1.5 mm	4	12 mm	83 mm	AECM-1215-4	68.10	AECM-1215-4X	80.05
.5000		.5000	1.000	.010	4	.5000	3.0	GEC-500-4-010	77.50	GEC-500-4-010X	86.75
.5000		.5000	1.000	.030	3	.5000	3.0	GEC-500-3-030	77.50		
.6250		.6250	1.250	.020	2	.6250	3.5	GEC-625-2-020	137.10		
.6250		.6250	1.250	.030	3	.6250	3.5	GEC-625-3-030	137.10		
.6250		.6250	1.250	.030	2	.6250	3.5	GEC-625-2-060	137.10		
.6250		.6250	1.250	.090	2	.6250	3.5	GEC-625-2-090	137.10		
.6250		.6250	1.250	.090	3	.6250	3.5	GEC-625-3-090	137.10		
.7500		.7500	1.500	.020	2	.7500	4.0	GEC-750-2-020	209.00		
1.0000		1.0000	1.500	.020	2	1.0000	4.0	GEC-001-2-020	316.60		
1.0000		1.0000	1.500	.030	2	1.0000	4.0	GEC-001-2-030	316.60		
1.0000		1.0000	1.500	.060	2	1.0000	4.0	GEC-001-2-060	316.60		
1.0000		1.0000	1.500	.060	2	1.0000	4.0	GEC-001-2-090	316.60		

*.0005" / .013 mm max TIR

End Mills – Corner Radius

2 Flute – Reduced Neck

MMRM



- Designed for mold making applications
- Manufactured to tighter cutter diameter tolerance (h8) for mold making applications
- Long reach for deep pocket milling
- Reduced neck diameter to avoid heeling
- Corner radius profile
- 30° helix
- Center cutting
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

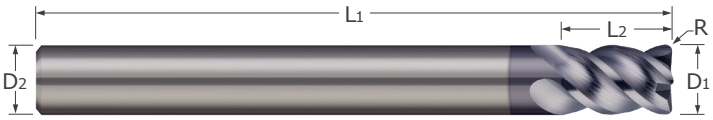
Cutter Diameter*	Length of Cut	Corner Radius	Overall Reach	Neck Diameter	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 (h8)	L_2 $^{+.38mm}_{-.00mm}$	R $^{+.000mm}_{-.013mm}$	L_3 $^{+.25mm}_{-.00mm}$	D_3 $^{+.00mm}_{-.13mm}$	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
0.8 mm	0.8 mm	0.1 mm	10 mm	0.78 mm	4 mm	50 mm	MMRM-008-10	33.70	MMRM-008-10X	36.95
1 mm	1 mm	0.1 mm	8 mm	0.95 mm	6 mm	57 mm	MMRM-010-8	37.30		
1.5 mm	1.5 mm	0.15 mm	7 mm	1.45 mm	6 mm	57 mm	MMRM-015-7	37.30		
1.5 mm	1.5 mm	0.15 mm	15 mm	1.45 mm	6 mm	57 mm	MMRM-015-15	37.30		
1.5 mm	1.5 mm	0.15 mm	25 mm	1.45 mm	6 mm	72 mm	MMRM-015-25	37.30	MMRM-015-25X	42.85
4 mm	4 mm	0.25 mm	9 mm	3.8 mm	6 mm	57 mm	MMRM-040-9	37.30		
4 mm	4 mm	0.25 mm	15 mm	3.8 mm	6 mm	57 mm			MMRM-040-15X	42.85
6 mm	6 mm	1 mm	11 mm	5.8 mm	6 mm	57 mm	MMRM-060-11	37.30	MMRM-060-11X	42.85
10 mm	10 mm	1 mm	25 mm	9.8 mm	10 mm	72 mm	MMRM-100-25	56.60		
12 mm	12 mm	1.5 mm	25 mm	11.8 mm	12 mm	83 mm	MMRM-120-25	90.60		

*.0005" / .013 mm max TIR

HMCM

End Mills For Hardened Steels

Corner Radius – 4 Flute



- Designed for high performance in hardened tool, die, stainless, and mold steels
- Optimized geometry for increased edge strength in hard milling applications
- Corner radius profile for added edge strength
- 45° helix ■ Center cutting
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide ■ CNC ground in the USA

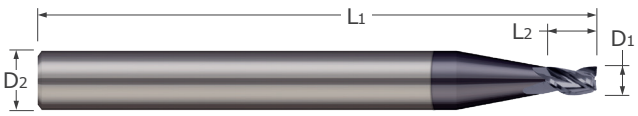
Cutter Diameter*	Length of Cut	Corner Radius	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 (h8)	L_2 $^{+.38\ mm}_{-.00\ mm}$	R $^{+.000\ mm}_{-.013\ mm}$	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
3 mm	8 mm	0.5 mm	6 mm	57 mm			HMCM-0305-4X	83.95
4 mm	11 mm	0.5 mm	6 mm	57 mm	HMCM-0405-4	78.70		
6 mm	13 mm	1.0 mm	6 mm	57 mm			HMCM-0610-4X	90.25
8 mm	19 mm	0.5 mm	8 mm	75 mm			HMCM-0805-4X	99.80
8 mm	19 mm	1.0 mm	8 mm	75 mm	HMCM-0810-4	91.50		
8 mm	19 mm	1.5 mm	8 mm	75 mm			HMCM-0815-4X	99.80
8 mm	19 mm	2.0 mm	8 mm	75 mm	HMCM-0820-4	91.50		
10 mm	22 mm	0.5 mm	10 mm	80 mm	HMCM-1005-4	100.80	HMCM-1005-4X	108.15
12 mm	26 mm	0.5 mm	12 mm	100 mm			HMCM-1205-4X	138.95
12 mm	26 mm	1.0 mm	12 mm	100 mm			HMCM-1210-4X	138.95
12 mm	26 mm	1.5 mm	12 mm	100 mm			HMCM-1215-4X	138.95
16 mm	32 mm	1.0 mm	16 mm	110 mm			HMCM-1610-4X	289.55
16 mm	32 mm	2.0 mm	16 mm	110 mm			HMCM-1620-4X	289.55
20 mm	38 mm	1.0 mm	20 mm	125 mm			HMCM-2010-4X	396.90
20 mm	38 mm	1.5 mm	20 mm	125 mm			HMCM-2015-4X	396.90
20 mm	38 mm	1.5 mm	20 mm	125 mm	HMCM-2015-4	373.30		
20 mm	38 mm	2.0 mm	20 mm	125 mm	HMCM-2020-4	373.30	HMCM-2020-4X	396.90
20 mm	38 mm	3.0 mm	20 mm	125 mm	HMCM-2030-4	373.30	HMCM-2030-4X	396.90

*.0005" / .013 mm max TIR

End Mills For Steels & High Temp Alloys

Square – 2 & 3 Flute – Stub Flute

MEF / MEFM



- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Stub flutes for maximum rigidity
- Square profile ■ 20° helix ■ Center cutting
- nACRo® coating option for added heat resistance in difficult-to-machine materials
- Solid carbide ■ CNC ground in the USA

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	0.1 mm	.0039	0.15 mm	2	3 mm	38 mm			MEFM-001-015K	82.20
	0.15 mm	.0059	0.25 mm	2	3 mm	38 mm			MEFM-0015-025K	66.80
	0.2 mm	.0079	0.3 mm	2	3 mm	38 mm	MEFM-002-030	52.10	MEFM-002-030K	56.50
.0100		.0100	.015	2	.1250	1.5	MEF-010-015	46.20		
	0.3 mm	.0118	0.45 mm	2	3 mm	38 mm	MEFM-003-045	46.20	MEFM-003-045K	50.60
.0150		.0150	.023	2	.1250	1.5	MEF-015-023	41.00	MEF-015-023K	45.50
.0150		.0150	.023	3	.1250	1.5	MEF-015-023-3	41.00	MEF-015-023-3K	45.50
	0.4 mm	.0157	0.6 mm	2	3 mm	38 mm	MEFM-004-060	41.00	MEFM-004-060K	45.65
.0200		.0200	.030	2	.1250	1.5			MEF-020-030K	33.45
	0.6 mm	.0236	0.9 mm	2	3 mm	38 mm	MEFM-006-090	28.80	MEFM-006-090K	33.20
.0250		.0250	.038	2	.1250	1.5	MEF-025-038	28.80	MEF-025-038K	33.20
.0300		.0300	.045	2	.1250	1.5	MEF-030-045	26.40	MEF-030-045K	30.80
.0300		.0300	.045	3	.1250	1.5	MEF-030-045-3	26.40	MEF-030-045-3K	30.80
.0313		.0313	.047	2	.1250	1.5	MEF-031-047	26.40	MEF-031-047K	30.80
.0313		.0313	.047	3	.1250	1.5			MEF-031-047-3K	30.80
	0.8 mm	.0315	1.2 mm	2	3 mm	38 mm	MEFM-008-120	26.40	MEFM-008-120K	30.80
.0350		.0350	.053	2	.1250	1.5	MEF-035-053	26.40	MEF-035-053K	30.80
	1 mm	.0394	1.5 mm	2	3 mm	38 mm	MEFM-010-150	26.40		
.0400		.0400	.060	2	.1250	1.5	MEF-040-060	26.40	MEF-040-060K	30.80
.0400		.0400	.060	3	.1250	1.5	MEF-040-060-3	26.40	MEF-040-060-3K	30.80
.0450		.0450	.068	2	.1250	1.5	MEF-045-068	26.40	MEF-045-068K	30.80
.0450		.0450	.068	3	.1250	1.5	MEF-045-068-3	26.40	MEF-045-068-3K	30.80
.0469		.0469	.071	2	.1250	1.5	MEF-047-071	26.40	MEF-047-071K	30.80
.0469		.0469	.071	3	.1250	1.5	MEF-047-071-3	26.40	MEF-047-071-3K	30.80
	1.2 mm	.0472	1.8 mm	2	3 mm	38 mm	MEFM-012-180	26.40	MEFM-012-180K	30.80
.0500		.0500	.075	2	.1250	1.5	MEF-050-075	26.40		
.0500		.0500	.075	3	.1250	1.5			MEF-050-075-3K	30.80
.0600		.0600	.090	2	.1250	1.5	MEF-060-090	26.40	MEF-060-090K	30.80
.0600		.0600	.090	3	.1250	1.5	MEF-060-090-3	26.40	MEF-060-090-3K	30.80
.0750		.0750	.113	2	.1250	1.5	MEF-075-113	26.40	MEF-075-113K	30.80
.0750		.0750	.113	3	.1250	1.5	MEF-075-113-3	26.40	MEF-075-113-3K	30.80
.0900		.0900	.125	2	.1250	1.5	MEF-090-125	26.40		
	2.5 mm	.0984	3 mm	2	3 mm	38 mm			MEFM-025-300K	30.95
	3 mm	.1181	3 mm	2	6 mm	57 mm	MEFM-030-300	34.90		
	4 mm	.1575	5 mm	2	6 mm	57 mm	MEFM-040-500	34.90	MEFM-040-500K	41.30
.1875		.1875	.200	2	.2500	2.5			MEF-187-250K	43.70

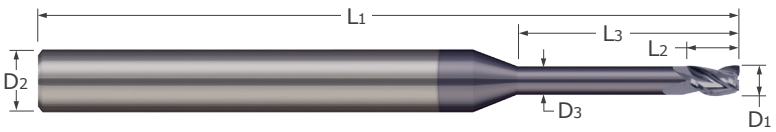
D_1 +.0000" −.0010"	decimal equiv.	L_2 +.015" −.000"		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.2500	.2500	.250	2	.2500	2.5	MEF-250-250	34.90	MEF-250-250K	41.55

*.0005" / .013 mm max TIR

MEF / MEFM

End Mills For Steels & High Temp Alloys

Square – 2 & 3 Flute – Long Reach, Stub Flute



- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Long reach for deep pocket milling
- Stub flutes for maximum rigidity
- Reduced neck diameter to avoid heeling
- Square profile ■ 20° helix ■ Center cutting
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide ■ CNC ground in the USA

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L2 +.015" −.000" +.38 mm −.00 mm	L3 +.010" −.010" +.25 mm −.00 mm	D3		D2 (h6)	L1	Tool #	Price	Tool #	Price
.0100		.0100	.015	.050	.009	2	.1250	1.5	MEF-010-050	52.40		
.0100		.0100	.015	.050	.009	3	.1250	1.5	MEF-010-050-3	52.40	MEF-010-050-3K	56.80
.0100		.0100	.015	.075	.009	2	.1250	1.5	MEF-010-075	52.40	MEF-010-075K	56.80
.0100		.0100	.015	.075	.009	3	.1250	1.5	MEF-010-075-3	52.40		
.0150		.0150	.023	.100	.014	2	.1250	1.5	MEF-015-100	47.10	MEF-015-100K	51.60
.0150		.0150	.023	.100	.014	3	.1250	1.5	MEF-015-100-3	47.10		
.0150		.0150	.023	.200	.014	2	.1250	1.5	MEF-015-200	48.40	MEF-015-200K	52.80
.0150		.0150	.023	.200	.014	3	.1250	1.5	MEF-015-200-3	48.40	MEF-015-200-3K	52.80
.0200		.0200	.030	.150	.019	2	.1250	1.5			MEF-020-150K	39.55
.0200		.0200	.030	.250	.019	2	.1250	1.5	MEF-020-250	36.10	MEF-020-250K	40.50
.0200		.0200	.030	.250	.019	3	.1250	1.5	MEF-020-250-3	36.10	MEF-020-250-3K	40.50
	0.6 mm	.0236	0.9 mm	3 mm	0.55 mm	2	3 mm	38 mm	MEFM-006-300	34.90		
	0.6 mm	.0236	0.9 mm	5 mm	0.55 mm	2	3 mm	38 mm	MEFM-006-500	36.10	MEFM-006-500K	40.50
	0.6 mm	.0236	0.9 mm	6 mm	0.55 mm	2	3 mm	38 mm			MEFM-006-600K	42.40
.0250		.0250	.038	.250	.024	3	.1250	1.5	MEF-025-250-3	36.10	MEF-025-250-3K	40.50
.0250		.0250	.038	.250	.024	2	.1250	1.5	MEF-025-250	36.10	MEF-025-250K	40.50
.0300		.0300	.045	.100	.028	2	.1250	1.5	MEF-030-100	32.50	MEF-030-100K	36.90
.0300		.0300	.045	.100	.028	3	.1250	1.5	MEF-030-100-3	32.50	MEF-030-100-3K	36.90
.0300		.0300	.045	.200	.028	2	.1250	1.5	MEF-030-200	33.70		
.0300		.0300	.045	.200	.028	3	.1250	1.5	MEF-030-200-3	33.70		
.0300		.0300	.045	.375	.028	2	.1250	1.5	MEF-030-375	37.40		
.0300		.0300	.045	.375	.028	3	.1250	1.5	MEF-030-375-3	37.40	MEF-030-375-3K	41.80
.0313		.0313	.047	.100	.029	2	.1250	1.5	MEF-031-100	32.50	MEF-031-100K	36.90
.0313		.0313	.047	.100	.029	3	.1250	1.5			MEF-031-100-3K	36.90
.0313		.0313	.047	.200	.029	2	.1250	1.5	MEF-031-200	33.70	MEF-031-200K	38.10
.0313		.0313	.047	.200	.029	3	.1250	1.5	MEF-031-200-3	33.70	MEF-031-200-3K	38.10
.0313		.0313	.047	.375	.029	2	.1250	1.5	MEF-031-375	37.40	MEF-031-375K	41.80
.0313		.0313	.047	.375	.029	3	.1250	1.5	MEF-031-375-3	37.40	MEF-031-375-3K	41.80
	0.8 mm	.0315	1.2 mm	4 mm	0.75 mm	2	3 mm	38 mm	MEFM-008-400	34.90	MEFM-008-400K	39.30
	0.8 mm	.0315	1.2 mm	7 mm	0.75 mm	2	3 mm	38 mm	MEFM-008-700	38.00	MEFM-008-700K	42.40
	0.8 mm	.0315	1.2 mm	9 mm	0.75 mm	2	3 mm	38 mm			MEFM-008-900K	47.30
.0350		.0350	.053	.150	.033	2	.1250	1.5	MEF-035-150	32.50		
.0350		.0350	.053	.150	.033	3	.1250	1.5	MEF-035-150-3	32.50	MEF-035-150-3K	36.90
.0350		.0350	.053	.250	.033	2	.1250	1.5	MEF-035-250	33.70		
.0350		.0350	.053	.250	.033	3	.1250	1.5	MEF-035-250-3	33.70	MEF-035-250-3K	38.10
.0350		.0350	.053	.400	.033	3	.1250	1.5	MEF-035-400-3	37.40	MEF-035-400-3K	41.80

*.0005" / .013 mm max TIR

Continued on next page

End Mills For Steels & High Temp Alloys

Square – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

MEF / MEFM

Continued from previous page

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	L_3 +.010" −.010" +.25 mm −.00 mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	1 mm	.0394	1.5 mm	4 mm	0.95 mm	2	3 mm	38 mm			MEFM-010-400K	39.55
	1 mm	.0394	1.5 mm	7 mm	0.95 mm	2	3 mm	38 mm	MEFM-010-700	38.00	MEFM-010-700K	42.40
.0400		.0400	.060	.250	.038	3	.1250	1.5	MEF-040-250-3	33.70		
.0400		.0400	.060	.500	.038	2	.1250	1.5	MEF-040-500	39.80	MEF-040-500K	44.20
.0450		.0450	.068	.150	.043	2	.1250	1.5	MEF-045-150	32.50	MEF-045-150K	36.90
.0450		.0450	.068	.150	.043	3	.1250	1.5	MEF-045-150-3	32.50	MEF-045-150-3K	36.90
.0450		.0450	.068	.250	.043	2	.1250	1.5	MEF-045-250	33.70	MEF-045-250K	38.10
.0450		.0450	.068	.250	.043	3	.1250	1.5	MEF-045-250-3	33.70	MEF-045-250-3K	38.10
.0450		.0450	.068	.500	.043	2	.1250	1.5			MEF-045-500K	44.20
.0450		.0450	.068	.500	.043	3	.1250	1.5	MEF-045-500-3	39.80	MEF-045-500-3K	44.20
.0469		.0469	.071	.150	.045	2	.1250	1.5	MEF-047-150	32.50	MEF-047-150K	36.90
.0469		.0469	.071	.150	.045	3	.1250	1.5	MEF-047-150-3	32.50	MEF-047-150-3K	36.90
.0469		.0469	.071	.250	.045	2	.1250	1.5			MEF-047-250K	38.10
.0469		.0469	.071	.250	.045	3	.1250	1.5			MEF-047-250-3K	38.10
.0469		.0469	.071	.500	.045	2	.1250	1.5	MEF-047-500	39.80		
	1.2 mm	.0472	1.8 mm	6 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-600	38.00	MEFM-012-600K	42.40
	1.2 mm	.0472	1.8 mm	10 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-1000	42.90	MEFM-012-1000K	47.30
	1.2 mm	.0472	1.8 mm	12 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-1200	46.20	MEFM-012-1200K	50.60
.0500		.0500	.075	.200	.048	2	.1250	1.5			MEF-050-200K	36.90
.0500		.0500	.075	.200	.048	3	.1250	1.5	MEF-050-200-3	32.50	MEF-050-200-3K	36.90
.0500		.0500	.075	.300	.048	2	.1250	1.5	MEF-050-300	34.90	MEF-050-300K	39.30
.0500		.0500	.075	.300	.048	3	.1250	1.5	MEF-050-300-3	34.90		
.0500		.0500	.075	.550	.048	2	.1250	1.5			MEF-050-550K	44.45
.0500		.0500	.075	.550	.048	3	.1250	1.5			MEF-050-550-3K	44.45
	1.5 mm	.0591	2.2 mm	6 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-600	38.00		
	1.5 mm	.0591	2.2 mm	10 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1000	42.90		
	1.5 mm	.0591	2.2 mm	12 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1200	46.20	MEFM-015-1200K	50.60
.0600		.0600	.090	.200	.056	2	.1250	1.5	MEF-060-200	32.50		
.0600		.0600	.090	.200	.056	3	.1250	1.5			MEF-060-200-3K	36.90
.0600		.0600	.090	.350	.056	2	.1250	1.5	MEF-060-350	34.90		
.0600		.0600	.090	.350	.056	3	.1250	1.5	MEF-060-350-3	34.90		
.0600		.0600	.090	.500	.056	2	.1250	1.5	MEF-060-500	39.80	MEF-060-500K	44.20
.0600		.0600	.090	.500	.056	3	.1250	1.5	MEF-060-500-3	39.80		
.0600		.0600	.090	.750	.056	2	.1250	2.0	MEF-060-750	46.00	MEF-060-750K	50.40
.0600		.0600	.090	.750	.056	3	.1250	2.0	MEF-060-750-3	46.00	MEF-060-750-3K	50.40
.0625		.0625	.093	.200	.058	2	.1250	1.5	MEF-062-200	32.50	MEF-062-200K	36.90
.0625		.0625	.093	.200	.058	3	.1250	1.5	MEF-062-200-3	32.50	MEF-062-200-3K	36.90
.0625		.0625	.093	.350	.058	2	.1250	1.5	MEF-062-350	34.90	MEF-062-350K	39.30
.0625		.0625	.093	.350	.058	3	.1250	1.5			MEF-062-350-3K	39.55
.0625		.0625	.093	.550	.058	2	.1250	1.5	MEF-062-550	39.80	MEF-062-550K	44.20
.0625		.0625	.093	.750	.058	2	.1250	2.0	MEF-062-750	46.00		
.0625		.0625	.093	.750	.058	3	.1250	2.0	MEF-062-750-3	46.00	MEF-062-750-3K	50.40
.0750		.0750	.113	.250	.071	2	.1250	1.5	MEF-075-250	32.50	MEF-075-250K	36.90
.0750		.0750	.113	.250	.071	3	.1250	1.5	MEF-075-250-3	32.50	MEF-075-250-3K	36.90
.0750		.0750	.113	.400	.071	2	.1250	1.5			MEF-075-400K	39.30
.0750		.0750	.113	.400	.071	3	.1250	1.5	MEF-075-400-3	34.90		
.0750		.0750	.113	.600	.071	2	.1250	2.0	MEF-075-600	39.80		
.0750		.0750	.113	.600	.071	3	.1250	2.0	MEF-075-600-3	39.80		
.0750		.0750	.113	.900	.071	2	.1250	2.0	MEF-075-900	47.80	MEF-075-900K	52.20
.0750		.0750	.113	.900	.071	3	.1250	2.0	MEF-075-900-3	47.80	MEF-075-900-3K	52.20

*.0005" / .013 mm max TIR

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MEF / MEFM

End Mills For Steels & High Temp Alloys

Square – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

Continued from previous page

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	L_3 +.010" −.010" +.25 mm −.00 mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0781		.0781	.117	.250	.074	2	.1250	1.5	MEF-078-250	32.50	MEF-078-250K	36.90
.0781		.0781	.117	.250	.074	3	.1250	1.5	MEF-078-250-3	32.50		
.0781		.0781	.117	.400	.074	2	.1250	1.5			MEF-078-400K	39.55
.0781		.0781	.117	.650	.074	2	.1250	2.0	MEF-078-650	39.80	MEF-078-650K	44.20
.0781		.0781	.117	.900	.074	2	.1250	2.0	MEF-078-900	47.80	MEF-078-900K	52.20
.0781		.0781	.117	.900	.074	3	.1250	2.0	MEF-078-900-3	47.80	MEF-078-900-3K	52.20
	2 mm	.0787	2.5 mm	7 mm	1.9 mm	2	3 mm	38 mm	MEFM-020-700	38.00		
	2 mm	.0787	2.5 mm	12 mm	1.9 mm	2	3 mm	38 mm			MEFM-020-1200K	50.85
	2 mm	.0787	2.5 mm	16 mm	1.9 mm	2	3 mm	38 mm			MEFM-020-1600K	53.65
	2 mm	.0787	2.5 mm	20 mm	1.9 mm	2	3 mm	50 mm	MEFM-020-2000	61.20	MEFM-020-2000K	65.60
	2 mm	.0787	2.5 mm	25 mm	1.9 mm	2	3 mm	50 mm	MEFM-020-2500	69.80	MEFM-020-2500K	74.20
.0900		.0900	.125	.250	.086	2	.1250	1.5	MEF-090-250	32.50	MEF-090-250K	36.90
.0900		.0900	.125	.400	.086	2	.1250	1.5	MEF-090-400	34.90	MEF-090-400K	39.30
.0900		.0900	.125	.900	.086	2	.1250	2.0	MEF-090-900	43.50	MEF-090-900K	47.90
.0938		.0938	.125	.250	.089	2	.1250	1.5	MEF-093-250	32.50		
.0938		.0938	.125	.500	.089	2	.1250	1.5			MEF-093-500K	39.55
.0938		.0938	.125	.750	.089	2	.1250	2.0	MEF-093-750	39.80	MEF-093-750K	44.20
.0938		.0938	.125	1.000	.089	2	.1250	2.0	MEF-093-1000	46.00	MEF-093-1000K	50.40
	2.5 mm	.0984	3 mm	10 mm	2.4 mm	2	3 mm	38 mm	MEFM-025-1000	42.20	MEFM-025-1000K	46.60
	2.5 mm	.0984	3 mm	20 mm	2.4 mm	2	3 mm	50 mm	MEFM-025-2000	61.20	MEFM-025-2000K	65.60
	2.5 mm	.0984	3 mm	25 mm	2.4 mm	2	3 mm	50 mm	MEFM-025-2500	69.80	MEFM-025-2500K	74.20
	3 mm	.1181	3 mm	15 mm	2.9 mm	2	6 mm	57 mm	MEFM-030-1500	50.20	MEFM-030-1500K	56.50
	3 mm	.1181	3 mm	30 mm	2.9 mm	2	6 mm	57 mm			MEFM-030-3000K	75.45
.1250		.1250	.125	1.000	.121	2	.1875	2.0	MEF-125-1000	46.00		
.1250		.1250	.125	1.500	.121	2	.1875	3.0	MEF-125-1500	52.60		
	4 mm	.1575	5 mm	30 mm	3.9 mm	2	6 mm	57 mm	MEFM-040-3000	67.30	MEFM-040-3000K	73.70
.1875		.1875	.200	1.000	.183	2	.2500	2.5			MEF-187-1000K	65.10
.1875		.1875	.200	1.500	.183	2	.2500	3	MEF-187-1500	67.30	MEF-187-1500K	73.70
.1875		.1875	.200	.500	.183	2	.2500	2.5	MEF-187-500	42.60		
.1875		.1875	.200	.750	.183	2	.2500	2.5	MEF-187-750	50.20	MEF-187-750K	56.50
	5 mm	.1969	6 mm	25 mm	4.9 mm	2	6 mm	57 mm	MEFM-050-2500	58.80	MEFM-050-2500K	65.10
	5 mm	.1969	6 mm	30 mm	4.9 mm	2	6 mm	57 mm	MEFM-050-3000	67.30	MEFM-050-3000K	73.70

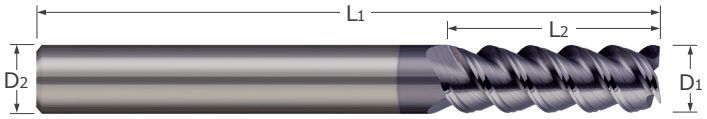
D_1 +.0000" −.0010"	decimal equiv.	L_2 +.015" −.000"	L_3 +.010" −.010"	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.2500	.2500	.250	1.000	.246	2	.2500	2.5	MEF-250-1000	58.80	MEF-250-1000K	65.10
.2500	.2500	.250	1.500	.246	2	.2500	3.0	MEF-250-1500	67.30		
.2500	.2500	.250	.750	.246	2	.2500	2.5	MEF-250-750	50.20	MEF-250-750K	56.50

*.0005" / .013 mm max TIR

End Mills For Steels & High Temp Alloys

Square – 3 & 4 Flute

SDH / SDHM



- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- 60° high helix for reduced cutting forces and increased material removal rates
- Square profile
- Center cutting
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

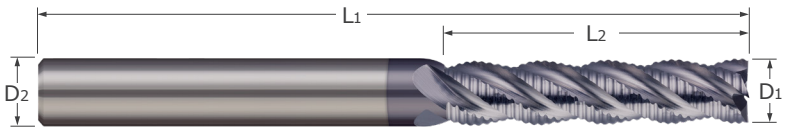
Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" −.0030"	(h9)	decimal equiv.	L2 +.030" −.000" +.78 mm −.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
	6 mm	.2362	18 mm	3	6 mm	57 mm	SDHM-060-3	26.60		
.2500		.2500	.750	3	.2500	2.5	SDH-250-03	32.40	SDH-250-03X	38.15
.2813		.2813	.750	3	.3125	2.5	SDH-281-03	37.60		
	12 mm	.4724	30 mm	4	12 mm	83 mm	SDHM-120-4	61.90		
.5000		.5000	1.000	3	.5000	3.0	SDH-500-03	74.30		
.5000		.5000	1.000	4	.5000	3.0			SDH-500-04X	83.65
	14 mm	.5512	35 mm	3	14 mm	83 mm	SDHM-140-3	75.40		
	16 mm	.6299	35 mm	3	16 mm	92 mm			SDHM-160-3X	134.35
	18 mm	.7087	45 mm	3	18 mm	92 mm	SDHM-180-3	161.80	SDHM-180-3X	177.65
	18 mm	.7087	45 mm	4	18 mm	92 mm	SDHM-180-4	161.80		
	20 mm	.7874	45 mm	3	20 mm	104 mm			SDHM-200-3X	229.90
	20 mm	.7874	45 mm	4	20 mm	104 mm	SDHM-200-4	206.30		

*.0005" / .013 mm max TIR

SHR / SHRM
SHL / SHLM

End Mills For Steels & High Temp Alloys

Square – 4 Flute – Chipbreaker Rougher



- Designed for roughing in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Integrated chipbreaker geometry generates increased material removal rates
- Available in standard and long length of cut options
- Weldon flat featured on sizes 3/8" and larger
- Square profile ■ 38° helix ■ Center cutting
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide ■ CNC ground in the USA

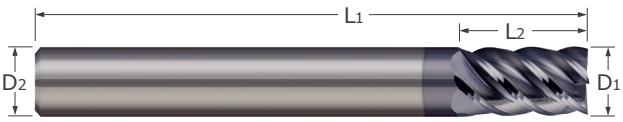
Cutter Diameter*			Length of Cut	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" −.0030"	(h9)	decimal equiv.	L2 +.030" −.000" +.78 mm −.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
	6 mm	.2362	16 mm	4	6 mm	57 mm	SHRM-060-4	44.20	SHRM-060-4X	49.75
	6 mm	.2362	25 mm	4	6 mm	75 mm	SHLM-060-4	56.50	SHLM-060-4X	61.95
.2500		.2500	.750	4	.2500	2.5			SHR-250-4X	50.45
.2500		.2500	1.125	4	.2500	3.0			SHL-250-4X	62.95
.3125		.3125	.813	4	.3125	2.5			SHR-312-4X	57.95
.3125		.3125	1.125	4	.3125	3.0			SHL-312-4X	72.25
	8 mm	.3150	22 mm	4	8 mm	63 mm			SHRM-080-4X	59.15
	8 mm	.3150	30 mm	4	8 mm	75 mm	SHLM-080-4	64.80		
.3750		.3750	.875	4	.3750	2.5	SHR-375-4	63.10	SHR-375-4X	70.75
.3750		.3750	1.250	4	.3750	3.0			SHL-375-4X	89.35
	10 mm	.3937	25 mm	4	10 mm	72 mm			SHRM-100-4X	76.85
	10 mm	.3937	38 mm	4	10 mm	100 mm	SHLM-100-4	84.90	SHLM-100-4X	94.35
	12 mm	.4724	30 mm	4	12 mm	83 mm			SHRM-120-4X	100.25
	12 mm	.4724	50 mm	4	12 mm	100 mm	SHLM-120-4	114.20	SHLM-120-4X	127.30
.5000		.5000	1.000	4	.5000	3.0	SHR-500-4	92.20	SHR-500-4X	101.35
.5000		.5000	2.000	4	.5000	4.5			SHL-500-4X	130.05
	14 mm	.5512	35 mm	4	14 mm	83 mm	SHRM-140-4	147.70	SHRM-140-4X	160.25
.6250		.6250	1.250	4	.6250	3.5	SHR-625-4	163.80	SHR-625-4X	177.35
.6250		.6250	2.500	4	.6250	5.0			SHL-625-4X	224.45
	16 mm	.6299	35 mm	4	16 mm	92 mm			SHRM-160-4X	178.35
	16 mm	.6299	75 mm	4	16 mm	150 mm			SHLM-160-4X	230.50
	18 mm	.7087	75 mm	4	18 mm	150 mm			SHLM-180-4X	319.60
.7500		.7500	1.500	4	.7500	4.0			SHR-750-4X	245.85
.7500		.7500	2.500	4	.7500	5.0			SHL-750-4X	312.25
	20 mm	.7874	45 mm	4	20 mm	104 mm			SHRM-200-4X	294.95

*.0005" / .013 mm max TIR

End Mills For Steels & High Temp Alloys

Square – 5 Flute – Stub & Standard

ASM / ASMM
ARM / ARMM



- Designed for applications in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- 45° high helix for reduced cutting forces and increased material removal rates
- Stub flutes for maximum rigidity
- Square profile
- Center cutting
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

Cutter Diameter*			Length of Cut	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" −.0020"	(h9)	decimal equiv.	L2 +.031" −.000" +.79 mm −.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
	3 mm	.1181	6 mm	5	6 mm	57 mm	ASMM-030-5	31.60	ASMM-030-5X	37.35
	4 mm	.1575	15 mm	5	6 mm	57 mm	ARMM-040-5	33.30		
.1875		.1875	.625	5	.1875	2.0	ARM-187-5	28.20		
	5 mm	.1969	10 mm	5	6 mm	57 mm	ASMM-050-5	31.60		
.2500		.2500	.750	5	.2500	2.5	ARM-250-5	35.40		

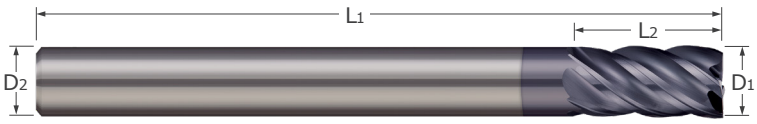
D1 +.0000" −.0030"	(h9)	decimal equiv.	L2 +.031" −.000" +.79 mm −.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
	8 mm	.3150	16 mm	5	8 mm	63 mm	ASMM-080-5	37.50		
.3750		.3750	.625	5	.3750	2.0	ASM-375-5	43.80		
	10 mm	.3937	19 mm	5	10 mm	72 mm	ASMM-100-5	44.40		
	10 mm	.3937	25 mm	5	10 mm	72 mm	ARMM-100-5	46.50	ARMM-100-5X	54.45
	12 mm	.4724	22 mm	5	12 mm	83 mm	ASMM-120-5	71.20		
.5000		.5000	.625	5	.5000	2.5	ASM-500-5	68.80	ASM-500-5X	78.05
.5000		.5000	1.000	5	.5000	3.0	ARM-500-5	77.70	ARM-500-5X	86.95
	14 mm	.5512	30 mm	5	14 mm	83 mm			ARMM-140-5X	120.65
	16 mm	.6299	35 mm	5	16 mm	92 mm			ARMM-160-5X	151.45
	18 mm	.7087	45 mm	5	18 mm	92 mm			ARMM-180-5X	200.35

*.0005" / .013 mm max TIR

VHS / VHM

End Mills For Steels & High Temp Alloys

Square – 5 Flute – Variable Helix



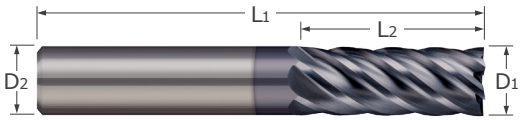
- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Variable helix design reduces chatter and harmonics and increases material removal rates
- Square profile
- Center cutting
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Cutter Diameter	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
D_1 $^{+.0000''}_{-.0030''}$	L_2 $^{+.015''}_{-.000''}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.5000	.625	5	.5000	3.0			VHS-500-5K	85.10
.5000	1.000	5	.5000	3.0			VHM-500-5K	93.65
.5000	1.250	5	.5000	3.5	VHM-5125-5	84.90	VHM-5125-5K	98.65
.7500	1.500	5	.7500	4.0	VHM-750-5	224.20		

EMH / EMHM

End Mills For Steels & High Temp Alloys

Square – 4 & 6 Flute



- Designed for finishing in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- 38° helix for superior surface finish
- Square profile
- Weldon flat featured on sizes 3/8" and larger on ANSI shanks only
- Center cutting
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

Cutter Diameter*			Length of Cut	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D_1 $^{+.0000"}_{-.0002"}$	(h9)	decimal equiv.	L_2 $^{+.030"}_{-.000"}$ $^{+.78\ mm}_{-.00\ mm}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	6 mm	.2362	18 mm	4	6 mm	57 mm			EMHM-060-4X	32.35
	6 mm	.2362	18 mm	6	6 mm	57 mm	EMHM-060-6	26.60		

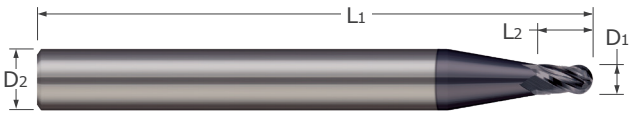
D_1 $^{+.0000"}_{-.0003"}$	(h9)	decimal equiv.	L_2 $^{+.030"}_{-.000"}$ $^{+.78\ mm}_{-.00\ mm}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.2813		.2813	.750	6	.3125	2.5	EMH-281-06	41.10	EMH-281-06X	48.80
	8 mm	.3150	20 mm	4	8 mm	63 mm	EMHM-080-4	33.00	EMHM-080-4X	40.95
	10 mm	.3937	22 mm	6	10 mm	72 mm			EMHM-100-6X	46.45
	12 mm	.4724	25 mm	6	12 mm	83 mm	EMHM-120-6	61.90		
	14 mm	.5512	30 mm	6	14 mm	83 mm	EMHM-140-6	75.40		
.6250		.6250	1.250	6	.6250	3.5	EMH-625-06	143.00		
	16 mm	.6299	35 mm	6	16 mm	92 mm			EMHM-160-6X	134.25
	20 mm	.7874	45 mm	6	20 mm	104 mm			EMHM-200-6X	229.90

*.0005" / .013 mm max TIR

End Mills For Steels & High Temp Alloys

Ball – 2 & 3 Flute – Stub Flute

BEF / BEFM



- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Stub flutes for maximum rigidity
- Ball profile
- 20° helix
- Center cutting
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	0.2 mm	.0079	0.3 mm	2	3 mm	38 mm	BEFM-002-030	60.90	BEFM-002-030K	65.30
	0.3 mm	.0118	0.45 mm	2	3 mm	38 mm	BEFM-003-045	54.20		
.0150		.0150	.023	2	.1250	1.5			BEF-015-023K	53.10
.0200		.0200	.030	2	.1250	1.5			BEF-020-030K	38.40
.0200		.0200	.030	3	.1250	1.5	BEF-020-030-3	34.00	BEF-020-030-3K	38.40
.0313		.0313	.047	3	.1250	1.5	BEF-031-047-3	31.30		
.0350		.0350	.053	3	.1250	1.5	BEF-035-053-3	31.30	BEF-035-053-3K	35.70
	1 mm	.0394	1.5 mm	2	3 mm	38 mm	BEFM-010-150	31.30		
.0400		.0400	.060	2	.1250	1.5	BEF-040-060	31.30	BEF-040-060K	35.70
.0400		.0400	.060	3	.1250	1.5	BEF-040-060-3	31.30	BEF-040-060-3K	35.70
.0450		.0450	.068	2	.1250	1.5	BEF-045-068	31.30	BEF-045-068K	35.70
.0450		.0450	.068	3	.1250	1.5	BEF-045-068-3	31.30	BEF-045-068-3K	35.70
.0469		.0469	.071	3	.1250	1.5			BEF-047-071-3K	35.95
	1.2 mm	.0472	1.8 mm	2	3 mm	38 mm			BEFM-012-180K	36.05
.0500		.0500	.075	2	.1250	1.5	BEF-050-075	31.30		
.0500		.0500	.075	3	.1250	1.5			BEF-050-075-3K	35.95
.0600		.0600	.090	2	.1250	1.5	BEF-060-090	31.30	BEF-060-090K	35.70
.0600		.0600	.090	3	.1250	1.5	BEF-060-090-3	31.30	BEF-060-090-3K	35.95
.0625		.0625	.093	2	.1250	1.5	BEF-062-093	31.30		
.0625		.0625	.093	3	.1250	1.5	BEF-062-093-3	31.30		
.0750		.0750	.113	2	.1250	1.5			BEF-075-113K	35.95
.0750		.0750	.113	3	.1250	1.5	BEF-075-113-3	31.30	BEF-075-113-3K	35.95
.0781		.0781	.117	2	.1250	1.5			BEF-078-117K	35.70
.0781		.0781	.117	3	.1250	1.5	BEF-078-117-3	31.30	BEF-078-117-3K	35.70
.0900		.0900	.125	2	.1250	1.5	BEF-090-125	31.30	BEF-090-125K	35.70
.0938		.0938	.125	2	.1250	1.5	BEF-093-125	31.30		
	2.5 mm	.0984	3 mm	2	3 mm	38 mm	BEFM-025-300	31.30		
	3 mm	.1181	3 mm	2	6 mm	57 mm	BEFM-030-300	45.20		
.1875		.1875	.200	2	.2500	2.5	BEF-187-250	45.20	BEF-187-250K	51.60
	5 mm	.1969	6 mm	2	6 mm	57 mm	BEFM-050-600	45.20	BEFM-050-600K	50.95

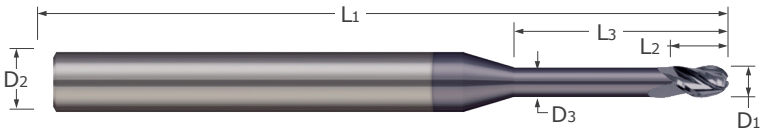
D_1 +.0000" −.0010"	decimal equiv.	L_2 +.015" −.000"		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.2500	.2500	.250	2	.2500	2.5	BEF-250-250	45.20		

*.0005" / .013 mm max TIR

BEF / BEFM

End Mills For Steels & High Temp Alloys

Ball – 2 & 3 Flute – Long Reach, Stub Flute



- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Long reach for deep pocket milling
- Stub flutes for maximum rigidity
- Reduced neck diameter to avoid heeling
- Ball profile ■ 20° helix ■ Center cutting
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide ■ CNC ground in the USA

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	L_3 +.010" −.000" +.25 mm −.00 mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0150		.0150	.023	.100	.014	2	.1250	1.5	BEF-015-100	54.20	BEF-015-100K	58.60
.0150		.0150	.023	.200	.014	2	.1250	1.5	BEF-015-200	55.40	BEF-015-200K	59.80
.0150		.0150	.023	.200	.014	3	.1250	1.5	BEF-015-200-3	55.40		
.0150		.0150	.023	.200	.014	3	.1250	1.5			BEF-015-200-3K	59.80
	0.5 mm	.0197	0.7 mm	3 mm	0.45 mm	2	3 mm	38 mm	BEFM-005-300	40.10		
	0.5 mm	.0197	0.7 mm	6 mm	0.45 mm	2	3 mm	38 mm			BEFM-005-600K	47.55
.0200		.0200	.030	.150	.019	2	.1250	1.5	BEF-020-150	40.10		
.0200		.0200	.030	.150	.019	3	.1250	1.5	BEF-020-150-3	40.10		
.0200		.0200	.030	.250	.019	3	.1250	1.5	BEF-020-250-3	41.30		
	0.6 mm	.0236	0.9 mm	3 mm	0.55 mm	2	3 mm	38 mm	BEFM-006-300	40.10		
	0.6 mm	.0236	0.9 mm	5 mm	0.55 mm	2	3 mm	38 mm	BEFM-006-500	41.30	BEFM-006-500K	45.70
	0.6 mm	.0236	0.9 mm	6 mm	0.55 mm	2	3 mm	38 mm	BEFM-006-600	42.90	BEFM-006-600K	47.55
.0250		.0250	.038	.150	.024	2	.1250	1.5	BEF-025-150	40.10	BEF-025-150K	44.50
.0250		.0250	.038	.150	.024	3	.1250	1.5	BEF-025-150-3	40.10	BEF-025-150-3K	44.50
.0250		.0250	.038	.250	.024	2	.1250	1.5	BEF-025-250	41.30	BEF-025-250K	45.70
.0250		.0250	.038	.250	.024	3	.1250	1.5	BEF-025-250-3	41.30	BEF-025-250-3K	45.70
.0300		.0300	.045	.125	.028	2	.1250	1.5	BEF-030-100	37.40	BEF-030-100K	41.80
.0300		.0300	.045	.125	.028	3	.1250	1.5	BEF-030-100-3	37.40	BEF-030-100-3K	42.05
.0300		.0300	.045	.200	.028	2	.1250	1.5	BEF-030-200	38.60		
.0300		.0300	.045	.200	.028	3	.1250	1.5	BEF-030-200-3	38.60	BEF-030-200-3K	43.00
.0300		.0300	.045	.375	.028	2	.1250	1.5			BEF-030-375K	43.15
.0300		.0300	.045	.375	.028	3	.1250	1.5	BEF-030-375-3	38.60	BEF-030-375-3K	43.00
.0313		.0313	.047	.125	.029	2	.1250	1.5	BEF-031-100	37.40	BEF-031-100K	42.05
.0313		.0313	.047	.125	.029	3	.1250	1.5	BEF-031-100-3	37.40	BEF-031-100-3K	41.80
.0313		.0313	.047	.200	.029	2	.1250	1.5	BEF-031-200	38.60	BEF-031-200K	43.00
.0313		.0313	.047	.200	.029	3	.1250	1.5	BEF-031-200-3	38.60		
.0313		.0313	.047	.375	.029	2	.1250	1.5	BEF-031-375	42.20	BEF-031-375K	46.60
.0313		.0313	.047	.375	.029	3	.1250	1.5	BEF-031-375-3	42.20	BEF-031-375-3K	46.60

*.0005" / .013 mm max TIR

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End Mills For Steels & High Temp Alloys

Ball – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

BEF / BEFM

Continued from previous page

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	L_3 +.010" −.000" +.25 mm −.00 mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	0.8 mm	.0315	1.2 mm	4 mm	0.75 mm	2	3 mm	38 mm	BEFM-008-400	37.40	BEFM-008-400K	41.80
	0.8 mm	.0315	1.2 mm	7 mm	0.75 mm	2	3 mm	38 mm	BEFM-008-700	38.60	BEFM-008-700K	43.00
	0.8 mm	.0315	1.2 mm	9 mm	0.75 mm	2	3 mm	38 mm	BEFM-008-900	42.20		
.0350		.0350	.053	.150	.033	2	.1250	1.5	BEF-035-150	37.40	BEF-035-150K	41.80
.0350		.0350	.053	.150	.033	3	.1250	1.5	BEF-035-150-3	37.40		
.0350		.0350	.053	.250	.033	2	.1250	1.5	BEF-035-250	38.60	BEF-035-250K	43.00
.0350		.0350	.053	.250	.033	3	.1250	1.5	BEF-035-250-3	38.60	BEF-035-250-3K	43.00
.0350		.0350	.053	.400	.033	2	.1250	1.5	BEF-035-400	42.20	BEF-035-400K	46.60
.0350		.0350	.053	.400	.033	3	.1250	1.5	BEF-035-400-3	42.20	BEF-035-400-3K	46.60
.0400		.0400	.060	.150	.038	2	.1250	1.5			BEF-040-150K	41.80
.0400		.0400	.060	.150	.038	3	.1250	1.5	BEF-040-150-3	37.40	BEF-040-150-3K	41.80
.0400		.0400	.060	.250	.038	2	.1250	1.5	BEF-040-250	38.60	BEF-040-250K	43.00
.0400		.0400	.060	.250	.038	3	.1250	1.5			BEF-040-250-3K	43.00
.0400		.0400	.060	.500	.038	2	.1250	1.5			BEF-040-500K	49.35
.0400		.0400	.060	.500	.038	3	.1250	1.5	BEF-040-500-3	44.70	BEF-040-500-3K	49.10
.0450		.0450	.068	.150	.043	2	.1250	1.5	BEF-045-150	37.40	BEF-045-150K	41.80
.0450		.0450	.068	.150	.043	3	.1250	1.5	BEF-045-150-3	37.40	BEF-045-150-3K	41.80
.0450		.0450	.068	.250	.043	2	.1250	1.5	BEF-045-250	38.60	BEF-045-250K	43.00
.0450		.0450	.068	.250	.043	3	.1250	1.5	BEF-045-250-3	38.60	BEF-045-250-3K	43.00
.0450		.0450	.068	.500	.043	2	.1250	1.5	BEF-045-500	44.70	BEF-045-500K	49.10
.0450		.0450	.068	.500	.043	3	.1250	1.5	BEF-045-500-3	44.70		
.0469		.0469	.071	.150	.045	2	.1250	1.5	BEF-047-150	37.40		
.0469		.0469	.071	.150	.045	3	.1250	1.5			BEF-047-150-3K	41.80
.0469		.0469	.071	.250	.045	2	.1250	1.5	BEF-047-250	38.60	BEF-047-250K	43.00
.0469		.0469	.071	.250	.045	3	.1250	1.5	BEF-047-250-3	38.60		
.0469		.0469	.071	.500	.045	2	.1250	1.5			BEF-047-500K	49.10
.0469		.0469	.071	.500	.045	3	.1250	1.5	BEF-047-500-3	44.70	BEF-047-500-3K	49.10
	1.2 mm	.0472	1.8 mm	10 mm	1.1 mm	2	3 mm	38 mm			BEFM-012-1000K	46.60
	1.2 mm	.0472	1.8 mm	12 mm	1.1 mm	2	3 mm	38 mm	BEFM-012-1200	46.30	BEFM-012-1200K	50.70
.0500		.0500	.075	.200	.048	2	.1250	1.5	BEF-050-200	37.40	BEF-050-200K	41.80
.0500		.0500	.075	.200	.048	3	.1250	1.5	BEF-050-200-3	37.40	BEF-050-200-3K	41.80
.0500		.0500	.075	.300	.048	2	.1250	1.5	BEF-050-300	38.60	BEF-050-300K	43.00
.0500		.0500	.075	.300	.048	3	.1250	1.5	BEF-050-300-3	38.60	BEF-050-300-3K	43.00
.0500		.0500	.075	.550	.048	2	.1250	1.5			BEF-050-550K	49.10
.0500		.0500	.075	.550	.048	3	.1250	1.5	BEF-050-550-3	44.70	BEF-050-550-3K	49.10
	1.5 mm	.0591	2.2 mm	6 mm	1.4 mm	2	3 mm	38 mm	BEFM-015-600	38.60	BEFM-015-600K	43.00
	1.5 mm	.0591	2.2 mm	10 mm	1.4 mm	2	3 mm	38 mm	BEFM-015-1000	42.20	BEFM-015-1000K	46.60
	1.5 mm	.0591	2.2 mm	12 mm	1.4 mm	2	3 mm	38 mm	BEFM-015-1200	46.30	BEFM-015-1200K	50.70
	1.5 mm	.0591	2.2 mm	15 mm	1.4 mm	2	3 mm	38 mm	BEFM-015-1500	49.00	BEFM-015-1500K	53.40
	1.5 mm	.0591	2.2 mm	20 mm	1.4 mm	2	3 mm	50 mm	BEFM-015-2000	61.20	BEFM-015-2000K	65.60

*.0005" / .013 mm max TIR

Continued on next page

BEF / BEFM

End Mills For Steels & High Temp Alloys

Ball – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

Continued from previous page

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	L_3 +.010" −.000" +.25 mm −.00 mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0600		.0600	.090	.200	.056	2	.1250	1.5	BEF-060-200	37.40	BEF-060-200K	41.80
.0600		.0600	.090	.200	.056	3	.1250	1.5	BEF-060-200-3	37.40	BEF-060-200-3K	41.80
.0600		.0600	.090	.350	.056	2	.1250	1.5	BEF-060-350	38.60	BEF-060-350K	43.00
.0600		.0600	.090	.350	.056	3	.1250	1.5			BEF-060-350-3K	43.00
.0600		.0600	.090	.500	.056	2	.1250	1.5	BEF-060-500	44.70	BEF-060-500K	49.10
.0600		.0600	.090	.500	.056	3	.1250	1.5	BEF-060-500-3	44.70	BEF-060-500-3K	49.10
.0600		.0600	.090	.750	.056	2	.1250	2.0	BEF-060-750	50.80		
.0600		.0600	.090	.750	.056	3	.1250	2.0	BEF-060-750-3	50.80	BEF-060-750-3K	55.20
.0625		.0625	.093	.200	.058	2	.1250	1.5			BEF-062-200K	42.05
.0625		.0625	.093	.200	.058	3	.1250	1.5	BEF-062-200-3	37.40		
.0625		.0625	.093	.550	.058	2	.1250	1.5	BEF-062-550	44.70	BEF-062-550K	49.10
.0625		.0625	.093	.550	.058	3	.1250	1.5	BEF-062-550-3	44.70	BEF-062-550-3K	49.10
.0625		.0625	.093	.750	.058	2	.1250	2.0	BEF-062-750	50.80	BEF-062-750K	55.20
.0750		.0750	.113	.250	.071	2	.1250	1.5	BEF-075-250	37.40	BEF-075-250K	41.80
.0750		.0750	.113	.250	.071	3	.1250	1.5	BEF-075-250-3	37.40	BEF-075-250-3K	41.80
.0750		.0750	.113	.400	.071	2	.1250	1.5	BEF-075-400	44.70	BEF-075-400K	49.10
.0750		.0750	.113	.400	.071	3	.1250	1.5	BEF-075-400-3	44.70	BEF-075-400-3K	49.10
.0750		.0750	.113	.600	.071	2	.1250	2.0	BEF-075-600	49.60	BEF-075-600K	54.00
.0750		.0750	.113	.600	.071	3	.1250	2.0	BEF-075-600-3	49.60	BEF-075-600-3K	54.00
.0750		.0750	.113	.900	.071	2	.1250	2.0	BEF-075-900	53.60	BEF-075-900K	58.00
.0750		.0750	.113	.900	.071	3	.1250	2.0	BEF-075-900-3	53.60	BEF-075-900-3K	58.00
.0781		.0781	.117	.250	.074	2	.1250	1.5	BEF-078-250	37.40		
.0781		.0781	.117	.250	.074	3	.1250	1.5			BEF-078-250-3K	42.05
.0781		.0781	.117	.400	.074	2	.1250	1.5	BEF-078-400	44.70	BEF-078-400K	49.10
.0781		.0781	.117	.400	.074	3	.1250	1.5	BEF-078-400-3	44.70	BEF-078-400-3K	49.10
.0781		.0781	.117	.650	.074	2	.1250	2.0	BEF-078-650	49.60	BEF-078-650K	54.00
.0781		.0781	.117	.650	.074	3	.1250	2.0	BEF-078-650-3	49.60	BEF-078-650-3K	54.00
.0781		.0781	.117	.900	.074	2	.1250	2.0	BEF-078-900	53.60	BEF-078-900K	58.00
.0781		.0781	.117	.900	.074	3	.1250	2.0	BEF-078-900-3	53.60	BEF-078-900-3K	58.00
	2 mm	.0787	2.5 mm	7 mm	1.9 mm	2	3 mm	38 mm	BEFM-020-700	38.60	BEFM-020-700K	43.00
	2 mm	.0787	2.5 mm	16 mm	1.9 mm	2	3 mm	38 mm	BEFM-020-1600	49.00		
	2 mm	.0787	2.5 mm	20 mm	1.9 mm	2	3 mm	50 mm	BEFM-020-2000	61.20	BEFM-020-2000K	65.60
	2 mm	.0787	2.5 mm	25 mm	1.9 mm	2	3 mm	50 mm	BEFM-020-2500	68.00	BEFM-020-2500K	72.40
.0900		.0900	.125	.250	.086	2	.1250	1.5	BEF-090-250	37.40	BEF-090-250K	41.80
.0900		.0900	.125	.400	.086	2	.1250	1.5	BEF-090-400	44.70	BEF-090-400K	49.10
.0900		.0900	.125	.400	.086	3	.1250	1.5	BEF-090-400-3	44.70		
.0900		.0900	.125	.400	.086	3	.1250	1.5			BEF-090-400-3K	49.10
.0900		.0900	.125	.650	.086	2	.1250	2.0	BEF-090-650	49.60		
.0900		.0900	.125	.650	.086	3	.1250	2.0	BEF-090-650-3	49.60		
.0900		.0900	.125	.650	.086	3	.1250	2.0			BEF-090-650-3K	54.00
.0900		.0900	.125	.900	.086	2	.1250	2.0	BEF-090-900	50.80	BEF-090-900K	55.20

*.0005" / .013 mm max TIR

Continued on next page

End Mills For Steels & High Temp Alloys

Ball – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

BEF / BEFM

Continued from previous page

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	L_3 +.010" −.000" +.25 mm −.00 mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0938		.0938	.125	.250	.089	2	.1250	1.5	BEF-093-250	37.40	BEF-093-250K	41.80
.0938		.0938	.125	.500	.089	2	.1250	1.5	BEF-093-500	44.70	BEF-093-500K	49.10
.0938		.0938	.125	.750	.089	2	.1250	2.0	BEF-093-750	50.80	BEF-093-750K	55.20
.0938		.0938	.125	1.000	.089	2	.1250	2.0	BEF-093-1000	53.60	BEF-093-1000K	58.00
	2.5 mm	.0984	3 mm	10 mm	2.4 mm	2	3 mm	38 mm	BEFM-025-1000	42.20	BEFM-025-1000K	46.60
	2.5 mm	.0984	3 mm	15 mm	2.4 mm	2	3 mm	38 mm	BEFM-025-1500	49.00	BEFM-025-1500K	53.40
	2.5 mm	.0984	3 mm	20 mm	2.4 mm	2	3 mm	50 mm			BEFM-025-2000K	65.60
	2.5 mm	.0984	3 mm	25 mm	2.4 mm	2	3 mm	50 mm	BEFM-025-2500	68.00	BEFM-025-2500K	72.40
	2.5 mm	.0984	3 mm	30 mm	2.4 mm	2	3 mm	60 mm	BEFM-025-3000	74.70	BEFM-025-3000K	79.40
	3 mm	.1181	3 mm	10 mm	2.9 mm	2	6 mm	57 mm	BEFM-030-1000	52.80		
	3 mm	.1181	3 mm	15 mm	2.9 mm	2	6 mm	57 mm	BEFM-030-1500	60.50		
	3 mm	.1181	3 mm	25 mm	2.9 mm	2	6 mm	57 mm	BEFM-030-2500	69.20		
	3 mm	.1181	3 mm	30 mm	2.9 mm	2	6 mm	57 mm	BEFM-030-3000	76.00	BEFM-030-3000K	81.35
.1250		.1250	.125	.375	.121	2	.1875	2.0	BEF-125-375	44.70	BEF-125-375K	49.70
.1250		.1250	.125	.750	.121	2	.1875	2.0	BEF-125-750	50.80	BEF-125-750K	55.80
.1250		.1250	.125	1.000	.121	2	.1875	2.0	BEF-125-1000	53.60	BEF-125-1000K	58.60
.1250		.1250	.125	1.500	.121	2	.1875	3.0	BEF-125-1500	57.50	BEF-125-1500K	62.80
	4 mm	.1575	5 mm	15 mm	3.9 mm	2	6 mm	57 mm	BEFM-040-1500	60.50	BEFM-040-1500K	66.05
	4 mm	.1575	5 mm	25 mm	3.9 mm	2	6 mm	57 mm	BEFM-040-2500	69.20	BEFM-040-2500K	74.75
	4 mm	.1575	5 mm	30 mm	3.9 mm	2	6 mm	57 mm	BEFM-040-3000	76.00	BEFM-040-3000K	81.35
.1875		.1875	.200	.750	.183	2	.2500	2.5	BEF-187-750	50.20		
.1875		.1875	.200	1.000	.183	2	.2500	2.5	BEF-187-1000	58.80		
.1875		.1875	.200	1.500	.183	2	.2500	3.0			BEF-187-1500K	73.95
	5 mm	.1969	6 mm	15 mm	4.9 mm	2	6 mm	57 mm	BEFM-050-1500	60.50	BEFM-050-1500K	66.05
	5 mm	.1969	6 mm	25 mm	4.9 mm	2	6 mm	57 mm	BEFM-050-2500	69.20	BEFM-050-2500K	74.75
	5 mm	.1969	6 mm	30 mm	4.9 mm	2	6 mm	57 mm	BEFM-050-3000	76.00	BEFM-050-3000K	81.35

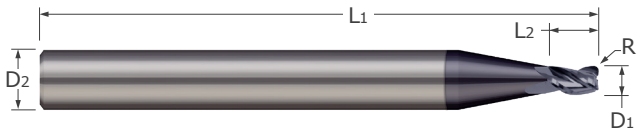
D_1 +.0000" −.0010"	decimal equiv.	L_2 +.015" −.000"	L_3 +.010" −.000"	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.2500	.2500	.250	.500	.246	2	.2500	2.5	BEF-250-500	42.60	BEF-250-500K	49.00
.2500	.2500	.250	.750	.246	2	.2500	2.5	BEF-250-750	50.20	BEF-250-750K	56.50
.2500	.2500	.250	1.000	.246	2	.2500	2.5	BEF-250-1000	58.80	BEF-250-1000K	65.10
.2500	.2500	.250	1.500	.246	2	.2500	3.0	BEF-250-1500	67.30	BEF-250-1500K	73.70

*.0005" / .013 mm max TIR

MEF / MEFM

End Mills For Steels & High Temp Alloys

Corner Radius – 2 & 3 Flute – Stub Flute



- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Stub flutes for maximum rigidity
- Corner radius profile ■ 20° helix ■ Center cutting
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide ■ CNC ground in the USA

Cutter Diameter*			Length of Cut	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	R +.0000" −.0005" +.000 mm −.013 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0150		.0150	.023	.002	2	.1250	1.5			MEF-015-023-002K	52.50
.0150		.0150	.023	.002	3	.1250	1.5	MEF-015-023-3-002	48.10	MEF-015-023-3-002K	52.50
	0.5 mm	.0197	0.7 mm	0.05 mm	2	3 mm	38 mm	MEFM-005-070-05	34.00	MEFM-005-070-05K	38.40
.0200		.0200	.030	.002	2	.1250	1.5	MEF-020-030-002	34.00	MEF-020-030-002K	38.40
.0200		.0200	.030	.002	3	.1250	1.5			MEF-020-030-3-002K	38.65
.0250		.0250	.038	.003	2	.1250	1.5			MEF-025-038-003K	38.65
.0250		.0250	.038	.003	3	.1250	1.5	MEF-025-038-3-003	34.00	MEF-025-038-3-003K	38.65
.0300		.0300	.045	.005	2	.1250	1.5	MEF-030-045-005	31.30	MEF-030-045-005K	35.70
.0300		.0300	.045	.005	3	.1250	1.5	MEF-030-045-3-005	31.30		
.0300		.0300	.045	.010	2	.1250	1.5	MEF-030-045-010	31.30	MEF-030-045-010K	35.95
.0300		.0300	.045	.010	3	.1250	1.5			MEF-030-045-3-010K	35.95
.0313		.0313	.047	.005	2	.1250	1.5	MEF-031-047-005	31.30	MEF-031-047-005K	35.70
.0313		.0313	.047	.005	3	.1250	1.5	MEF-031-047-3-005	31.30		
.0313		.0313	.047	.010	3	.1250	1.5	MEF-031-047-3-010	31.30	MEF-031-047-3-010K	35.95
	0.8 mm	.0315	1.2 mm	0.05 mm	2	3 mm	38 mm	MEFM-008-120-05	31.30	MEFM-008-120-05K	35.70
.0350		.0350	.053	.005	2	.1250	1.5	MEF-035-053-005	31.30	MEF-035-053-005K	35.70
.0350		.0350	.053	.005	3	.1250	1.5	MEF-035-053-3-005	31.30	MEF-035-053-3-005K	35.70
.0350		.0350	.053	.010	2	.1250	1.5	MEF-035-053-010	31.30	MEF-035-053-010K	35.70
.0350		.0350	.053	.010	3	.1250	1.5	MEF-035-053-3-010	31.30	MEF-035-053-3-010K	35.70
	1 mm	.0394	1.5 mm	0.1 mm	2	3 mm	38 mm	MEFM-010-150-10	31.30	MEFM-010-150-10K	35.70
	1 mm	.0394	1.5 mm	0.2 mm	2	3 mm	38 mm	MEFM-010-150-20	31.30	MEFM-010-150-20K	35.70
.0400		.0400	.060	.005	2	.1250	1.5	MEF-040-060-005	31.30	MEF-040-060-005K	35.95
.0400		.0400	.060	.010	2	.1250	1.5	MEF-040-060-010	31.30	MEF-040-060-010K	35.70
.0400		.0400	.060	.010	3	.1250	1.5	MEF-040-060-3-010	31.30	MEF-040-060-3-010K	35.70
.0450		.0450	.068	.005	2	.1250	1.5	MEF-045-068-005	31.30	MEF-045-068-005K	35.70
.0450		.0450	.068	.005	3	.1250	1.5	MEF-045-068-3-005	31.30	MEF-045-068-3-005K	35.70
.0450		.0450	.068	.010	2	.1250	1.5			MEF-045-068-010K	35.95
.0450		.0450	.068	.010	3	.1250	1.5	MEF-045-068-3-010	31.30	MEF-045-068-3-010K	35.70
.0469		.0469	.071	.005	2	.1250	1.5	MEF-047-071-005	31.30	MEF-047-071-005K	35.70
.0469		.0469	.071	.005	3	.1250	1.5	MEF-047-071-3-005	31.30	MEF-047-071-3-005K	35.70
.0469		.0469	.071	.010	2	.1250	1.5	MEF-047-071-010	31.30	MEF-047-071-010K	35.70
.0469		.0469	.071	.010	3	.1250	1.5	MEF-047-071-3-010	31.30		
	1.2 mm	.0472	1.8 mm	0.1 mm	2	3 mm	38 mm	MEFM-012-180-10	31.30	MEFM-012-180-10K	35.70
	1.2 mm	.0472	1.8 mm	0.2 mm	2	3 mm	38 mm	MEFM-012-180-20	31.30	MEFM-012-180-20K	35.70

*.0005" / .013 mm max TIR

Continued on next page

End Mills For Steels & High Temp Alloys

Corner Radius – 2 & 3 Flute – Stub Flute (cont.)

MEF / MEFM

Continued from previous page

Cutter Diameter*			Length of Cut	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	R +.0000" −.0005" +.000 mm −.013 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0500		.0500	.075	.005	2	.1250	1.5	MEF-050-075-005	31.30	MEF-050-075-005K	35.70
.0500		.0500	.075	.005	3	.1250	1.5	MEF-050-075-3-005	31.30	MEF-050-075-3-005K	35.70
.0500		.0500	.075	.010	2	.1250	1.5	MEF-050-075-010	31.30	MEF-050-075-010K	35.70
.0500		.0500	.075	.010	3	.1250	1.5			MEF-050-075-3-010K	35.95
	1.5 mm	.0591	2.2 mm	0.15 mm	2	3 mm	38 mm	MEFM-015-220-15	31.30		
	1.5 mm	.0591	2.2 mm	0.25 mm	2	3 mm	38 mm	MEFM-015-220-25	31.30	MEFM-015-220-25K	35.70
.0600		.0600	.090	.005	2	.1250	1.5	MEF-060-090-005	31.30	MEF-060-090-005K	35.70
.0600		.0600	.090	.005	3	.1250	1.5	MEF-060-090-3-005	31.30	MEF-060-090-3-005K	35.70
.0600		.0600	.090	.010	2	.1250	1.5	MEF-060-090-010	31.30		
.0600		.0600	.090	.010	3	.1250	1.5	MEF-060-090-3-010	31.30	MEF-060-090-3-010K	35.70
.0600		.0600	.090	.015	2	.1250	1.5	MEF-060-090-015	31.30	MEF-060-090-015K	35.70
.0600		.0600	.090	.015	3	.1250	1.5	MEF-060-090-3-015	31.30		
.0625		.0625	.093	.005	2	.1250	1.5	MEF-062-093-005	31.30	MEF-062-093-005K	35.70
.0625		.0625	.093	.005	3	.1250	1.5	MEF-062-093-3-005	31.30		
.0625		.0625	.093	.010	2	.1250	1.5	MEF-062-093-010	31.30	MEF-062-093-010K	35.70
.0625		.0625	.093	.010	3	.1250	1.5	MEF-062-093-3-010	31.30		
.0625		.0625	.093	.015	2	.1250	1.5	MEF-062-093-015	31.30	MEF-062-093-015K	35.95
.0750		.0750	.113	.005	2	.1250	1.5	MEF-075-113-005	31.30	MEF-075-113-005K	35.70
.0750		.0750	.113	.005	3	.1250	1.5	MEF-075-113-3-005	31.30	MEF-075-113-3-005K	35.70
.0750		.0750	.113	.010	2	.1250	1.5	MEF-075-113-010	31.30	MEF-075-113-010K	35.70
.0750		.0750	.113	.010	3	.1250	1.5	MEF-075-113-3-010	31.30	MEF-075-113-3-010K	35.70
.0750		.0750	.113	.015	2	.1250	1.5	MEF-075-113-015	31.30	MEF-075-113-015K	35.70
.0750		.0750	.113	.015	3	.1250	1.5	MEF-075-113-3-015	31.30	MEF-075-113-3-015K	35.70
.0781		.0781	.117	.005	2	.1250	1.5	MEF-078-117-005	31.30	MEF-078-117-005K	35.70
.0781		.0781	.117	.005	3	.1250	1.5	MEF-078-117-3-005	31.30	MEF-078-117-3-005K	35.95
.0781		.0781	.117	.010	2	.1250	1.5	MEF-078-117-010	31.30		
.0781		.0781	.117	.015	2	.1250	1.5	MEF-078-117-015	31.30	MEF-078-117-015K	35.70
.0781		.0781	.117	.015	3	.1250	1.5	MEF-078-117-3-015	31.30	MEF-078-117-3-015K	35.70
	2 mm	.0787	2.5 mm	0.15 mm	2	3 mm	38 mm	MEFM-020-250-15	31.30		
	2 mm	.0787	2.5 mm	0.25 mm	2	3 mm	38 mm	MEFM-020-250-25	31.30	MEFM-020-250-25K	35.95
.0900		.0900	.125	.005	2	.1250	1.5	MEF-090-125-005	31.30	MEF-090-125-005K	35.70
.0900		.0900	.125	.010	2	.1250	1.5	MEF-090-125-010	31.30	MEF-090-125-010K	35.70
.0900		.0900	.125	.015	2	.1250	1.5			MEF-090-125-015K	35.95
.0938		.0938	.125	.005	2	.1250	1.5	MEF-093-125-005	31.30		
.0938		.0938	.125	.010	2	.1250	1.5	MEF-093-125-010	31.30	MEF-093-125-010K	35.70
	3 mm	.1181	3 mm	0.15 mm	2	6 mm	57 mm			MEFM-030-300-15K	51.60
	3 mm	.1181	3 mm	0.25 mm	2	6 mm	57 mm	MEFM-030-300-25	45.20	MEFM-030-300-25K	51.60
.1250		.1250	.125	.005	2	.1875	2.0	MEF-125-125-005	33.70	MEF-125-125-005K	38.70
.1250		.1250	.125	.010	2	.1875	2.0			MEF-125-125-010K	38.70
	4 mm	.1575	5 mm	0.25 mm	2	6 mm	57 mm	MEFM-040-500-25	45.20		
	5 mm	.1969	6 mm	0.25 mm	2	6 mm	57 mm	MEFM-050-600-25	45.20	MEFM-050-600-25K	51.60

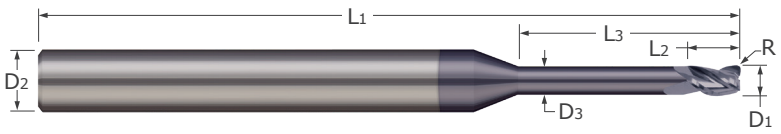
D_1 +.0000" −.0010"	decimal equiv.	L_2 +.015" −.000"	R +.0000" −.0005"		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.2500	.2500	.250	.005	2	.2500	2.5	MEF-250-250-005	45.20	MEF-250-250-005K	51.60
.2500	.2500	.250	.010	2	.2500	2.5	MEF-250-250-010	45.20	MEF-250-250-010K	51.60
.2500	.2500	.250	.015	2	.2500	2.5	MEF-250-250-015	45.20	MEF-250-250-015K	51.60

*.0005" / .013 mm max TIR

MEF / MEFM

End Mills For Steels & High Temp Alloys

Corner Radius – 2 & 3 Flute – Long Reach, Stub Flute



- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Long reach for deep pocket milling
- Stub flutes for maximum rigidity
- Reduced neck diameter to avoid heeling
- Corner radius profile ■ 20° helix ■ Center cutting
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide ■ CNC ground in the USA

Cutter Diameter*		Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000"+.000mm −.0005"−.013mm		L_2 +.015" −.000" +.38mm −.00mm	R +.0000" −.0005" +.000mm −.013mm	L_3 +.010" −.010" +.25mm −.00mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0150	.0150	.023	.002	.100	.014	2	.1250	1.5	MEF-015-100-002	54.20	MEF-015-100-002K	58.60
.0150	.0150	.023	.002	.100	.014	3	.1250	1.5			MEF-015-100-3-002K	58.60
.0150	.0150	.023	.002	.200	.014	2	.1250	1.5	MEF-015-200-002	55.40	MEF-015-200-002K	59.80
.0150	.0150	.023	.002	.200	.014	3	.1250	1.5	MEF-015-200-3-002	55.40	MEF-015-200-3-002K	59.80
0.5 mm	.0197	0.7 mm	0.05 mm	6 mm	0.45 mm	2	3 mm	38 mm	MEFM-005-600-05	42.20	MEFM-005-600-05K	46.60
.0200	.0200	.030	.002	.150	.019	2	.1250	1.5			MEF-020-150-002K	44.50
.0200	.0200	.030	.002	.250	.019	2	.1250	1.5	MEF-020-250-002	41.30		
.0200	.0200	.030	.002	.250	.019	3	.1250	1.5			MEF-020-250-3-002K	45.70
0.6 mm	.0236	0.9 mm	0.05 mm	5 mm	0.55 mm	2	3 mm	38 mm	MEFM-006-500-05	41.30	MEFM-006-500-05K	45.70
0.6 mm	.0236	0.9 mm	0.05 mm	6 mm	0.55 mm	2	3 mm	38 mm	MEFM-006-600-05	45.00	MEFM-006-600-05K	49.40
.0250	.0250	.038	.003	.150	.024	2	.1250	1.5	MEF-025-150-003	40.10	MEF-025-150-003K	44.50
.0250	.0250	.038	.003	.150	.024	3	.1250	1.5			MEF-025-150-3-003K	44.50
.0250	.0250	.038	.003	.250	.024	2	.1250	1.5	MEF-025-250-003	41.30	MEF-025-250-003K	45.70
.0250	.0250	.038	.003	.250	.024	3	.1250	1.5			MEF-025-250-3-003K	45.70
.0300	.0300	.045	.005	.100	.028	2	.1250	1.5	MEF-030-100-005	37.40	MEF-030-100-005K	41.80
.0300	.0300	.045	.005	.100	.028	3	.1250	1.5			MEF-030-100-3-005K	41.80
.0300	.0300	.045	.005	.200	.028	2	.1250	1.5	MEF-030-200-005	38.60	MEF-030-200-005K	43.00
.0300	.0300	.045	.005	.375	.028	2	.1250	1.5	MEF-030-375-005	42.20	MEF-030-375-005K	46.60
.0300	.0300	.045	.005	.375	.028	3	.1250	1.5	MEF-030-375-3-005	42.20	MEF-030-375-3-005K	46.60
.0300	.0300	.045	.010	.100	.028	2	.1250	1.5			MEF-030-100-010K	42.05
.0300	.0300	.045	.010	.100	.028	3	.1250	1.5	MEF-030-100-3-010	37.40	MEF-030-100-3-010K	41.80
.0300	.0300	.045	.010	.200	.028	2	.1250	1.5	MEF-030-200-010	38.60	MEF-030-200-010K	43.00
.0300	.0300	.045	.010	.375	.028	2	.1250	1.5	MEF-030-375-010	42.20	MEF-030-375-010K	46.60
.0300	.0300	.045	.010	.375	.028	3	.1250	1.5	MEF-030-375-3-010	42.20	MEF-030-375-3-010K	46.60
.0313	.0313	.047	.005	.100	.029	2	.1250	1.5	MEF-031-100-005	37.40	MEF-031-100-005K	41.80
.0313	.0313	.047	.005	.100	.029	3	.1250	1.5	MEF-031-100-3-005	37.40	MEF-031-100-3-005K	41.80
.0313	.0313	.047	.005	.200	.029	2	.1250	1.5	MEF-031-200-005	38.60	MEF-031-200-005K	43.00
.0313	.0313	.047	.005	.200	.029	3	.1250	1.5	MEF-031-200-3-005	38.60	MEF-031-200-3-005K	43.00
.0313	.0313	.047	.005	.375	.029	2	.1250	1.5	MEF-031-375-005	42.20	MEF-031-375-005K	46.60
.0313	.0313	.047	.005	.375	.029	3	.1250	1.5	MEF-031-375-3-005	42.20	MEF-031-375-3-005K	46.60
.0313	.0313	.047	.010	.100	.029	2	.1250	1.5	MEF-031-100-010	37.40		
.0313	.0313	.047	.010	.100	.029	3	.1250	1.5	MEF-031-100-3-010	37.40	MEF-031-100-3-010K	41.80

*.0005" / .013 mm max TIR

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End Mills For Steels & High Temp Alloys

Corner Radius – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

MEF / MEFM

Continued from previous page

Cutter Diameter*		Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000"+.000mm −.0005"−.013mm		L_2 +.015" −.000" +.38mm −.00mm	R +.0000" −.0005" +.000mm −.013mm	L_3 +.010" −.010" +.25mm −.00mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0313	.0313	.047	.010	.200	.029	2	.1250	1.5	MEF-031-200-010	38.60	MEF-031-200-010K	43.00
.0313	.0313	.047	.010	.200	.029	3	.1250	1.5	MEF-031-200-3-010	38.60	MEF-031-200-3-010K	43.00
.0313	.0313	.047	.010	.375	.029	2	.1250	1.5	MEF-031-375-010	42.20	MEF-031-375-010K	46.60
.0313	.0313	.047	.010	.375	.029	3	.1250	1.5	MEF-031-375-3-010	42.20	MEF-031-375-3-010K	46.60
0.8 mm	.0315	1.2 mm	0.05 mm	4 mm	0.75 mm	2	3 mm	38 mm			MEFM-008-400-05K	41.50
0.8 mm	.0315	1.2 mm	0.05 mm	7 mm	0.75 mm	2	3 mm	38 mm	MEFM-008-700-05	41.70	MEFM-008-700-05K	46.10
0.8 mm	.0315	1.2 mm	0.05 mm	9 mm	0.75 mm	2	3 mm	38 mm	MEFM-008-900-05	46.50	MEFM-008-900-05K	50.90
.0350	.0350	.053	.005	.150	.033	2	.1250	1.5	MEF-035-150-005	37.40	MEF-035-150-005K	41.80
.0350	.0350	.053	.005	.150	.033	3	.1250	1.5	MEF-035-150-3-005	37.40	MEF-035-150-3-005K	41.80
.0350	.0350	.053	.005	.250	.033	2	.1250	1.5	MEF-035-250-005	38.60	MEF-035-250-005K	43.00
.0350	.0350	.053	.005	.250	.033	3	.1250	1.5	MEF-035-250-3-005	38.60	MEF-035-250-3-005K	43.00
.0350	.0350	.053	.005	.400	.033	2	.1250	1.5	MEF-035-400-005	42.20	MEF-035-400-005K	46.60
.0350	.0350	.053	.005	.400	.033	3	.1250	1.5	MEF-035-400-3-005	42.20	MEF-035-400-3-005K	46.60
.0350	.0350	.053	.010	.150	.033	2	.1250	1.5	MEF-035-150-010	37.40	MEF-035-150-010K	41.80
.0350	.0350	.053	.010	.150	.033	3	.1250	1.5	MEF-035-150-3-010	37.40		
.0350	.0350	.053	.010	.250	.033	2	.1250	1.5	MEF-035-250-010	38.60	MEF-035-250-010K	43.00
.0350	.0350	.053	.010	.250	.033	3	.1250	1.5	MEF-035-250-3-010	38.60	MEF-035-250-3-010K	43.00
.0350	.0350	.053	.010	.400	.033	2	.1250	1.5	MEF-035-400-010	42.20	MEF-035-400-010K	46.60
.0350	.0350	.053	.010	.400	.033	3	.1250	1.5	MEF-035-400-3-010	42.20	MEF-035-400-3-010K	46.60
1 mm	.0394	1.5 mm	0.1 mm	4 mm	0.95 mm	2	3 mm	38 mm	MEFM-010-400-10	37.40		
1 mm	.0394	1.5 mm	0.2 mm	4 mm	0.95 mm	2	3 mm	38 mm	MEFM-010-400-20	37.40		
1 mm	.0394	1.5 mm	0.2 mm	7 mm	0.95 mm	2	3 mm	38 mm	MEFM-010-700-20	41.70	MEFM-010-700-20K	46.10
1 mm	.0394	1.5 mm	0.2 mm	9 mm	0.95 mm	2	3 mm	38 mm	MEFM-010-900-20	46.40		
.0400	.0400	.060	.005	.150	.038	2	.1250	1.5	MEF-040-150-005	37.40	MEF-040-150-005K	41.80
.0400	.0400	.060	.005	.150	.038	3	.1250	1.5	MEF-040-150-3-005	37.40		
.0400	.0400	.060	.005	.250	.038	2	.1250	1.5	MEF-040-250-005	38.60	MEF-040-250-005K	43.00
.0400	.0400	.060	.005	.250	.038	3	.1250	1.5	MEF-040-250-3-005	38.60	MEF-040-250-3-005K	43.00
.0400	.0400	.060	.005	.500	.038	2	.1250	1.5	MEF-040-500-005	44.70	MEF-040-500-005K	49.10
.0400	.0400	.060	.005	.500	.038	3	.1250	1.5	MEF-040-500-3-005	44.70	MEF-040-500-3-005K	49.10
.0400	.0400	.060	.010	.150	.038	2	.1250	1.5	MEF-040-150-010	37.40	MEF-040-150-010K	41.80
.0400	.0400	.060	.010	.150	.038	3	.1250	1.5	MEF-040-150-3-010	37.40	MEF-040-150-3-010K	41.80
.0400	.0400	.060	.010	.250	.038	2	.1250	1.5	MEF-040-250-010	38.60	MEF-040-250-010K	43.00
.0400	.0400	.060	.010	.250	.038	3	.1250	1.5	MEF-040-250-3-010	38.60	MEF-040-250-3-010K	43.00
.0400	.0400	.060	.010	.500	.038	2	.1250	1.5	MEF-040-500-010	44.70	MEF-040-500-010K	49.10
.0400	.0400	.060	.010	.500	.038	3	.1250	1.5	MEF-040-500-3-010	44.70	MEF-040-500-3-010K	49.10
.0450	.0450	.068	.005	.150	.043	2	.1250	1.5	MEF-045-150-005	37.40	MEF-045-150-005K	41.80
.0450	.0450	.068	.005	.150	.043	3	.1250	1.5	MEF-045-150-3-005	37.40	MEF-045-150-3-005K	41.80
.0450	.0450	.068	.005	.250	.043	2	.1250	1.5	MEF-045-250-005	38.60	MEF-045-250-005K	43.00
.0450	.0450	.068	.005	.250	.043	3	.1250	1.5	MEF-045-250-3-005	38.60	MEF-045-250-3-005K	43.00
.0450	.0450	.068	.005	.500	.043	2	.1250	1.5	MEF-045-500-005	44.70	MEF-045-500-005K	49.10
.0450	.0450	.068	.005	.500	.043	3	.1250	1.5	MEF-045-500-3-005	44.70	MEF-045-500-3-005K	49.10
.0450	.0450	.068	.010	.150	.043	2	.1250	1.5	MEF-045-150-010	37.40	MEF-045-150-010K	41.80
.0450	.0450	.068	.010	.150	.043	3	.1250	1.5	MEF-045-150-3-010	37.40	MEF-045-150-3-010K	41.80
.0450	.0450	.068	.010	.250	.043	2	.1250	1.5	MEF-045-250-010	38.60	MEF-045-250-010K	43.00
.0450	.0450	.068	.010	.250	.043	3	.1250	1.5	MEF-045-250-3-010	38.60	MEF-045-250-3-010K	43.00
.0450	.0450	.068	.010	.500	.043	2	.1250	1.5	MEF-045-500-010	44.70	MEF-045-500-010K	49.10
.0450	.0450	.068	.010	.500	.043	3	.1250	1.5	MEF-045-500-3-010	44.70	MEF-045-500-3-010K	49.10

*.0005" / .013 mm max TIR

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End Mills For Steels & High Temp Alloys

Corner Radius – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

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Cutter Diameter*		Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000"+.000mm −.0005"−.013mm		L_2 +.015" −.000" +.38mm −.00mm	R +.0000" −.0005" +.000mm −.013mm	L_3 +.010" −.010" +.25mm −.00mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0469	.0469	.071	.005	.150	.045	2	.1250	1.5	MEF-047-150-005	37.40	MEF-047-150-005K	41.80
.0469	.0469	.071	.005	.150	.045	3	.1250	1.5	MEF-047-150-3-005	37.40	MEF-047-150-3-005K	41.80
.0469	.0469	.071	.005	.250	.045	2	.1250	1.5	MEF-047-250-005	38.60	MEF-047-250-005K	43.00
.0469	.0469	.071	.005	.500	.045	2	.1250	1.5	MEF-047-500-005	44.70		
.0469	.0469	.071	.005	.500	.045	3	.1250	1.5	MEF-047-500-3-005	44.70	MEF-047-500-3-005K	49.10
.0469	.0469	.071	.010	.150	.045	2	.1250	1.5	MEF-047-150-010	37.40	MEF-047-150-010K	41.80
.0469	.0469	.071	.010	.150	.045	3	.1250	1.5	MEF-047-150-3-010	37.40	MEF-047-150-3-010K	41.80
.0469	.0469	.071	.010	.250	.045	2	.1250	1.5	MEF-047-250-010	38.60	MEF-047-250-010K	43.00
.0469	.0469	.071	.010	.250	.045	3	.1250	1.5	MEF-047-250-3-010	38.60	MEF-047-250-3-010K	43.00
.0469	.0469	.071	.010	.500	.045	2	.1250	1.5	MEF-047-500-010	44.70	MEF-047-500-010K	49.10
.0469	.0469	.071	.010	.500	.045	3	.1250	1.5	MEF-047-500-3-010	44.70	MEF-047-500-3-010K	49.10
1.2 mm	.0472	1.8 mm	0.1 mm	6 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-600-10	41.70		
1.2 mm	.0472	1.8 mm	0.1 mm	10 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-1000-10	46.50	MEFM-012-1000-10K	50.90
1.2 mm	.0472	1.8 mm	0.1 mm	12 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-1200-10	50.50	MEFM-012-1200-10K	55.00
1.2 mm	.0472	1.8 mm	0.2 mm	6 mm	1.1 mm	2	3 mm	38 mm			MEFM-012-600-20K	46.10
1.2 mm	.0472	1.8 mm	0.2 mm	10 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-1000-20	46.50	MEFM-012-1000-20K	50.90
1.2 mm	.0472	1.8 mm	0.2 mm	12 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-1200-20	50.50	MEFM-012-1200-20K	55.00
.0500	.0500	.075	.005	.200	.048	2	.1250	1.5	MEF-050-200-005	37.40	MEF-050-200-005K	41.80
.0500	.0500	.075	.005	.200	.048	3	.1250	1.5	MEF-050-200-3-005	37.40	MEF-050-200-3-005K	41.80
.0500	.0500	.075	.005	.300	.048	2	.1250	1.5	MEF-050-300-005	39.80	MEF-050-300-005K	44.20
.0500	.0500	.075	.005	.300	.048	3	.1250	1.5	MEF-050-300-3-005	39.80	MEF-050-300-3-005K	44.20
.0500	.0500	.075	.005	.550	.048	2	.1250	1.5	MEF-050-550-005	44.70	MEF-050-550-005K	49.10
.0500	.0500	.075	.005	.550	.048	3	.1250	1.5	MEF-050-550-3-005	44.70		
.0500	.0500	.075	.010	.200	.048	2	.1250	1.5	MEF-050-200-010	37.40	MEF-050-200-010K	41.80
.0500	.0500	.075	.010	.200	.048	3	.1250	1.5	MEF-050-200-3-010	37.40	MEF-050-200-3-010K	42.05
.0500	.0500	.075	.010	.300	.048	2	.1250	1.5	MEF-050-300-010	39.80	MEF-050-300-010K	44.20
.0500	.0500	.075	.010	.300	.048	3	.1250	1.5	MEF-050-300-3-010	39.80	MEF-050-300-3-010K	44.20
.0500	.0500	.075	.010	.550	.048	2	.1250	1.5			MEF-050-550-010K	49.10
.0500	.0500	.075	.010	.550	.048	3	.1250	1.5	MEF-050-550-3-010	44.70	MEF-050-550-3-010K	49.10
1.5 mm	.0591	2.2 mm	0.15 mm	10 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1000-15	46.50	MEFM-015-1000-15K	50.90
1.5 mm	.0591	2.2 mm	0.15 mm	12 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1200-15	50.50	MEFM-015-1200-15K	55.00
1.5 mm	.0591	2.2 mm	0.15 mm	15 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1500-15	53.30	MEFM-015-1500-15K	57.70
1.5 mm	.0591	2.2 mm	0.15 mm	20 mm	1.4 mm	2	3 mm	50 mm	MEFM-015-2000-15	65.60	MEFM-015-2000-15K	70.00
1.5 mm	.0591	2.2 mm	0.25 mm	10 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1000-25	46.50		
1.5 mm	.0591	2.2 mm	0.25 mm	12 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1200-25	50.50		
1.5 mm	.0591	2.2 mm	0.25 mm	15 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1500-25	53.30	MEFM-015-1500-25K	57.70
1.5 mm	.0591	2.2 mm	0.25 mm	20 mm	1.4 mm	2	3 mm	50 mm	MEFM-015-2000-25	65.60	MEFM-015-2000-25K	70.00
.0600	.0600	.090	.005	.200	.056	2	.1250	1.5	MEF-060-200-005	37.40	MEF-060-200-005K	41.80
.0600	.0600	.090	.005	.200	.056	3	.1250	1.5	MEF-060-200-3-005	37.40	MEF-060-200-3-005K	41.80
.0600	.0600	.090	.005	.350	.056	2	.1250	1.5	MEF-060-350-005	39.80	MEF-060-350-005K	44.20
.0600	.0600	.090	.005	.350	.056	3	.1250	1.5	MEF-060-350-3-005	39.80	MEF-060-350-3-005K	44.20
.0600	.0600	.090	.005	.500	.056	2	.1250	1.5	MEF-060-500-005	44.70	MEF-060-500-005K	49.10
.0600	.0600	.090	.005	.500	.056	3	.1250	1.5	MEF-060-500-3-005	44.70	MEF-060-500-3-005K	49.10
.0600	.0600	.090	.005	.750	.056	2	.1250	2.0	MEF-060-750-005	50.80	MEF-060-750-005K	55.20
.0600	.0600	.090	.005	.750	.056	3	.1250	2.0	MEF-060-750-3-005	50.80	MEF-060-750-3-005K	55.20
.0600	.0600	.090	.010	.200	.056	3	.1250	1.5	MEF-060-200-3-010	37.40	MEF-060-200-3-010K	41.80

*.0005" / .013 mm max TIR

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End Mills For Steels & High Temp Alloys

Corner Radius – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

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Cutter Diameter*		Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000"+.000mm −.0005"−.013mm		L_2 +.015" −.000" +.38mm −.00mm	R +.0000" −.0005" +.000mm −.013mm	L_3 +.010" −.010" +.25mm −.00mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0600	.0600	.090	.010	.350	.056	2	.1250	1.5	MEF-060-350-010	39.80	MEF-060-350-010K	44.20
.0600	.0600	.090	.010	.350	.056	3	.1250	1.5	MEF-060-350-3-010	39.80	MEF-060-350-3-010K	44.20
.0600	.0600	.090	.010	.500	.056	2	.1250	1.5	MEF-060-500-010	44.70	MEF-060-500-010K	49.10
.0600	.0600	.090	.010	.500	.056	3	.1250	1.5	MEF-060-500-3-010	44.70	MEF-060-500-3-010K	49.10
.0600	.0600	.090	.010	.750	.056	2	.1250	2.0	MEF-060-750-010	50.80	MEF-060-750-010K	55.20
.0600	.0600	.090	.010	.750	.056	3	.1250	2.0	MEF-060-750-3-010	50.80	MEF-060-750-3-010K	55.20
.0600	.0600	.090	.015	.200	.056	2	.1250	1.5	MEF-060-200-015	37.40	MEF-060-200-015K	41.80
.0600	.0600	.090	.015	.200	.056	3	.1250	1.5	MEF-060-200-3-015	37.40	MEF-060-200-3-015K	41.80
.0600	.0600	.090	.015	.350	.056	2	.1250	1.5	MEF-060-350-015	39.80	MEF-060-350-015K	44.20
.0600	.0600	.090	.015	.350	.056	3	.1250	1.5	MEF-060-350-3-015	39.80	MEF-060-350-3-015K	44.20
.0600	.0600	.090	.015	.500	.056	2	.1250	1.5	MEF-060-500-015	44.70	MEF-060-500-015K	49.10
.0600	.0600	.090	.015	.500	.056	3	.1250	1.5	MEF-060-500-3-015	44.70	MEF-060-500-3-015K	49.10
.0600	.0600	.090	.015	.750	.056	2	.1250	2.0	MEF-060-750-015	50.80	MEF-060-750-015K	55.20
.0600	.0600	.090	.015	.750	.056	3	.1250	2.0	MEF-060-750-3-015	50.80	MEF-060-750-3-015K	55.20
.0625	.0625	.093	.005	.200	.058	2	.1250	1.5	MEF-062-200-005	37.40	MEF-062-200-005K	41.80
.0625	.0625	.093	.005	.200	.058	3	.1250	1.5	MEF-062-200-3-005	37.40	MEF-062-200-3-005K	41.80
.0625	.0625	.093	.005	.350	.058	2	.1250	1.5	MEF-062-350-005	39.80		
.0625	.0625	.093	.005	.350	.058	3	.1250	1.5	MEF-062-350-3-005	39.80	MEF-062-350-3-005K	44.20
.0625	.0625	.093	.005	.550	.058	2	.1250	1.5	MEF-062-550-005	44.70	MEF-062-550-005K	49.10
.0625	.0625	.093	.005	.550	.058	3	.1250	1.5			MEF-062-550-3-005K	49.10
.0625	.0625	.093	.005	.750	.058	2	.1250	2.0	MEF-062-750-005	50.80	MEF-062-750-005K	55.20
.0625	.0625	.093	.005	.750	.058	3	.1250	2.0	MEF-062-750-3-005	50.80	MEF-062-750-3-005K	55.20
.0625	.0625	.093	.010	.200	.058	2	.1250	1.5	MEF-062-200-010	37.40		
.0625	.0625	.093	.010	.200	.058	3	.1250	1.5	MEF-062-200-3-010	37.40		
.0625	.0625	.093	.010	.350	.058	2	.1250	1.5	MEF-062-350-010	39.80	MEF-062-350-010K	44.20
.0625	.0625	.093	.010	.350	.058	3	.1250	1.5	MEF-062-350-3-010	39.80	MEF-062-350-3-010K	44.20
.0625	.0625	.093	.010	.550	.058	2	.1250	1.5	MEF-062-550-010	44.70	MEF-062-550-010K	49.10
.0625	.0625	.093	.010	.550	.058	3	.1250	1.5	MEF-062-550-3-010	44.70		
.0625	.0625	.093	.010	.750	.058	2	.1250	2.0	MEF-062-750-010	50.80	MEF-062-750-010K	55.20
.0625	.0625	.093	.010	.750	.058	3	.1250	2.0	MEF-062-750-3-010	50.80	MEF-062-750-3-010K	55.20
.0625	.0625	.093	.015	.200	.058	2	.1250	1.5	MEF-062-200-015	37.40	MEF-062-200-015K	42.05
.0625	.0625	.093	.015	.200	.058	3	.1250	1.5	MEF-062-200-3-015	37.40	MEF-062-200-3-015K	41.80
.0625	.0625	.093	.015	.350	.058	2	.1250	1.5	MEF-062-350-015	39.20	MEF-062-350-015K	43.60
.0625	.0625	.093	.015	.350	.058	3	.1250	1.5	MEF-062-350-3-015	39.20	MEF-062-350-3-015K	43.60
.0625	.0625	.093	.015	.550	.058	2	.1250	1.5	MEF-062-550-015	44.70	MEF-062-550-015K	49.10
.0625	.0625	.093	.015	.550	.058	3	.1250	1.5	MEF-062-550-3-015	44.70	MEF-062-550-3-015K	49.10
.0625	.0625	.093	.015	.750	.058	2	.1250	2.0	MEF-062-750-015	50.80	MEF-062-750-015K	55.20
.0625	.0625	.093	.015	.750	.058	3	.1250	2.0	MEF-062-750-3-015	50.80	MEF-062-750-3-015K	55.20
.0750	.0750	.113	.005	.250	.071	2	.1250	1.5	MEF-075-250-005	37.40	MEF-075-250-005K	41.80
.0750	.0750	.113	.005	.250	.071	3	.1250	1.5	MEF-075-250-3-005	37.40	MEF-075-250-3-005K	41.80
.0750	.0750	.113	.005	.400	.071	2	.1250	1.5	MEF-075-400-005	39.80	MEF-075-400-005K	44.20
.0750	.0750	.113	.005	.400	.071	3	.1250	1.5	MEF-075-400-3-005	39.80	MEF-075-400-3-005K	44.20
.0750	.0750	.113	.005	.600	.071	2	.1250	2.0	MEF-075-600-005	44.70	MEF-075-600-005K	49.10
.0750	.0750	.113	.005	.600	.071	3	.1250	2.0	MEF-075-600-3-005	44.70	MEF-075-600-3-005K	49.10
.0750	.0750	.113	.005	.900	.071	2	.1250	2.0	MEF-075-900-005	53.60	MEF-075-900-005K	58.00
.0750	.0750	.113	.005	.900	.071	3	.1250	2.0	MEF-075-900-3-005	53.60	MEF-075-900-3-005K	58.00

*.0005" / .013 mm max TIR

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Corner Radius – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

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Cutter Diameter*		Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000"+.000mm −.0005"−.013mm		L_2 +.015" −.000" +.38mm −.00mm	R +.0000" −.0005" +.000mm −.013mm	L_3 +.010" −.010" +.25mm −.00mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0750	.0750	.113	.010	.250	.071	2	.1250	1.5	MEF-075-250-010	37.40	MEF-075-250-010K	41.80
.0750	.0750	.113	.010	.250	.071	3	.1250	1.5	MEF-075-250-3-010	37.40	MEF-075-250-3-010K	41.80
.0750	.0750	.113	.010	.400	.071	2	.1250	1.5	MEF-075-400-010	39.80	MEF-075-400-010K	44.20
.0750	.0750	.113	.010	.400	.071	3	.1250	1.5	MEF-075-400-3-010	39.80	MEF-075-400-3-010K	44.20
.0750	.0750	.113	.010	.600	.071	2	.1250	2.0	MEF-075-600-010	44.70	MEF-075-600-010K	49.10
.0750	.0750	.113	.010	.600	.071	3	.1250	2.0	MEF-075-600-3-010	44.70	MEF-075-600-3-010K	49.10
.0750	.0750	.113	.010	.900	.071	2	.1250	2.0	MEF-075-900-010	53.60	MEF-075-900-010K	58.00
.0750	.0750	.113	.010	.900	.071	3	.1250	2.0	MEF-075-900-3-010	53.60	MEF-075-900-3-010K	58.00
.0750	.0750	.113	.015	.250	.071	2	.1250	1.5	MEF-075-250-015	37.40	MEF-075-250-015K	41.80
.0750	.0750	.113	.015	.250	.071	3	.1250	1.5	MEF-075-250-3-015	37.40	MEF-075-250-3-015K	41.80
.0750	.0750	.113	.015	.400	.071	2	.1250	1.5	MEF-075-400-015	39.80	MEF-075-400-015K	44.20
.0750	.0750	.113	.015	.400	.071	3	.1250	1.5	MEF-075-400-3-015	39.80	MEF-075-400-3-015K	44.20
.0750	.0750	.113	.015	.600	.071	2	.1250	2.0	MEF-075-600-015	44.70	MEF-075-600-015K	49.10
.0750	.0750	.113	.015	.600	.071	3	.1250	2.0	MEF-075-600-3-015	44.70	MEF-075-600-3-015K	49.10
.0750	.0750	.113	.015	.900	.071	2	.1250	2.0	MEF-075-900-015	53.60	MEF-075-900-015K	58.00
.0750	.0750	.113	.015	.900	.071	3	.1250	2.0	MEF-075-900-3-015	53.60	MEF-075-900-3-015K	58.00
.0781	.0781	.117	.005	.250	.074	2	.1250	1.5	MEF-078-250-005	37.40	MEF-078-250-005K	41.80
.0781	.0781	.117	.005	.250	.074	3	.1250	1.5	MEF-078-250-3-005	37.40	MEF-078-250-3-005K	41.80
.0781	.0781	.117	.005	.400	.074	2	.1250	1.5	MEF-078-400-005	39.80	MEF-078-400-005K	44.20
.0781	.0781	.117	.005	.400	.074	3	.1250	1.5	MEF-078-400-3-005	39.80	MEF-078-400-3-005K	44.20
.0781	.0781	.117	.005	.650	.074	2	.1250	2.0	MEF-078-650-005	44.70	MEF-078-650-005K	49.10
.0781	.0781	.117	.005	.650	.074	3	.1250	2.0	MEF-078-650-3-005	44.70		
.0781	.0781	.117	.005	.900	.074	2	.1250	2.0	MEF-078-900-005	53.60	MEF-078-900-005K	58.00
.0781	.0781	.117	.005	.900	.074	3	.1250	2.0	MEF-078-900-3-005	53.60	MEF-078-900-3-005K	58.00
.0781	.0781	.117	.010	.250	.074	2	.1250	1.5	MEF-078-250-010	37.40	MEF-078-250-010K	42.05
.0781	.0781	.117	.010	.250	.074	3	.1250	1.5	MEF-078-250-3-010	37.40	MEF-078-250-3-010K	41.80
.0781	.0781	.117	.010	.400	.074	2	.1250	1.5	MEF-078-400-010	39.80	MEF-078-400-010K	44.20
.0781	.0781	.117	.010	.400	.074	3	.1250	1.5	MEF-078-400-3-010	39.80	MEF-078-400-3-010K	44.20
.0781	.0781	.117	.010	.650	.074	2	.1250	2.0	MEF-078-650-010	44.70	MEF-078-650-010K	49.10
.0781	.0781	.117	.010	.650	.074	3	.1250	2.0	MEF-078-650-3-010	44.70		
.0781	.0781	.117	.010	.900	.074	2	.1250	2.0	MEF-078-900-010	53.60	MEF-078-900-010K	58.00
.0781	.0781	.117	.010	.900	.074	3	.1250	2.0	MEF-078-900-3-010	53.60	MEF-078-900-3-010K	58.00
.0781	.0781	.117	.015	.250	.074	2	.1250	1.5	MEF-078-250-015	37.40	MEF-078-250-015K	41.80
.0781	.0781	.117	.015	.250	.074	3	.1250	1.5	MEF-078-250-3-015	37.40	MEF-078-250-3-015K	41.80
.0781	.0781	.117	.015	.400	.074	2	.1250	1.5	MEF-078-400-015	39.80	MEF-078-400-015K	44.20
.0781	.0781	.117	.015	.400	.074	3	.1250	1.5	MEF-078-400-3-015	39.80	MEF-078-400-3-015K	44.20
.0781	.0781	.117	.015	.650	.074	2	.1250	2.0	MEF-078-650-015	44.70	MEF-078-650-015K	49.10
.0781	.0781	.117	.015	.900	.074	2	.1250	2.0			MEF-078-900-015K	58.00
.0781	.0781	.117	.015	.900	.074	3	.1250	2.0	MEF-078-900-3-015	53.60	MEF-078-900-3-015K	58.00
2 mm	.0787	2.5 mm	0.15 mm	7 mm	1.9 mm	2	3 mm	38 mm	MEFM-020-700-15	42.90	MEFM-020-700-15K	47.30
2 mm	.0787	2.5 mm	0.15 mm	12 mm	1.9 mm	2	3 mm	38 mm	MEFM-020-1200-15	50.50	MEFM-020-1200-15K	55.00
2 mm	.0787	2.5 mm	0.15 mm	16 mm	1.9 mm	2	3 mm	38 mm			MEFM-020-1600-15K	57.95
2 mm	.0787	2.5 mm	0.15 mm	25 mm	1.9 mm	2	3 mm	50 mm			MEFM-020-2500-15K	76.70
2 mm	.0787	2.5 mm	0.25 mm	7 mm	1.9 mm	2	3 mm	38 mm	MEFM-020-700-25	42.90	MEFM-020-700-25K	47.30
2 mm	.0787	2.5 mm	0.25 mm	12 mm	1.9 mm	2	3 mm	38 mm	MEFM-020-1200-25	50.50	MEFM-020-1200-25K	55.00
2 mm	.0787	2.5 mm	0.25 mm	16 mm	1.9 mm	2	3 mm	38 mm	MEFM-020-1600-25	53.30	MEFM-020-1600-25K	57.70
2 mm	.0787	2.5 mm	0.25 mm	20 mm	1.9 mm	2	3 mm	50 mm	MEFM-020-2000-25	65.60	MEFM-020-2000-25K	70.00

*.0005" / .013 mm max TIR

Continued on next page

End Mills For Steels & High Temp Alloys

Corner Radius – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

MEF / MEFM

Continued from previous page

Cutter Diameter*		Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000"+.000mm −.0005"−.013mm		L_2 +.015" −.000" +.38mm −.00mm	R +.0000" −.0005" +.000mm −.013mm	L_3 +.010" −.010" +.25mm −.00mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
2 mm	.0787	2.5 mm	0.25 mm	25 mm	1.9 mm	2	3 mm	50 mm	MEFM-020-2500-25	72.30	MEFM-020-2500-25K	76.70
.0900	.0900	.125	.005	.250	.086	2	.1250	1.5	MEF-090-250-005	37.40	MEF-090-250-005K	41.80
.0900	.0900	.125	.005	.400	.086	2	.1250	1.5	MEF-090-400-005	39.80	MEF-090-400-005K	44.20
.0900	.0900	.125	.005	.650	.086	2	.1250	2.0	MEF-090-650-005	44.70	MEF-090-650-005K	49.10
.0900	.0900	.125	.005	.900	.086	2	.1250	2.0	MEF-090-900-005	53.60	MEF-090-900-005K	58.00
.0900	.0900	.125	.010	.250	.086	2	.1250	1.5	MEF-090-250-010	37.40	MEF-090-250-010K	41.80
.0900	.0900	.125	.010	.400	.086	2	.1250	1.5	MEF-090-400-010	39.80	MEF-090-400-010K	44.20
.0900	.0900	.125	.010	.650	.086	2	.1250	2.0	MEF-090-650-010	44.70	MEF-090-650-010K	49.10
.0900	.0900	.125	.010	.900	.086	2	.1250	2.0	MEF-090-900-010	53.60	MEF-090-900-010K	58.00
.0900	.0900	.125	.015	.250	.086	2	.1250	1.5	MEF-090-250-015	37.40	MEF-090-250-015K	41.80
.0900	.0900	.125	.015	.400	.086	2	.1250	1.5	MEF-090-400-015	39.80	MEF-090-400-015K	44.20
.0900	.0900	.125	.015	.650	.086	2	.1250	2.0	MEF-090-650-015	44.70	MEF-090-650-015K	49.10
.0900	.0900	.125	.015	.900	.086	2	.1250	2.0	MEF-090-900-015	53.60	MEF-090-900-015K	58.00
.0938	.0938	.125	.005	.250	.089	2	.1250	1.5	MEF-093-250-005	37.40	MEF-093-250-005K	41.80
.0938	.0938	.125	.005	.500	.089	2	.1250	1.5			MEF-093-500-005K	49.10
.0938	.0938	.125	.005	.750	.089	2	.1250	2.0	MEF-093-750-005	50.80	MEF-093-750-005K	55.20
.0938	.0938	.125	.005	1.000	.089	2	.1250	2.0	MEF-093-1000-005	53.60	MEF-093-1000-005K	58.00
.0938	.0938	.125	.010	.250	.089	2	.1250	1.5	MEF-093-250-010	37.40	MEF-093-250-010K	41.80
.0938	.0938	.125	.010	.500	.089	2	.1250	1.5	MEF-093-500-010	44.70	MEF-093-500-010K	49.10
.0938	.0938	.125	.010	.750	.089	2	.1250	2.0	MEF-093-750-010	50.80	MEF-093-750-010K	55.20
.0938	.0938	.125	.010	1.000	.089	2	.1250	2.0	MEF-093-1000-010	53.60	MEF-093-1000-010K	58.00
.0938	.0938	.125	.015	.250	.089	2	.1250	1.5	MEF-093-250-015	37.40	MEF-093-250-015K	42.05
.0938	.0938	.125	.015	.500	.089	2	.1250	1.5	MEF-093-500-015	44.70	MEF-093-500-015K	49.10
.0938	.0938	.125	.015	1.000	.089	2	.1250	2.0	MEF-093-1000-015	53.60		
2.5 mm	.0984	3 mm	0.15 mm	15 mm	2.4 mm	2	3 mm	38 mm			MEFM-025-1500-15K	57.70
2.5 mm	.0984	3 mm	0.15 mm	20 mm	2.4 mm	2	3 mm	50 mm	MEFM-025-2000-15	65.60	MEFM-025-2000-15K	70.00
2.5 mm	.0984	3 mm	0.15 mm	25 mm	2.4 mm	2	3 mm	50 mm	MEFM-025-2500-15	72.30	MEFM-025-2500-15K	76.70
2.5 mm	.0984	3 mm	0.15 mm	30 mm	2.4 mm	2	3 mm	60 mm			MEFM-025-3000-15K	84.00
2.5 mm	.0984	3 mm	0.25 mm	20 mm	2.4 mm	2	3 mm	50 mm	MEFM-025-2000-25	65.60	MEFM-025-2000-25K	70.00
2.5 mm	.0984	3 mm	0.25 mm	25 mm	2.4 mm	2	3 mm	50 mm	MEFM-025-2500-25	72.30	MEFM-025-2500-25K	76.70
3 mm	.1181	3 mm	0.15 mm	10 mm	2.9 mm	2	6 mm	57 mm			MEFM-030-1000-15K	59.20
3 mm	.1181	3 mm	0.15 mm	15 mm	2.9 mm	2	6 mm	57 mm	MEFM-030-1500-15	60.50	MEFM-030-1500-15K	66.80
3 mm	.1181	3 mm	0.15 mm	25 mm	2.9 mm	2	6 mm	57 mm			MEFM-030-2500-15K	78.00
3 mm	.1181	3 mm	0.15 mm	30 mm	2.9 mm	2	6 mm	57 mm	MEFM-030-3000-15	76.00	MEFM-030-3000-15K	82.30
3 mm	.1181	3 mm	0.25 mm	10 mm	2.9 mm	2	6 mm	57 mm	MEFM-030-1000-25	52.80	MEFM-030-1000-25K	59.20
3 mm	.1181	3 mm	0.25 mm	15 mm	2.9 mm	2	6 mm	57 mm	MEFM-030-1500-25	60.50	MEFM-030-1500-25K	66.80
.1250	.1250	.125	.005	.375	.121	2	.1875	2.0	MEF-125-375-005	39.80	MEF-125-375-005K	44.80
.1250	.1250	.125	.005	.750	.121	2	.1875	2.0	MEF-125-750-005	47.10	MEF-125-750-005K	52.10
.1250	.1250	.125	.005	1.000	.121	2	.1875	2.0	MEF-125-1000-005	53.30	MEF-125-1000-005K	58.30
.1250	.1250	.125	.005	1.500	.121	2	.1875	3.0	MEF-125-1500-005	57.50		
.1250	.1250	.125	.010	.375	.121	2	.1875	2.0	MEF-125-375-010	39.80		
.1250	.1250	.125	.010	.750	.121	2	.1875	2.0	MEF-125-750-010	47.10	MEF-125-750-010K	52.10
.1250	.1250	.125	.010	1.000	.121	2	.1875	2.0	MEF-125-1000-010	53.30		

*.0005" / .013 mm max TIR

Continued on next page

MEF / MEFM

End Mills For Steels & High Temp Alloys

Corner Radius – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

Continued from previous page

Cutter Diameter*		Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000"+.000mm −.0005"−.013mm		L_2 +.015" −.000" +.38mm −.00mm	R +.0000" −.0005" +.000mm −.013mm	L_3 +.010" −.010" +.25mm −.00mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.1250	.1250	.125	.010	1.500	.121	2	.1875	3.0	MEF-125-1500-010	57.50	MEF-125-1500-010K	62.80
.1250	.1250	.125	.015	.375	.121	2	.1875	2.0	MEF-125-375-015	39.80	MEF-125-375-015K	44.80
.1250	.1250	.125	.015	.750	.121	2	.1875	2.0	MEF-125-750-015	47.10	MEF-125-750-015K	52.10
.1250	.1250	.125	.015	1.000	.121	2	.1875	2.0	MEF-125-1000-015	53.30	MEF-125-1000-015K	58.30
4 mm	.1575	5 mm	0.25 mm	30 mm	3.9 mm	2	6 mm	57 mm			MEFM-040-3000-25K	82.10
4 mm	.1575	5 mm	0.5 mm	30 mm	3.9 mm	2	6 mm	57 mm	MEFM-040-3000-50	75.80	MEFM-040-3000-50K	82.10
4 mm	.1575	5 mm	1 mm	30 mm	3.9 mm	2	6 mm	57 mm	MEFM-040-3000-100	75.80	MEFM-040-3000-100K	82.10
.1875	.1875	.200	.005	1.000	.183	2	.2500	2.5	MEF-187-1000-005	67.40	MEF-187-1000-005K	73.70
.1875	.1875	.200	.010	1.000	.183	2	.2500	2.5	MEF-187-1000-010	67.40	MEF-187-1000-010K	73.70
.1875	.1875	.200	.010	1.500	.183	2	.2500	3.0	MEF-187-1500-010	76.00	MEF-187-1500-010K	82.30
.1875	.1875	.200	.015	1.000	.183	2	.2500	2.5	MEF-187-1000-015	67.40	MEF-187-1000-015K	73.70
.1875	.1875	.200	.015	1.500	.183	2	.2500	3.0	MEF-187-1500-015	76.00	MEF-187-1500-015K	82.30
.1875	.1875	.200	.005	.750	.183	2	.2500	2.5	MEF-187-750-005	60.00	MEF-187-750-005K	66.30
.1875	.1875	.200	.015	.750	.183	2	.2500	2.5	MEF-187-750-015	60.00	MEF-187-750-015K	66.30
.1875	.1875	.200	.010	.750	.183	2	.2500	2.5	MEF-187-750-010	60.00	MEF-187-750-010K	66.30
5 mm	.1969	6 mm	0.25 mm	15 mm	4.9 mm	2	6 mm	57 mm	MEFM-050-1500-25	60.40	MEFM-050-1500-25K	66.80
5 mm	.1969	6 mm	0.25 mm	25 mm	4.9 mm	2	6 mm	57 mm	MEFM-050-2500-25	69.00	MEFM-050-2500-25K	75.40
5 mm	.1969	6 mm	0.25 mm	30 mm	4.9 mm	2	6 mm	57 mm			MEFM-050-3000-25K	82.10
5 mm	.1969	6 mm	0.5 mm	30 mm	4.9 mm	2	6 mm	57 mm	MEFM-050-3000-50	75.80	MEFM-050-3000-50K	82.10
5 mm	.1969	6 mm	1 mm	30 mm	4.9 mm	2	6 mm	57 mm	MEFM-050-3000-100	75.80		

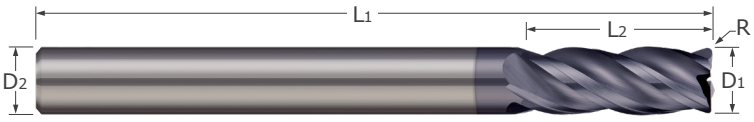
D_1 +.0000" −.0005"		L_2 +.015" −.000"	R +.0000" −.0005"	L_3 +.010" −.000"	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.2500	.2500	.250	.005	.750	.246	2	.2500	2.5	MEF-250-750-005	60.00	MEF-250-750-005K	66.30
.2500	.2500	.250	.010	.750	.246	2	.2500	2.5	MEF-250-750-010	60.00	MEF-250-750-010K	66.30
.2500	.2500	.250	.015	.750	.246	2	.2500	2.5	MEF-250-750-015	60.00	MEF-250-750-015K	66.30
.2500	.2500	.250	.010	1.000	.246	2	.2500	2.5	MEF-250-1000-010	67.40	MEF-250-1000-010K	73.70
.2500	.2500	.250	.005	1.000	.246	2	.2500	2.5	MEF-250-1000-005	67.40	MEF-250-1000-005K	73.70
.2500	.2500	.250	.015	1.000	.246	2	.2500	2.5	MEF-250-1000-015	67.40	MEF-250-1000-015K	73.70

*.0005" / .013 mm max TIR

End Mills For Steels & High Temp Alloys

Corner Radius – 4 Flute – Variable Helix

VHS / VHSM
VHM / VHMM



- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Variable helix design reduces chatter and harmonics and increases material removal rates
- Specialized geometry for maximum performance in high velocity tool paths
- Corner radius profile
- Weldon flat offered on sizes 3/8" and larger
- Center cutting
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

Cutter Diameter*			Length of Cut	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" −.0020"	(h9)	decimal equiv.	L2 +.031" −.000" +.79 mm −.00 mm	R +.0000" −.0005" +.000 mm −.013 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
	3 mm	.1181	8 mm	0.5 mm	4	4 mm	50 mm			VHMM-030-4X	22.65
.1250		.1250	.500	.010	4	.1250	1.5			VHM-125-4X	19.25
	4 mm	.1575	8 mm	0.5 mm	4	4 mm	50 mm	VHSM-040-4	24.80	VHSM-040-4X	28.15
	4 mm	.1575	11 mm	0.5 mm	4	4 mm	50 mm	VHMM-040-4	27.50		
	5 mm	.1969	16 mm	0.5 mm	4	6 mm	57 mm	VHMM-050-4	32.70		

D1 +.0000" −.0030"	(h9)	decimal equiv.	L2 +.031" −.000" +.79 mm −.00 mm	R +.0000" −.0005" +.000 mm −.013 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
	6 mm	.2362	16 mm	0.5 mm	4	6 mm	57 mm			VHMM-060-4X	38.70
.2500		.2500	.500	.020	4	.2500	2.5	VHS-250-4	29.20	VHS-250-4X	34.85
	8 mm	.3150	16 mm	0.5 mm	4	8 mm	63 mm	VHSM-080-4	34.30		
	8 mm	.3150	19 mm	0.5 mm	4	8 mm	63 mm	VHMM-080-4	38.20	VHMM-080-4X	46.15
.3750		.3750	.875	.020	4	.3750	2.5	VHM-375-4	42.90		
	10 mm	.3937	19 mm	0.6 mm	4	10 mm	72 mm	VHSM-100-4	43.90		
	10 mm	.3937	22 mm	0.6 mm	4	10 mm	72 mm	VHMM-100-4	48.80	VHMM-100-4X	56.55
.4375		.4375	1.000	.020	4	.4375	2.5	VHM-437-4	67.00	VHM-437-4X	76.35
	12 mm	.4724	22 mm	0.5 mm	4	12 mm	83 mm			VHSM-120-4X	74.55
	12 mm	.4724	26 mm	0.6 mm	4	12 mm	83 mm	VHMM-120-4	69.50	VHMM-120-4X	81.35
.5000		.5000	1.250	.030	4	.5000	3.5	VHM-5125-4	78.00	VHM-5125-4X	85.95
	25 mm	.9843	38 mm	0.8 mm	4	25 mm	127 mm			VHMM-250-4X	350.00

*.0005" / .013 mm max TIR

VLM

End Mills For Steels & High Temp Alloys

Corner Radius – 4 & 5 Flute – Variable Helix – Long Flute

- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Variable helix design reduces chatter and harmonics and increases material removal rates
- Specialized geometry for maximum performance in high velocity tool paths
- Long flutes for deep pocket milling
- Corner radius profile
- Weldon flat offered on sizes 3/8" and larger
- Center cutting
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

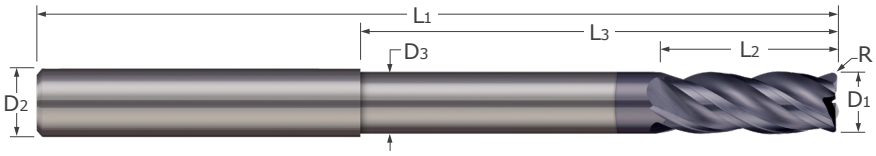
Cutter Diameter	Length of Cut	Corner Radius	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated		nACRo® Coated	
D_1 $^{+.0000''}_{-.0020''}$	L_2 $^{+.030"}_{-.000"}$	R $^{+.0000"}_{-.0005"}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price	Tool #	Price
.1875	.750	.0100	4	.1875	2.5			VLM-187-4X	37.55		
.2500	1.125	.0200	4	.2500	3.0	VLM-250-4	41.30				
.2500	1.125	.0200	5	.2500	3.0	VLM-250-5-020	46.20				

D_1 $^{+.0000''}_{-.0020''}$	L_2 $^{+.030"}_{-.000"}$	R $^{+.0000"}_{-.0005"}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price	Tool #	Price
.3125	1.125	.0200	4	.3125	3.0	VLM-312-4	46.10				
.3125	1.125	.0200	5	.3125	3.0					VLM-312-5-020K	58.40
.3750	1.250	.0200	5	.3750	3.0	VLM-375-5-020	61.90			VLM-375-5-020K	70.90
.5000	1.750	.0900	5	.5000	4.5	VLM-500-5-090	104.80			VLM-500-5-090K	118.90

End Mills For Steels & High Temp Alloys

VLR / VLRM

Corner Radius – 4 Flute – Variable Helix – Long Reach – Reduced Neck



- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Variable helix design reduces chatter and harmonics and increases material removal rates
- Specialized geometry for maximum performance in high velocity tool paths
- Long reach for deep pocket milling
- Corner radius profile
- Weldon flat offered on sizes 3/8" and larger
- Center cutting
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

Cutter Diameter*			Length of Cut	Corner Radius	Overall Reach	Neck Diameter	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0020" (h9)		decimal equiv.	L_2 +.010" −.000" +.25 mm −.00 mm	R +.0000" −.0005" +.000mm −.013mm	L_3 +.015" −.000" +.38 mm −.00 mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	6 mm	.2362	8 mm	0.5 mm	30 mm	5.49 mm	4	6 mm	75 mm	VLRM-060-4	55.70	VLRM-060-4X	61.15

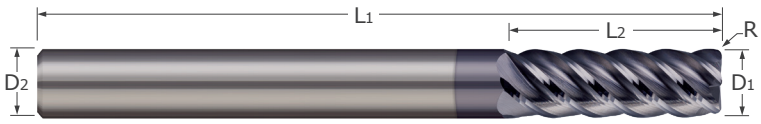
D_1 +.0000" −.0030" (h9)		decimal equiv.	L_2 +.010" −.000" +.25 mm −.00 mm	R +.0000" −.0005" +.000mm −.013mm	L_3 +.015" −.000" +.38 mm −.00 mm	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.3125		.3125	.625	.020	2.625	.293	4	.3125	4.0	VLR-312-4	59.00		
	8 mm	.3150	10 mm	0.5 mm	50 mm	7.49 mm	4	8 mm	100 mm			VLRM-080-4X	69.00
.3750		.3750	.750	.020	2.750	.355	4	.3750	4.0			VLR-375-4X	90.50
	10 mm	.3937	12 mm	0.6 mm	50 mm	9.5 mm	4	10 mm	100 mm	VLRM-100-4	88.60		
.5000		.5000	1.000	.030	4.500	.480	4	.5000	6.0			VLR-500-4X	161.90
.6250		.6250	1.250	.030	4.500	.605	4	.6250	6.0	VLR-625-4	228.20		
	16 mm	.6299	22 mm	0.7 mm	80 mm	15.49 mm	4	16 mm	130 mm	VLRM-160-4	265.20		

*.0005" / .013 mm max TIR

ARC

End Mills For Steels & High Temp Alloys

Corner Radius – 5 Flute



- Designed for roughing in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- 45° high helix for reduced cutting forces and increased material removal rates
- Corner radius profile
- Weldon flat offered on sizes 3/8" and larger
- Center cutting
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

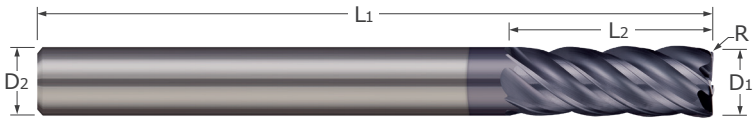
Cutter Diameter	Length of Cut	Corner Radius	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D_1 $^{+.0000''}_{-.0020''}$	L_2 $^{+.030"}_{-.000"}$	R $^{+.0000"}_{-.0005"}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.1875	.625	.0100	5	.1875	2.0	ARC-187-5-010	32.60		
.1875	.625	.0300	5	.1875	2.0	ARC-187-5-030	32.60		

D_1 $^{+.0000''}_{-.0030''}$	L_2 $^{+.030"}_{-.000"}$	R $^{+.0000"}_{-.0005"}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.3125	.813	.0200	5	.3125	2.5			ARC-312-5-020X	53.00
.3750	.875	.0600	5	.3750	2.5	ARC-375-5-060	51.50	ARC-375-5-060X	59.25
.5000	1.000	.0100	5	.5000	3.0	ARC-500-5-010	89.00		
.6250	1.250	.0900	5	.6250	3.5	ARC-625-5-090	150.20	ARC-625-5-090X	163.85
.7500	1.500	.0200	5	.7500	4.0			ARC-750-5-020X	244.25
.7500	1.500	.0900	5	.7500	4.0	ARC-750-5-090	229.00		

End Mills For Steels & High Temp Alloys

Corner Radius – 5 Flute – Variable Helix

VHS / VHSM
VHM / VHMM



- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Variable helix design reduces chatter and harmonics and increases material removal rates
- Specialized geometry for maximum performance in high velocity tool paths
- Corner radius profile
- Weldon flat offered on sizes 3/8" and larger
- Center cutting
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

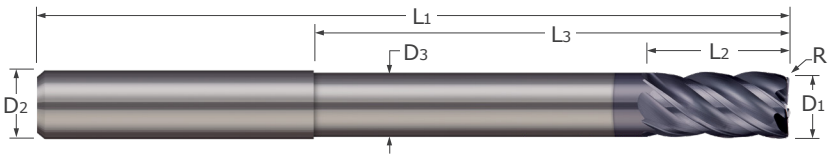
Cutter Diameter*			Length of Cut	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000" −.0020"	(h9)	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	R +.0000" −.0005" +.000 mm −.013 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	3 mm	.1181	6 mm	0.3 mm	5	4 mm	50 mm	VHSM-030-5	19.30	VHSM-030-5K	24.55
	3 mm	.1181	8 mm	0.3 mm	5	4 mm	50 mm	VHMM-030-5	21.50	VHMM-030-5K	26.50
	4 mm	.1575	8 mm	0.3 mm	5	4 mm	50 mm	VHSM-040-5	27.30	VHSM-040-5K	32.55
	4 mm	.1575	11 mm	0.3 mm	5	4 mm	50 mm	VHMM-040-5	30.30		
	6 mm	.2362	10 mm	0.5 mm	5	6 mm	57 mm	VHSM-060-5	32.30	VHSM-060-5K	38.60
	6 mm	.2362	16 mm	0.5 mm	5	6 mm	57 mm	VHMM-060-5	35.90	VHMM-060-5K	42.30
.2500		.2500	.500	.020	5	.2500	2.5	VHS-250-5-020	32.50		
D_1 +.0000" −.0030"	(h9)	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	R +.0000" −.0005" +.000 mm −.013 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.3125		.3125	.500	.020	5	.3125	2.5	VHS-312-5-020	40.80	VHS-312-5-020K	48.40
	8 mm	.3150	16 mm	0.5 mm	5	8 mm	63 mm	VHSM-080-5	38.00	VHSM-080-5K	47.00
	8 mm	.3150	19 mm	0.5 mm	5	8 mm	63 mm	VHMM-080-5	42.20	VHMM-080-5K	51.30
.3750		.3750	.625	.020	5	.3750	2.5	VHS-375-5-020	44.70	VHS-375-5-020K	53.70
.3750		.3750	.875	.020	5	.3750	2.5			VHM-375-5-020K	59.05
	12 mm	.4724	22 mm	0.5 mm	5	12 mm	83 mm	VHSM-120-5	67.30	VHSM-120-5K	80.50
	12 mm	.4724	26 mm	0.5 mm	5	12 mm	83 mm			VHMM-120-5K	87.90
.5000		.5000	.625	.030	5	.5000	3.0	VHS-500-5-030	72.70	VHS-500-5-030K	85.00
.5000		.5000	1.000	.060	5	.5000	3.0	VHM-500-5-060	80.80		
.5000		.5000	.625	.090	5	.5000	3.0	VHS-500-5-090	72.70	VHS-500-5-090K	85.00
.5000		.5000	1.000	.090	5	.5000	3.0	VHM-500-5-090	80.80	VHM-500-5-090K	93.65
.5000		.5000	1.000	.125	5	.5000	3.0	VHM-500-5-125	80.80		
.6250		.6250	1.250	.060	5	.6250	3.5	VHM-625-5-060	152.20		
.7500		.7500	1.500	.125	5	.7500	4.0	VHM-750-5-125	224.20		

*.0005" / .013 mm max TIR

VLR

End Mills For Steels & High Temp Alloys

Corner Radius – 5 Flute – Variable Helix – Long Reach – Reduced Neck



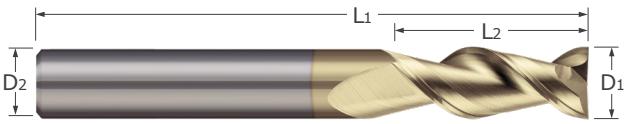
- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Variable helix design reduces chatter and harmonics and increases material removal rates
- Specialized geometry for maximum performance in high velocity tool paths
- Long reach for deep pocket milling
- Corner radius profile
- Weldon flat offered on sizes 3/8" and larger
- Center cutting
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Cutter Diameter	Length of Cut	Corner Radius	Overall Reach	Neck Diameter	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 $^{+.0000''}_{-.0030''}$	L_2 $^{+.010''}_{-.000''}$	R $^{+.0000''}_{-.0005''}$	L_3 $^{+.015''}_{-.000''}$	D_3		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.3750	.750	.0200	2.750	.355	5	.3750	4.0			VLR-375-5-020K	96.10
.5000	1.000	.0300	4.500	.480	5	.5000	6.0	VLR-500-5-030	153.10	VLR-500-5-030K	169.05
.5000	1.000	.0600	4.500	.480	5	.5000	6.0	VLR-500-5-060	153.10		
.5000	1.000	.0900	4.500	.480	5	.5000	6.0	VLR-500-5-090	153.10	VLR-500-5-090K	168.50
.5000	1.000	.1250	4.500	.480	5	.5000	6.0			VLR-500-5-125K	169.05

End Mills For Aluminum Alloys

Square – 2 & 3 Flute – Stub & Standard

ASM / ASMM
ARM / ARMM



- Designed for exceptional performance in aluminum, non ferrous materials and soft materials
- 45° high helix for reduced cutting forces and increased material removal rates
- Square profile
- Center cutting
- ZrN coated option for high hardness, lubricity, and abrasion resistance
- Solid carbide
- CNC ground in the USA

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		ZrN Coated	
D_1 (h8)		decimal equiv.	L_2 +.030" −.000" +.51 mm −.00 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
	2 mm	.0787	4 mm	2	4 mm	50 mm	ASMM-020-2	24.40		
	6 mm	.2362	20 mm	3	6 mm	57 mm	ARMM-060-3	30.70		

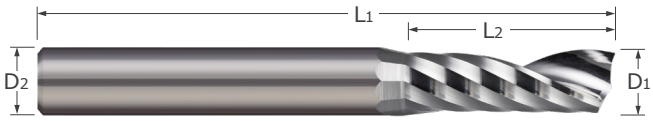
D_1 +.0000" −.0030"	D_1 +.00 mm −.08 mm	D_1 decimal equiv.	L_2 +.030" −.000" +.51 mm −.00 mm	Flutes	D_2 (h6)	L_1	Uncoated Tool #	Uncoated Price	ZrN Coated Tool #	ZrN Coated Price
.2813		.2813	.750	2	.3125	2.5	ARM-281-2	38.00		
.3125		.3125	.500	2	.3125	2.0	ASM-312-2	34.10		
.3125		.3125	.813	3	.3125	2.5	ARM-312-3	38.00		
	8 mm	.3150	25 mm	2	8 mm	63 mm			ARMM-080-2S	47.45
	8 mm	.3150	25 mm	3	8 mm	63 mm	ARMM-080-3	38.00	ARMM-080-3S	47.45
	12 mm	.4724	30 mm	3	12 mm	83 mm	ARMM-120-3	71.20		
.5000		.5000	.625	2	.5000	2.5	ASM-500-2	67.20	ASM-500-2S	78.55
.5000		.5000	1.250	3	.5000	3.5	ARM-5125-3	78.20		
	14 mm	.5510	30 mm	3	14 mm	83mm	ARMM-140-3	82.70		
	16 mm	.6299	35 mm	2	16 mm	92 mm	ARMM-160-2	132.70	ARMM-160-2S	148.85
	16 mm	.6299	35 mm	3	16 mm	92 mm			ARMM-160-3S	148.85
	18 mm	.7087	45 mm	3	18 mm	92 mm	ARMM-180-3	177.10		

*.0005" / .013 mm max TIR

SFA / SFAM

End Mills For Aluminum Alloys

Square – Single Flute – Upcut Router



- Single flute design for applications in aluminum and non-ferrous materials
- Polished flute improves chip evacuation and helps to reduce built up edge
- Optimized geometry for increased material removal rates
- End cutting
- Solid carbide
- CNC ground in the USA

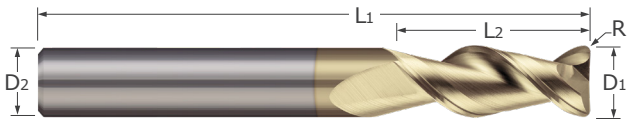
Cutter Diameter*			Length of Cut	Shank Diameter	Overall Length	Uncoated	
D_1 +.0000" −.0020"	+.00 mm −.05 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	D_2 (h6)	L_1	Tool #	Price
.0625		.0625	.250	.1250	1.5	SFA-062-22	32.40
.0625		.0625	.250	.2500	2.0	SFA-062-42	38.10
	2 mm	.0787	6 mm	6 mm	57 mm	SFAM-020020	35.80
	3 mm	.1181	12 mm	6 mm	57 mm	SFAM-030020	35.80
.1250		.1250	.250	.1250	1.5	SFA-125-22	28.60
.1250		.1250	.250	.2500	2.0	SFA-125-42	33.30
.1250		.1250	.500	.1250	1.5	SFA-125-24	28.60
.1250		.1250	.500	.2500	2.0	SFA-125-44	33.30
.1562		.1562	.625	.2500	2.0	SFA-156-45	33.30
	4 mm	.1575	16 mm	6 mm	57 mm	SFAM-040020	35.80
.1875		.1875	.500	.1875	2.0	SFA-187-33	31.60
.1875		.1875	.500	.2500	2.0	SFA-187-44	33.30
.1875		.1875	.625	.1875	2.0	SFA-187-35	31.60
.1875		.1875	.625	.2500	2.0	SFA-187-45	33.30
	5 mm	.1969	20 mm	6 mm	57 mm	SFAM-050025	35.80
.2188		.2188	.750	.2500	2.5	SFA-218-46	33.30
	6 mm	.2362	20 mm	6 mm	100 mm	SFAM-060100	53.60
	6 mm	.2362	25 mm	6 mm	57 mm	SFAM-060030	35.80
.2500		.2500	.375	.2500	2.5	SFA-250-43	33.30
.2500		.2500	.750	.2500	2.5	SFA-250-46	33.30
.2500		.2500	1.250	.2500	3.0	SFA-250-410	37.50
	8 mm	.3150	20 mm	8 mm	100 mm	SFAM-080100	68.50
	8 mm	.3150	30 mm	8 mm	75 mm	SFAM-080040	54.90
.3750		.3750	1.125	.3750	3.0	SFA-375-69	49.90
	10 mm	.3937	25 mm	10 mm	120 mm	SFAM-100100	83.40
	10 mm	.3937	35 mm	10 mm	90 mm	SFAM-100050	72.90
	12 mm	.4724	40 mm	12 mm	90 mm	SFAM-120050	90.50
.5000		.5000	1.000	.5000	3.0	SFA-500-88	82.70
.5000		.5000	1.500	.5000	4.0	SFA-500-812	86.90
	20 mm	.7874	40 mm	20 mm	150 mm	SFAM-200100	355.80
	20 mm	.7874	50 mm	20 mm	100 mm	SFAM-200050	272.80

*.0005" / .013 mm max TIR

End Mills For Aluminum Alloys

Corner Radius – 2 & 3 Flute

ARC



- Designed for exceptional performance in aluminum, non ferrous materials and soft materials
- 45° high helix for reduced cutting forces and increased material removal rates
- Stub flutes for maximum rigidity
- Corner radius profile
- Center cutting
- ZrN coated option for high hardness, lubricity, and abrasion resistance
- Solid carbide
- CNC ground in the USA

Cutter Diameter	Length of Cut	Corner Radius	Flutes	Shank Dia.	Overall Length	Uncoated		ZrN Coated	
D_1 $^{+.0000''}_{-.0020''}$	L_2 $^{+.030"}_{-.000"}$	R $^{+.0000"}_{-.0005"}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.2500	.750	.0100	2	.2500	2.5	ARC-250-2-010	37.40		

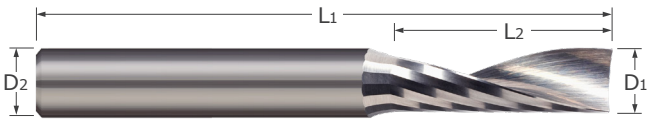
D_1 $^{+.0000''}_{-.0030''}$	L_2 $^{+.030"}_{-.000"}$	R $^{+.0000"}_{-.0005"}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.3125	.813	.0300	2	.3125	2.5			ARC-312-2-030S	49.50
.5000	1.000	.0300	3	.5000	3.0	ARC-500-3-030	82.10	ARC-500-3-030S	93.25
.5000	1.250	.0300	3	.5000	3.5	ARC-5125-3-030	86.10		
.6250	1.250	.0300	2	.6250	3.5	ARC-625-2-030	144.90		
.6250	1.250	.0600	2	.6250	3.5	ARC-625-2-060	144.90		
.6250	1.250	.0600	3	.6250	3.5	ARC-625-3-060	144.90		
.6250	1.250	.0900	2	.6250	3.5	ARC-625-2-090	144.90		
.6250	1.250	.0900	3	.6250	3.5	ARC-625-3-090	144.90		
.7500	1.500	.0600	2	.7500	4.0	ARC-750-2-060	211.00		
1.0000	1.500	.0200	2	1.0000	4.0	ARC-001-2-020	319.60		
1.0000	1.500	.0300	2	1.0000	4.0	ARC-001-2-030	319.60		
1.0000	1.500	.0600	2	1.0000	4.0	ARC-001-2-060	319.60		
1.0000	1.500	.0900	2	1.0000	4.0	ARC-001-2-090	319.60	ARC-001-2-090S	345.90
1.0000	1.500	.1250	2	1.0000	4.0	ARC-001-2-125	319.60	ARC-001-2-125S	345.90

* .0005" max TIR

SFP / SFPM

End Mills For Plastics & Composites

Square – Single Flute – Upcut Router



- Single flute design for applications in plastics
- Polished flute improves chip evacuation
- Optimized geometry for increased material removal rates
- End cutting ■ Solid carbide ■ CNC ground in the USA

Cutter Diameter*			Length of Cut	Shank Diameter	Overall Length	Uncoated	
D1 +.0000" −.0020"	+.00 mm −.05 mm	decimal equiv.	L2 +.015" −.000" +.38 mm −.00 mm	D2 (h6)	L1	Tool #	Price
	1 mm	.0394	5 mm	3 mm	57 mm	SFPM-010-10	30.90
.0625		.0625	.250	.1250	1.50	SFP-062-22	32.40
.0625		.0625	.250	.2500	2.00	SFP-062-42	38.10
	2 mm	.0787	6 mm	3 mm	57 mm	SFPM-020-10	30.90
	2 mm	.0787	10 mm	3 mm	38 mm	SFPM-020-20	28.00
	2 mm	.0787	12 mm	3 mm	57 mm	SFPM-020-30	30.90
	2 mm	.0787	14 mm	3 mm	75 mm	SFPM-020-40	35.80
	3 mm	.1181	8 mm	3 mm	57 mm	SFPM-030-10	30.90
	3 mm	.1181	8 mm	6 mm	57 mm	SFPM-030-50	34.00
	3 mm	.1181	12 mm	3 mm	38 mm	SFPM-030-20	28.00
	3 mm	.1181	18 mm	6 mm	57 mm	SFPM-030-60	36.60
.1250		.1250	.250	.1250	1.50	SFP-125-22	28.60
.1250		.1250	.250	.2500	2.00	SFP-125-42	33.30
.1250		.1250	.500	.1250	1.50	SFP-125-24	28.60
.1250		.1250	.500	.2500	2.00	SFP-125-44	33.30
.1562		.1562	.625	.2500	2.00	SFP-156-45	33.30
	4 mm	.1575	12 mm	4 mm	50 mm	SFPM-040-10	32.90
	4 mm	.1575	12 mm	6 mm	57 mm	SFPM-040-50	34.00
	4 mm	.1575	15 mm	4 mm	50 mm	SFPM-040-20	30.30
	4 mm	.1575	20 mm	6 mm	57 mm	SFPM-040-60	36.60
	4 mm	.1575	20 mm	6 mm	75 mm	SFPM-040-70	44.80
	4 mm	.1575	20 mm	8 mm	100 mm	SFPM-040-80	51.10
.1875		.1875	.500	.1875	2.00	SFP-187-33	31.60
.1875		.1875	.500	.2500	2.00	SFP-187-44	33.30
.1875		.1875	.625	.1875	2.00	SFP-187-35	31.60
.1875		.1875	.625	.2500	2.00	SFP-187-45	33.30
	5 mm	.1969	16 mm	5 mm	50 mm	SFPM-050-10	42.00
	5 mm	.1969	16 mm	6 mm	57 mm	SFPM-050-40	43.90
	5 mm	.1969	20 mm	8 mm	95 mm	SFPM-050-70	51.10
	5 mm	.1969	28 mm	6 mm	57 mm	SFPM-050-50	43.90
	5 mm	.1969	28 mm	6 mm	75 mm	SFPM-050-60	47.10
	6 mm	.2362	16 mm	6 mm	57 mm	SFPM-060-10	43.90

*.0005" / .013 mm max TIR

Continued on next page

End Mills For Plastics & Composites

Square – Single Flute – Upcut Router (cont.)

SFP / SFPM

Continued from previous page

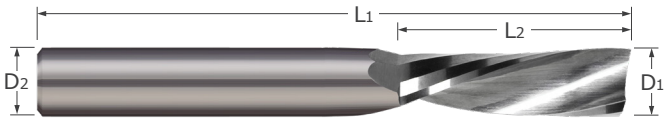
Cutter Diameter*			Length of Cut	Shank Diameter	Overall Length	Uncoated	
D_1 +.0000" −.0020"	+.00 mm −.05 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	D_2 (h6)	L_1	Tool #	Price
	6 mm	.2362	20 mm	6 mm	57 mm	SFPM-060-20	44.80
	6 mm	.2362	20 mm	8 mm	95 mm	SFPM-060-60	51.10
	6 mm	.2362	35 mm	6 mm	75 mm	SFPM-060-30	47.10
	6 mm	.2362	35 mm	8 mm	75 mm	SFPM-060-50	54.00
.2500		.2500	.375	.2500	2.50	SFP-250-43	33.30
.2500		.2500	.750	.2500	2.50	SFP-250-46	33.30
.2500		.2500	1.250	.2500	3.00	SFP-250-410	37.50
	8 mm	.3150	18 mm	8 mm	50 mm	SFPM-080-10	39.40
	8 mm	.3150	22 mm	8 mm	63 mm	SFPM-080-20	42.60
	8 mm	.3150	30 mm	8 mm	75 mm	SFPM-080-30	51.10
	8 mm	.3150	40 mm	8 mm	100 mm	SFPM-080-40	65.20
.3750		.3750	1.125	.3750	3.00	SFP-375-69	49.90
	10 mm	.3937	25 mm	10 mm	72 mm	SFPM-100-10	54.80
	10 mm	.3937	30 mm	10 mm	150 mm	SFPM-100-30	96.40
	10 mm	.3937	55 mm	10 mm	100 mm	SFPM-100-20	77.60
	12 mm	.4724	30 mm	12 mm	83 mm	SFPM-120-10	83.60
	12 mm	.4724	40 mm	12 mm	150 mm	SFPM-120-20	124.60
.5000		.5000	1.000	.5000	3.00	SFP-500-88	82.70
.5000		.5000	1.500	.5000	4.00	SFP-500-812	86.90

*.0005" / .013 mm max TIR

SFL / SFLM

End Mills For Plastics & Composites

Square – Single Flute – Downcut Router



- Single flute design for applications in plastics and composites
- Left hand spiral routers drive chips downward, preventing delamination in multi-layered workpieces
- Polished flute improves chip evacuation
- Optimized geometry for increased material removal rates
- End cutting
- Solid carbide
- CNC ground in the USA

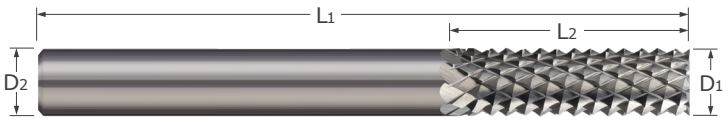
Cutter Diameter*			Length of Cut	Shank Diameter	Overall Length	Uncoated	
D_1 +.0000" −.0020"	+.00 mm −.05 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	D_2 (h6)	L_1	Tool #	Price
	1 mm	.0394	5 mm	3 mm	57 mm	SFLM-010-10	30.90
.0625		.0625	.250	.2500	2.0	SFL-062-42	38.10
	2 mm	.0787	6 mm	3 mm	57 mm	SFLM-020-10	30.90
	2 mm	.0787	14 mm	3 mm	75 mm	SFLM-020-40	35.80
	3 mm	.1181	8 mm	3 mm	57 mm	SFLM-030-10	30.90
	3 mm	.1181	12 mm	3 mm	38 mm	SFLM-030-20	28.00
.1250		.1250	.250	.1250	1.5	SFL-125-22	28.60
.1250		.1250	.250	.2500	2.0	SFL-125-42	33.30
.1250		.1250	.500	.1250	1.5	SFL-125-24	28.60
.1250		.1250	.500	.2500	2.0	SFL-125-44	33.30
	4 mm	.1575	12 mm	4 mm	57 mm	SFLM-040-10	32.90
	4 mm	.1575	15 mm	4 mm	40 mm	SFLM-040-20	30.30
	4 mm	.1575	20 mm	6 mm	57 mm	SFLM-040-60	36.60
	4 mm	.1575	20 mm	6 mm	75 mm	SFLM-040-70	44.80
	4 mm	.1575	20 mm	8 mm	95 mm	SFLM-040-80	51.10
.1875		.1875	.500	.1875	2.0	SFL-187-33	31.60
.1875		.1875	.500	.2500	2.0	SFL-187-44	33.30
.1875		.1875	.625	.1875	2.0	SFL-187-35	31.60
.1875		.1875	.625	.2500	2.0	SFL-187-45	33.30
	5 mm	.1969	20 mm	8 mm	95 mm	SFLM-050-70	51.10
	5 mm	.1969	28 mm	6 mm	75 mm	SFLM-050-60	47.10
.2188		.2188	.750	.2500	2.5	SFL-218-46	33.30
	6 mm	.2362	16 mm	6 mm	57 mm	SFLM-060-10	43.90
	6 mm	.2362	20 mm	8 mm	95 mm	SFLM-060-60	51.10
	6 mm	.2362	20 mm	6 mm	57 mm	SFLM-060-20	44.80
.2500		.2500	.375	.2500	2.5	SFL-250-43	33.30
.2500		.2500	.750	.2500	2.5	SFL-250-46	33.30
.2500		.2500	1.250	.2500	3.0	SFL-250-410	37.50
.3750		.3750	1.125	.3750	3.0	SFL-375-69	49.90
	12 mm	.4724	30 mm	12 mm	83 mm	SFLM-120-10	83.60
.5000		.5000	1.500	.5000	4.0	SFL-500-812	86.90

*.0005" / .013 mm max TIR

End Mills For Plastics & Composites

Diamond Cut – No End Cut

RDA



- Ideal for routing fiber reinforced, epoxy resin, and composites
- Diamond-cut flute pattern provides smooth cutting action and reduces delamination
- Non end-cutting
- Solid carbide
- CNC ground in the USA

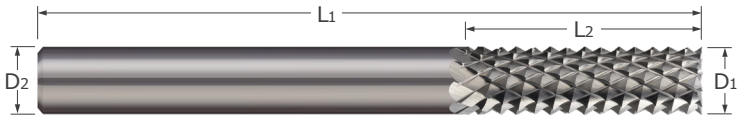
Cutter Diameter*	Length of Cut	Shank Dia.	Overall Length	Uncoated	
D_1 $^{+.0000''}_{-.0030''}$	L_2 $^{+.030''}_{-.000''}$	D_2 (h6)	L_1	Tool #	Price
.0938	.375	.1250	1.5	RDA-20	13.90
.1250	.500	.1250	1.5	RDA-30	13.90
.2500	.750	.2500	2.0	RDA-60	23.80
.2500	.750	.2500	2.5	RDA-70	25.40
.2500	1.000	.2500	3.0	RDA-80	33.20

*.0005″ max TIR

End Mills For Plastics & Composites

Diamond Cut – Burr End Cut

RDB



- Ideal for routing fiber reinforced, epoxy resin, and composites
- Diamond-cut flute pattern provides smooth cutting action and reduces delamination
- Burr end cut profile
- Solid carbide
- CNC ground in the USA

Cutter Diameter*	Length of Cut	Shank Dia.	Overall Length	Uncoated	
D_1 $^{+.0000''}_{-.0030''}$	L_2 $^{+.030''}_{-.000''}$	D_2 (h6)	L_1	Tool #	Price
.0625	.188	.1250	1.5	RDB-10	16.50
.0938	.375	.1250	1.5	RDB-20	16.50
.1250	.500	.1250	1.5	RDB-30	16.50
.1875	.625	.1875	2.0	RDB-40	23.50
.1875	.625	.2500	2.0	RDB-50	26.60
.2500	.750	.2500	2.0	RDB-60	28.30
.2500	.750	.2500	2.5	RDB-70	30.20
.2500	1.000	.2500	3.0	RDB-80	39.60
.3750	1.000	.3750	2.5	RDB-100	70.10
.5000	1.000	.5000	3.0	RDB-110	92.70

*.0005″ max TIR

RDC

End Mills For Plastics & Composites

Diamond Cut – End Mill Cut

- Ideal for routing fiber reinforced, epoxy resin, and composites
- Diamond-cut flute pattern provides smooth cutting action and reduces delamination
- End mill end cut profile
- Solid carbide
- CNC ground in the USA

Cutter Diameter*	Length of Cut	Shank Dia.	Overall Length	Uncoated	
D_1 $^{+.0000''}_{-.0030''}$	L_2 $^{+.030''}_{-.000''}$	D_2 (h6)	L_1	Tool #	Price
.0938	.375	.1250	1.5	RDC-20	16.50
.1250	.500	.1250	1.5	RDC-30	16.50
.1875	.625	.1875	2.0	RDC-40	23.50
.1875	.625	.2500	2.0	RDC-50	26.60
.2500	.750	.2500	2.0	RDC-60	28.30
.2500	.750	.2500	2.5	RDC-70	30.20
.2500	1.000	.2500	3.0	RDC-80	39.60

*.0005" max TIR

RDD

End Mills For Plastics & Composites

Diamond Cut – 135° Drill Point

- Ideal for routing fiber reinforced, epoxy resin, and composites
- Diamond-cut flute pattern provides smooth cutting action and reduces delamination
- 135° drill point
- Solid carbide
- CNC ground in the USA

Cutter Diameter*	Length of Cut	Shank Dia.	Overall Length	Uncoated	
D_1 $^{+.0000''}_{-.0030''}$	L_2 $^{+.030''}_{-.000''}$	D_2 (h6)	L_1	Tool #	Price
.0625	.188	.1250	1.5	RDD-10	16.50
.0938	.375	.1250	1.5	RDD-20	16.50
.1250	.500	.1250	1.5	RDD-30	16.50
.1875	.625	.1875	2.0	RDD-40	23.50
.1875	.625	.2500	2.0	RDD-50	26.60
.2500	.750	.2500	2.0	RDD-60	28.30
.2500	.750	.2500	2.5	RDD-70	30.20
.2500	1.000	.2500	3.0	RDD-80	39.60
.3125	1.000	.3125	2.5	RDD-90	52.80
.5000	1.000	.5000	3.0	RDD-110	92.70

*.0005" max TIR

End Mills For Plastics & Composites

Diamond Cut – Fish Tail End Cut

RDE

- Ideal for routing fiber reinforced, epoxy resin, and composites
- Diamond-cut flute pattern provides smooth cutting action and reduces delamination
- Less breakout when through-plunging
- Fish tail end cut profile
- Solid carbide
- CNC ground in the USA

Cutter Diameter*	Length of Cut	Shank Dia.	Overall Length	Uncoated	
D_1 $^{+.0000''}_{-.0030''}$	L_2 $^{+.030''}_{-.000''}$	D_2 (h6)	L_1	Tool #	Price
.1875	.625	.1875	2.0	RDE-40	23.50
.1875	.625	.2500	2.0	RDE-50	26.60
.2500	1.000	.2500	3.0	RDE-80	39.60
.3750	1.000	.3750	2.5	RDE-100	70.10
.5000	1.000	.5000	3.0	RDE-110	92.70

*.0005" max TIR

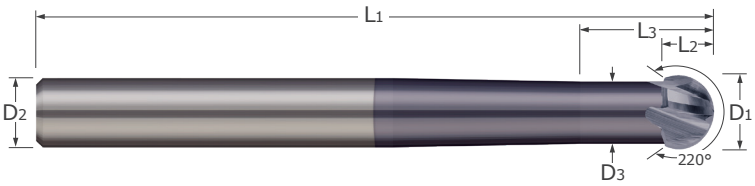
Technical Resources on Micro100.com

Find Simulation Files, Speeds & Feeds, Torque Recommendations, Programs, Blogs, and more at micro100.com/resources

SCAN

SBM / SBMM

Undercutting End Mills
220°



- Designed for undercutting, deburring, and multi-axis machining
- 220° spherical ball
- 30° helix
- Center cutting
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" −.0020"	+.00mm −.05mm		L2	L3 +.030" −.000" +.78 mm −.00 mm	D3 +.003" −.005" +.08mm −.13mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
	2 mm	.0787	1.3 mm	6 mm	1.3 mm	2	6 mm	75 mm			SBMM-020-206X	94.75
	2 mm	.0787	1.3 mm	6 mm	1.3 mm	4	6 mm	75 mm	SBMM-020-406	89.50	SBMM-020-406X	94.75
	2 mm	.0787	1.3 mm	10 mm	1.3 mm	2	6 mm	75 mm	SBMM-020-210	89.50	SBMM-020-210X	94.75
	2 mm	.0787	1.3 mm	10 mm	1.3 mm	4	6 mm	75 mm	SBMM-020-410	89.50	SBMM-020-410X	94.75
	2 mm	.0787	1.3 mm	16 mm	1.3 mm	2	6 mm	75 mm	SBMM-020-216	89.50	SBMM-020-216X	94.75
	2 mm	.0787	1.3 mm	16 mm	1.3 mm	3	6 mm	75 mm	SBMM-020-316	89.50	SBMM-020-316X	94.75
	2 mm	.0787	1.3 mm	16 mm	1.3 mm	4	6 mm	75 mm			SBMM-020-416X	94.75
	3 mm	.1181	2.0 mm	9 mm	2.0 mm	4	6 mm	75 mm			SBMM-030-409X	94.75
	3 mm	.1181	2.0 mm	15 mm	2.0 mm	2	6 mm	75 mm	SBMM-030-215	89.50	SBMM-030-215X	94.75
	3 mm	.1181	2.0 mm	15 mm	2.0 mm	4	6 mm	75 mm	SBMM-030-415	89.50	SBMM-030-415X	94.75
	3 mm	.1181	2.0 mm	21 mm	2.0 mm	2	6 mm	75 mm	SBMM-030-221	89.50	SBMM-030-221X	94.75
	3 mm	.1181	2.0 mm	21 mm	2.0 mm	3	6 mm	75 mm	SBMM-030-321	89.50		
	3 mm	.1181	2.0 mm	21 mm	2.0 mm	4	6 mm	75 mm			SBMM-030-421X	94.75
.1250		.1250	.100	.250	.100	4	.2500	3.0	SBM-125-4	89.50	SBM-125-4X	94.75
	4 mm	.1575	2.7 mm	12 mm	2.7 mm	2	6 mm	75 mm	SBMM-040-212	89.50	SBMM-040-212X	94.75
	4 mm	.1575	2.7 mm	12 mm	2.7 mm	4	6 mm	75 mm			SBMM-040-412X	94.75
	4 mm	.1575	2.7 mm	20 mm	2.7 mm	2	6 mm	75 mm			SBMM-040-220X	94.75
	4 mm	.1575	2.7 mm	20 mm	2.7 mm	4	6 mm	75 mm	SBMM-040-420	89.50	SBMM-040-420X	94.75
	4 mm	.1575	2.7 mm	32 mm	2.7 mm	2	6 mm	100 mm	SBMM-040-232	89.50	SBMM-040-232X	94.75
	4 mm	.1575	2.7 mm	32 mm	2.7 mm	4	6 mm	100 mm	SBMM-040-432	89.50	SBMM-040-432X	94.35
.1875		.1875	.150	.350	.150	4	.2500	3.0	SBM-187-4	89.50	SBM-187-4X	94.75
	6 mm	.2362	4.0 mm	18 mm	4.0 mm	2	6 mm	75 mm	SBMM-060-218	89.50	SBMM-060-218X	94.75
	6 mm	.2362	4.0 mm	18 mm	4.0 mm	3	6 mm	75 mm	SBMM-060-318	89.50		
	6 mm	.2362	4.0 mm	18 mm	4.0 mm	4	6 mm	75 mm	SBMM-060-418	89.50	SBMM-060-418X	94.75
	6 mm	.2362	4.0 mm	30 mm	4.0 mm	2	6 mm	75 mm			SBMM-060-230X	94.75
	6 mm	.2362	4.0 mm	30 mm	4.0 mm	4	6 mm	75 mm	SBMM-060-430	89.50	SBMM-060-430X	94.75
	6 mm	.2362	4.0 mm	32 mm	4.0 mm	2	6 mm	100 mm	SBMM-060-248	89.50	SBMM-060-248X	94.75
	6 mm	.2362	4.0 mm	32 mm	4.0 mm	3	6 mm	100 mm	SBMM-060-348	89.50		
	6 mm	.2362	4.0 mm	32 mm	4.0 mm	4	6 mm	100 mm	SBMM-060-448	89.50	SBMM-060-448X	94.35
.2500		.2500	.200	.500	.200	2	.2500	3.0	SBM-250-2	89.50	SBM-250-2X	94.75
.2500		.2500	.200	.500	.200	3	.2500	3.0	SBM-250-3	89.50	SBM-250-3X	94.75
.2500		.2500	.200	.500	.200	4	.2500	3.0	SBM-250-4	89.50	SBM-250-4X	94.75

*.0005" / .013 mm max TIR

Continued on next page

Undercutting End Mills

220° (cont.)

SBM / SBMM

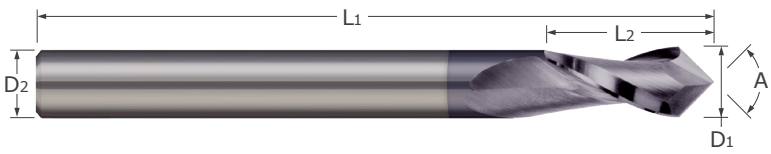
Continued from previous page

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0030"	+.00mm −.08mm		L_2	L_3 +.030" −.000" +.78 mm −.00 mm	D_3 +.003" −.005" +.08mm −.13mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.3125		.3125	.250	.600	.250	4	.3125	4.0	SBM-312-4	112.60		
	8 mm	.3150	5.4 mm	24 mm	5.4 mm	4	8 mm	100 mm	SBMM-080-424	112.60	SBMM-080-424X	122.75
	8 mm	.3150	5.4 mm	40 mm	5.4 mm	2	8 mm	100 mm	SBMM-080-240	112.60	SBMM-080-240X	122.30
	8 mm	.3150	5.4 mm	40 mm	5.4 mm	3	8 mm	100 mm	SBMM-080-340	112.60	SBMM-080-340X	122.30
	8 mm	.3150	5.4 mm	40 mm	5.4 mm	4	8 mm	100 mm			SBMM-080-440X	122.75
	8 mm	.3150	5.4 mm	55 mm	5.4 mm	2	8 mm	100 mm			SBMM-080-264X	122.30
	8 mm	.3150	5.4 mm	55 mm	5.4 mm	4	8 mm	100 mm			SBMM-080-464X	122.75
.3750		.3750	.300	.800	.300	4	.3750	4.0	SBM-375-4	144.60	SBM-375-4X	154.75
	10 mm	.3937	6.7 mm	30 mm	6.7 mm	2	10 mm	100 mm	SBMM-100-230	151.80		
	10 mm	.3937	6.7 mm	30 mm	6.7 mm	4	10 mm	100 mm			SBMM-100-430X	160.65
	10 mm	.3937	6.7 mm	50 mm	6.7 mm	2	10 mm	100 mm	SBMM-100-250	151.80	SBMM-100-250X	160.65
	10 mm	.3937	6.7 mm	50 mm	6.7 mm	4	10 mm	100 mm			SBMM-100-450X	160.65
	10 mm	.3937	6.7 mm	55 mm	6.7 mm	2	10 mm	100 mm	SBMM-100-272	151.80	SBMM-100-272X	160.65
	10 mm	.3937	6.7 mm	55 mm	6.7 mm	4	10 mm	100 mm	SBMM-100-472	151.80	SBMM-100-472X	160.65
	12 mm	.4724	8.0 mm	36 mm	8.0 mm	2	12 mm	100 mm			SBMM-120-236X	188.45
	12 mm	.4724	8.0 mm	36 mm	8.0 mm	4	12 mm	100 mm	SBMM-120-436	177.60	SBMM-120-436X	188.45
	12 mm	.4724	8.0 mm	55 mm	8.0 mm	4	12 mm	100 mm			SBMM-120-472X	188.45
.5000		.5000	.400	.900	.400	2	.5000	4.0	SBM-500-2	179.90		
.5000		.5000	.400	.900	.400	4	.5000	4.0	SBM-500-4	179.90		
.6250		.6250	.500	1.000	.500	2	.6250	4.0	SBM-625-2	223.70	SBM-625-2X	236.65
.6250		.6250	.500	1.000	.500	3	.6250	4.0	SBM-625-3	223.70	SBM-625-3X	236.65
.6250		.6250	.500	1.000	.500	4	.6250	4.0			SBM-625-4X	236.65

*.0005" / .013 mm max TIR

DM / DMM

Drill/End Mills
2 & 4 Flute



- Designed for chamfering, milling, and some spotting applications
- 2 flute design effective in spotting and drilling applications
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- 30° helix ■ Solid carbide ■ CNC ground in the USA

Included Angle	Cutter Diameter*	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
A +1° −1°	D1	L2 +.030" −.000" +.76 mm −.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
90°	3 mm	8 mm	2	3 mm	38 mm	DMM-030-290	19.90	DMM-030-290X	22.75
	3 mm	8 mm	4	3 mm	38 mm	DMM-030-490	20.80	DMM-030-490X	23.75
	.1250	.500	2	.1250	1.5	DM-125-290	19.90	DM-125-290X	22.75
	.1250	.500	4	.1250	1.5	DM-125-490	20.80	DM-125-490X	23.75
	4 mm	11 mm	2	4 mm	50 mm	DMM-040-290	27.80	DMM-040-290X	31.15
	4 mm	11 mm	4	4 mm	50 mm	DMM-040-490	28.90	DMM-040-490X	32.25
	.1875	.625	2	.1875	2.0	DM-187-290	27.80	DM-187-290X	31.15
	.1875	.625	4	.1875	2.0	DM-187-490	29.10	DM-187-490X	32.35
	5 mm	13 mm	2	6 mm	57 mm	DMM-050-290	34.80	DMM-050-290X	40.45
	6 mm	16 mm	2	6 mm	57 mm			DMM-060-290X	40.45
	6 mm	16 mm	4	6 mm	57 mm			DMM-060-490X	42.05
	.2500	.750	2	.2500	2.5	DM-250-290	34.80	DM-250-290X	40.45
	.2500	.750	4	.2500	2.5	DM-250-490	36.40	DM-250-490X	42.05
	.3125	.813	2	.3125	2.5	DM-312-290	43.30	DM-312-290X	51.25
	.3125	.813	4	.3125	2.5	DM-312-490	45.50	DM-312-490X	53.45
	8 mm	22 mm	2	8 mm	63 mm	DMM-080-290	43.30	DMM-080-290X	51.25
	8 mm	22 mm	4	8 mm	63 mm	DMM-080-490	45.20	DMM-080-490X	53.05
	.3750	1.000	2	.3750	2.5	DM-375-290	54.30	DM-375-290X	62.05
	.3750	1.000	4	.3750	2.5	DM-375-490	57.10	DM-375-490X	64.95
	10 mm	25 mm	2	10 mm	72 mm			DMM-100-290X	62.05
	12 mm	30 mm	2	12 mm	83 mm			DMM-120-290X	93.75
	.5000	1.000	2	.5000	3.0	DM-500-290	82.00	DM-500-290X	91.25
	.5000	1.000	4	.5000	3.0	DM-500-490	89.70	DM-500-490X	98.95
	.6250	1.250	2	.6250	3.5	DM-625-290	164.60	DM-625-290X	178.15
	.6250	1.250	4	.6250	3.5	DM-625-490	172.30	DM-625-490X	185.85
	.7500	1.500	2	.7500	4.0	DM-750-290	242.10	DM-750-290X	257.15
	.7500	1.500	4	.7500	4.0	DM-750-490	253.50	DM-750-490X	268.45
	20 mm	45 mm	4	20 mm	104 mm			DMM-200-490X	285.00

* .0005" / .013 mm max TIR. Tolerances for cutter diameters .125"-.250": .000" / -.002"; diameters .313"-.750": .000" / -.003".

Continued on next page

Drill/End Mills

2 & 4 Flute (cont.)

DM / DMM

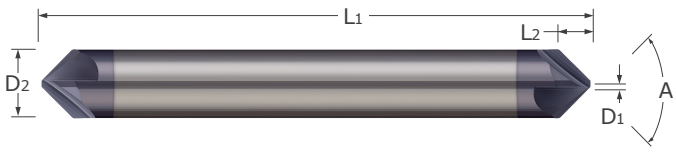
Continued from previous page

Included Angle	Cutter Diameter*	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
A +1° −1°	D_1	L_2 +.030" −.000" +.76 mm −.00 mm		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
120°	3 mm	8 mm	2	3 mm	38 mm	DMM-030-2120	19.90		
	3 mm	8 mm	4	3 mm	38 mm	DMM-030-4120	20.80	DMM-030-4120X	23.75
	.1250	.500	2	.1250	1.5			DM-125-2120X	22.75
	.1250	.500	4	.1250	1.5	DM-125-4120	20.80	DM-125-4120X	23.75
	4 mm	11 mm	2	4 mm	50 mm	DMM-040-2120	27.80	DMM-040-2120X	31.15
	4 mm	11 mm	4	4 mm	50 mm	DMM-040-4120	28.90		
	.1875	.625	2	.1875	2.0	DM-187-2120	27.80	DM-187-2120X	31.15
	.1875	.625	4	.1875	2.0	DM-187-4120	29.10	DM-187-4120X	32.35
	5 mm	13 mm	2	6 mm	57 mm			DMM-050-2120X	40.45
	5 mm	13 mm	4	6 mm	57 mm	DMM-050-4120	36.40		
	.2500	.750	2	.2500	2.5	DM-250-2120	34.80	DM-250-2120X	40.45
	.2500	.750	4	.2500	2.5	DM-250-4120	36.40	DM-250-4120X	42.05
	.3125	.813	2	.3125	2.5	DM-312-2120	43.30	DM-312-2120X	51.25
	.3125	.813	4	.3125	2.5	DM-312-4120	45.50		
	8 mm	22 mm	2	8 mm	63 mm	DMM-080-2120	43.30		
	8 mm	22 mm	4	8 mm	63 mm	DMM-080-4120	45.20		
	.3750	1.000	2	.3750	2.5	DM-375-2120	54.30	DM-375-2120X	62.05
	.3750	1.000	4	.3750	2.5	DM-375-4120	57.10	DM-375-4120X	64.95
	10 mm	25 mm	2	10 mm	72 mm	DMM-100-2120	54.30		
	10 mm	25 mm	4	10 mm	72 mm	DMM-100-4120	56.50		
	12 mm	30 mm	2	12 mm	83 mm	DMM-120-2120	82.00		
	.5000	1.000	2	.5000	3.0	DM-500-2120	82.00	DM-500-2120X	91.25
	.5000	1.000	4	.5000	3.0	DM-500-4120	89.70	DM-500-4120X	98.95
	.6250	1.250	2	.6250	3.5			DM-625-2120X	178.15
	.6250	1.250	4	.6250	3.5			DM-625-4120X	185.85
	16 mm	35 mm	4	16 mm	92 mm	DMM-160-4120	171.80	DMM-160-4120X	185.35
	.7500	1.500	2	.7500	4.0	DM-750-2120	242.10	DM-750-2120X	257.15
	.7500	1.500	4	.7500	4.0	DM-750-4120	253.50		

* .0005" / .013 mm max TIR. Tolerances for cutter diameters .125"-.250": .000" / -.002"; diameters .313"-.750": .000" / -.003".

CS

Chamfer Cutters



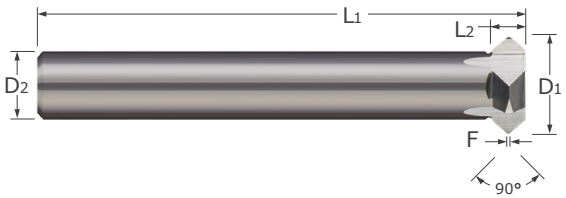
- Designed for chamfer milling, countersinking, and deburring
- Double-ended
- Available in 60°, 82°, 90°, 100°, and 120° included angles
- Tip Diameter (D1) is non-cutting
- Multi-tooth for greater metal removal rates
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

Included Angle	Tip Diameter	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
A $^{+1°}_{-1°}$	D1 $^{+.000"}_{-.003"}$	L2		D2 (h6)	L1	Tool #	Price	Tool #	Price
60°	.030	.082	3	.1250	1.5	CS-125-060	28.80	CS-125-060X	32.95
	.040	.128	4	.1875	2.0			CS-187-060X	39.25
	.050	.173	6	.2500	2.5	CS-250-060	37.60	CS-250-060X	46.55
	.060	.219	6	.3125	2.5	CS-312-060	52.60	CS-312-060X	65.85
	.070	.264	6	.3750	2.5	CS-375-060	60.00	CS-375-060X	72.75
	.080	.364	6	.5000	3.0	CS-500-060	87.20	CS-500-060X	102.65
82°	.030	.055	3	.1250	1.5	CS-125-082	28.80	CS-125-082X	32.95
	.040	.085	4	.1875	2.0			CS-187-082X	39.25
	.050	.115	6	.2500	2.5	CS-250-082	37.60	CS-250-082X	46.55
	.060	.145	6	.3125	2.5	CS-312-082	52.60	CS-312-082X	65.85
	.070	.175	6	.3750	2.5	CS-375-082	60.00	CS-375-082X	72.75
	.080	.242	6	.5000	3.0	CS-500-082	87.20	CS-500-082X	102.65
90°	.030	.047	3	.1250	1.5	CS-125-090	28.80	CS-125-090X	32.95
	.040	.074	4	.1875	2.0	CS-187-090	34.30	CS-187-090X	39.25
	.050	.100	6	.2500	2.5	CS-250-090	37.60	CS-250-090X	46.55
	.060	.126	6	.3125	2.5	CS-312-090	52.60	CS-312-090X	65.85
	.070	.152	6	.3750	2.5	CS-375-090	60.00	CS-375-090X	72.75
	.080	.210	6	.5000	3.0	CS-500-090	87.20	CS-500-090X	102.65
100°	.030	.040	3	.1250	1.5	CS-125-100	28.80	CS-125-100X	32.95
	.040	.062	4	.1875	2.0	CS-187-100	34.30	CS-187-100X	39.25
	.050	.084	6	.2500	2.5	CS-250-100	37.60	CS-250-100X	46.55
	.060	.106	6	.3125	2.5	CS-312-100	52.60	CS-312-100X	65.85
	.070	.128	6	.3750	2.5	CS-375-100	60.00	CS-375-100X	72.75
	.080	.176	6	.5000	3.0	CS-500-100	87.20	CS-500-100X	102.65
120°	.030	.027	3	.1250	1.5	CS-125-120	28.80	CS-125-120X	32.95
	.050	.058	6	.2500	2.5	CS-250-120	37.60	CS-250-120X	46.55
	.070	.088	6	.3750	2.5			CS-375-120X	72.75
	.080	.121	6	.5000	3.0			CS-500-120X	102.65

Chamfer Cutters

Back Chamfer Cutters

MBC

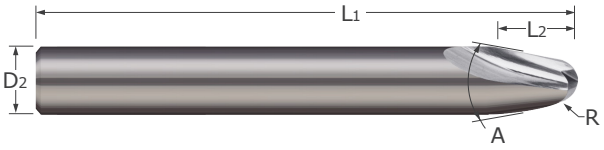


- 90° included angle for chamfer milling the top and bottom of a part
- Multiple flutes for improved finish and increased metal removal rates
- Cuts on angle only
- Solid carbide head brazed on a carbide shank
- CNC ground in the USA

Cutter Diameter	Cutter Width	Flat	Flutes	Shank Diameter	Overall Length	Uncoated	
D_1 $^{+.000"}_{-.005"}$	L_2 $^{+.000"}_{-.015"}$	F $^{+.000"}_{-.005"}$		D_2 (h6)	L_1	Tool #	Price
.375	.125	.031	4	.2500	2.63	MBC-375	88.00
.500	.125	.031	5	.3125	2.63	MBC-500	107.30
.750	.156	.031	6	.3750	2.66	MBC-750	133.10
1.000	.188	.031	7	.5000	3.19	MBC-001	173.60

Runner Cutters

MRF / MRT

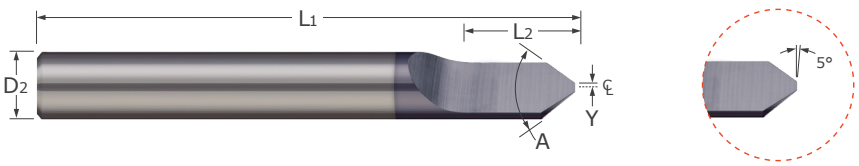


- Designed to mill 20° and 30° channels in molds
- 2 helical flutes
- Center cutting
- Solid carbide
- CNC ground in the USA

Included Angle	Radius	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated	
A $^{+1°}_{-1°}$	R $^{+.0030"}_{-.0000"}$	L_2		D_2 (h6)	L_1	Tool #	Price
20°	.0312	.383	2	.1875	2.0	MRT-187-031	46.70
	.0469	.308	2	.1875	2.0	MRT-187-046	46.70
	.0625	.414	2	.2500	2.5	MRT-250-062	51.70
	.1094	.366	2	.3125	2.5	MRT-312-109	62.90
	.1250	.468	2	.3750	2.5	MRT-375-125	66.20
30°	.0312	.262	2	.1875	2.0	MRF-187-031	46.70
	.0625	.287	2	.2500	2.5	MRF-250-062	51.70
	.0781	.243	2	.2500	2.5	MRF-250-078	51.70

RTC / RTCM / RSC
RSCM / RNC / RNCM

Engraving Cutters
Tipped Off – Single Ended



- Designed for engraving and v-grooving in various applications
- Tipped off end diameter for improved cutting
- Point offset (Y) represents half of flat generated in workpiece (Workpiece Flat = 2Y)
- Half round style
- Relieved for right hand milling
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

Included Angle	Shank Diameter	Point Offset	Split Length	Overall Length	Uncoated		AlTiN Coated	
A +0°30′ −0°30′	D2 (h6)	Y +.001" −.001" +.02 mm −.02 mm	L2 +.015" −.000" +.38 mm −.00 mm	L1	Tool #	Price	Tool #	Price
30°	3 mm	0.10 mm	7 mm	38 mm	RTCM-030-1	16.00	RTCM-030-1X	18.95
	.1250	.004	.375	1.5	RTC-125-1	21.90	RTC-125-1X	23.45
	.1250	.004	.375	3.0	RTC-125-13	22.60	RTC-125-13X	25.05
	4 mm	0.10 mm	10 mm	50 mm	RTCM-040-1	20.40	RTCM-040-1X	23.85
	.1875	.004	.437	2.0	RTC-187-1	27.20		
	5 mm	0.10 mm	12 mm	50 mm	RTCM-050-1	23.20		
	6 mm	0.10 mm	12 mm	57 mm	RTCM-060-1	24.70	RTCM-060-1X	30.45
	.2500	.004	.500	2.5	RTC-250-1	29.40	RTC-250-1X	40.55
	.2500	.004	.500	4.0	RTC-250-14	42.90		
	.2500	.010	.500	2.5	RTC-250-120	28.40		
	.2500	.022	.500	2.5	RTC-250-145	37.30		
	.2500	.030	.500	2.5	RTC-250-160	37.30		
	.3125	.004	.500	2.5	RTC-312-1	55.00		
	.3125	.004	.500	4.0	RTC-312-14	69.10		
	8 mm	0.10 mm	12 mm	63 mm	RTCM-080-1	39.60	RTCM-080-1X	47.55
	12 mm	0.10 mm	14 mm	83 mm			RTCM-120-1X	94.60
60°	3 mm	0.10 mm	5 mm	38 mm	RSCM-030-1	16.00	RSCM-030-1X	18.95
	.1250	.004	.375	1.5	RSC-125-1	21.60	RSC-125-1X	22.75
	.1250	.004	.375	3.0	RSC-125-13	23.00		
	4 mm	0.10 mm	6 mm	50 mm	RSCM-040-1	20.40	RSCM-040-1X	23.85
	.1875	.004	.375	2.0	RSC-187-1	26.40	RSC-187-1X	33.25
	.1875	.004	.375	3.0	RSC-187-13	28.00		
	5 mm	0.10 mm	7 mm	50 mm			RSCM-050-1X	28.00
	6 mm	0.10 mm	8 mm	57 mm	RSCM-060-1	24.70	RSCM-060-1X	30.45
	.2500	.004	.375	2.5	RSC-250-1	31.40		
	.2500	.004	.375	4.0	RSC-250-14	46.70		
	.2500	.010	.375	2.5	RSC-250-120	31.20	RSC-250-120X	40.55
	.2500	.015	.375	2.5	RSC-250-130	34.70		
	.2500	.022	.375	2.5	RSC-250-145	37.30		

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Engraving Cutters

Tipped Off – Single Ended (cont.)

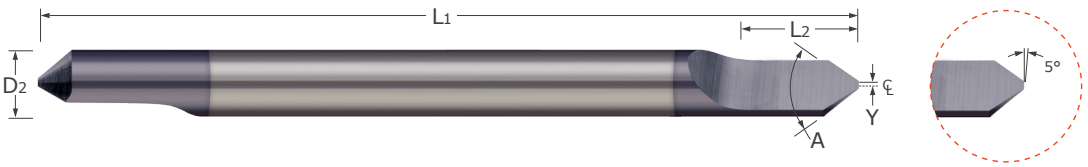
RTC / RTCM / RSC
RSCM / RNC / RNCM

Continued from previous page

Included Angle	Shank Diameter	Point Offset	Split Length	Overall Length	Uncoated		AlTiN Coated	
A +0°30′ −0°30′	D2 (h6)	Y +.001" −.001" +.02 mm −.02 mm	L2 +.015" −.000" +.38 mm −.00 mm	L1	Tool #	Price	Tool #	Price
	.2500	.030	.375	2.5	RSC-250-160	37.30		
	.3125	.004	.500	2.5	RSC-312-1	54.80		
	.3125	.004	.500	4.0	RSC-312-14	69.10		
	8 mm	0.10 mm	10 mm	63 mm	RSCM-080-1	39.60	RSCM-080-1X	47.55
60°	.3750	.004	.500	2.5	RSC-375-1	67.50		
	.3750	.004	.500	4.0	RSC-375-14	97.60		
	10 mm	0.10 mm	12 mm	72 mm	RSCM-100-1	58.40	RSCM-100-1X	66.05
	12 mm	0.10 mm	14 mm	83 mm	RSCM-120-1	82.00		
	.5000	.004	.625	3.0	RSC-500-1	107.70	RSC-500-1X	112.95
	3 mm	0.10 mm	5 mm	38 mm	RNCM-030-1	16.00	RNCM-030-1X	18.95
	.1250	.004	.375	1.5	RNC-125-1	20.30	RNC-125-1X	28.05
	.1250	.004	.375	3.0	RNC-125-13	26.60		
	4 mm	0.10 mm	6 mm	50 mm	RNCM-040-1	20.40	RNCM-040-1X	23.85
	.1875	.004	.375	2.0	RNC-187-1	28.60		
	.1875	.004	.375	3.0	RNC-187-13	29.80	RNC-187-13X	35.55
	5 mm	0.10 mm	7 mm	50 mm	RNCM-050-1	23.20	RNCM-050-1X	27.75
	6 mm	0.10 mm	8 mm	57 mm	RNCM-060-1	24.70	RNCM-060-1X	30.45
	.2500	.004	.375	2.5	RNC-250-1	32.60	RNC-250-1X	33.75
90°	.2500	.004	.375	4.0	RNC-250-14	39.50	RNC-250-14X	50.05
	.2500	.015	.375	2.5	RNC-250-130	37.30		
	.2500	.022	.375	2.5	RNC-250-145	37.30		
	.2500	.030	.375	2.5	RNC-250-160	37.30		
	.3125	.004	.500	2.5	RNC-312-1	44.40		
	8 mm	0.10 mm	10 mm	63 mm	RNCM-080-1	39.60	RNCM-080-1X	47.55
	.3750	.004	.500	2.5	RNC-375-1	64.80	RNC-375-1X	74.25
	10 mm	0.10 mm	12 mm	72 mm	RNCM-100-1	58.40		
	12 mm	0.10 mm	14 mm	83 mm	RNCM-120-1	82.00	RNCM-120-1X	93.75
	.5000	.004	.625	3.0	RNC-500-1	104.90		

RTC / RTCM / RSC
RSCM / RNC / RNCM

Engraving Cutters
Tipped Off – Doubled Ended



- Designed for engraving and v-grooving in various applications
- Tipped off end diameter for improved cutting
- Point offset (Y) represents half of flat generated in workpiece (Workpiece Flat = 2Y)
- Double ended
- Half round drill style
- Relieved for right hand milling
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide ■ CNC ground in the USA

Included Angle	Shank Diameter	Point Offset	Split Length	Overall Length	Uncoated		AlTiN Coated	
A +0°30′ −0°30′	D2 (h6)	Y +.001" −.001" +.02 mm −.02 mm	L2 +.015" −.015" +.38 mm −.38 mm	L1	Tool #	Price	Tool #	Price
30°	3 mm	0.10 mm	7 mm	38 mm	RTCM-030-2	21.30	RTCM-030-2X	25.55
	.1250	.004	.375	2.0	RTC-125-2	25.70	RTC-125-2X	34.55
	.1250	.004	.375	3.0	RTC-125-23	32.10	RTC-125-23X	40.35
	4 mm	0.10 mm	10 mm	50 mm	RTCM-040-2	27.30	RTCM-040-2X	32.25
	.1875	.004	.437	2.0	RTC-187-2	33.80	RTC-187-2X	42.65
	.1875	.004	.437	3.0	RTC-187-23	39.10		
	5 mm	0.10 mm	12 mm	50 mm	RTCM-050-2	30.70	RTCM-050-2X	35.65
	6 mm	0.10 mm	12 mm	57 mm	RTCM-060-2	33.60	RTCM-060-2X	42.85
	.2500	.004	.500	2.5	RTC-250-2	39.40	RTC-250-2X	49.75
	.2500	.004	.500	4.0	RTC-250-24	54.80		
	.2500	.010	.500	2.5	RTC-250-220	41.70	RTC-250-220X	50.65
	.2500	.015	.500	2.5	RTC-250-230	36.40		
	.2500	.022	.500	2.5	RTC-250-245	46.50	RTC-250-245X	52.90
	.2500	.030	.500	2.5	RTC-250-260	46.50		
	.3125	.004	.500	2.5	RTC-312-2	69.10		
	.3125	.004	.500	4.0	RTC-312-24	84.10		
	8 mm	0.10 mm	12 mm	63 mm	RTCM-080-2	53.20	RTCM-080-2X	66.45
	.3750	.004	.500	2.5	RTC-375-2	85.80		
	.3750	.004	.500	4.0	RTC-375-24	108.50		
	10 mm	0.10 mm	12 mm	72 mm	RTCM-100-2	76.10		
	.5000	.004	.625	3.0	RTC-500-2	117.70		
60°	3 mm	0.10 mm	5 mm	38 mm	RSCM-030-2	21.30	RSCM-030-2X	25.55
	.1250	.004	.375	2.0	RSC-125-2	26.80	RSC-125-2X	31.65
	.1250	.004	.375	3.0	RSC-125-23	31.80		
	4 mm	0.10 mm	6 mm	50 mm	RSCM-040-2	27.30	RSCM-040-2X	32.25
	.1875	.004	.375	2.0	RSC-187-2	32.60	RSC-187-2X	38.05
	.1875	.004	.375	3.0	RSC-187-23	40.50		
	5 mm	0.10 mm	7 mm	50 mm			RSCM-050-2X	34.90
	6 mm	0.10 mm	8 mm	57 mm	RSCM-060-2	33.60	RSCM-060-2X	42.85
	.2500	.004	.375	2.5	RSC-250-2	40.90	RSC-250-2X	52.15

Continued on next page

Engraving Cutters

Tipped Off – Doubled Ended (cont.)

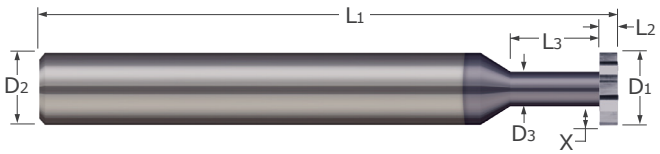
RTC / RTCM / RSC
RSCM / RNC / RNCM

Continued from previous page

Included Angle	Shank Diameter	Point Offset	Split Length	Overall Length	Uncoated		AlTiN Coated	
A $^{+0°30'}_{-0°30'}$	D_2 (h6)	Y $^{+.001"}_{-.001"}$ $^{+.02\ mm}_{-.02\ mm}$	L_2 $^{+.015"}_{-.015"}$ $^{+.38\ mm}_{-.38\ mm}$	L_1	Tool #	Price	Tool #	Price
60°	.2500	.004	.375	4.0	RSC-250-24	59.70		
	.2500	.010	.375	2.5	RSC-250-220	41.30	RSC-250-220X	52.55
	.2500	.015	.375	2.5	RSC-250-230	42.20		
	.2500	.030	.375	2.5	RSC-250-260	46.50		
	.3125	.004	.500	2.5	RSC-312-2	70.70	RSC-312-2X	73.55
	.3125	.004	.500	4.0	RSC-312-24	84.10		
	.3750	.004	.500	2.5	RSC-375-2	82.20		
	.3750	.004	.500	4.0	RSC-375-24	107.80		
	10 mm	0.10 mm	12 mm	72 mm	RSCM-100-2	76.10	RSCM-100-2X	86.60
	.5000	.004	.625	3.0	RSC-500-2	126.30		
90°	3 mm	0.10 mm	5 mm	38 mm	RNCM-030-2	21.30	RNCM-030-2X	25.55
	.1250	.004	.375	2.0	RNC-125-2	27.20	RNC-125-2X	36.65
	.1250	.004	.375	3.0	RNC-125-23	33.20	RNC-125-23X	41.45
	4 mm	0.10 mm	6 mm	50 mm	RNCM-040-2	27.30	RNCM-040-2X	32.25
	.1875	.004	.375	2.0	RNC-187-2	33.70	RNC-187-2X	39.55
	.1875	.004	.375	3.0	RNC-187-23	39.70		
	5 mm	0.10 mm	7 mm	50 mm	RNCM-050-2	30.70		
	6 mm	0.10 mm	8 mm	57 mm	RNCM-060-2	33.60	RNCM-060-2X	42.85
	.2500	.004	.375	2.5	RNC-250-2	41.80	RNC-250-2X	50.75
	.2500	.004	.375	4.0	RNC-250-24	54.80	RNC-250-24X	66.75
	.2500	.010	.375	2.5	RNC-250-220	41.40		
	.2500	.015	.375	2.5	RNC-250-230	43.20	RNC-250-230X	54.45
	.2500	.030	.375	2.5	RNC-250-260	46.50		
	.3125	.004	.500	2.5	RNC-312-2	67.40		
	.3125	0.004	.500	4.0	RNC-312-24	84.10	RNC-312-24X	98.65
	8 mm	0.10 mm	10 mm	63 mm	RNCM-080-2	53.20	RNCM-080-2X	66.45
	.3750	.004	.500	2.5	RNC-375-2	85.10	RNC-375-2X	101.15
	.3750	.004	.500	4.0	RNC-375-24	106.10		
	.5000	.004	.625	3.0	RNC-500-2	123.60	RNC-500-2X	141.55
	.5000	.004	.625	4.0	RNC-500-24	177.50		

KC

Keyseat Cutters
Square



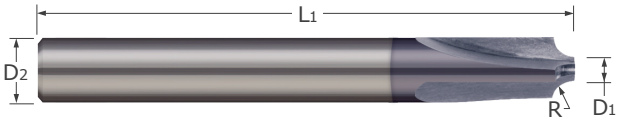
- Keyseat cutters down to .093" diameter
- Both sides of cutter are dished for clearance
- Standard and long length styles
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

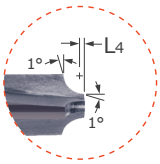
Cutter Diameter	Cutter Width	Neck Diameter	Radial Depth of Cut	Neck Length	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 $^{+.0000"}_{-.0020"}$	L_2 $^{+.001"}_{-.000"}$	D_3 $^{+.000"}_{-.002"}$	X	L_3 $^{+.010"}_{-.000"}$		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.0938	.010	.047	.019	.140	4	.1250	1.5	KC-093-140-010	47.00		
.0938	.015	.047	.019	.140	4	.1250	1.5	KC-093-140-015	44.40	KC-093-140-015X	47.05
.0938	.040	.047	.019	.140	4	.1250	1.5	KC-093-140-040	44.40		
.1250	.015	.062	.028	.190	6	.1250	1.5	KC-125-190-015	44.40	KC-125-190-015X	47.05
.1250	.025	.062	.028	.190	6	.1250	1.5	KC-125-190-025	44.40		
.1250	.030	.062	.028	.190	6	.1250	1.5	KC-125-190-030	44.40		
.1250	.040	.062	.028	.190	6	.1250	1.5	KC-125-190-040	44.40	KC-125-190-040X	47.05
.1250	.045	.062	.028	.190	6	.1250	1.5	KC-125-190-045	44.40	KC-125-190-045X	47.05
.1250	.050	.062	.028	.190	6	.1250	1.5	KC-125-190-050	44.40		
.1250	.060	.062	.028	.190	6	.1250	1.5	KC-125-190-060	44.40	KC-125-190-060X	47.05
.1250	.062	.062	.028	.190	6	.1250	1.5	KC-125-190-062	44.40		
.1250	.093	.062	.028	.190	6	.1250	1.5	KC-125-190-093	44.40	KC-125-190-093X	47.05
.1875	.025	.090	.045	.300	6	.1875	2.0	KC-187-300-025	47.00		
.1875	.029	.090	.045	.300	6	.1875	2.0	KC-187-300-029	47.00		
.1875	.045	.090	.045	.300	6	.1875	2.0			KC-187-300-045X	50.15
.1875	.050	.090	.045	.300	6	.1875	2.0	KC-187-300-050	47.00		
.1875	.093	.090	.045	.550	6	.1875	2.0	KC-187-550-093	47.00		
.1875	.125	.090	.045	.550	6	.1875	2.0	KC-187-550-125	47.00		
.3750	.156	.190	.089	.600	8	.3750	2.5	KC-375-600-156	72.70		
.3750	.187	.190	.089	1.125	8	.3750	2.5	KC-375-1125-187	72.70	KC-375-1125-187X	80.25
.5000	.030	.250	.121	.750	8	.5000	3.0	KC-500-750-030	93.80		
.5000	.093	.250	.121	1.500	8	.5000	3.0	KC-500-1500-093	106.10		
.5000	.103	.250	.121	.750	8	.5000	3.0	KC-500-750-103	93.80		
.5000	.118	.250	.121	1.500	8	.5000	3.0	KC-500-1500-118	106.10		
.5000	.120	.250	.121	.750	8	.5000	3.0	KC-500-750-120	93.80		
.5000	.156	.250	.121	.750	8	.5000	3.0	KC-500-750-156	93.80		
.5000	.156	.250	.121	1.500	8	.5000	3.0	KC-500-1500-156	106.10		
.5000	.187	.250	.121	.750	8	.5000	3.0	KC-500-750-187	93.80		
.5000	.187	.250	.121	1.500	8	.5000	3.0			KC-500-1500-187X	115.15

Corner Rounding End Mills

3 Flute – Single Ended

CREM





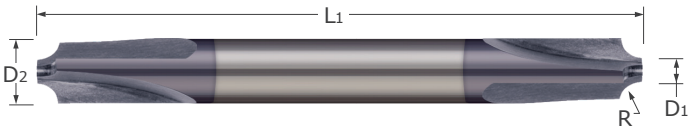
- Designed to mill corner radii into a part
- 1° max flares tangent at pilot and shoulder to avoid steps and burrs
- Cuts on radius only
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

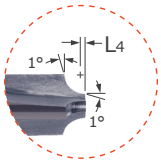
Minor Diameter	Radius	Max Lead in Length	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.000 mm −.076 mm	R +.000 mm −.013 mm	L_4	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
1.5 mm	0.3 mm	.13 mm	6 mm	57 mm	CREM-060-030	45.40		
1.5 mm	0.8 mm	.13 mm	6 mm	57 mm	CREM-060-080	45.40		
1.5 mm	1.5 mm	.13 mm	6 mm	57 mm	CREM-060-150	45.40		
1.5 mm	2.0 mm	.13 mm	6 mm	57 mm	CREM-060-200	45.40	CREM-060-200X	50.85
1.5 mm	2.5 mm	.13 mm	8 mm	63 mm			CREM-080-250X	62.35
1.5 mm	3.0 mm	.13 mm	8 mm	63 mm	CREM-080-300	54.50		
1.5 mm	4.0 mm	.13 mm	10 mm	73 mm	CREM-100-400	74.10		

CRE

Corner Rounding End Mills

3 Flute – Double Ended





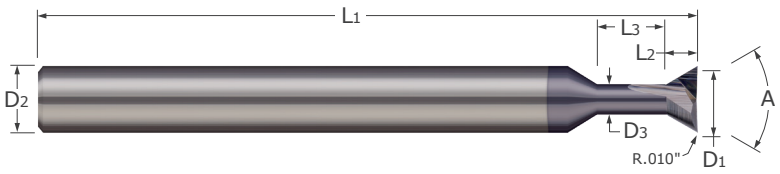
- Designed to mill corner radii into a part
- 1° max flares tangent at pilot and shoulder to avoid steps and burrs
- Cuts on radius only
- Double-ended
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

Minor Diameter	Radius	Max Lead in Length	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 $^{+.000''}_{-.002''}$	R $^{+.0000''}_{-.0005''}$	L_4	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.060	.0100	.005	.1250	2.0	CRE-125-010	40.40	CRE-125-010X	44.45
.060	.0156	.005	.1250	2.0	CRE-125-015	40.40	CRE-125-015X	44.45
.060	.0200	.005	.1250	2.0	CRE-125-020	40.40	CRE-125-020X	44.45
.060	.0250	.005	.1250	2.0	CRE-125-025	40.40	CRE-125-025X	44.45
.060	.0300	.005	.1250	2.0	CRE-125-030	40.40	CRE-125-030X	44.45
.060	.0312	.005	.1250	2.0	CRE-125-031	40.40	CRE-125-031X	44.45
.060	.0350	.005	.1875	2.0	CRE-187-035	43.60	CRE-187-035X	48.55
.060	.0400	.005	.1875	2.0	CRE-187-040	43.60	CRE-187-040X	48.55
.060	.0450	.005	.1875	2.0	CRE-187-045	43.60	CRE-187-045X	48.55
.060	.0469	.005	.1875	2.0	CRE-187-047	43.60	CRE-187-047X	48.55
.060	.0500	.005	.1875	2.0	CRE-187-050	43.60	CRE-187-050X	48.55
.060	.0550	.005	.1875	2.0	CRE-187-055	43.60	CRE-187-055X	48.55
.060	.0600	.005	.1875	2.0	CRE-187-060	43.60	CRE-187-060X	48.55
.060	.0625	.005	.1875	2.0	CRE-187-062	43.60	CRE-187-062X	48.55

D_1 $^{+.000''}_{-.003''}$	R $^{+.0000''}_{-.0005''}$	L_4	D_2 (h6)	L_1	Tool #	Price	Tool #	Price
.060	.0700	.005	.2500	2.5	CRE-250-070	56.40	CRE-250-070X	64.15
.060	.0750	.005	.2500	2.5	CRE-250-075	56.40	CRE-250-075X	64.15
.060	.0781	.005	.2500	2.5	CRE-250-078	56.40	CRE-250-078X	64.15
.060	.0800	.005	.2500	2.5	CRE-250-080	56.40	CRE-250-080X	64.15
.060	.0900	.005	.2500	2.5	CRE-250-090	56.40	CRE-250-090X	64.15
.060	.0938	.005	.2500	2.5	CRE-250-093	56.40	CRE-250-093X	64.15
.060	.1000	.005	.3125	2.5	CRE-312-100	68.10	CRE-312-100X	81.55
.060	.1094	.005	.3125	2.5	CRE-312-109	68.10	CRE-312-109X	81.55
.060	.1250	.005	.3125	2.5	CRE-312-125	68.10	CRE-312-125X	81.55
.060	.1406	.005	.3750	2.5	CRE-375-140	92.60	CRE-375-140X	105.15
.060	.1562	.005	.3750	2.5	CRE-375-156	92.60	CRE-375-156X	105.15
.120	.1718	.010	.5000	3.0	CRE-500-171	143.40	CRE-500-171X	157.25
.120	.1875	.010	.5000	3.0	CRE-500-187	143.40	CRE-500-187X	157.25
.120	.2031	.010	.6250	3.5	CRE-625-203	153.70	CRE-625-203X	176.65
.120	.2188	.010	.6250	3.5	CRE-625-218	153.70	CRE-625-218X	176.65
.120	.2344	.010	.6250	3.5	CRE-625-234	153.70	CRE-625-234X	176.65
.120	.2500	.010	.6250	3.5	CRE-625-250	153.70	CRE-625-250X	176.65
.120	.2812	.010	.7500	4.0	CRE-750-281	215.60		
.120	.3125	.010	.7500	4.0	CRE-750-312	215.60	CRE-750-312X	242.05
.120	.3750	.010	1.0000	4.0	CRE-001-375	402.20	CRE-001-375X	438.05
.120	.4370	.010	1.0000	4.0	CRE-001-437	402.20	CRE-001-437X	438.05

Dovetail Cutters

DT



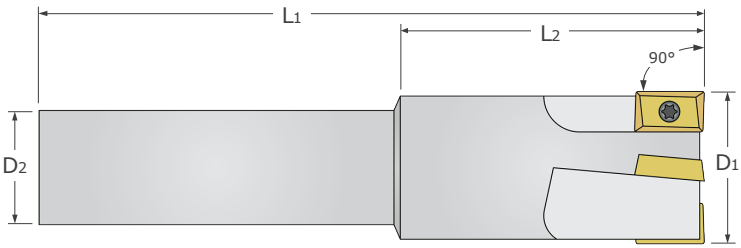
- Designed to mill dovetail grooves into a part
- Offered with 30°, 60°, and 90° included angles
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

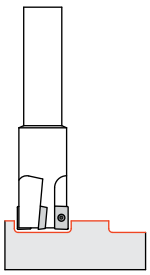
Included Angle	Cutter Diameter*	Length of Cut	Neck Diameter	Neck Length	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
A $^{+1°}_{-1°}$	D_1 $^{+.0000"}_{-.0020"}$	L_2	D_3	L_3 $^{+.030"}_{-.000"}$	R		D_2 (h6)	L_1	Tool #	Price	Tool #	Price
30°	.1250	.095	.080	.125	.010	2	.1250	1.5	DT-125-030-010	63.70	DT-125-030-010X	66.15
	.1875	.127	.125	.125	.010	2	.1875	2.0	DT-187-030-010	68.10	DT-187-030-010X	71.05
	.2500	.161	.170	.125	.010	2	.2500	2.5	DT-250-030-010	85.90	DT-250-030-010X	91.05
	.3125	.221	.200	.312	.010	2	.3125	2.5	DT-312-030-010	92.90	DT-312-030-010X	100.50
	.3750	.263	.240	.375	.010	3	.3750	2.5	DT-375-030-010	98.10	DT-375-030-010X	105.55
	.5000	.347	.320	.500	.010	3	.5000	3.0	DT-500-030-010	127.20	DT-500-030-010X	136.15
60°	.1250	.065	.065	.125	.010	2	.1250	1.5	DT-125-060-010	63.70	DT-125-060-010X	66.15
	.1875	.093	.095	.125	.010	2	.1875	2.0	DT-187-060-010	68.10	DT-187-060-010X	71.05
	.2500	.125	.120	.125	.010	2	.2500	2.5	DT-250-060-010	85.90	DT-250-060-010X	91.05
	.3125	.162	.140	.312	.010	2	.3125	2.5	DT-312-060-010	92.90	DT-312-060-010X	100.50
	.3750	.190	.170	.375	.010	3	.3750	2.5	DT-375-060-010	98.10	DT-375-060-010X	105.55
	.5000	.255	.220	.500	.010	3	.5000	3.0	DT-500-060-010	127.20	DT-500-060-010X	136.15
90°	.1250	.042	.070	.125	.010	2	.1250	1.5	DT-125-090-010	63.70	DT-125-090-010X	66.15
	.1875	.048	.120	.125	.010	2	.1875	2.0	DT-187-090-010	68.10	DT-187-090-010X	71.05
	.2500	.064	.150	.125	.010	2	.2500	2.5	DT-250-090-010	85.90	DT-250-090-010X	91.05
	.3125	.095	.150	.312	.010	2	.3125	2.5	DT-312-090-010	92.90	DT-312-090-010X	100.95
	.3750	.127	.150	.375	.010	3	.3750	2.5	DT-375-090-010	98.10	DT-375-090-010X	105.55
	.5000	.164	.200	.500	.010	3	.5000	3.0	DT-500-090-010	127.20	DT-500-090-010X	136.15

* .0005" max TIR

Indexable

Milling – Tool Holders





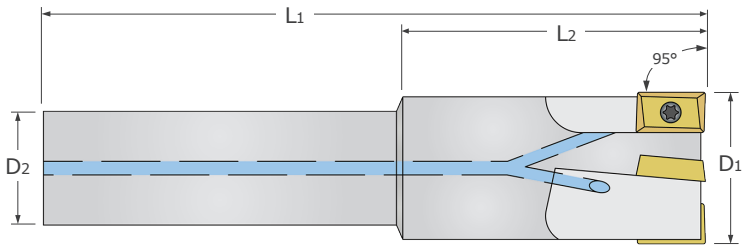
- 90° orientation angle allows for square shoulder cutting
- Utilizes ANSI standard APKT style inserts (not included)
- Each tool holder includes a M2.5 x T-8 torx screw and torx key (part # 16-1020)
- Non coolant-through
- Insert not included

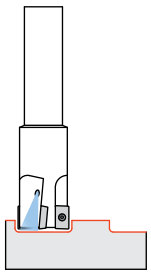
Cutter Diameter	Body Length	Flutes	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
D_1	L_2		D_2	L_1			Tool #	Price
.375	1.500	1	.5000	3.0	50-2100	BAAP 1216 2	31-1216	125.90
.500	1.500	1	.5000	3.0	50-2100	BAAP 1616 2	31-1616	140.70
.625	1.500	2	.5000	3.0	50-2100	BAAP 1816 2	31-1816	155.50
.750	2.000	3	.7500	4.4	50-2100	BAAP 2424 2	31-2424	214.70
1.000	2.000	4	.7500	4.4	50-2100	BAAP 3224 2	31-3224	229.40
1.250	2.000	5	.7500	4.4	50-2100	BAAP 4024 2	31-4024	341.90

See pg 318 for indexable insert accessories

Indexable

Milling – Tool Holders – Coolant Through





- Coolant-through milling tool holders designed to enhance chip evacuation
- 90° orentation angle allows for square shoulder cutting
- Utilizes ANSI standard APKT style inserts (not included)
- Each tool holder includes a M2.5 x T-8 torx screw and torx key (part # 16-1020)
- Insert not included

Cutter Diameter	Body Length	Flutes	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
D_1	L_2		D_2	L_1			Tool #	Price
.375	1.500	1	.5000	3.0	50-2100	AAAP 1216 2	30-1216	155.50
.500	1.500	1	.5000	3.0	50-2100	AAAP 1616 2	30-1616	170.20
.625	1.500	2	.5000	3.0	50-2100	AAAP 1816 2	30-1816	185.80
.750	2.000	3	.7500	4.4	50-2100	AAAP 2424 2	30-2424	218.80
1.000	2.000	4	.7500	4.4	50-2100	AAAP 3224 2	30-3224	350.80
1.250	2.000	5	.7500	4.4	50-2100	AAAP 4024 2	30-4024	375.90

See pg 318 for indexable insert accessories
See pg 325 for tool set options

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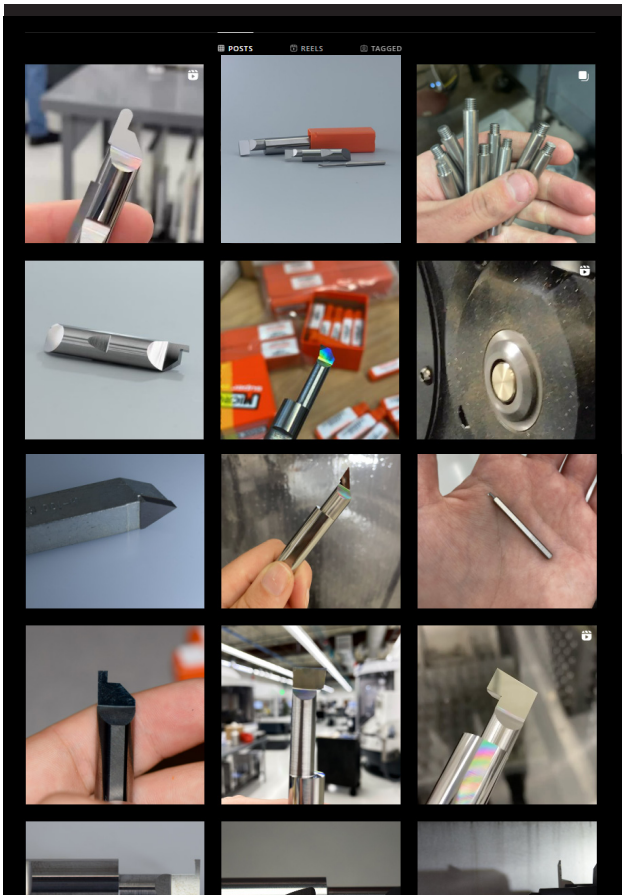
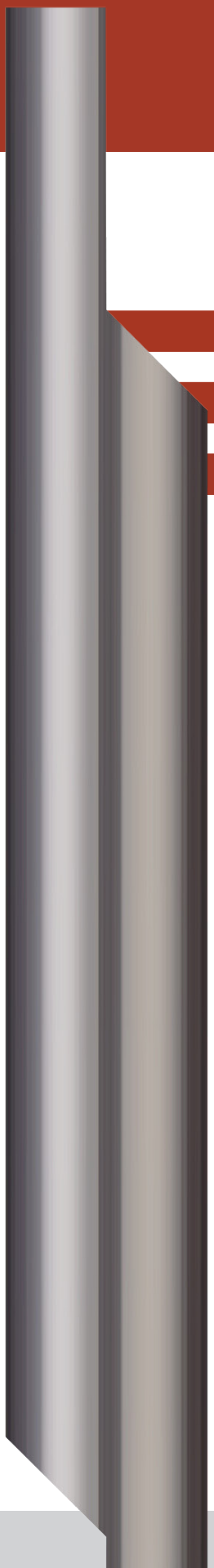


BLANKS SETS & ACCESSORIES



Blanks 308

Sets 314

Accessories 328

Blanks

Half Round

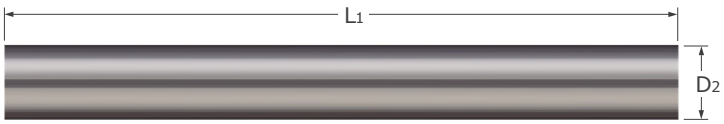
HR / HRM

- Half round style carbide blanks
- Polished split face
- Solid carbide
- CNC Ground in the USA

Split Height			Shank Diameter	Overall Length	Half Round Blank	
	$D_2/2$	decimal equiv.	D_2	L_1	Tool #	Price
	1 mm	.0394	2 mm	38 mm	HRM-020-38	17.40
	1.5 mm	.0591	3 mm	38 mm	HRM-030-38	18.30
	2.5 mm	.0984	5 mm	50 mm	HRM-050-50	30.50
	3 mm	.1181	6 mm	57 mm	HRM-060-57	36.50
.1250		.1250	.2500	2.5	HR-250	44.50
	4 mm	.1575	8 mm	63 mm	HRM-080-63	60.10
	5 mm	.1969	10 mm	72 mm	HRM-100-72	84.70

SR / SRM

Blanks
Round Blanks



- Round style
- Finish ground blanks
- Solid carbide
- CNC ground in the USA

Shank Diameter		Overall Length	Round Blank	
D_2 (h6)		L_1	Tool #	Price
1 mm	.0394	30 mm	SRM-010-030	5.50
1 mm	.0394	310 mm	SRM-010-310	15.40
1.5 mm	.0591	100 mm	SRM-015-100	7.50
.0625	.0625	1.0	SR-062-1	8.10
.0625	.0625	2.0	SR-062-2	8.00
.0625	.0625	3.0	SR-062-3	7.90
.0625	.0625	4.0	SR-062-4	7.50
.0625	.0625	12.0	SR-062-12	20.90
2 mm	.0787	38 mm	SRM-020-038	6.20
2 mm	.0787	100 mm	SRM-020-100	9.50
2 mm	.0787	310 mm	SRM-020-310	20.80
.0938	.0938	1.0	SR-093-1	8.90
.0938	.0938	3.0	SR-093-3	10.40
.0938	.0938	4.0	SR-093-4	12.90
.0938	.0938	6.0	SR-093-6	13.30
.0938	.0938	12.0	SR-093-12	19.40
2.5 mm	.0984	100 mm	SRM-025-100	9.50
3 mm	.1181	38 mm	SRM-030-038	6.80
3 mm	.1181	100 mm	SRM-030-100	11.40
3 mm	.1181	310 mm	SRM-030-310	27.80
.1250	.1250	1.5	SR-125-1.5	7.30
.1250	.1250	2.0	SR-125-2	8.00
.1250	.1250	3.0	SR-125-3	9.60
.1250	.1250	4.0	SR-125-4	12.20
.1250	.1250	6.0	SR-125-6	18.50
.1250	.1250	12.0	SR-125-12	31.60
.1562	.1562	1.5	SR-156-1.5	8.70
.1562	.1562	2.0	SR-156-2	11.00
.1562	.1562	3.0	SR-156-3	14.40
.1562	.1562	4.0	SR-156-4	16.60
.1562	.1562	6.0	SR-156-6	28.70
4 mm	.1575	50 mm	SRM-040-050	7.90
4 mm	.1575	100 mm	SRM-040-100	16.20

*Denotes chamfered end.

Continued on next page

Blanks

Round Blanks (cont.)

SR / SRM

Continued from previous page

Shank Diameter		Overall Length	Round Blank	
D_2 (h6)		L_1	Tool #	Price
4 mm	.1575	310 mm	SRM-040-310	39.80
4.5 mm	.1772	100 mm	SRM-045-100	19.20
.1875	.1875	1.5	SR-187-1.5*	9.00
.1875	.1875	2.0	SR-187-2*	10.40
.1875	.1875	4.0	SR-187-4	20.10
.1875	.1875	6.0	SR-187-6	29.00
.1875	.1875	12.0	SR-187-12	52.10
5 mm	.1969	50 mm	SRM-050-050	9.90
5 mm	.1969	100 mm	SRM-050-100	22.10
5 mm	.1969	310 mm	SRM-050-310	63.70
5.5 mm	.2165	100 mm	SRM-055-100	24.20
6 mm	.2362	57 mm	SRM-060-057	14.90
6 mm	.2362	100 mm	SRM-060-100	29.40
6 mm	.2362	310 mm	SRM-060-310	75.50
.2500	.2500	2.0	SR-250-2*	15.40
.2500	.2500	2.5	SR-250-2.5*	18.30
.2500	.2500	3.0	SR-250-3*	19.20
.2500	.2500	4.0	SR-250-4	29.30
.2500	.2500	6.0	SR-250-6	41.90
.2500	.2500	12.0	SR-250-12	78.10
7 mm	.2756	100 mm	SRM-070-100	38.80
.3125	.3125	2.0	SR-312-2*	19.60
.3125	.3125	2.5	SR-312-2.5*	23.70
.3125	.3125	4.0	SR-312-4*	43.00
.3125	.3125	6.0	SR-312-6	59.80
.3125	.3125	12.0	SR-312-12	107.90
8 mm	.3150	100 mm	SRM-080-100	39.20
8 mm	.3150	310 mm	SRM-080-310	102.10
9 mm	.3543	100 mm	SRM-090-100	40.20
9 mm	.3543	310 mm	SRM-090-310	122.70
.3750	.3750	2.0	SR-375-2*	23.90
.3750	.3750	2.5	SR-375-2.5*	29.50
.3750	.3750	4.0	SR-375-4*	48.10
.3750	.3750	6.0	SR-375-6	73.30
.3750	.3750	12.0	SR-375-12	140.10
10 mm	.3937	72 mm	SRM-100-072	35.60
10 mm	.3937	100 mm	SRM-100-100	58.70
10 mm	.3937	310 mm	SRM-100-310	165.80
.4375	.4375	2.5	SR-437-2.5*	59.30
.4375	.4375	4.0	SR-437-4	87.70
.4375	.4375	6.0	SR-437-6	134.30
.4375	.4375	12.0	SR-437-12	207.00
12 mm	.4724	100 mm	SRM-120-100	77.20
12 mm	.4724	310 mm	SRM-120-310	220.40
.5000	.5000	2.5	SR-500-2.5*	46.20

*Denotes chamfered end.

Continued on next page

SR / SRM

Blanks

Round Blanks (cont.)

Continued from previous page

Shank Diameter		Overall Length	Round Blank	
D_2 (h6)		L_1	Tool #	Price
.5000	.5000	3.0	SR-500-3*	48.60
.5000	.5000	4.0	SR-500-4	74.40
.5000	.5000	6.0	SR-500-6	113.40
.5000	.5000	12.0	SR-500-12	255.50
13 mm	.5118	310 mm	SRM-130-310	224.50
14 mm	.5512	100 mm	SRM-140-100	110.50
.5625	.5625	3.5	SR-562-3.5*	93.30
.6250	.6250	3.5	SR-625-3.5*	115.40
.6250	.6250	4.0	SR-625-4	115.70
.6250	.6250	6.0	SR-625-6	168.60
.6250	.6250	12.0	SR-625-12	321.50
16 mm	.6299	100 mm	SRM-160-100	113.70
16 mm	.6299	310 mm	SRM-160-310	325.80
.6875	.6875	6.0	SR-687-6	335.20
18 mm	.7087	100 mm	SRM-180-100	155.60
.7500	.7500	4.0	SR-750-4*	138.10
.7500	.7500	6.0	SR-750-6	264.30
.7500	.7500	12.0	SR-750-12	432.40
20 mm	.7874	100 mm	SRM-200-100	168.10
25 mm	.9843	310 mm	SRM-250-310	726.70
1.0000	1.0000	5.0	SR-001-5*	449.20
1.0000	1.0000	12.0	SR-001-12	751.70

*Denotes chamfered end.

Blanks

Split End – Single Ended

RS /RSM

- Precision ground blank designed for custom profiles requiring a split face
- Precision manufactured in the USA

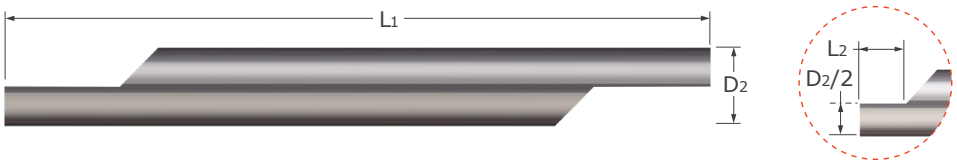
Split Length*			Shank Diameter	Overall Length	Single-Ended Blank	
L_2 +.015" −.000"	+1.0 mm −0.0 mm	decimal equiv.	D_2 (h6)	L_1	Tool #	Price
	4 mm	.1575	2 mm	38 mm	RSM-020-1	10.20
	6 mm	.2362	4 mm	50 mm	RSM-040-1	14.20
	8 mm	.3150	6 mm	57 mm	RSM-060-1	20.80
.375		.3750	.1250	1.5	RS-125-1	17.80
.375		.3750	.1250	3.0	RS-125-13	20.10
.375		.3750	.1875	2.0	RS-187-1	21.70
.375		.3750	.1875	3.0	RS-187-13	29.80
.375		.3750	.2500	2.5	RS-250-1	28.10
.375		.3750	.2500	4.0	RS-250-14	44.40
	10 mm	.3937	8 mm	63 mm	RSM-080-1	39.00
	12 mm	.4724	10 mm	72 mm	RSM-100-1	51.60
.500		.5000	.3125	2.5	RS-312-1	41.90
.500		.5000	.3125	4.0	RS-312-14	63.80
.500		.5000	.3750	2.5	RS-375-1	54.80
.500		.5000	.3750	4.0	RS-375-14	86.70
.625		.6250	.5000	3.0	RS-500-1	93.30
.625		.6250	.5000	4.0	RS-500-14	128.20

* Centerline +.0010" / -.0000" and +.024 mm / -.000 mm

RS /RSM

Blanks

Split End – Double Ended



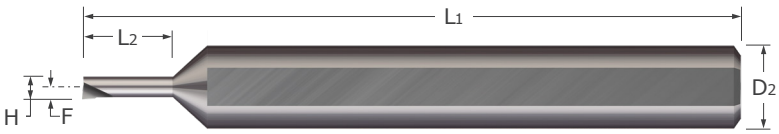
- Precision ground blank designed for custom profiles requiring a split face
- Double-ended allows for maximum utilitzation of the blank
- Precision manufactured in the USA

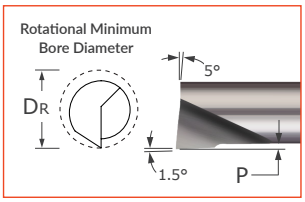
Split Length*			Shank Diameter	Overall Length	Double-Ended Blank	
L_2 +.015" −.015"	+1.0 mm −0.0 mm	decimal equiv.	D_2 (h6)	L_1	Tool #	Price
	4 mm	.1575	2 mm	38 mm	RSM-020-2	14.20
	5 mm	.1969	3 mm	38 mm	RSM-030-2	15.10
	6 mm	.2362	4 mm	50 mm	RSM-040-2	18.80
	8 mm	.3150	6 mm	57 mm	RSM-060-2	27.70
.375		.3750	.1250	2.0000	RS-125-2	24.70
.375		.3750	.1250	3.0000	RS-125-23	26.50
.375		.3750	.1875	2.0000	RS-187-2	30.10
.375		.3750	.1875	3.0000	RS-187-23	37.10
.375		.3750	.2500	2.5000	RS-250-2	38.00
.375		.3750	.2500	4.0000	RS-250-24	52.30
	10 mm	.3937	8 mm	63 mm	RSM-080-2	49.80
	12 mm	.4724	10 mm	72 mm	RSM-100-2	69.40
.500		.5000	.3125	2.5000	RS-312-2	55.80
.500		.5000	.3125	4.0000	RS-312-24	78.30
.500		.5000	.3750	2.5000	RS-375-2	68.80
.500		.5000	.3750	4.0000	RS-375-24	102.70
.625		.6250	.5000	3.0000	RS-500-2	110.60
.625		.6250	.5000	4.0000	RS-500-24	158.40

* Centerline +.0010" / -.0000" and +.024 mm / -.000 mm

Sets

Standard – Boring Tools – Right Hand – Sharp – Miniature





- Designed for facing and boring applications in bores .015" and larger
- Polished face for improved edge retention and chip evacuation while reducing galling
- Split geometry makes the tool as rigid as possible
- On center neck design allows for static and live/rotating applications
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Head Width	Rotational Minimum Bore Diameter	Maximum Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated	Set	
H	D_R	L_2 $^{+.010"}_{-.000"}$	P	F	D_2 (h6)	L_1	Tool #	Set #	Price
.0180	.020	.075	.0020	.0100	.1250	1.5	MBB-020075		
.0225	.025	.100	.0025	.0125	.1250	1.5	MBB-025100		
.0275	.030	.100	.0025	.0150	.1250	1.5	MBB-030100		
.0320	.035	.100	.0030	.0175	.1250	1.5	MBB-035100	MBB-0	215.30
.0365	.040	.150	.0035	.0200	.1250	1.5	MBB-040150		
.0405	.045	.150	.0045	.0225	.1250	1.5	MBB-045150		

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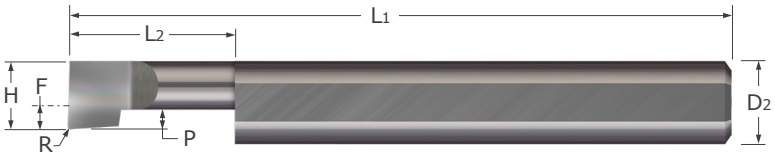
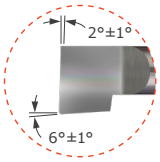
Sets

Standard – Boring Tools – Right Hand



- Designed for facing and boring applications in bores .050" and larger
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split geometry makes the tool as rigid as possible
- Corner radius profile
- Lockdown flat automatically locates tool on center
- Coating options provide added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

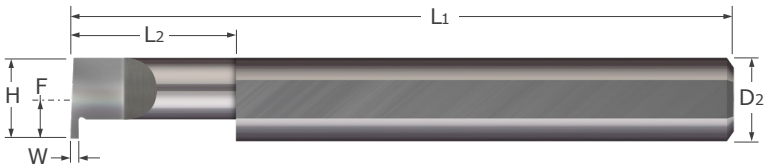


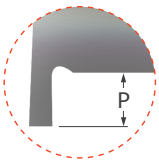
Shank Dia.	Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Overall Length	Uncoated	Set	
D_2 (h6)	H		L_2 $^{+.050"}_{-.000"}$	R $^{+.003"}_{-.000"}$	P	F	L_1	Tool #	Set #	Price
1/8	.050	.060	.300	.003	.012	-.0125	1.5	BB-050300	BB-1	164.80
	.060	.070	.300	.003	.015	-.0025	1.5	BB-060300		
	.080	.090	.300	.003	.020	.0175	1.5	BB-080300		
	.100	.110	.400	.003	.025	.0375	1.5	BB-100400		
	.100	.110	.500	.003	.025	.0375	1.5	BB-100500		
	.100	.110	.600	.003	.025	.0375	1.5	BB-100600		
D_2 (h6)	H		L_2 $^{+.050"}_{-.000"}$	R $^{+.002"}_{-.000"}$	P	F	L_1	Tool #	Set #	Price
3/16	.120	.132	.500	.006	.030	.0263	2.0	BB-120500	BB-2	174.10
	.120	.132	.700	.006	.030	.0263	2.0	BB-120700		
	.140	.152	.400	.006	.035	.0463	2.0	BB-140400		
	.140	.152	.700	.006	.035	.0463	2.0	BB-140700		
	.160	.176	.400	.006	.040	.0663	2.0	BB-160400		
	.160	.176	.750	.006	.040	.0663	2.0	BB-160750		
1/4	.180	.196	.500	.006	.045	.0550	2.5	BB-180500	BB-3	188.50
	.180	.196	.750	.006	.045	.0550	2.5	BB-180750		
	.180	.196	1.000	.006	.045	.0550	2.5	BB-1801000		
	.200	.216	.400	.006	.050	.0750	2.5	BB-200400		
	.200	.216	.600	.006	.050	.0750	2.5	BB-200600		
	.200	.216	1.000	.006	.050	.0750	2.5	BB-2001000		
5/16	.230	.250	.400	.006	.057	.0738	2.5	BB-230400	BB-4	253.40
	.230	.250	.600	.006	.057	.0738	2.5	BB-230600		
	.230	.250	.800	.006	.057	.0738	2.5	BB-230800		
	.230	.250	1.000	.006	.057	.0738	2.5	BB-2301000		
	.290	.310	.500	.006	.072	.1338	2.5	BB-290500		
	.290	.310	1.000	.006	.072	.1338	2.5	BB-2901000		
3/8	.320	.340	.500	.006	.080	.1325	2.5	BB-320500	BB-5	345.10
	.320	.340	1.000	.006	.080	.1325	2.5	BB-3201000		
	.320	.340	1.500	.006	.080	.1325	2.5	BB-3201500		
	.360	.380	.750	.006	.090	.1725	2.5	BB-360750		
	.360	.380	1.250	.006	.090	.1725	2.5	BB-3601250		
	.360	.380	1.800	.006	.090	.1725	2.5	BB-3601800		

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Sets

Standard – Grooving Tools – Retaining Ring – Right Hand





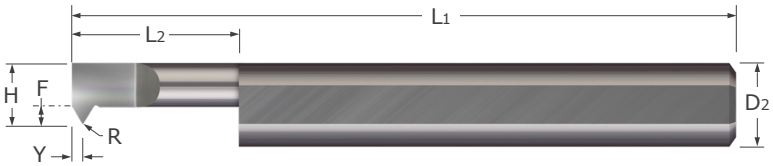
- Designed for generating retaining ring grooves
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- Coating options provide added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Width	Head Width	Min. Bore Diameter*	Max. Bore Depth	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated	Set	
W $^{+.001"}_{-.000"}$	H		L_2 $^{+.050"}_{-.000"}$	P	F	D_2 (h6)	L_1	Tool #	Set #	Price
.017	.250	.272	.250	.050	.1250	.2500	2.5	RR-017-4	RR-1	237.90
.025	.250	.272	.625	.050	.1250	.2500	2.5	RR-025-10		
.030	.250	.272	.500	.050	.1250	.2500	2.5	RR-030-8		
.030	.250	.272	.625	.050	.1250	.2500	2.5	RR-030-10		
.033	.312	.334	.500	.100	.1562	.3125	2.5	RR-033-8		
.033	.312	.334	.750	.100	.1562	.3125	2.5	RR-033-12		
W $^{+.002"}_{-.000"}$	H		L_2 $^{+.050"}_{-.000"}$	P	F	D_2 (h6)	L_1	Tool #	Set #	Price
.039	.375	.397	.750	.100	.1875	.3750	2.5	RR-039-12	RR-2	357.40
.046	.375	.397	1.000	.100	.1875	.3750	2.5	RR-046-16		
.055	.375	.397	1.250	.100	.1875	.3750	2.5	RR-055-20		
.062	.375	.397	.750	.100	.1875	.3750	2.5	RR-062-12		
.087	.375	.397	.750	.100	.1875	.3750	2.5	RR-087-12		
.087	.375	.397	1.250	.100	.1875	.3750	2.5	RR-087-20		

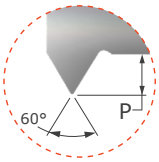
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Sets

Standard – Threading Tools – UN Threads – Single Point – Right Hand



- Designed for threading mulitple thread pitches (ANSI, UN, and Metric 60°)
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split geometry makes the tool as rigid as possible
- Corner radius profile
- Lockdown flat automatically locates tool on center
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

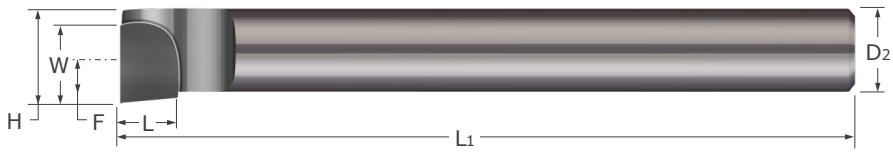


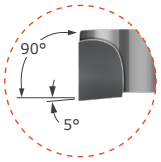
Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Radius	Centerline Offset	Shank Diameter	Overall Length	Uncoated	Set	
TPI	H		L_2 $^{+.050"}_{-.000"}$	Y $^{+.010"}_{-.000"}$	P	R $^{+.001"}_{-.000"}$	F	D_2 (h6)	L_1	Tool #	Set #	Price
24-56	.180	.202	.500	.023	.040	.002	.0550	.2500	2.5	IT-180500	IT-1	299.70
24-40	.200	.222	.600	.026	.045	.002	.0750	.2500	2.5	IT-200600		
20-40	.230	.252	.600	.032	.055	.002	.0738	.3125	2.5	IT-230600		
14-40	.290	.312	.750	.040	.070	.002	.1338	.3125	2.5	IT-290750		
10-32	.320	.342	.750	.043	.075	.002	.1325	.3750	2.5	IT-320750		
10-32	.360	.382	.750	.049	.085	.002	.1725	.3750	2.5	IT-360750		

*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Sets

Standard – Boring Tools – Right Hand – Brazed



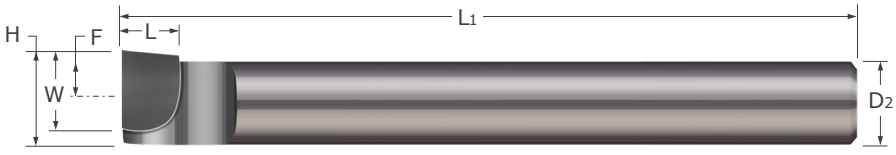


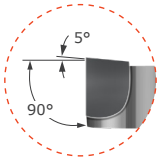
- Designed for right hand facing and boring applications in bores .320" and larger
- Long shank enables flexible reach options (preset at any length)
- Sharp corner profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- CNC ground in the USA

Head Width	Width	Length	Centerline Offset	Shank Diameter	Overall Length	Brazed Style	Set	
H	W	L	F	D_2 $^{+.000"}_{-.003"}$	L_1	Tool #	Set #	Price
.320	.250	.188	.195	.250	4.0	TBB-250		
.463	.313	.250	.276	.375	6.0	TBB-375		
.625	.500	.250	.375	.500	7.0	TBB-500	TBB-5	162.70
.795	.500	.250	.483	.625	8.0	TBB-625		
.935	.625	.250	.560	.750	9.0	TBB-750		

Sets

Standard – Boring Tools – Left Hand – Brazed





- Designed for left hand facing and boring applications in bores .320" and larger
- Long shank enables flexible reach options (preset at any length)
- Sharp corner profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- CNC ground in the USA

Head Width	Width	Length	Centerline Offset	Shank Diameter	Overall Length	Brazed Style	Set	
H	W	L	F	D_2 $^{+.000"}_{-.003"}$	L_1	Tool #	Set #	Price
.320	.250	.188	.195	.250	4.0	TBBL-250		
.463	.313	.250	.276	.375	6.0	TBBL-375		
.625	.500	.250	.375	.500	7.0	TBBL-500	TBBL-5	158.60
.795	.500	.250	.483	.625	8.0	TBBL-625		
.935	.625	.250	.560	.750	9.0	TBBL-750		

Sets

Brazed – Forming Tools – 90° Radius Concave – Right Hand

- Right hand tool designed for forming a convex radius
- Tangential 5° blend angles aid in providing a burr-free transition
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Square Shank	Overall Length	Brazed	Set	
R +.0005" −.0005"	A +.0000" −.0050"	C	Tool #	Set #	Price
.0625	.3750	2.5	RAD-2	RAD-21	197.80
.1250	.3750	2.5	RAD-4		
.2500	.3750	2.5	RAD-8		
.3750	.5000	3.5	RAD-12		
.0312	.3750	2.5	RAD-1	RAD-22	399.60
.0625	.3750	2.5	RAD-2		
.0938	.3750	2.5	RAD-3		
.1250	.3750	2.5	RAD-4		
.1562	.3750	2.5	RAD-5		
.1875	.3750	2.5	RAD-6		
.2188	.3750	2.5	RAD-7		
.2500	.3750	2.5	RAD-8		
.0625	.3750	2.5	RAD-2	RAD-23	430.50
.1250	.3750	2.5	RAD-4		
.1875	.3750	2.5	RAD-6		
.2500	.3750	2.5	RAD-8		
.3125	.5000	3.5	RAD-10		
.3750	.5000	3.5	RAD-12		
.4375	.7500	4.5	RAD-14		
.5000	.7500	4.5	RAD-16		
.0312	.3750	2.5	RAD-1	RAD-24	862.10
.0625	.3750	2.5	RAD-2		
.0938	.3750	2.5	RAD-3		
.1250	.3750	2.5	RAD-4		
.1562	.3750	2.5	RAD-5		
.1875	.3750	2.5	RAD-6		
.2188	.3750	2.5	RAD-7		
.2500	.3750	2.5	RAD-8		
.2812	.5000	3.5	RAD-9		
.3125	.5000	3.5	RAD-10		
.3438	.5000	3.5	RAD-11		
.3750	.5000	3.5	RAD-12		
.4062	.7500	4.5	RAD-13		
.4375	.7500	4.5	RAD-14		
.4688	.7500	4.5	RAD-15		
.5000	.7500	4.5	RAD-16		

Sets

Indexable Boring Bars – Facing – Coolant Through – Right Hand

Set Contents	Holder Nomenclature	Part Number	Set	
		Tool #	Set #	Price
3 STFCR Tool Holders 3/8", 1/2", and 5/8" Shank Diameters	A06J STFCR 2	20-1031	40-2100	274.00
	A08K STFCR 2	20-1033		
	A10M STFCR 2	20-1035		
3 Inserts	-	50-1300		
3 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		

Sets

Indexable Boring Bars – Boring – Coolant Through – Right Hand

Set Contents	Holder Nomenclature	Part Number	Set	
		Tool #	Set #	Price
4 SCLCR Tool Holders 1/4", 5/16", 3/8", and 1/2" Shank Diameters	A04F SCLCR 2	20-0821	40-0100	325.80
	A05H SCLCR 2	20-0823		
	A06J SCLCR 2	20-0825		
	A08K SCLCR 2	20-0827		
4 Inserts	-	50-1100		
4 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		
3 Tool Holders 1/2", 5/8", 3/4" Shank Diameters	A08K SCLCR 3	20-0850	40-2500	388.20
	A10M SCLCR 3	20-0852		
	A12Q SCLCR 3	20-0854		
3 Inserts	-	50-1105		
3 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M3.5 x TK-15	-	16-1070		

Sets

Indexable Boring Bars – Profiling – Coolant Through – Right Hand

Set Contents	Holder Nomenclature	Part Number	Set	
		Tool #	Set #	Price
3 SDUCR Tool Holders 3/8", 1/2", and 5/8" Shank Diameters	A06J SDUCR 2	20-0931	40-2400	274.00
	A08K SDUCR 2	20-0933		
	A10M SDUCR 2	20-0935		
3 Inserts	-	50-1200		
3 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		

Sets

Indexable Boring Bars – Multi-Purpose Set 1

Set Contents	Holder Nomenclature	Part Number	Set	
		Tool #	Set #	Price
6 Assorted Tool Holders 1/4" Square Shank	SCLCR 0404 D2	10-3231	40-7101	294.70
	SCLCL 0404 D2	10-3232		
	SCBCR 0404 D2	10-3151		
	SCKCR 0404 D2	10-3211		
	SCMCN 0404 D2	10-3311		
	SCSCR 0404 D2	10-3351		
1 Boring Bar 1/4" Shank Diameter	A04F SCLCR 2	21-0921		
7 Inserts	-	50-1100		
7 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		
6 Assorted Tool Holders 5/16" Square Shank	SCLCL 0404 D2	10-3233	40-7102	303.50
	SCLCL 0505 D2	10-3234		
	SCBCR 0505 D2	10-3153		
	SCKCR 0505 D2	10-3212		
	SCMCN 0505 D2	10-3312		
	SCSCR 0505 D2	10-3353		
1 Boring Bar 1/4" Shank Diameter	A05H SCLCR 2	21-0921		
7 Inserts	-	50-1100		
7 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		
6 Assorted Tool Holders 3/8" Square Shank	SCLCR 0606 E2	10-3235	40-7103	318.30
	SCLCL 0606 E2	10-3236		
	SCBCR 0606 E2	10-3155		
	SCKCR 0606 E2	10-3213		
	SCMCN 0606 E2	10-3313		
	SCSCR 0606 E2	10-3355		
1 Boring Bar 5/16" Shank Diameter	A06J SCLCR 2	21-0923		
7 Inserts	-	50-1100		
7 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		
6 Assorted Tool Holders 1/2" Square Shank	SCLCR 0808 F2	10-3237	40-7104	340.70
	SCLCL 0808 F2	10-3238		
	SCBCR 0808 F2	10-3157		
	SCKCR 0808 F2	10-3215		
	SCMCN 0808 F2	10-3314		
	SCSCR 0808 F2	10-3357		
1 Boring Bar 3/8" Shank Diameter	A08K SCLCR 2	20-0825		
7 Inserts	-	50-1100		
7 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		

Continued on next page

Sets

Indexable Boring Bars – Multi-Purpose Set 1 (cont.)

Continued from previous page

Set Contents	Holder Nomenclature	Part Number	Set	
		Tool #	Set #	Price
6 Assorted Tool Holders 5/8" Square Shank	SCLCR 1010 H2	10-3241	40-7105	459.10
	SCLCL 1010 H2	10-3242		
	SCBCR 1010 H2	10-3159		
	SCKCR 1010 H2	10-3217		
	SCMCN 1010 H2	10-3315		
	SCSCR 1010 H2	10-3359		
1 Boring Bar 1/2" Shank Diameter	A10M SCLCR 2	20-0827		
7 Inserts	-	50-1100		
7 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		

Sets

Indexable Boring Bars – Multi-Purpose Set 2

Set Contents	Holder Nomenclature	Part Number	Set	
		Tool #	Set #	Price
3 Tool Holders 3/4" Square Shank	SCLCR 1212 J3	10-3251	40-7150	494.00
	SCLCL 1212 J3	10-3252		
	SCSCR 1212 J3	10-3365		
1 Boring Bar 3/4" Shank Diameter	A12Q SCLCR 3	20-0854		
4 Inserts	-	50-1105		
4 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M3.5 x TK-15	-	16-1070		

Sets

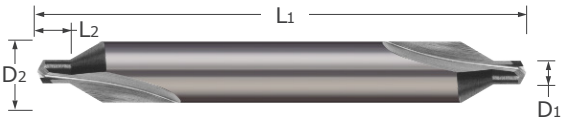
Indexable Boring Bars – Multi-Purpose Set 3

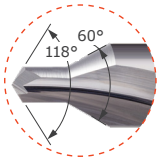
Set Contents	Holder Nomenclature	Part Number	Set	
		Tool #	Set #	Price
3 Assorted Tool Holders 5/16" Square Shank	SDJCR 0505 H2	10-3641		
	SDJCL 0505 H2	10-3642		
	SDNCN 0505 H2	10-3761		
1 Boring Bar 5/16" Shank Diameter	A05H SDQCR 2	20-0901	40-7200	240.80
4 Inserts	-	50-1200		
4 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		
3 Assorted Tool Holders 3/8" Square Shank	SDJCR 0606 H2	10-3651		
	SDJCL 0606 H2	10-3652		
	SDNCN 0606 H2	10-3762		
1 Boring Bar 3/8" Shank Diameter	A06J SDUCR 2	21-1031	40-7201	266.50
4 Inserts	-	50-1200		
4 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		
3 Assorted Tool Holders 1/2" Square Shank	SDJCR 0808H2	10-3653		
	SDJCL 0808H2	10-3654		
	SDNCN 0808 H2	10-3763		
1 Boring Bar 1/2" Shank Diameter	A08K SDUCR 2	21-1033	40-7202	294.70
4 Inserts	-	50-1200		
4 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		
3 Assorted Tool Holders 5/8" Square Shank	SDJCR 1010 H2	10-3615		
	SDJCL 1010 H2	10-3616		
	SDNCN 1010 H2	10-3764		
1 Boring Bar 5/8" Shank Diameter	A10M SDUCR 2	21-1035	40-7203	362.80
4 Inserts	-	50-1200		
4 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		

Sets
Indexable – Milling – Tool Holders – Coolant Through

Set Contents	Holder Nomenclature	Part Number	Set	
		Tool #	Set #	Price
3 Tool Holders 1/2" Shank Diameters	AAAP 1216 2	30-1216	60-3003	362.80
	AAAP 1616 2	30-1616		
	AAAP 1816 2	30-1816		
4 Inserts	-	50-2100		
4 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M3.5 x TK-15	-	16-1070		

Sets
Combined Drill & Countersinks



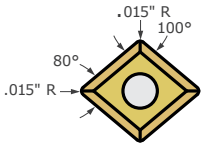


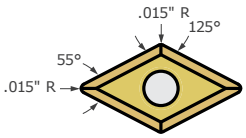
- Designed for predrilling 60° live center holes
- Can be utilized for countersinking and spot drilling
- Double-ended for quicker tool changes
- Solid carbide
- CNC ground in the USA

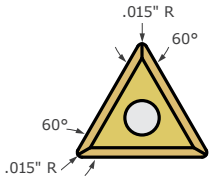
Drill Diameter	Drill Length	Shank Diameter	Overall Length	Uncoated	Set	
D_1 $^{+.0030"}_{-.0000"}$	L_2	D_2 (h6)	L_1	Tool #	Set #	Price
.0469	.047	.1250	1.500	DC-1	DC-0	380.10
.0781	.078	.1875	1.875	DC-2		
.1094	.109	.2500	2.000	DC-3		
.1250	.125	.3125	2.500	DC-4		
.1875	.188	.4375	2.750	DC-5		
.2188	.219	.5000	3.000	DC-6		

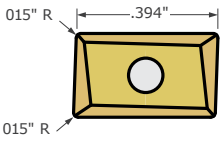
Indexable Inserts

Indexable Cutters – Inserts

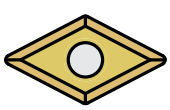
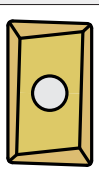








- Solid carbide

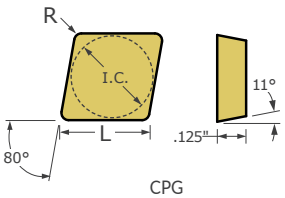
Insert Type	Insert*	
	Tool #	Price
	50-1100	12.00
	50-1105	14.50
	50-1200	12.70
	50-1300	10.90
	50-2100	13.20

*Must be ordered in quantities of 10.

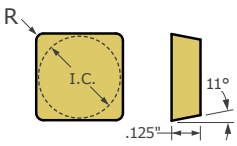
CPG / SPG

Indexable Inserts

Indexable Cutters – Generic Inserts – Diamond Style



CPG



SPG

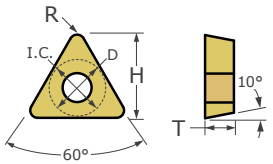
- 80° diamond insert with radius on corner
- For use in clamp locking style holder
- Solid carbide

Inscribed Circle	Length	Radius	Style	Diamond Style Insert	
IC +.001" −.001"	L +.001" −.001"	R +.003" −.003"		Tool #	Price
.464	.471	.015	CPG	CPG-4621	16.70
.464	.471	.031	CPG	CPG-4622	16.70
.500	.508	.015	CPG	CPG-421	15.00
.500	.508	.031	CPG	CPG-422	12.60
.375	-	.031	SPG	SPG-322	15.10
.500	-	.031	SPG	SPG-422	13.40

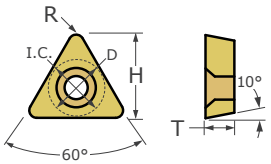
TPG / TP / TD

Indexable Inserts

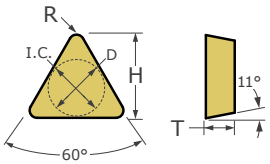
Indexable Cutters – Generic Inserts – Triangle Style



TP



TD-6P



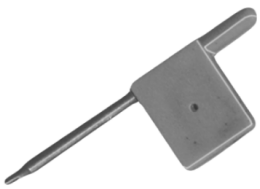
TPG

- 60° triangular insert with radius on corner
- For use with clamp locking style holder
- Solid carbide

Inscribed Circle	Thickness	Height	Radius	Hole Diameter	Set Screw UN	Style	Triangle Style Insert	
IC +.001" −.001"	T +.005" −.005"	H	R +.003" −.003"	D +.003" −.003"			Tool #	Price
.250	.094	.3438	.031	.137	4-40	TP	TP-42	14.30
.250	.094	.3600	.015	.137	4-40	TP	TP-41	10.00
.250	.125	.3440	.031			TPG	TPG-222	10.60
.375	.125	.5324	.031			TPG	TPG-322	12.60
.375	.125	.5324	.031	.163	6-32	TP	TP-62	16.60
.375	.125	.5324	.031	.125	4-40	TD	TD-6P-2	16.60
.375	.125	.5479	.015			TPG	TPG-321	11.90
.375	.125	.5479	.015	.163	6-32	TP	TP-61	16.60
.375	.125	.5480	.015	.125	4-40	TD	TD-6P-1	16.60
.500	.188	.7030	.047			TPG	TPG-433	19.30
.500	.188	.7199	.031			TPG	TPG-432	14.00

Accessories

Indexable Accessories

Accessory Type	Compatibility	Description	Accessory	
			Tool #	Price
	Inserts 50-1100 50-1200 50-1300 50-2100	Torx Screw M2.5 x T-8	16-1020	4.40
	Inserts 50-1105	Torx Screw M3.5 x T-15	16-1030	5.20
	Screw 16-1020	Torx Key M2.5 x TK-8	16-1060	4.10
	Screw 16-1030	Torx Key M3.5 x TK-15	16-1070	4.80

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Coatings Chart

Coating/ Substrate:	**TiN** Titanium Nitride -G	**AlTiN** Aluminum Titanium Nitride -X	**nACRo®** Aluminum Chromium Nitride Silicone -K	**ZrN** Zirconium Nitride -S
Application/ Benefits:	▪ General purpose coating with proven performance and increasing tool productivity with higher feeds and speeds in machining of ferrous materials and in applications that are not generating excessive/ extreme heat	▪ Maintains high surface hardness at elevated temperatures, promotes tool life and allows for faster feeds and speeds ▪ Higher breakdown temperatures ▪ High Performance and versatile coating ▪ Excellent for dry-machining	▪ Extremely heat and scratch resistant coating that provides exceptional performance for those "tough and difficult" materials where temperatures increase dramatically during the machining application	▪ Better tool performance over uncoated carbide in numerous non-ferrous materials ▪ Characteristics include a high hardness with lubricity and abrassion resistance ▪ Generally, an alternative to diamond coatings
Materials:				
	General purpose, ferrous and non-ferrous materials	Alloy steels, stainless steels, tool steels, titanium, inconel, nickel and other aerospace materials	Aluminum Alloy Steels, Carbon Steels, Stainless Steels, Hardened Steels, Nickel Alloys, Cast Irons, Titanium and other High Temperature Alloys	Abrasive non-ferrous alloys such as Brass, Bronze, Copper and Abrasive Aluminum Alloys
Color:	Gold	Dark Gray / Black	Black / Gray	Light Gold / Champagne
Structure:	Mono-layer	Multi-layer	Nano-composite	Mono-layer
Hardness (HV 0.05):	2170 (21 GPa)	3569 (35 GPa)	4079(40 GPa)	2460 (24 GPa)
Coefficient of Friction:	.50	.60	0.45	.50
Coating Thickness (microns):	2 - 5	2 - 5	1 - 7	2 - 5
Max. Working Temp:	1000° F	1400° F	2012° F	1100° F

PLEASE NOTE: Information and test results were compiled from multiple sources and testing methods. Data presented is intended to be a general application guideline for comparing various coatings.

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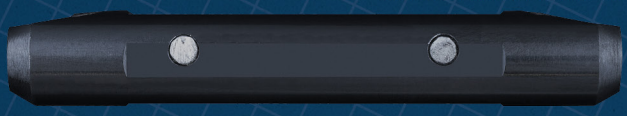
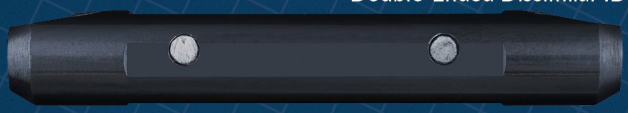
Double-Ended Similar ID



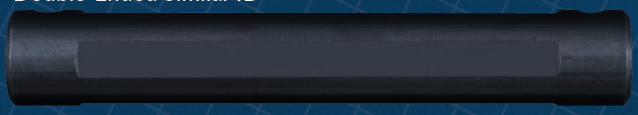
Double-Ended Dissimilar ID



Double-Ended with ER

NEW Standard Holders

Double-Ended Similar ID



Double-Ended Dissimilar ID

Double-Ended with ER

Learn Which Holder is Right for You Beginning on Page 8.

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