MICRO 100®

Make More With Micro 100

2026 US Catalog

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.

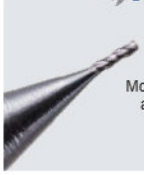
Powerful Performance

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 31,000 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.

TITAN USA

Trust in Titan USA

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

COREHOG

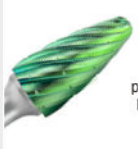
Innovative Tools for Innovative Materials

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.



ata sgspro

We Know Burs

More than 1,200 precision-engineered carbide burs with options tailored to every grinding application.

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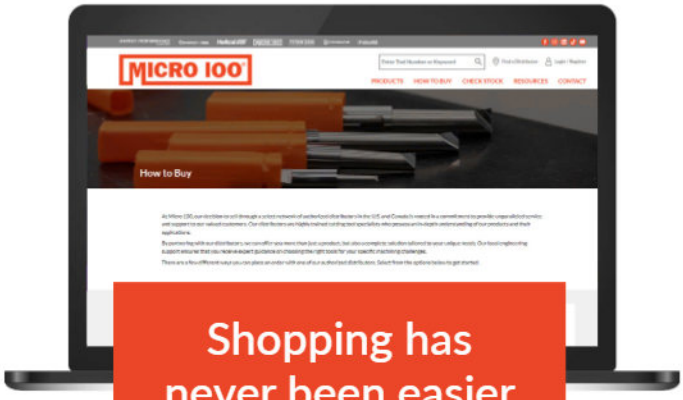

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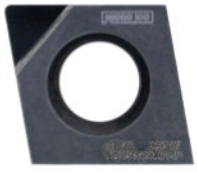

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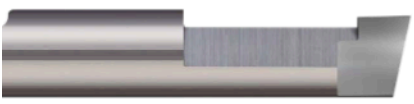

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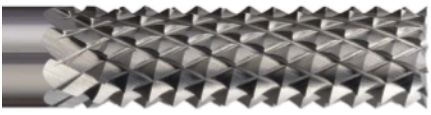

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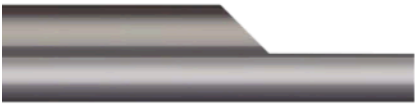

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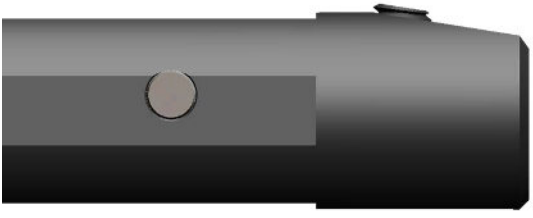
Tool Holders & Systems

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



Quick Change Holders & Parts

Benefits & Options on pg 9

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 50

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 52

This offering of Collets includes ER Collets, Metric ID ER Collets, and Collet Sets, which are available in counts of 7, 9, 10, and 13 with both standard and metric options.

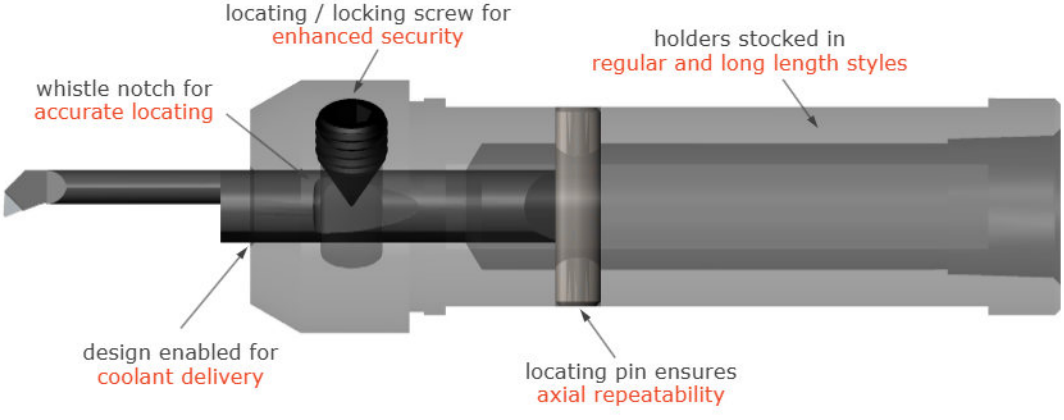
Animations, Benefits, and Details Found Online At
micro100.com/resources/tool-holders

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

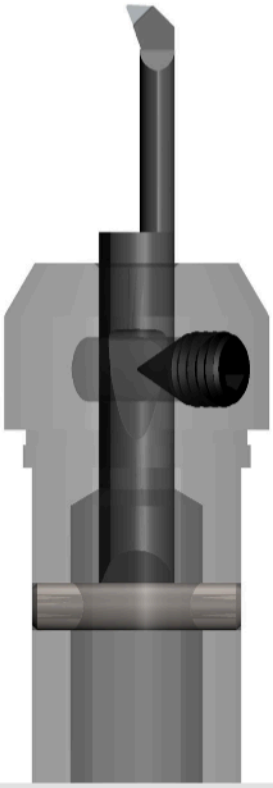


During tool changes, the precision ground bevel specially engineered on the rear of each Micro 100 quick change tool aligns with a locating pin in the quick change tool holder. The distance from this locational point to the tip of the tool is highly controlled, meaning that our Micro-Quik tooling system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

Quick Change Tool Holders

starts on pg 15

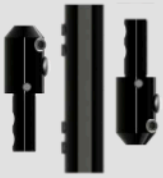
Whistle notch configuration proven to enhance axial accuracy.



Micro 100's offering of quick change tool holders, including our popular headless-style products, delivers unparalleled speed, repeatability, and accuracy. These unique holders are engineered for use in all Swiss, standard, and 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

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 setup 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.

Continued from previous page

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

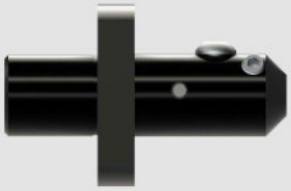
Application Specific

PSC Tool Holder pg 29

QT

Optimized for machines with PSC / Capto® connections

Star Swiss Machine Holders starts on pg 30



QZST

Designed for Star Swiss Machines

Grinding Holder pg 34

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 their shanks.

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

Standard PSC Tool Holders

starts on pg 15

Micro 100's PSC Holders are designed for seamless compatibility, featuring a Capto®-compatible connection and a Standard shank ID system for use with all ID tools in standard turning applications. Optimized for lathes with or without an automatic tool changer, these holders offer maximum rigidity in small work envelopes. Heat-treated for durability and coated with black oxide for corrosion resistance, each holder includes a hex wrench, locating screw, and locking screw for easy setup.

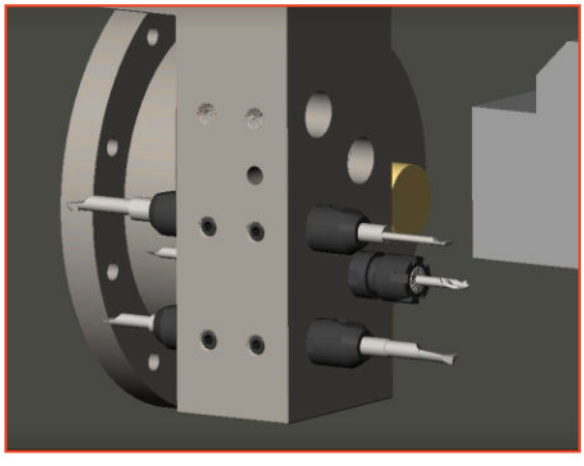
Standard Reference Guide

	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 setup time by having multiple variations of connections readily accessible in the machine.



Scan to view or go online at micro100.com/resources/tool-holders

Let Us Help You **Make More** With Micro 100

Stay Connected With Us

- ✓ Micro 100 Product Releases
- ✓ Valuable Technical Resources
- ✓ Machining Tips and Best Practices
- ✓ Giveaways & Promotions

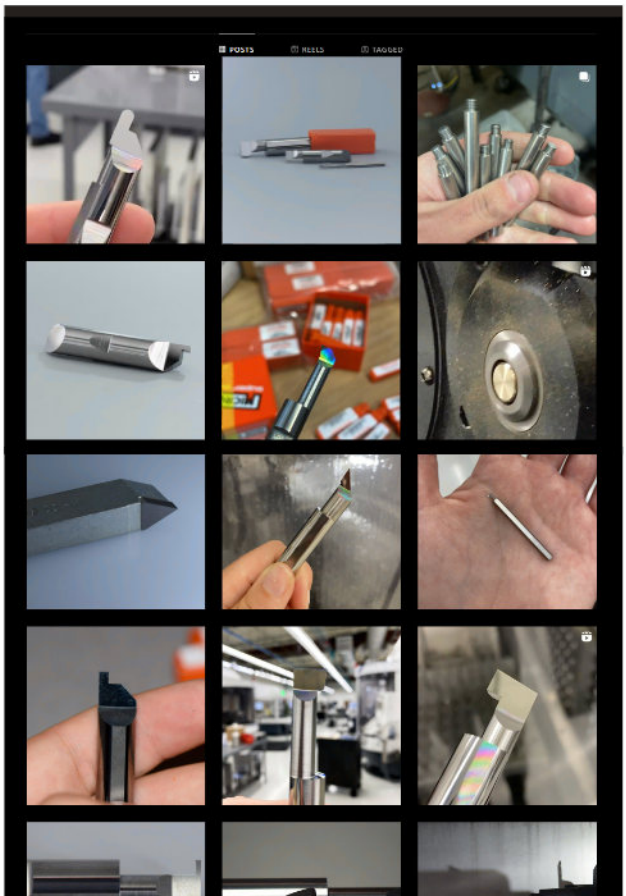
Join Our Email List

Scan the QR code below to sign up for our email list! Our bi-weekly email delivers 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!

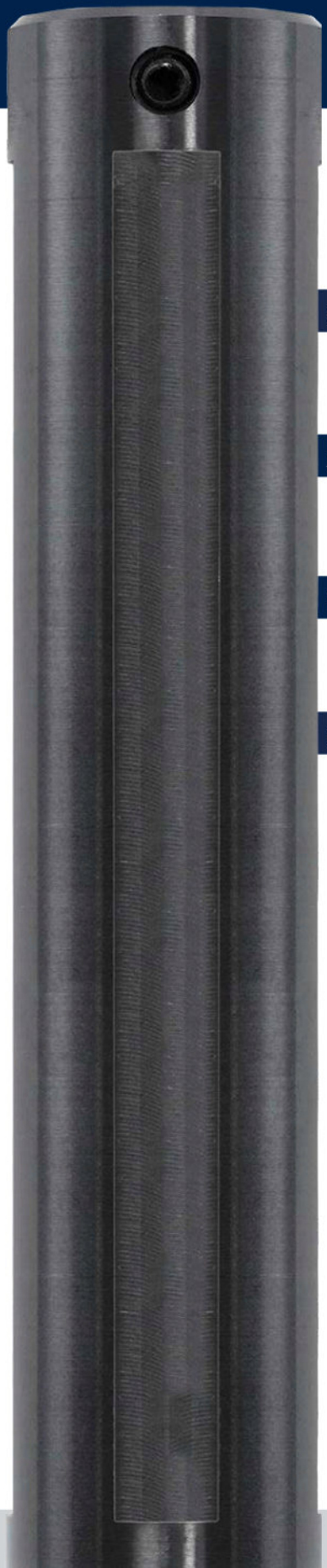
Follow Us on Social

From amazing tool geometries to beautiful final parts made with Micro 100 turning tools, you'll find it all on our social media channels! Also, be sure to send us your pictures and videos! We love to check out what you accomplish with our tools.

- Instagram @micro100
- Facebook @micro100
- LinkedIn @micro100
- Youtube @micro.100



TOOL HOLDERS & SYSTEMS



Quick Change Holders & Parts

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Taper Integrated Holders 50
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Collets

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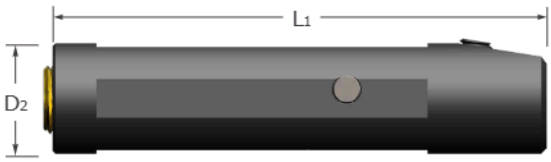
NEW!

Quick Change Holders

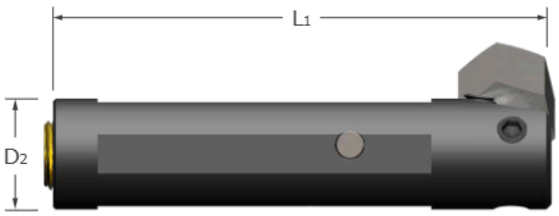
Straight Holder – Standard Length

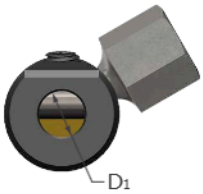
QTS / QTSP

Plumbed QTS



Plumbed & Ported QTSP

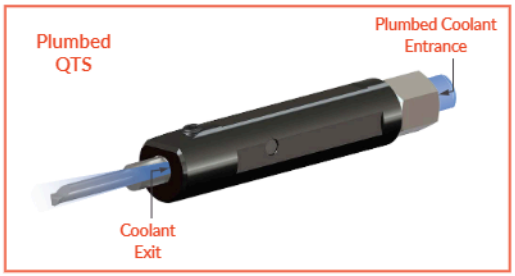


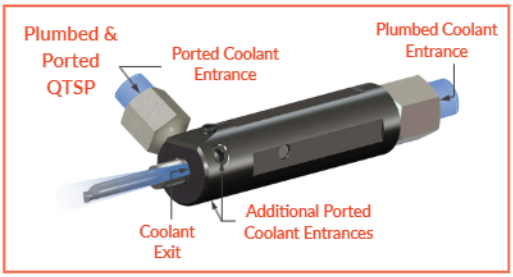


- Headless tool holder engineered for maximum versatility in any Swiss, standard lathe, or multi-function lathe
- Standard plumbed and 3 ported options for enhanced coolant accessibility
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- 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 #	USD$
.1875	12 mm	-	1/8-27	2.8	40317	QTS-187-472	182.95
.1875	.5000	-	1/8-27	2.8	40317	QTS-187-500	182.95
.1875	.6250	-	1/8-27	2.8	40317	QTS-187-625	198.20
.1875	16 mm	-	1/8-27	2.8	40317	QTS-187-630	198.20
.1875	.7500	1/4-28 HP	1/8-27	2.8	40316	QTSP-187-750	257.25
.1875	20 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-187-787	257.25
.1875	22 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-187-866	257.25
.1875	25 mm	1/4-28 HP	1/8-27	2.8	40315	QTSP-187-984	257.25
.1875	1.0000	1/4-28 HP	1/8-27	2.8	40315	QTSP-187-1000	257.25
.1875	1.2500	1/4-28 HP	1/8-27	2.8	40279	QTSP-187-1250	257.25 NEW

Continued on next page





See pages 35-38 for replacement parts and accessories

QTS / QTSP

Quick Change Holders

Straight Holder – Standard Length (cont.)

Continued from previous page

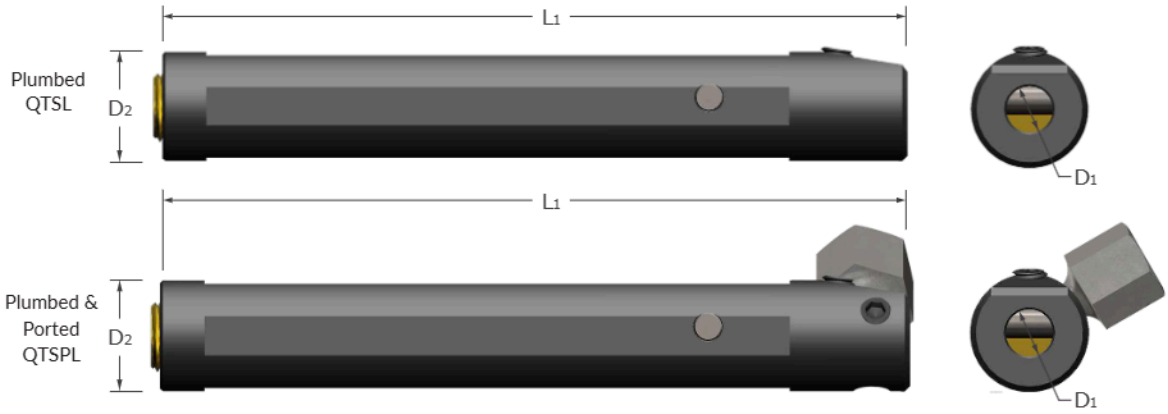
	Internal Diameter	Shank Diameter	Ported Thread	Plumbed Thread	Overall Length	Locating Locking Screw	Tool Holder	
	D_1 +.0005" −.0000"	D_2 −.0003" −.0008" −.008mm −.020mm			L_1		Tool #	USD$
	.2500	12 mm	-	1/8-27	2.8	40317	QTS-250-472	182.95
	.2500	.5000	-	1/8-27	2.8	40317	QTS-250-500	182.95
	.2500	.6250	-	1/8-27	2.8	40317	QTS-250-625	198.20
	.2500	16 mm	-	1/8-27	2.8	40317	QTS-250-630	198.20
	.2500	.7500	1/4-28 HP	1/8-27	2.8	40316	QTSP-250-750	257.25
	.2500	20 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-250-787	257.25
	.2500	22 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-250-866	257.25
	.2500	25 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-250-984	257.25
	.2500	1.0000	1/4-28 HP	1/8-27	2.8	40315	QTSP-250-1000	257.25
NEW	.2500	1.2500	1/4-28 HP	1/8-27	2.8	40279	QTSP-250-1250	257.25
	.3125	.6250	-	1/8-27	2.8	40317	QTS-312-625	198.20
	.3125	16 mm	-	1/4-18	2.8	40317	QTS-312-630	198.20
	.3125	.7500	-	1/4-18	2.8	40317	QTS-312-750	213.50
	.3125	20 mm	-	1/4-18	2.8	40317	QTS-312-787	213.50
	.3125	22 mm	1/4-28 HP	1/4-18	2.8	40317	QTSP-312-866	257.25
	.3125	25 mm	1/4-28 HP	1/4-18	2.8	40316	QTSP-312-984	257.25
	.3125	1.0000	1/4-28 HP	1/4-18	2.8	40316	QTSP-312-1000	257.25
NEW	.3125	1.2500	1/4-28 HP	1/4-18	2.8	40315	QTSP-312-1250	257.25
	.3750	.6250	-	1/4-18	2.8	40317	QTS-375-625	198.20
	.3750	.7500	-	1/4-18	2.8	40317	QTS-375-750	213.50
	.3750	20 mm	-	1/4-18	2.8	40317	QTS-375-787	213.50
	.3750	22 mm	1/4-28 HP	1/4-18	2.8	40317	QTSP-375-866	257.25
	.3750	25 mm	1/4-28 HP	1/4-18	2.8	40316	QTSP-375-984	257.25
	.3750	1.0000	1/4-28 HP	1/4-18	2.8	40316	QTSP-375-1000	257.25
NEW	.3750	1.2500	1/4-28 HP	1/4-18	2.8	40315	QTSP-375-1250	257.25
	.5000	.7500	-	3/8-18	2.8	40317	QTS-500-750	213.50
	.5000	1.0000	1/4-28 HP	3/8-18	2.8	40317	QTSP-500-1000	235.15
NEW	.5000	1.2500	1/4-28 HP	3/8-18	2.8	40315	QTSP-500-1250	257.25

See pages 35-38 for replacement parts and accessories

Quick Change Holders

Straight Holder – Long Length

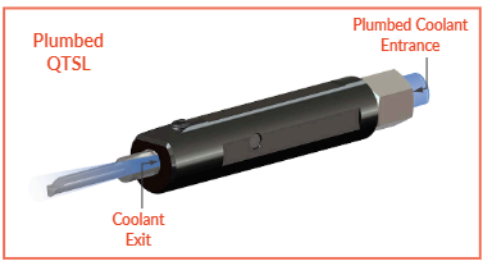
QTSL / QTSPL

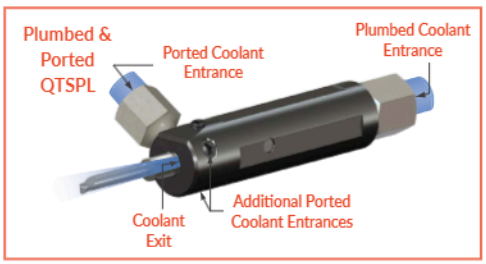


- Quick change, long length tool holder designed for applications requiring an extended reach
- Headless tool holder engineered for maximum versatility in any Swiss, standard lathe, or multi-function lathe
- Standard plumbed and 3 ported options for enhanced coolant accessibility
- Proprietary Micro-Quik 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 #	USD$
.1875	.7500	1/4-28 HP	1/8-27	5.8	40316	QTSPL-187-750	316.05
.1875	20 mm	1/4-28 HP	1/8-27	5.8	40316	QTSPL-187-787	316.05
.1875	22 mm	1/4-28 HP	1/8-27	5.8	40316	QTSPL-187-866	316.05
.1875	25 mm	1/4-28 HP	1/8-27	5.8	40315	QTSPL-187-984	316.05
.1875	1.0000	1/4-28 HP	1/8-27	5.8	40315	QTSPL-187-1000	316.05
.2500	.7500	1/4-28 HP	1/8-27	5.8	40316	QTSPL-250-750	316.05
.2500	20 mm	1/4-28 HP	1/8-27	5.8	40316	QTSPL-250-787	316.05
.2500	22 mm	1/4-28 HP	1/8-27	5.8	40316	QTSPL-250-866	316.05
.2500	25 mm	1/4-28 HP	1/8-27	5.8	40316	QTSPL-250-984	316.05
.2500	1.0000	1/4-28 HP	1/8-27	5.8	40315	QTSPL-250-1000	316.05
.3125	.7500	-	1/4-18	5.8	40317	QTSL-312-750*	264.50
.3125	22 mm	1/4-28 HP	1/4-18	5.8	40316	QTSPL-312-866	316.05
.3125	25 mm	1/4-28 HP	1/4-18	5.8	40316	QTSPL-312-984	316.05
.3125	1.0000	1/4-28 HP	1/4-18	5.8	40316	QTSPL-312-1000	316.05
.3750	.7500	-	1/4-18	5.8	40317	QTSL-375-750*	264.50
.3750	22 mm	-	1/4-18	5.8	40317	QTSL-375-866*	264.50
.3750	25 mm	1/4-28 HP	1/4-18	5.8	40316	QTSPL-375-984	316.05
.3750	1.0000	1/4-28 HP	1/4-18	5.8	40316	QTSPL-375-1000	316.05
.5000	.7500	-	3/8-18	5.8	40317	QTSL-500-750*	264.50
.5000	1.0000	1/4-28 HP	3/8-18	5.8	40316	QTSPL-500-1000	316.05

*Item not ported



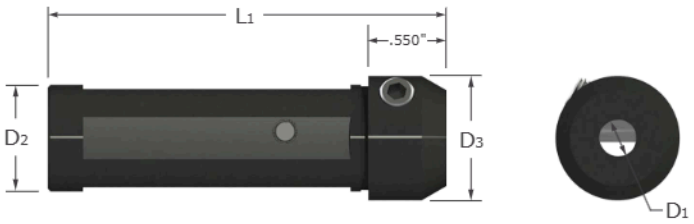


See pages 35-38 for replacement parts and accessories

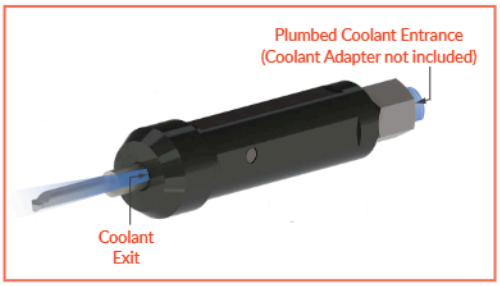
QTH / QTHM

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 #	USD$
.1875	.750	1/8-27 NPT	12 mm	2.8	QTHM-312	167.70
.1875	.750	1/8-27 NPT	.5000	2.8	QTH-85	167.70
.1875	.750	1/8-27 NPT	.6250	2.8	QTH-105	182.95
.1875	.750	1/8-27 NPT	16 mm	2.8	QTHM-316	182.95
.1875	.875	1/4-18 NPT	.7500	2.8	QTH-205	198.20
.1875	.875	1/4-18 NPT	20 mm	2.8	QTHM-320	198.20
.1875	1.062	1/4-18 NPT	22 mm	2.8	QTHM-322	198.20
.1875	1.250	1/4-18 NPT	25 mm	2.8	QTHM-325	198.20
.1875	1.062	1/4-18 NPT	1.0000	2.8	QTH-405	198.20
.1875	-	1/4-18 NPT	1.2500	2.8	QTH-605	198.20
.1875	-	1/4-18 NPT	32 mm	2.8	QTHM-332	198.20
.2500	.750	1/8-27 NPT	12 mm	2.8	QTHM-412	167.70
.2500	.750	1/8-27 NPT	.5000	2.8	QTH-86	167.70
.2500	.750	1/8-27 NPT	.6250	2.8	QTH-106	182.95
.2500	.750	1/8-27 NPT	16 mm	2.8	QTHM-416	182.95
.2500	.875	1/4-18 NPT	.7500	2.8	QTH-206	198.20
.2500	.875	1/4-18 NPT	20 mm	2.8	QTHM-420	198.20
.2500	1.062	1/4-18 NPT	22 mm	2.8	QTHM-422	198.20
.2500	1.250	1/4-18 NPT	25 mm	2.8	QTHM-425	198.20
.2500	1.062	1/4-18 NPT	1.0000	2.8	QTH-406	198.20
.2500	-	1/4-18 NPT	1.2500	2.8	QTH-606	198.20
.2500	-	1/4-18 NPT	32 mm	2.8	QTHM-432	198.20

Continued on next page

See pages 35-38 for replacement parts and accessories

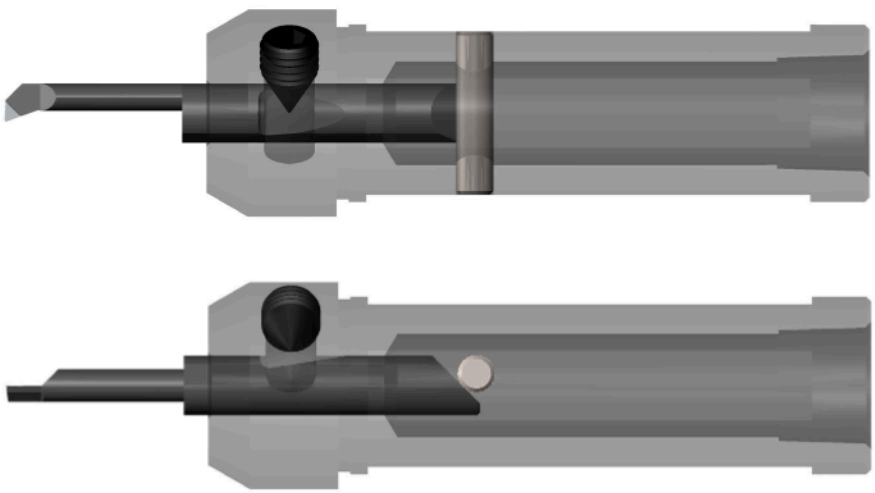
Quick Change Holders

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 #	USD$
.3125	.875	1/8-27 NPT	.6250	2.8	QTH-107	182.95
.3125	.875	1/8-27 NPT	16 mm	2.8	QTHM-516	182.95
.3125	.875	1/4-18 NPT	.7500	2.8	QTH-207	198.20
.3125	.875	1/4-18 NPT	20 mm	2.8	QTHM-520	198.20
.3125	1.062	1/4-18 NPT	22 mm	2.8	QTHM-522	198.20
.3125	1.250	1/4-18 NPT	25 mm	2.8	QTHM-525	198.20
.3125	1.062	1/4-18 NPT	1.0000	2.8	QTH-407	198.20
.3125	-	1/4-18 NPT	1.2500	2.8	QTH-607	198.20
.3125	-	1/4-18 NPT	32 mm	2.8	QTHM-532	198.20
.3750	1.000	1/8-27 NPT	.6250	2.8	QTH-108	182.95
.3750	1.000	1/8-27 NPT	16 mm	2.8	QTHM-616	182.95
.3750	1.000	1/4-18 NPT	.7500	2.8	QTH-208	198.20
.3750	1.000	1/4-18 NPT	20 mm	2.8	QTHM-620	198.20
.3750	1.062	1/4-18 NPT	22 mm	2.8	QTHM-622	198.20
.3750	1.250	1/4-18 NPT	25 mm	2.8	QTHM-625	198.20
.3750	1.062	1/4-18 NPT	1.0000	2.8	QTH-408	198.20
.3750	-	1/4-18 NPT	1.2500	2.8	QTH-608	198.20
.3750	-	1/4-18 NPT	32 mm	2.8	QTHM-632	198.20
.5000	1.062	1/4-18 NPT	.7500	2.8	QTH-210	198.20
.5000	1.062	1/4-18 NPT	20 mm	2.8	QTHM-820	198.20
.5000	1.062	1/4-18 NPT	22 mm	2.8	QTHM-822	198.20
.5000	1.250	1/4-18 NPT	25 mm	2.8	QTHM-825	198.20
.5000	1.062	1/4-18 NPT	1.0000	2.8	QTH-410	198.20
.5000	-	1/4-18 NPT	1.2500	2.8	QTH-610	198.20
.5000	-	1/4-18 NPT	32 mm	2.8	QTHM-832	198.20

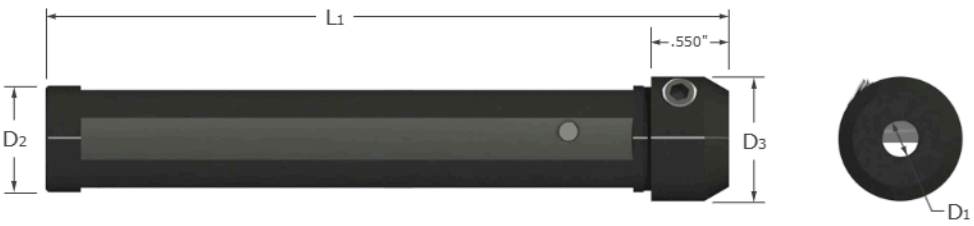


See pages 35-38 for replacement parts and accessories

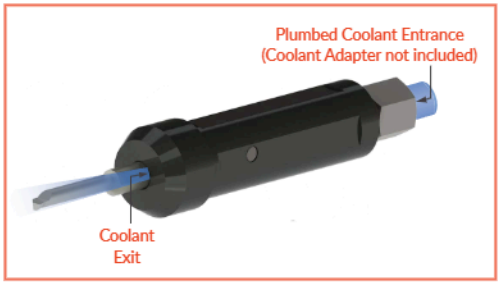
QTHL / QTHML

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 #	USD$
.1875	.750	1/8-27 NPT	12 mm	5.8	QTHM-312L	228.65
.1875	.750	1/8-27 NPT	.5000	5.8	QTH-85L	228.65
.1875	.750	1/8-27 NPT	.6250	5.8	QTH-105L	243.90
.1875	.750	1/8-27 NPT	16 mm	5.8	QTHM-316L	243.90
.1875	.875	1/4-18 NPT	.7500	5.8	QTH-205L	259.20
.1875	.875	1/4-18 NPT	20 mm	5.8	QTHM-320L	259.20
.1875	1.062	1/4-18 NPT	22 mm	5.8	QTHM-322L	259.20
.1875	1.062	1/4-18 NPT	1.0000	5.8	QTH-405L	259.20
.1875	1.250	1/4-18 NPT	25 mm	5.8	QTHM-325L	259.20
.1875	-	1/4-18 NPT	1.2500	5.8	QTH-605L	259.20
.1875	-	1/4-18 NPT	32 mm	5.8	QTHM-332L	259.20
.2500	.750	1/8-27 NPT	.5000	5.8	QTH-86L	228.65
.2500	.750	1/8-27 NPT	.6250	5.8	QTH-106L	243.90
.2500	.750	1/8-27 NPT	16 mm	5.8	QTHM-416L	243.90
.2500	.875	1/4-18 NPT	.7500	5.8	QTH-206L	259.20
.2500	.875	1/4-18 NPT	20 mm	5.8	QTHM-420L	259.20
.2500	1.062	1/4-18 NPT	22 mm	5.8	QTHM-422L	259.20
.2500	1.062	1/4-18 NPT	1.0000	5.8	QTH-406L	259.20
.2500	1.250	1/4-18 NPT	25 mm	5.8	QTHM-425L	259.20
.2500	-	1/4-18 NPT	1.2500	5.8	QTH-606L	259.20
.2500	-	1/4-18 NPT	32 mm	5.8	QTHM-432L	259.20

Continued on next page

See pages 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 #	USD$
.3125	.875	1/8-27 NPT	.6250	5.8	QTH-107L	243.90
.3125	.875	1/8-27 NPT	16 mm	5.8	QTHM-516L	243.90
.3125	.875	1/8-27 NPT	.7500	5.8	QTH-207L	259.20
.3125	.875	1/4-18 NPT	20 mm	5.8	QTHM-520L	259.20
.3125	1.062	1/4-18 NPT	22 mm	5.8	QTHM-522L	259.20
.3125	1.062	1/4-18 NPT	1.0000	5.8	QTH-407L	259.20
.3125	1.250	1/4-18 NPT	25 mm	5.8	QTHM-525L	259.20
.3125	-	1/4-18 NPT	1.2500	5.8	QTH-607L	259.20
.3125	-	1/4-18 NPT	32 mm	5.8	QTHM-532L	259.20
.3750	1.000	1/8-27 NPT	.6250	5.8	QTH-108L	243.90
.3750	1.000	1/8-27 NPT	16 mm	5.8	QTHM-616L	243.90
.3750	1.000	1/4-18 NPT	.7500	5.8	QTH-208L	259.20
.3750	1.062	1/4-18 NPT	22 mm	5.8	QTHM-622L	259.20
.3750	1.062	1/4-18 NPT	1.0000	5.8	QTH-408L	259.20
.3750	1.250	1/4-18 NPT	25 mm	5.8	QTHM-625L	259.20
.3750	-	1/4-18 NPT	1.2500	5.8	QTH-608L	259.20
.3750	-	1/4-18 NPT	32 mm	5.8	QTHM-632L	259.20
.5000	1.062	1/4-18 NPT	.7500	5.8	QTH-210L	259.20
.5000	1.062	1/4-18 NPT	22 mm	5.8	QTHM-822L	259.20
.5000	1.062	1/4-18 NPT	1.0000	5.8	QTH-410L	259.20
.5000	1.250	1/4-18 NPT	25 mm	5.8	QTHM-825L	259.20
.5000	-	1/4-18 NPT	1.2500	5.8	QTH-610L	259.20
.5000	-	1/4-18 NPT	32 mm	5.8	QTHM-832L	259.20

See pages 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 minimum 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 setup time by having more shank variations available in the machine at time of setup
- Unique "3 point" locking and locating system ensures repeatability
- 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 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 #	USD$
.1875	.5000	2.20	40317	QD-3-500	286.70
.1875	.5000	3.20	40317	QD1-3-500	298.80
.1875	.6250	2.20	40317	QD-3-625	298.80
.1875	.6250	3.20	40317	QD1-3-625	311.00
.1875	.7500	3.20	40316	QD1-3-750	317.65
.1875	20 mm	3.20	40316	QD1-3-787	317.65
.1875	22 mm	3.20	40316	QD1-3-866	324.25
.1875	25 mm	3.20	40315	QD1-3-984	329.70
.1875	1.0000	3.20	40315	QD1-3-1000	329.70
.2500	.5000	3.20	40317	QD1-4-500	298.80
.2500	.6250	3.20	40317	QD1-4-625	311.00
.2500	.7500	3.20	40316	QD1-4-750	317.65
.2500	1.0000	3.20	40315	QD1-4-1000	329.70
.3125	.6250	3.20	40317	QD1-5-625	311.00
.3125	.7500	3.20	40317	QD1-5-750	317.65
.3125	1.0000	3.20	40316	QD1-5-1000	329.70
.3750	.7500	3.20	40317	QD1-6-750	317.65
.3750	1.0000	3.20	40316	QD1-6-1000	329.70
.5000	.7500	3.50	40317	QD2-8-750	317.65
.5000	1.0000	3.50	40316	QD2-8-1000	329.70

See It in Action

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

Tech Tip

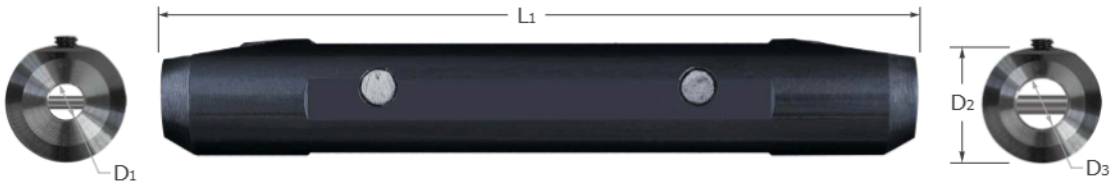
Utilizing multiple styles of double-ended holders can significantly reduce setup time by having multiple variations of connections readily accessible in the machine.

See pages 35-38 for replacement parts and accessories

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 setup time by having more shank variations available in the machine at time of setup
- Unique "3 point" locking and locating system ensures repeatability
- 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 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 #	USD$
.1875	.2500	.5000	3.20	40317	40317	QD1-3-4-500	305.55
.1875	.2500	.6250	3.20	40317	40317	QD1-3-4-625	317.65
.1875	.2500	.7500	3.20	40316	40316	QD1-3-4-750	324.25
.1875	.2500	20 mm	3.20	40316	40316	QD1-3-4-787	324.25
.1875	.2500	22 mm	3.20	40316	40316	QD1-3-4-866	329.70
.1875	.2500	25 mm	3.20	40315	40316	QD1-3-4-984	336.65
.1875	.2500	1.0000	3.20	40315	40315	QD1-3-4-1000	336.65
.2500	.3125	.6250	3.20	40317	40317	QD1-4-5-625	317.65
.2500	.3125	.7500	3.20	40316	40317	QD1-4-5-750	324.25
.2500	.3125	1.0000	3.20	40315	40316	QD1-4-5-1000	336.65
.3125	.3750	.6250	3.20	40317	40317	QD1-5-6-625	317.65
.3125	.3750	.7500	3.20	40317	40317	QD1-5-6-750	324.25
.3125	.3750	1.0000	3.20	40316	40316	QD1-5-6-1000	336.65
.3750	.5000	.7500	3.20	40317	40317	QD1-6-8-750	324.25
.3750	.5000	1.0000	3.20	40316	40316	QD1-6-8-1000	336.65

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 setup time by having multiple variations of connections readily accessible in the machine.

See pages 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 setup time by having more shank variations available in the machine at time of setup
- Unique "3 point" locking and locating system ensures repeatability
- 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

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 #	USD$
ER8-Mini	.1875	.5000	2.20	40317	QD-MR8-3-500	324.25
	.1875	.5000	3.20	40317	QD1-MR8-3-500	336.65
	.1875	.6250	2.20	40317	QD-MR8-3-625	336.65
	.1875	.6250	3.20	40317	QD1-MR8-3-625	348.70
	.2500	.5000	3.20	40317	QD1-MR8-4-500	336.65
	.2500	.6250	3.20	40317	QD1-MR8-4-625	348.70
	.3125	.6250	3.20	40317	QD1-MR8-5-625	348.70
ER11-Mini	.1875	.6250	2.20	40317	QD-MR11-3-625	336.65
	.1875	.6250	3.20	40317	QD1-MR11-3-625	348.70
	.1875	.7500	3.20	40316	QD1-MR11-3-750	355.35
	.1875	20 mm	3.20	40316	QD1-MR11-3-787	355.35
	.1875	22 mm	3.20	40316	QD1-MR11-3-866	360.75
	.1875	25 mm	3.20	40315	QD1-MR11-3-984	367.45
	.1875	1.0000	3.20	40315	QD1-MR11-3-1000	367.45
	.2500	.6250	3.20	40317	QD1-MR11-4-625	348.70
	.2500	.7500	3.20	40316	QD1-MR11-4-750	355.35

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 setup time by having multiple variations of connections readily accessible in the machine.

See pages 35-38 for replacement parts and accessories

Quick Change Holders

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

QDMR

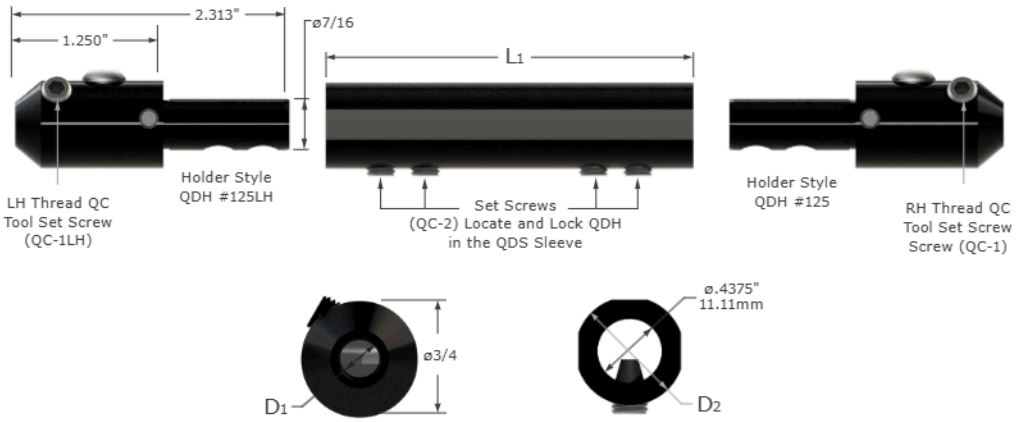
Continued from previous page

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 #	USD$
ER11-Mini	.2500	20 mm	3.20	40316	QD1-MR11-4-787	355.35
	.2500	22 mm	3.20	40316	QD1-MR11-4-866	360.75
	.2500	25 mm	3.20	40316	QD1-MR11-4-984	367.45
	.2500	1.0000	3.20	40315	QD1-MR11-4-1000	367.45
	.3125	.6250	3.20	40317	QD1-MR11-5-625	348.70
	.3125	.7500	3.20	40317	QD1-MR11-5-750	355.35
	.3125	1.0000	3.20	40316	QD1-MR11-5-1000	367.45
	.3750	.6250	3.20	40317	QD1-MR11-6-625	348.70
	.3750	.7500	3.20	40317	QD1-MR11-6-750	355.35
	.3750	1.0000	3.20	40316	QD1-MR11-6-1000	367.45
	.5000	.7500	3.50	40317	QD2-MR11-8-750	355.35
	.5000	1.0000	3.50	40316	QD2-MR11-8-1000	367.45
ER16-Mini	.1875	.7500	3.20	40316	QD1-MR16-3-750	355.35
	.1875	20 mm	3.20	40316	QD1-MR16-3-787	355.35
	.1875	22 mm	3.20	40316	QD1-MR16-3-866	360.75
	.1875	25 mm	3.20	40315	QD1-MR16-3-984	367.45
	.1875	1.0000	3.20	40315	QD1-MR16-3-1000	367.45
	.2500	.7500	3.20	40316	QD1-MR16-4-750	355.35
	.2500	20 mm	3.20	40316	QD1-MR16-4-787	355.35
	.2500	22 mm	3.20	40316	QD1-MR16-4-866	360.75
	.2500	25 mm	3.20	40316	QD1-MR16-4-984	367.45
	.2500	1.0000	3.20	40315	QD1-MR16-4-1000	367.45
	.3125	.7500	3.20	40317	QD1-MR16-5-750	355.35
	.3125	1.0000	3.20	40316	QD1-MR16-5-1000	367.45
	.3750	.7500	3.20	40317	QD1-MR16-6-750	355.35
	.3750	1.0000	3.20	40316	QD1-MR16-6-1000	367.45
	.5000	.7500	3.50	40317	QD2-MR16-8-750	355.35
	.5000	1.0000	3.50	40316	QD2-MR16-8-1000	367.45

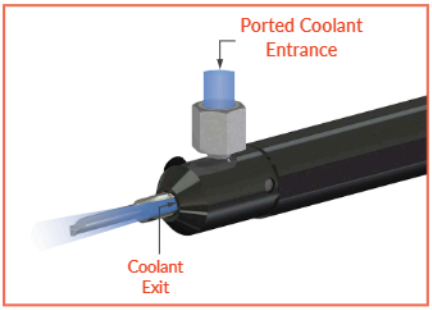
See pages 35-38 for replacement parts and accessories

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 the 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 #	USD$	D1 +.0005" −.0000"		Tool #	USD$	Tool #	USD$
.7500	2.5	QDS-750-2.5	183.65	.1875	1/4-28 HP	QDH-3125	169.05	QDH-3125LH	169.05
				.2500	1/4-28 HP	QDH-4125	169.05	QDH-4125LH	169.05
				.3125	1/4-28 HP	QDH-5125	169.05	QDH-5125LH	169.05
.7500	3.1	QDS-750-3.1	191.05	.1875	1/4-28 HP	QDH-3125	169.05	QDH-3125LH	169.05
				.2500	1/4-28 HP	QDH-4125	169.05	QDH-4125LH	169.05
				.3125	1/4-28 HP	QDH-5125	169.05	QDH-5125LH	169.05
20 mm	64 mm	QDSM-20-64	183.65	.1875	1/4-28 HP	QDH-3125	169.05	QDH-3125LH	169.05
				.2500	1/4-28 HP	QDH-4125	169.05	QDH-4125LH	169.05
				.3125	1/4-28 HP	QDH-5125	169.05	QDH-5125LH	169.05
20 mm	79 mm	QDSM-20-79	191.05	.1875	1/4-28 HP	QDH-3125	169.05	QDH-3125LH	169.05
				.2500	1/4-28 HP	QDH-4125	169.05	QDH-4125LH	169.05
				.3125	1/4-28 HP	QDH-5125	169.05	QDH-5125LH	169.05
22 mm	64 mm	QDSM-22-64	191.05	.1875	1/4-28 HP	QDH-3125	169.05	QDH-3125LH	169.05
				.2500	1/4-28 HP	QDH-4125	169.05	QDH-4125LH	169.05
				.3125	1/4-28 HP	QDH-5125	169.05	QDH-5125LH	169.05

Continued on next page

See pages 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 #	USD$	D_1 +.0005" −.0000"		Tool #	USD$	Tool #	USD$
22 mm	79 mm	QDSM-22-79	198.30	.1875	1/4-28 HP	QDH-3125	169.05	QDH-3125LH	169.05
				.2500	1/4-28 HP	QDH-4125	169.05	QDH-4125LH	169.05
				.3125	1/4-28 HP	QDH-5125	169.05	QDH-5125LH	169.05
25 mm	64 mm	QDSM-25-64	198.30	.1875	1/4-28 HP	QDH-3125	169.05	QDH-3125LH	169.05
				.2500	1/4-28 HP	QDH-4125	169.05	QDH-4125LH	169.05
				.3125	1/4-28 HP	QDH-5125	169.05	QDH-5125LH	169.05
1.0000	2.500	QDS-1.00-2.5	198.30	.1875	1/4-28 HP	QDH-3125	169.05	QDH-3125LH	169.05
				.2500	1/4-28 HP	QDH-4125	169.05	QDH-4125LH	169.05
				.3125	1/4-28 HP	QDH-5125	169.05	QDH-5125LH	169.05
1.0000	3.100	QDS-1.00-3.1	213.10	.1875	1/4-28 HP	QDH-3125	169.05	QDH-3125LH	169.05
				.2500	1/4-28 HP	QDH-4125	169.05	QDH-4125LH	169.05
				.3125	1/4-28 HP	QDH-5125	169.05	QDH-5125LH	169.05

Technical Resources on Micro100.com

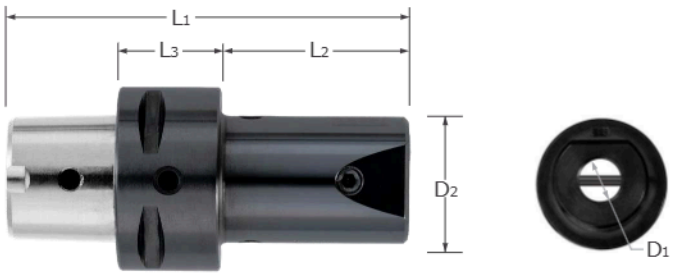
Find Simulation Files, Speeds & Feeds, Torque Recommendations, Programs, Blogs, and more at micro100.com/resources

SCAN

See pages 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

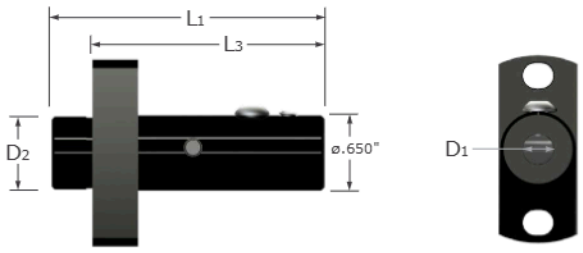
Shank Type	Internal Diameter	Head Length	Head Diameter	Flange Length	Overall Length	Coolant Adapter Thread	Locating Locking Screw	Tool Holder	
	D_1 $^{+.0005"}_{-.0000"}$	L_2	D_2	L_3	L_1			Tool #	USD$
C3	.1875	1.134	.866	.591	2.473	M12 x 1.5	40315	QT-187-C3	469.75
C3	.2500	1.340	.866	.591	2.679	M12 x 1.5	40315	QT-250-C3	469.75
C3	.3125	1.309	.866	.591	2.647	M12 x 1.5	40316	QT-312-C3	469.75
C3	.3750	1.278	.866	.591	2.616	M12 x 1.5	40316	QT-375-C3	469.75
C3	.5000	1.528	.984	.591	2.867	M12 x 1.5	40316	QT-500-C3	469.75
C4	.1875	1.134	.866	.787	2.867	M14 x 1.5	40315	QT-187-C4	469.75
C4	.2500	1.340	.866	.787	3.072	M14 x 1.5	40315	QT-250-C4	469.75
C4	.3125	1.309	.866	.787	3.041	M14 x 1.5	40316	QT-312-C4	469.75
C4	.3750	1.278	.866	.787	3.010	M14 x 1.5	40316	QT-375-C4	469.75
C4	.5000	1.528	.984	.787	3.260	M14 x 1.5	40316	QT-500-C4	469.75
C6	.1875	1.134	.866	.866	3.497	M20 x 2.0	40315	QT-187-C6	508.20
C6	.2500	1.340	.866	.866	3.702	M20 x 2.0	40315	QT-250-C6	508.20
C6	.3125	1.309	.866	.866	3.671	M20 x 2.0	40316	QT-312-C6	508.20
C6	.3750	1.278	.866	.866	3.640	M20 x 2.0	40316	QT-375-C6	508.20
C6	.5000	1.528	.984	.866	3.890	M20 x 2.0	40316	QT-500-C6	508.20

See pages 35-38 for replacement parts and accessories

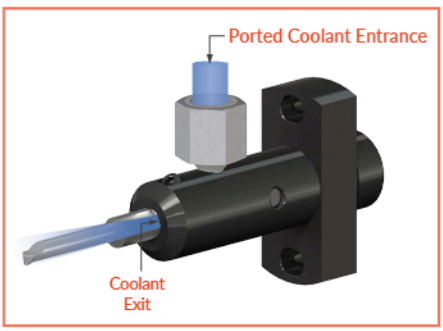
Quick Change Holders

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



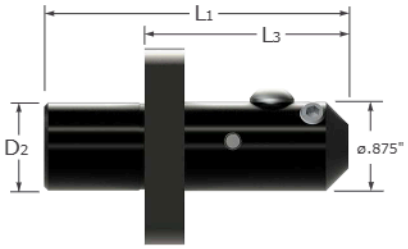
Internal Diameter	Overall Reach	Shank Diameter	Overall Length	Ported Thread	Locating/Locking Screw	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	L_3	D_2	L_1			Tool #	USD$
.1875	1.956	16 mm	2.350	1/4-28 HP	40316	QZST-316L-SR10J	365.95
.3125	1.956	16 mm	2.350	1/4-28 HP	40317	QZST-516L-SR10J	365.95

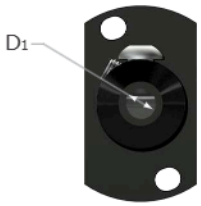
See page 34 for Centerline Indicating Tool
See pages 35-38 for replacement parts and accessories

QZST

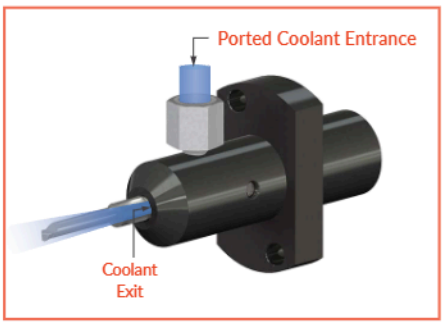
Quick Change Holders

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", .3125" and .3750 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



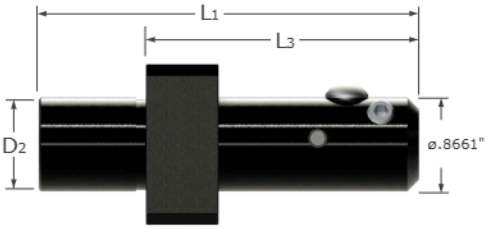
Internal Diameter	Overall Reach	Shank Diameter	Overall Length	Ported Thread	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	L_3	D_2	L_1		Tool #	USD$
.1875	1.400	22 mm	2.384	1/4-28 HP	QZST-322-SR20	380.65
.1875	2.000	22 mm	2.984	1/4-28 HP	QZST-322L-SR20	380.65
.2500	1.400	22 mm	2.384	1/4-28 HP	QZST-422-SR20	380.65
.2500	2.000	22 mm	2.984	1/4-28 HP	QZST-422L-SR20	380.65
.3125	1.400	22 mm	2.384	1/4-28 HP	QZST-522-SR20	380.65
.3125	2.000	22 mm	2.984	1/4-28 HP	QZST-522L-SR20	380.65
.3750	1.400	22 mm	2.384	1/4-28 HP	QZST-622-SR20	380.65
.3750	2.000	22 mm	2.984	1/4-28 HP	QZST-622L-SR20	380.65

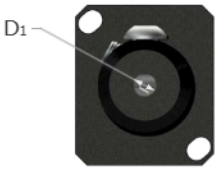
See page 34 for Centerline Indicating Tool
See pages 35-38 for replacement parts and accessories

Quick Change Holders

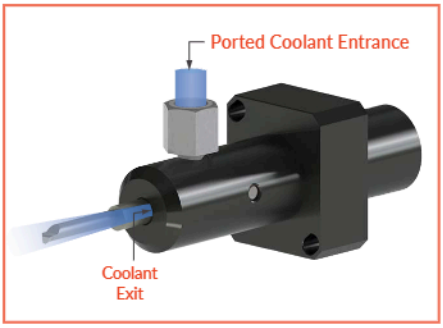
Star Swiss Machines – SR-20RIV

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



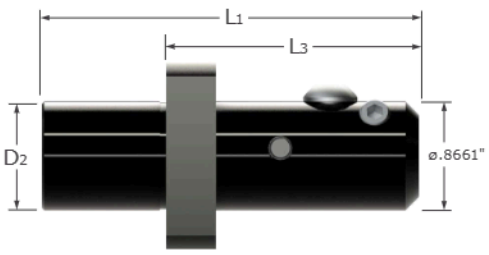
Internal Diameter	Overall Reach	Shank Diameter	Overall Length	Ported Thread	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	L_3	D_2	L_1		Tool #	USD$
.1875	2.510	22 mm	3.494	1/4-28 HP	QZST-322L-SR20RIV	380.65
.2500	2.510	22 mm	3.494	1/4-28 HP	QZST-422L-SR20RIV	380.65
.3125	2.510	22 mm	3.494	1/4-28 HP	QZST-522L-SR20RIV	380.65

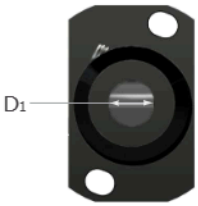
See page 34 for Centerline Indicating Tool
See pages 35-38 for replacement parts and accessories

QZST

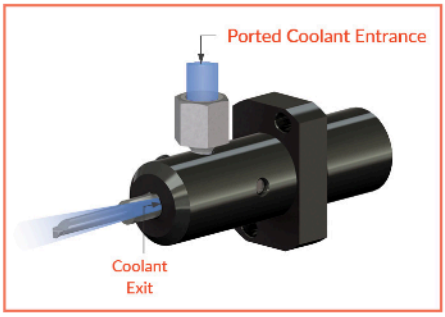
Quick Change Holders

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



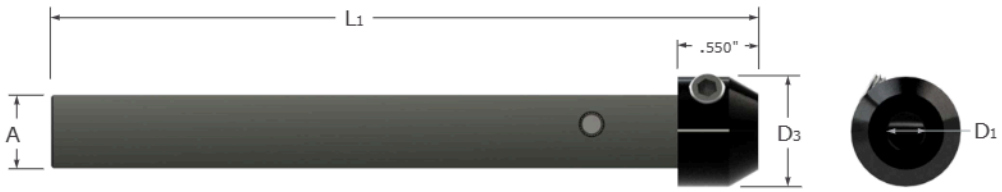
Internal Diameter	Overall Reach	Shank Diameter	Overall Length	Ported Thread	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	L_3	D_2	L_1		Tool #	USD$
.1875	2.000	22 mm	2.984	1/4-28 HP	QZST-322L-SW20	380.65
.2500	2.000	22 mm	2.984	1/4-28 HP	QZST-422L-SW20	380.65
.3125	2.000	22 mm	2.984	1/4-28 HP	QZST-522L-SW20	380.65

See page 34 for Centerline Indicating Tool
See pages 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

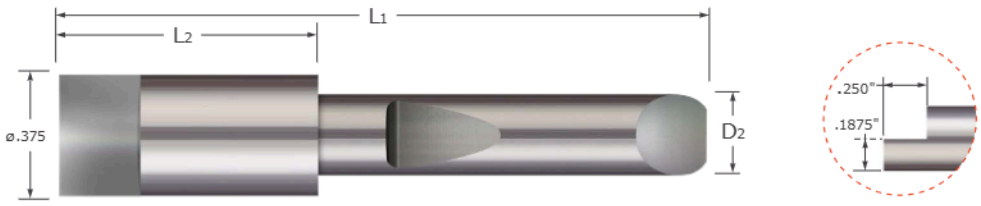
Internal Diameter	Head Diameter	Square Shank	Overall Length	Tool Holder	
D_1 $^{+.0005"}_{-.0000"}$	D_3 $^{+.005"}_{-.005"}$	A $^{+.0000"}_{-.0010"}$	L_1	Tool #	USD$
.1875	.750	.5000	4.8	QSG-187-500	213.10
.1875	1.063	.7500	4.8	QSG-187-750	235.15
.2500	.750	.5000	4.8	QSG-250-500	213.10
.2500	1.063	.7500	4.8	QSG-250-750	235.15
.3125	.875	.5000	4.8	QSG-312-500	213.10
.3125	1.063	.7500	4.8	QSG-312-750	235.15
.3750	1.063	.7500	4.8	QSG-375-750	235.15
.5000	1.063	.7500	4.8	QSG-500-750	235.15

See pages 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 setup 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 #	USD$
.1875	1.000	2.0	QI-187	159.55
.2500	.800	2.0	QI-250	159.55
.3125	.800	2.0	QI-312	159.55

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 #	USD$	Tool #	USD$
	Straight Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/8-27 NPT	JIC 4	40301	6.30	41301	52.50
	Straight Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	JIC 4	40302	6.30	41302	52.50
	Straight Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	JIC 4	40303	9.15	41303	72.75
	Straight Coolant Adapter	Fits: QTH, QTHL, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	1/8-27 NPT	40311	9.15	41311	72.75
	Straight Coolant Adapter	Fits: QTH, QTHL, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	1/8-27 NPT	40312	9.15	41312	72.75
	90° Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/8-27 NPT	JIC 4	40304	10.85	41304	87.55
	90° Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	JIC 4	40305	10.85	41305	87.55
	90° Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	JIC 4	40306	10.85	41306	87.55
	90° Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	1/8-27 NPT	40307	14.80	41307	121.90
	NPT Coolant Reducer	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	1/8-27 NPT	40308	6.30	41308	52.50

Continued on next page

Quick Change Holder Parts

Coolant Accessories (cont.)

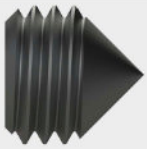
Continued from previous page

	Accessory Type	Compatibility	Coolant Access Type	Holder Thread	Coolant Supply Thread	Single		Package of 10	
						Tool #	USD$	Tool #	USD$
	NPT Coolant Reducer	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	1/8-27 NPT	40309	9.15	41309	72.75
	Plumbed Plug	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/8-27 NPT	-	40197	4.70	41197	37.80
	Plumbed Plug	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	-	40198	4.70	41198	37.80
	Plumbed Plug	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	-	40221	4.70	41221	37.80
	High Pressure Coolant Fitting	Fits: QZST, QDH, QTSP, QTSPL	Ported	1/4-28 HP	1/8-27 NPT	QN-1	9.15	QN-10	72.75
	1.28" Coolant Extension	Fits: QZST, QDH, QTSP, QTSPL	Ported	1/4-28 HP	1/4-28 HP	40199	8.75	41199	72.75
	45° Coolant Adapter	Fits: QZST, QDH, QTSP, QTSPL	Ported	1/4-28 HP	1/8-27 NPT	40313	9.15	41313	72.75
	90° Coolant Adapter	Fits: QZST, QDH, QTSP, QTSPL	Ported	1/4-28 HP	1/8-27 NPT	40314	9.15	41314	72.75
	Button Head Screw (Port Plug)	Fits: QDH, QZST / Hex Key not stocked for this item	Ported	1/4-28 HP	-	QC-5	1.60		
	Port Plug	Fits: QTSP, QTSPL	Ported	1/4-28 HP	-	40278	1.60	41278	12.70
	Hex Wrench	Fits: 40278 Porting Plug	Ported	-	-	40249	1.60	41249	13.40

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 #	USD$	Tool #	USD$
	Locating / Locking Screw (Right Hand Threads)	Fits: QTH, QTHM, QZST, QSG, QDH Requires: QHT-1 Hex Key	QC-1	5.20	QC-10	36.45
	Locating / Locking Screw	Fits: QDH Requires: QHT-1 Hex Key	QC-1LH	14.80		
	Locating / Locking Screw	See QTS, QTSP, QTSL, QTSPL tables for compatibility	40208	1.60	41208	12.70
	Locating / Locking Screw	See QTS, QTSP, QTSL, QTSPL tables for compatibility	40215	1.60	41215	12.70
	Locating / Locking Screw	See QTS, QTSP, QTSL, QTSPL tables for compatibility	40216	1.60	41216	12.70
	Locating / Locking Screw	See QTS, QTSP, QTSPL, QTSL, QZST-SR10J tables for compatibility	40317	1.60	41317	12.70
	Locating / Locking Screw	See QTS, QTSP, QTSPL, QTSL, QZST-SR10J tables for compatibility	40316	1.60	41316	12.70
	Locating / Locking Screw	See QTS, QTSP, QTSPL, QTSL, QZST-SR10J tables for compatibility	40315	1.60	41315	12.70
	Locating / Locking Screw	See QTS, QTSP, QTSPL, QTSL, QZST-SR10J tables for compatibility	40279	1.60	41279	12.70

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Quick Change Parts

Accessories (cont.)

QC

Continued from previous page

	Accessory Type	Compatibility	Single		Package of 10	
			Tool #	USD$	Tool #	USD$
	(Left Hand Threads) Locating / Locking Screw	Fits: QDS, QDSM Requires: QHT-1 Hex Key	QC-2	5.20	QC-20	36.45
	Locating / Locking Screw	Fits: QZST-SR10J Requires: 3/32" Hex Key	QC-6	1.60		
	Hex Wrench	Fits: QC-3, QC-4 Locking Screws	QHK-1	1.60		
	Hex Wrench	Fits: QC-6 Socket Set Screws, 40208, 40215, 40216 Locating / Locking Screws	QHK-2	1.60		
	T Style Handle Hex Wrench	Fits: QC-1, QC-1LH, QC-2 Locating / Locking Screws	QHT-1	8.15	QHT-10	65.45

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 #	USD$
		3 mm	.1181	15 mm	12 mm	40239	THM-312	105.05
		3 mm	.1181	19 mm	16 mm	40239	THM-316	105.05
		3 mm	.1181	25 mm	20 mm	40287	THM-320	115.70
	.1250		.1250	15 mm	12 mm	40239	THMA-412	131.85
	.1250		.1250	.625	.5000	40211	TH-84	100.80
	.1250		.1250	19 mm	16 mm	40239	THMA-416	131.85
	.1250		.1250	.750	.6250	40263	TH-104	100.80
	.1250		.1250	.875	.7500	40284	TH-204	111.35
	.1250		.1250	25 mm	20 mm	40287	THMA-420	115.70
	.1250		.1250	27 mm	22 mm	40287	THMA-422	115.70
	.1250		.1250	32 mm	25 mm	40286	THMA-425	137.30
	.1250		.1250	1.250	1.0000	40285	TH-404	132.00
NEW	.1250		.1250	1.500	1.250	40285	TH-604	159.30
		4 mm	.1575	15 mm	12 mm	40283	THM-412	105.05
		4 mm	.1575	19 mm	16 mm	40239	THM-416	105.05
		4 mm	.1575	25 mm	20 mm	40287	THM-420	115.70
	.1875		.1875	15 mm	12 mm	40283	THMA-512	131.85
	.1875		.1875	.625	.5000	40211	TH-85	100.80
	.1875		.1875	19 mm	16 mm	40239	THMA-516	131.85
	.1875		.1875	.750	.6250	40263	TH-105	100.80
	.1875		.1875	.875	.7500	40284	TH-205	111.35
	.1875		.1875	25 mm	20 mm	40287	THMA-520	115.70
	.1875		.1875	27 mm	22 mm	40287	THMA-522	115.70
	.1875		.1875	32 mm	25 mm	40286	THMA-525	137.30
	.1875		.1875	1.250	1.0000	40285	TH-405	132.00
NEW	.1875		.1875	1.500	1.2500	40285	TH-605	159.30

Continued on next page

See page 49 for replacement parts and accessories

NEW!

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 #	USD$	
	6 mm	.2362	15 mm	12 mm	40283	THM-612	105.05	
	6 mm	.2362	19 mm	16 mm	40239	THM-616	105.05	
	6 mm	.2362	25 mm	20 mm	40287	THM-620	115.70	
.2500		.2500	15 mm	12 mm	40283	THMA-612	131.85	
.2500		.2500	.625	.5000	40211	TH-86	100.80	
.2500		.2500	19 mm	16 mm	40239	THMA-616	131.85	
.2500		.2500	.750	.6250	40211	TH-106	100.80	
.2500		.2500	.875	.7500	40263	TH-206	111.35	
.2500		.2500	25 mm	20 mm	40287	THMA-620	115.70	
.2500		.2500	27 mm	22 mm	40287	THMA-622	115.70	
.2500		.2500	32 mm	25 mm	40286	THMA-625	137.30	
.2500		.2500	1.250	1.0000	40285	TH-406	132.00	
.2500		.2500	1.500	1.250	40285	TH-606	159.30	NEW
.3125		.3125	15 mm	12 mm	40283	THMA-712	131.85	
.3125		.3125	.625	.5000	40211	TH-87	100.80	
.3125		.3125	19 mm	16 mm	40283	THMA-716	131.85	
.3125		.3125	.750	.6250	40211	TH-107	100.80	
.3125		.3125	.875	.7500	40263	TH-207	111.35	
.3125		.3125	25 mm	20 mm	40287	THMA-720	115.70	
.3125		.3125	27 mm	22 mm	40287	THMA-722	115.70	
.3125		.3125	32 mm	25 mm	40287	THMA-725	137.30	
.3125		.3125	1.250	1.0000	40284	TH-407	132.00	
.3125		.3125	1.500	1.2500	40285	TH-607	159.30	NEW
	8 mm	.3150	15 mm	12 mm	40283	THM-812	105.05	
	8 mm	.3150	19 mm	16 mm	40283	THM-816	105.05	
	8 mm	.3150	25 mm	20 mm	40287	THM-820	115.70	
.3750		.3750	.625	.5000	40211	TH-88	100.80	
.3750		.3750	19 mm	16 mm	40283	THMA-816	131.85	
.3750		.3750	.750	.6250	40211	TH-108	100.80	
.3750		.3750	.875	.7500	40211	TH-208	111.35	
.3750		.3750	25 mm	20 mm	40239	THMA-820	115.70	
.3750		.3750	27 mm	22 mm	40287	THMA-822	115.70	
.3750		.3750	32 mm	25 mm	40287	THMA-825	137.30	
.3750		.3750	1.250	1.0000	40284	TH-408	132.00	
.3750		.3750	1.500	1.2500	40285	TH-608	159.30	NEW
	10 mm	.3937	25 mm	20 mm	40239	THM-1020	115.70	
	12 mm	.4724	19 mm	16 mm	40283	THM-1216	105.05	
	12 mm	.4724	25 mm	20 mm	40283	THM-1220	115.70	
.5000		.5000	.875	.7500	40211	TH-210	111.35	
.5000		.5000	1.125	1.0000	40284	TH-410	132.00	
.5000		.5000	1.500	1.2500	40285	TH-610	159.30	NEW

See page 49 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 #	USD$
	.1250	.5000	2.75	40211	THS-2-500	133.35
	.1250	.6250	2.75	40211	THS-2-625	133.35
	.1250	16 mm	2.75	40263	THS-2-630	140.00
	.1250	.7500	2.75	40263	THS-2-750	140.00
	.1250	20 mm	2.75	40263	THS-2-787	140.00
	.1250	22 mm	2.75	40284	THS-2-866	140.00
	.1250	25 mm	2.75	40284	THS-2-984	146.65
	.1250	1.0000	2.75	40284	THS-2-1000	146.65
NEW	.1250	1.2500	2.750	40285	THS-2-1250	167.95
	.1875	.5000	2.75	40211	THS-3-500	133.35
	.1875	.6250	2.75	40211	THS-3-625	133.35
	.1875	16 mm	2.75	40211	THS-3-630	140.00
	.1875	.7500	2.75	40263	THS-3-750	140.00
	.1875	20 mm	2.75	40284	THS-3-787	140.00
	.1875	22 mm	2.75	40284	THS-3-866	140.00
	.1875	25 mm	2.75	40284	THS-3-984	146.65
	.1875	1.0000	2.75	40284	THS-3-1000	146.65
NEW	.1875	1.2500	2.750	40285	THS-3-1250	167.95
	.2500	.6250	2.75	40211	THS-4-625	133.35
	.2500	16 mm	2.75	40211	THS-4-630	133.35
	.2500	.7500	2.75	40211	THS-4-750	140.00
	.2500	20 mm	2.75	40211	THS-4-787	140.00
	.2500	22 mm	2.75	40263	THS-4-866	140.00
	.2500	25 mm	2.75	40284	THS-4-984	140.00
	.2500	1.0000	2.75	40284	THS-4-1000	146.65
NEW	.2500	1.2500	2.750	40285	THS-4-1250	167.95

Continued on next page

See page 49 for replacement parts and accessories

NEW!

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 #	USD$	
.3125	.6250	2.75	40211	THS-5-625	133.35	
.3125	16 mm	2.75	40211	THS-5-630	133.35	
.3125	.7500	2.75	40211	THS-5-750	140.00	
.3125	20 mm	2.75	40211	THS-5-787	140.00	
.3125	22 mm	2.75	40263	THS-5-866	140.00	
.3125	25 mm	2.75	40284	THS-5-984	140.00	
.3125	1.0000	2.75	40284	THS-5-1000	146.65	
.3125	1.2500	2.750	40285	THS-5-1250	167.95	NEW
.3750	.7500	2.75	40211	THS-6-750	140.00	
.3750	20 mm	2.75	40211	THS-6-787	140.00	
.3750	22 mm	2.75	40211	THS-6-866	140.00	
.3750	25 mm	2.75	40263	THS-6-984	146.65	
.3750	1.0000	2.75	40263	THS-6-1000	146.65	
.3750	1.2500	2.750	40284	THS-6-1250	167.95	NEW
.5000	25 mm	2.75	40211	THS-8-984	146.65	
.5000	1.0000	2.75	40211	THS-8-1000	146.65	
.5000	1.2500	2.750	40284	THS-8-1250	167.95	NEW

Sent Directly to Your Inbox

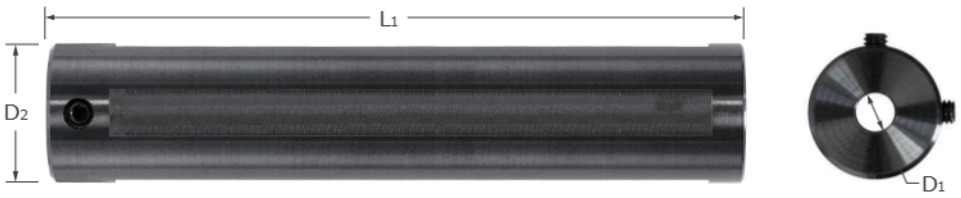
Valuable information about Micro 100 products and technical resources directly to your inbox. Be the first to know of newly-released tools to gain an immediate leg-up on the competition!

See page 49 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 #	USD$
.1250	.7500	5.75	40263	THSL-2-750	156.15
.1250	20 mm	5.75	40263	THSL-2-787	156.15
.1250	22 mm	5.75	40284	THSL-2-866	160.25
.1250	1.0000	5.75	40284	THSL-2-1000	164.15
.1875	.7500	5.75	40263	THSL-3-750	156.15
.1875	20 mm	5.75	40284	THSL-3-787	156.15
.1875	22 mm	5.75	40284	THSL-3-866	160.25
.1875	1.0000	5.75	40284	THSL-3-1000	164.15
.2500	.7500	5.75	40211	THSL-4-750	156.15
.2500	20 mm	5.75	40211	THSL-4-787	156.15
.2500	22 mm	5.75	40263	THSL-4-866	160.25
.2500	1.0000	5.75	40284	THSL-4-1000	164.15
.3125	.7500	5.75	40211	THSL-5-750	156.15
.3125	20 mm	5.75	40211	THSL-5-787	156.15
.3125	22 mm	5.75	40263	THSL-5-866	160.25
.3125	1.0000	5.75	40284	THSL-5-1000	164.15
.3750	.7500	5.75	40211	THSL-6-750	156.15
.3750	20 mm	5.75	40211	THSL-6-787	156.15
.3750	22 mm	5.75	40211	THSL-6-866	160.25
.3750	1.0000	5.75	40263	THSL-6-1000	164.15
.5000	1.0000	5.75	40211	THSL-8-1000	164.15

See page 49 for replacement parts and accessories

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 setup time by having more shank variations available in the machine at time of setup
- 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 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 #	USD$
.1875	.5000	2.20	40211	TD-3-500	249.00
.1875	.5000	3.20	40211	TD1-3-500	261.10
.1875	.6250	2.20	40211	TD-3-625	261.10
.1875	.6250	3.20	40211	TD1-3-625	274.60
.1875	.7500	3.20	40263	TD1-3-750	280.05
.1875	1.0000	3.20	40284	TD1-3-1000	292.15
.2500	.6250	3.20	40211	TD1-4-625	274.60
.2500	.7500	3.20	40211	TD1-4-750	280.05
.2500	1.0000	3.20	40263	TD1-4-1000	292.15
.3125	.6250	3.20	40211	TD1-5-625	274.60
.3125	.7500	3.20	40211	TD1-5-750	280.05
.3125	1.0000	3.20	40263	TD1-5-1000	292.15
.3750	.7500	3.20	40211	TD1-6-750	280.05
.3750	1.0000	3.20	40263	TD1-6-1000	292.15
.5000	1.0000	3.50	40211	TD2-8-1000	292.15

See It in Action

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

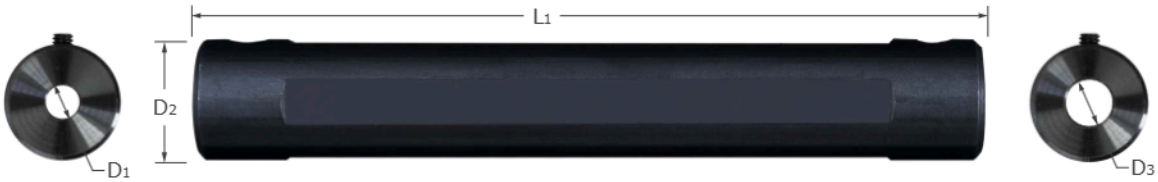
Tech Tip

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

See page 49 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 setup time by having more shank variations available in the machine at time of setup
- 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 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 #	USD$
.1250	.1875	.5000	2.20	40211	40211	TD-2-3-500	255.80
.1250	.1875	.5000	3.20	40211	40211	TD1-2-3-500	267.95
.1250	.1875	.6250	2.20	40211	40211	TD-2-3-625	267.95
.1250	.1875	.6250	3.20	40211	40211	TD1-2-3-625	280.05
.1250	.1875	.7500	3.20	40263	40263	TD1-2-3-750	286.70
.1250	.1875	1.0000	3.20	40284	40284	TD1-2-3-1000	298.80
.1875	.2500	.6250	2.20	40211	40211	TD-3-4-625	267.95
.1875	.2500	.6250	3.20	40211	40211	TD1-3-4-625	280.05
.1875	.2500	.7500	3.20	40263	40211	TD1-3-4-750	286.70
.1875	.2500	1.0000	3.20	40284	40263	TD1-3-4-1000	298.80
.2500	.3125	.6250	3.20	40211	40211	TD1-4-5-625	280.05
.2500	.3125	.7500	3.20	40211	40211	TD1-4-5-750	286.70
.2500	.3125	1.0000	3.20	40263	40263	TD1-4-5-1000	298.80
.3125	.3750	.7500	3.20	40211	40211	TD1-5-6-750	286.70
.3125	.3750	1.0000	3.20	40263	40263	TD1-5-6-1000	298.80
.3750	.5000	1.0000	3.50	40263	40211	TD2-6-8-1000	298.80

See It in Action

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

Tech Tip

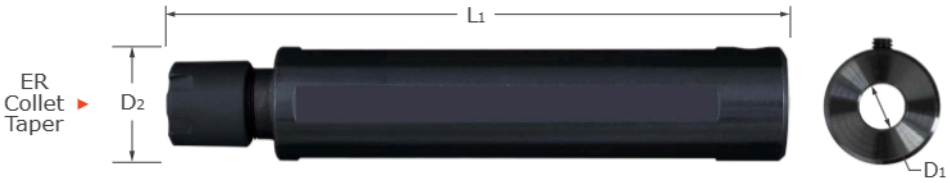
Utilizing multiple styles of double-ended holders can significantly reduce setup time by having multiple variations of connections readily accessible in the machine.

See page 49 for replacement parts and accessories

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 end 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 setup time by having more shank variations available in the machine at time of setup
- 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 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 #	USD$
ER8-Mini	.1250	.5000	2.20	40211	TD-MR8-2-500	286.70
	.1250	.5000	3.20	40211	TD1-MR8-2-500	298.80
	.1250	.6250	2.20	40211	TD-MR8-2-625	298.80
	.1250	.6250	3.20	40211	TD1-MR8-2-625	311.00
	.1875	.5000	2.20	40211	TD-MR8-3-500	286.70
	.1875	.5000	3.20	40211	TD1-MR8-3-500	298.80
	.1875	.6250	2.20	40211	TD-MR8-3-625	298.80
	.1875	.6250	3.20	40211	TD1-MR8-3-625	311.00
	.2500	.6250	3.20	40211	TD1-MR8-4-625	311.00
	.3125	.6250	3.20	40211	TD1-MR8-5-625	311.00
ER11-Mini	.1250	.6250	2.20	40211	TD-MR11-2-625	298.80
	.1250	.6250	3.20	40211	TD1-MR11-2-625	311.00
	.1250	.7500	3.20	40263	TD1-MR11-2-750	317.65
	.1250	22 mm	3.20	40263	TD1-MR11-2-866	324.25
	.1250	25 mm	3.20	40284	TD1-MR11-2-984	329.70
	.1250	1.0000	3.20	40284	TD1-MR11-2-1000	329.70
	.1875	.6250	2.20	40211	TD-MR11-3-625	298.80
	.1875	.6250	3.20	40211	TD1-MR11-3-625	311.00
	.1875	.7500	3.20	40263	TD1-MR11-3-750	317.65

Continued on next page

See page 49 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 #	USD$
ER11-Mini	.1875	22 mm	3.20	40263	TD1-MR11-3-866	324.25
	.1875	25 mm	3.20	40284	TD1-MR11-3-984	329.70
	.1875	1.0000	3.20	40284	TD1-MR11-3-1000	329.70
	.2500	.6250	3.20	40211	TD1-MR11-4-625	311.00
	.2500	.7500	3.20	40211	TD1-MR11-4-750	317.65
	.2500	1.0000	3.20	40263	TD1-MR11-4-1000	329.70
	.3125	.6250	3.20	40211	TD1-MR11-5-625	311.00
	.3125	.7500	3.20	40211	TD1-MR11-5-750	317.65
	.3125	1.0000	3.20	40263	TD1-MR11-5-1000	329.70
	.3750	.7500	3.20	40211	TD1-MR11-6-750	317.65
	.3750	1.0000	3.20	40263	TD1-MR11-6-1000	329.70
	.5000	1.0000	3.50	40211	TD2-MR11-8-1000	329.70
ER16-Mini	.1250	.7500	3.20	40263	TD1-MR16-2-750	317.65
	.1250	22 mm	3.20	40263	TD1-MR16-2-866	324.25
	.1250	25 mm	3.20	40284	TD1-MR16-2-984	329.70
	.1250	1.0000	3.20	40284	TD1-MR16-2-1000	329.70
	.1875	.7500	3.20	40263	TD1-MR16-3-750	317.65
	.1875	22 mm	3.20	40263	TD1-MR16-3-866	324.25
	.1875	25 mm	3.20	40284	TD1-MR16-3-984	329.70
	.1875	1.0000	3.20	40284	TD1-MR16-3-1000	329.70
	.2500	.7500	3.20	40211	TD1-MR16-4-750	317.65
	.2500	1.0000	3.20	40263	TD1-MR16-4-1000	329.70
	.3125	.7500	3.20	40211	TD1-MR16-5-750	317.65
	.3125	1.0000	3.20	40263	TD1-MR16-5-1000	329.70
	.3750	.7500	3.20	40211	TD1-MR16-6-750	317.65
	.3750	1.0000	3.20	40263	TD1-MR16-6-1000	329.70
	.5000	1.0000	3.50	40211	TD2-MR16-8-1000	329.70

See It In Action

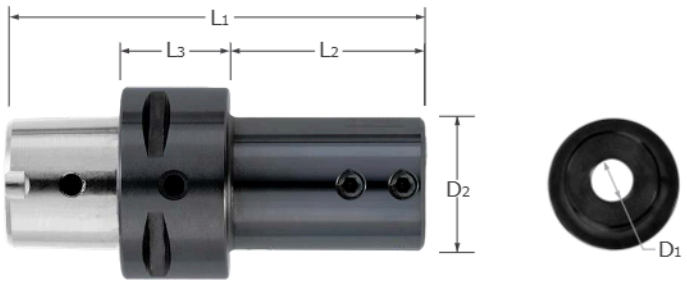
Scan the QR code to see tooling demonstrations to help you make more.

Tech Tip

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

See page 49 for replacement parts and accessories

Standard Holders
PSC Holders

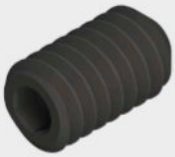


- PSC Holders combine a Capto® compatible connection with our Standard shank ID system
- Tool holder optimized for use with Micro 100 standard shank tools in turning applications
- PSC flange designed for use on lathes with or without an automatic tool changer
- Short head length accommodates smaller work envelopes and provides maximum rigidity
- 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 #	USD$
C4	.1250	1.134	.866	.787	2.867	M14 x 1.5	40284	ST-125-C4	441.15
C4	.1875	1.134	.866	.787	2.867	M14 x 1.5	40284	ST-187-C4	441.15
C4	.2500	1.340	.866	.787	3.072	M14 x 1.5	40263	ST-250-C4	441.15
C4	.3125	1.309	.866	.787	3.041	M14 x 1.5	40263	ST-312-C4	441.15
C4	.3750	1.278	.866	.787	3.010	M14 x 1.5	40211	ST-375-C4	441.15
C4	.5000	1.528	.984	.787	3.260	M14 x 1.5	40211	ST-500-C4	441.15
C6	.1250	1.134	.866	.866	3.497	M20 x 2.0	40284	ST-125-C6	479.85
C6	.1875	1.134	.866	.866	3.497	M20 x 2.0	40284	ST-187-C6	479.85
C6	.2500	1.340	.866	.866	3.702	M20 x 2.0	40263	ST-250-C6	479.85
C6	.3125	1.309	.866	.866	3.671	M20 x 2.0	40263	ST-312-C6	479.85
C6	.3750	1.278	.866	.866	3.640	M20 x 2.0	40211	ST-375-C6	479.85
C6	.5000	1.528	.984	.866	3.890	M20 x 2.0	40211	ST-500-C6	479.85

See page 49 for replacement parts and accessories

Standard Parts
Accessories

	Accessory Type	Compatibility	Single		Package of 10	
			Tool #	USD$	Tool #	USD$
	Locating / Locking Screw	See standard holder tables on pages 39-47 for compatibility	40211	1.60	41211	12.70
	Locating / Locking Screw		40263	1.60	41263	12.70
	Locating / Locking Screw		40284	1.60	41284	12.70
	Locating / Locking Screw		40285	1.60	41285	12.70
	Locating / Locking Screw		40283	1.60	41283	12.70
	Locating / Locking Screw		40239	1.60	41239	12.70
	Locating / Locking Screw		40287	1.60	41287	12.70
	Locating / Locking Screw		40286	1.60	41286	12.70

Taper Integrated Holders

Solid ER

ERI

- 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 #	USD$
ER08	.1250	.394	ER08I-2-394	352.15
ER08	.1250	.590	ER08I-2-590	352.15
ER11	.1250	.394	ER11I-2-394	352.15
ER11	.1250	.590	ER11I-2-590	352.15
ER11	.1250	.787	ER11I-2-787	352.15
ER16	.1250	.630	ER16I-2-630	368.30
ER16	.1250	.984	ER16I-2-984	368.30
ER16	.1875	.630	ER16I-3-630	368.30
ER16	.1875	.984	ER16I-3-984	368.30

See page 51 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 #	USD$	Tool #	USD$
	Stop Screw	M6	40810	19.60	41810	174.90
	Stop Screw	M8	40811	23.60	41811	215.35
	Locking Screw	M3	40812	2.95	41812	23.80
	Locking Screw	M4	40813	2.95	41813	23.80

ER Collets

Metric ID

ER

- 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 #	USD$
ER08	1.0 mm	0.5-1.0 mm	ER08-039	27.60
ER08	1.5 mm	1.0-1.5 mm	ER08-059	27.60
ER08	2.0 mm	1.5-2.0 mm	ER08-079	27.60
ER08	2.5 mm	2.0-2.5 mm	ER08-098	27.60
ER08	3.0 mm	2.5-3.0 mm	ER08-118	27.60
ER08	3.5 mm	3.0-3.5 mm	ER08-138	27.60
ER08	4.0 mm	3.5-4.0 mm	ER08-157	27.60
ER08	4.5 mm	4.0-4.5 mm	ER08-177	27.60
ER08	5.0 mm	4.5-5.0 mm	ER08-197	27.60
ER11	1.0 mm	0.5-1.0 mm	ER11-039	23.60
ER11	1.5 mm	1.0-1.5 mm	ER11-059	23.60
ER11	2.0 mm	1.5-2.0 mm	ER11-079	23.60
ER11	2.5 mm	2.0-2.5 mm	ER11-098	23.60
ER11	3.0 mm	2.5-3.0 mm	ER11-118	23.60
ER11	3.5 mm	3.0-3.5 mm	ER11-138	23.60
ER11	4.0 mm	3.5-4.0 mm	ER11-157	23.60
ER11	4.5 mm	4.0-4.5 mm	ER11-177	23.60
ER11	5.0 mm	4.5-5.0 mm	ER11-197	23.60
ER11	5.5 mm	5.0-5.5 mm	ER11-217	23.60
ER11	6.0 mm	5.5-6.0 mm	ER11-236	23.60
ER11	6.5 mm	6.0-6.5 mm	ER11-256	23.60
ER11	7.0 mm	6.5-7.0 mm	ER11-276	23.60
ER16	1.0 mm	0.5-1.0 mm	ER16-039	23.80
ER16	1.5 mm	1.0-1.5 mm	ER16-059	23.80
ER16	2.0 mm	1.5-2.0 mm	ER16-079	23.80
ER16	2.5 mm	1.5-2.5 mm	ER16-098	23.80
ER16	3.0 mm	2.0-3.0 mm	ER16-118	23.80
ER16	3.5 mm	2.5-3.5 mm	ER16-138	23.80
ER16	4.0 mm	3.0-4.0 mm	ER16-157	23.80
ER16	4.5 mm	3.5-4.5 mm	ER16-177	23.80
ER16	5.0 mm	4.0-5.0 mm	ER16-197	23.80
ER16	5.5 mm	4.5-5.5 mm	ER16-217	23.80
ER16	6.0 mm	5.0-6.0 mm	ER16-236	23.80
ER16	6.5 mm	5.5-6.5 mm	ER16-256	23.80
ER16	7.0 mm	6.0-7.0 mm	ER16-276	23.80

Continued on next page

ER

ER Collets

Metric ID (cont.)

Continued from previous page

Taper Size	ID	Clamp Range	Tool Holder	
	D_1		Tool #	USD$
ER16	7.5 mm	6.5-7.5 mm	ER16-295	23.80
ER16	8.0 mm	7.0-8.0 mm	ER16-315	23.80
ER16	8.5 mm	7.5-8.5 mm	ER16-335	23.80
ER16	9.0 mm	8.0-9.0 mm	ER16-354	23.80
ER16	9.5 mm	8.5-9.5 mm	ER16-374	23.80
ER16	10.0 mm	9.0-10.0 mm	ER16-394	23.80
ER16	10.5 mm	9.5-10.5 mm	ER16-413	23.80
ER20	1.0 mm	0.5-1.0 mm	ER20-039	30.85
ER20	1.5 mm	1.0-1.5 mm	ER20-059	30.85
ER20	2.0 mm	1.5-2.0 mm	ER20-079	30.85
ER20	2.5 mm	1.5-2.5 mm	ER20-098	30.85
ER20	3.0 mm	2.0-3.0 mm	ER20-118	30.85
ER20	3.5 mm	2.5-3.5 mm	ER20-138	30.85
ER20	4.0 mm	3.0-4.0 mm	ER20-157	30.85
ER20	4.5 mm	3.5-4.5 mm	ER20-177	30.85
ER20	5.0 mm	4.0-5.0 mm	ER20-197	30.85
ER20	5.5 mm	4.5-5.5 mm	ER20-217	30.85
ER20	6.0 mm	5.0-6.0 mm	ER20-236	30.85
ER20	6.5 mm	5.5-6.5 mm	ER20-256	30.85
ER20	7.0 mm	6.0-7.0 mm	ER20-276	30.85
ER20	7.5 mm	6.5-7.5 mm	ER20-295	30.85
ER20	8.0 mm	7.0-8.0 mm	ER20-315	30.85
ER20	8.5 mm	7.5-8.5 mm	ER20-335	30.85
ER20	9.0 mm	8.0-9.0 mm	ER20-354	30.85
ER20	9.5 mm	8.5-9.5 mm	ER20-374	30.85
ER20	10.0 mm	9.0-10.0 mm	ER20-394	30.85
ER20	10.5 mm	9.5-10.5 mm	ER20-413	30.85
ER20	11.0 mm	10.0-11.0 mm	ER20-433	30.85
ER20	11.5 mm	10.5-11.5 mm	ER20-453	30.85
ER20	12.0 mm	11.0-12.0 mm	ER20-472	30.85
ER20	12.5 mm	11.5-12.5 mm	ER20-492	30.85
ER20	13.0 mm	12.0-13.0 mm	ER20-512	30.85
ER20	13.5 mm	12.5-13.5 mm	ER20-531	30.85
ER20	14.0 mm	13.0-14.0 mm	ER20-551	30.85
ER32	3.0 mm	2.0-3.0 mm	ER32-118	32.65
ER32	3.5 mm	2.5-3.5 mm	ER32-138	32.65
ER32	4.0 mm	3.0-4.0 mm	ER32-158	32.65
ER32	4.5 mm	3.5-4.5 mm	ER32-177	32.65
ER32	5.0 mm	4.0-5.0 mm	ER32-197	32.65
ER32	5.5 mm	4.5-5.5 mm	ER32-217	32.65
ER32	6.0 mm	5.0-6.0 mm	ER32-236	32.65
ER32	6.5 mm	5.5-6.5 mm	ER32-256	32.65
ER32	7.0 mm	6.0-7.0 mm	ER32-276	32.65
ER32	7.5 mm	6.5-7.5 mm	ER32-295	32.65
ER32	8.0 mm	7.0-8.0 mm	ER32-315	32.65

Continued on next page

ER Collets

Metric ID (cont.)

Continued from previous page

Taper Size	ID	Clamp Range	Tool Holder	
	D_1		Tool #	USD$
ER32	8.5 mm	7.5-8.5 mm	ER32-335	32.65
ER32	9.0 mm	8.0-9.0 mm	ER32-354	32.65
ER32	9.5 mm	8.5-9.5 mm	ER32-374	32.65
ER32	10.0 mm	9.0-10.0 mm	ER32-394	32.65
ER32	10.5 mm	9.5-10.5 mm	ER32-413	32.65
ER32	11.0 mm	10.0-11.0 mm	ER32-433	32.65
ER32	11.5 mm	10.5-11.5 mm	ER32-453	32.65
ER32	12.0 mm	11.0-12.0 mm	ER32-472	32.65
ER32	12.5 mm	11.5-12.5 mm	ER32-492	32.65
ER32	13.0 mm	12.0-13.0 mm	ER32-512	32.65
ER32	13.5 mm	12.5-13.5 mm	ER32-532	32.65
ER32	14.0 mm	13.0-14.0 mm	ER32-551	32.65
ER32	14.5 mm	13.5-14.5 mm	ER32-571	32.65
ER32	15.0 mm	14.0-15.0 mm	ER32-591	32.65
ER32	15.5 mm	14.5-15.5 mm	ER32-610	32.65
ER32	16.0 mm	15.0-16.0 mm	ER32-630	32.65
ER32	16.5 mm	15.5-16.5 mm	ER32-650	32.65
ER32	17.0 mm	16.0-17.0 mm	ER32-669	32.65
ER32	17.5 mm	16.5-17.5 mm	ER32-689	32.65
ER32	18.0 mm	17.0-18.0 mm	ER32-709	32.65
ER32	18.5 mm	17.5-18.5 mm	ER32-728	32.65
ER32	19.0 mm	18.0-19.0 mm	ER32-748	32.65
ER32	19.5 mm	18.5-19.5 mm	ER32-768	32.65
ER32	20.0 mm	19.0-20.0 mm	ER32-787	32.65
ER32	21.0 mm	20.0-21.0 mm	ER32-827	32.65

ER

ER Collets
Standard ID

- 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 #	USD$
ER08	.0625	.043-.062	ER08-062	27.60
ER08	.1250	.086-.125	ER08-125	27.60
ER08	.1875	.148-.187	ER08-187	27.60
ER11	.0625	.043-.062	ER11-062	23.60
ER11	.0937	.054-.093	ER11-093	23.60
ER11	.1250	.086-.125	ER11-125	23.60
ER11	.1562	.117-.156	ER11-156	23.60
ER11	.1875	.148-.187	ER11-187	23.60
ER11	.2187	.179-.218	ER11-218	23.60
ER11	.2500	.211-.250	ER11-250	23.60
ER11	.2811	.242-.281	ER11-281	23.60
ER16	.0625	.043-.062	ER16-062	23.80
ER16	.0937	.054-.093	ER16-093	23.80
ER16	.1250	.086-.125	ER16-125	23.80
ER16	.1562	.117-.156	ER16-156	23.80
ER16	.1875	.148-.187	ER16-187	23.80
ER16	.2187	.179-.218	ER16-218	23.80
ER16	.2500	.211-.250	ER16-250	23.80
ER16	.2811	.242-.281	ER16-281	23.80
ER16	.3125	.273-.312	ER16-312	23.80
ER16	.3437	.304-.343	ER16-343	23.80
ER16	.3750	.336-.375	ER16-375	23.80
ER16	.4062	.367-.406	ER16-406	23.80
ER20	.0625	.043-.062	ER20-062	30.85
ER20	.0937	.054-.093	ER20-093	30.85
ER20	.1250	.086-.125	ER20-125	30.85
ER20	.1562	.117-.156	ER20-156	30.85
ER20	.1875	.148-.187	ER20-187	30.85
ER20	.2187	.179-.218	ER20-218	30.85
ER20	.2500	.211-.250	ER20-250	30.85
ER20	.2811	.242-.281	ER20-281	30.85
ER20	.3125	.273-.312	ER20-312	30.85
ER20	.3437	.304-.343	ER20-343	30.85
ER20	.3750	.336-.375	ER20-375	30.85
ER20	.4062	.367-.406	ER20-406	30.85
ER20	.4375	.398-.437	ER20-437	30.85
ER20	.4687	.429-.468	ER20-468	30.85
ER20	.5000	.461-.500	ER20-500	30.85

Continued on next page

ER Collets

Standard ID (cont.)

Continued from previous page

Taper Size	ID	Clamp Range	ER Collet	
	D_1		Tool #	USD$
ER32	.0625	.043-.062	ER32-062	32.65
ER32	.0937	.054-.093	ER32-093	32.65
ER32	.1250	.086-.125	ER32-125	32.65
ER32	.1562	.117-.156	ER32-156	32.65
ER32	.1875	.148-.187	ER32-187	32.65
ER32	.2187	.179-.218	ER32-218	32.65
ER32	.2500	.211-.250	ER32-250	32.65
ER32	.2811	.242-.281	ER32-281	32.65
ER32	.3125	.273-.312	ER32-312	32.65
ER32	.3437	.304-.343	ER32-343	32.65
ER32	.3750	.336-.375	ER32-375	32.65
ER32	.4062	.367-.406	ER32-406	32.65
ER32	.4375	.398-.437	ER32-437	32.65
ER32	.4687	.429-.468	ER32-468	32.65
ER32	.5000	.461-.500	ER32-500	32.65
ER32	.5312	.492-.531	ER32-531	32.65
ER32	.5625	.523-.562	ER32-562	32.65
ER32	.5937	.554-.593	ER32-593	32.65
ER32	.6250	.586-.625	ER32-625	32.65
ER32	.6562	.617-.656	ER32-656	32.65
ER32	.6875	.648-.687	ER32-687	32.65
ER32	.7187	.679-.718	ER32-718	32.65
ER32	.7500	.711-.750	ER32-750	32.65

ERMS

ER Collets
Metric ID - Metallic Sealed

- 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 #	USD$
ER11	3.0 mm	ERMS11-118	66.30
ER11	4.0 mm	ERMS11-157	66.30
ER11	5.0 mm	ERMS11-197	66.30
ER11	6.0 mm	ERMS11-236	66.30
ER11	7.0 mm	ERMS11-276	66.30
ER16	3.0 mm	ERMS16-118	53.25
ER16	4.0 mm	ERMS16-157	53.25
ER16	5.0 mm	ERMS16-197	53.25
ER16	6.0 mm	ERMS16-236	53.25
ER16	7.0 mm	ERMS16-276	53.25
ER16	8.0 mm	ERMS16-315	53.25
ER16	9.0 mm	ERMS16-354	53.25
ER16	10.0 mm	ERMS16-394	53.25
ER20	3.0 mm	ERMS20-118	59.65
ER20	4.0 mm	ERMS20-157	59.65
ER20	5.0 mm	ERMS20-197	59.65
ER20	6.0 mm	ERMS20-236	59.65
ER20	7.0 mm	ERMS20-276	59.65
ER20	8.0 mm	ERMS20-315	59.65
ER20	9.0 mm	ERMS20-354	59.65
ER20	10.0 mm	ERMS20-394	59.65
ER20	11.0 mm	ERMS20-433	59.65
ER20	12.0 mm	ERMS20-472	59.65
ER20	13.0 mm	ERMS20-512	59.65
ER32	3.0 mm	ERMS32-118	63.45
ER32	4.0 mm	ERMS32-157	63.45
ER32	5.0 mm	ERMS32-197	63.45
ER32	6.0 mm	ERMS32-236	63.45
ER32	7.0 mm	ERMS32-276	63.45
ER32	8.0 mm	ERMS32-315	63.45
ER32	9.0 mm	ERMS32-354	63.45
ER32	10.0 mm	ERMS32-394	63.45
ER32	11.0 mm	ERMS32-433	63.45
ER32	12.0 mm	ERMS32-472	63.45
ER32	13.0 mm	ERMS32-512	63.45
ER32	14.0 mm	ERMS32-551	63.45
ER32	15.0 mm	ERMS32-591	63.45
ER32	16.0 mm	ERMS32-630	63.45
ER32	17.0 mm	ERMS32-669	63.45
ER32	18.0 mm	ERMS32-709	63.45
ER32	19.0 mm	ERMS32-748	63.45
ER32	20.0 mm	ERMS32-787	63.45

ER Collets

Standard ID - Metallic Sealed

ERMS

- 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 #	USD$
ER11	.1250	ERMS11-125	66.30
ER11	.1875	ERMS11-187	66.30
ER11	.2500	ERMS11-250	66.30
ER16	.1250	ERMS16-125	53.25
ER16	.1875	ERMS16-187	53.25
ER16	.2500	ERMS16-250	53.25
ER16	.3125	ERMS16-312	53.25
ER16	.3750	ERMS16-375	53.25
ER20	.1250	ERMS20-125	59.65
ER20	.1875	ERMS20-187	59.65
ER20	.2500	ERMS20-250	59.65
ER20	.3125	ERMS20-312	59.65
ER20	.3750	ERMS20-375	59.65
ER20	.5000	ERMS20-500	59.65
ER32	.2500	ERMS32-250	63.45
ER32	.3125	ERMS32-312	63.45
ER32	.3750	ERMS32-375	63.45
ER32	.5000	ERMS32-500	63.45
ER32	.6250	ERMS32-625	63.45
ER32	.7500	ERMS32-750	63.45

ERS/ERM

ER Collets
Sets

- 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

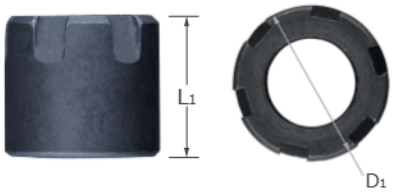
Taper Size	ID Type	Collet Count	Clamp Range	Set	
	D_1			Tool #	USD$
ER08	Metric	9	0.5-5.0 mm	ER08M-1	235.85
ER11	Standard	7	.043-.250	ER11S-1	156.40
ER11	Metric	13	0.5-7.0 mm	ER11M-1	291.00
ER16	Standard	10	.054-.375	ER16S-1	226.90
ER16	Metric	10	0.5-10.0 mm	ER16M-1	226.90
ER20	Standard	12	.117-.500	ER20S-1	351.30
ER20	Metric	12	1.5-13.0 mm	ER20M-1	351.30
ER32	Standard	18	.179-.750	ER32S-1	558.90
ER32	Metric	18	2.0-20 mm	ER32M-1	558.90

ER Collets

ER Collet Nuts

CMR

- 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 #	USD$
ER08	Mini	12 mm	11 mm	M10 x 0.75	CMR08-SW	32.05
ER11	Mini	16 mm	12 mm	M13 x 0.75	CMR11-SW	33.75
ER16	Mini	22 mm	18 mm	M19 x 1.0	CMR16-SW	35.00

ER Collets

ER Collet Wrenches

MRSW

- Wrenches utilized for various collet nut connections

Taper Size	Nut Size	ER Wrenches	
		Tool #	USD$
ER08	Mini	MR08-SW	24.40
ER11	Mini	MR11-SW	25.65
ER16	Mini	MR16-SW	26.90

TURNING TOOLS

Internal Diameter (ID) - Quick Change

Quick Change - Boring Tools NEW!	63
Quick Change - Profiling Tools NEW SIZES!	82
Quick Change - Grooving Tools NEW SIZES!	88
Quick Change - Broaching	109
Quick Change - Threading Tools	113
Quick Change - Holemaking Tools	122
Quick Change - Blanks	124

Internal Diameter (ID) - Standard

Standard - Boring Tools NEW SIZES!	129
Standard - Profiling Tools NEW SIZES!	153
Standard - Grooving Tools NEW SIZES!	159
Standard - Threading Tools	184

Internal Diameter (ID) - Indexable

Indexable - Boring Bars, Boring	198
Indexable - Boring Bars, Facing	200
Indexable - Boring Bars, Profiling	201

Outside Diameter (OD) - Indexable

Indexable - Tool Holders, Chamfering & Turning	202
Indexable - Tool Holders, Facing & Turning	203
Indexable - Tool Holders, Profiling	206

Outside Diameter (OD) - Brazed

Brazed - Box Turning Tools	207
Brazed - Forming Tools	208
Brazed - Grooving Tools	215
Brazed - Threading Tools	220
Brazed - Screw Machine Tools	221
Brazed - Cut Off Tools	223

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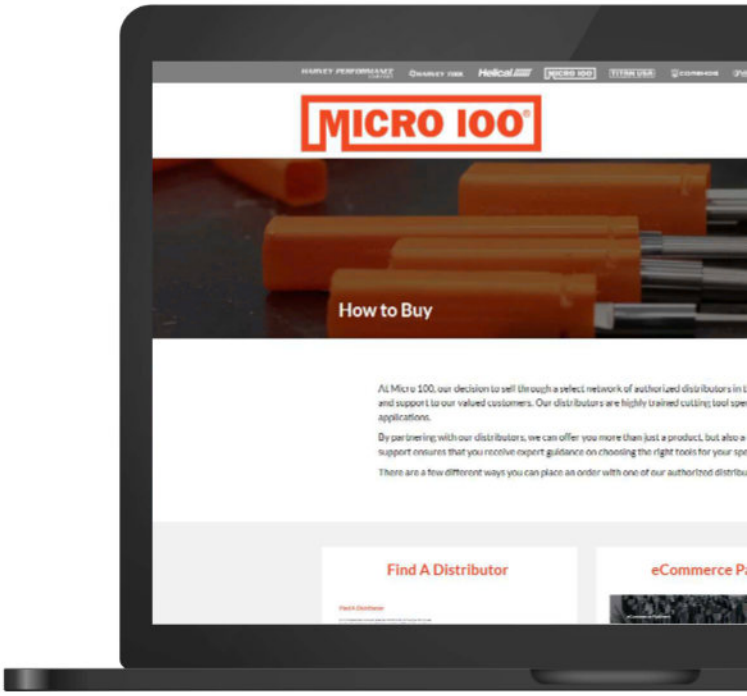

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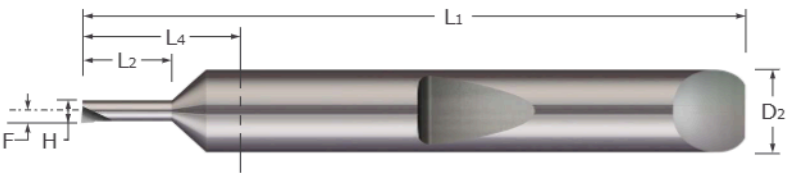
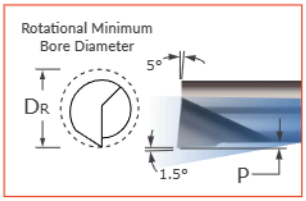
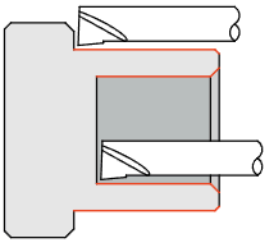
Quick Change – Boring Tools

Right Hand – Sharp - Miniature





- 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 #	USD$	Tool #	USD$
	.0135	.0150	.050	.0015	.590	.0075	.1875	1.5	QMBB-015050	67.65	QMBB-015050X	73.50
	.0135	.0150	.075	.0015	.590	.0075	.1875	1.5	QMBB-015075	67.65	QMBB-015075X	74.60
	.0180	.0200	.050	.0020	.590	.0100	.1875	1.5	QMBB-020050	67.65	QMBB-020050X	74.60
	.0180	.0200	.075	.0020	.590	.0100	.1875	1.5	QMBB-020075	67.65	QMBB-020075X	73.50
	.0180	.0200	.100	.0020	.590	.0100	.1875	1.5	QMBB-020100	67.65	QMBB-020100X	74.60
	.0225	.0250	.050	.0025	.590	.0125	.1875	1.5	QMBB-025050	59.65	QMBB-025050X	66.45
	.0225	.0250	.075	.0025	.590	.0125	.1875	1.5	QMBB-025075	59.65	QMBB-025075X	66.45
	.0225	.0250	.100	.0025	.590	.0125	.1875	1.5	QMBB-025100	59.65	QMBB-025100X	65.30
	.0225	.0250	.125	.0025	.590	.0125	.1875	1.5	QMBB-025125	59.65	QMBB-025125X	66.45
	.0275	.0300	.075	.0025	.590	.0150	.1875	1.5	QMBB-030075	59.65	QMBB-030075X	66.45
	.0275	.0300	.100	.0025	.590	.0150	.1875	1.5	QMBB-030100	59.65	QMBB-030100X	65.30
	.0275	.0300	.125	.0025	.590	.0150	.1875	1.5	QMBB-030125	59.65	QMBB-030125X	66.45
	.0275	.0300	.150	.0025	.590	.0150	.1875	1.5	QMBB-030150	59.65	QMBB-030150X	66.45
	.0320	.0350	.075	.0030	.590	.0175	.1875	1.5	QMBB-035075	59.65	QMBB-035075X	66.45
	.0320	.0350	.100	.0030	.590	.0175	.1875	1.5	QMBB-035100	59.65	QMBB-035100X	65.30
	.0320	.0350	.150	.0030	.590	.0175	.1875	1.5	QMBB-035150	59.65	QMBB-035150X	65.30
	.0320	.0350	.200	.0030	.590	.0175	.1875	1.5	QMBB-035200	59.65	QMBB-035200X	66.45
	.0365	.0400	.100	.0035	.590	.0200	.1875	1.5	QMBB-040100	59.65	QMBB-040100X	66.45
	.0365	.0400	.150	.0035	.590	.0200	.1875	1.5	QMBB-040150	59.65	QMBB-040150X	65.30
	.0365	.0400	.200	.0035	.590	.0200	.1875	1.5	QMBB-040200	59.65	QMBB-040200X	65.30
NEW	.0365	.0400	.250	.0035	.590	.0200	.1875	1.5	QMBB-040250	59.65	QMBB-040250X	65.95
	.0405	.0450	.100	.0045	.590	.0225	.1875	1.5	QMBB-045100	59.65	QMBB-045100X	66.45
	.0405	.0450	.150	.0045	.590	.0225	.1875	1.5	QMBB-045150	59.65	QMBB-045150X	65.30
	.0405	.0450	.200	.0045	.590	.0225	.1875	1.5	QMBB-045200	59.65	QMBB-045200X	65.30
NEW	.0405	.0450	.250	.0045	.590	.0225	.1875	1.5	QMBB-045250	59.65	QMBB-045250X	65.95
	.0440	.0500	.100	.0060	.590	.0250	.1875	1.5	QMBB-050100	46.60	QMBB-050100X	53.40
	.0440	.0500	.150	.0060	.590	.0250	.1875	1.5	QMBB-050150	46.60	QMBB-050150X	51.65
	.0440	.0500	.200	.0060	.590	.0250	.1875	1.5	QMBB-050200	46.60	QMBB-050200X	51.65
	.0440	.0500	.300	.0060	.590	.0250	.1875	1.5	QMBB-050300	46.60	QMBB-050300X	51.65
NEW	.0440	.0500	.400	.0060	.590	.0250	.1875	1.5	QMBB-050400	46.60	QMBB-050400X	52.90

Continued on next page

See pages 16-34 for quick change holder options

NEW!

Quick Change – Boring Tools

Right Hand – Sharp - Miniature (cont.)

QMBB

Continued from previous page

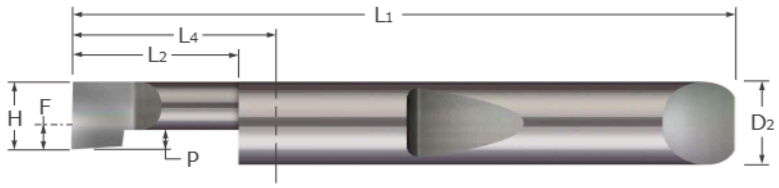
Head Width	Rotational Minimum Bore Dia.	Max. Bore Depth	Projection	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H	D_R	L_2 $^{+.030"}_{-.000"}$	P	L_4	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.0525	.0600	.150	.0075	.590	.0300	.1875	1.5	QMBB-060150	46.60	QMBB-060150X	51.65
.0525	.0600	.200	.0075	.590	.0300	.1875	1.5	QMBB-060200	46.60	QMBB-060200X	51.65
.0525	.0600	.300	.0075	.590	.0300	.1875	1.5	QMBB-060300	46.60	QMBB-060300X	51.65
.0525	.0600	.400	.0075	.590	.0300	.1875	1.5	QMBB-060400	46.60	QMBB-060400X	51.65
.0525	.0600	.500	.0075	.590	.0300	.1875	1.5	QMBB-060500	46.60	QMBB-060500X	51.65
.0625	.0700	.150	.0075	.590	.0350	.1875	1.5			QMBB-070150X	51.65
.0625	.0700	.200	.0075	.590	.0350	.1875	1.5	QMBB-070200	46.60	QMBB-070200X	51.65
.0625	.0700	.300	.0075	.590	.0350	.1875	1.5	QMBB-070300	46.60	QMBB-070300X	51.65
.0625	.0700	.400	.0075	.590	.0350	.1875	1.5	QMBB-070400	46.60	QMBB-070400X	51.65
.0625	.0700	.500	.0075	.590	.0350	.1875	1.5	QMBB-070500	46.60	QMBB-070500X	51.65
.0700	.0800	.150	.0100	.590	.0400	.1875	1.5			QMBB-080150X	51.65
.0700	.0800	.200	.0100	.590	.0400	.1875	1.5	QMBB-080200	46.60	QMBB-080200X	51.65
.0700	.0800	.300	.0100	.590	.0400	.1875	1.5	QMBB-080300	46.60	QMBB-080300X	51.65
.0700	.0800	.500	.0100	.590	.0400	.1875	1.5	QMBB-080500	46.60	QMBB-080500X	51.65
.0700	.0800	.600	.0100	1.090	.0400	.1875	2.0	QMBB-080600	46.60	QMBB-080600X	51.65
.0800	.0900	.200	.0100	.590	.0450	.1875	1.5	QMBB-090200	46.60	QMBB-090200X	53.40
.0800	.0900	.300	.0100	.590	.0450	.1875	1.5	QMBB-090300	46.60	QMBB-090300X	51.65
.0800	.0900	.500	.0100	.590	.0450	.1875	1.5	QMBB-090500	46.60	QMBB-090500X	51.65
.0800	.0900	.700	.0100	1.090	.0450	.1875	2.0	QMBB-090700	46.60	QMBB-090700X	51.65
.0875	.1000	.200	.0125	.590	.0500	.1875	1.5	QMBB-100200	46.60	QMBB-100200X	53.40
.0875	.1000	.300	.0125	.590	.0500	.1875	1.5	QMBB-100300	46.60	QMBB-100300X	51.65
.0875	.1000	.500	.0125	.590	.0500	.1875	1.5	QMBB-100500	46.60	QMBB-100500X	51.65
.0875	.1000	.700	.0125	1.090	.0500	.1875	2.0	QMBB-100700	46.60	QMBB-100700X	51.65
.0875	.1000	.800	.0125	1.090	.0500	.1875	2.0	QMBB-100800	46.60	QMBB-100800X	51.65

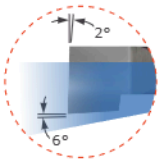
See pages 16-34 for quick change holder options

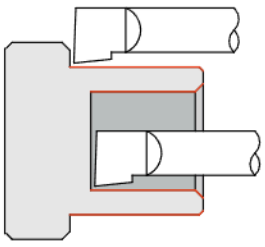
QBB

Quick Change – Boring Tools

Right Hand – Sharp







- 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 #	USD$	Tool #	USD$
	.0500	.0550	.150	.013	.590	-.0438	.1875	1.5	QBB-050150	46.60	QBB-050150X	51.65
	.0500	.0550	.200	.013	.590	-.0438	.1875	1.5	QBB-050200	46.60	QBB-050200X	51.65
	.0500	.0550	.250	.013	.590	-.0438	.1875	1.5	QBB-050250-000	46.60	QBB-050250-000X	53.40
	.0500	.0550	.300	.013	.590	-.0438	.1875	1.5	QBB-050300	46.60	QBB-050300X	51.65
	.0500	.0550	.400	.013	.590	-.0438	.1875	1.5	QBB-050400	46.60	QBB-050400X	51.65
	.0600	.0700	.150	.015	.590	-.0338	.1875	1.5	QBB-060150	46.60	QBB-060150X	51.65
	.0600	.0700	.200	.015	.590	-.0338	.1875	1.5	QBB-060200	46.60	QBB-060200X	51.65
	.0600	.0700	.250	.015	.590	-.0338	.1875	1.5	QBB-060250-000	46.60	QBB-060250-000X	53.40
	.0600	.0700	.300	.015	.590	-.0338	.1875	1.5	QBB-060300	46.60	QBB-060300X	51.65
	.0600	.0700	.400	.015	.590	-.0338	.1875	1.5	QBB-060400	46.60	QBB-060400X	51.65
	.0600	.0700	.500	.015	.590	-.0338	.1875	1.5	QBB-060500	46.60	QBB-060500X	51.65
	.0700	.0800	.150	.015	.590	-.0238	.1875	1.5	QBB-070150-000	46.60	QBB-070150-000X	53.40
	.0700	.0800	.200	.015	.590	-.0238	.1875	1.5	QBB-070200-000	46.60	QBB-070200-000X	53.40
	.0700	.0800	.300	.015	.590	-.0238	.1875	1.5	QBB-070300-000	46.60	QBB-070300-000X	53.40
	.0800	.0900	.150	.020	.590	-.0138	.1875	1.5	QBB-080150-000	46.60	QBB-080150-000X	53.40
	.0800	.0900	.200	.020	.590	-.0138	.1875	1.5	QBB-080200	46.60	QBB-080200X	51.65
	.0800	.0900	.300	.020	.590	-.0138	.1875	1.5	QBB-080300	46.60	QBB-080300X	51.65
	.0800	.0900	.400	.020	.590	-.0138	.1875	1.5	QBB-080400-000	46.60	QBB-080400-000X	53.40
	.0800	.0900	.500	.020	.590	-.0138	.1875	1.5	QBB-080500	46.60	QBB-080500X	51.65
	.0800	.0900	.600	.020	1.090	-.0138	.1875	2.0	QBB-080600	46.60	QBB-080600X	51.65
NEW	.0800	.0900	.700	.020	1.090	-.0138	.1875	2.0	QBB-080700-000	46.60	QBB-080700-000X	52.90
	.0900	.1000	.150	.020	.590	-.0038	.1875	1.5	QBB-090150-000	49.45	QBB-090150-000X	56.35
	.0900	.1000	.200	.020	.590	-.0038	.1875	1.5	QBB-090200-000	49.45	QBB-090200-000X	56.35
	.0900	.1000	.300	.020	.590	-.0038	.1875	1.5	QBB-090300-000	49.45	QBB-090300-000X	56.35
	.0900	.1000	.400	.020	.590	-.0038	.1875	1.5	QBB-090400-000	49.45	QBB-090400-000X	56.35
	.0900	.1000	.500	.020	.590	-.0038	.1875	1.5	QBB-090500-000	49.45	QBB-090500-000X	56.35

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

Continued on next page

See pages 16-34 for quick change holder options
See page 63 for miniature sizes
For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pages 75 - 78

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 #	USD$	Tool #	USD$
.1000	.1100	.150	.025	.590	.0063	.1875	1.5	QBB-100150-000	49.45	QBB-100150-000X	56.35
.1000	.1100	.200	.025	.590	.0063	.1875	1.5	QBB-100200	49.45	QBB-100200X	54.65
.1000	.1100	.300	.025	.590	.0063	.1875	1.5	QBB-100300	49.45	QBB-100300X	54.65
.1000	.1100	.400	.025	.590	.0063	.1875	1.5	QBB-100400-000	49.45	QBB-100400-000X	56.35
.1000	.1100	.500	.025	.590	.0063	.1875	1.5	QBB-100500	49.45	QBB-100500X	54.65
.1000	.1100	.600	.025	1.090	.0063	.1875	2.0	QBB-100600-000	51.35	QBB-100600-000X	58.25
.1000	.1100	.700	.025	1.090	.0063	.1875	2.0	QBB-100700	49.45	QBB-100700X	54.65
.1000	.1100	.800	.025	1.090	.0063	.1875	2.0	QBB-100800-000	49.45	QBB-100800-000X	56.35
.1100	.1220	.150	.028	.590	.0163	.1875	1.5	QBB-110150-000	49.45	QBB-110150-000X	56.35
.1100	.1220	.200	.028	.590	.0163	.1875	1.5	QBB-110200-000	49.45	QBB-110200-000X	56.35
.1100	.1220	.300	.028	.590	.0163	.1875	1.5	QBB-110300-000	49.45	QBB-110300-000X	56.35
.1100	.1220	.400	.028	.590	.0163	.1875	1.5	QBB-110400-000	49.45	QBB-110400-000X	56.35
.1100	.1220	.500	.028	.590	.0163	.1875	1.5	QBB-110500-000	49.45	QBB-110500-000X	56.35
.1100	.1220	.600	.028	1.090	.0163	.1875	2.0	QBB-110600-000	51.35	QBB-110600-000X	58.25
.1100	.1220	.700	.028	1.090	.0163	.1875	2.0	QBB-110700-000	51.35	QBB-110700-000X	58.25
.1200	.1320	.250	.030	.590	.0263	.1875	1.5	QBB-120250-000	49.45	QBB-120250-000X	56.35
.1200	.1320	.350	.030	.590	.0263	.1875	1.5	QBB-120350-000	49.45	QBB-120350-000X	56.35
.1200	.1320	.500	.030	.590	.0263	.1875	1.5	QBB-120500-000	49.45	QBB-120500-000X	56.35
.1200	.1320	.600	.030	1.090	.0263	.1875	2.0	QBB-120600-000	51.35	QBB-120600-000X	58.25
.1200	.1320	.700	.030	1.090	.0263	.1875	2.0	QBB-120700-000	51.35	QBB-120700-000X	58.25
.1200	.1320	.800	.030	1.090	.0263	.1875	2.0	QBB-120800-000	51.35	QBB-120800-000X	58.25
.1200	.1320	1.000	.030	1.090	.0263	.1875	2.0	QBB-1201000-000	51.35	QBB-1201000-000X	58.25
.1400	.1520	.250	.035	.590	.0463	.1875	1.5	QBB-140250-000	49.45	QBB-140250-000X	56.35
.1400	.1520	.400	.035	.590	.0463	.1875	1.5	QBB-140400-000	49.45	QBB-140400-000X	56.35
.1400	.1520	.500	.035	.590	.0463	.1875	1.5	QBB-140500-000	49.45	QBB-140500-000X	56.35
.1400	.1520	.600	.035	1.090	.0463	.1875	2.0	QBB-140600-000	51.35	QBB-140600-000X	58.25
.1400	.1520	.700	.035	1.090	.0463	.1875	2.0	QBB-140700-000	51.35	QBB-140700-000X	58.25
.1400	.1520	.750	.035	1.090	.0463	.1875	2.0	QBB-140750-000	51.35	QBB-140750-000X	58.25
.1400	.1520	.800	.035	1.090	.0463	.1875	2.0	QBB-140800-000	51.35	QBB-140800-000X	58.25
.1400	.1520	.900	.035	1.090	.0463	.1875	2.0	QBB-140900-000	51.35	QBB-140900-000X	58.25
.1600	.1760	.250	.040	.590	.0663	.1875	1.5	QBB-160250-000	49.45	QBB-160250-000X	56.35
.1600	.1760	.400	.040	.590	.0663	.1875	1.5	QBB-160400-000	49.45	QBB-160400-000X	56.35
.1600	.1760	.500	.040	.590	.0663	.1875	1.5	QBB-160500-000	49.45	QBB-160500-000X	56.35
.1600	.1760	.600	.040	1.090	.0663	.1875	2.0	QBB-160600-000	49.45	QBB-160600-000X	56.35
.1600	.1760	.750	.040	1.090	.0663	.1875	2.0	QBB-160750-000	51.35	QBB-160750-000X	58.25
.1600	.1760	.900	.040	1.090	.0663	.1875	2.0	QBB-160900-000	51.35	QBB-160900-000X	58.25
.1600	.1760	1.000	.040	1.090	.0663	.1875	2.0	QBB-1601000-000	49.45	QBB-1601000-000X	56.35
.1600	.1760	1.250	.040	1.590	.0663	.1875	2.5	QBB-1601250-000	53.40	QBB-1601250-000X	60.75

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

Continued on next page

See pages 16-34 for quick change holder options

See page 63 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pages 75 - 78

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 #	USD$	Tool #	USD$
	.1800	.1960	.350	.045	.853	.0550	.2500	2.0	QBB-180350-000	55.35	QBB-180350-000X	63.65
	.1800	.1960	.500	.045	.853	.0550	.2500	2.0	QBB-180500-000	55.35	QBB-180500-000X	63.65
	.1800	.1960	.600	.045	.853	.0550	.2500	2.0	QBB-180600-000	55.35	QBB-180600-000X	63.65
	.1800	.1960	.750	.045	.853	.0550	.2500	2.0	QBB-180750-000	55.35	QBB-180750-000X	63.65
	.1800	.1960	.900	.045	1.353	.0550	.2500	2.5	QBB-180900-000	57.50	QBB-180900-000X	66.25
	.1800	.1960	1.000	.045	1.353	.0550	.2500	2.5	QBB-1801000-000	57.50	QBB-1801000-000X	66.25
	.1800	.1960	1.250	.045	1.353	.0550	.2500	2.5	QBB-1801250-000	57.50	QBB-1801250-000X	66.25
	.1800	.1960	1.500	.045	1.853	.0550	.2500	3.0	QBB-1801500-000	59.75	QBB-1801500-000X	68.50
NEW	.1800	.1960	1.750	.045	1.853	.0550	.2500	3.0	QBB-1801750-000	71.15	QBB-1801750-000X	79.15
	.2000	.2160	.400	.050	.853	.0750	.2500	2.0	QBB-200400-000	55.35	QBB-200400-000X	63.65
	.2000	.2160	.500	.050	.853	.0750	.2500	2.0	QBB-200500-000	55.35	QBB-200500-000X	63.65
	.2000	.2160	.600	.050	.853	.0750	.2500	2.0	QBB-200600-000	55.35	QBB-200600-000X	63.65
	.2000	.2160	.700	.050	.853	.0750	.2500	2.0	QBB-200700-000	55.35	QBB-200700-000X	63.65
	.2000	.2160	.750	.050	.853	.0750	.2500	2.0	QBB-200750-000	55.35	QBB-200750-000X	63.65
	.2000	.2160	1.000	.050	1.353	.0750	.2500	2.5	QBB-2001000-000	55.35	QBB-2001000-000X	64.20
	.2000	.2160	1.300	.050	1.353	.0750	.2500	2.5	QBB-2001300-000	55.35	QBB-2001300-000X	64.20
NEW	.2000	.2160	1.500	.050	1.853	.0750	.2500	3.0	QBB-2001500-000	71.15	QBB-2001500-000X	79.15
	.2300	.2500	.400	.058	.853	.0738	.3125	2.0	QBB-230400-000	71.10	QBB-230400-000X	81.05
	.2300	.2500	.500	.058	.853	.0738	.3125	2.0	QBB-230500-000	71.10	QBB-230500-000X	81.05
	.2300	.2500	.600	.058	.853	.0738	.3125	2.0	QBB-230600-000	71.10	QBB-230600-000X	81.05
	.2300	.2500	.700	.058	.853	.0738	.3125	2.0	QBB-230700-000	71.10	QBB-230700-000X	81.05
	.2300	.2500	.750	.058	.853	.0738	.3125	2.0	QBB-230750-000	71.10	QBB-230750-000X	81.05
	.2300	.2500	.800	.058	1.353	.0738	.3125	2.5	QBB-230800-000	73.00	QBB-230800-000X	83.55
	.2300	.2500	.900	.058	1.353	.0738	.3125	2.5	QBB-230900-000	73.00	QBB-230900-000X	83.55
	.2300	.2500	1.000	.058	1.353	.0738	.3125	2.5	QBB-2301000-000	71.10	QBB-2301000-000X	81.60
	.2300	.2500	1.250	.058	1.353	.0738	.3125	2.5	QBB-2301250-000	71.10	QBB-2301250-000X	81.60
	.2300	.2500	1.500	.058	1.853	.0738	.3125	3.0	QBB-2301500-000	71.10	QBB-2301500-000X	81.60
NEW	.2300	.2500	1.750	.058	1.853	.0738	.3125	3.0	QBB-2301750-000	71.15	QBB-2301750-000X	80.70
	.2600	.2800	.500	.065	.853	.1038	.3125	2.0	QBB-260500-000	71.10	QBB-260500-000X	81.05
	.2600	.2800	.750	.065	.853	.1038	.3125	2.0	QBB-260750-000	71.10	QBB-260750-000X	81.05
	.2600	.2800	1.000	.065	1.353	.1038	.3125	2.5	QBB-2601000-000	73.00	QBB-2601000-000X	83.55
	.2600	.2800	1.250	.065	1.353	.1038	.3125	2.5	QBB-2601250-000	73.00	QBB-2601250-000X	83.55
	.2900	.3100	.500	.073	.853	.1338	.3125	2.0	QBB-290500-000	71.10	QBB-290500-000X	81.05
	.2900	.3100	.600	.073	.853	.1338	.3125	2.0	QBB-290600-000	71.10	QBB-290600-000X	81.05
	.2900	.3100	.750	.073	.853	.1338	.3125	2.0	QBB-290750-000	71.10	QBB-290750-000X	81.05
	.2900	.3100	.900	.073	1.353	.1338	.3125	2.5	QBB-290900-000	73.00	QBB-290900-000X	83.55
	.2900	.3100	1.000	.073	1.353	.1338	.3125	2.5	QBB-2901000-000	73.00	QBB-2901000-000X	83.55
	.2900	.3100	1.250	.073	1.353	.1338	.3125	2.5	QBB-2901250-000	73.00	QBB-2901250-000X	83.55
	.3200	.3400	.500	.080	.853	.1325	.3750	2.0	QBB-320500-000	97.55	QBB-320500-000X	109.20
	.3200	.3400	1.000	.080	1.353	.1325	.3750	2.5	QBB-3201000-000	103.15	QBB-3201000-000X	115.60
	.3200	.3400	1.500	.080	1.853	.1325	.3750	3.0	QBB-3201500-000	108.30	QBB-3201500-000X	120.65

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

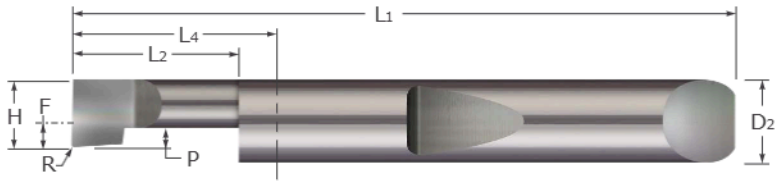
See pages 16-34 for quick change holder options
See page 63 for miniature sizes
For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pages 75 - 78

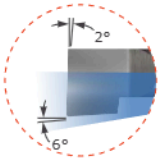
NEW!

Quick Change – Boring Tools

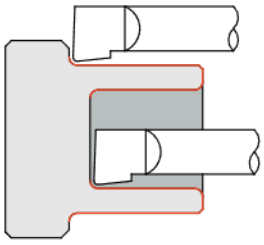
Right Hand

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
- 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	Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated		
H		L_2 +.030" −.000"	R +.001" −.001"	P	L_4	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$	
.0500	.0550	.150	.003	.013	.590	-.0438	.1875	1.5	QBB3-050150	51.95	QBB3-050150X	58.80	
.0500	.0550	.200	.003	.013	.590	-.0438	.1875	1.5	QBB3-050200	51.95	QBB3-050200X	58.80	
.0500	.0550	.250	.003	.013	.590	-.0438	.1875	1.5	QBB3-050250	51.95	QBB3-050250X	58.80	
.0500	.0550	.300	.003	.013	.590	-.0438	.1875	1.5	QBB3-050300	51.95	QBB3-050300X	58.80	
.0500	.0550	.400	.003	.013	.590	-.0438	.1875	1.5	QBB3-050400	51.95	QBB3-050400X	58.80	
.0600	.0700	.150	.003	.015	.590	-.0338	.1875	1.5	QBB3-060150	51.95	QBB3-060150X	58.80	
.0600	.0700	.200	.003	.015	.590	-.0338	.1875	1.5	QBB3-060200	51.95	QBB3-060200X	58.80	
.0600	.0700	.250	.003	.015	.590	-.0338	.1875	1.5	QBB3-060250	51.95	QBB3-060250X	58.80	
.0600	.0700	.300	.003	.015	.590	-.0338	.1875	1.5	QBB3-060300	51.95	QBB3-060300X	58.80	
.0600	.0700	.400	.003	.015	.590	-.0338	.1875	1.5	QBB3-060400	51.95	QBB3-060400X	58.80	
.0600	.0700	.500	.003	.015	.590	-.0338	.1875	1.5	QBB3-060500	51.95	QBB3-060500X	58.80	
.0700	.0800	.150	.003	.015	.590	-.0238	.1875	1.5	QBB3-070150	51.95	QBB3-070150X	58.80	
.0700	.0800	.200	.003	.015	.590	-.0238	.1875	1.5	QBB3-070200	51.95	QBB3-070200X	58.80	
.0700	.0800	.300	.003	.015	.590	-.0238	.1875	1.5	QBB3-070300	51.95	QBB3-070300X	58.80	
.0700	.0800	.400	.003	.015	.590	-.0238	.1875	1.5	QBB3-070400	52.05	QBB3-070400X	58.30	NEW
.0700	.0800	.500	.003	.015	.590	-.0238	.1875	1.5	QBB3-070500	52.05	QBB3-070500X	58.30	NEW
.0800	.0900	.150	.003	.020	.590	-.0138	.1875	1.5	QBB3-080150	51.95	QBB3-080150X	58.80	
.0800	.0900	.200	.003	.020	.590	-.0138	.1875	1.5	QBB3-080200	51.95	QBB3-080200X	58.80	
.0800	.0900	.300	.003	.020	.590	-.0138	.1875	1.5	QBB3-080300	51.95	QBB3-080300X	58.80	
.0800	.0900	.400	.003	.020	.590	-.0138	.1875	1.5	QBB3-080400	51.95	QBB3-080400X	58.80	
.0800	.0900	.500	.003	.020	.590	-.0138	.1875	1.5	QBB3-080500	51.95	QBB3-080500X	58.80	
.0800	.0900	.600	.003	.020	1.090	-.0138	.1875	2.0	QBB3-080600	54.05	QBB3-080600X	60.90	
.0800	.0900	.700	.003	.020	1.090	-.0138	.1875	2.0	QBB3-080700	53.95	QBB3-080700X	60.40	NEW
.0900	.1000	.150	.003	.020	.590	-.0038	.1875	1.5	QBB3-090150	51.95	QBB3-090150X	58.80	
.0900	.1000	.200	.003	.020	.590	-.0038	.1875	1.5	QBB3-090200	51.95	QBB3-090200X	58.80	
.0900	.1000	.300	.003	.020	.590	-.0038	.1875	1.5	QBB3-090300	51.95	QBB3-090300X	58.80	
.0900	.1000	.400	.003	.020	.590	-.0038	.1875	1.5	QBB3-090400	51.95	QBB3-090400X	58.80	
.0900	.1000	.500	.003	.020	.590	-.0038	.1875	1.5	QBB3-090500	51.95	QBB3-090500X	58.80	

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

Continued on next page

See pages 16-34 for quick change holder options

See page 63 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pages 75 - 78

QBB

Quick Change – Boring Tools

Right Hand (cont.)

Continued from previous page

	Head Width	Min. Bore Dia.*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	H		L_2 +.030" −.000"	R +.001" −.001"	P	L_4	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
	.1000	.1100	.150	.003	.025	.590	.0063	.1875	1.5	QBB3-100150	49.45	QBB3-100150X	56.35
	.1000	.1100	.200	.003	.025	.590	.0063	.1875	1.5	QBB3-100200	49.45	QBB3-100200X	56.35
	.1000	.1100	.300	.003	.025	.590	.0063	.1875	1.5	QBB3-100300	49.45	QBB3-100300X	56.35
	.1000	.1100	.400	.003	.025	.590	.0063	.1875	1.5	QBB3-100400	49.45	QBB3-100400X	56.35
	.1000	.1100	.500	.003	.025	.590	.0063	.1875	1.5	QBB3-100500	49.45	QBB3-100500X	56.35
	.1000	.1100	.600	.003	.025	1.090	.0063	.1875	2.0	QBB3-100600	51.35	QBB3-100600X	58.25
	.1000	.1100	.700	.003	.025	1.090	.0063	.1875	2.0	QBB3-100700	51.35	QBB3-100700X	58.25
	.1000	.1100	.800	.003	.025	1.090	.0063	.1875	2.0	QBB3-100800	51.35	QBB3-100800X	58.25
	.1100	.1220	.150	.003	.028	.590	.0163	.1875	1.5	QBB3-110150	49.45	QBB3-110150X	56.35
	.1100	.1220	.200	.003	.028	.590	.0163	.1875	1.5	QBB3-110200	49.45	QBB3-110200X	56.35
	.1100	.1220	.300	.003	.028	.590	.0163	.1875	1.5	QBB-110300	49.45	QBB-110300X	54.65
	.1100	.1220	.400	.003	.028	.590	.0163	.1875	1.5	QBB3-110400	49.45	QBB3-110400X	56.35
	.1100	.1220	.500	.003	.028	.590	.0163	.1875	1.5	QBB-110500	49.45	QBB-110500X	54.65
	.1100	.1220	.600	.003	.028	1.090	.0163	.1875	2.0	QBB3-110600	51.35	QBB3-110600X	58.25
	.1100	.1220	.700	.003	.028	1.090	.0163	.1875	2.0	QBB-110700	49.45	QBB-110700X	54.65
	.1100	.1220	.800	.003	.028	1.090	.0163	.1875	2.0	QBB3-110800	49.45	QBB3-110800X	56.35
	.1200	.1320	.250	.003	.030	.590	.0263	.1875	1.5	QBB-120250	49.45	QBB-120250X	54.65
	.1200	.1320	.250	.005	.030	.590	.0263	.1875	1.5	QBB5-120250	49.45	QBB5-120250X	56.35
	.1200	.1320	.350	.003	.030	.590	.0263	.1875	1.5	QBB-120350	49.45	QBB-120350X	54.65
	.1200	.1320	.350	.005	.030	.590	.0263	.1875	1.5	QBB5-120350	49.45	QBB5-120350X	56.35
	.1200	.1320	.500	.003	.030	.590	.0263	.1875	1.5	QBB-120500	49.45	QBB-120500X	54.65
	.1200	.1320	.500	.005	.030	.590	.0263	.1875	1.5	QBB5-120500	49.45	QBB5-120500X	56.35
	.1200	.1320	.600	.003	.030	1.090	.0263	.1875	2.0	QBB3-120600	51.35	QBB3-120600X	58.25
	.1200	.1320	.600	.005	.030	1.090	.0263	.1875	2.0	QBB5-120600	51.35	QBB5-120600X	58.25
	.1200	.1320	.700	.003	.030	1.090	.0263	.1875	2.0	QBB-120700	49.45	QBB-120700X	54.65
	.1200	.1320	.700	.005	.030	1.090	.0263	.1875	2.0	QBB5-120700	51.35	QBB5-120700X	58.25
	.1200	.1320	.800	.003	.030	1.090	.0263	.1875	2.0	QBB-120800	49.45	QBB-120800X	54.65
	.1200	.1320	.800	.005	.030	1.090	.0263	.1875	2.0	QBB5-120800	51.35	QBB5-120800X	58.25
NEW	.1200	.1320	1.000	.003	.030	1.090	.0263	.1875	2.0	QBB3-1201000	51.40	QBB3-1201000X	57.70
NEW	.1200	.1320	1.000	.005	.030	1.090	.0263	.1875	2.0	QBB5-1201000	51.40	QBB5-1201000X	57.70
	.1400	.1520	.250	.003	.035	.590	.0463	.1875	1.5	QBB3-140250	49.45	QBB3-140250X	56.35
	.1400	.1520	.250	.005	.035	.590	.0463	.1875	1.5	QBB5-140250	49.45	QBB5-140250X	56.35
	.1400	.1520	.400	.003	.035	.590	.0463	.1875	1.5	QBB-140400	49.45	QBB-140400X	54.65
	.1400	.1520	.400	.005	.035	.590	.0463	.1875	1.5	QBB5-140400	49.45	QBB5-140400X	56.35
	.1400	.1520	.500	.003	.035	.590	.0463	.1875	1.5	QBB3-140500	49.45	QBB3-140500X	56.35
	.1400	.1520	.500	.005	.035	.590	.0463	.1875	1.5	QBB5-140500	49.45	QBB5-140500X	56.35
	.1400	.1520	.600	.003	.035	1.090	.0463	.1875	2.0	QBB-140600	49.45	QBB-140600X	54.65
	.1400	.1520	.600	.005	.035	1.090	.0463	.1875	2.0	QBB5-140600	51.35	QBB5-140600X	58.25
	.1400	.1520	.700	.003	.035	1.090	.0463	.1875	2.0	QBB3-140700	51.35	QBB3-140700X	58.25
	.1400	.1520	.700	.005	.035	1.090	.0463	.1875	2.0	QBB5-140700	51.35	QBB5-140700X	58.25
	.1400	.1520	.750	.003	.035	1.090	.0463	.1875	2.0	QBB3-140750	51.35	QBB3-140750X	58.25
	.1400	.1520	.750	.005	.035	1.090	.0463	.1875	2.0	QBB5-140750	51.35	QBB5-140750X	58.25
	.1400	.1520	.800	.003	.035	1.090	.0463	.1875	2.0	QBB-140800	49.45	QBB-140800X	54.65
	.1400	.1520	.800	.005	.035	1.090	.0463	.1875	2.0	QBB5-140800	51.35	QBB5-140800X	58.25
	.1400	.1520	.900	.003	.035	1.090	.0463	.1875	2.0	QBB3-140900	51.35	QBB3-140900X	58.25
	.1400	.1520	.900	.005	.035	1.090	.0463	.1875	2.0	QBB5-140900	51.35	QBB5-140900X	58.25

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

Continued on next page

See pages 16-34 for quick change holder options

See page 63 for miniature sizes

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NEW!

Quick Change – Boring Tools

QBB

Right Hand (cont.)

Continued from previous page

Head Width	Min. Bore Dia.*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated		
H		L_2 +.030" −.000"	R +.001" −.001"	P	L_4	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$	
.1600	.1760	.250	.003	.040	.590	.0663	.1875	1.5	QBB3-160250	49.45	QBB3-160250X	56.35	
.1600	.1760	.250	.005	.040	.590	.0663	.1875	1.5	QBB5-160250	49.45	QBB5-160250X	56.35	
.1600	.1760	.400	.003	.040	.590	.0663	.1875	1.5	QBB-160400	49.45	QBB-160400X	54.65	
.1600	.1760	.400	.005	.040	.590	.0663	.1875	1.5	QBB5-160400	49.45	QBB5-160400X	56.35	
.1600	.1760	.500	.003	.040	.590	.0663	.1875	1.5	QBB3-160500	49.45	QBB3-160500X	56.35	
.1600	.1760	.500	.005	.040	.590	.0663	.1875	1.5	QBB5-160500	49.45	QBB5-160500X	56.35	
.1600	.1760	.600	.003	.040	1.090	.0663	.1875	2.0	QBB-160600	49.45	QBB-160600X	54.65	
.1600	.1760	.600	.005	.040	1.090	.0663	.1875	2.0	QBB5-160600	51.35	QBB5-160600X	58.25	
.1600	.1760	.700	.003	.040	1.090	.0663	.1875	2.0	QBB3-160700	51.35	QBB3-160700X	58.25	
.1600	.1760	.700	.005	.040	1.090	.0663	.1875	2.0	QBB5-160700	51.35	QBB5-160700X	58.25	
.1600	.1760	.750	.003	.040	1.090	.0663	.1875	2.0	QBB-160750	49.45	QBB-160750X	54.65	
.1600	.1760	.750	.005	.040	1.090	.0663	.1875	2.0	QBB5-160750	51.35	QBB5-160750X	58.25	
.1600	.1760	.800	.003	.040	1.090	.0663	.1875	2.0	QBB3-160800	51.35	QBB3-160800X	58.25	
.1600	.1760	.800	.005	.040	1.090	.0663	.1875	2.0	QBB5-160800	51.35	QBB5-160800X	58.25	
.1600	.1760	.900	.003	.040	1.090	.0663	.1875	2.0	QBB3-160900	51.35	QBB3-160900X	58.25	
.1600	.1760	.900	.005	.040	1.090	.0663	.1875	2.0	QBB5-160900	51.35	QBB5-160900X	58.25	
.1600	.1760	1.000	.003	.040	1.090	.0663	.1875	2.0	QBB-1601000	49.45	QBB-1601000X	54.65	
.1600	.1760	1.000	.005	.040	1.090	.0663	.1875	2.0	QBB5-1601000	51.35	QBB5-1601000X	58.25	
.1600	.1760	1.250	.003	.040	1.590	.0663	.1875	2.5	QBB3-1601250	53.40	QBB3-1601250X	60.75	
.1800	.1960	.350	.003	.045	.853	.0550	.2500	2.0	QBB3-180350	51.40	QBB3-180350X	58.95	NEW
.1800	.1960	.350	.005	.045	.853	.0550	.2500	2.0	QBB5-180350	51.35	QBB5-180350X	59.65	
.1800	.1960	.500	.003	.045	.853	.0550	.2500	2.0	QBB3-180500	53.25	QBB3-180500X	60.85	NEW
.1800	.1960	.500	.005	.045	.853	.0550	.2500	2.0	QBB-180500	53.30	QBB-180500X	61.45	
.1800	.1960	.500	.008	.045	.853	.0550	.2500	2.0	QBB8-180500	53.30	QBB8-180500X	61.45	
.1800	.1960	.600	.003	.045	.853	.0550	.2500	2.0	QBB3-180600	53.25	QBB3-180600X	60.85	NEW
.1800	.1960	.600	.005	.045	.853	.0550	.2500	2.0	QBB5-180600	53.30	QBB5-180600X	61.45	
.1800	.1960	.750	.003	.045	.853	.0550	.2500	2.0	QBB3-180750	53.25	QBB3-180750X	60.85	NEW
.1800	.1960	.750	.005	.045	.853	.0550	.2500	2.0	QBB-180750	53.30	QBB-180750X	61.45	
.1800	.1960	.750	.008	.045	.853	.0550	.2500	2.0	QBB8-180750	53.30	QBB8-180750X	61.45	
.1800	.1960	.900	.003	.045	1.353	.0550	.2500	2.5	QBB3-180900	55.20	QBB3-180900X	63.30	NEW
.1800	.1960	.900	.005	.045	1.353	.0550	.2500	2.5	QBB5-180900	55.25	QBB5-180900X	64.05	
.1800	.1960	1.000	.003	.045	1.353	.0550	.2500	2.5	QBB3-1801000	55.20	QBB3-1801000X	63.30	NEW
.1800	.1960	1.000	.005	.045	1.353	.0550	.2500	2.5	QBB-1801000	53.30	QBB-1801000X	62.00	
.1800	.1960	1.000	.008	.045	1.353	.0550	.2500	2.5	QBB8-1801000	55.25	QBB8-1801000X	64.05	
.1800	.1960	1.250	.003	.045	1.353	.0550	.2500	2.5	QBB3-1801250	55.20	QBB3-1801250X	63.30	NEW
.1800	.1960	1.250	.005	.045	1.353	.0550	.2500	2.5	QBB-1801250	53.30	QBB-1801250X	62.00	
.1800	.1960	1.500	.003	.045	1.853	.0550	.2500	3.0	QBB3-1801500	62.55	QBB3-1801500X	70.65	NEW
.1800	.1960	1.500	.005	.045	1.853	.0550	.2500	3.0	QBB-1801500	62.55	QBB-1801500X	71.40	
.1800	.1960	1.750	.003	.045	1.853	.0550	.2500	3.0	QBB3-1801750	62.55	QBB3-1801750X	70.65	NEW
.1800	.1960	1.750	.005	.045	1.853	.0550	.2500	3.0	QBB5-1801750	62.55	QBB5-1801750X	70.65	NEW
.2000	.2160	.400	.005	.050	.853	.0750	.2500	2.0	QBB5-200400	53.30	QBB5-200400X	61.45	
.2000	.2160	.500	.005	.050	.853	.0750	.2500	2.0	QBB-200500	53.30	QBB-200500X	61.45	
.2000	.2160	.500	.008	.050	.853	.0750	.2500	2.0	QBB8-200500	53.30	QBB8-200500X	61.45	
.2000	.2160	.600	.005	.050	.853	.0750	.2500	2.0	QBB5-200600	53.30	QBB5-200600X	61.45	
.2000	.2160	.700	.005	.050	.853	.0750	.2500	2.0	QBB5-200700	53.30	QBB5-200700X	61.45	
.2000	.2160	.750	.005	.050	.853	.0750	.2500	2.0	QBB-200750	53.30	QBB-200750X	61.45	

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

Continued on next page

See pages 16-34 for quick change holder options

See page 63 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pages 75 - 78

QBB

Quick Change – Boring Tools

Right Hand (cont.)

Continued from previous page

Head Width	Min. Bore Dia.*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H		L_2 $^{+.030"}_{-.000"}$	R $^{+.001"}_{-.001"}$	P	L_4	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.2000	.2160	.750	.008	.050	.853	.0750	.2500	2.0	QBB8-200750	53.30	QBB8-200750X	61.45
.2000	.2160	.800	.005	.050	1.353	.0750	.2500	2.5	QBB5-200800	55.25	QBB5-200800X	64.05
.2000	.2160	.900	.005	.050	1.353	.0750	.2500	2.5	QBB5-200900	55.25	QBB5-200900X	64.05
.2000	.2160	1.000	.005	.050	1.353	.0750	.2500	2.5	QBB-2001000	53.30	QBB-2001000X	62.00
.2000	.2160	1.000	.008	.050	1.353	.0750	.2500	2.5	QBB8-2001000	55.25	QBB8-2001000X	64.05
.2000	.2160	1.100	.005	.050	1.353	.0750	.2500	2.5	QBB5-2001100	55.25	QBB5-2001100X	64.05
.2000	.2160	1.200	.005	.050	1.353	.0750	.2500	2.5	QBB-2001200	53.30	QBB-2001200X	62.00
.2000	.2160	1.300	.005	.050	1.853	.0750	.2500	3.0	QBB5-2001300	55.25	QBB5-2001300X	64.05
.2000	.2160	1.500	.005	.050	1.853	.0750	.2500	3.0	QBB-2001500	62.55	QBB-2001500X	71.40
NEW .2000	.2160	1.750	.005	.050	1.853	.0750	.2500	3.0	QBB5-2001750	62.55	QBB5-2001750X	70.65
.2300	.2500	.400	.005	.058	.853	.0738	.3125	2.0	QBB5-230400	71.50	QBB5-230400X	81.50
.2300	.2500	.500	.005	.058	.853	.0738	.3125	2.0	QBB-230500	71.50	QBB-230500X	81.50
.2300	.2500	.500	.008	.058	.853	.0738	.3125	2.0	QBB8-230500	71.50	QBB8-230500X	81.50
.2300	.2500	.600	.005	.058	.853	.0738	.3125	2.0	QBB5-230600	71.50	QBB5-230600X	81.50
.2300	.2500	.700	.005	.058	.853	.0738	.3125	2.0	QBB5-230700	71.50	QBB5-230700X	81.50
.2300	.2500	.750	.005	.058	.853	.0738	.3125	2.0	QBB-230750	71.50	QBB-230750X	81.50
.2300	.2500	.750	.008	.058	.853	.0738	.3125	2.0	QBB8-230750	71.50	QBB8-230750X	81.50
.2300	.2500	.800	.005	.058	1.353	.0738	.3125	2.5	QBB5-230800	73.35	QBB5-230800X	83.95
.2300	.2500	.900	.005	.058	1.353	.0738	.3125	2.5	QBB5-230900	73.35	QBB5-230900X	83.95
.2300	.2500	1.000	.005	.058	1.353	.0738	.3125	2.5	QBB-2301000	71.50	QBB-2301000X	82.05
.2300	.2500	1.000	.008	.058	1.353	.0738	.3125	2.5	QBB8-2301000	73.35	QBB8-2301000X	83.95
.2300	.2500	1.100	.005	.058	1.353	.0738	.3125	2.5	QBB5-2301100	73.35	QBB5-2301100X	83.95
.2300	.2500	1.150	.005	.058	1.353	.0738	.3125	2.5	QBB5-2301150	73.35	QBB5-2301150X	83.95
.2300	.2500	1.200	.005	.058	1.353	.0738	.3125	2.5	QBB5-2301200	73.35	QBB5-2301200X	83.95
.2300	.2500	1.250	.005	.058	1.353	.0738	.3125	2.5	QBB-2301250	71.50	QBB-2301250X	82.05
.2300	.2500	1.400	.005	.058	1.853	.0738	.3125	3.0	QBB5-2301400	82.30	QBB5-2301400X	92.80
.2300	.2500	1.500	.005	.058	1.853	.0738	.3125	3.0	QBB-2301500	82.30	QBB-2301500X	92.80
.2300	.2500	1.600	.005	.058	1.853	.0738	.3125	3.0	QBB-2301600	82.30	QBB-2301600X	92.80
.2300	.2500	1.750	.005	.058	1.853	.0738	.3125	3.0	QBB5-2301750	82.30	QBB5-2301750X	92.80
.2600	.2800	.400	.005	.065	.853	.1038	.3125	2.0	QBB5-260400	71.50	QBB5-260400X	81.50
.2600	.2800	.500	.005	.065	.853	.1038	.3125	2.0	QBB5-260500	71.50	QBB5-260500X	81.50
.2600	.2800	.600	.005	.065	.853	.1038	.3125	2.0	QBB5-260600	71.50	QBB5-260600X	81.50
.2600	.2800	.700	.005	.065	.853	.1038	.3125	2.0	QBB5-260700	71.50	QBB5-260700X	81.50
.2600	.2800	.750	.005	.065	.853	.1038	.3125	2.0	QBB5-260750	71.50	QBB5-260750X	81.50
.2600	.2800	.750	.008	.065	.853	.1038	.3125	2.0	QBB8-260750	71.50	QBB8-260750X	81.50
.2600	.2800	.800	.005	.065	1.353	.1038	.3125	2.5	QBB5-260800	73.35	QBB5-260800X	83.95
.2600	.2800	.900	.005	.065	1.353	.1038	.3125	2.5	QBB5-260900	73.35	QBB5-260900X	83.95
.2600	.2800	1.000	.005	.065	1.353	.1038	.3125	2.5	QBB5-2601000	73.35	QBB5-2601000X	83.95
.2600	.2800	1.000	.008	.065	1.353	.1038	.3125	2.5	QBB8-2601000	73.35	QBB8-2601000X	83.95
.2600	.2800	1.250	.005	.065	1.353	.1038	.3125	2.5	QBB5-2601250	73.35	QBB5-2601250X	83.95
.2600	.2800	1.250	.008	.065	1.353	.1038	.3125	2.5	QBB8-2601250	73.35	QBB8-2601250X	83.95
.2900	.3100	.500	.005	.073	.853	.1338	.3125	2.0	QBB-290500	71.50	QBB-290500X	81.50
.2900	.3100	.600	.005	.073	.853	.1338	.3125	2.0	QBB5-290600	71.50	QBB5-290600X	81.50
.2900	.3100	.750	.005	.073	.853	.1338	.3125	2.0	QBB-290750	71.50	QBB-290750X	81.50
.2900	.3100	.750	.008	.073	.853	.1338	.3125	2.0	QBB8-290750	71.50	QBB8-290750X	81.50
.2900	.3100	.900	.005	.073	1.353	.1338	.3125	2.5	QBB5-290900	73.35	QBB5-290900X	83.95

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

Continued on next page

See pages 16-34 for quick change holder options

See page 63 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pages 75 - 78

NEW!

Quick Change – Boring Tools

Right Hand (cont.)

QBB

Continued from previous page

Head Width	Min. Bore Dia.*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.030" −.000"	R +.001" −.001"	P	L_4	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.2900	.3100	1.000	.005	.073	1.353	.1338	.3125	2.5	QBB-2901000	71.50	QBB-2901000X	82.05
.2900	.3100	1.000	.008	.073	1.353	.1338	.3125	2.5	QBB8-2901000	73.35	QBB8-2901000X	83.95
.2900	.3100	1.100	.005	.073	1.353	.1338	.3125	2.5	QBB5-2901100	73.35	QBB5-2901100X	83.95
.2900	.3100	1.250	.005	.073	1.353	.1338	.3125	2.5	QBB-2901250	71.50	QBB-2901250X	82.05
.2900	.3100	1.250	.008	.073	1.353	.1338	.3125	2.5	QBB8-2901250	73.35	QBB8-2901250X	83.95
.2900	.3100	1.350	.005	.073	1.853	.1338	.3125	3.0	QBB5-2901350	82.30	QBB5-2901350X	92.80
.2900	.3100	1.500	.005	.073	1.853	.1338	.3125	3.0	QBB-2901500	82.30	QBB-2901500X	92.80
.2900	.3100	1.600	.005	.073	1.853	.1338	.3125	3.0	QBB5-2901600	82.30	QBB5-2901600X	92.80
.2900	.3100	1.750	.005	.073	1.853	.1338	.3125	3.0	QBB-2901750	82.30	QBB-2901750X	92.80
.3200	.3400	.500	.005	.080	.853	.1325	.3750	2.0	QBB-320500	97.55	QBB-320500X	108.50
.3200	.3400	.600	.005	.080	.853	.1325	.3750	2.0	QBB5-320600	97.55	QBB5-320600X	109.20
.3200	.3400	.750	.005	.080	.853	.1325	.3750	2.0	QBB-320750	97.55	QBB-320750X	108.50
.3200	.3400	.750	.008	.080	.853	.1325	.3750	2.0	QBB8-320750	97.55	QBB8-320750X	109.20
.3200	.3400	.900	.005	.080	1.353	.1325	.3750	2.5	QBB5-320900	100.00	QBB5-320900X	112.40
.3200	.3400	1.000	.005	.080	1.353	.1325	.3750	2.5	QBB-3201000	97.55	QBB-3201000X	109.85
.3200	.3400	1.000	.008	.080	1.353	.1325	.3750	2.5	QBB8-3201000	100.00	QBB8-3201000X	112.40
.3200	.3400	1.100	.005	.080	1.353	.1325	.3750	2.5	QBB5-3201100	100.00	QBB5-3201100X	112.40
.3200	.3400	1.250	.005	.080	1.353	.1325	.3750	2.5	QBB-3201250	97.55	QBB-3201250X	109.85
.3200	.3400	1.250	.008	.080	1.353	.1325	.3750	2.5	QBB8-3201250	100.00	QBB8-3201250X	112.40
.3200	.3400	1.500	.005	.080	1.853	.1325	.3750	3.0	QBB-3201500	108.30	QBB-3201500X	120.65
.3200	.3400	1.600	.005	.080	1.853	.1325	.3750	3.0	QBB5-3201600	108.30	QBB5-3201600X	120.65
.3200	.3400	1.800	.005	.080	1.853	.1325	.3750	3.0	QBB-3201800	108.30	QBB-3201800X	120.65
.3200	.3400	2.000	.005	.080	2.353	.1325	.3750	3.5	QBB-3202000	118.10	QBB-3202000X	131.45
.3200	.3400	2.500	.005	.080	2.853	.1325	.3750	4.0	QBB-3202500	124.75	QBB-3202500X	138.10
.3600	.3800	.500	.005	.090	.853	.1725	.3750	2.0	QBB5-360500	97.55	QBB5-360500X	109.20
.3600	.3800	.750	.005	.090	.853	.1725	.3750	2.0	QBB-360750	97.55	QBB-360750X	108.50
.3600	.3800	.750	.008	.090	.853	.1725	.3750	2.0	QBB8-360750	97.55	QBB8-360750X	109.20
.3600	.3800	.900	.005	.090	1.353	.1725	.3750	2.5	QBB5-360900	97.55	QBB5-360900X	109.85
.3600	.3800	1.000	.005	.090	1.353	.1725	.3750	2.5	QBB-3601000	97.55	QBB-3601000X	109.85
.3600	.3800	1.000	.008	.090	1.353	.1725	.3750	2.5	QBB8-3601000	97.55	QBB8-3601000X	109.85
.3600	.3800	1.250	.005	.090	1.353	.1725	.3750	2.5	QBB-3601250	97.55	QBB-3601250X	109.85
.3600	.3800	1.250	.008	.090	1.353	.1725	.3750	2.5	QBB8-3601250	97.55	QBB8-3601250X	109.85
.3600	.3800	1.500	.005	.090	1.853	.1725	.3750	3.0	QBB-3601500	108.30	QBB-3601500X	120.65
.3600	.3800	1.800	.005	.090	1.853	.1725	.3750	3.0	QBB-3601800	108.30	QBB-3601800X	120.65
.3600	.3800	2.000	.005	.090	2.353	.1725	.3750	3.5	QBB-3602000	118.10	QBB-3602000X	131.45
.3600	.3800	2.500	.005	.090	2.853	.1725	.3750	4.0	QBB-3602500	124.75	QBB-3602500X	138.10
.4100	.4300	.750	.005	.104	1.040	.1600	.5000	2.5	QBB5-410750	135.90	QBB5-410750X	152.90
.4100	.4300	1.000	.005	.104	1.040	.1600	.5000	2.5	QBB5-4101000	135.90	QBB5-4101000X	152.90
.4100	.4300	1.250	.005	.104	1.540	.1600	.5000	3.0	QBB5-4101250	139.35	QBB5-4101250X	156.35
.4100	.4300	1.500	.005	.104	1.540	.1600	.5000	3.0	QBB5-4101500	139.35	QBB5-4101500X	156.35

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

Continued on next page

See pages 16-34 for quick change holder options

See page 63 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pages 75 - 78

QBB

Quick Change – Boring Tools

Right Hand (cont.)

Continued from previous page

Head Width	Min. Bore Dia.*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H		L_2 $^{+.030"}_{-.000"}$	R $^{+.001"}_{-.001"}$	P	L_4	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.4600	.4800	1.000	.005	.115	1.040	.2100	.5000	2.5	QBB-4601000	135.90	QBB-4601000X	152.90
.4600	.4800	1.250	.005	.115	1.540	.2100	.5000	3.0	QBB-4601250	135.90	QBB-4601250X	152.90
.4600	.4800	1.500	.005	.115	1.540	.2100	.5000	3.0	QBB-4601500	135.90	QBB-4601500X	152.90
.4600	.4800	2.000	.005	.115	2.040	.2100	.5000	3.5	QBB-4602000	149.15	QBB-4602000X	167.20
.4600	.4800	2.500	.005	.115	2.540	.2100	.5000	4.0	QBB-4602500	157.70	QBB-4602500X	175.95
.4600	.4800	3.000	.005	.115	3.040	.2100	.5000	4.5	QBB-4603000	165.30	QBB-4603000X	184.95
.4900	.5100	1.000	.005	.123	1.040	.2400	.5000	2.5	QBB-4901000	135.90	QBB-4901000X	152.90
.4900	.5100	1.250	.005	.123	1.540	.2400	.5000	3.0	QBB-4901250	135.90	QBB-4901250X	152.90
.4900	.5100	1.500	.005	.123	1.540	.2400	.5000	3.0			QBB-4901500X	152.90
.4900	.5100	2.000	.005	.123	2.040	.2400	.5000	3.5	QBB-4902000	149.15	QBB-4902000X	167.20
.4900	.5100	2.500	.005	.123	2.540	.2400	.5000	4.0	QBB-4902500	157.70	QBB-4902500X	175.95
.4900	.5100	3.000	.005	.123	3.040	.2400	.5000	4.5	QBB-4903000	165.30	QBB-4903000X	184.95

*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 pages 16-34 for quick change holder options

See page 63 for miniature sizes

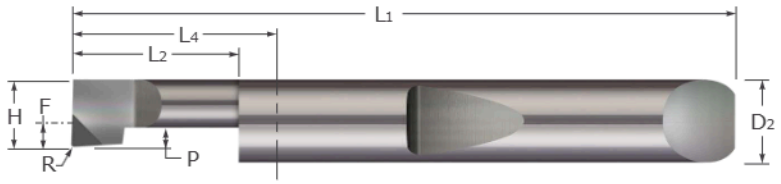
For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pages 75 - 78

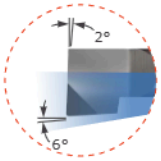
NEW!

Quick Change – Boring Tools

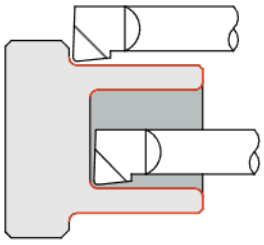
Right Hand - PCD Tipped

QBB-PCD





- PCD diamond brazed on solid carbide body for significant tool life improvement over carbide
- Designed for facing and boring applications in bores .132" and larger
- Split geometry makes the tool as rigid as possible
- Coolant fed enabled shank design
- Corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- CNC ground in the USA



Head Width	Min. Bore Dia.*	Max. Bore Depth	Corner Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		
H		L_2 +.0015" −.0015"	R +.001" −.001"	P	L_4	F	D_2 (h6)	L_1	Tool #	USD$	
.1200	.1320	.250	.004	.030	.590	.0263	.1875	1.5	QBB4-120250-PCD	169.00	NEW
.1200	.1320	.500	.004	.030	.590	.0263	.1875	1.5	QBB4-120500-PCD	169.00	NEW
.1200	.1320	.800	.004	.030	1.090	.0263	.1875	2.0	QBB4-120800-PCD	169.00	NEW
.1400	.1520	.500	.004	.035	.590	.0463	.1875	1.5	QBB4-140500-PCD	169.00	NEW
.1400	.1520	.750	.004	.035	1.090	.0463	.1875	2.0	QBB4-140750-PCD	169.00	NEW
.1600	.1760	.500	.004	.040	.590	.0663	.1875	1.5	QBB4-160500-PCD	169.00	NEW
.1600	.1760	.750	.004	.040	1.090	.0663	.1875	2.0	QBB4-160750-PCD	169.00	NEW
.1600	.1760	1.000	.004	.040	1.090	.0663	.1875	2.0	QBB4-1601000-PCD	169.00	NEW
.1800	.1960	.500	.004	.045	.853	.0550	.2500	2.0	QBB4-180500-PCD	187.40	NEW
.1800	.1960	.750	.004	.045	.853	.0550	.2500	2.0	QBB4-180750-PCD	187.40	NEW
.1800	.1960	1.000	.004	.045	1.353	.0550	.2500	2.5	QBB4-1801000-PCD	187.40	NEW
.2000	.2160	.500	.004	.050	.853	.0750	.2500	2.0	QBB4-200500-PCD	187.40	NEW
.2000	.2160	.750	.004	.050	.853	.0750	.2500	2.0	QBB4-200750-PCD	187.40	NEW
.2000	.2160	1.000	.004	.050	1.353	.0750	.2500	2.5	QBB4-2001000-PCD	187.40	NEW
.2300	.2500	.500	.004	.058	.853	.0738	.3125	2.0	QBB4-230500-PCD	217.60	NEW
.2300	.2500	.750	.004	.058	.853	.0738	.3125	2.0	QBB4-230750-PCD	217.60	NEW
.2300	.2500	1.000	.004	.058	1.353	.0738	.3125	2.5	QBB4-2301000-PCD	217.60	NEW
.2900	.3100	.750	.004	.073	.853	.1338	.3125	2.0	QBB4-290750-PCD	217.60	NEW
.2900	.3100	1.000	.004	.073	1.353	.1338	.3125	2.5	QBB4-2901000-PCD	217.60	NEW
.2900	.3100	1.250	.004	.073	1.353	.1338	.3125	2.5	QBB4-2901250-PCD	217.60	NEW
.3200	.3400	.750	.004	.080	.853	.1325	.3750	2.0	QBB4-320750-PCD	239.20	NEW
.3200	.3400	1.000	.004	.080	1.353	.1325	.3750	2.5	QBB4-3201000-PCD	239.20	NEW
.3200	.3400	1.250	.004	.080	1.353	.1325	.3750	2.5	QBB4-3201250-PCD	239.20	NEW
.3600	.3800	.750	.004	.090	.853	.1725	.3750	2.0	QBB4-360750-PCD	239.20	NEW
.3600	.3800	1.000	.004	.090	1.353	.1725	.3750	2.5	QBB4-3601000-PCD	239.20	NEW
.3600	.3800	1.250	.004	.090	1.353	.1725	.3750	2.5	QBB4-3601250-PCD	239.20	NEW
.4900	.5100	1.000	.004	.123	1.040	.2400	.5000	2.5	QBB4-4901000-PCD	304.00	NEW
.4900	.5100	1.500	.004	.123	1.540	.2400	.5000	3.0	QBB4-4901500-PCD	304.00	NEW
.4900	.5100	2.000	.004	.123	2.040	.2400	.5000	3.5	QBB4-4902000-PCD	304.00	NEW

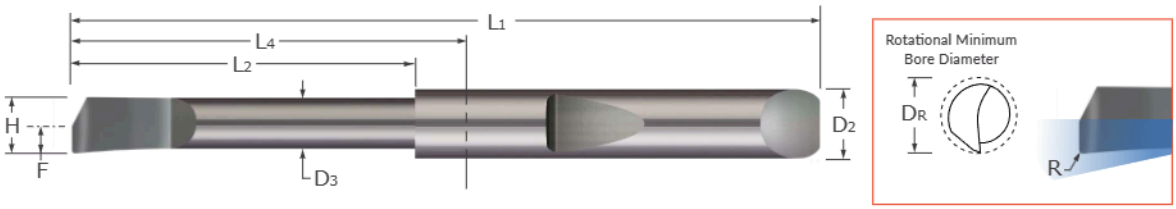
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pages 16-34 for quick change holder options

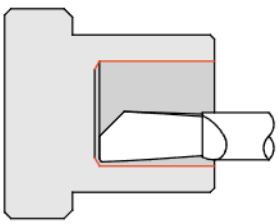
QHBBC

Quick Change – 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
- 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 #	USD$
.0275	.030	.187	.004	.590	.025	.0150	.1875	1.5	QHBBC-030187-004	49.55
.0275	.030	.250	.004	.590	.025	.0150	.1875	1.5	QHBBC-030250-004	49.55
.0325	.035	.125	.004	.590	.030	.0175	.1875	1.5	QHBBC-035125-004	49.55
.0325	.035	.187	.004	.590	.030	.0175	.1875	1.5	QHBBC-035187-004	49.55
.0325	.035	.250	.004	.590	.030	.0175	.1875	1.5	QHBBC-035250-004	49.55
.0375	.040	.187	.004	.590	.035	.0200	.1875	1.5	QHBBC-040187-004	49.55
.0375	.040	.250	.004	.590	.035	.0200	.1875	1.5	QHBBC-040250-004	49.55
.0375	.040	.312	.004	.590	.035	.0200	.1875	1.5	QHBBC-040312-004	49.55
.0450	.050	.187	.004	.590	.040	.0250	.1875	1.5	QHBBC-050187-004	49.55
.0450	.050	.312	.004	.590	.040	.0250	.1875	1.5	QHBBC-050312-004	49.55
.0450	.050	.375	.004	.590	.040	.0250	.1875	1.5	QHBBC-050375-004	49.55
.0550	.060	.250	.004	.590	.050	.0300	.1875	1.5	QHBBC-060250-004	49.55
.0550	.060	.375	.004	.590	.050	.0300	.1875	1.5	QHBBC-060375-004	49.55
.0550	.060	.500	.004	.590	.050	.0300	.1875	1.5	QHBBC-060500-004	49.55
.0650	.070	.312	.004	.590	.060	.0350	.1875	1.5	QHBBC-070312-004	49.55
.0650	.070	.437	.004	.590	.060	.0350	.1875	1.5	QHBBC-070437-004	49.55
.0650	.070	.562	.004	1.090	.060	.0350	.1875	2.0	QHBBC-070562-004	49.55
.0750	.080	.375	.004	.590	.070	.0400	.1875	1.5	QHBBC-080375-004	49.55
.0750	.080	.500	.004	.590	.070	.0400	.1875	1.5	QHBBC-080500-004	49.55
.0750	.080	.625	.004	1.090	.070	.0400	.1875	2.0	QHBBC-080625-004	49.55
.0850	.090	.375	.004	.590	.080	.0450	.1875	1.5	QHBBC-090375-004	49.55
.0850	.090	.500	.004	.590	.080	.0450	.1875	1.5	QHBBC-090500-004	49.55
.0850	.090	.687	.004	1.090	.080	.0450	.1875	2.0	QHBBC-090687-004	49.55
.0950	.100	.437	.004	.590	.090	.0500	.1875	1.5	QHBBC-100437-004	49.55
.0950	.100	.562	.004	1.090	.090	.0500	.1875	2.0	QHBBC-100562-004	49.55
.0950	.100	.750	.004	1.090	.090	.0500	.1875	2.0	QHBBC-100750-004	49.55
.1100	.120	.500	.004	.590	.100	.0600	.1875	1.5	QHBBC-120500-004	49.55
.1100	.120	.625	.004	1.090	.100	.0600	.1875	2.0	QHBBC-120625-004	49.55
.1100	.120	1.000	.004	1.090	.100	.0600	.1875	2.0	QHBBC-1201000-004	49.55

Continued on next page

See pages 16-34 for quick change holder options

Quick Change – Boring Tools

Helical Back Rake – Corner Radius (cont.)

QHBBC

Continued from previous page

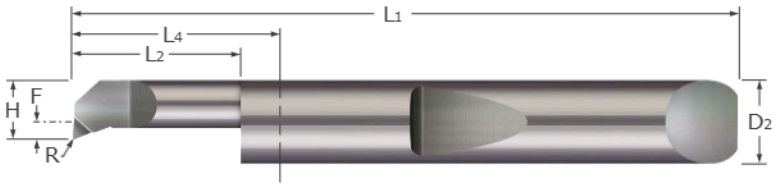
Head Width	Rotational Min. Bore Diameter	Maximum Bore Depth	Radius	Length From Holder	Neck Diameter	Centerline Offset	Shank Diameter	Overall Length	Uncoated	
H	D_r	L_2 $^{+.050"}_{-.000"}$	R $^{+.003"}_{-.000"}$	L_4	D_3 $^{+.000"}_{-.002"}$	F	D_2 (h6)	L_1	Tool #	USD$
.1225	.135	.562	.004	1.090	.110	.0675	.1875	2.0	QHBBC-135562-004	49.55
.1225	.135	.750	.004	1.090	.110	.0675	.1875	2.0	QHBBC-135750-004	49.55
.1225	.135	1.000	.004	1.090	.110	.0675	.1875	2.0	QHBBC-1351000-004	49.55
.1400	.150	.625	.004	1.090	.130	.0750	.1875	2.0	QHBBC-1500625-004	49.55
.1400	.150	1.000	.004	1.090	.130	.0750	.1875	2.0	QHBBC-1501000-004	49.55
.1400	.150	1.250	.004	1.590	.130	.0750	.1875	2.5	QHBBC-1501250-004	49.55
.1700	.180	1.000	.004	1.090	.160	.0900	.1875	2.0	QHBBC-1801000-004	49.55
.1700	.180	1.250	.004	1.590	.160	.0900	.1875	2.5	QHBBC-1801250-004	49.55
.1700	.180	1.500	.004	1.590	.160	.0900	.1875	2.5	QHBBC-1801500-004	49.55
.1975	.210	1.000	.004	1.353	.185	.1050	.2500	2.5	QHBBC-2101000-004	56.10
.1975	.210	1.250	.004	1.353	.185	.1050	.2500	2.5	QHBBC-2101250-004	56.10
.1975	.210	1.500	.004	1.853	.185	.1050	.2500	3.0	QHBBC-2101500-004	56.10
.2275	.240	1.000	.004	1.353	.215	.1200	.2500	2.5	QHBBC-2401000-004	56.10
.2275	.240	1.500	.004	1.853	.215	.1200	.2500	3.0	QHBBC-2401500-004	56.10
.2275	.240	1.750	.004	1.853	.215	.1200	.2500	3.0	QHBBC-2401750-004	56.10
.2750	.300	1.000	.004	1.353	.250	.1500	.3125	2.5	QHBBC-3001000-004	73.95
.2750	.300	1.500	.004	1.853	.250	.1500	.3125	3.0	QHBBC-3001500-004	73.95
.2750	.300	1.750	.004	1.853	.250	.1500	.3125	3.0	QHBBC-3001750-004	73.95
.3400	.360	1.000	.004	1.353	.320	.1800	.3750	2.5	QHBBC-3601000-004	100.50
.3400	.360	1.500	.004	1.853	.320	.1800	.3750	3.0	QHBBC-3601500-004	100.50
.3400	.360	2.000	.004	2.353	.320	.1800	.3750	3.5	QHBBC-3602000-004	125.55
.3400	.360	2.500	.004	2.853	.320	.1800	.3750	4.0	QHBBC-3602500-004	125.55

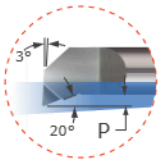
See pages 16-34 for quick change holder options

QBT

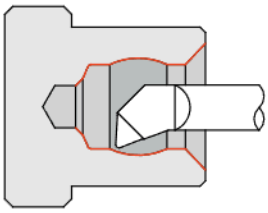
Quick Change – Boring Tools

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 #	USD$	Tool #	USD$
.0500	.0550	.150	.002	.005	.590	-.0438	.1875	1.5	QBT-050150	49.65	QBT-050150X	56.65
.0500	.0550	.200	.002	.005	.590	-.0438	.1875	1.5	QBT-050200	49.65	QBT-050200X	55.00
.0500	.0550	.300	.002	.005	.590	-.0438	.1875	1.5	QBT-050300	49.65	QBT-050300X	56.65
.0500	.0550	.400	.002	.005	.590	-.0438	.1875	1.5	QBT-050400	49.65	QBT-050400X	55.00
.0500	.0550	.500	.002	.005	.590	-.0438	.1875	1.5	QBT-050500	49.65	QBT-050500X	55.00
.0600	.0700	.150	.002	.010	.590	-.0338	.1875	1.5	QBT-060150	49.65	QBT-060150X	56.65
.0600	.0700	.200	.002	.010	.590	-.0338	.1875	1.5	QBT-060200	49.65	QBT-060200X	55.00
.0600	.0700	.300	.002	.010	.590	-.0338	.1875	1.5	QBT-060300	49.65	QBT-060300X	56.65
.0600	.0700	.400	.002	.010	.590	-.0338	.1875	1.5	QBT-060400	49.65	QBT-060400X	55.00
.0600	.0700	.500	.002	.010	.590	-.0338	.1875	1.5	QBT-060500	49.65	QBT-060500X	55.00
.0700	.0800	.150	.004	.015	.590	-.0238	.1875	1.5	QBT-070150	49.65	QBT-070150X	56.65
.0700	.0800	.200	.004	.015	.590	-.0238	.1875	1.5	QBT-070200	49.65	QBT-070200X	55.00
.0700	.0800	.300	.004	.015	.590	-.0238	.1875	1.5	QBT-070300	49.65	QBT-070300X	56.65
.0700	.0800	.400	.004	.015	.590	-.0238	.1875	1.5	QBT-070400	49.65	QBT-070400X	55.00
.0700	.0800	.600	.004	.015	1.090	-.0238	.1875	2.0	QBT-070600	49.65	QBT-070600X	55.00
.0800	.0900	.150	.004	.015	.590	-.0138	.1875	1.5	QBT4-080150	49.65	QBT4-080150X	56.65
.0800	.0900	.200	.004	.015	.590	-.0138	.1875	1.5	QBT4-080200	49.65	QBT4-080200X	56.65
.0800	.0900	.300	.004	.015	.590	-.0138	.1875	1.5	QBT4-080300	49.65	QBT4-080300X	56.65
.0800	.0900	.400	.004	.015	.590	-.0138	.1875	1.5	QBT4-080400	49.65	QBT4-080400X	56.65
.0800	.0900	.500	.004	.015	.590	-.0138	.1875	1.5	QBT4-080500	49.65	QBT4-080500X	56.65
.0800	.0900	.600	.004	.015	1.090	-.0138	.1875	2.0	QBT4-080600	49.65	QBT4-080600X	56.65
.0900	.1000	.200	.004	.015	.590	-.0038	.1875	1.5	QBT4-090200	49.65	QBT4-090200X	56.65
.0900	.1000	.300	.004	.015	.590	-.0038	.1875	1.5	QBT4-090300	49.65	QBT4-090300X	56.65
.0900	.1000	.400	.004	.015	.590	-.0038	.1875	1.5	QBT4-090400	49.65	QBT4-090400X	56.65
.0900	.1000	.500	.004	.015	.590	-.0038	.1875	1.5	QBT4-090500	49.65	QBT4-090500X	56.65
.1000	.1100	.200	.004	.015	.590	.0063	.1875	1.5	QBT4-100200	49.65	QBT4-100200X	56.65
.1000	.1100	.300	.004	.015	.590	.0063	.1875	1.5	QBT4-100300	49.65	QBT4-100300X	56.65
.1000	.1100	.400	.004	.015	.590	.0063	.1875	1.5	QBT4-100400	49.65	QBT4-100400X	56.65
.1000	.1100	.500	.004	.015	.590	.0063	.1875	1.5	QBT4-100500	49.65	QBT4-100500X	56.65
.1000	.1100	.600	.004	.015	1.090	.0063	.1875	2.0	QBT4-100600	49.65	QBT4-100600X	56.65
.1000	.1100	.700	.004	.015	1.090	.0063	.1875	2.0	QBT4-100700	49.65	QBT4-100700X	56.65
.1100	.1220	.250	.004	.020	.590	.0163	.1875	1.5	QBT-110250	49.65	QBT-110250X	55.00
.1100	.1220	.500	.004	.020	.590	.0163	.1875	1.5	QBT-110500	49.65	QBT-110500X	55.00
.1100	.1220	.750	.004	.020	1.090	.0163	.1875	2.0	QBT-110750	49.65	QBT-110750X	55.00

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

Continued on next page

See pages 16-34 for quick change holder options

Quick Change – Boring Tools

Top Rake Chipbreaker (cont.)

QBT

Continued from previous page

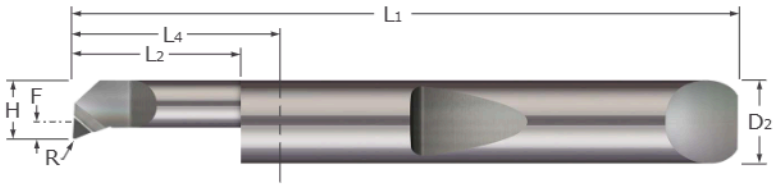
Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.030" −.000"	R +.0005" −.0005"	P	L_4	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.1200	.1320	.250	.004	.020	.590	.0263	.1875	1.5	QBT-120250	49.65	QBT-120250X	55.00
.1200	.1320	.375	.004	.020	.590	.0263	.1875	1.5	QBT4-120375	49.65	QBT4-120375X	55.00
.1200	.1320	.500	.004	.020	.590	.0263	.1875	1.5	QBT-120500	49.65	QBT-120500X	55.00
.1200	.1320	.750	.004	.020	1.090	.0263	.1875	2.0	QBT-120750	49.65	QBT-120750X	55.00
.1200	.1320	1.000	.004	.020	1.090	.0263	.1875	2.0	QBT-1201000	49.65	QBT-1201000X	55.00
.1200	.1320	1.250	.004	.020	1.590	.0263	.1875	2.5	QBT-1201250	54.40	QBT-1201250X	61.70
.1400	.1520	.250	.004	.025	.590	.0463	.1875	1.5	QBT4-140250	49.65	QBT4-140250X	55.00
.1400	.1520	.375	.004	.025	.590	.0463	.1875	1.5	QBT4-140375	49.65	QBT4-140375X	55.00
.1400	.1520	.500	.004	.025	.590	.0463	.1875	1.5	QBT4-140500	49.65	QBT4-140500X	55.00
.1400	.1520	.750	.004	.025	1.090	.0463	.1875	2.0	QBT-140750	49.65	QBT-140750X	56.65
.1400	.1520	1.000	.004	.025	1.090	.0463	.1875	2.0	QBT-1401000	49.65	QBT-1401000X	56.65
.1600	.1760	.375	.006	.025	.590	.0663	.1875	1.5	QBT6-160375	49.65	QBT6-160375X	55.00
.1600	.1760	.500	.006	.025	.590	.0663	.1875	1.5	QBT-160500	49.65	QBT-160500X	55.00
.1600	.1760	.750	.006	.025	1.090	.0663	.1875	2.0	QBT-160750	49.65	QBT-160750X	55.00
.1600	.1760	1.000	.006	.025	1.090	.0663	.1875	2.0	QBT-1601000	49.65	QBT-1601000X	55.00
.1600	.1760	1.250	.006	.025	1.590	.0663	.1875	2.5	QBT-1601250	49.65	QBT-1601250X	56.55
.1800	.1960	.375	.006	.030	.853	.0550	.2500	2.0	QBT6-180375	62.15	QBT6-180375X	70.40
.1800	.1960	.500	.006	.030	.853	.0550	.2500	2.0	QBT-180500	62.15	QBT-180500X	70.40
.1800	.1960	.750	.006	.030	.853	.0550	.2500	2.0	QBT-180750	62.15	QBT-180750X	70.40
.1800	.1960	1.000	.006	.030	1.353	.0550	.2500	2.5	QBT-1801000	62.15	QBT-1801000X	70.95
.1800	.1960	1.250	.006	.030	1.353	.0550	.2500	2.5	QBT-1801250	62.15	QBT-1801250X	70.95
.1800	.1960	1.500	.006	.030	1.853	.0550	.2500	3.0	QBT-1801500	71.40	QBT-1801500X	80.10
.2000	.2160	.375	.006	.030	.853	.0750	.2500	2.0	QBT6-200375	62.15	QBT6-200375X	70.40
.2000	.2160	.600	.006	.030	.853	.0750	.2500	2.0	QBT-200600	62.15	QBT-200600X	70.40
.2000	.2160	.750	.006	.030	.853	.0750	.2500	2.0	QBT6-200750	62.15	QBT6-200750X	70.40
.2000	.2160	1.000	.006	.030	1.353	.0750	.2500	2.5	QBT-2001000	62.15	QBT-2001000X	70.95
.2000	.2160	1.250	.006	.030	1.353	.0750	.2500	2.5	QBT-2001250	62.15	QBT-2001250X	70.95
.2000	.2160	1.500	.006	.030	1.853	.0750	.2500	3.0	QBT-2001500	71.40	QBT-2001500X	80.10
.2300	.2500	.500	.004	.040	.853	.0738	.3125	2.0	QBT4-230500	77.60	QBT4-230500X	87.55
.2300	.2500	.500	.006	.040	.853	.0738	.3125	2.0	QBT6-230500	77.60	QBT6-230500X	87.55
.2300	.2500	.750	.004	.040	.853	.0738	.3125	2.0	QBT4-230750	77.60	QBT4-230750X	87.55
.2300	.2500	.750	.006	.040	.853	.0738	.3125	2.0	QBT-230750	77.60	QBT-230750X	87.55
.2300	.2500	1.100	.006	.040	1.353	.0738	.3125	2.5	QBT-2301100	77.60	QBT-2301100X	88.10
.2300	.2500	1.300	.006	.040	1.353	.0738	.3125	2.5	QBT-2301300	77.60	QBT-2301300X	88.10
.2300	.2500	1.600	.006	.040	1.853	.0738	.3125	3.0	QBT-2301600	90.35	QBT-2301600X	100.80
.2600	.2800	.500	.004	.045	.853	.1038	.3125	2.0	QBT4-260500	77.60	QBT4-260500X	87.55
.2600	.2800	.500	.006	.045	.853	.1038	.3125	2.0	QBT6-260500	77.60	QBT6-260500X	87.55
.2600	.2800	.750	.004	.045	.853	.1038	.3125	2.0	QBT4-260750	77.60	QBT4-260750X	87.55
.2600	.2800	.750	.006	.045	.853	.1038	.3125	2.0	QBT6-260750	77.60	QBT6-260750X	87.55
.3000	.3200	.750	.006	.050	.853	.1125	.3750	2.0	QBT6-300750	77.60	QBT6-300750X	87.60
.3000	.3200	1.000	.006	.050	1.353	.1125	.3750	2.5	QBT-3001000	93.15	QBT-3001000X	105.65
.3000	.3200	1.250	.006	.050	1.353	.1125	.3750	2.5	QBT6-3001250	93.15	QBT6-3001250X	105.65
.3000	.3200	1.600	.006	.050	1.853	.1125	.3750	3.0	QBT-3001600	104.25	QBT-3001600X	116.70
.3000	.3200	2.100	.006	.050	2.353	.1125	.3750	3.5	QBT-3002100	113.70	QBT-3002100X	127.05
.3600	.3800	1.000	.006	.050	1.353	.1725	.3750	2.5	QBT-3601000	93.15	QBT-3601000X	105.65
.3600	.3800	1.600	.006	.050	1.853	.1725	.3750	3.0	QBT-3601600	104.25	QBT-3601600X	116.70
.3600	.3800	2.100	.006	.050	2.353	.1725	.3750	3.5	QBT-3602100	113.70	QBT-3602100X	127.05
.4600	.4800	1.000	.006	.075	1.040	.2100	.5000	2.5	QBT-4601000	141.55	QBT-4601000X	158.50
.4600	.4800	1.600	.006	.075	2.040	.2100	.5000	3.5	QBT-4601600	141.55	QBT-4601600X	159.80
.4600	.4800	2.100	.006	.075	2.540	.2100	.5000	4.0	QBT-4602100	149.55	QBT-4602100X	167.65
.4900	.5100	1.000	.006	.075	1.040	.2400	.5000	2.5			QBT-4901000X	158.50
.4900	.5100	1.600	.006	.075	2.040	.2400	.5000	3.5	QBT-4901600	141.55	QBT-4901600X	159.80
.4900	.5100	2.100	.006	.075	2.540	.2400	.5000	4.0	QBT-4902100	149.55	QBT-4902100X	167.65

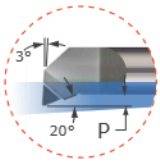
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

QBT-PCD

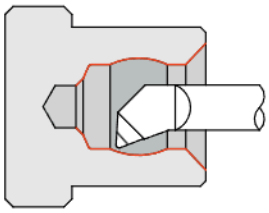
Quick Change – Boring Tools

Top Rake Chipbreaker - PCD Tipped





- PCD diamond brazed on solid carbide body for significant tool life improvement over carbide
- Optimized for finishing operations
- Top rake geometry provides freer cutting
- Coolant fed enabled shank design
- Corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- 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	
	H		L_2 $^{+.030"}_{-.000"}$	R $^{+.0005"}_{-.0005"}$	P	L_4	F	D_2 (h6)	L_1	Tool #	USD$
NEW	.1200	.1320	.250	.004	.020	.590	.0263	.1875	1.5	QBT4-120250-PCD	175.50
NEW	.1200	.1320	.500	.004	.020	.590	.0263	.1875	1.5	QBT4-120500-PCD	175.50
NEW	.1600	.1760	.500	.004	.025	.590	.0663	.1875	1.5	QBT4-160500-PCD	175.50
NEW	.1600	.1760	.750	.004	.025	1.090	.0663	.1875	2.0	QBT4-160750-PCD	175.50
NEW	.1600	.1760	1.000	.004	.025	1.090	.0663	.1875	2.0	QBT4-1601000-PCD	175.50
NEW	.1800	.1960	.500	.004	.030	.853	.0550	.2500	2.0	QBT4-180500-PCD	200.35
NEW	.1800	.1960	.750	.004	.030	.853	.0550	.2500	2.0	QBT4-180750-PCD	200.35
NEW	.1800	.1960	1.000	.004	.030	1.353	.0550	.2500	2.5	QBT4-1801000-PCD	200.35
NEW	.2000	.2160	.500	.004	.030	.853	.0750	.2500	2.0	QBT4-200500-PCD	200.35
NEW	.2000	.2160	.750	.004	.030	.853	.0750	.2500	2.0	QBT4-200750-PCD	200.35
NEW	.2000	.2160	1.000	.004	.030	1.353	.0750	.2500	2.5	QBT4-2001000-PCD	200.35
NEW	.2300	.2500	.500	.004	.040	.853	.0738	.3125	2.0	QBT4-230500-PCD	225.20
NEW	.2300	.2500	.750	.004	.040	.853	.0738	.3125	2.0	QBT4-230750-PCD	225.20
NEW	.2300	.2500	1.000	.004	.040	1.353	.0738	.3125	2.5	QBT4-2301000-PCD	225.20
NEW	.3000	.3200	.750	.004	.050	.853	.1125	.3750	2.0	QBT4-300750-PCD	252.20
NEW	.3000	.3200	1.000	.004	.050	1.353	.1125	.3750	2.5	QBT4-3001000-PCD	252.20
NEW	.3000	.3200	1.250	.004	.050	1.353	.1125	.3750	2.5	QBT4-3001250-PCD	252.20
NEW	.3600	.3800	1.000	.004	.050	1.353	.1725	.3750	2.5	QBT4-3601000-PCD	252.20
NEW	.3600	.3800	1.500	.004	.050	1.853	.1725	.3750	3.0	QBT4-3601500-PCD	252.20
NEW	.3600	.3800	2.000	.004	.050	2.353	.1725	.3750	3.5	QBT4-3602000-PCD	252.20

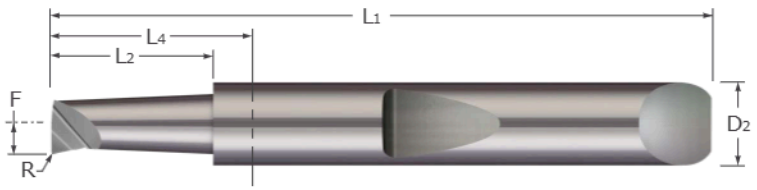
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

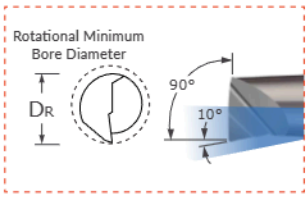
See pages 16-34 for quick change holder options

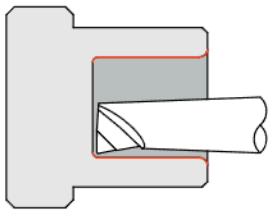
Quick Change – Boring Tools

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

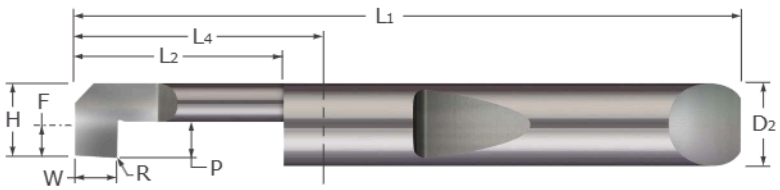
Rotational Minimum Bore Diameter	Maximum Bore Depth	Radius	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_R	L_2 $^{+.030"}_{-.000"}$	$R^{+.001"}_{-.001"}$	L_4	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.1180	.500	.003	.853	.0550	.2500	2.0	QBM-118500	53.30	QBM-118500X	61.45
.1180	.750	.003	.853	.0550	.2500	2.0			QBM-118750X	61.45
.1500	.500	.003	.853	.0710	.2500	2.0	QBM-150500	53.30	QBM-150500X	61.45
.1500	.750	.003	.853	.0710	.2500	2.0	QBM-150750	53.30	QBM-150750X	61.45
.2000	.500	.008	.853	.0950	.2500	2.0			QBM-200500X	61.45
.2000	.750	.008	.853	.0950	.2500	2.0	QBM-200750	53.30	QBM-200750X	61.45
.2000	1.250	.008	1.353	.0950	.2500	2.5	QBM-2001250	53.30	QBM-2001250X	62.00
.2300	.750	.008	.853	.1100	.2500	2.0	QBM-230750	53.30	QBM-230750X	61.45
.2300	1.250	.008	1.353	.1100	.2500	2.5	QBM-2301250	53.30	QBM-2301250X	62.00
.2300	1.500	.008	1.853	.1100	.2500	3.0	QBM-2301500	60.30	QBM-2301500X	69.05
.3000	1.500	.008	1.853	.1450	.3750	3.0	QBM-3001500	108.30		
.3000	1.750	.008	1.853	.1450	.3750	3.0	QBM-3001750	108.30	QBM-3001750X	120.65
.3600	1.000	.008	1.353	.1750	.3750	2.5	QBM-3601000	97.55		
.3600	1.500	.008	1.853	.1750	.3750	3.0	QBM-3601500	108.30	QBM-3601500X	120.65
.3600	2.000	.008	2.353	.1750	.3750	3.5	QBM-3602000	118.10	QBM-3602000X	131.45
.4600	1.000	.008	1.040	.2250	.5000	2.5	QBM-4601000	135.90		
.4600	1.500	.008	1.540	.2250	.5000	3.0	QBM-4601500	135.90		
.4600	2.000	.008	2.040	.2250	.5000	3.5	QBM-4602000	149.15		
.4600	2.500	.008	2.540	.2250	.5000	4.0	QBM-4602500	157.70		
.4600	3.000	.008	3.040	.2250	.5000	4.5	QBM-4603000	165.30	QBM-4603000X	184.95

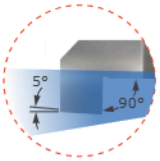
See pages 16-34 for quick change holder options

QRB

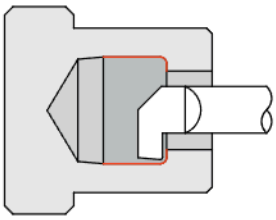
Quick Change – Boring Tools

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 #	USD$	Tool #	USD$
.1560	.1720	1.000	.075	.005	.060	1.090	.0623	.1875	2.0			QRB-1561000X	54.65
.1800	.1960	.500	.100	.005	.080	.853	.0550	.2500	2.0	QRB-180500	53.30	QRB-180500X	61.45
.1800	.1960	.750	.100	.005	.080	1.353	.0550	.2500	2.5	QRB-180750	53.30	QRB-180750X	62.00
.1800	.1960	1.000	.100	.005	.080	1.353	.0550	.2500	2.5	QRB-1801000	53.30	QRB-1801000X	62.00
.2000	.2160	.500	.113	.008	.090	.853	.0750	.2500	2.0	QRB-200500	53.30		
.2000	.2160	.750	.113	.008	.090	1.353	.0750	.2500	2.5	QRB-200750	53.30	QRB-200750X	62.00
.2000	.2160	1.000	.113	.008	.090	1.353	.0750	.2500	2.5	QRB-2001000	53.30		
.2000	.2160	1.250	.113	.008	.090	1.853	.0750	.2500	3.0	QRB-2001250	62.55		
.2300	.2500	.500	.138	.008	.110	.853	.0738	.3125	2.0	QRB-230500	71.50	QRB-230500X	81.50
.2300	.2500	.750	.138	.008	.110	1.353	.0738	.3125	2.5	QRB-230750	71.50		
.2300	.2500	1.250	.138	.008	.110	1.853	.0738	.3125	3.0			QRB-2301250X	92.80
.3000	.3200	.750	.138	.008	.110	1.353	.1438	.3125	2.5	QRB-300750	71.50	QRB-300750X	81.45
.3000	.3200	1.250	.138	.008	.110	1.853	.1438	.3125	3.0	QRB-3001250	82.30		
.3600	.3800	1.000	.163	.008	.130	1.353	.1725	.3750	2.5			QRB-3601000X	109.85
.3600	.3800	1.250	.163	.008	.130	1.853	.1725	.3750	3.0	QRB-3601250	108.30		
.3600	.3800	1.500	.163	.008	.130	1.853	.1725	.3750	3.0	QRB-3601500	108.30	QRB-3601500X	120.65
.4600	.4800	1.250	.200	.008	.160	1.540	.2100	.5000	3.0	QRB-4601250	135.90		
.4600	.4800	1.500	.200	.008	.160	2.040	.2100	.5000	3.5	QRB-4601500	149.15	QRB-4601500X	167.20
.4600	.4800	1.800	.200	.008	.160	2.040	.2100	.5000	3.5	QRB-4601800	149.15	QRB-4601800X	167.20
.4900	.5100	1.000	.200	.008	.160	1.540	.2400	.5000	3.0	QRB-4901000	135.90		
.4900	.5100	1.500	.200	.008	.160	2.040	.2400	.5000	3.5	QRB-4901500	149.15	QRB-4901500X	167.20
.4900	.5100	1.800	.200	.008	.160	2.040	.2400	.5000	3.5			QRB-4901800X	167.20

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

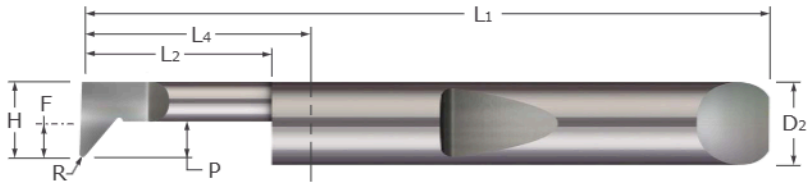
See pages 16-34 for quick change holder options

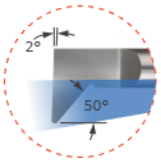
NEW!

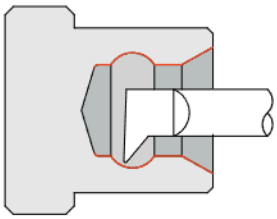
Quick Change – Profiling Tools

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 #	USD$	Tool #	USD$
.0500	.0550	.150	.0020	.015	.590	-.0438	.1875	1.5	QPR2-050150	49.65	QPR2-050150X	56.65
.0500	.0550	.200	.0020	.015	.590	-.0438	.1875	1.5	QPR2-050200	49.65	QPR2-050200X	56.65
.0600	.0700	.150	.0020	.020	.590	-.0338	.1875	1.5	QPR2-060150	49.65	QPR2-060150X	56.65
.0600	.0700	.200	.0020	.020	.590	-.0338	.1875	1.5	QPR2-060200	49.65	QPR2-060200X	56.65
.0700	.0800	.150	.0020	.025	.590	-.0238	.1875	1.5	QPR2-070150	49.65	QPR2-070150X	56.65
.0700	.0800	.200	.0020	.025	.590	-.0238	.1875	1.5	QPR2-070200	49.65	QPR2-070200X	56.65
.0700	.0800	.200	.0050	.025	.590	-.0238	.1875	1.5	QPR-070200	49.65	QPR-070200X	55.00
.0700	.0800	.300	.0020	.025	.590	-.0238	.1875	1.5	QPR2-070300	49.65	QPR2-070300X	56.65
.0700	.0800	.300	.0050	.025	.590	-.0238	.1875	1.5	QPR-070300	49.65	QPR-070300X	55.00
.0700	.0800	.500	.0020	.025	.590	-.0238	.1875	1.5	QPR2-070500	49.65	QPR2-070500X	56.65
.0700	.0800	.500	.0050	.025	.590	-.0238	.1875	1.5	QPR-070500	49.65	QPR-070500X	55.00
.1000	.1100	.200	.0050	.035	.590	.0063	.1875	1.5	QPR5-100200	49.65	QPR5-100200X	55.00
.1000	.1100	.300	.0050	.035	.590	.0063	.1875	1.5	QPR5-100300	49.65	QPR5-100300X	55.00
.1100	.1240	.250	.0050	.040	.590	.0163	.1875	1.5	QPR-110250	49.65	QPR-110250X	55.00
.1100	.1240	.375	.0050	.040	.590	.0163	.1875	1.5	QPR5-110375	49.65	QPR5-110375X	55.00
.1100	.1240	.500	.0050	.040	.590	.0163	.1875	1.5	QPR-110500	49.65	QPR-110500X	55.00
.1200	.1340	.250	.0080	.050	.590	.0263	.1875	1.5	QPR-120250	49.65	QPR-120250X	55.00
.1200	.1340	.375	.0050	.050	.590	.0263	.1875	1.5	QPR5-120375	49.65	QPR5-120375X	55.00
.1200	.1340	.375	.0080	.050	.590	.0263	.1875	1.5	QPR8-120375	49.65	QPR8-120375X	55.00
.1200	.1340	.500	.0080	.050	.590	.0263	.1875	1.5	QPR-120500	49.65	QPR-120500X	55.00
.1200	.1340	.750	.0050	.050	1.090	.0263	.1875	2.0	QPR5-120750	49.65	QPR5-120750X	55.00
.1200	.1340	.750	.0080	.050	1.090	.0263	.1875	2.0	QPR-120750	49.65	QPR-120750X	55.00
.1400	.1540	.375	.0050	.050	.590	.0463	.1875	1.5	QPR5-140375	49.65	QPR5-140375X	55.00
.1400	.1540	.375	.0080	.050	.590	.0463	.1875	1.5	QPR8-140375	49.65	QPR8-140375X	56.65
.1400	.1540	.500	.0050	.050	.590	.0463	.1875	1.5	QPR5-140500	49.65	QPR5-140500X	55.00
.1400	.1540	.500	.0080	.050	.590	.0463	.1875	1.5	QPR8-140500	49.65	QPR8-140500X	55.00

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
NEW	.1600	.1780	.375	.0050	.050	.590	.0663	.1875	1.5	QPR5-160375	49.60	QPR5-160375X	56.00
	.1600	.1780	.375	.0080	.050	.590	.0663	.1875	1.5	QPR8-160375	49.65	QPR8-160375X	55.00
NEW	.1600	.1780	.500	.0050	.050	.590	.0663	.1875	1.5	QPR5-160500	49.60	QPR5-160500X	56.00
	.1600	.1780	.500	.0080	.050	.590	.0663	.1875	1.5	QPR-160500	49.65	QPR-160500X	55.00
NEW	.1600	.1780	.750	.0050	.050	1.090	.0663	.1875	2.0	QPR5-160750	62.20	QPR5-160750X	68.50
	.1600	.1780	.750	.0080	.050	1.090	.0663	.1875	2.0	QPR-160750	49.65	QPR-160750X	55.00
NEW	.1600	.1780	1.000	.0050	.050	1.090	.0663	.1875	2.0	QPR5-1601000	62.20	QPR5-1601000X	68.50
	.1600	.1780	1.000	.0080	.050	1.090	.0663	.1875	2.0	QPR-1601000	49.65	QPR-1601000X	55.00
NEW	.1800	.1980	.375	.0050	.080	.853	.0550	.2500	2.0	QPR5-180375	62.20	QPR5-180375X	69.70
	.1800	.1980	.375	.0080	.080	.853	.0550	.2500	2.0	QPR8-180375	62.15	QPR8-180375X	70.40
NEW	.1800	.1980	.500	.0050	.080	.853	.0550	.2500	2.0	QPR5-180500	62.20	QPR5-180500X	69.70
	.1800	.1980	.500	.0080	.080	.853	.0550	.2500	2.0	QPR-180500	62.15	QPR-180500X	70.40
NEW	.1800	.1980	.750	.0050	.080	.853	.0550	.2500	2.0	QPR5-180750	62.20	QPR5-180750X	69.70
	.1800	.1980	.750	.0080	.080	.853	.0550	.2500	2.0	QPR-180750	62.15	QPR-180750X	70.40
NEW	.1800	.1980	1.000	.0050	.080	1.353	.0550	.2500	2.5	QPR5-1801000	62.20	QPR5-1801000X	70.20
	.1800	.1980	1.000	.0080	.080	1.353	.0550	.2500	2.5	QPR-1801000	62.15	QPR-1801000X	70.95
	.2000	.2180	.500	.0050	.080	.853	.0750	.2500	2.0	QPR5-200500	62.15	QPR5-200500X	70.40
	.2000	.2180	.500	.0080	.080	.853	.0750	.2500	2.0	QPR8-200500	62.15	QPR8-200500X	70.40
	.2000	.2180	.750	.0050	.080	.853	.0750	.2500	2.0	QPR5-200750	62.15	QPR5-200750X	70.40
	.2000	.2180	.750	.0080	.080	.853	.0750	.2500	2.0	QPR8-200750	62.15	QPR8-200750X	70.40
NEW	.2000	.2180	1.000	.0050	.080	1.353	.0750	.2500	2.5	QPR5-2001000	77.70	QPR5-2001000X	85.65
NEW	.2000	.2180	1.000	.0080	.080	1.353	.0750	.2500	2.5	QPR8-2001000	77.70	QPR8-2001000X	85.65
	.2300	.2520	.500	.0080	.080	.853	.0738	.3125	2.0	QPR8-230500	77.60	QPR8-230500X	87.55
	.2300	.2520	.750	.0080	.080	.853	.0738	.3125	2.0	QPR-230750	77.60	QPR-230750X	87.55
	.2300	.2520	1.000	.0080	.080	1.353	.0738	.3125	2.5	QPR-2301000	77.60	QPR-2301000X	88.10
	.2300	.2520	1.250	.0080	.080	1.353	.0738	.3125	2.5	QPR-2301250	77.60	QPR-2301250X	88.10
	.2300	.2520	1.500	.0080	.080	1.853	.0738	.3125	3.0	QPR-2301500	79.30	QPR-2301500X	89.70
	.2600	.2820	.750	.0080	.090	.853	.1038	.3125	2.0	QPR8-260750	77.60	QPR8-260750X	87.55
	.2600	.2820	1.000	.0080	.090	1.353	.1038	.3125	2.5	QPR8-2601000	77.60	QPR8-2601000X	88.10
	.3000	.3220	.750	.0080	.110	.853	.1438	.3125	2.0	QPR8-300750	77.60	QPR8-300750X	87.55
	.3000	.3220	1.000	.0080	.110	1.353	.1438	.3125	2.5	QPR-3001000	77.60	QPR-3001000X	88.10
	.3000	.3220	1.250	.0080	.110	1.353	.1438	.3125	2.5	QPR-3001250	77.60	QPR-3001250X	88.10
	.3000	.3220	1.500	.0080	.110	1.853	.1438	.3125	3.0	QPR-3001500	79.30	QPR-3001500X	89.70
	.3600	.3820	.750	.0080	.130	.853	.1725	.3750	2.0	QPR8-360750	101.10	QPR8-360750X	112.25
	.3600	.3820	1.000	.0080	.130	1.353	.1725	.3750	2.5	QPR-3601000	101.10	QPR-3601000X	113.50
	.3600	.3820	1.250	.0080	.130	1.353	.1725	.3750	2.5	QPR-3601250	101.10	QPR-3601250X	113.50
	.3600	.3820	1.500	.0080	.130	1.853	.1725	.3750	3.0	QPR-3601500	102.90	QPR-3601500X	115.25
	.4600	.4820	.750	.0080	.150	1.040	.2100	.5000	2.5	QPR8-460750	141.55	QPR8-460750X	158.50
	.4600	.4820	1.000	.0080	.150	1.540	.2100	.5000	3.0	QPR-4601000	141.55	QPR-4601000X	158.50
	.4600	.4820	1.500	.0080	.150	1.540	.2100	.5000	3.0	QPR-4601500	141.55	QPR-4601500X	158.50
	.4600	.4820	1.800	.0080	.150	2.040	.2100	.5000	3.5	QPR-4601800	154.50	QPR-4601800X	172.75
	.4900	.5120	1.000	.0080	.150	1.540	.2400	.5000	3.0	QPR-4901000	141.55	QPR-4901000X	158.50
	.4900	.5120	1.500	.0080	.150	1.540	.2400	.5000	3.0	QPR-4901500	141.55	QPR-4901500X	158.50
	.4900	.5120	1.800	.0080	.150	2.040	.2400	.5000	3.5	QPR-4901800	154.50	QPR-4901800X	172.75

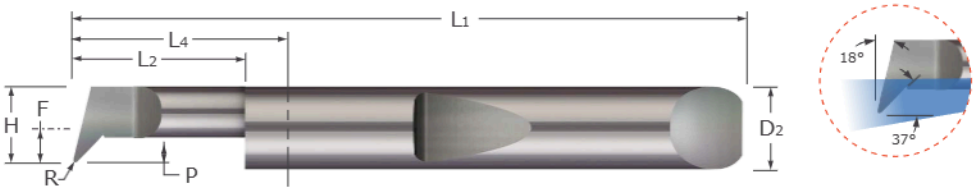
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

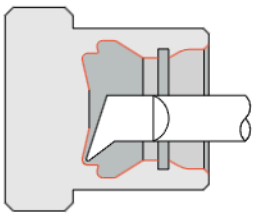
See pages 16-34 for quick change holder options

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 #	USD$	Tool #	USD$
.0500	.0550	.150	.0020	.015	.590	-.0438	.1875	1.5	QPA2-050150	49.65	QPA2-050150X	55.00
.0500	.0550	.200	.0020	.015	.590	-.0438	.1875	1.5	QPA2-050200	49.65	QPA2-050200X	55.00
.0600	.0700	.150	.0020	.020	.590	-.0338	.1875	1.5	QPA2-060150	49.65	QPA2-060150X	55.00
.0600	.0700	.200	.0020	.020	.590	-.0338	.1875	1.5	QPA2-060200	49.65	QPA2-060200X	55.00
.0700	.0800	.150	.0020	.020	.590	-.0238	.1875	1.5	QPA2-070150	49.65	QPA2-070150X	55.00
.0700	.0800	.200	.0020	.020	.590	-.0238	.1875	1.5	QPA2-070200	49.65	QPA2-070200X	55.00
.0800	.0900	.200	.0020	.025	.590	-.0138	.1875	1.5	QPA2-080200	49.65	QPA2-080200X	55.00
.0800	.0900	.300	.0020	.025	.590	-.0138	.1875	1.5	QPA2-080300	49.65	QPA2-080300X	55.00
.0900	.1000	.200	.0020	.030	.590	-.0038	.1875	1.5	QPA2-090200	49.65	QPA2-090200X	55.00
.0900	.1000	.300	.0020	.030	.590	-.0038	.1875	1.5	QPA2-090300	49.65	QPA2-090300X	55.00
.1000	.1100	.200	.0020	.030	.590	.0063	.1875	1.5	QPA2-100200	49.65	QPA2-100200X	55.00
.1000	.1100	.200	.0050	.030	.590	.0063	.1875	1.5	QPA5-100200	49.65	QPA5-100200X	55.00
.1000	.1100	.300	.0020	.030	.590	.0063	.1875	1.5	QPA2-100300	49.65	QPA2-100300X	55.00
.1000	.1100	.300	.0050	.030	.590	.0063	.1875	1.5	QPA5-100300	49.65	QPA5-100300X	55.00
.1100	.1240	.250	.0050	.035	.590	.0163	.1875	1.5	QPA5-110250	49.65	QPA5-110250X	55.00
.1100	.1240	.375	.0050	.035	.590	.0163	.1875	1.5	QPA5-110375	49.65	QPA5-110375X	55.00
.1200	.1340	.250	.0050	.035	.590	.0263	.1875	1.5	QPA5-120250	49.65	QPA5-120250X	55.00
.1200	.1340	.375	.0050	.035	.590	.0263	.1875	1.5	QPA5-120375	49.65	QPA5-120375X	55.00
.1400	.1540	.375	.0050	.040	.590	.0463	.1875	1.5	QPA5-140375	49.65	QPA5-140375X	55.00
.1400	.1540	.500	.0050	.040	.590	.0463	.1875	1.5	QPA5-140500	49.65	QPA5-140500X	55.00
.1600	.1780	.375	.0050	.050	.590	.0663	.1875	1.5	QPA5-160375	49.65	QPA5-160375X	55.00
.1600	.1780	.500	.0050	.050	.590	.0663	.1875	1.5	QPA5-160500	49.65	QPA5-160500X	55.00
.1800	.1980	.375	.0050	.055	.853	.0550	.2500	2.0	QPA5-180375	62.15	QPA5-180375X	70.40
.1800	.1980	.500	.0050	.055	.853	.0550	.2500	2.0	QPA5-180500	62.15	QPA5-180500X	70.40

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
.2000	.2180	.500	.0050	.060	.853	.0750	.2500	2.0	QPA5-200500	62.15	QPA5-200500X	70.40
.2000	.2180	.500	.0080	.060	.853	.0750	.2500	2.0	QPA8-200500	62.15	QPA8-200500X	70.40
.2000	.2180	.750	.0050	.060	.853	.0750	.2500	2.0	QPA5-200750	62.15	QPA5-200750X	70.40
.2000	.2180	.750	.0080	.060	.853	.0750	.2500	2.0	QPA8-200750	62.15	QPA8-200750X	70.40
.2300	.2520	.500	.0080	.070	.853	.0738	.3125	2.0	QPA8-230500	77.60	QPA8-230500X	87.55
.2300	.2520	.750	.0080	.070	.853	.0738	.3125	2.0	QPA8-230750	77.60	QPA8-230750X	87.55
.2600	.2820	.750	.0080	.080	.853	.1038	.3125	2.0	QPA8-260750	77.60	QPA8-260750X	87.55
.2600	.2820	1.000	.0080	.080	1.353	.1038	.3125	2.5	QPA8-2601000	77.60	QPA8-2601000X	88.10
.3000	.3220	.750	.0080	.090	.853	.1438	.3125	2.0	QPA8-300750	77.60	QPA8-300750X	87.55
.3000	.3220	1.000	.0080	.090	1.353	.1438	.3125	2.5	QPA8-3001000	77.60	QPA8-3001000X	88.10
.3600	.3820	.750	.0080	.110	.853	.1725	.3750	2.0	QPA8-360750	101.10	QPA8-360750X	112.85
.3600	.3820	1.000	.0080	.110	1.353	.1725	.3750	2.5	QPA8-3601000	101.10	QPA8-3601000X	113.50
.4100	.4320	.750	.0080	.120	1.040	.1600	.5000	2.5	QPA8-410750	141.55	QPA8-410750X	158.50
.4100	.4320	1.250	.0080	.120	1.540	.1600	.5000	3.0	QPA8-4101250	141.55	QPA8-4101250X	158.50
.4600	.4820	.750	.0080	.140	1.040	.2100	.5000	2.5	QPA8-460750	141.55	QPA8-460750X	158.50
.4600	.4820	1.000	.0080	.140	1.040	.2100	.5000	2.5	QPA8-4601000	141.55	QPA8-4601000X	158.50

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

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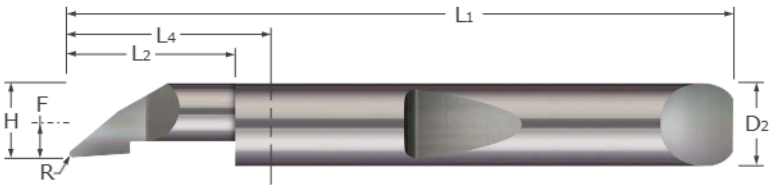
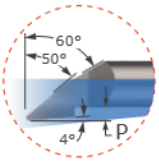
See pages 16-34 for quick change holder options

Quick Change – Profiling Tools

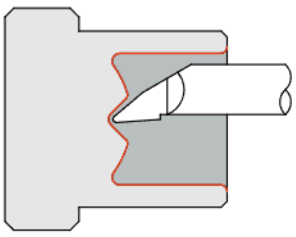
Axial Profiling

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		L2 +.030" −.000"	R +.0005" −.0005"	P	L4	F	D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.0500	.0550	.150	.0050	.005	.590	-.0438	.1875	1.5	QPF5-050150	49.65	QPF5-050150X	55.00
.0500	.0550	.200	.0050	.005	.590	-.0438	.1875	1.5	QPF-050200	49.65	QPF-050200X	55.00
.0500	.0550	.400	.0050	.005	.590	-.0438	.1875	1.5	QPF-050400	49.65	QPF-050400X	55.00
.0500	.0550	.500	.0050	.005	.590	-.0438	.1875	1.5	QPF-050500	49.65	QPF-050500X	55.00
.0600	.0700	.200	.0050	.005	.590	-.0338	.1875	1.5			QPF-060200X	55.00
.0600	.0700	.400	.0050	.005	.590	-.0338	.1875	1.5	QPF-060400	49.65	QPF-060400X	55.00
.0600	.0700	.500	.0050	.005	.590	-.0338	.1875	1.5	QPF-060500	49.65	QPF-060500X	55.00
.0700	.0800	.150	.0050	.010	.590	-.0238	.1875	1.5	QPF5-070150	49.65	QPF5-070150X	55.00
.0700	.0800	.200	.0050	.010	.590	-.0238	.1875	1.5	QPF-070200	49.65	QPF-070200X	55.00
.0700	.0800	.300	.0050	.010	.590	-.0238	.1875	1.5	QPF5-070300	49.65	QPF5-070300X	55.00
.0700	.0800	.400	.0050	.010	.590	-.0238	.1875	1.5	QPF-070400	49.65	QPF-070400X	55.00
.0700	.0800	.500	.0050	.010	.590	-.0238	.1875	1.5	QPF-070500	49.65	QPF-070500X	55.00
.0700	.0800	.600	.0050	.010	1.090	-.0238	.1875	2.0	QPF-070600	49.65	QPF-070600X	55.00
.0800	.0900	.150	.0050	.010	.590	-.0138	.1875	1.5	QPF5-080150	49.65	QPF5-080150X	55.00
.0800	.0900	.200	.0050	.010	.590	-.0138	.1875	1.5	QPF5-080200	49.65	QPF5-080200X	55.00
.0800	.0900	.250	.0050	.010	.590	-.0138	.1875	1.5	QPF5-080250	49.65	QPF5-080250X	55.00
.0900	.1000	.200	.0050	.010	.590	-.0038	.1875	1.5	QPF5-090200	49.65	QPF5-090200X	55.00
.0900	.1000	.300	.0050	.010	.590	-.0038	.1875	1.5	QPF5-090300	49.65	QPF5-090300X	55.00
.1000	.1100	.300	.0050	.015	.590	.0063	.1875	1.5	QPF5-100300	49.65	QPF5-100300X	55.00
.1000	.1100	.400	.0050	.015	.590	.0063	.1875	1.5	QPF5-100400	49.65	QPF5-100400X	55.00
.1100	.1220	.250	.0050	.015	.590	.0163	.1875	1.5	QPF-110250	49.65	QPF-110250X	55.00
.1100	.1220	.375	.0050	.015	.590	.0163	.1875	1.5	QPF5-110375	49.65	QPF5-110375X	55.00
.1100	.1220	.500	.0050	.015	.590	.0163	.1875	1.5	QPF-110500	49.65	QPF-110500X	55.00
.1100	.1220	.750	.0050	.015	1.090	.0163	.1875	2.0	QPF-110750	49.65	QPF-110750X	55.00
.1200	.1320	.250	.0080	.020	.590	.0263	.1875	1.5	QPF-120250	49.65	QPF-120250X	55.00
.1200	.1320	.375	.0050	.020	.590	.0263	.1875	1.5	QPF5-120375	49.65	QPF5-120375X	55.00
.1200	.1320	.500	.0080	.020	.590	.0263	.1875	1.5	QPF-120500	49.65	QPF-120500X	55.00
.1200	.1320	.750	.0080	.020	1.090	.0263	.1875	2.0	QPF-120750	49.65	QPF-120750X	55.00
.1200	.1320	1.000	.0080	.020	1.090	.0263	.1875	2.0	QPF-1201000	49.65	QPF-1201000X	55.00

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
.1400	.1520	.375	.0080	.020	.590	.0463	.1875	1.5	QPF8-140375	49.65	QPF8-140375X	55.00
.1400	.1520	.500	.0080	.020	.590	.0463	.1875	1.5	QPF8-140500	49.65	QPF8-140500X	55.00
.1600	.1760	.375	.0080	.030	.590	.0663	.1875	1.5	QPF8-160375	49.65	QPF8-160375X	55.00
.1600	.1760	.500	.0080	.030	.590	.0663	.1875	1.5	QPF-160500	49.65	QPF-160500X	55.00
.1600	.1760	.750	.0080	.030	1.090	.0663	.1875	2.0	QPF-160750	49.65	QPF-160750X	55.00
.1600	.1760	1.000	.0080	.030	1.090	.0663	.1875	2.0	QPF-1601000	49.65	QPF-1601000X	55.00
.1800	.1960	.375	.0080	.030	.853	.0550	.2500	2.0	QPF8-180375	62.15	QPF8-180375X	70.40
.1800	.1960	.500	.0080	.030	.853	.0550	.2500	2.0	QPF-180500	62.15	QPF-180500X	70.40
.1800	.1960	.750	.0080	.030	.853	.0550	.2500	2.0	QPF-180750	62.15	QPF-180750X	70.40
.1800	.1960	1.000	.0080	.030	1.353	.0550	.2500	2.5	QPF-1801000	62.15	QPF-1801000X	70.95
.2000	.2160	.400	.0080	.030	.853	.0750	.2500	2.0	QPF8-200400	62.15	QPF8-200400X	70.40
.2000	.2160	.600	.0080	.030	.853	.0750	.2500	2.0	QPF-200600	62.15	QPF-200600X	70.40
.2000	.2160	.800	.0080	.030	1.353	.0750	.2500	2.5	QPF8-200800	62.15	QPF8-200800X	70.95
.2000	.2160	1.000	.0080	.030	1.353	.0750	.2500	2.5	QPF-2001000	62.15	QPF-2001000X	70.95
.2300	.2500	.750	.0080	.030	.853	.0738	.3125	2.0	QPF-230750	77.60	QPF-230750X	87.55
.2300	.2500	1.000	.0080	.030	1.353	.0738	.3125	2.5	QPF-2301000	77.60	QPF-2301000X	88.10
.2300	.2500	1.100	.0080	.030	1.353	.0738	.3125	2.5			QPF-2301100X	88.10
.2300	.2500	1.250	.0080	.030	1.353	.0738	.3125	2.5	QPF-2301250	77.60	QPF-2301250X	88.10
.2600	.2800	.750	.0080	.030	.853	.1038	.3125	2.5	QPF8-260750	77.60	QPF8-260750X	88.10
.3000	.3200	1.000	.0080	.030	1.353	.1438	.3125	2.5	QPF-3001000	77.60	QPF-3001000X	88.10
.3000	.3200	1.250	.0080	.030	1.353	.1438	.3125	2.5	QPF-3001250	77.60	QPF-3001250X	88.10
.3600	.3800	.750	.0080	.030	.853	.1725	.3750	2.0	QPF8-360750	101.10	QPF8-360750X	112.25
.3600	.3800	1.000	.0080	.030	1.353	.1725	.3750	2.5	QPF-3601000	101.10	QPF-3601000X	113.50
.3600	.3800	1.250	.0080	.030	1.353	.1725	.3750	2.5	QPF-3601250	101.10	QPF-3601250X	113.50
.4100	.4300	.750	.0080	.040	1.040	.1600	.5000	2.5	QPF8-410750	141.55	QPF8-410750X	158.50
.4100	.4300	1.000	.0080	.040	1.040	.1600	.5000	2.5	QPF8-4101000	141.55	QPF8-4101000X	158.50
.4600	.4800	.750	.0080	.050	1.040	.2100	.5000	2.5	QPF8-460750	141.55	QPF8-460750X	158.50
.4600	.4800	1.000	.0080	.050	1.040	.2100	.5000	2.5	QPF-4601000	141.55	QPF-4601000X	158.50
.4600	.4800	1.600	.0080	.050	2.040	.2100	.5000	3.5			QPF-4601600X	162.85
.4900	.5100	1.800	.0080	.050	2.040	.2400	.5000	3.5			QPF-4901800X	162.85

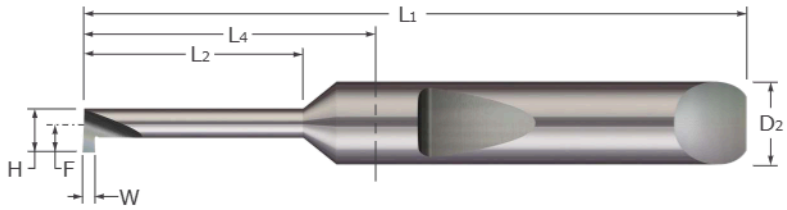
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

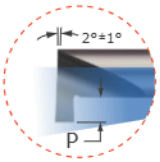
See pages 16-34 for quick change holder options

Quick Change – Grooving Tools

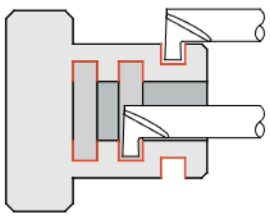
Retaining Ring – Square – Miniature

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 #	USD$	Tool #	USD$
.010	.0600	.0700	.100	.020	.590	.0400	.1875	1.5	QMRR-010-100-060	69.15	QMRR-010-100-060X	75.00
.010	.0600	.0700	.150	.020	.590	.0400	.1875	1.5	QMRR-010-150-060	69.15	QMRR-010-150-060X	75.00
.010	.0600	.0700	.250	.020	.590	.0400	.1875	1.5	QMRR-010-250-060	69.15	QMRR-010-250-060X	75.00
.015	.0600	.0700	.100	.020	.590	.0400	.1875	1.5	QMRR-015-100-060	69.15	QMRR-015-100-060X	75.00
.015	.0600	.0700	.150	.020	.590	.0400	.1875	1.5	QMRR-015-150-060	69.15	QMRR-015-150-060X	75.00
.015	.0600	.0700	.250	.020	.590	.0400	.1875	1.5	QMRR-015-250-060	69.15	QMRR-015-250-060X	75.00
.015	.0800	.0900	.250	.025	.590	.0525	.1875	1.5			QMRR-015-250-080X	75.00
.015	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMRR-015-375-080	69.15		
.015	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMRR-015-500-080	69.15		
.015	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMRR-015-250-100	69.15	QMRR-015-250-100X	75.00
.015	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMRR-015-500-100	69.15		
.015	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMRR-015-750-100	69.15	QMRR-015-750-100X	75.00
.017	.1200	.1340	.150	.040	.590	.0800	.1875	1.5	QMRR-017-150-120	69.15	QMRR-017-150-120X	75.00
.017	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMRR-017-250-120	69.15	QMRR-017-250-120X	75.00
.020	.0600	.0700	.100	.020	.590	.0400	.1875	1.5	QMRR-020-100-060	62.15	QMRR-020-100-060X	67.80
.020	.0600	.0700	.150	.020	.590	.0400	.1875	1.5	QMRR-020-150-060	62.15	QMRR-020-150-060X	67.80
.020	.0600	.0700	.250	.020	.590	.0400	.1875	1.5	QMRR-020-250-060	62.15	QMRR-020-250-060X	67.80
.020	.0700	.0800	.100	.020	.590	.0450	.1875	1.5	QMRR-020-100-070	62.15	QMRR-020-100-070X	67.80
.020	.0700	.0800	.150	.020	.590	.0450	.1875	1.5	QMRR-020-150-070	62.15	QMRR-020-150-070X	67.80
.020	.0800	.0900	.150	.025	.590	.0525	.1875	1.5	QMRR-020-150-080	62.15	QMRR-020-150-080X	67.80
.020	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMRR-020-250-080	62.15	QMRR-020-250-080X	67.80
.020	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMRR-020-375-080	62.15	QMRR-020-375-080X	67.80
.020	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMRR-020-500-080	62.15		
.020	.0900	.1000	.150	.025	.590	.0575	.1875	1.5	QMRR-020-150-090	62.15	QMRR-020-150-090X	67.80
.020	.0900	.1000	.250	.025	.590	.0575	.1875	1.5	QMRR-020-250-090	62.15	QMRR-020-250-090X	67.80
.020	.1000	.1100	.150	.030	.590	.0650	.1875	1.5	QMRR-020-150-100	62.15	QMRR-020-150-100X	67.80
.020	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMRR-020-250-100	62.15	QMRR-020-250-100X	67.80
.020	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMRR-020-500-100	62.15	QMRR-020-500-100X	67.80
.020	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0			QMRR-020-750-100X	67.80

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
.020	.1200	.1340	.150	.040	.590	.0800	.1875	1.5	QMRR-020-150-120	62.15	QMRR-020-150-120X	67.80
.020	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMRR-020-250-120	62.15	QMRR-020-250-120X	67.80
.020	.1200	.1340	.375	.040	.590	.0800	.1875	1.5	QMRR-020-375-120	62.15	QMRR-020-375-120X	67.80
.020	.1200	.1340	.500	.040	.590	.0800	.1875	1.5	QMRR-020-500-120	62.15	QMRR-020-500-120X	67.80
.020	.1200	.1340	.750	.040	1.090	.0800	.1875	2.0	QMRR-020-750-120	62.15	QMRR-020-750-120X	67.80
.025	.1200	.1340	.150	.040	.590	.0800	.1875	1.5	QMRR-025-150-120	62.15	QMRR-025-150-120X	67.80
.025	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMRR-025-250-120	62.15	QMRR-025-250-120X	67.80
.030	.0700	.0800	.100	.020	.590	.0450	.1875	1.5	QMRR-030-100-070	62.15	QMRR-030-100-070X	67.80
.030	.0700	.0800	.150	.020	.590	.0450	.1875	1.5	QMRR-030-150-070	62.15	QMRR-030-150-070X	67.80
.030	.0800	.0900	.150	.025	.590	.0525	.1875	1.5	QMRR-030-150-080	62.15	QMRR-030-150-080X	67.80
.030	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMRR-030-250-080	62.15	QMRR-030-250-080X	67.80
.030	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMRR-030-375-080	62.15	QMRR-030-375-080X	67.80
.030	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMRR-030-500-080	62.15	QMRR-030-500-080X	67.80
.030	.0900	.1000	.150	.025	.590	.0575	.1875	1.5	QMRR-030-150-090	62.15	QMRR-030-150-090X	67.80
.030	.0900	.1000	.250	.025	.590	.0575	.1875	1.5	QMRR-030-250-090	62.15	QMRR-030-250-090X	67.80
.030	.1000	.1100	.150	.030	.590	.0650	.1875	1.5	QMRR-030-150-100	62.15	QMRR-030-150-100X	67.80
.030	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMRR-030-250-100	62.15	QMRR-030-250-100X	67.80
.030	.1000	.1100	.375	.030	.590	.0650	.1875	1.5	QMRR-030-375-100	62.15	QMRR-030-375-100X	67.80
.030	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMRR-030-500-100	62.15	QMRR-030-500-100X	67.80
.030	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMRR-030-750-100	62.15	QMRR-030-750-100X	67.80
.030	.1200	.1340	.150	.040	.590	.0800	.1875	1.5	QMRR-030-150-120	62.15	QMRR-030-150-120X	67.80
.030	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMRR-030-250-120	62.15	QMRR-030-250-120X	67.80
.030	.1200	.1340	.375	.040	.590	.0800	.1875	1.5	QMRR-030-375-120	62.15	QMRR-030-375-120X	67.80
.030	.1200	.1340	.500	.040	.590	.0800	.1875	1.5	QMRR-030-500-120	62.15	QMRR-030-500-120X	67.80
.030	.1200	.1340	.750	.040	1.090	.0800	.1875	2.0	QMRR-030-750-120	62.15	QMRR-030-750-120X	67.80

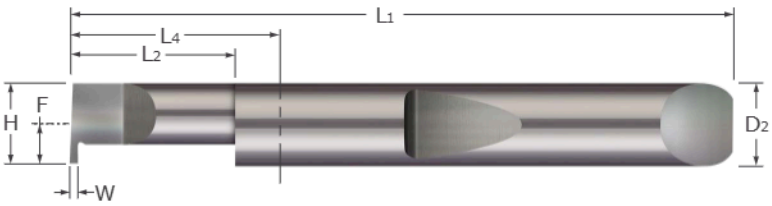
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

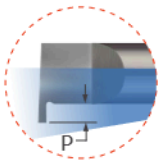
See pages 16-34 for quick change holder options

Quick Change – Grooving Tools

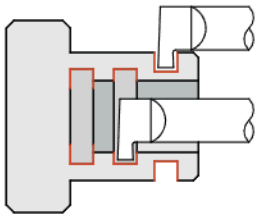
Retaining Ring – Square

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 #	USD$	Tool #	USD$
.017	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QRR-017-4	52.90	QRR-017-4X	58.20
.017	.1800	.1980	.375	.030	.590	.0863	.1875	1.5	QRR-017-6	52.90	QRR-017-6X	58.20
.017	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QRR-017-8	52.90	QRR-017-8X	58.20
.017	.1800	.1980	.625	.030	1.090	.0863	.1875	2.0	QRR-017-10	52.90	QRR-017-10X	58.20
.017	.1800	.1980	.750	.030	1.090	.0863	.1875	2.0	QRR-017-750-180	52.90	QRR-017-750-180X	58.20
.017	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-017-250-245	62.15	QRR-017-250-245X	70.40
.017	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QRR-017-375-245	62.15	QRR-017-375-245X	70.40
.020	.1200	.1340	.150	.030	.590	.0263	.1875	1.5	QRR-020-150-120	52.90	QRR-020-150-120X	58.20
.020	.1200	.1340	.250	.030	.590	.0263	.1875	1.5	QRR-020-250-120	52.90	QRR-020-250-120X	58.20
.020	.1400	.1540	.250	.030	.590	.0463	.1875	1.5	QRR-020-250-140	52.90	QRR-020-250-140X	58.20
.020	.1400	.1540	.375	.030	.590	.0463	.1875	1.5	QRR-020-375-140	52.90	QRR-020-375-140X	58.20
.020	.1600	.1780	.250	.030	.590	.0663	.1875	1.5	QRR-020-250-160	52.90	QRR-020-250-160X	58.20
.020	.1600	.1780	.375	.030	.590	.0663	.1875	1.5	QRR-020-375-160	52.90	QRR-020-375-160X	58.20
.020	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QRR-020-4	52.90	QRR-020-4X	58.20
.020	.1800	.1980	.375	.030	.590	.0863	.1875	1.5	QRR-020-6	52.90	QRR-020-6X	58.20
.020	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QRR-020-8	52.90	QRR-020-8X	58.20
.020	.1800	.1980	.625	.030	1.090	.0863	.1875	2.0	QRR-020-10	52.90	QRR-020-10X	58.20
.020	.1800	.1980	.750	.030	1.090	.0863	.1875	2.0	QRR-020-750-180	62.15	QRR-020-750-180X	69.05
.020	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-020-250-245	62.15	QRR-020-250-245X	70.40
.020	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QRR-020-375-245	62.15	QRR-020-375-245X	70.40
.020	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-020-500-245	62.15	QRR-020-500-245X	70.40
.020	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	QRR-020-625-245	62.15	QRR-020-625-245X	70.40
.020	.3700	.3920	.625	.050	.853	.1825	.3750	2.0	QRR-020-625-370	101.10	QRR-020-625-370X	112.85
.020	.3700	.3920	1.000	.050	1.353	.1825	.3750	2.5	QRR-020-1000-370	101.10	QRR-020-1000-370X	113.50
.025	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-025-4	62.15	QRR-025-4X	70.40
.025	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QRR-025-6	62.15	QRR-025-6X	70.40
.025	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-025-8	62.15	QRR-025-8X	70.40
.025	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	QRR-025-10	62.15	QRR-025-10X	70.40
.025	.2450	.2670	.750	.050	.853	.1200	.2500	2.0	QRR-025-750-245	62.15	QRR-025-750-245X	70.40

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

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See pages 16-34 for quick change holder options
See page 88 for miniature sizes

QRR

Quick Change – Grooving Tools

Retaining Ring – Square (cont.)

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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 #	USD$	Tool #	USD$
.030	.1200	.1340	.150	.030	.590	.0263	.1875	1.5	QRR-030-150-120	52.90	QRR-030-150-120X	58.20
.030	.1200	.1340	.250	.030	.590	.0263	.1875	1.5	QRR-030-250-120	52.90	QRR-030-250-120X	58.20
.030	.1400	.1540	.250	.030	.590	.0463	.1875	1.5	QRR-030-250-140	52.90	QRR-030-250-140X	58.20
.030	.1400	.1540	.375	.030	.590	.0463	.1875	1.5	QRR-030-375-140	52.90	QRR-030-375-140X	58.20
.030	.1400	.1540	.375	.050	.590	.0463	.1875	1.5	QRR-6757	52.90	QRR-6757X	59.75
.030	.1600	.1780	.250	.030	.590	.0663	.1875	1.5	QRR-030-250-160	52.90	QRR-030-250-160X	58.20
.030	.1600	.1780	.375	.030	.590	.0663	.1875	1.5	QRR-030-375-160	52.90	QRR-030-375-160X	58.20
.030	.1600	.1780	.375	.050	.590	.0663	.1875	1.5	QRR-3565	52.90	QRR-3565X	59.75
.030	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QRR-030-250-180	52.90	QRR-030-250-180X	58.20
.030	.1800	.1980	.250	.050	.590	.0863	.1875	1.5	QRR-0495	52.90	QRR-0495X	59.75
.030	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QRR-030-500-180	52.90	QRR-030-500-180X	58.20
.030	.1800	.1980	.500	.050	.590	.0863	.1875	1.5	QRR-5911	52.90	QRR-5911X	59.75
.030	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-030-4	62.15	QRR-030-4X	70.40
.030	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QRR-030-6	62.15	QRR-030-6X	70.40
.030	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-030-8	62.15	QRR-030-8X	70.40
.030	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	QRR-030-10	62.15	QRR-030-10X	70.40
.030	.2450	.2670	.750	.050	.853	.1200	.2500	2.0	QRR-030-750-245	62.15	QRR-030-750-245X	70.40
.030	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-030-500-310	77.60	QRR-030-500-310X	87.55
.030	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-030-750-310	77.60	QRR-030-750-310X	87.55
.030	.3700	.3920	.625	.050	.853	.1825	.3750	2.0	QRR-030-625-370	101.10	QRR-030-625-370X	112.85
.030	.3700	.3920	1.000	.050	1.353	.1825	.3750	2.5	QRR-030-1000-370	101.10	QRR-030-1000-370X	113.50
.033	.3100	.3320	.250	.100	.853	.1538	.3125	2.0	QRR-033-250-310	77.60	QRR-033-250-310X	87.55
.033	.3100	.3320	.375	.100	.853	.1538	.3125	2.0	QRR-033-6	77.60	QRR-033-6X	87.55
.033	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-033-8	77.60	QRR-033-8X	87.55
.033	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-033-12	77.60	QRR-033-12X	87.55
.038	.2450	.2670	.500	.080	.853	.1200	.2500	2.0	QRR-9076	62.15	QRR-9076X	70.40
.038	.3100	.3320	.250	.100	.853	.1538	.3125	2.0	QRR-038-250-310	77.60	QRR-038-250-310X	87.55
.038	.3100	.3320	.375	.100	.853	.1538	.3125	2.0	QRR-038-6	77.60	QRR-038-6X	87.55
.038	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-038-8	77.60	QRR-038-8X	87.55
.038	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-038-12	77.60	QRR-038-12X	87.55
.039	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QRR-039-250-180	52.90	QRR-039-250-180X	58.20
.039	.1800	.1980	.250	.060	.590	.0863	.1875	1.5	QRR-5824	52.90	QRR-5824X	59.75
.039	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QRR-039-500-180	52.90	QRR-039-500-180X	58.20
.039	.1800	.1980	.500	.060	.590	.0863	.1875	1.5	QRR-1828	52.90	QRR-1828X	59.75
.039	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-039-250-245	62.15	QRR-039-250-245X	70.40
.039	.2450	.2670	.250	.080	.853	.1200	.2500	2.0	QRR-8363	62.15	QRR-8363X	70.40
.039	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-039-500-245	62.15	QRR-039-500-245X	70.40
.039	.2450	.2670	.500	.080	.853	.1200	.2500	2.0	QRR-1774	62.15	QRR-1774X	70.40
.039	.3700	.3920	.375	.100	.853	.1825	.3750	2.0	QRR-039-375-370	101.10	QRR-039-375-370X	112.25
.039	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-039-8	101.10	QRR-039-8X	112.25
.039	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-039-12	101.10	QRR-039-12X	112.25
.039	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-039-16	101.10	QRR-039-16X	113.50
.039	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-039-20	101.10	QRR-039-20X	113.50
.040	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-2122	62.15	QRR-2122X	70.40
.040	.2450	.2670	.250	.080	.853	.1200	.2500	2.0	QRR-1248	62.15	QRR-1248X	70.40
.040	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-4112	62.15	QRR-4112X	70.40
.040	.2450	.2670	.500	.080	.853	.1200	.2500	2.0	QRR-3030	62.15	QRR-3030X	70.40

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

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See pages 16-34 for quick change holder options
See page 88 for miniature sizes

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 #	USD$	Tool #	USD$
.046	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-046-500-310	77.60	QRR-046-500-310X	87.55
.046	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-046-750-310	77.60	QRR-046-750-310X	87.55
.046	.3700	.3920	.375	.100	.853	.1825	.3750	2.0	QRR-046-375-370	101.10	QRR-046-375-370X	112.25
.046	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-046-8	101.10	QRR-046-8X	112.25
.046	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-046-12	101.10	QRR-046-12X	112.25
.046	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-046-16	101.10	QRR-046-16X	113.50
.046	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-046-20	101.10	QRR-046-20X	113.50
.055	.2450	.2670	.500	.080	.853	.1200	.2500	2.0	QRR-4257	62.15	QRR-4257X	70.40
.055	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-055-8	101.10	QRR-055-8X	112.25
.055	.3700	.3920	.500	.150	.853	.1825	.3750	2.0	QRR-1660	101.10	QRR-1660X	112.85
.055	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-055-12	101.10	QRR-055-12X	112.25
.055	.3700	.3920	.750	.150	.853	.1825	.3750	2.0	QRR-5000	101.10	QRR-5000X	112.85
.055	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-055-16	101.10	QRR-055-16X	113.50
.055	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-055-20	101.10	QRR-055-20X	113.50
.059	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-059-8	101.10	QRR-059-8X	112.25
.059	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-059-12	101.10	QRR-059-12X	112.25
.059	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-059-16	101.10		
.059	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-059-20	101.10	QRR-059-20X	113.50
.062	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QRR-062-250-180	52.90	QRR-062-250-180X	58.20
.062	.1800	.1980	.250	.070	.590	.0863	.1875	1.5	QRR-7865	52.90	QRR-7865X	59.75
.062	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QRR-062-500-180	52.90	QRR-062-500-180X	58.20
.062	.1800	.1980	.500	.070	.590	.0863	.1875	1.5	QRR-4145	52.90	QRR-4145X	59.75
.062	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-062-250-245	62.15	QRR-062-250-245X	70.40
.062	.2450	.2670	.250	.090	.853	.1200	.2500	2.0	QRR-6681	62.15	QRR-6681X	70.40
.062	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-062-500-245	62.15	QRR-062-500-245X	70.40
.062	.2450	.2670	.500	.090	.853	.1200	.2500	2.0	QRR-2685	62.15	QRR-2685X	70.40
.062	.2450	.2670	.750	.050	.853	.1200	.2500	2.0	QRR-1198	62.15	QRR-1198X	70.40
.062	.2450	.2670	.750	.090	.853	.1200	.2500	2.0	QRR-2795	62.15	QRR-2795X	70.40
.062	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-062-500-310	77.60	QRR-062-500-310X	87.55
.062	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-062-750-310	77.60	QRR-062-750-310X	87.55
.062	.3700	.3920	.250	.100	.853	.1825	.3750	2.0	QRR-062-250-370	101.10	QRR-062-250-370X	112.25
.062	.3700	.3920	.375	.100	.853	.1825	.3750	2.0	QRR-062-375-370	101.10	QRR-062-375-370X	112.25
.062	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-062-8	101.10	QRR-062-8X	112.25
.062	.3700	.3920	.500	.150	.853	.1825	.3750	2.0	QRR-0824	101.10	QRR-0824X	112.85
.062	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-062-12	101.10	QRR-062-12X	112.25
.062	.3700	.3920	.750	.150	.853	.1825	.3750	2.0	QRR-6068	101.10	QRR-6068X	112.85
.062	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-062-16	101.10	QRR-062-16X	113.50
.062	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-062-20	101.10	QRR-062-20X	113.50
.069	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-069-8	101.10	QRR-069-8X	112.25
.069	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-069-12	101.10	QRR-069-12X	112.25
.069	.3700	.3920	.750	.150	.853	.1825	.3750	2.0	QRR-7828	101.10	QRR-7828X	112.85
.069	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-069-16	101.10	QRR-069-16X	113.50
.069	.3700	.3920	1.000	.150	1.353	.1825	.3750	2.5	QRR-4609	101.10	QRR-4609X	113.50
.069	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-069-20	101.10		
.079	.3700	.3920	.500	.100	.853	.1825	.3750	2.0			QRR-079-8X	112.25
.079	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-079-12	101.10	QRR-079-12X	112.25
.079	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-079-16	101.10	QRR-079-16X	113.50
.079	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-079-20	101.10	QRR-079-20X	113.50

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

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See pages 16-34 for quick change holder options

See page 88 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 #	USD$	Tool #	USD$
.087	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-087-500-310	77.60	QRR-087-500-310X	87.55
.087	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-087-750-310	77.60	QRR-087-750-310X	87.55
.087	.3700	.3920	.375	.100	.853	.1825	.3750	2.0	QRR-087-375-370	101.10	QRR-087-375-370X	112.25
.087	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-087-8	101.10		
.087	.3700	.3920	.500	.150	.853	.1825	.3750	2.0	QRR-7847	101.10	QRR-7847X	112.85
.087	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-087-12	101.10	QRR-087-12X	112.25
.087	.3700	.3920	.750	.150	.853	.1825	.3750	2.0	QRR-4895	101.10	QRR-4895X	112.85
.087	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-087-16	101.10	QRR-087-16X	113.50
.087	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-087-20	101.10	QRR-087-20X	113.50
.093	.4950	.5170	.500	.150	1.040	.2450	.5000	2.5	QRR-7835	141.55	QRR-7835X	158.50
.093	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QRR-093-12	141.55	QRR-093-12X	158.50
.093	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QRR-093-16	141.55	QRR-093-16X	158.50
.093	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-093-20	141.55	QRR-093-20X	158.50
.093	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QRR-093-24	141.55	QRR-093-24X	158.50
.118	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QRR-118-12	141.55	QRR-118-12X	158.50
.118	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QRR-118-16	141.55	QRR-118-16X	158.50
.118	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-118-20	141.55	QRR-118-20X	158.50
.118	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QRR-118-24	141.55		
.125	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-125-750-370	101.10	QRR-125-750-370X	112.25
.125	.3700	.3920	.750	.150	.853	.1825	.3750	2.0	QRR-3068	101.10	QRR-3068X	112.85
.125	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-125-1000-370	101.10	QRR-125-1000-370X	113.50
.125	.3700	.3920	1.000	.150	1.353	.1825	.3750	2.5	QRR-5586	101.10	QRR-5586X	113.50
.125	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-125-1250-370	101.10	QRR-125-1250-370X	113.50
.125	.3700	.3920	1.250	.150	1.353	.1825	.3750	2.5	QRR-0965	101.10	QRR-0965X	113.50
.125	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QRR-125-12	141.55	QRR-125-12X	158.50
.125	.4950	.5170	.750	.200	1.040	.2450	.5000	2.5	QRR-5199	141.55	QRR-5199X	158.50
.125	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QRR-125-16	141.55	QRR-125-16X	158.50
.125	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-125-20	141.55	QRR-125-20X	158.50
.125	.4950	.5170	1.250	.200	1.540	.2450	.5000	3.0	QRR-7934	141.55	QRR-7934X	158.50
.125	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QRR-125-24	141.55	QRR-125-24X	158.50
.156	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QRR-156-12	141.55		
.156	.4950	.5170	.750	.200	1.040	.2450	.5000	2.5	QRR-1563	141.55	QRR-1563X	158.50
.156	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5			QRR-156-16X	158.50
.156	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-156-20	141.55	QRR-156-20X	158.50
.156	.4950	.5170	1.250	.200	1.540	.2450	.5000	3.0	QRR-9832	141.55	QRR-9832X	158.50
.156	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QRR-156-24	141.55		
.187	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QRR-187-12	141.55		
.187	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QRR-187-16	141.55	QRR-187-16X	158.50
.187	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-187-20	141.55		
.187	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QRR-187-24	141.55		
.236	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QRR-236-12	141.55		
.236	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5			QRR-236-16X	158.50
.236	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-236-20	141.55		
.250	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QRR-250-16	141.55		
.250	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-250-20	141.55		
.250	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QRR-250-24	141.55	QRR-250-24X	158.50

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

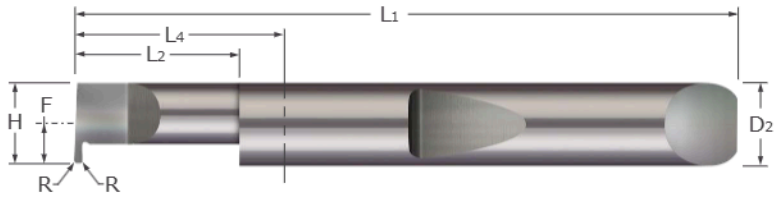
See pages 16-34 for quick change holder options

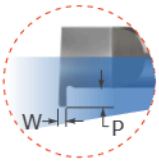
See page 88 for miniature sizes

Quick Change – Grooving Tools

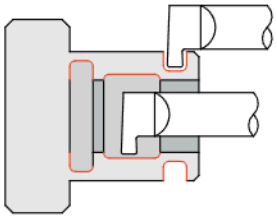
Retaining Ring - Corner Radius - Right Hand

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	Cntrln 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 #	USD$	Tool #	USD$
.017	.1800	.1980	.250	.003	.030	.590	.0863	.1875	1.5	QRRC3-017-250-180	57.10	QRRC3-017-250-180X	62.60
.017	.1800	.1980	.375	.003	.030	.590	.0863	.1875	1.5	QRRC3-017-375-180	57.10	QRRC3-017-375-180X	62.60
.017	.2450	.2670	.250	.003	.050	.853	.1200	.2500	2.0	QRRC3-017-250-245	71.40	QRRC3-017-250-245X	79.55
.017	.2450	.2670	.375	.003	.050	.853	.1200	.2500	2.0	QRRC3-017-375-245	71.40	QRRC3-017-375-245X	79.55
.020	.1800	.1980	.250	.003	.030	.590	.0863	.1875	1.5	QRRC3-020-250-180	57.10	QRRC3-020-250-180X	62.60
.020	.1800	.1980	.375	.003	.030	.590	.0863	.1875	1.5	QRRC3-020-375-180	57.10	QRRC3-020-375-180X	62.60
.020	.2450	.2670	.250	.003	.050	.853	.1200	.2500	2.0	QRRC3-020-250-245	71.40	QRRC3-020-250-245X	79.55
.020	.2450	.2670	.375	.003	.050	.853	.1200	.2500	2.0	QRRC3-020-375-245	71.40	QRRC3-020-375-245X	79.55
.025	.2450	.2670	.250	.003	.050	.853	.1200	.2500	2.0	QRRC3-025-250-245	71.40	QRRC3-025-250-245X	79.55
.025	.2450	.2670	.375	.003	.050	.853	.1200	.2500	2.0	QRRC3-025-375-245	71.40	QRRC3-025-375-245X	79.55
.030	.1800	.1980	.250	.003	.030	.590	.0863	.1875	1.5	QRRC3-030-250-180	57.10	QRRC3-030-250-180X	62.60
.030	.1800	.1980	.500	.003	.030	.590	.0863	.1875	1.5	QRRC3-030-500-180	57.10	QRRC3-030-500-180X	62.60
.030	.2450	.2670	.250	.003	.050	.853	.1200	.2500	2.0	QRRC3-030-250-245	71.40	QRRC3-030-250-245X	79.55
.030	.2450	.2670	.375	.003	.050	.853	.1200	.2500	2.0	QRRC3-030-375-245	71.40	QRRC3-030-375-245X	79.55
.030	.3100	.3320	.500	.003	.100	.853	.1538	.3125	2.0	QRRC3-030-500-310	89.05	QRRC3-030-500-310X	99.00
.030	.3100	.3320	.750	.003	.100	.853	.1538	.3125	2.0	QRRC3-030-750-310	89.05	QRRC3-030-750-310X	99.00
.033	.3100	.3320	.500	.003	.100	.853	.1538	.3125	2.0	QRRC3-033-500-310	89.05	QRRC3-033-500-310X	99.00
.033	.3100	.3320	.750	.003	.100	.853	.1538	.3125	2.0	QRRC3-033-750-310	89.05	QRRC3-033-750-310X	99.00
.038	.3100	.3320	.500	.003	.100	.853	.1538	.3125	2.0	QRRC3-038-500-310	89.05	QRRC3-038-500-310X	99.00
.038	.3100	.3320	.750	.003	.100	.853	.1538	.3125	2.0	QRRC3-038-750-310	89.05	QRRC3-038-750-310X	99.00
W +.002" −.000"	H		L2 +.030" −.000"	R +.001" −.000"	P	L4	F	D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.039	.3700	.3920	.500	.003	.100	.853	.1825	.3750	2.0	QRRC3-039-500-370	112.70	QRRC3-039-500-370X	124.40
.039	.3700	.3920	.750	.003	.100	.853	.1825	.3750	2.0	QRRC3-039-750-370	112.70	QRRC3-039-750-370X	124.40
.039	.3700	.3920	1.000	.003	.100	1.353	.1825	.3750	2.5	QRRC3-039-1000-370	112.70	QRRC3-039-1000-370X	125.25
.062	.3700	.3920	.500	.003	.100	.853	.1825	.3750	2.0	QRRC3-062-500-370	112.70	QRRC3-062-500-370X	124.40
.062	.3700	.3920	.500	.006	.100	.853	.1825	.3750	2.0	QRRC6-062-500-370	112.70	QRRC6-062-500-370X	124.40
.062	.3700	.3920	.750	.003	.100	.853	.1825	.3750	2.0	QRRC3-062-750-370	112.70	QRRC3-062-750-370X	124.40
.062	.3700	.3920	.750	.006	.100	.853	.1825	.3750	2.0	QRRC6-062-750-370	112.70	QRRC6-062-750-370X	124.40
.062	.3700	.3920	1.000	.003	.100	1.353	.1825	.3750	2.5	QRRC3-062-1000-370	112.70	QRRC3-062-1000-370X	125.25
.062	.3700	.3920	1.000	.006	.100	1.353	.1825	.3750	2.5	QRRC6-062-1000-370	112.70	QRRC6-062-1000-370X	125.25

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

Continued on next page

See pages 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	Cntrln 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 #	USD$	Tool #	USD$
.087	.3700	.3920	.500	.003	.100	.853	.1825	.3750	2.0	QRRC3-087-500-370	112.70	QRRC3-087-500-370X	124.40
.087	.3700	.3920	.500	.006	.100	.853	.1825	.3750	2.0	QRRC6-087-500-370	112.70	QRRC6-087-500-370X	124.40
.087	.3700	.3920	.750	.003	.100	.853	.1825	.3750	2.0	QRRC3-087-750-370	112.70	QRRC3-087-750-370X	124.40
.087	.3700	.3920	.750	.006	.100	.853	.1825	.3750	2.0	QRRC6-087-750-370	112.70	QRRC6-087-750-370X	124.40
.087	.3700	.3920	1.000	.003	.100	1.353	.1825	.3750	2.5	QRRC3-087-1000-370	112.70	QRRC3-087-1000-370X	125.25
.087	.3700	.3920	1.000	.006	.100	1.353	.1825	.3750	2.5	QRRC6-087-1000-370	112.70	QRRC6-087-1000-370X	125.25
.093	.4950	.5170	.750	.003	.150	1.040	.2450	.5000	2.5	QRRC3-093-750-495	155.05	QRRC3-093-750-495X	172.05
.093	.4950	.5170	.750	.006	.150	1.040	.2450	.5000	2.5	QRRC6-093-750-495	155.05	QRRC6-093-750-495X	172.05
.093	.4950	.5170	1.000	.003	.150	1.040	.2450	.5000	2.5	QRRC3-093-1000-495	155.05	QRRC3-093-1000-495X	172.05
.093	.4950	.5170	1.000	.006	.150	1.040	.2450	.5000	2.5	QRRC6-093-1000-495	155.05	QRRC6-093-1000-495X	172.05
.125	.4950	.5170	.750	.003	.150	1.040	.2450	.5000	2.5	QRRC3-125-750-495	155.05	QRRC3-125-750-495X	172.05
.125	.4950	.5170	.750	.006	.150	1.040	.2450	.5000	2.5	QRRC6-125-750-495	155.05	QRRC6-125-750-495X	172.05
.125	.4950	.5170	1.000	.003	.150	1.040	.2450	.5000	2.5	QRRC3-125-1000-495	155.05	QRRC3-125-1000-495X	172.05
.125	.4950	.5170	1.000	.006	.150	1.040	.2450	.5000	2.5	QRRC6-125-1000-495	155.05	QRRC6-125-1000-495X	172.05

*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

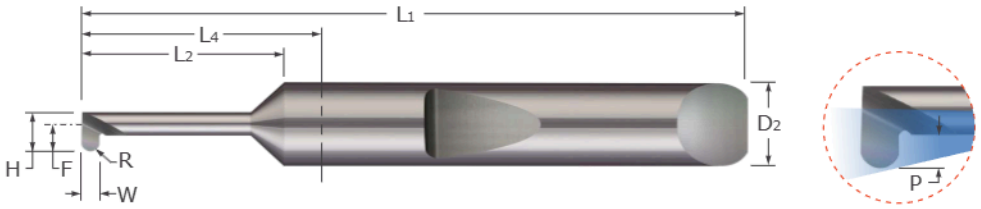
SCAN

See pages 16-34 for quick change holder options

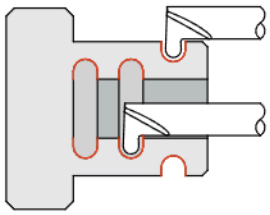
Quick Change – Grooving Tools

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



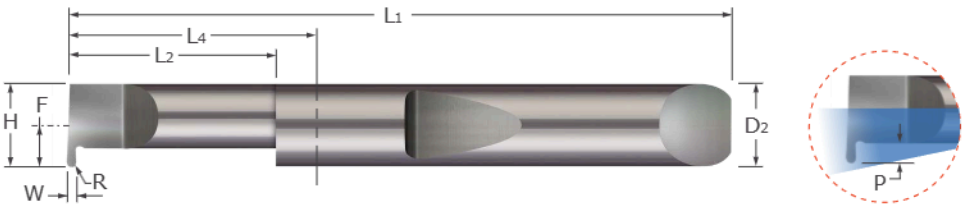
Width	Radius	Head Width	Mini. Bore Dia.*	Max. Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
W +.002" −.000"	R +.001" −.000"	H		L2 +.030" −.000"	P	L4	F	D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.015	.0075	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMFR-015-250-080	69.15	QMFR-015-250-080X	75.00
.015	.0075	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMFR-015-375-080	69.15	QMFR-015-375-080X	75.00
.015	.0075	.0800	.0900	.500	.025	.590	.0525	.1875	1.5			QMFR-015-500-080X	75.00
.015	.0075	.1000	.1100	.250	.030	.590	.0650	.1875	1.5			QMFR-015-250-100X	75.00
.015	.0075	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMFR-015-500-100	69.15		
.015	.0075	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMFR-015-750-100	69.15	QMFR-015-750-100X	75.00
.020	.0100	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMFR-020-250-080	62.15	QMFR-020-250-080X	67.80
.020	.0100	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMFR-020-375-080	62.15	QMFR-020-375-080X	67.80
.020	.0100	.0800	.0900	.500	.025	.590	.0525	.1875	1.5			QMFR-020-500-080X	67.80
.020	.0100	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMFR-020-250-100	62.15	QMFR-020-250-100X	67.80
.020	.0100	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMFR-020-750-100	62.15		
.020	.0100	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMFR-020-250-120	62.15	QMFR-020-250-120X	67.80
.020	.0100	.1200	.1340	.500	.040	.590	.0800	.1875	1.5	QMFR-020-500-120	62.15	QMFR-020-500-120X	67.80
.020	.0100	.1200	.1340	.750	.040	1.090	.0800	.1875	2.0	QMFR-020-750-120	62.15	QMFR-020-750-120X	67.80
.030	.0150	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMFR-030-250-080	62.15	QMFR-030-250-080X	67.80
.030	.0150	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMFR-030-375-080	62.15		
.030	.0150	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMFR-030-500-080	62.15	QMFR-030-500-080X	67.80
.030	.0150	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMFR-030-250-100	62.15	QMFR-030-250-100X	67.80
.030	.0150	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMFR-030-750-100	62.15	QMFR-030-750-100X	67.80
.030	.0150	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMFR-030-250-120	62.15	QMFR-030-250-120X	67.80
.030	.0150	.1200	.1340	.500	.040	.590	.0800	.1875	1.5	QMFR-030-500-120	62.15	QMFR-030-500-120X	67.80
.030	.0150	.1200	.1340	.750	.040	1.090	.0800	.1875	2.0	QMFR-030-750-120	62.15	QMFR-030-750-120X	67.80

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

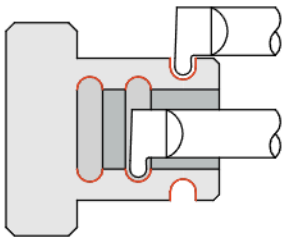
See pages 16-34 for quick change holder options

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 #	USD$	Tool #	USD$
	.017	.0085	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QFR-017-4	57.10	QFR-017-4X	62.60
	.017	.0085	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QFR-017-8	57.10	QFR-017-8X	62.60
	.017	.0085	.1800	.1980	.625	.030	1.090	.0863	.1875	2.0	QFR-017-10	57.10		
	.020	.0100	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QFR-020-4	57.10	QFR-020-4X	62.60
	.020	.0100	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QFR-020-8	57.10	QFR-020-8X	62.60
	.020	.0100	.1800	.1980	.625	.030	1.090	.0863	.1875	2.0			QFR-020-10X	62.60
	.025	.0125	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QFR-025-4	71.40	QFR-025-4X	79.55
	.025	.0125	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QFR-025-6	71.40	QFR-025-6X	79.55
	.025	.0125	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QFR-025-8	71.40	QFR-025-8X	79.55
	.025	.0125	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	QFR-025-10	71.40	QFR-025-10X	79.55
NEW	.025	.0125	.2450	.2670	.750	.050	.853	.1200	.2500	2.0	QFR-025-12	71.40	QFR-025-12X	78.90
	.030	.0150	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QFR-030-4	71.40	QFR-030-4X	79.55
	.030	.0150	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QFR-030-6	71.40		
	.030	.0150	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QFR-030-8	71.40	QFR-030-8X	79.55
	.030	.0150	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	QFR-030-10	71.40	QFR-030-10X	79.55
NEW	.030	.0150	.2450	.2670	.750	.050	.853	.1200	.2500	2.0	QFR-030-12	71.40	QFR-030-12X	78.90
	.033	.0165	.3100	.3320	.375	.100	.853	.1538	.3125	2.0	QFR-033-6	89.05	QFR-033-6X	99.00
	.033	.0165	.3100	.3320	.500	.100	.853	.1538	.3125	2.0			QFR-033-8X	99.00
	.033	.0165	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QFR-033-12	89.05		
	.038	.0190	.3100	.3320	.375	.100	.853	.1538	.3125	2.0	QFR-038-6	89.05	QFR-038-6X	99.00
	.038	.0190	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QFR-038-8	89.05	QFR-038-8X	99.00
	.038	.0190	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QFR-038-12	89.05	QFR-038-12X	99.00
	.039	.0195	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-039-8	112.70	QFR-039-8X	124.40
	.039	.0195	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-039-12	112.70		
	.039	.0195	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-039-16	112.70		
	.046	.0230	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-046-8	112.70	QFR-046-8X	124.40
	.046	.0230	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-046-12	112.70		
	.046	.0230	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-046-20	112.70		
	.055	.0275	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-055-8	112.70	QFR-055-8X	124.40
	.055	.0275	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-055-12	112.70	QFR-055-12X	124.40
	.055	.0275	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-055-16	112.70	QFR-055-16X	125.25
	.055	.0275	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5			QFR-055-20X	125.25

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

Continued on next page

See pages 16-34 for quick change holder options
See page 96 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 #	USD$	Tool #	USD$
.059	.0295	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-059-8	112.70	QFR-059-8X	124.40
.059	.0295	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-059-12	112.70		
.059	.0295	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-059-16	112.70		
.059	.0295	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-059-20	112.70		
.062	.0310	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-062-8	112.70	QFR-062-8X	124.40
.062	.0310	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-062-12	112.70	QFR-062-12X	124.40
.062	.0310	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-062-16	112.70	QFR-062-16X	125.25
.062	.0310	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5			QFR-062-20X	125.25
.069	.0345	.3700	.3920	.500	.100	.853	.1825	.3750	2.0			QFR-069-8X	124.40
.069	.0345	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-069-12	112.70	QFR-069-12X	124.40
.069	.0345	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5			QFR-069-16X	125.25
.069	.0345	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-069-20	112.70	QFR-069-20X	125.25
.079	.0395	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-079-8	112.70	QFR-079-8X	124.40
.079	.0395	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-079-12	112.70	QFR-079-12X	124.40
.079	.0395	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-079-16	112.70	QFR-079-16X	125.25
.079	.0395	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-079-20	112.70	QFR-079-20X	125.25
.087	.0435	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-087-8	112.70	QFR-087-8X	124.40
.087	.0435	.3700	.3920	.500	.150	.853	.1825	.3750	2.0	QFR-7847	112.70	QFR-7847X	124.40
.087	.0435	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-087-12	112.70	QFR-087-12X	124.40
.087	.0435	.3700	.3920	.750	.150	.853	.1825	.3750	2.0	QFR-4895	112.70	QFR-4895X	124.40
.087	.0435	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5			QFR-087-20X	125.25
.093	.0465	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QFR-093-12	155.05	QFR-093-12X	172.05
.093	.0465	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QFR-093-16	155.05	QFR-093-16X	172.05
.093	.0465	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0			QFR-093-20X	172.05
.093	.0465	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QFR-093-24	155.05	QFR-093-24X	172.05
.118	.0590	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QFR-118-12	155.05		
.118	.0590	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QFR-118-16	155.05	QFR-118-16X	172.05
.125	.0625	.3700	.3920	1.000	.150	1.353	.1825	.3750	2.5	QFR-5586	112.70	QFR-5586X	125.25
.125	.0625	.3700	.3920	1.250	.150	1.353	.1825	.3750	2.5	QFR-0965	112.70	QFR-0965X	125.25
.125	.0625	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QFR-125-12	155.05	QFR-125-12X	172.05
.125	.0625	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QFR-125-16	155.05	QFR-125-16X	172.05
.125	.0625	.4950	.5170	1.000	.200	1.040	.2450	.5000	2.5	QFR-7934	155.05	QFR-7934X	172.05
.125	.0625	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QFR-125-20	155.05	QFR-125-20X	172.05
.125	.0625	.4950	.5170	1.250	.200	1.540	.2450	.5000	3.0	QFR-0271	155.05	QFR-0271X	172.05
.125	.0625	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QFR-125-24	155.05	QFR-125-24X	172.05
.156	.0780	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QFR-156-20	155.05	QFR-156-20X	172.05
.156	.0780	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QFR-156-24	155.05		
.187	.0935	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QFR-187-12	155.05		
.187	.0935	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QFR-187-16	155.05		
.187	.0935	.4950	.5170	1.000	.200	1.040	.2450	.5000	2.5	QFR-5272	155.05	QFR-5272X	172.05
.187	.0935	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0			QFR-187-20X	172.05
.187	.0935	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0			QFR-187-24X	172.05
.236	.1180	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QFR-236-12	155.05		
.236	.1180	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QFR-236-24	155.05		
.250	.1250	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QFR-250-12	155.05		
.250	.1250	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5			QFR-250-16X	172.05

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

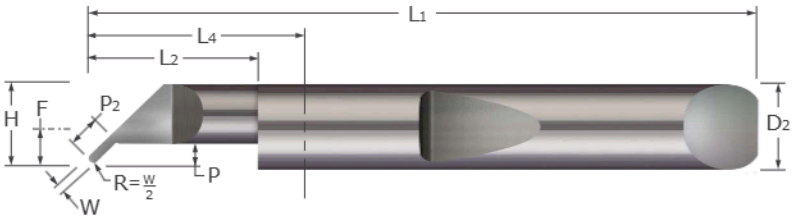
See pages 16-34 for quick change holder options

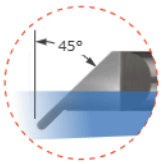
See page 96 for miniature sizes

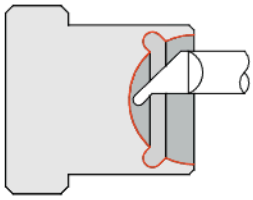
QUP

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	P_2	H		L_2 +.030" −.000"	L_4	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.020	.050	.0765	.1800	.1980	.375	.590	.0862	.1875	1.5	QUP-18020-6	66.15	QUP-18020-6X	73.00
.020	.050	.0765	.1800	.1980	.500	.590	.0862	.1875	1.5	QUP-18020-8	66.15	QUP-18020-8X	73.00
.025	.050	.0780	.1800	.1980	.375	.590	.0862	.1875	1.5	QUP-18025-6	66.15	QUP-18025-6X	73.00
.025	.050	.0780	.1800	.1980	.500	.590	.0862	.1875	1.5	QUP-18025-8	66.15	QUP-18025-8X	73.00
.025	.060	.0921	.2400	.2620	.375	.853	.1150	.2500	2.0	QUP-25025-6	71.25	QUP-25025-6X	79.45
.025	.060	.0921	.2400	.2620	.500	.853	.1150	.2500	2.0	QUP-25025-8	71.25	QUP-25025-8X	79.45
.030	.050	.0794	.1800	.1980	.375	.590	.0862	.1875	1.5	QUP-18030-6	66.15	QUP-18030-6X	73.00
.030	.050	.0794	.1800	.1980	.500	.590	.0862	.1875	1.5	QUP-18030-8	66.15	QUP-18030-8X	73.00
.030	.060	.0936	.2400	.2620	.500	.853	.1150	.2500	2.0	QUP-25030-8	71.25	QUP-25030-8X	79.45
.030	.060	.0936	.2400	.2620	1.000	1.353	.1150	.2500	2.5	QUP-25030-16	71.25	QUP-25030-16X	80.00
.039	.050	.0821	.1800	.1980	.375	.590	.0862	.1875	1.5	QUP-18039-6	66.15	QUP-18039-6X	73.00
.039	.060	.0962	.2400	.2620	.500	.853	.1150	.2500	2.0	QUP-25039-8	71.25	QUP-25039-8X	79.45
.039	.060	.0962	.2400	.2620	1.000	1.353	.1150	.2500	2.5	QUP-25039-16	71.25	QUP-25039-16X	80.00
.050	.083	.1320	.3030	.3250	.500	.853	.1467	.3125	2.0	QUP-31050-8	86.65	QUP-31050-8X	96.50
.050	.083	.1320	.3030	.3250	1.000	1.353	.1467	.3125	2.5	QUP-31050-16	89.50	QUP-31050-16X	100.00
.062	.083	.1355	.3030	.3250	1.000	1.353	.1467	.3125	2.5	QUP-31062-16	89.50	QUP-31062-16X	100.00
.062	.095	.1525	.3650	.3870	1.000	1.353	.1775	.3750	2.5	QUP-37062-16	115.15	QUP-37062-16X	127.60
.062	.125	.1949	.4900	.5120	1.500	1.540	.2400	.5000	3.0	QUP-50062-24	158.95	QUP-50062-24X	175.95

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

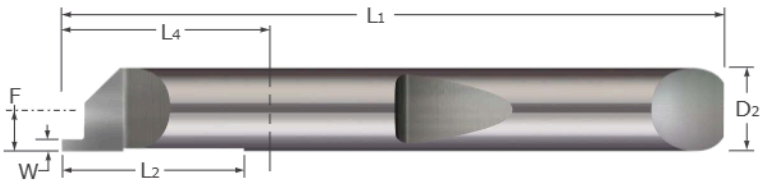
See pages 16-34 for quick change holder options

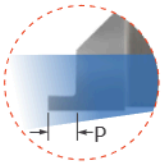
NEW!

Quick Change – Grooving Tools

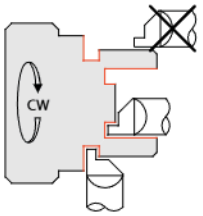
Face Grooving – Square

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 #	USD$	Tool #	USD$
.015	.025	.197	.500	.590	.0938	.1875	1.5	QFG-187-015-025	49.85	QFG-187-015-025X	55.10
.015	.025	.260	.750	.853	.1250	.2500	2.0	QFG-250-015-025	49.85	QFG-250-015-025X	58.00
.017	.025	.197	.500	.590	.0938	.1875	1.5	QFG-187-017-025	49.85	QFG-187-017-025X	55.10
.017	.025	.260	.750	.853	.1250	.2500	2.0	QFG-250-017-025	49.85	QFG-250-017-025X	58.00
.020	.025	.197	.500	.590	.0938	.1875	1.5	QFG-187-020-025	49.85	QFG-187-020-025X	55.10
.020	.025	.260	.750	.853	.1250	.2500	2.0	QFG-250-020-025	49.85	QFG-250-020-025X	58.00
.020	.050	.190	.500	.590	.0860	.1875	1.5	QFG-180-020	49.85	QFG-180-020X	55.10
.020	.050	.197	.500	.590	.0938	.1875	1.5	QFG-187-020-050	49.85	QFG-187-020-050X	55.10
.020	.050	.240	.750	.853	.1050	.2500	2.0	QFG-230-020	49.85	QFG-230-020X	58.00
.020	.050	.260	.750	.853	.1250	.2500	2.0	QFG-250-020	49.85	QFG-250-020X	58.00
.025	.025	.197	.500	.590	.0938	.1875	1.5	QFG-187-025-025	49.85	QFG-187-025-025X	55.10
.025	.025	.260	.750	.853	.1250	.2500	2.0	QFG-250-025-025	49.85	QFG-250-025-025X	58.00
.025	.050	.197	.500	.590	.0938	.1875	1.5	QFG-187-025-050	49.85	QFG-187-025-050X	55.10
.025	.050	.260	.750	.853	.1250	.2500	2.0	QFG-250-025-050	49.85	QFG-250-025-050X	58.00
.030	.050	.190	.500	.590	.0860	.1875	1.5	QFG-180-030	49.85	QFG-180-030X	55.10
.030	.050	.197	.500	.590	.0938	.1875	1.5	QFG-187-030-050	49.85	QFG-187-030-050X	55.10
.030	.050	.240	.750	.853	.1050	.2500	2.0	QFG-230-030	49.85	QFG-230-030X	58.00
.030	.050	.260	.750	.853	.1250	.2500	2.0	QFG-250-030	49.85	QFG-250-030X	58.00
.030	.050	.322	.750	.853	.1563	.3125	2.0	QFG-312-030	68.05	QFG-312-030X	78.05
.030	.050	.385	.750	.853	.1875	.3750	2.0	QFG-375-030-050	94.75	QFG-375-030-050X	105.70
.030	.075	.197	.500	.590	.0938	.1875	1.5	QFG-187-030-075	49.85	QFG-187-030-075X	55.10
.030	.075	.260	.750	.853	.1250	.2500	2.0	QFG-250-030-075	49.85	QFG-250-030-075X	58.00
.030	.075	.322	.750	.853	.1563	.3125	2.0	QFG-3098	68.05	QFG-3098X	78.05
.039	.050	.260	.750	.853	.1250	.2500	2.0	QFG-250-039-050	49.85	QFG-250-039-050X	58.00
.039	.050	.385	.750	.853	.1875	.3750	2.0	QFG-375-039-050	94.75	QFG-375-039-050X	105.70
.039	.075	.260	.750	.853	.1250	.2500	2.0	QFG-250-039-075	49.85	QFG-250-039-075X	58.00
.040	.050	.197	.500	.590	.0938	.1875	1.5	QFG-187-040-050	49.85	QFG-187-040-050X	55.10
.040	.050	.260	.750	.853	.1250	.2500	2.0	QFG-250-040-050	49.85	QFG-250-040-050X	58.00
.040	.050	.322	.750	.853	.1563	.3125	2.0	QFG-312-040	68.05	QFG-312-040X	78.05
.040	.050	.385	.750	.853	.1875	.3750	2.0	QFG-375-040-050	94.75	QFG-375-040-050X	105.70
.040	.075	.197	.500	.590	.0938	.1875	1.5	QFG-187-040-075	49.85	QFG-187-040-075X	55.10
.040	.075	.260	.750	.853	.1250	.2500	2.0	QFG-250-040-075	49.85	QFG-250-040-075X	58.00
.040	.075	.322	.750	.853	.1563	.3125	2.0	QFG-5702	68.05	QFG-5702X	78.05

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
	.050	.050	.197	.500	.590	.0938	.1875	1.5	QFG-187-050-050	49.85	QFG-187-050-050X	55.10
	.050	.050	.260	.750	.853	.1250	.2500	2.0	QFG-250-050-050	49.85	QFG-250-050-050X	58.00
	.050	.050	.385	.750	.853	.1875	.3750	2.0	QFG-375-050-050	94.75	QFG-375-050-050X	105.70
	.050	.075	.197	.500	.590	.0938	.1875	1.5	QFG-187-050-075	49.85	QFG-187-050-075X	55.10
	.050	.075	.260	.750	.853	.1250	.2500	2.0	QFG-250-050-075	49.85	QFG-250-050-075X	58.00
	.050	.075	.322	.750	.853	.1563	.3125	2.0	QFG-312-050-075	68.05	QFG-312-050-075X	78.05
	.059	.075	.197	.500	.590	.0938	.1875	1.5	QFG-187-059-075	49.85	QFG-187-059-075X	55.10
	.059	.075	.260	.750	.853	.1250	.2500	2.0	QFG-250-059-075	49.85	QFG-250-059-075X	58.00
	.059	.075	.385	.750	.853	.1875	.3750	2.0	QFG-375-059-075	94.75	QFG-375-059-075X	105.70
	.059	.100	.197	.500	.590	.0938	.1875	1.5	QFG-187-059-100	49.85	QFG-187-059-100X	55.10
	.059	.100	.260	.750	.853	.1250	.2500	2.0	QFG-250-059-100	49.85	QFG-250-059-100X	58.00
	.062	.075	.197	.500	.590	.0938	.1875	1.5	QFG-187-062-075	49.85	QFG-187-062-075X	55.10
	.062	.075	.260	.750	.853	.1250	.2500	2.0	QFG-250-062-075	49.85	QFG-250-062-075X	58.00
	.062	.075	.322	.750	.853	.1563	.3125	2.0	QFG-312-062-075	68.05	QFG-312-062-075X	78.05
	.062	.075	.385	.750	.853	.1875	.3750	2.0	QFG-375-062-075	94.75	QFG-375-062-075X	105.70
	.062	.100	.197	.500	.590	.0938	.1875	1.5	QFG-187-062-100	49.85	QFG-187-062-100X	55.10
	.062	.100	.260	.750	.853	.1250	.2500	2.0	QFG-250-062-100	49.85	QFG-250-062-100X	58.00
	.062	.100	.322	.750	.853	.1563	.3125	2.0	QFG-312-062	68.05	QFG-312-062X	78.05
	.062	.100	.385	.750	.853	.1875	.3750	2.0	QFG-375-062	94.75	QFG-375-062X	105.70
	.062	.100	.480	1.000	1.040	.2200	.5000	2.5	QFG-470-062	107.45	QFG-470-062X	123.55
	.062	.100	.500	1.000	1.040	.2400	.5000	2.5	QFG-490-062	107.45	QFG-490-062X	123.55
	.062	.150	.197	.500	.590	.0938	.1875	1.5	QFG-187-062-150	49.85	QFG-187-062-150X	55.10
	.062	.150	.260	.750	.853	.1250	.2500	2.0	QFG-250-062-150	49.85	QFG-250-062-150X	58.00
	.062	.150	.322	.750	.853	.1563	.3125	2.0	QFG-312-062-150	68.05	QFG-312-062-150X	78.05
	.062	.150	.385	.750	.853	.1875	.3750	2.0	QFG-375-062-150	94.75	QFG-375-062-150X	105.70
	.062	.150	.500	1.450	1.540	.2400	.5000	3.0	QFG-1206	109.75	QFG-1206X	126.65
	.078	.100	.260	.750	.853	.1250	.2500	2.0	QFG-250-078-100	49.85	QFG-250-078-100X	58.00
	.078	.100	.322	.750	.853	.1563	.3125	2.0	QFG-312-078-100	68.05	QFG-312-078-100X	78.05
	.078	.100	.385	.750	.853	.1875	.3750	2.0	QFG-375-078	94.75	QFG-375-078X	105.70
	.078	.100	.480	1.000	1.040	.2200	.5000	2.5	QFG-470-078	107.45	QFG-470-078X	123.55
	.078	.100	.500	1.000	1.040	.2400	.5000	2.5	QFG-490-078	107.45	QFG-490-078X	123.55
NEW	.078	.150	.260	.750	.853	.1250	.2500	2.0	QFG-8389	94.75	QFG-8389X	102.25
NEW	.078	.150	.322	.750	.853	.1563	.3125	2.0	QFG-2983	94.75	QFG-2983X	103.95
NEW	.078	.150	.385	.750	.853	.1875	.3750	2.0	QFG-5534	94.75	QFG-5534X	105.50
	.093	.100	.385	.750	.853	.1875	.3750	2.0	QFG-375-093	94.75	QFG-375-093X	105.70
	.093	.100	.480	1.000	1.040	.2200	.5000	2.5	QFG-470-093	107.45	QFG-470-093X	123.55
	.093	.100	.500	1.000	1.040	.2400	.5000	2.5	QFG-490-093	107.45	QFG-490-093X	123.55
	.093	.150	.322	.750	.853	.1563	.3125	2.0	QFG-312-093-150	68.05	QFG-312-093-150X	78.05
	.093	.150	.385	.750	.853	.1875	.3750	2.0	QFG-375-093-150	94.75	QFG-375-093-150X	105.70
	.118	.150	.385	.750	.853	.1875	.3750	2.0	QFG-375-118	94.75	QFG-375-118X	105.70
	.118	.150	.480	1.000	1.040	.2200	.5000	2.5	QFG-470-118	107.45	QFG-470-118X	123.55
	.118	.150	.500	1.000	1.040	.2400	.5000	2.5	QFG-490-118	107.45	QFG-490-118X	123.55
NEW	.118	.250	.385	.750	.853	.1875	.3750	2.0	QFG-6931	94.75	QFG-6931X	105.50
NEW	.118	.250	.500	1.450	1.540	.2400	.5000	3.0	QFG-8373	109.75	QFG-8373X	125.35
	.125	.150	.385	.750	.853	.1875	.3750	2.0	QFG-375-125	94.75	QFG-375-125X	105.70
	.125	.150	.480	1.000	1.040	.2200	.5000	2.5	QFG-470-125	107.45	QFG-470-125X	123.55
	.125	.150	.500	1.000	1.040	.2400	.5000	2.5	QFG-490-125	107.45	QFG-490-125X	123.55
	.125	.250	.385	.750	.853	.1875	.3750	2.0	QFG-375-125-250	94.75	QFG-375-125-250X	105.70
	.125	.250	.500	1.450	1.540	.2400	.5000	3.0	QFG-5017	109.75	QFG-5017X	126.65
	.156	.150	.480	1.000	1.040	.2200	.5000	2.5	QFG-470-156	107.45	QFG-470-156X	123.55
	.156	.150	.500	1.000	1.040	.2400	.5000	2.5	QFG-490-156	107.45		

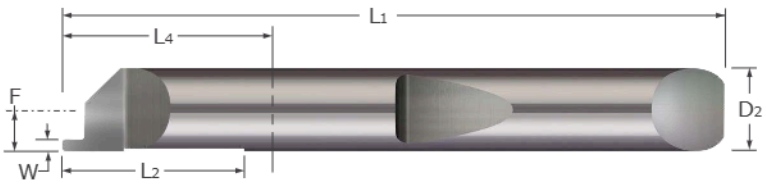
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

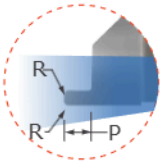
See pages 16-34 for quick change holder options

Quick Change – Grooving Tools

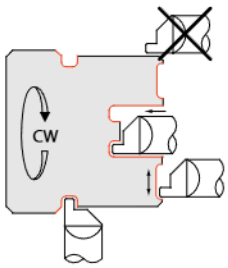
Face Grooving – Corner Radius

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	Proj.	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 #	USD$	Tool #	USD$
.015	.025	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-015-025	46.00	QFGC3-187-015-025X	52.90
.015	.025	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-015-025	53.55	QFGC3-250-015-025X	61.70
.017	.025	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-017-025	46.00	QFGC3-187-017-025X	52.90
.017	.025	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-017-025	53.55	QFGC3-250-017-025X	61.70
.020	.025	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-020-025	46.00	QFGC3-187-020-025X	52.90
.020	.025	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-020-025	53.55	QFGC3-250-020-025X	61.70
.025	.025	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-025-025	46.00	QFGC3-187-025-025X	52.90
.025	.025	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-025-025	53.55	QFGC3-250-025-025X	61.70
.030	.050	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-030-050	46.00	QFGC3-187-030-050X	52.90
.030	.050	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-030-050	53.55	QFGC3-250-030-050X	61.70
.030	.050	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-312-030-050	70.40	QFGC3-312-030-050X	80.35
.030	.050	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-030-050	95.70	QFGC3-375-030-050X	107.45
.039	.050	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-039-050	46.00	QFGC3-187-039-050X	52.90
.039	.050	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-039-050	53.55	QFGC3-250-039-050X	61.70
.039	.050	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-039-050	95.70	QFGC3-375-039-050X	107.45
.040	.050	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-040-050	46.00	QFGC3-187-040-050X	52.90
.040	.050	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-040-050	53.55	QFGC3-250-040-050X	61.70
.040	.050	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-312-040-050	70.40	QFGC3-312-040-050X	80.35
.040	.050	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-040-050	95.70	QFGC3-375-040-050X	107.45
.050	.050	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-050-050	46.00	QFGC3-187-050-050X	52.90
.050	.050	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-050-050	53.55	QFGC3-250-050-050X	61.70
.050	.050	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-312-050-050	70.40	QFGC3-312-050-050X	80.35
.050	.050	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-050-050	95.70	QFGC3-375-050-050X	107.45
.059	.075	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-059-075	95.70	QFGC3-375-059-075X	107.45

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

Continued on next page

See pages 16-34 for quick change holder options

QFGC

Quick Change – Grooving Tools

Face Grooving – Corner Radius (cont.)

Continued from previous page

Width	Proj.	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 #	USD$	Tool #	USD$
.062	.075	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-062-075	46.00	QFGC3-187-062-075X	52.90
.062	.075	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-062-075	53.55	QFGC3-250-062-075X	61.70
.062	.075	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-312-062-075	70.40	QFGC3-312-062-075X	80.35
.062	.075	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-062-075	95.70	QFGC3-375-062-075X	107.45
.062	.100	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-062-100	46.00	QFGC3-187-062-100X	52.90
.062	.100	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-062-100	53.55	QFGC3-250-062-100X	61.70
.078	.100	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-078-100	53.55	QFGC3-250-078-100X	61.70
.078	.100	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-312-078-100	70.40	QFGC3-312-078-100X	80.35
.078	.100	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-078-100	95.70	QFGC3-375-078-100X	107.45
.093	.100	.385	.006	.750	.853	.1875	.3750	2.0	QFGC6-375-093-100	95.70	QFGC6-375-093-100X	107.45
.093	.150	.322	.006	.750	.853	.1563	.3125	2.0	QFGC6-312-093-150	70.40	QFGC6-312-093-150X	80.35
.118	.150	.385	.006	.750	.853	.1875	.3750	2.0	QFGC6-375-118-150	95.70	QFGC6-375-118-150X	107.45
.125	.100	.385	.006	.750	.853	.1875	.3750	2.0	QFGC6-375-125-100	95.70	QFGC6-375-125-100X	107.45

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

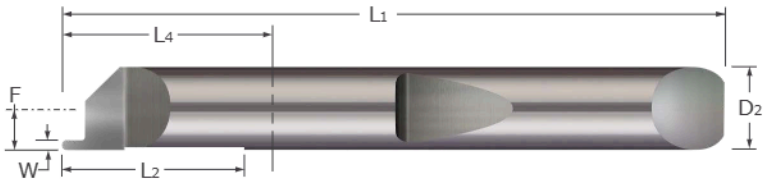
See pages 16-34 for quick change holder options

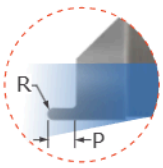
NEW!

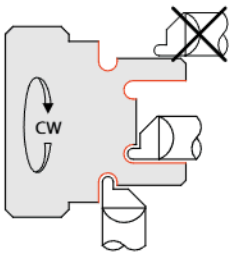
Quick Change – Grooving Tools

QFGF

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
- 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 #	USD$	Tool #	USD$	
.015	.0075	.025	.197	.500	.590	.0938	.1875	1.5	QFGF-187-015-025	46.20	QFGF-187-015-025X	53.20	
.015	.0075	.025	.260	.750	.853	.1250	.2500	2.0	QFGF-250-015-025	51.60	QFGF-250-015-025X	59.95	
.017	.0085	.025	.197	.500	.590	.0938	.1875	1.5	QFGF-187-017-025	46.20	QFGF-187-017-025X	53.20	
.017	.0085	.025	.260	.750	.853	.1250	.2500	2.0	QFGF-250-017-025	51.60	QFGF-250-017-025X	59.95	
.020	.0100	.050	.190	.500	.590	.0860	.1875	1.5	QFGF-180-020	46.20	QFGF-180-020X	53.20	
.020	.0100	.050	.197	.500	.590	.0938	.1875	1.5	QFGF-187-020-050	46.20	QFGF-187-020-050X	53.20	
.020	.0100	.050	.240	.750	.853	.1050	.2500	2.0	QFGF-230-020	51.60	QFGF-230-020X	59.95	
.020	.0100	.050	.260	.750	.853	.1250	.2500	2.0	QFGF-250-020	51.60	QFGF-250-020X	59.95	
.025	.0125	.050	.197	.500	.590	.0938	.1875	1.5	QFGF-187-025-050	46.20	QFGF-187-025-050X	53.20	
.025	.0125	.050	.260	.750	.853	.1250	.2500	2.0	QFGF-250-025-050	51.60	QFGF-250-025-050X	59.95	
.030	.0150	.050	.190	.500	.590	.0860	.1875	1.5	QFGF-180-030	46.20	QFGF-180-030X	53.20	
.030	.0150	.050	.197	.500	.590	.0938	.1875	1.5	QFGF-187-030-050	46.20	QFGF-187-030-050X	53.20	
.030	.0150	.050	.260	.750	.853	.1250	.2500	2.0	QFGF-250-030	51.60	QFGF-250-030X	59.95	
.030	.0150	.075	.260	.750	.853	.1250	.2500	2.0	QFGF-2652	51.55	QFGF-2652X	59.15	NEW
.039	.0195	.075	.197	.500	.590	.0938	.1875	1.5	QFGF-187-039-075	46.20	QFGF-187-039-075X	53.20	
.039	.0195	.075	.260	.750	.853	.1250	.2500	2.0	QFGF-250-039-075	51.60	QFGF-250-039-075X	59.95	
.040	.0200	.050	.260	.750	.853	.1250	.2500	2.0	QFGF-250-040	51.60	QFGF-250-040X	59.95	
.040	.0200	.075	.197	.500	.590	.0938	.1875	1.5	QFGF-187-040-075	46.20	QFGF-187-040-075X	53.20	
.040	.0200	.075	.260	.750	.853	.1250	.2500	2.0	QFGF-250-040-075	51.60	QFGF-250-040-075X	59.95	
.050	.0250	.050	.322	.750	.853	.1563	.3125	2.0	QFGF-312-050	70.60	QFGF-312-050X	80.45	
.050	.0250	.075	.197	.500	.590	.0938	.1875	1.5	QFGF-187-050-075	46.20	QFGF-187-050-075X	53.20	
.050	.0250	.075	.260	.750	.853	.1250	.2500	2.0	QFGF-250-050-075	51.60	QFGF-250-050-075X	59.95	
.062	.0310	.075	.322	.750	.853	.1563	.3125	2.0	QFGF-312-062-075	70.60	QFGF-312-062-075X	80.45	
.062	.0310	.075	.385	.750	.853	.1875	.3750	2.0	QFGF-375-062-075	97.65	QFGF-375-062-075X	109.40	
.062	.0310	.100	.197	.500	.590	.0938	.1875	1.5	QFGF-187-062-100	46.20	QFGF-187-062-100X	53.20	
.062	.0310	.100	.260	.750	.853	.1250	.2500	2.0	QFGF-250-062-100	51.60	QFGF-250-062-100X	59.95	
.062	.0310	.100	.322	.750	.853	.1563	.3125	2.0	QFGF-312-062	70.60	QFGF-312-062X	80.45	
.062	.0310	.100	.385	.750	.853	.1875	.3750	2.0	QFGF-375-062	97.65	QFGF-375-062X	109.40	
.078	.0390	.100	.385	.750	.853	.1875	.3750	2.0	QFGF-375-078	97.65	QFGF-375-078X	109.40	
.078	.0390	.150	.385	.750	.853	.1875	.3750	2.0	QFGF-5534	97.65	QFGF-5534X	108.40	NEW
.093	.0465	.100	.385	.750	.853	.1875	.3750	2.0	QFGF-375-093	97.65	QFGF-375-093X	109.40	
.093	.0465	.150	.385	.750	.853	.1875	.3750	2.0	QFGF-9166	97.65	QFGF-9166X	108.40	NEW
.125	.0625	.150	.385	.750	.853	.1875	.3750	2.0	QFGF-375-125	97.65	QFGF-375-125X	109.40	

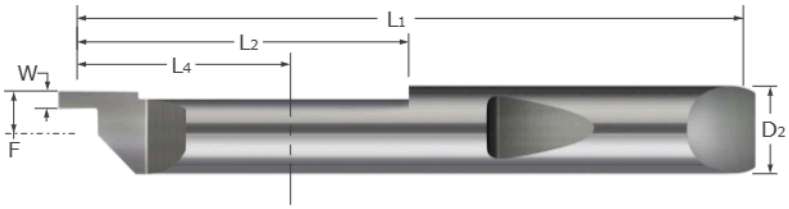
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

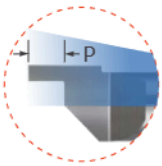
See pages 16-34 for quick change holder options

QFGI

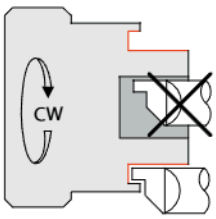
Quick Change – Grooving Tools

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 #	USD$	Tool #	USD$
.020	.040	.260	.750	.853	.1150	.2500	2.0	QFGI-8240	51.25	QFGI-8240X	59.55
.020	.040	.260	1.250	1.353	.1150	.2500	2.5	QFGI-6198	53.30	QFGI-6198X	62.00
.020	.040	.322	.750	.853	.1463	.3125	2.0	QFGI-9800	70.30	QFGI-9800X	80.10
.020	.040	.322	1.250	1.353	.1463	.3125	2.5	QFGI-6738	72.10	QFGI-6738X	82.50
.030	.060	.260	.750	.853	.1150	.2500	2.0	QFGI-6600	51.25	QFGI-6600X	59.55
.030	.060	.260	1.250	1.353	.1150	.2500	2.5	QFGI-3461	53.30	QFGI-3461X	62.00
.030	.060	.322	.750	.853	.1463	.3125	2.0	QFGI-5774	70.30	QFGI-5774X	80.10
.030	.060	.322	1.250	1.353	.1463	.3125	2.5	QFGI-1413	72.10	QFGI-1413X	82.50
.040	.080	.260	.750	.853	.1150	.2500	2.0	QFGI-6481	51.25	QFGI-6481X	59.55
.040	.080	.260	1.250	1.353	.1150	.2500	2.5	QFGI-9741	53.30	QFGI-9741X	62.00
.040	.080	.322	.750	.853	.1463	.3125	2.0	QFGI-8157	70.30	QFGI-8157X	80.10
.040	.080	.322	1.250	1.353	.1463	.3125	2.5	QFGI-9114	72.10	QFGI-9114X	82.50
.050	.100	.260	.750	.853	.1150	.2500	2.0	QFGI-1311	51.25	QFGI-1311X	59.55
.050	.100	.260	1.250	1.353	.1150	.2500	2.5	QFGI-7516	53.30	QFGI-7516X	62.00
.050	.100	.322	.750	.853	.1463	.3125	2.0	QFGI-5336	70.30	QFGI-5336X	80.10
.050	.100	.322	1.250	1.353	.1463	.3125	2.5	QFGI-9489	72.10	QFGI-9489X	82.50
.062	.125	.322	.750	.853	.1463	.3125	2.0	QFGI-2609	70.30	QFGI-2609X	80.10
.062	.125	.322	1.250	1.353	.1463	.3125	2.5	QFGI-0720	72.10	QFGI-0720X	82.50
.062	.125	.385	.750	.853	.1775	.3750	2.0	QFGI-3852	97.65	QFGI-3852X	109.40
.062	.125	.385	1.250	1.353	.1775	.3750	2.5	QFGI-8466	99.70	QFGI-8466X	112.15

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

Continued on next page

See pages 16-34 for quick change holder options

Quick Change – Grooving Tools

Face Grooving – Internal Tooth – Square (cont.)

QFGI

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 #	USD$	Tool #	USD$
.078	.156	.322	.750	.853	.1463	.3125	2.0	QFGI-4397	70.30	QFGI-4397X	80.10
.078	.156	.322	1.250	1.353	.1463	.3125	2.5	QFGI-3465	72.10	QFGI-3465X	82.50
.078	.156	.385	.750	.853	.1775	.3750	2.0	QFGI-2855	97.65	QFGI-2855X	109.40
.078	.156	.385	1.250	1.353	.1775	.3750	2.5	QFGI-2684	99.70	QFGI-2684X	112.15
.093	.187	.322	.750	.853	.1463	.3125	2.0	QFGI-5482	70.30	QFGI-5482X	80.10
.093	.187	.322	1.250	1.353	.1463	.3125	2.5	QFGI-2378	72.10	QFGI-2378X	82.50
.093	.187	.385	.750	.853	.1775	.3750	2.0	QFGI-1641	97.65	QFGI-1641X	109.40
.093	.187	.385	1.250	1.353	.1775	.3750	2.5	QFGI-1707	99.70	QFGI-1707X	112.15
.118	.236	.385	.750	.853	.1775	.3750	2.0	QFGI-4674	97.65	QFGI-4674X	109.40
.118	.236	.385	1.250	1.353	.1775	.3750	2.5	QFGI-2969	99.70	QFGI-2969X	112.15
.118	.236	.510	1.000	1.040	.2400	.5000	2.5	QFGI-6754	110.60	QFGI-6754X	127.60
.118	.236	.510	1.500	1.540	.2400	.5000	3.0	QFGI-3667	112.55	QFGI-3667X	129.55
.125	.250	.385	.750	.853	.1775	.3750	2.0	QFGI-1535	97.65	QFGI-1535X	109.40
.125	.250	.385	1.250	1.353	.1775	.3750	2.5	QFGI-7015	99.70	QFGI-7015X	112.15
.125	.250	.510	1.000	1.040	.2400	.5000	2.5	QFGI-4349	110.60	QFGI-4349X	127.60
.125	.250	.510	1.500	1.540	.2400	.5000	3.0	QFGI-4098	112.55	QFGI-4098X	129.55

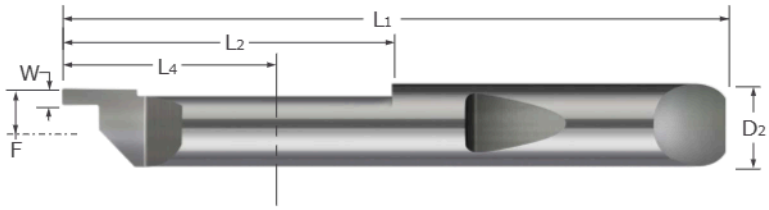
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

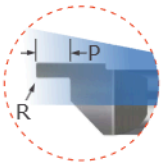
See pages 16-34 for quick change holder options

QFGIC

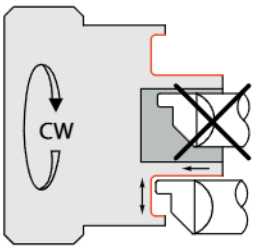
Quick Change – Grooving Tools

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 #	USD$	Tool #	USD$
.020	.003	.040	.260	1.250	1.353	.1150	.2500	2.5	QFGIC3-6198	54.25	QFGIC3-6198X	63.10
.020	.003	.040	.322	1.250	1.353	.1463	.3125	2.5	QFGIC3-6738	73.35	QFGIC3-6738X	83.95
.030	.003	.060	.260	1.250	1.353	.1150	.2500	2.5	QFGIC3-3461	54.25	QFGIC3-3461X	63.10
.030	.003	.060	.322	1.250	1.353	.1463	.3125	2.5	QFGIC3-1413	73.35	QFGIC3-1413X	83.95
.040	.003	.080	.260	1.250	1.353	.1150	.2500	2.5	QFGIC3-9741	54.25	QFGIC3-9741X	63.10
.040	.003	.080	.322	1.250	1.353	.1463	.3125	2.5	QFGIC3-9114	73.35	QFGIC3-9114X	83.95
.050	.003	.100	.260	1.250	1.353	.1150	.2500	2.5	QFGIC3-7516	54.25	QFGIC3-7516X	63.10
.050	.003	.100	.322	1.250	1.353	.1463	.3125	2.5	QFGIC3-9489	73.35	QFGIC3-9489X	83.95
.062	.003	.125	.322	1.250	1.353	.1463	.3125	2.5	QFGIC3-0720	73.35	QFGIC3-0720X	83.95
.062	.003	.125	.385	1.250	1.353	.1775	.3750	2.5	QFGIC3-8466	101.50	QFGIC3-8466X	114.10
.078	.003	.156	.322	1.250	1.353	.1463	.3125	2.5	QFGIC3-3465	73.35	QFGIC3-3465X	83.95
.078	.003	.156	.385	1.250	1.353	.1775	.3750	2.5	QFGIC3-2684	101.50	QFGIC3-2684X	114.10
.093	.006	.187	.322	1.250	1.353	.1463	.3125	2.5	QFGIC6-2378	73.35	QFGIC6-2378X	83.95
.093	.006	.187	.385	1.250	1.353	.1775	.3750	2.5	QFGIC6-1707	101.50	QFGIC6-1707X	114.10
.118	.006	.236	.385	1.250	1.353	.1775	.3750	2.5	QFGIC6-2969	101.50	QFGIC6-2969X	114.10
.125	.006	.250	.385	1.250	1.353	.1775	.3750	2.5	QFGIC6-7015	101.50	QFGIC6-7015X	114.10

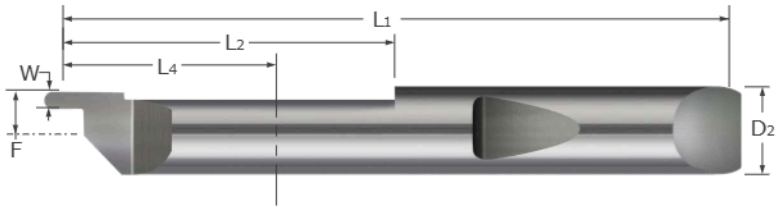
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

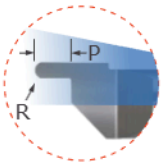
See pages 16-34 for quick change holder options

Quick Change – Grooving Tools

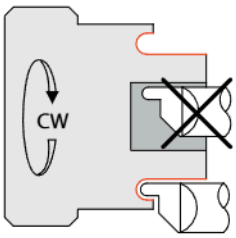
Face Grooving – Internal Tooth - Full Radius

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 #	USD$	Tool #	USD$
.020	.0100	.040	.260	1.250	1.353	.1150	.2500	2.5	QFGIF-6198	55.25	QFGIF-6198X	64.05
.020	.0100	.040	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-6738	74.95	QFGIF-6738X	85.50
.030	.0150	.060	.260	1.250	1.353	.1150	.2500	2.5	QFGIF-3461	55.25	QFGIF-3461X	64.05
.030	.0150	.060	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-1413	74.95	QFGIF-1413X	85.50
.040	.0200	.080	.260	1.250	1.353	.1150	.2500	2.5	QFGIF-9741	55.25	QFGIF-9741X	64.05
.040	.0200	.080	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-9114	74.95	QFGIF-9114X	85.50
.050	.0250	.100	.260	1.250	1.353	.1150	.2500	2.5	QFGIF-7516	55.25	QFGIF-7516X	64.05
.050	.0250	.100	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-9489	74.95	QFGIF-9489X	85.50
.062	.0310	.125	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-0720	74.95	QFGIF-0720X	85.50
.062	.0310	.125	.385	1.250	1.353	.1775	.3750	2.5	QFGIF-8466	103.45	QFGIF-8466X	115.85
.078	.0390	.156	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-3465	74.95	QFGIF-3465X	85.50
.078	.0390	.156	.385	1.250	1.353	.1775	.3750	2.5	QFGIF-2684	103.45	QFGIF-2684X	115.85
.093	.0465	.187	.322	1.250	1.353	.1463	.3125	2.5	QFGIF-2378	74.95	QFGIF-2378X	85.50
.093	.0465	.187	.385	1.250	1.353	.1775	.3750	2.5	QFGIF-1707	103.45	QFGIF-1707X	115.85
.118	.0590	.236	.385	1.250	1.353	.1775	.3750	2.5	QFGIF-2969	103.45	QFGIF-2969X	115.85
.125	.0625	.250	.385	1.250	1.353	.1775	.3750	2.5	QFGIF-7015	103.45	QFGIF-7015X	115.85

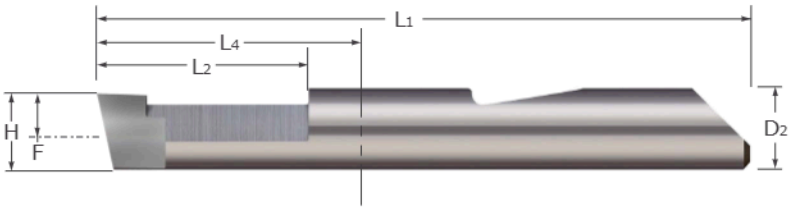
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

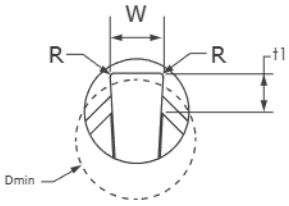
See pages 16-34 for quick change holder options

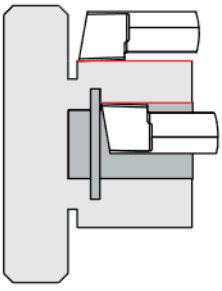
QBRK

Quick Change – Broaching Tools

Standard Keyway







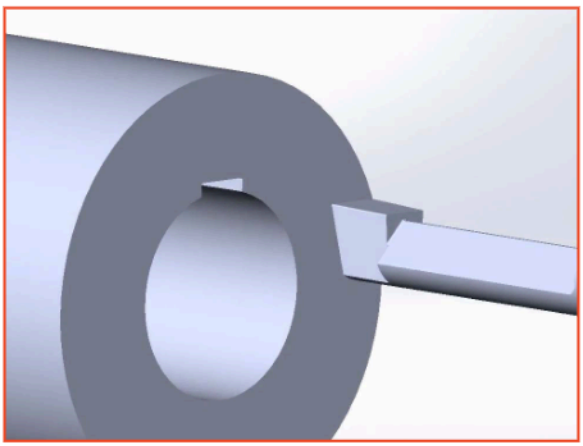
- Designed for multiple pass static broaching of standard internal and external keyways
- Coolant fed enabled shank design
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

Broach Width	Min. Bore Dia.*	Max Broach Depth	Corner Radius	Max Radial Engagement	Broach Height	Centerline Offset	Length From Holder	Shank Dia*	Overall Length	Uncoated		nACRo® Coated	
W $^{+.0000"}_{-.0010"}$	Dmin	L2 $^{+.030"}_{-.000"}$	R	T1	H	F	L4	D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.0938	.1875	.500	.000	.065	.170	.076	.590	.1875	1.5	QBRK-09300500	50.05	QBRK-09300500K	56.85
.0938	.1875	1.000	.000	.065	.170	.076	1.090	.1875	2.0	QBRK-093001000	51.95	QBRK-093001000K	58.80
.1250	.1875	.500	.000	.080	.159	.065	.590	.1875	1.5	QBRK-12500500	50.05	QBRK-12500500K	56.85
.1250	.1875	1.000	.000	.080	.159	.065	1.090	.1875	2.0	QBRK-125001000	51.95	QBRK-125001000K	58.80
.1875	.3125	1.000	.000	.115	.276	.120	1.353	.3125	2.5	QBRK-187001000	70.60	QBRK-187001000K	81.05
.1875	.3125	1.500	.000	.115	.276	.120	1.853	.3125	3.0	QBRK-187001500	79.15	QBRK-187001500K	89.60
.2500	.3750	1.000	.000	.150	.323	.135	1.353	.3750	2.5	QBRK-250001000	96.15	QBRK-250001000K	108.55
.2500	.3750	1.500	.000	.150	.323	.135	1.853	.3750	3.0	QBRK-250001500	104.10	QBRK-250001500K	116.50

*Minimum Bore Diameter is for reference only. Please refer to workpiece specifications or standard bore sizes for proper bore sizing.

Quick Change Broaching Animations

Get to know our new Quick Change Broaching Tools with animations on Micro100.com. Designed for multiple pass static broaching, these solid carbide tools feature a coolant-fed enabled shank for improved chip evacuation and nACRo® coating options for enhanced heat resistance in difficult-to-machine materials.



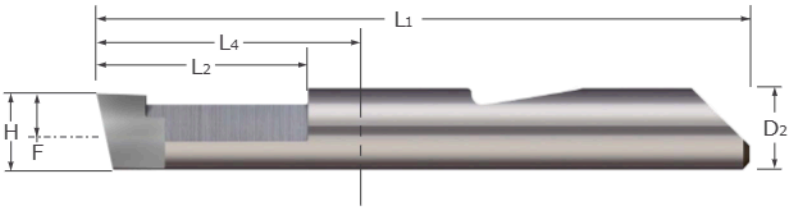
Scan to view or go online at micro100.com/resources/quick-change-broaching

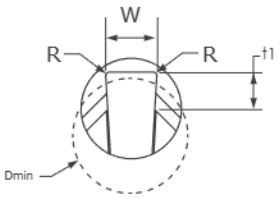
See pages 16-34 for quick change holder options

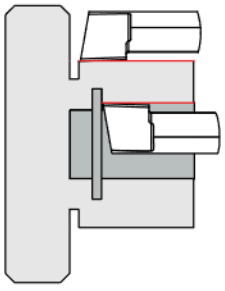
Quick Change – Broaching Tools

Metric Keyway

QBRKM







- Designed for multiple pass static broaching of metric internal and external keyways
- Available in tolerance grades P9, JS9 (DIN 6885), and C11 (DIN 138)
- Coolant fed enabled shank design
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

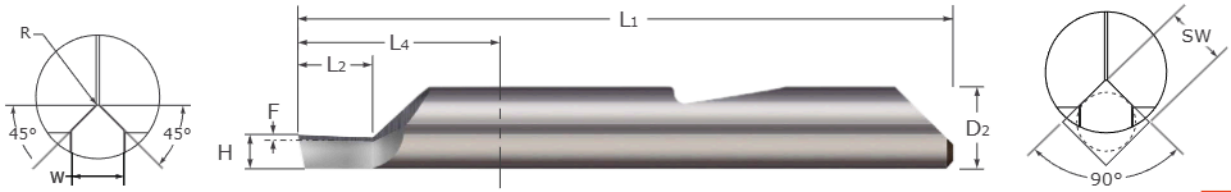
Tolerance Grade	Broach Width	Min Bore Dia.*	Max Broach Depth	Corner Radius	Max Radial Engagement	Broach Height	Centerline Offset	Length From Holder	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
	W metric equiv. +.0000" −.0010"	Dmin	L2 +.030" −.000"	R	T1	H	F	L4	D2 (h6)	L1	Tool #	USD$	Tool #	USD$
P9	1.98 mm .0780	.1875	.472	.004	.051	.174	.080	.590	.1875	1.5	QBRKM-1981012	50.05	QBRKM-1981012K	56.85
P9	2.99 mm .1177	.1875	.472	.004	.075	.162	.068	.590	.1875	1.5	QBRKM-2981012	50.05	QBRKM-2981012K	56.85
P9	2.99 mm .1177	.1875	.984	.004	.075	.162	.068	1.090	.1875	2.0	QBRKM-2981025	51.95	QBRKM-2981025K	58.80
P9	3.98 mm .1568	.2500	.591	.004	.102	.217	.092	.853	.2500	2.0	QBRKM-3981015	51.25	QBRKM-3981015K	59.40
P9	3.98 mm .1568	.2500	.984	.004	.102	.217	.092	1.353	.2500	2.5	QBRKM-3981025	53.20	QBRKM-3981025K	62.00
P9	3.98 mm .1568	.2500	1.575	.004	.102	.217	.092	1.853	.2500	3.0	QBRKM-3981040	60.20	QBRKM-3981040K	69.05
P9	4.98 mm .1962	.2500	.984	.008	.075	.197	.072	1.353	.2500	2.5	QBRKM-4982025	53.20	QBRKM-4982025K	62.00
P9	4.98 mm .1962	.2500	1.575	.008	.075	.197	.072	1.853	.2500	3.0	QBRKM-4982040	60.20	QBRKM-4982040K	69.05
P9	4.98 mm .2356	.3125	.984	.008	.142	.254	.098	1.353	.3125	2.5	QBRKM-5982025	70.60	QBRKM-5982025K	81.05
P9	4.98 mm .2356	.3125	1.575	.008	.142	.254	.098	1.853	.3125	3.0	QBRKM-5982040	79.15	QBRKM-5982040K	89.60
JS9	2.00 mm .0787	.1875	.472	.004	.051	.174	.080	.590	.1875	1.5	QBRKM-2001012	50.05	QBRKM-2001012K	56.85
JS9	3.00 mm .1181	.1875	.472	.004	.075	.162	.068	.590	.1875	1.5	QBRKM-3001012	50.05	QBRKM-3001012K	56.85
JS9	3.00 mm .1181	.1875	.984	.004	.075	.162	.068	1.090	.1875	2.0	QBRKM-3001025	51.95	QBRKM-3001025K	58.80
JS9	4.00 mm .1575	.2500	.591	.004	.102	.217	.092	.853	.2500	2.0	QBRKM-4001015	51.25	QBRKM-4001015K	59.40
JS9	4.00 mm .1575	.2500	.984	.004	.102	.217	.092	1.353	.2500	2.5	QBRKM-4001025	53.20	QBRKM-4001025K	62.00
JS9	4.00 mm .1575	.2500	1.575	.004	.102	.217	.092	1.853	.2500	3.0	QBRKM-4001040	60.20	QBRKM-4001040K	69.05
JS9	5.00 mm .1969	.2500	.984	.008	.075	.197	.072	1.353	.2500	2.5	QBRKM-5002025	53.20	QBRKM-5002025K	62.00
JS9	5.00 mm .1969	.2500	1.575	.008	.075	.197	.072	1.853	.2500	3.0	QBRKM-5002040	60.20	QBRKM-5002040K	69.05
JS9	6.00 mm .2362	.3125	.984	.008	.142	.253	.097	1.353	.3125	2.5	QBRKM-6002025	70.60	QBRKM-6002025K	81.05
JS9	6.00 mm .2362	.3125	1.575	.008	.142	.253	.097	1.853	.3125	3.0	QBRKM-6002040	79.15	QBRKM-6002040K	89.60
C11	2.11 mm .0831	.1875	.472	.014	.051	.173	.079	.590	.1875	1.5	QBRKM-2113512	50.05	QBRKM-2113512K	56.85
C11	3.11 mm .1224	.1875	.472	.014	.075	.160	.066	.590	.1875	1.5	QBRKM-3113512	50.05	QBRKM-3113512K	56.85
C11	3.11 mm .1224	.1875	.472	.020	.075	.160	.066	.590	.1875	1.5	QBRKM-3115012	50.05	QBRKM-3115012K	56.85
C11	4.13 mm .1626	.2500	.591	.020	.102	.215	.090	.853	.2500	2.0	QBRKM-4135015	51.25	QBRKM-4135015K	59.40
C11	4.13 mm .1626	.2500	.984	.020	.102	.215	.090	1.353	.2500	2.5	QBRKM-4135025	53.20	QBRKM-4135025K	62.00
C11	4.13 mm .1626	.2500	1.575	.020	.102	.215	.090	1.853	.2500	3.0	QBRKM-4135040	60.20	QBRKM-4135040K	69.05
C11	5.13 mm .2020	.2500	.984	.020	.075	.194	.069	1.353	.2500	2.5	QBRKM-5135025	53.20	QBRKM-5135025K	62.00
C11	5.13 mm .2020	.2500	1.575	.020	.075	.194	.069	1.853	.2500	3.0	QBRKM-5135040	60.20	QBRKM-5135040K	69.05
C11	6.13 mm .2413	.3125	.984	.020	.142	.250	.094	1.353	.3125	2.5	QBRKM-6135025	70.60	QBRKM-6135025K	81.05
C11	6.13 mm .2413	.3125	1.575	.020	.142	.250	.094	1.853	.3125	3.0	QBRKM-6135040	79.15	QBRKM-6135040K	89.60

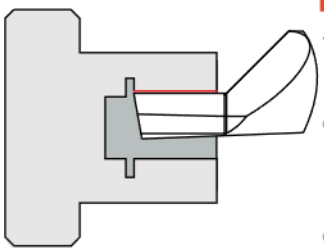
*Minimum Bore Diameter is for reference only. Please refer to workpiece specifications or standard bore sizes for proper bore sizing.

See pages 16-34 for quick change holder options

QBRSQ

Quick Change – Broaching Tools
Square





- Designed for multiple pass static broaching of standard and metric square ID form
- Coolant fed enabled shank design
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

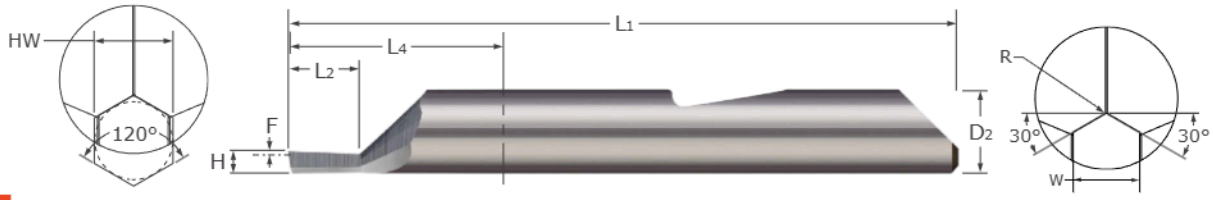
Square Width Range		Broach Width	Max Broach Depth	Corner Radius	Broach Height	Centerline Offset	Length From Holder	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
SW	metric	W $^{+.001"}_{-.001"}$	L2 $^{+.030"}_{-.000"}$	R	H	F	L4	D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.059-.078	1.5-2.0 mm	.056	.138	.002	.043	-.051	.590	.1875	1.5	QBRSQ-1520	50.80	QBRSQ-1520K	57.70
.078-.098	2.0-2.5 mm	.070	.138	.002	.064	-.030	.590	.1875	1.5	QBRSQ-2025	50.80	QBRSQ-2025K	57.70
.098-.114	2.5-2.9 mm	.081	.138	.002	.086	-.008	.590	.1875	1.5	QBRSQ-2529	50.80	QBRSQ-2529K	57.70
.114 .137	2.9-3.5 mm	.097	.177	.002	.101	.007	.590	.1875	1.5	QBRSQ-2935	50.80	QBRSQ-2935K	57.70
.137-.157	3.5-4.0 mm	.111	.217	.002	.128	.034	.590	.1875	1.5	QBRSQ-3540	50.80	QBRSQ-3540K	57.70

See pages 16-34 for quick change holder options

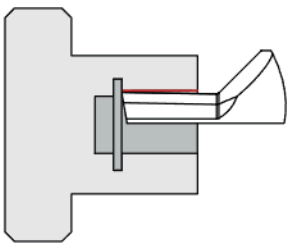
Quick Change – Broaching Tools

Hexagon

QBRH



- Designed for multiple pass static broaching of standard and metric hexagon forms
- Coolant fed enabled shank design
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA



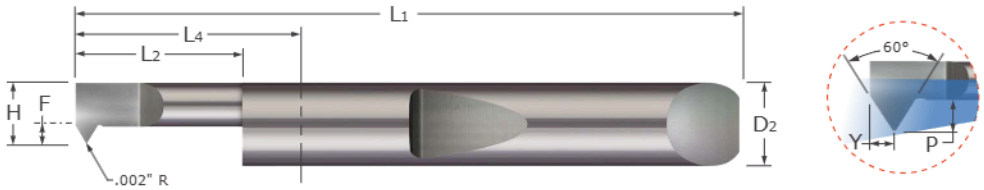
Hex Width Range		Broach Width	Max Broach Depth	Corner Radius	Broach Height	Centerline Offset	Length From Holder	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
HW	metric	W +.001" −.001"	L2 +.030" −.000"	R	H	F	L4	D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.078-.098	2.0-2.5 mm	.041	.157	.002	.075	-.019	.590	.1875	1.5	QBRH-2025	51.60	QBRH-2025K	58.55
.098-.114	2.5-2.9 mm	.051	.157	.002	.095	.001	.590	.1875	1.5	QBRH-2529	51.60	QBRH-2529K	58.55
.114 .137	2.9-3.5 mm	.059	.177	.002	.111	.017	.590	.1875	1.5	QBRH-2935	51.60	QBRH-2935K	58.55
.137-.157	3.5-4.0 mm	.071	.217	.002	.135	.041	.590	.1875	1.5	QBRH-3540	51.60	QBRH-3540K	58.55
.157-.177	4.0-4.5 mm	.082	.236	.004	.155	.061	.590	.1875	1.5	QBRH-4045	51.60	QBRH-4045K	58.55
.177-.196	4.5-5.0 mm	.092	.276	.004	.173	.048	.853	.2500	2.0	QBRH-4550	52.90	QBRH-4550K	61.05
.196-.315	5.0-8.0 mm	.102	.354	.004	.194	.069	.853	.2500	2.0	QBRH-5080	52.90	QBRH-5080K	61.05

See pages 16-34 for quick change holder options

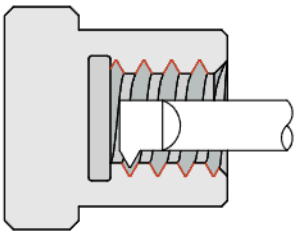
QIT

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		L_2 +.030" −.000"	Y +.002" −.000"	P	L_4	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
40-72	.0350	.0400	.075	.012	.015	.590	.0250	.1875	1.5	QIT-035075	72.50	QIT-035075X	78.65
40-72	.0350	.0400	.100	.012	.015	.590	.0250	.1875	1.5	QIT-035100	72.50		
40-72	.0350	.0400	.150	.012	.015	.590	.0250	.1875	1.5	QIT-035150	72.50	QIT-035150X	78.65
28-72	.0400	.0450	.075	.015	.020	.590	.0300	.1875	1.5	QIT-040075	72.50	QIT-040075X	78.65
28-72	.0400	.0450	.150	.015	.020	.590	.0300	.1875	1.5	QIT-040150	72.50	QIT-040150X	78.65
28-72	.0500	.0550	.100	.015	.020	.590	.0350	.1875	1.5			QIT-050100X	66.75
28-72	.0500	.0550	.150	.015	.020	.590	.0350	.1875	1.5	QIT-050150	61.35	QIT-050150X	67.05
28-72	.0500	.0550	.200	.015	.020	.590	.0350	.1875	1.5	QIT-050200	61.35	QIT-050200X	67.05
28-56	.0600	.0700	.150	.015	.020	.590	-.0337	.1875	1.5	QIT-060150	61.35	QIT-060150X	68.25
28-56	.0600	.0700	.200	.015	.020	.590	-.0335	.1875	1.5	QIT-060200	61.35	QIT-060200X	67.05
28-56	.0600	.0700	.250	.015	.020	.590	-.0335	.1875	1.5	QIT-060250	61.35	QIT-060250X	67.05
28-56	.0600	.0700	.300	.015	.020	.590	-.0335	.1875	1.5	QIT-060300	61.35	QIT-060300X	67.05
28-56	.0600	.0700	.350	.015	.020	.590	-.0337	.1875	1.5	QIT-060350	61.35	QIT-060350X	68.25
28-56	.0800	.0900	.200	.015	.020	.590	-.0137	.1875	1.5	QIT-080200	61.35	QIT-080200X	68.25
28-56	.0800	.0900	.250	.015	.020	.590	-.0135	.1875	1.5	QIT-080250	61.35	QIT-080250X	67.05
28-56	.0800	.0900	.350	.015	.020	.590	-.0135	.1875	1.5	QIT-080350	61.35	QIT-080350X	67.05
28-56	.0800	.0900	.500	.015	.020	.590	-.0135	.1875	1.5	QIT-080500	61.35	QIT-080500X	67.05
28-56	.0800	.0900	.600	.015	.020	1.090	-.0137	.1875	2.0	QIT-080600	61.35	QIT-080600X	68.25
24-56	.1000	.1100	.250	.018	.025	.590	.0065	.1875	1.5	QIT-100250	61.35	QIT-100250X	67.05
24-56	.1000	.1100	.350	.018	.025	.590	.0065	.1875	1.5	QIT-100350	61.35	QIT-100350X	67.05
24-56	.1000	.1100	.500	.018	.025	.590	.0065	.1875	1.5	QIT-100500	61.35	QIT-100500X	67.05
24-56	.1000	.1100	.600	.018	.025	1.090	.0065	.1875	2.0	QIT-100600	61.35	QIT-100600X	67.05
24-56	.1000	.1100	.750	.018	.025	1.090	.0062	.1875	2.0	QIT-100750	61.35	QIT-100750X	68.25

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

Continued on next page

See pages 16-34 for quick change holder options

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 #	USD$	Tool #	USD$
20-56	.1100	.1260	.250	.020	.030	.590	.0165	.1875	1.5	QIT-110250	61.35	QIT-110250X	67.05
20-56	.1100	.1260	.400	.020	.030	.590	.0165	.1875	1.5	QIT-110400	61.35	QIT-110400X	67.05
20-56	.1100	.1260	.500	.020	.030	.590	.0165	.1875	1.5	QIT-110500	61.35	QIT-110500X	67.05
20-56	.1100	.1260	.600	.020	.030	1.090	.0165	.1875	2.0	QIT-110600	61.35	QIT-110600X	67.05
20-56	.1100	.1260	.750	.020	.030	1.090	.0165	.1875	2.0	QIT-110750	61.35	QIT-110750X	67.05
20-56	.1200	.1360	.250	.020	.030	.590	.0265	.1875	1.5	QIT-120250	61.35	QIT-120250X	67.05
20-56	.1200	.1360	.400	.020	.030	.590	.0265	.1875	1.5	QIT-120400	61.35	QIT-120400X	67.05
20-56	.1200	.1360	.500	.020	.030	.590	.0265	.1875	1.5	QIT-120500	61.35	QIT-120500X	67.05
20-56	.1200	.1360	.600	.020	.030	1.090	.0265	.1875	2.0	QIT-120600	61.35	QIT-120600X	67.05
20-56	.1200	.1360	.750	.020	.030	1.090	.0265	.1875	2.0	QIT-120750	61.35	QIT-120750X	67.05
16-56	.1400	.1560	.250	.023	.035	.590	.0465	.1875	1.5	QIT-140250	61.35	QIT-140250X	67.05
16-56	.1400	.1560	.400	.023	.035	.590	.0465	.1875	1.5	QIT-140400	61.35	QIT-140400X	67.05
16-56	.1400	.1560	.500	.023	.035	.590	.0465	.1875	1.5	QIT-140500	61.35	QIT-140500X	67.05
16-56	.1400	.1560	.750	.023	.035	1.090	.0465	.1875	2.0	QIT-140750	61.35	QIT-140750X	67.05
16-56	.1400	.1560	1.000	.023	.035	1.090	.0462	.1875	2.0	QIT-1401000	61.35	QIT-1401000X	68.25
14-56	.1600	.1820	.250	.029	.040	.590	.0665	.1875	1.5	QIT-160250	61.35	QIT-160250X	67.05
14-56	.1600	.1820	.400	.029	.040	.590	.0665	.1875	1.5	QIT-160400	61.35	QIT-160400X	67.05
14-56	.1600	.1820	.500	.029	.040	.590	.0665	.1875	1.5	QIT-160500	61.35	QIT-160500X	67.05
14-56	.1600	.1820	.750	.029	.040	1.090	.0665	.1875	2.0	QIT-160750	61.35	QIT-160750X	67.05
14-56	.1600	.1820	1.000	.029	.040	1.090	.0665	.1875	2.0	QIT-1601000	61.35	QIT-1601000X	67.05
14-56	.1800	.2020	.350	.029	.040	.853	.0550	.2500	2.0	QIT-180350	65.45	QIT-180350X	73.75
14-56	.1800	.2020	.500	.029	.040	.853	.0550	.2500	2.0	QIT-180500	65.45	QIT-180500X	73.75
14-56	.1800	.2020	.750	.029	.040	.853	.0550	.2500	2.0	QIT-180750	65.45	QIT-180750X	73.75
14-56	.1800	.2020	1.000	.029	.040	1.353	.0550	.2500	2.5	QIT-1801000	65.45	QIT-1801000X	74.30
14-56	.1800	.2020	1.125	.029	.040	1.353	.0550	.2500	2.5	QIT-1801125	65.45	QIT-1801125X	74.30
13-56	.2000	.2220	.400	.032	.045	.853	.0750	.2500	2.0	QIT-200400	65.45	QIT-200400X	73.75
13-56	.2000	.2220	.600	.032	.045	.853	.0750	.2500	2.0	QIT-200600	65.45	QIT-200600X	73.75
13-56	.2000	.2220	.750	.032	.045	.853	.0750	.2500	2.0	QIT-200750	65.45	QIT-200750X	73.75
13-56	.2000	.2220	1.000	.032	.045	1.353	.0750	.2500	2.5	QIT-2001000	65.45	QIT-2001000X	74.30
13-56	.2000	.2220	1.125	.032	.045	1.353	.0750	.2500	2.5	QIT-2001125	65.45	QIT-2001125X	74.30
10-48	.2300	.2520	.400	.038	.055	.853	.0735	.3125	2.0	QIT-230400	82.05	QIT-230400X	92.00
10-48	.2300	.2520	.600	.038	.055	.853	.0735	.3125	2.0	QIT-230600	82.05	QIT-230600X	92.00
10-48	.2300	.2520	.750	.038	.055	.853	.0735	.3125	2.0	QIT-230750	82.05	QIT-230750X	92.00
10-48	.2300	.2520	1.000	.038	.055	1.353	.0735	.3125	2.5	QIT-2301000	82.05	QIT-2301000X	92.50
10-48	.2300	.2520	1.250	.038	.055	1.353	.0737	.3125	2.5	QIT-2301250	82.05	QIT-2301250X	92.50
10-48	.2300	.2520	1.500	.038	.055	1.853	.0735	.3125	3.0	QIT-2301500	92.80	QIT-2301500X	103.35
10-48	.2300	.2520	1.750	.038	.055	1.853	.0737	.3125	3.0	QIT-2301750	92.80	QIT-2301750X	103.35
8-40	.2900	.3120	.500	.046	.070	.853	.1340	.3125	2.0	QIT-290500	82.05	QIT-290500X	92.00
8-40	.2900	.3120	.750	.046	.070	.853	.1340	.3125	2.0	QIT-290750	82.05	QIT-290750X	92.00
8-40	.2900	.3120	1.000	.046	.070	1.353	.1340	.3125	2.5	QIT-2901000	82.05	QIT-2901000X	92.50
8-40	.2900	.3120	1.250	.046	.070	1.353	.1340	.3125	2.5	QIT-2901250	82.05	QIT-2901250X	92.50
8-40	.2900	.3120	1.500	.046	.070	1.853	.1337	.3125	3.0	QIT-2901500	92.80	QIT-2901500X	103.35
8-40	.2900	.3120	1.750	.046	.070	1.853	.1340	.3125	3.0	QIT-2901750	92.80	QIT-2901750X	103.35
8-40	.3200	.3420	.500	.049	.075	.853	.1325	.3750	2.0	QIT-320500	106.90	QIT-320500X	118.05

*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 #	USD$	Tool #	USD$
8-40	.3200	.3420	.750	.049	.075	.853	.1325	.3750	2.0	QIT-320750	106.90	QIT-320750X	118.05
8-40	.3200	.3420	1.000	.049	.075	1.353	.1325	.3750	2.5	QIT-3201000	106.90	QIT-3201000X	119.35
8-40	.3200	.3420	1.250	.049	.075	1.353	.1325	.3750	2.5	QIT-3201250	106.90	QIT-3201250X	119.35
8-40	.3200	.3420	1.500	.049	.075	1.853	.1325	.3750	3.0	QIT-3201500	117.65	QIT-3201500X	130.15
8-40	.3200	.3420	1.800	.049	.075	1.853	.1325	.3750	3.0	QIT-3201800	117.65	QIT-3201800X	130.15
7-32	.3600	.3820	.500	.055	.085	.853	.1725	.3750	2.0	QIT-360500	106.90	QIT-360500X	118.05
7-32	.3600	.3820	.750	.055	.085	.853	.1725	.3750	2.0	QIT-360750	106.90	QIT-360750X	118.05
7-32	.3600	.3820	1.000	.055	.085	1.353	.1725	.3750	2.5	QIT-3601000	106.90	QIT-3601000X	119.35
7-32	.3600	.3820	1.250	.055	.085	1.353	.1725	.3750	2.5	QIT-3601250	106.90	QIT-3601250X	119.35
7-32	.3600	.3820	1.500	.055	.085	1.853	.1725	.3750	3.0	QIT-3601500	117.65	QIT-3601500X	130.15
7-32	.3600	.3820	1.800	.055	.085	1.853	.1725	.3750	3.0	QIT-3601800	117.65	QIT-3601800X	130.15
7-32	.3600	.3820	2.000	.055	.085	2.353	.1725	.3750	3.5	QIT-3602000	120.15	QIT-3602000X	133.70
5-32	.4600	.4820	.750	.078	.120	1.040	.2100	.5000	2.5	QIT-460750	149.80	QIT-460750X	166.85
5-32	.4600	.4820	1.500	.078	.120	1.540	.2100	.5000	3.0	QIT-4601500	149.80	QIT-4601500X	166.85
5-32	.4600	.4820	2.000	.078	.120	2.040	.2100	.5000	3.5	QIT-4602000	163.55	QIT-4602000X	181.60
5-32	.4900	.5120	.750	.078	.120	1.040	.2400	.5000	2.5	QIT-490750	149.80	QIT-490750X	166.85
5-32	.4900	.5120	1.125	.078	.120	1.540	.2400	.5000	3.0	QIT-4901125	149.80	QIT-4901125X	166.85
5-32	.4900	.5120	1.500	.078	.120	1.540	.2400	.5000	3.0	QIT-4901500	149.80	QIT-4901500X	166.85
5-32	.4900	.5120	2.000	.078	.120	2.040	.2400	.5000	3.5	QIT-4902000	163.55	QIT-4902000X	181.60
5-32	.4900	.5120	2.500	.078	.120	2.540	.2400	.5000	4.0	QIT-4902500	169.70	QIT-4902500X	187.90

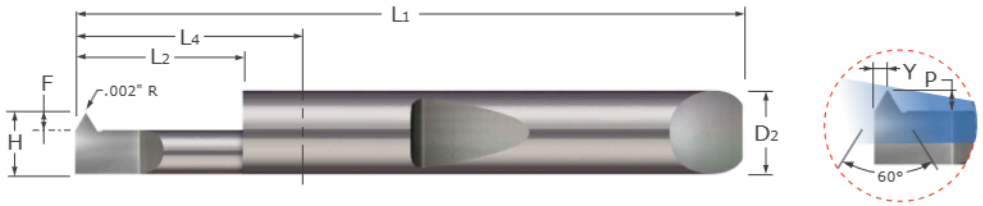
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pgs 16-34 for quick change holder options

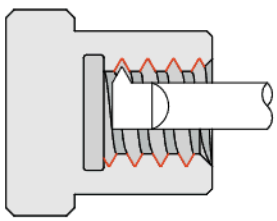
Quick Change – Threading Tools

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 #	USD$	Tool #	USD$
28-56	.0800	.0900	.350	.015	.020	.590	-.0137	.1875	1.5	QITL-080350	61.35	QITL-080350X	61.35
24-56	.1000	.1100	.250	.018	.025	.590	.0062	.1875	1.5	QITL-100250	61.35	QITL-100250X	61.35
24-56	.1000	.1100	.500	.018	.025	.590	.0062	.1875	1.5	QITL-100500	61.35	QITL-100500X	61.35
20-56	.1200	.1360	.250	.020	.030	.590	.0262	.1875	1.5	QITL-120250	61.35	QITL-120250X	61.35
20-56	.1200	.1360	.500	.017	.030	.590	.0262	.1875	1.5	QITL-120500	61.35	QITL-120500X	68.25
16-56	.1400	.1560	.500	.020	.035	.590	.0462	.1875	1.5	QITL-140500	61.35	QITL-140500X	68.25
14-56	.1600	.1820	.400	.023	.040	.590	.0662	.1875	1.5	QITL-160400	61.35	QITL-160400X	68.25
14-56	.1600	.1820	.750	.023	.040	1.090	.0662	.1875	2.0	QITL-160750	63.10	QITL-160750X	69.80
14-56	.1800	.2020	.350	.029	.040	.853	.0550	.2500	2.0	QITL-180350	65.45	QITL-180350X	65.45
14-56	.1800	.2020	.500	.029	.040	.853	.0550	.2500	2.0	QITL-180500	65.45	QITL-180500X	65.45
14-56	.1800	.2020	.750	.029	.040	.853	.0550	.2500	2.0	QITL-180750	65.45	QITL-180750X	65.45
14-56	.1800	.2020	1.000	.029	.040	1.353	.0550	.2500	2.5	QITL-1801000	67.30	QITL-1801000X	67.30
13-56	.2000	.2220	.600	.026	.045	.853	.0750	.2500	2.0	QITL-200600	65.45	QITL-200600X	73.75
13-56	.2000	.2220	1.000	.026	.045	1.353	.0750	.2500	2.5	QITL-2001000	67.30	QITL-2001000X	76.00
10-48	.2300	.2520	.750	.032	.055	.853	.0737	.3125	2.0	QITL-230750	82.05	QITL-230750X	92.00
10-48	.2300	.2520	1.000	.032	.055	1.353	.0737	.3125	2.5	QITL-2301000	83.65	QITL-2301000X	94.20
8-40	.2900	.3120	.750	.040	.070	.853	.1337	.3125	2.0	QITL-290750	82.05	QITL-290750X	92.00
8-40	.2900	.3120	1.250	.040	.070	1.353	.1337	.3125	2.5	QITL-2901250	83.65	QITL-2901250X	94.20
8-40	.3200	.3420	.750	.043	.075	.853	.1325	.3750	2.0	QITL-320750	106.90	QITL-320750X	118.60
8-40	.3200	.3420	1.000	.043	.075	1.353	.1325	.3750	2.5	QITL-3201000	108.40	QITL-3201000X	120.90
7-32	.3600	.3820	.750	.049	.085	.853	.1725	.3750	2.0	QITL-360750	106.90	QITL-360750X	118.60
7-32	.3600	.3820	1.250	.049	.085	1.353	.1725	.3750	2.5	QITL-3601250	108.40	QITL-3601250X	120.90
5-32	.4900	.5120	1.500	.069	.120	1.540	.2400	.5000	3.0	QITL-4901500	151.50	QITL-4901500X	168.50

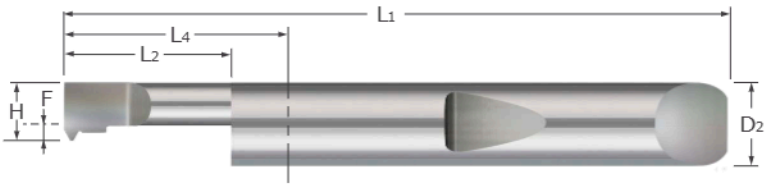
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

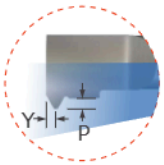
See pages 16-34 for quick change holder options

QTT

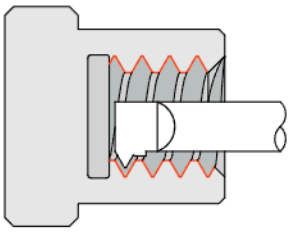
Quick Change – Threading Tools

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 #	USD$	Tool #	USD$
2-56	.050	.055	.150	.012	.0097	.590	-.0438	.1875	1.5	QTT-000256-015	62.55	QTT-000256-015X	69.45
2-56	.050	.055	.200	.012	.0097	.590	-.0438	.1875	1.5	QTT-000256-020	62.55	QTT-000256-020X	69.45
4-40	.065	.075	.200	.014	.0135	.590	-.0288	.1875	1.5	QTT-000440-020	62.55	QTT-000440-020X	69.45
4-40	.065	.075	.250	.014	.0135	.590	-.0288	.1875	1.5	QTT-000440-025	62.55	QTT-000440-025X	69.45
5-44	.080	.090	.200	.014	.0123	.590	-.0138	.1875	1.5	QTT-000544-020	62.55	QTT-000544-020X	69.45
5-44	.080	.090	.250	.014	.0123	.590	-.0138	.1875	1.5	QTT-000544-025	62.55	QTT-000544-025X	69.45
6-32	.080	.090	.250	.017	.0169	.590	-.0138	.1875	1.5	QTT-000632-025	62.55	QTT-000632-025X	69.45
6-32	.080	.090	.350	.017	.0169	.590	-.0138	.1875	1.5	QTT-000632-035	62.55	QTT-000632-035X	69.45
8-32	.100	.110	.250	.017	.0169	.590	.0063	.1875	1.5	QTT-000832-025	62.55	QTT-000832-025X	69.45
8-32	.100	.110	.350	.017	.0169	.590	.0063	.1875	1.5	QTT-000832-035	62.55	QTT-000832-035X	69.45
10-24	.120	.136	.250	.021	.0226	.590	.0263	.1875	1.5	QTT-001024-025	62.55	QTT-001024-025X	69.45
10-24	.120	.136	.400	.021	.0226	.590	.0263	.1875	1.5	QTT-001024-040	62.55	QTT-001024-040X	69.45
10-32	.120	.136	.250	.017	.0169	.590	.0263	.1875	1.5	QTT-001032-025	62.55	QTT-001032-025X	69.45
10-32	.120	.136	.400	.017	.0169	.590	.0263	.1875	1.5	QTT-001032-040	62.55	QTT-001032-040X	69.45
1/4-20	.160	.182	.400	.024	.0271	.590	.0663	.1875	1.5	QTT-014020-040	62.55	QTT-014020-040X	69.45
1/4-20	.160	.182	.500	.024	.0271	.590	.0663	.1875	1.5	QTT-014020-050	62.55	QTT-014020-050X	69.45
1/4-28	.180	.202	.500	.018	.0193	.853	.0550	.2500	2.0	QTT-014028-050	66.95	QTT-014028-050X	75.10
1/4-28	.180	.202	.750	.018	.0193	.853	.0550	.2500	2.0	QTT-014028-075	66.95	QTT-014028-075X	75.10
5/16-18	.220	.242	.750	.026	.0301	.853	.0638	.3125	2.0	QTT-051618-075	83.65	QTT-051618-075X	93.65
5/16-18	.220	.242	1.000	.026	.0301	1.353	.0638	.3125	2.5	QTT-051618-100	85.35	QTT-051618-100X	95.85
5/16-24	.220	.242	.750	.021	.0226	.853	.0638	.3125	2.0	QTT-051624-075	83.65	QTT-051624-075X	93.65
5/16-24	.220	.242	1.000	.021	.0226	1.353	.0638	.3125	2.5	QTT-051624-100	85.35	QTT-051624-100X	95.85
3/8-16	.280	.302	.750	.028	.0338	.853	.1238	.3125	2.0	QTT-038016-075	83.65	QTT-038016-075X	93.65
3/8-16	.280	.302	1.000	.028	.0338	1.353	.1238	.3125	2.5	QTT-038016-100	85.35	QTT-038016-100X	95.85
3/8-24	.300	.322	.750	.021	.0226	.853	.1438	.3125	2.0	QTT-038024-075	83.65	QTT-038024-075X	93.65
3/8-24	.300	.322	1.000	.021	.0226	1.353	.1438	.3125	2.5	QTT-038024-100	85.35	QTT-038024-100X	95.85

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

Continued on next page

See pages 16-34 for quick change holder options

Quick Change – Threading Tools

QTT

UN Topping– Single Point (cont.)

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 #	USD$	Tool #	USD$
7/16-14	.310	.332	.750	.032	.0387	.853	.1538	.3125	2.0	QTT-071614-075	83.65	QTT-071614-075X	93.65
7/16-14	.310	.332	1.000	.032	.0387	1.353	.1538	.3125	2.5	QTT-071614-100	85.35	QTT-071614-100X	95.85
7/16-20	.350	.372	1.000	.024	.0271	1.353	.1625	.3750	2.5	QTT-071620-100	108.95	QTT-071620-100X	121.55
7/16-20	.350	.372	1.250	.024	.0271	1.353	.1625	.3750	2.5	QTT-071620-125	108.95	QTT-071620-125X	121.55
1/2-13	.380	.402	1.000	.034	.0416	1.040	.1300	.5000	2.5	QTT-012013-100	152.70	QTT-012013-100X	169.60
1/2-13	.380	.402	1.250	.034	.0416	1.540	.1300	.5000	3.0	QTT-012013-125	154.40	QTT-012013-125X	171.35
1/2-20	.410	.432	1.000	.024	.0271	1.040	.1600	.5000	2.5	QTT-012020-100	152.70	QTT-012020-100X	169.60
1/2-20	.410	.432	1.250	.024	.0271	1.540	.1600	.5000	3.0	QTT-012020-125	154.40	QTT-012020-125X	171.35
9/16-12	.410	.432	1.000	.036	.0451	1.040	.1600	.5000	2.5	QTT-091612-100	152.70	QTT-091612-100X	169.60
9/16-12	.410	.432	1.250	.036	.0451	1.540	.1600	.5000	3.0	QTT-091612-125	154.40	QTT-091612-125X	171.35
9/16-18	.460	.482	1.000	.026	.0301	1.040	.2100	.5000	2.5	QTT-091618-100	152.70	QTT-091618-100X	169.60
9/16-18	.460	.482	1.250	.026	.0301	1.540	.2100	.5000	3.0	QTT-091618-125	154.40	QTT-091618-125X	171.35
5/8-11	.490	.512	1.000	.039	.0492	1.040	.2400	.5000	2.5	QTT-058011-100	152.70	QTT-058011-100X	169.60
5/8-11	.490	.512	1.250	.039	.0492	1.540	.2400	.5000	3.0	QTT-058011-125	154.40	QTT-058011-125X	171.35
3/4-16	.490	.512	1.000	.028	.0338	1.040	.2400	.5000	2.5	QTT-034016-100	152.70	QTT-034016-100X	169.60
3/4-16	.490	.512	1.250	.028	.0338	1.540	.2400	.5000	3.0	QTT-034016-125	154.40	QTT-034016-125X	171.35

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

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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!

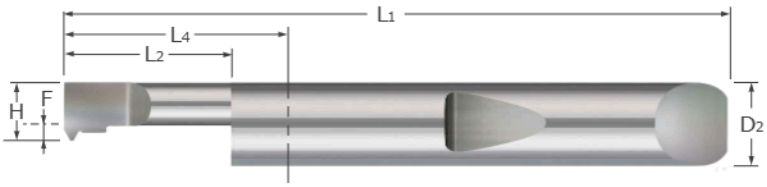
SCAN

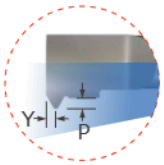
See pages 16-34 for quick change holder options

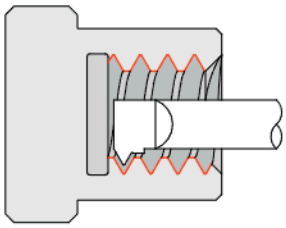
QTMT

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 #	USD$	Tool #	USD$
M2.5x0.45	1.50mm	1.70mm	5.00mm	.300mm	.244mm	14.99mm	-0.88mm	.1875	1.5	QTMT-025045-05	62.55	QTMT-025045-05X	68.80
M2.5x0.45	1.50mm	1.70mm	7.00mm	.300mm	.244mm	14.99mm	-0.88mm	.1875	1.5	QTMT-025045-07	62.55	QTMT-025045-07X	68.80
M3x0.50	2.00mm	2.20mm	6.00mm	.319mm	.271mm	14.99mm	-0.38mm	.1875	1.5	QTMT-030050-06	62.55	QTMT-030050-06X	68.80
M3x0.50	2.00mm	2.20mm	8.00mm	.319mm	.271mm	14.99mm	-0.38mm	.1875	1.5	QTMT-030050-08	62.55	QTMT-030050-08X	68.80
M4x0.70	2.50mm	2.70mm	7.00mm	.396mm	.379mm	14.99mm	0.12mm	.1875	1.5	QTMT-040070-07	62.55	QTMT-040070-07X	68.80
M4x0.70	2.50mm	2.70mm	10.00mm	.396mm	.379mm	14.99mm	0.12mm	.1875	1.5	QTMT-040070-10	62.55	QTMT-040070-10X	68.80
M4.5x0.75	3.00mm	3.40mm	6.00mm	.415mm	.406mm	14.99mm	0.62mm	.1875	1.5	QTMT-045075-06	62.55	QTMT-045075-06X	68.80
M4.5x0.75	3.00mm	3.40mm	9.00mm	.415mm	.406mm	14.99mm	0.62mm	.1875	1.5	QTMT-045075-09	62.55	QTMT-045075-09X	68.80
M5x0.80	3.00mm	3.40mm	6.00mm	.434mm	.433mm	14.99mm	0.62mm	.1875	1.5	QTMT-050080-06	62.55	QTMT-050080-06X	68.80
M5x0.80	3.00mm	3.40mm	9.00mm	.434mm	.433mm	14.99mm	0.62mm	.1875	1.5	QTMT-050080-09	62.55	QTMT-050080-09X	68.80
M6x1.00	4.00mm	4.50mm	10.00mm	.511mm	.541mm	14.99mm	1.62mm	.1875	1.5	QTMT-060100-10	62.55	QTMT-060100-10X	68.80
M6x1.00	4.00mm	4.50mm	14.00mm	.511mm	.541mm	27.69mm	1.62mm	.1875	2.0	QTMT-060100-14	64.30	QTMT-060100-14X	70.40
M8x1.25	5.50mm	6.00mm	14.00mm	.607mm	.677mm	21.67mm	1.53mm	.3125	2.0	QTMT-080125-14	83.65	QTMT-080125-14X	89.70
M8x1.25	5.50mm	6.00mm	22.00mm	.607mm	.677mm	34.37mm	1.53mm	.3125	2.5	QTMT-080125-22	85.35	QTMT-080125-22X	91.40
M10x1.50	7.50mm	8.00mm	24.00mm	.703mm	.812mm	34.37mm	3.53mm	.3125	2.5	QTMT-100150-24	85.35	QTMT-100150-24X	91.40
M10x1.50	7.50mm	8.00mm	31.00mm	.703mm	.812mm	34.37mm	3.53mm	.3125	2.5	QTMT-100150-31	85.35	QTMT-100150-31X	91.40
M12x1.75	9.00mm	9.50mm	22.00mm	.804mm	.957mm	34.37mm	4.24mm	.3750	2.5	QTMT-120175-22	108.95	QTMT-120175-22X	115.00
M12x1.75	9.00mm	9.50mm	31.00mm	.804mm	.957mm	34.37mm	4.24mm	.3750	2.5	QTMT-120175-31	108.95	QTMT-120175-31X	115.00
M16x2.00	12.50mm	13.00mm	31.00mm	.896mm	1.085mm	39.12mm	6.15mm	.5000	3.0	QTMT-160200-31	154.40	QTMT-160200-31X	160.45
M16x2.00	12.50mm	13.00mm	44.00mm	.896mm	1.085mm	51.82mm	6.15mm	.5000	3.5	QTMT-160200-44	159.25	QTMT-160200-44X	165.30
M20x2.50	12.50mm	13.00mm	31.00mm	1.086mm	1.353mm	39.12mm	6.15mm	.5000	3.0	QTMT-200250-31	154.40	QTMT-200250-31X	160.45
M20x2.50	12.50mm	13.00mm	44.00mm	1.086mm	1.353mm	51.82mm	6.15mm	.5000	3.5	QTMT-200250-44	159.25	QTMT-200250-44X	165.30

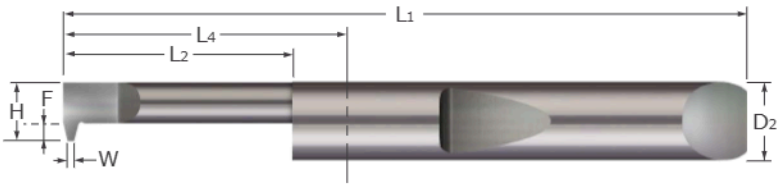
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

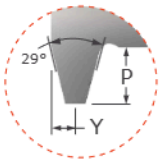
See pages 16-34 for quick change holder options

Quick Change – Threading Tools

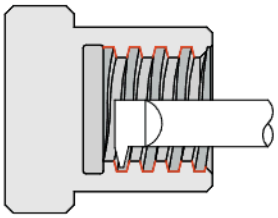
ACME Threads

QIAT





- Designed for cutting pitch-specific ACME threads
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split geometry makes the tool as rigid as possible
- 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
- Unique "3 point" locking and locating system ensures axial and radial tool repeatability , tip-to-tip consistency, and part-to-part accuracy
- Solid carbide
- CNC ground in the USA



Thread Size	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Flat	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
T.P.I.	H		$L2^{+.300"}_{-.000"}$	Y	P	$W^{+.010"}_{-.000"}$	L4	F	D2 (h6)	L1	Tool #	USD$	Tool #	USD$
16	.165	.187	.400	.035	.045	.021	.853	.0400	.2500	2.0	QIAT2-400-16	58.25	QIAT2-400-16X	58.25
16	.165	.187	.600	.024	.045	.021	.853	.0400	.2500	2.0	QIAT2-600-16	58.25	QIAT2-600-16X	58.25
16	.165	.187	.750	.035	.045	.021	.853	.0400	.2500	2.0	QIAT2-750-16	58.25	QIAT2-750-16X	58.25
16	.165	.187	1.000	.035	.045	.021	1.353	.0400	.2500	2.5	QIAT2-1000-16	58.95	QIAT2-1000-16X	58.95
14	.219	.241	.500	.043	.070	.024	.853	.0627	.3125	2.0	QIAT2-500-14	72.25	QIAT2-500-14X	72.25
14	.219	.241	.750	.030	.070	.024	.853	.0627	.3125	2.0	QIAT2-750-14	72.25	QIAT2-750-14X	72.25
14	.219	.241	1.000	.043	.070	.024	1.353	.0627	.3125	2.5	QIAT2-1000-14	72.90	QIAT2-1000-14X	72.90
14	.219	.241	1.250	.043	.070	.024	1.353	.0627	.3125	2.5	QIAT2-1250-14	72.90	QIAT2-1250-14X	72.90
12	.269	.291	.750	.049	.085	.028	.853	.1127	.3125	2.0	QIAT2-750-12	95.00	QIAT2-750-12X	95.00
12	.269	.291	1.000	.036	.085	.028	1.353	.1127	.3125	2.5	QIAT2-1000-12	95.85	QIAT2-1000-12X	95.85
12	.269	.291	1.250	.049	.085	.028	1.353	.1127	.3125	2.5	QIAT2-1250-12	95.85	QIAT2-1250-12X	95.85
12	.269	.291	1.800	.049	.085	.028	2.353	.1127	.3125	3.5	QIAT2-1800-12	97.20	QIAT2-1800-12X	97.20
10	.378	.400	.750	.060	.120	.032	1.040	.1280	.5000	2.5	QIAT2-750-10	133.35	QIAT2-750-10X	133.35
10	.378	.400	1.500	.060	.120	.032	1.540	.1280	.5000	3.0	QIAT2-1500-10	134.15	QIAT2-1500-10X	134.15
10	.378	.400	2.000	.060	.120	.032	2.040	.1280	.5000	3.5	QIAT2-2000-10	134.90	QIAT2-2000-10X	134.90
8	.478	.500	.750	.064	.120	.041	1.040	.2280	.5000	2.5	QIAT2-750-8	133.35	QIAT2-750-8X	133.35
8	.478	.500	1.500	.064	.120	.041	1.540	.2280	.5000	3.0	QIAT2-1500-8	134.15	QIAT2-1500-8X	134.15
8	.478	.500	2.000	.064	.120	.041	2.040	.2280	.5000	3.5	QIAT2-2000-8	134.90	QIAT2-2000-8X	134.90
6	.490	.512	.750	.072	.120	.057	1.040	.2400	.5000	2.5	QIAT-750-6	133.35	QIAT-750-6X	133.35
6	.490	.512	1.500	.072	.120	.057	1.540	.2400	.5000	3.0	QIAT-1500-6	134.15	QIAT-1500-6X	134.15
6	.490	.512	2.000	.072	.120	.057	2.040	.2400	.5000	3.5	QIAT-2000-6	134.90	QIAT-2000-6X	134.90
5	.490	.512	1.500	.078	.120	.069	1.540	.2400	.5000	3.0	QIAT-1500-5	134.15	QIAT-1500-5X	134.15
5	.490	.512	2.000	.078	.120	.069	2.040	.2400	.5000	3.5	QIAT-2000-5	134.90	QIAT-2000-5X	134.90

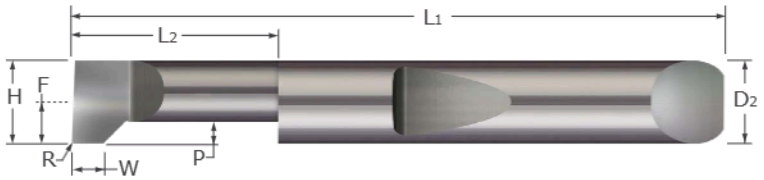
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

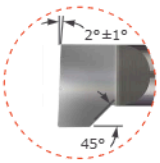
See pages 16-34 for quick change holder options

QLTR

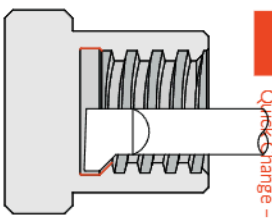
Quick Change – Threading Tools

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 geometry makes the tool as rigid as possible
- 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
- Unique "3 point" locking and locating system ensures axial and radial tool repeatability , tip-to-tip consistency, and part-to-part accuracy
- Solid carbide
- CNC ground in the USA



Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Flat	Radius	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H		$L_2^{+.300"}_{-.000"}$	$W^{+.002"}_{-.002"}$	$R^{+.001"}_{-.001"}$	P	L_4	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.094	.104	.250	.049	.002	.040	.590	.0002	.1875	1.5	QLTR-094-4	48.05	QLTR-094-4X	48.05
.094	.104	.375	.049	.002	.040	.590	.0002	.1875	1.5	QLTR-094-6	48.05	QLTR-094-6X	48.05
.125	.141	.250	.063	.002	.040	.590	.0312	.1875	1.5	QLTR-125-4	48.05	QLTR-125-4X	48.05
.125	.141	.375	.063	.002	.040	.590	.0312	.1875	1.5	QLTR-125-6	48.05	QLTR-125-6X	48.05
.156	.178	.375	.063	.005	.040	.590	.0624	.1875	1.5	QLTR-156-6	48.05	QLTR-156-6X	48.05
.156	.178	.500	.063	.005	.040	.590	.0624	.1875	1.5	QLTR-156-8	48.05	QLTR-156-8X	48.05
.180	.202	.375	.078	.005	.040	.590	.0862	.1875	1.5	QLTR-180-6	48.05	QLTR-180-6X	48.05
.180	.202	.500	.078	.005	.040	1.090	.0862	.1875	1.5	QLTR-180-8	48.05	QLTR-180-8X	48.05
.180	.202	.750	.078	.005	.040	1.090	.0862	.1875	2.0	QLTR-180-12	48.90	QLTR-180-12X	48.90
.180	.202	1.000	.078	.005	.040	1.090	.0862	.1875	2.0	QLTR-180-16	48.90	QLTR-180-16X	48.90
.245	.267	.500	.094	.005	.050	1.353	.1200	.2500	2.0	QLTR-245-8	57.60	QLTR-245-8X	57.60
.245	.267	.750	.094	.005	.050	1.353	.1200	.2500	2.0	QLTR-245-12	57.60	QLTR-245-12X	57.60
.245	.267	1.000	.094	.005	.050	1.853	.1200	.2500	2.5	QLTR-245-16	58.25	QLTR-245-16X	58.25
.245	.267	1.250	.094	.005	.050	1.853	.1200	.2500	2.5	QLTR-245-20	58.25	QLTR-245-20X	58.25
.310	.332	.750	.094	.005	.075	.853	.1537	.3125	2.0	QLTR-310-12	72.35	QLTR-310-12X	72.35
.310	.332	1.250	.094	.005	.075	1.353	.1537	.3125	2.5	QLTR-310-20	73.00	QLTR-310-20X	73.00
.370	.392	.750	.125	.005	.100	.853	.1825	.3750	2.0	QLTR-370-12	95.60	QLTR-370-12X	95.60
.370	.392	1.250	.125	.005	.100	1.353	.1825	.3750	2.5	QLTR-370-20	96.25	QLTR-370-20X	96.25
.495	.517	1.000	.156	.005	.125	1.040	.2450	.5000	2.5	QLTR-495-16	135.65	QLTR-495-16X	135.65
.495	.517	1.500	.156	.005	.125	1.540	.2450	.5000	3.0	QLTR-495-24	136.30	QLTR-495-24X	136.30

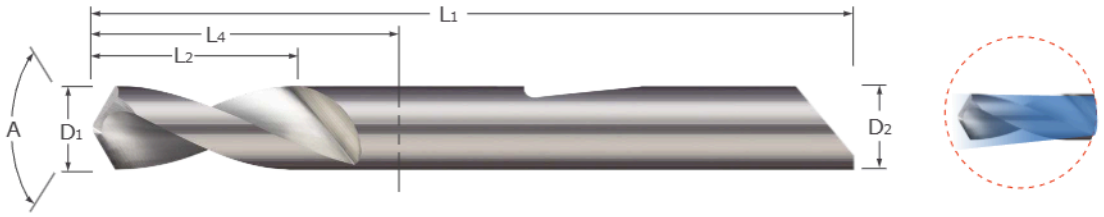
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pages 16-34 for quick change holder options

Quick Change – Holemaking Tools

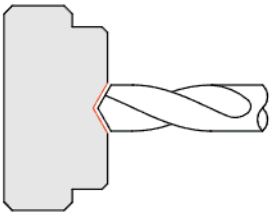
Spotting Drills

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 #	USD$	Tool #	USD$
82°	.0900	.270	.006	I	.590	.1875	1.5	QSPD-090-082	45.20	QSPD-090-082X	51.95
	.1181	.354	.008	I	.590	.1875	1.5	QSPD-118-082	45.20	QSPD-118-082X	51.95
	.1250	.375	.010	I	.590	.1875	1.5	QSPD-125-082	45.20	QSPD-125-082X	51.95
	.1875	.625	.005	II	1.090	.1875	2.0	QSPD-187-082	45.20	QSPD-187-082X	51.95
	.2500	.750	.005	II	1.353	.2500	2.5	QSPD-250-082	53.20	QSPD-250-082X	61.90
	.3750	1.000	.005	II	1.353	.3750	2.5	QSPD-375-082	71.40	QSPD-375-082X	83.80
	.5000	1.000	.005	II	1.540	.5000	3.0	QSPD-500-082	96.40	QSPD-500-082X	113.40
90°	.0200	.060	.002	I	.590	.1875	1.5			QSPD-020-090X	61.05
	.0250	.075	.002	I	.590	.1875	1.5	QSPD-025-090	51.60		
	.0300	.090	.003	I	.590	.1875	1.5	QSPD-030-090	51.60		
	.0350	.105	.003	I	.590	.1875	1.5			QSPD-035-090X	56.75
	.0400	.120	.004	I	.590	.1875	1.5	QSPD-040-090	45.20	QSPD-040-090X	50.10
	.0450	.135	.004	I	.590	.1875	1.5	QSPD-045-090	45.20		
	.0600	.180	.006	I	.590	.1875	1.5	QSPD-060-090	45.20	QSPD-060-090X	50.10
	.0900	.270	.006	I	.590	.1875	1.5	QSPD-090-090	45.20	QSPD-090-090X	50.10
	.1181	.354	.008	I	.590	.1875	1.5	QSPD-118-090	45.20	QSPD-118-090X	50.10
	.1250	.375	.010	I	.590	.1875	1.5	QSPD-125-090	45.20	QSPD-125-090X	50.10
	.1875	.625	.005	II	1.090	.1875	2.0	QSPD-187-090	45.20	QSPD-187-090X	50.10
	.2500	.750	.005	II	1.353	.2500	2.5	QSPD-250-090	53.20	QSPD-250-090X	61.65
	.3750	1.000	.005	II	1.353	.3750	2.5	QSPD-375-090	71.40	QSPD-375-090X	83.80
	.5000	1.000	.005	II	1.540	.5000	3.0	QSPD-500-090	96.40	QSPD-500-090X	113.40
100°	.0900	.270	.006	I	.590	.1875	1.5	QSPD-090-100	45.20	QSPD-090-100X	51.95
	.1181	.354	.008	I	.590	.1875	1.5	QSPD-118-100	45.20	QSPD-118-100X	51.95
	.1250	.375	.010	I	.590	.1875	1.5	QSPD-125-100	45.20	QSPD-125-100X	51.95
	.1875	.625	.005	II	1.090	.1875	2.0	QSPD-187-100	45.20	QSPD-187-100X	51.95
	.2500	.750	.005	II	1.353	.2500	2.5	QSPD-250-100	53.20	QSPD-250-100X	61.90
	.3750	1.000	.005	II	1.353	.3750	2.5	QSPD-375-100	71.40	QSPD-375-100X	83.80
	.5000	1.000	.005	II	1.540	.5000	3.0	QSPD-500-100	96.40	QSPD-500-100X	113.40

Continued on next page

See pages 16-34 for quick change holder options

QSPD

Quick Change – Holemaking Tools

Spotting Drills (cont.)

Continued from previous page

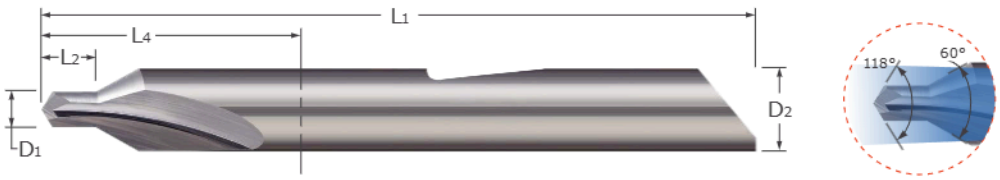
Included Angle	Drill Diameter	Flute Length	Web Thickness	Type	Length From Holder	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
A					L_4		L_1	Tool #	USD$	Tool #	USD$
120°	.0150	.045	.002	I	.590	.1875	1.5	QSPD-015-120	58.15		
	.0300	.090	.003	I	.590	.1875	1.5	QSPD-030-120	51.60		
	.0350	.105	.003	I	.590	.1875	1.5	QSPD-035-120	51.60		
	.0400	.120	.004	I	.590	.1875	1.5	QSPD-040-120	45.20		
	.0450	.135	.004	I	.590	.1875	1.5	QSPD-045-120	45.20	QSPD-045-120X	50.10
	.0500	.150	.005	I	.590	.1875	1.5			QSPD-050-120X	47.90
	.0600	.180	.006	I	.590	.1875	1.5	QSPD-060-120	45.20	QSPD-060-120X	50.10
	.0900	.270	.006	I	.590	.1875	1.5	QSPD-090-120	45.20	QSPD-090-120X	50.10
	.1181	.354	.008	I	.590	.1875	1.5	QSPD-118-120	45.20	QSPD-118-120X	51.95
	.1250	.375	.010	I	.590	.1875	1.5	QSPD-125-120	45.20	QSPD-125-120X	50.10
	.1875	.625	.005	II	1.090	.1875	2.0	QSPD-187-120	45.20	QSPD-187-120X	50.10
	.2500	.750	.005	II	1.353	.2500	2.5	QSPD-250-120	53.20	QSPD-250-120X	61.65
	.3750	1.000	.005	II	1.353	.3750	2.5	QSPD-375-120	71.40	QSPD-375-120X	83.80
	.5000	1.000	.005	II	1.540	.5000	3.0	QSPD-500-120	96.40	QSPD-500-120X	113.40
140°	.0300	.090	.003	I	.590	.1875	1.5	QSPD-030-140	51.60		
	.0450	.135	.004	I	.590	.1875	1.5			QSPD-045-140X	50.10
	.0600	.180	.006	I	.590	.1875	1.5	QSPD-060-140	45.20	QSPD-060-140X	50.10
	.0900	.270	.006	I	.590	.1875	1.5	QSPD-090-140	45.20	QSPD-090-140X	50.10
	.1181	.354	.008	I	.590	.1875	1.5	QSPD-118-140	45.20	QSPD-118-140X	50.10
	.1250	.375	.010	I	.590	.1875	1.5	QSPD-125-140	45.20	QSPD-125-140X	50.10
	.1875	.625	.005	II	1.090	.1875	2.0	QSPD-187-140	45.20	QSPD-187-140X	50.10
	.2500	.750	.005	II	1.353	.2500	2.5	QSPD-250-140	53.20	QSPD-250-140X	61.65
	.3750	1.000	.005	II	1.353	.3750	2.5	QSPD-375-140	71.40	QSPD-375-140X	83.80
	.5000	1.000	.005	II	1.540	.5000	3.0	QSPD-500-140	96.40	QSPD-500-140X	113.40

See pages 16-34 for quick change holder options

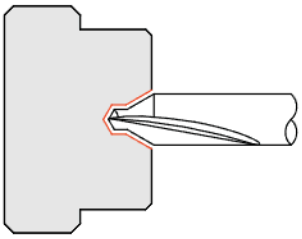
Quick Change – Holemaking Tools

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



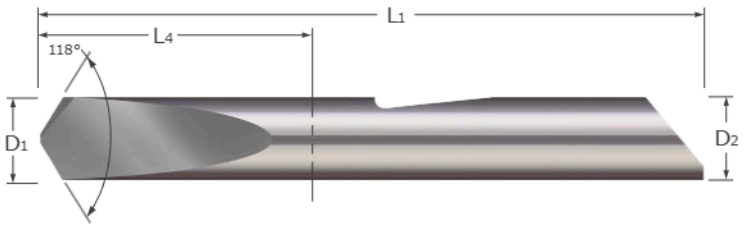
Drill Diameter	Drill Length	Length From Holder	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 $^{+.003"}_{-.000"}$	L_2 $^{+.015"}_{-.000"}$	L_4	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.025	.025	1.090	.1875	2.0	QDC-00	35.65	QDC-00X	40.35
.031	.031	1.090	.1875	2.0	QDC-01	35.65	QDC-01X	40.35
.047	.047	1.090	.1875	2.0	QDC-1	35.65	QDC-1X	40.35

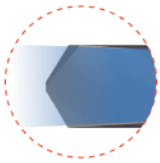
D_1 $^{+.003"}_{-.000"}$	L_2 $^{+.030"}_{-.000"}$	L_4	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.078	.078	1.090	.1875	2.0	QDC-2	35.65	QDC-2X	40.35
.109	.109	1.353	.2500	2.5	QDC-3	62.15	QDC-3X	70.95
.125	.125	1.353	.3125	2.5	QDC-4	83.15	QDC-4X	93.65
.188	.188	1.540	.5000	3.0	QDC-5	125.25	QDC-5X	142.25
.219	.219	1.540	.5000	3.0	QDC-6	125.25	QDC-6X	142.25

See pages 16-34 for quick change holder options

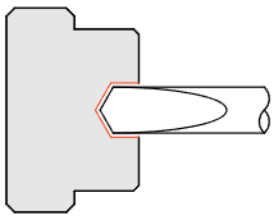
QSD

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
- 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



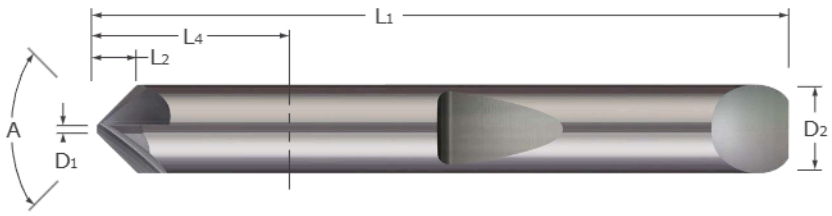
Drill Diameter	Web Thickness	Length From Holder	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 $^{+.0000"}_{-.0005"}$	$^{+.001"}_{-.001"}$	L_4	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.0312	.010	.340	.1875	1.25	QSD-031	26.20	QSD-031X	30.60
.0625	.012	.590	.1875	1.50	QSD-062	27.35	QSD-062X	31.50
.0938	.016	.590	.1875	1.50	QSD-093	28.00	QSD-093X	32.55
.1250	.020	.590	.1875	1.50	QSD-125	30.80	QSD-125X	35.25
.1562	.025	1.090	.1875	2.00	QSD-156	33.50		
.1875	.028	1.090	.1875	2.00	QSD-187	39.15	QSD-187X	44.00
.2500	.035	.853	.2500	2.00	QSD-250	52.65	QSD-250X	58.10
.3125	.040	1.353	.3125	2.50	QSD-312	72.80	QSD-312X	78.75
.3750	.046	1.353	.3750	2.50	QSD-375	87.65	QSD-375X	94.50

See pages 16-34 for quick change holder options

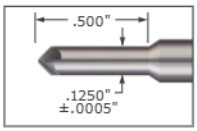
Quick Change – Holemaking Tools

QCS

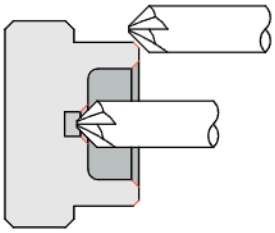
Countersink & Chamfer Tools



- 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	
$A^{+1°}_{-1°}$	$D_1{}^{+.000"}_{-.003"}$	L_2		L_4	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
	.030	.082	3	.590	.1875	1.5	QCS-125-060	51.35	QCS-125-060X*	56.55
	.040	.128	4	1.090	.1875	2.0	QCS-187-060	51.35	QCS-187-060X	56.55
60°	.050	.173	6	1.353	.2500	2.5	QCS-250-060	58.55	QCS-250-060X	67.40
	.060	.219	6	1.353	.3125	2.5	QCS-312-060	78.70	QCS-312-060X	89.20
	.070	.264	6	1.353	.3750	2.5	QCS-375-060	97.55	QCS-375-060X	109.85
	.030	.055	3	.590	.1875	1.5	QCS-125-082	51.35	QCS-125-082X*	56.55
	.040	.085	4	1.090	.1875	2.0	QCS-187-082	51.35	QCS-187-082X	56.55
82°	.050	.115	6	1.353	.2500	2.5	QCS-250-082	58.55	QCS-250-082X	67.40
	.060	.145	6	1.353	.3125	2.5	QCS-312-082	78.70	QCS-312-082X	89.20
	.070	.175	6	1.353	.3750	2.5	QCS-375-082	97.55		
	.030	.047	3	.590	.1875	1.5	QCS-125-090	51.35	QCS-125-090X*	56.55
	.040	.074	4	1.090	.1875	2.0	QCS-187-090	51.35	QCS-187-090X	56.55
90°	.050	.100	6	1.353	.2500	2.5	QCS-250-090	58.55	QCS-250-090X	67.40
	.060	.126	6	1.353	.3125	2.5	QCS-312-090	78.70	QCS-312-090X	89.20
	.070	.152	6	1.353	.3750	2.5	QCS-375-090	97.55	QCS-375-090X	109.85
	.080	.210	6	1.540	.5000	3.0	QCS-500-090	135.90		
	.030	.040	3	.590	.1875	1.5	QCS-125-100	51.35	QCS-125-100X*	56.55
	.040	.062	4	1.090	.1875	2.0	QCS-187-100	51.35	QCS-187-100X	56.55
100°	.050	.084	6	1.353	.2500	2.5	QCS-250-100	58.55	QCS-250-100X	67.40
	.060	.106	6	1.353	.3125	2.5	QCS-312-100	78.70	QCS-312-100X	89.20
	.070	.128	6	1.353	.3750	2.5			QCS-375-100X	109.85
	.030	.027	3	.590	.1875	1.5	QCS-125-120	51.35	QCS-125-120X*	56.55
	.040	.043	4	1.090	.1875	2.0	QCS-187-120	51.35	QCS-187-120X	56.55
120°	.050	.058	6	1.353	.2500	2.5	QCS-250-120	58.55	QCS-250-120X	67.40
	.060	.073	6	1.353	.3125	2.5	QCS-312-120	78.70	QCS-312-120X	89.20
	.080	.121	6	1.540	.5000	3.0			QCS-500-120X	152.90

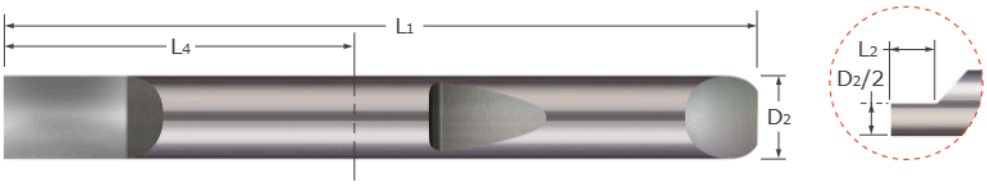
*QCS-125 tools feature a necked down shank

See pages 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 #	USD$
.1875	.375	.590	1.5	QSP-187-1.5	31.60
.1875	.375	1.090	2.0	QSP-187-2.0	33.90
.2500	.375	.853	2.0	QSP-250-2.0	35.95
.2500	.375	1.353	2.5	QSP-250-2.5	39.15
.2500	.375	1.853	3.0	QSP-250-3.0	42.25
.3125	.500	.853	2.0	QSP-312-2.0	48.20
.3125	.500	1.353	2.5	QSP-312-2.5	50.80
.3125	.500	1.853	3.0	QSP-312-3.0	56.85
.3750	.500	.853	2.0	QSP-375-2.0	61.05
.3750	.500	1.353	2.5	QSP-375-2.5	63.30
.3750	.500	1.853	3.0	QSP-375-3.0	67.75
.5000	.625	1.040	2.5	QSP-500-2.5	85.35
.5000	.625	1.540	3.0	QSP-500-3.0	89.70
.5000	.625	3.040	4.5	QSP-500-4.5	103.60

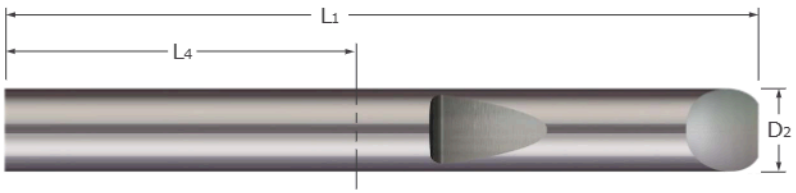
*Centerline +.001" / -.000"

See pages 16-34 for quick change holder options

Quick Change – Blanks

Full Round

QSR



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

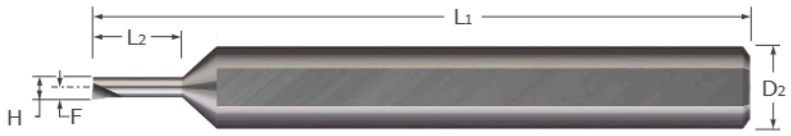
Shank Diameter	Length from Holder	Overall Length	Tool Holder	
D_2 (h6)	L_4	L_1	Tool #	USD$
.1875	.590	1.5	QSR-187-1.5	31.60
.1875	1.090	2.0	QSR-187-2.0	33.90
.2500	.853	2.0	QSR-250-2.0	35.95
.2500	1.353	2.5	QSR-250-2.5	39.15
.2500	1.853	3.0	QSR-250-3.0	42.25
.3125	.853	2.0	QSR-312-2.0	48.20
.3125	1.353	2.5	QSR-312-2.5	50.80
.3125	1.853	3.0	QSR-312-3.0	56.85
.3750	1.353	2.5	QSR-375-2.5	63.30
.3750	1.853	3.0	QSR-375-3.0	67.75
.3750	2.353	3.5	QSR-375-3.5	69.70
.5000	1.040	2.5	QSR-500-2.5	85.35
.5000	1.540	3.0	QSR-500-3.0	89.70
.5000	2.040	3.5	QSR-500-3.5	93.35
.5000	2.540	4.0	QSR-500-4.0	98.20

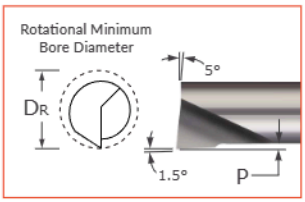
See pages 16-34 for quick change holder options

MBB / MBBM

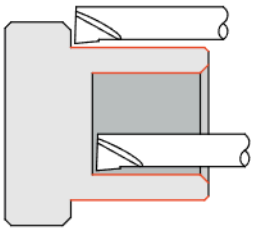
Standard – Boring Tools

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.	D_R	L_2 +.010" −.000" +.25mm −.00mm	P	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.0135		.0135	.015	.050	.0015	.0075	.1250	1.5	MBB-015050	57.90	MBB-015050X	63.95
.0135		.0135	.015	.075	.0015	.0075	.1250	1.5	MBB-015075	57.90	MBB-015075X	63.95
	.45 mm	.0177	0.5 mm	2 mm	.05 mm	.25 mm	3 mm	38 mm	MBBM-005020	46.40		
.0180		.0180	.020	.050	.0020	.0100	.1250	1.5	MBB-020050	57.90	MBB-020050X	63.95
.0180		.0180	.020	.075	.0020	.0100	.1250	1.5	MBB-020075	57.90	MBB-020075X	63.95
.0180		.0180	.020	.100	.0020	.0100	.1250	1.5	MBB-020100	57.90	MBB-020100X	63.95
	.54 mm	.0213	0.6 mm	2.5 mm	.06 mm	.30 mm	3 mm	38 mm	MBBM-006025	46.40		
.0225		.0225	.025	.050	.0025	.0125	.1250	1.5	MBB-025050	51.05	MBB-025050X	57.10
.0225		.0225	.025	.075	.0025	.0125	.1250	1.5	MBB-025075	51.05	MBB-025075X	57.10
.0225		.0225	.025	.100	.0025	.0125	.1250	1.5	MBB-025100	51.05	MBB-025100X	57.10
.0225		.0225	.025	.125	.0025	.0125	.1250	1.5	MBB-025125	51.05	MBB-025125X	57.10
.0275		.0275	.030	.075	.0025	.0150	.1250	1.5	MBB-030075	51.05	MBB-030075X	57.10
.0275		.0275	.030	.100	.0025	.0150	.1250	1.5	MBB-030100	51.05	MBB-030100X	57.10
.0275		.0275	.030	.125	.0025	.0150	.1250	1.5	MBB-030125	51.05	MBB-030125X	57.10
.0275		.0275	.030	.150	.0025	.0150	.1250	1.5	MBB-030150	51.05	MBB-030150X	57.10
	.72 mm	.0283	0.8 mm	3 mm	.08 mm	.40 mm	3 mm	38 mm	MBBM-008030	46.40		
	.72 mm	.0283	0.8 mm	4 mm	.08 mm	.40 mm	3 mm	38 mm	MBBM-008040	46.40	MBBM-008040X	52.50
.0320		.0320	.035	.075	.0030	.0175	.1250	1.5	MBB-035075	51.05	MBB-035075X	57.10
.0320		.0320	.035	.100	.0030	.0175	.1250	1.5	MBB-035100	51.05	MBB-035100X	57.10
.0320		.0320	.035	.150	.0030	.0175	.1250	1.5	MBB-035150	51.05	MBB-035150X	57.10
.0320		.0320	.035	.200	.0030	.0175	.1250	1.5	MBB-035200	51.05	MBB-035200X	57.10
	.81 mm	.0317	0.9 mm	4 mm	.09 mm	.45 mm	3 mm	38 mm	MBBM-009040	46.40		
	.81 mm	.0317	0.9 mm	5 mm	.09 mm	0.45 mm	3 mm	38 mm	MBBM-009050	46.40		
	.91 mm	.0357	1 mm	4 mm	.09 mm	0.50 mm	3 mm	38 mm	MBBM-010040	46.40		
.0365		.0365	.040	.100	.0035	.0200	.1250	1.5	MBB-040100	51.05	MBB-040100X	57.10
.0365		.0365	.040	.150	.0035	.0200	.1250	1.5	MBB-040150	51.05	MBB-040150X	57.10
.0365		.0365	.040	.200	.0035	.0200	.1250	1.5	MBB-040200	51.05	MBB-040200X	57.10
.0405		.0405	.045	.100	.0045	.0225	.1250	1.5	MBB-045100	51.05	MBB-045100X	57.10
.0405		.0405	.045	.150	.0045	.0225	.1250	1.5	MBB-045150	51.05	MBB-045150X	57.10
.0405		.0405	.045	.200	.0045	.0225	.1250	1.5	MBB-045200	51.05	MBB-045200X	57.10

Continued on next page

See pages 39-47 for standard tool holders
See page 300 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 #	USD$	Tool #	USD$
.0440	.0440	.050	.100	.0060	.0250	.1250	1.5	MBB-050100	51.05	MBB-050100X	57.10
.0440	.0440	.050	.150	.0060	.0250	.1250	1.5	MBB-050150	51.05	MBB-050150X	57.10
.0440	.0440	.050	.200	.0060	.0250	.1250	1.5	MBB-050200	51.05	MBB-050200X	57.10
.0440	.0440	.050	.300	.0060	.0250	.1250	1.5	MBB-050300	51.05	MBB-050300X	57.10
.0525	.0525	.060	.150	.0075	.0300	.1250	1.5	MBB-060150	51.05	MBB-060150X	57.10
.0525	.0525	.060	.200	.0075	.0300	.1250	1.5	MBB-060200	51.05	MBB-060200X	57.10
.0525	.0525	.060	.300	.0075	.0300	.1250	1.5	MBB-060300	51.05	MBB-060300X	57.10
.0525	.0525	.060	.400	.0075	.0300	.1250	1.5	MBB-060400	51.05	MBB-060400X	57.10
.0525	.0525	.060	.500	.0075	.0300	.1250	1.5	MBB-060500	51.05	MBB-060500X	57.10
.0625	.0625	.070	.150	.0075	.0350	.1250	1.5	MBB-070150	51.05	MBB-070150X	57.10
.0625	.0625	.070	.200	.0075	.0350	.1250	1.5	MBB-070200	51.05	MBB-070200X	57.10
.0625	.0625	.070	.300	.0075	.0350	.1250	1.5	MBB-070300	51.05	MBB-070300X	57.10
.0625	.0625	.070	.400	.0075	.0350	.1250	1.5	MBB-070400	51.05	MBB-070400X	57.10
.0625	.0625	.070	.500	.0075	.0350	.1250	1.5	MBB-070500	51.05	MBB-070500X	57.10
.0700	.0700	.080	.150	.0100	.0400	.1250	1.5	MBB-080150	51.05	MBB-080150X	57.10
.0700	.0700	.080	.200	.0100	.0400	.1250	1.5	MBB-080200	51.05		
.0700	.0700	.080	.300	.0100	.0400	.1250	1.5	MBB-080300	51.05	MBB-080300X	57.10
.0700	.0700	.080	.500	.0100	.0400	.1250	1.5	MBB-080500	51.05	MBB-080500X	57.10
.0700	.0700	.080	.600	.0100	.0400	.1250	1.5	MBB-080600	51.05	MBB-080600X	57.10
.0800	.0800	.090	.200	.0100	.0450	.1250	1.5	MBB-090200	51.05	MBB-090200X	57.10
.0800	.0800	.090	.300	.0100	.0450	.1250	1.5	MBB-090300	51.05	MBB-090300X	57.10
.0800	.0800	.090	.500	.0100	.0450	.1250	1.5	MBB-090500	51.05	MBB-090500X	57.10
.0800	.0800	.090	.700	.0100	.0450	.1250	1.5	MBB-090700	51.05	MBB-090700X	57.10
.0875	.0875	.100	.200	.0125	.0500	.1250	1.5	MBB-100200	51.05	MBB-100200X	57.10
.0875	.0875	.100	.300	.0125	.0500	.1250	1.5	MBB-100300	51.05	MBB-100300X	57.10
.0875	.0875	.100	.500	.0125	.0500	.1250	1.5	MBB-100500	51.05	MBB-100500X	57.10
.0875	.0875	.100	.700	.0125	.0500	.1250	1.5	MBB-100700	51.05	MBB-100700X	57.10
.0875	.0875	.100	.800	.0125	.0500	.1250	2.0	MBB-100800	51.05	MBB-100800X	57.10

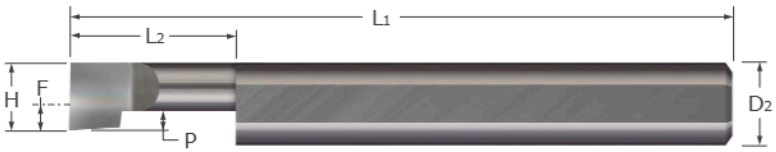
See pages 39-47 for standard tool holders

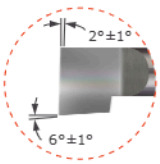
See page 300 for tool set options

BBS / BBM

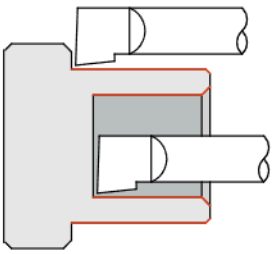
Standard – Boring Tools

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 #	USD$	Tool #	USD$	Tool #	USD$
	1 mm	.0394	1.12 mm	4 mm	.25 mm	-1 mm	4 mm	50 mm	BBM-040104	36.70	BBM-040104G	41.60	BBM-040104X	43.00
	1 mm	.0394	1.12 mm	6 mm	.25 mm	-1 mm	4 mm	50 mm	BBM-040106	36.70			BBM-040106X	43.00
	1 mm	.0394	1.12 mm	8 mm	.25 mm	-1 mm	4 mm	50 mm	BBM-040108	36.70	BBM-040108G	41.60	BBM-040108X	43.00
.050		.0500	.0550	.150	.012	-.0125	.1250	1.5	BB-050150S	37.45	BB-050150SG	42.05	BB-050150SX	43.20
.050		.0500	.0550	.200	.012	-.0125	.1250	1.5	BB-050200S	37.45	BB-050200SG	42.05	BB-050200SX	43.20
.050		.0500	.0550	.250	.012	-.0125	.1250	1.5	BB-050250S	37.45	BB-050250SG	43.50	BB-050250SX	43.50
.050		.0500	.0550	.300	.012	-.0125	.1250	1.5	BB-050300S	37.45	BB-050300SG	42.05	BB-050300SX	43.20
.050		.0500	.0550	.400	.012	-.0125	.1250	1.5	BB-050400S	37.45	BB-050400SG	42.05	BB-050400SX	43.20
.060		.0600	.0700	.150	.015	-.0025	.1250	1.5	BB-060150S	37.45	BB-060150SG	42.05	BB-060150SX	43.20
.060		.0600	.0700	.200	.015	-.0025	.1250	1.5	BB-060200S	37.45	BB-060200SG	42.05	BB-060200SX	43.20
.060		.0600	.0700	.250	.015	-.0025	.1250	1.5	BB-060250S	37.45	BB-060250SG	43.50	BB-060250SX	43.50
.060		.0600	.0700	.300	.015	-.0025	.1250	1.5	BB-060300S	37.45	BB-060300SG	42.05	BB-060300SX	43.20
.060		.0600	.0700	.400	.015	-.0025	.1250	1.5	BB-060400S	37.45	BB-060400SG	42.05	BB-060400SX	43.20
.060		.0600	.0700	.500	.015	-.0025	.1250	1.5	BB-060500S	37.45	BB-060500SG	42.05	BB-060500SX	43.20
.070		.0700	.0800	.150	.015	.0075	.1250	1.5	BB-070150S	37.45			BB-070150SX	43.20
.070		.0700	.0800	.200	.015	.0075	.1250	1.5	BB-070200S	37.45			BB-070200SX	43.20
.070		.0700	.0800	.300	.015	.0075	.1250	1.5	BB-070300S	37.45			BB-070300SX	43.20
	2 mm	.0787	2.25 mm	4 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040204	36.70				
	2 mm	.0787	2.25 mm	6 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040206	36.70			BBM-040206X	43.00
	2 mm	.0787	2.25 mm	8 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040208	36.70				
	2 mm	.0787	2.25 mm	10 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040210	36.70			BBM-040210X	43.00
	2 mm	.0787	2.25 mm	13 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040213	36.70			BBM-040213X	43.00
.080		.0800	.0900	.150	.020	.0175	.1250	1.5	BB-080150S	37.45	BB-080150SG	42.05	BB-080150SX	43.20
.080		.0800	.0900	.200	.020	.0175	.1250	1.5	BB-080200S	37.45	BB-080200SG	42.05	BB-080200SX	43.20
.080		.0800	.0900	.300	.020	.0175	.1250	1.5	BB-080300S	37.45	BB-080300SG	42.05	BB-080300SX	43.20
.080		.0800	.0900	.400	.020	.0175	.1250	1.5	BB-080400S	37.45	BB-080400SG	42.05	BB-080400SX	43.20
.080		.0800	.0900	.500	.020	.0175	.1250	1.5	BB-080500S	37.45	BB-080500SG	42.05	BB-080500SX	43.20
.080		.0800	.0900	.600	.020	.0175	.1250	1.5	BB-080600S	37.45	BB-080600SG	42.05	BB-080600SX	43.20
NEW .080		.0800	.0900	.700	.020	.0175	.1250	2.0	BB-080700S	38.70			BB-080700SX	44.40

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$	Tool #	USD$
.090		.0900	.1000	.150	.020	.0275	.1250	1.5	BB-090150S	37.45			BB-090150SX	43.50
.090		.0900	.1000	.200	.020	.0275	.1250	1.5	BB-090200S	37.45			BB-090200SX	43.50
.090		.0900	.1000	.300	.020	.0275	.1250	1.5	BB-090300S	37.45			BB-090300SX	43.20
.090		.0900	.1000	.400	.020	.0275	.1250	1.5	BB-090400S	37.45	BB-090400SG	43.50	BB-090400SX	43.50
.090		.0900	.1000	.500	.020	.0275	.1250	1.5	BB-090500S	37.45	BB-090500SG	43.50	BB-090500SX	43.50
.100		.1000	.1100	.150	.025	.0375	.1250	1.5	BB-100150S	37.45	BB-100150SG	42.05	BB-100150SX	43.20
.100		.1000	.1100	.200	.025	.0375	.1250	1.5	BB-100200S	37.45	BB-100200SG	42.05	BB-100200SX	43.20
.100		.1000	.1100	.300	.025	.0375	.1250	1.5	BB-100300S	37.45	BB-100300SG	42.05	BB-100300SX	43.20
.100		.1000	.1100	.400	.025	.0375	.1250	1.5	BB-100400S	37.45	BB-100400SG	42.05	BB-100400SX	43.20
.100		.1000	.1100	.500	.025	.0375	.1250	1.5	BB-100500S	37.45	BB-100500SG	42.05	BB-100500SX	43.20
.100		.1000	.1100	.600	.025	.0375	.1250	1.5	BB-100600S	37.45	BB-100600SG	42.05	BB-100600SX	43.20
.100		.1000	.1100	.700	.025	.0375	.1250	1.5	BB-100700S	37.45	BB-100700SG	42.05	BB-100700SX	43.20
.100		.1000	.1100	.800	.025	.0375	.1250	2.0	BB-100800S	38.80	BB-100800SG	44.90	BB-100800SX	44.90
.110		.1100	.1220	.150	.027	.0475	.1250	1.5	BB-110150S	37.45	BB-110150SG	42.05	BB-110150SX	43.20
.110		.1100	.1220	.200	.027	.0475	.1250	1.5	BB-110200S	37.45	BB-110200SG	42.05	BB-110200SX	43.20
.110		.1100	.1220	.300	.027	.0475	.1250	1.5	BB-110300S	37.45	BB-110300SG	42.05	BB-110300SX	43.20
.110		.1100	.1220	.400	.027	.0475	.1250	1.5	BB-110400S	37.45	BB-110400SG	42.05	BB-110400SX	43.20
.110		.1100	.1220	.500	.027	.0475	.1250	1.5	BB-110500S	37.45	BB-110500SG	42.05	BB-110500SX	43.20
.110		.1100	.1220	.600	.027	.0475	.1250	1.5	BB-110600S	37.45	BB-110600SG	42.05	BB-110600SX	43.20
.110		.1100	.1220	.700	.027	.0475	.1250	1.5	BB-110700S	37.45	BB-110700SG	42.05	BB-110700SX	43.20
	3 mm	.1181	3.3 mm	8 mm	.75 mm	1 mm	4 mm	50 mm	BBM-040308	36.70				
	3 mm	.1181	3.3 mm	10 mm	.75 mm	1 mm	4 mm	50 mm	BBM-040310	36.70	BBM-040310G	41.60		
	3 mm	.1181	3.3 mm	13 mm	.75 mm	1 mm	4 mm	50 mm	BBM-040313	36.70				
	3 mm	.1181	3.3 mm	15 mm	.75 mm	1 mm	4 mm	50 mm	BBM-040315	36.70			BBM-040315X	43.00
	3 mm	.1181	3.3 mm	20 mm	.75 mm	1 mm	4 mm	50 mm	BBM-040320	36.70	BBM-040320G	41.60	BBM-040320X	43.00
.120		.1200	.1320	.250	.030	.0263	.1875	2.0	BB-120250S	39.95	BB-120250SG	45.05	BB-120250SX	46.30
.120		.1200	.1320	.350	.030	.0263	.1875	2.0	BB-120350S	39.95	BB-120350SG	45.05	BB-120350SX	46.30
.120		.1200	.1320	.500	.030	.0263	.1875	2.0	BB-120500S	39.95	BB-120500SG	45.05	BB-120500SX	46.30
.120		.1200	.1320	.600	.030	.0263	.1875	2.0	BB-120600S	39.95	BB-120600SG	45.05	BB-120600SX	46.30
.120		.1200	.1320	.700	.030	.0263	.1875	2.0	BB-120700S	39.95	BB-120700SG	45.05	BB-120700SX	46.30
.120		.1200	.1320	.800	.030	.0263	.1875	2.0	BB-120800S	39.95	BB-120800SG	45.05	BB-120800SX	46.30
.120		.1200	.1320	1.000	.030	.0263	.1875	2.0	BB-1201000S	39.95	BB-1201000SG	46.85	BB-1201000SX	46.85
.140		.1400	.1520	.250	.035	.0463	.1875	2.0	BB-140250S	39.95	BB-140250SG	45.05	BB-140250SX	46.30
.140		.1400	.1520	.400	.035	.0463	.1875	2.0	BB-140400S	39.95	BB-140400SG	45.05	BB-140400SX	46.30
.140		.1400	.1520	.500	.035	.0463	.1875	2.0	BB-140500S	39.95	BB-140500SG	45.05	BB-140500SX	46.30
.140		.1400	.1520	.600	.035	.0463	.1875	2.0	BB-140600S	39.95	BB-140600SG	45.05	BB-140600SX	46.30
.140		.1400	.1520	.700	.035	.0463	.1875	2.0	BB-140700S	39.95			BB-140700SX	46.30
.140		.1400	.1520	.750	.035	.0463	.1875	2.0	BB-140750S	39.95	BB-140750SG	45.05	BB-140750SX	46.30
.140		.1400	.1520	.800	.035	.0463	.1875	2.0	BB-140800S	39.95	BB-140800SG	45.05	BB-140800SX	46.30
.140		.1400	.1520	.900	.035	.0463	.1875	2.0	BB-140900S	39.95	BB-140900SG	46.85	BB-140900SX	46.85
	4 mm	.1575	4.4 mm	8 mm	1 mm	2 mm	4 mm	50 mm	BBM-040408	36.70				
	4 mm	.1575	4.4 mm	10 mm	1 mm	2 mm	4 mm	50 mm	BBM-040410	36.70	BBM-040410G	41.60	BBM-040410X	43.00
	4 mm	.1575	4.4 mm	15 mm	1 mm	2 mm	4 mm	50 mm	BBM-040415	36.70				
	4 mm	.1575	4.4 mm	20 mm	1 mm	2 mm	4 mm	50 mm	BBM-040420	36.70	BBM-040420G	41.60		
	4 mm	.1575	4.4 mm	25 mm	1 mm	2 mm	4 mm	50 mm	BBM-040425	36.70			BBM-040425X	43.00

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

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See pages 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 #	USD$	Tool #	USD$	Tool #	USD$
	.160	.1600	.1760	.250	.040	.0663	.1875	2.0	BB-160250S	39.95	BB-160250SG	45.05	BB-160250SX	46.30
	.160	.1600	.1760	.400	.040	.0663	.1875	2.0	BB-160400S	39.95	BB-160400SG	45.05	BB-160400SX	46.30
	.160	.1600	.1760	.500	.040	.0663	.1875	2.0	BB-160500S	39.95	BB-160500SG	45.05	BB-160500SX	46.30
	.160	.1600	.1760	.600	.040	.0663	.1875	2.0	BB-160600S	39.95	BB-160600SG	45.05	BB-160600SX	46.30
	.160	.1600	.1760	.750	.040	.0663	.1875	2.0	BB-160750S	39.95	BB-160750SG	45.05	BB-160750SX	46.30
	.160	.1600	.1760	.900	.040	.0663	.1875	2.0	BB-160900S	39.95	BB-160900SG	45.05	BB-160900SX	46.30
	.160	.1600	.1760	1.000	.040	.0663	.1875	2.0	BB-1601000S	39.95	BB-1601000SG	45.05	BB-1601000SX	46.30
	.160	.1600	.1760	1.250	.040	.0663	.1875	2.5	BB-1601250S	41.45	BB-1601250SG	48.75	BB-1601250SX	48.75
	.180	.1800	.1960	.350	.045	.0550	.2500	2.5	BB-180350S	43.10	BB-180350SG	50.35	BB-180350SX	51.95
	.180	.1800	.1960	.500	.045	.0550	.2500	2.5	BB-180500S	43.10	BB-180500SG	50.35	BB-180500SX	51.95
	.180	.1800	.1960	.600	.045	.0550	.2500	2.5	BB-180600S	43.10	BB-180600SG	50.35	BB-180600SX	51.95
	.180	.1800	.1960	.750	.045	.0550	.2500	2.5	BB-180750S	43.10	BB-180750SG	50.35	BB-180750SX	51.95
	.180	.1800	.1960	.900	.045	.0550	.2500	2.5	BB-180900S	43.10	BB-180900SG	50.35	BB-180900SX	51.95
	.180	.1800	.1960	1.000	.045	.0550	.2500	2.5	BB-1801000S	43.10	BB-1801000SG	50.35	BB-1801000SX	51.95
	.180	.1800	.1960	1.100	.045	.0550	.2500	2.5	BB-1801100S	43.10	BB-1801100SG	50.35	BB-1801100SX	51.95
	.180	.1800	.1960	1.250	.045	.0550	.2500	2.5	BB-1801250S	43.10	BB-1801250SG	50.35	BB-1801250SX	51.95
	.180	.1800	.1960	1.500	.045	.0550	.2500	2.5	BB-1801500S	43.10	BB-1801500SG	50.35	BB-1801500SX	51.95
NEW	.180	.1800	.1960	1.750	.045	.0550	.2500	3.0	BB-1801750S	114.20			BB-1801750SX	122.35
	5 mm	.1969	5.4 mm	10 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060510	41.20				
	5 mm	.1969	5.4 mm	15 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060515	41.20				
	5 mm	.1969	5.4 mm	20 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060520	41.20				
	5 mm	.1969	5.4 mm	25 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060525	41.20				
	5 mm	.1969	5.4 mm	28 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060528	41.20	BBM-060528G	48.30	BBM-060528X	49.85
	.200	.2000	.2160	.400	.050	.0750	.2500	2.5	BB-200400S	43.10	BB-200400SG	50.35	BB-200400SX	51.95
	.200	.2000	.2160	.500	.050	.0750	.2500	2.5	BB-200500S	43.10	BB-200500SG	50.35	BB-200500SX	51.95
	.200	.2000	.2160	.600	.050	.0750	.2500	2.5	BB-200600S	43.10	BB-200600SG	50.35	BB-200600SX	51.95
	.200	.2000	.2160	.700	.050	.0750	.2500	2.5	BB-200700S	43.10	BB-200700SG	50.35	BB-200700SX	51.95
	.200	.2000	.2160	.800	.050	.0750	.2500	2.5	BB-200800S	43.10	BB-200800SG	50.35	BB-200800SX	51.95
	.200	.2000	.2160	.900	.050	.0750	.2500	2.5	BB-200900S	43.10	BB-200900SG	50.35	BB-200900SX	51.95
	.200	.2000	.2160	1.000	.050	.0750	.2500	2.5	BB-2001000S	43.10	BB-2001000SG	50.35	BB-2001000SX	51.95
	.200	.2000	.2160	1.100	.050	.0750	.2500	2.5	BB-2001100S	43.10			BB-2001100SX	51.95
	.200	.2000	.2160	1.200	.050	.0750	.2500	2.5	BB-2001200S	43.10				
	.200	.2000	.2160	1.300	.050	.0750	.2500	2.5	BB-2001300S	43.10			BB-2001300SX	51.95
NEW	.200	.2000	.2160	1.500	.050	.0750	.2500	2.5	BB-2001500S	43.10			BB-2001500SX	51.20

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

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See pages 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 #	USD$	Tool #	USD$	Tool #	USD$	
.230		.2300	.2500	.400	.057	.0738	.3125	2.5	BB-230400S	59.10	BB-230400SG	69.70	BB-230400SX	69.70	
.230		.2300	.2500	.500	.057	.0738	.3125	2.5	BB-230500S	59.10	BB-230500SG	69.70	BB-230500SX	69.70	
.230		.2300	.2500	.600	.057	.0738	.3125	2.5	BB-230600S	59.10	BB-230600SG	69.70	BB-230600SX	69.70	
.230		.2300	.2500	.700	.057	.0738	.3125	2.5	BB-230700S	59.10	BB-230700SG	69.70	BB-230700SX	69.70	
.230		.2300	.2500	.800	.057	.0738	.3125	2.5	BB-230800S	59.10	BB-230800SG	69.70	BB-230800SX	69.70	
.230		.2300	.2500	.900	.057	.0738	.3125	2.5	BB-230900S	59.10	BB-230900SG	69.70	BB-230900SX	69.70	
.230		.2300	.2500	1.000	.057	.0738	.3125	2.5	BB-2301000S	59.10	BB-2301000SG	69.70	BB-2301000SX	69.70	
.230		.2300	.2500	1.100	.057	.0738	.3125	2.5	BB-2301100S	59.10	BB-2301100SG	69.70	BB-2301100SX	69.70	
.230		.2300	.2500	1.150	.057	.0738	.3125	2.5	BB-2301150S	59.10	BB-2301150SG	69.70			
.230		.2300	.2500	1.200	.057	.0738	.3125	2.5	BB-2301200S	59.10	BB-2301200SG	69.70	BB-2301200SX	69.70	
.230		.2300	.2500	1.250	.057	.0738	.3125	2.5	BB-2301250S	59.10	BB-2301250SG	69.70	BB-2301250SX	69.70	
.230		.2300	.2500	1.400	.057	.0738	.3125	2.5	BB-2301400S	59.10			BB-2301400SX	69.70	
.230		.2300	.2500	1.500	.057	.0738	.3125	2.5	BB-2301500S	59.10	BB-2301500SG	69.70	BB-2301500SX	69.70	
.230		.2300	.2500	1.600	.057	.0738	.3125	2.5	BB-2301600S	59.10	BB-2301600SG	69.70	BB-2301600SX	69.70	
.230		.2300	.2500	1.750	.057	.0738	.3125	3.5	BB-2301750S	90.15			BB-2301750SX	100.45	NEW
	6 mm	.2362	6.5 mm	10 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060610	41.20					
	6 mm	.2362	6.5 mm	15 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060615	41.20	BBM-060615G	48.30			
	6 mm	.2362	6.5 mm	20 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060620	41.20			BBM-060620X	49.85	
	6 mm	.2362	6.5 mm	25 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060625	41.20					
	6 mm	.2362	6.5 mm	30 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060630	41.20					
	6 mm	.2362	6.5 mm	35 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060635	41.20					
	6 mm	.2362	6.5 mm	38 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060638	41.20			BBM-060638X	49.85	
.260		.2600	.2800	.500	.065	.1038	.3125	2.5	BB-260500S	59.10	BB-260500SG	69.70	BB-260500SX	69.70	
.260		.2600	.2800	.750	.065	.1038	.3125	2.5	BB-260750S	59.10	BB-260750SG	69.70	BB-260750SX	69.70	
.260		.2600	.2800	1.000	.065	.1038	.3125	2.5	BB-2601000S	59.10	BB-2601000SG	69.70	BB-2601000SX	69.70	
.260		.2600	.2800	1.250	.065	.1038	.3125	2.5	BB-2601250S	59.10	BB-2601250SG	69.70	BB-2601250SX	69.70	
	7 mm	.2755	7.5 mm	15 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080715	56.10					
	7 mm	.2755	7.5 mm	25 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080725	56.10					
	7 mm	.2755	7.5 mm	32 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080732	56.10					
	7 mm	.2755	7.5 mm	38 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080738	56.10					
	7 mm	.2755	7.5 mm	46 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080746	56.10					
.290		.2900	.3100	.500	.072	.1338	.3125	2.5	BB-290500S	59.10	BB-290500SG	69.70	BB-290500SX	69.70	
.290		.2900	.3100	.600	.072	.1338	.3125	2.5	BB-290600S	59.10	BB-290600SG	69.70	BB-290600SX	69.70	
.290		.2900	.3100	.750	.072	.1338	.3125	2.5	BB-290750S	59.10	BB-290750SG	69.70	BB-290750SX	69.70	
.290		.2900	.3100	.900	.072	.1338	.3125	2.5	BB-290900S	59.10	BB-290900SG	69.70	BB-290900SX	69.70	
.290		.2900	.3100	1.000	.072	.1338	.3125	2.5	BB-2901000S	59.10	BB-2901000SG	69.70	BB-2901000SX	69.70	
.290		.2900	.3100	1.100	.072	.1338	.3125	2.5	BB-2901100S	59.10	BB-2901100SG	69.70			
.290		.2900	.3100	1.250	.072	.1338	.3125	2.5	BB-2901250S	59.10	BB-2901250SG	69.70	BB-2901250SX	69.70	
.290		.2900	.3100	1.500	.072	.1338	.3125	2.5	BB-2901500S	59.10	BB-2901500SG	69.70	BB-2901500SX	69.70	
.290		.2900	.3100	1.600	.072	.1338	.3125	2.5	BB-2901600S	59.10	BB-2901600SG	69.70			
.290		.2900	.3100	1.750	.072	.1338	.3125	2.5	BB-2901750S	59.10	BB-2901750SG	69.70	BB-2901750SX	69.70	

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

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See pages 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.	L_2 +.050" −.000" +1.24mm −.00mm		P	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$	Tool #	USD$
8 mm	.3150	8.5 mm	13 mm	2 mm	4 mm	8 mm	63 mm	BBM-080813	56.10				
8 mm	.3150	8.5 mm	20 mm	2 mm	4 mm	8 mm	63 mm	BBM-080820	56.10				
8 mm	.3150	8.5 mm	25 mm	2 mm	4 mm	8 mm	63 mm	BBM-080825	56.10	BBM-080825G	66.35		
8 mm	.3150	8.5 mm	38 mm	2 mm	4 mm	8 mm	63 mm	BBM-080838	56.10				
8 mm	.3150	8.5 mm	46 mm	2 mm	4 mm	8 mm	63 mm	BBM-080846	56.10				
8 mm	.3150	8.5 mm	50 mm	2 mm	4 mm	8 mm	63 mm	BBM-080850	56.10	BBM-080850G	66.35		
.320	.3200	.3400	.500	.080	.1325	.3750	2.5	BB-320500S	81.35			BB-320500SX	93.75
.320	.3200	.3400	.600	.080	.1325	.3750	2.5	BB-320600S	81.35	BB-320600SG	92.75	BB-320600SX	93.75
.320	.3200	.3400	.750	.080	.1325	.3750	2.5	BB-320750S	81.35	BB-320750SG	92.75	BB-320750SX	93.75
.320	.3200	.3400	.900	.080	.1325	.3750	2.5	BB-320900S	81.35				
.320	.3200	.3400	1.000	.080	.1325	.3750	2.5	BB-3201000S	81.35	BB-3201000SG	92.75	BB-3201000SX	93.75
.320	.3200	.3400	1.100	.080	.1325	.3750	2.5	BB-3201100S	81.35	BB-3201100SG	92.75		
.320	.3200	.3400	1.250	.080	.1325	.3750	2.5	BB-3201250S	81.35	BB-3201250SG	92.75	BB-3201250SX	93.75
.320	.3200	.3400	1.500	.080	.1325	.3750	2.5	BB-3201500S	81.35	BB-3201500SG	92.75	BB-3201500SX	93.75
.320	.3200	.3400	1.600	.080	.1325	.3750	2.5	BB-3201600S	81.35				
.320	.3200	.3400	1.800	.080	.1325	.3750	2.5	BB-3201800S	81.35	BB-3201800SG	92.75	BB-3201800SX	93.75
.320	.3200	.3400	2.000	.080	.1325	.3750	4.0	BB-3202000S	104.55	BB-3202000SG	117.90	BB-3202000SX	117.90
.320	.3200	.3400	2.500	.080	.1325	.3750	4.0	BB-3202500S	104.55	BB-3202500SG	117.90	BB-3202500SX	117.90
.320	.3200	.3400	3.000	.080	.1325	.3750	4.0	BB-3203000S	104.55			BB-3203000SX	117.90
9 mm	.3543	9.5 mm	25 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100925	84.95				
9 mm	.3543	9.5 mm	32 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100932	84.95				
9 mm	.3543	9.5 mm	38 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100938	84.95				
9 mm	.3543	9.5 mm	46 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100946	84.95				
9 mm	.3543	9.5 mm	50 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100950	84.95				
.360	.3600	.3800	.500	.090	.1725	.3750	2.5	BB-360500S	81.35	BB-360500SG	92.75	BB-360500SX	93.75
.360	.3600	.3800	.600	.090	.1725	.3750	2.5	BB-360600S	81.35	BB-360600SG	92.75		
.360	.3600	.3800	.750	.090	.1725	.3750	2.5	BB-360750S	81.35	BB-360750SG	92.75	BB-360750SX	93.75
.360	.3600	.3800	.900	.090	.1725	.3750	2.5	BB-360900S	81.35			BB-360900SX	93.75
.360	.3600	.3800	1.000	.090	.1725	.3750	2.5	BB-3601000S	81.35	BB-3601000SG	92.75	BB-3601000SX	93.75
.360	.3600	.3800	1.150	.090	.1725	.3750	2.5	BB-3601150S	81.35			BB-3601150SX	93.75
.360	.3600	.3800	1.250	.090	.1725	.3750	2.5	BB-3601250S	81.35	BB-3601250SG	92.75	BB-3601250SX	93.75
.360	.3600	.3800	1.500	.090	.1725	.3750	2.5	BB-3601500S	81.35	BB-3601500SG	92.75	BB-3601500SX	93.75
.360	.3600	.3800	1.600	.090	.1725	.3750	2.5	BB-3601600S	81.35	BB-3601600SG	92.75	BB-3601600SX	93.75
.360	.3600	.3800	1.800	.090	.1725	.3750	2.5	BB-3601800S	81.35	BB-3601800SG	92.75	BB-3601800SX	93.75
.360	.3600	.3800	2.000	.090	.1725	.3750	4.0	BB-3602000S	104.55	BB-3602000SG	117.90	BB-3602000SX	117.90
.360	.3600	.3800	2.500	.090	.1725	.3750	4.0	BB-3602500S	104.55				
.360	.3600	.3800	3.000	.090	.1725	.3750	4.0	BB-3603000S	104.55			BB-3603000SX	117.90
10 mm	.3937	10.5 mm	25 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101025	84.95				
10 mm	.3937	10.5 mm	32 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101032	84.95				
10 mm	.3937	10.5 mm	38 mm	2.50 mm	5 mm	10 mm	72 mm			BBM-101038G	96.55		
10 mm	.3937	10.5 mm	50 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101050	84.95	BBM-101050G	96.55	BBM-101050X	99.45

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

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See pages 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.	L_2	+.050" −.000" +1.24mm −.00mm	P	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$	Tool #	USD$
11 mm	.4331	11.5 mm	15 mm	2.75 mm	5 mm	12 mm	83 mm	BBM-121115	107.15				
11 mm	.4331	11.5 mm	38 mm	2.75 mm	5 mm	12 mm	83 mm	BBM-121138	107.15				
12 mm	.4724	12.5 mm	20 mm	3 mm	6 mm	12 mm	83 mm	BBM-121220	107.15				
12 mm	.4724	12.5 mm	32 mm	3 mm	6 mm	12 mm	83 mm	BBM-121232	107.15				
12 mm	.4724	12.5 mm	46 mm	3 mm	6 mm	12 mm	83 mm	BBM-121246	107.15				
12 mm	.4724	12.5 mm	60 mm	3 mm	6 mm	12 mm	83 mm	BBM-121260	107.15				
.490	.4900	.5100	.750	.122	.2400	.5000	3.0	BB-490750S	114.20			BB-490750SX	131.15
.490	.4900	.5100	1.000	.122	.2400	.5000	3.0	BB-4901000S	114.20			BB-4901000SX	131.15
.490	.4900	.5100	1.250	.122	.2400	.5000	3.0	BB-4901250S	114.20			BB-4901250SX	131.15
.490	.4900	.5100	1.500	.122	.2400	.5000	3.0	BB-4901500S	114.20			BB-4901500SX	131.15
.490	.4900	.5100	2.000	.122	.2400	.5000	4.0	BB-4902000S	125.25	BB-4902000SG	141.85	BB-4902000SX	143.50
.490	.4900	.5100	2.500	.122	.2400	.5000	4.0	BB-4902500S	125.25	BB-4902500SG	141.85	BB-4902500SX	143.50
.490	.4900	.5100	2.750	.122	.2400	.5000	4.0	BB-4902750S	125.25			BB-4902750SX	143.50
.490	.4900	.5100	3.000	.122	.2400	.5000	6.0	BB-4903000S	158.15				
.490	.4900	.5100	3.500	.122	.2400	.5000	6.0	BB-4903500S	158.15			BB-4903500SX	179.40
.490	.4900	.5100	4.000	.122	.2400	.5000	6.0					BB-4904000SX	179.40
.490	.4900	.5100	4.500	.122	.2400	.5000	6.0	BB-4904500S	158.15				

*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

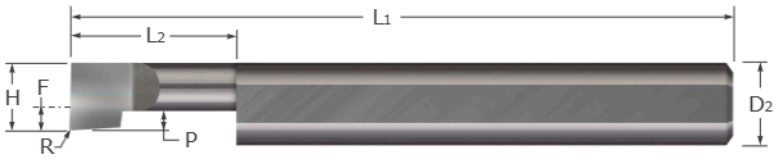
SCAN

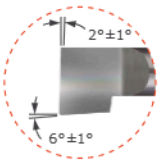
See pages 39-47 for standard tool holders

BB

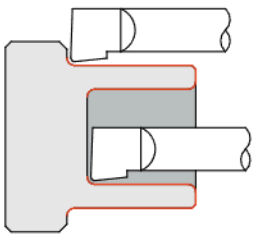
Standard – Boring Tools

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	Proj.	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
	H		L2 +.050" −.000"	R +.003" −.000"	P	F	D2 (h6)	L1	Tool #	USD$	Tool #	USD$	Tool #	USD$
	.050	.055	.150	.003	.012	-.0125	.1250	1.5	BB-050150	39.80	BB-050150G	44.60	BB-050150X	45.50
	.050	.055	.200	.003	.012	-.0125	.1250	1.5	BB-050200	39.80	BB-050200G	44.60	BB-050200X	45.50
	.050	.055	.250	.003	.012	-.0125	.1250	1.5	BB3-050250	39.80	BB3-050250G	46.00	BB3-050250X	46.00
	.050	.055	.300	.003	.012	-.0125	.1250	1.5	BB-050300	39.80	BB-050300G	44.60	BB-050300X	45.50
	.050	.055	.400	.003	.012	-.0125	.1250	1.5	BB-050400	39.80	BB-050400G	44.60	BB-050400X	45.50
	.060	.070	.150	.003	.015	-.0025	.1250	1.5	BB-060150	39.80	BB-060150G	44.60	BB-060150X	45.50
	.060	.070	.200	.003	.015	-.0025	.1250	1.5	BB-060200	39.80	BB-060200G	44.60	BB-060200X	45.50
	.060	.070	.250	.003	.015	-.0025	.1250	1.5	BB3-060250	39.80	BB3-060250G	46.00	BB3-060250X	46.00
	.060	.070	.300	.003	.015	-.0025	.1250	1.5	BB-060300	39.80	BB-060300G	44.60	BB-060300X	45.50
	.060	.070	.400	.003	.015	-.0025	.1250	1.5	BB-060400	39.80	BB-060400G	44.60	BB-060400X	45.50
	.060	.070	.500	.003	.015	-.0025	.1250	1.5	BB-060500	39.80	BB-060500G	44.60	BB-060500X	45.50
	.070	.080	.150	.003	.015	.0075	.1250	1.5	BB-070150	39.80			BB-070150X	45.50
	.070	.080	.200	.003	.015	.0075	.1250	1.5	BB-070200	39.80			BB-070200X	45.50
	.070	.080	.300	.003	.015	.0075	.1250	1.5	BB-070300	39.80			BB-070300X	45.50
NEW	.070	.080	.400	.003	.015	.0075	.1250	1.5	BB3-070400	39.80			BB3-070400X	45.40
NEW	.070	.080	.500	.003	.015	.0075	.1250	1.5	BB3-070500	39.80			BB3-070500X	45.40
	.080	.090	.150	.003	.020	.0175	.1250	1.5	BB-080150	39.80	BB-080150G	44.60	BB-080150X	45.50
	.080	.090	.200	.003	.020	.0175	.1250	1.5	BB-080200	39.80	BB-080200G	44.60	BB-080200X	45.50
	.080	.090	.300	.003	.020	.0175	.1250	1.5	BB-080300	39.80	BB-080300G	44.60	BB-080300X	45.50
	.080	.090	.400	.003	.020	.0175	.1250	1.5	BB-080400	39.80	BB-080400G	44.60	BB-080400X	45.50
	.080	.090	.500	.003	.020	.0175	.1250	1.5	BB-080500	39.80	BB-080500G	44.60	BB-080500X	45.50
	.080	.090	.600	.003	.020	.0175	.1250	1.5	BB-080600	39.80	BB-080600G	44.60	BB-080600X	45.50
NEW	.080	.090	.700	.003	.020	.0175	.1250	2.0	BB3-080700	39.80			BB3-080700X	45.40
	.090	.100	.150	.003	.020	.0275	.1250	1.5	BB3-090150	39.80	BB3-090150G	46.00	BB3-090150X	46.00
	.090	.100	.200	.003	.020	.0275	.1250	1.5			BB3-090200G	46.00	BB3-090200X	46.00
	.090	.100	.300	.003	.020	.0275	.1250	1.5	BB-090300	39.80			BB-090300X	45.50
	.090	.100	.400	.003	.020	.0275	.1250	1.5	BB3-090400	39.80	BB3-090400G	46.00	BB3-090400X	46.00
	.090	.100	.500	.003	.020	.0275	.1250	1.5	BB3-090500	39.80			BB3-090500X	46.00
	.100	.110	.150	.003	.025	.0375	.1250	1.5	BB-100150	39.80	BB-100150G	44.60	BB-100150X	45.50
	.100	.110	.200	.003	.025	.0375	.1250	1.5	BB-100200	39.80	BB-100200G	44.60	BB-100200X	45.50
	.100	.110	.300	.003	.025	.0375	.1250	1.5	BB-100300	39.80	BB-100300G	44.60	BB-100300X	45.50
	.100	.110	.400	.003	.025	.0375	.1250	1.5	BB-100400	39.80	BB-100400G	44.60	BB-100400X	45.50
	.100	.110	.500	.003	.025	.0375	.1250	1.5	BB-100500	39.80	BB-100500G	44.60	BB-100500X	45.50
	.100	.110	.600	.003	.025	.0375	.1250	1.5	BB-100600	39.80	BB-100600G	44.60	BB-100600X	45.50
	.100	.110	.700	.003	.025	.0375	.1250	1.5	BB-100700	39.80			BB-100700X	45.50
	.100	.110	.800	.003	.025	.0375	.1250	2.0	BB3-100800	41.85	BB3-100800G	47.90	BB3-100800X	47.90

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

Continued on next page

See pages 39-47 for standard tool holders

NEW!

Standard – Boring Tools

BB

Right Hand (cont.)

Continued from previous page

Head Width	Minimum Bore Dia.*	Max. Bore Depth	Radius	Proj.	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 #	USD$	Tool #	USD$	Tool #	USD$
.110	.122	.150	.003	.027	.0475	.1250	1.5	BB-110150	39.80	BB-110150G	44.60	BB-110150X	45.50
.110	.122	.200	.003	.027	.0475	.1250	1.5	BB-110200	39.80	BB-110200G	44.60	BB-110200X	45.50
.110	.122	.300	.003	.027	.0475	.1250	1.5	BB-110300	39.80	BB-110300G	44.60	BB-110300X	45.50
.110	.122	.400	.003	.027	.0475	.1250	1.5	BB-110400	39.80	BB-110400G	44.60	BB-110400X	45.50
.110	.122	.500	.003	.027	.0475	.1250	1.5	BB-110500	39.80	BB-110500G	44.60	BB-110500X	45.50
.110	.122	.600	.003	.027	.0475	.1250	1.5	BB-110600	39.80	BB-110600G	44.60	BB-110600X	45.50
.110	.122	.700	.003	.027	.0475	.1250	1.5	BB-110700	39.80	BB-110700G	44.60	BB-110700X	45.50
.110	.122	.800	.003	.027	.0475	.1250	2.0	BB3-110800	41.85	BB3-110800G	47.90	BB3-110800X	47.90
H		L_2 +.050" −.000"	R +.002" −.000"	P	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$	Tool #	USD$
.120	.132	.250	.003	.030	.0263	.1875	2.0	BB3-120250	42.25	BB3-120250G	49.20	BB3-120250X	49.20
.120	.132	.250	.006	.030	.0263	.1875	2.0	BB-120250	42.25	BB-120250G	47.55	BB-120250X	48.80
.120	.132	.350	.003	.030	.0263	.1875	2.0	BB3-120350	42.25	BB3-120350G	49.20	BB3-120350X	49.20
.120	.132	.350	.006	.030	.0263	.1875	2.0	BB-120350	42.25	BB-120350G	47.55	BB-120350X	48.80
.120	.132	.500	.003	.030	.0263	.1875	2.0	BB3-120500	42.25	BB3-120500G	49.20	BB3-120500X	49.20
.120	.132	.500	.006	.030	.0263	.1875	2.0	BB-120500	42.25	BB-120500G	47.55	BB-120500X	48.80
.120	.132	.600	.003	.030	.0263	.1875	2.0	BB3-120600	42.25	BB3-120600G	49.20	BB3-120600X	49.20
.120	.132	.600	.006	.030	.0263	.1875	2.0	BB-120600	42.25	BB-120600G	47.55	BB-120600X	48.80
.120	.132	.700	.003	.030	.0263	.1875	2.0	BB3-120700	42.25	BB3-120700G	49.20	BB3-120700X	49.20
.120	.132	.700	.006	.030	.0263	.1875	2.0	BB-120700	42.25	BB-120700G	47.55	BB-120700X	48.80
.120	.132	.800	.003	.030	.0263	.1875	2.0	BB3-120800	42.25	BB3-120800G	49.20	BB3-120800X	49.20
.120	.132	.800	.006	.030	.0263	.1875	2.0	BB-120800	42.25	BB-120800G	47.55	BB-120800X	48.80
.120	.132	1.000	.003	.030	.0263	.1875	2.0	BB3-1201000	42.25			BB3-1201000X	48.50 NEW
.120	.132	1.000	.006	.030	.0263	.1875	2.0	BB6-1201000	42.25			BB6-1201000X	48.50 NEW
.140	.152	.250	.003	.035	.0463	.1875	2.0	BB3-140250	42.25	BB3-140250G	49.20	BB3-140250X	49.20
.140	.152	.250	.006	.035	.0463	.1875	2.0	BB-140250	42.25	BB-140250G	47.55	BB-140250X	48.80
.140	.152	.400	.003	.035	.0463	.1875	2.0	BB3-140400	42.25	BB3-140400G	49.20	BB3-140400X	49.20
.140	.152	.400	.006	.035	.0463	.1875	2.0	BB-140400	42.25	BB-140400G	47.55	BB-140400X	48.80
.140	.152	.500	.003	.035	.0463	.1875	2.0	BB3-140500	42.25	BB3-140500G	49.20	BB3-140500X	49.20
.140	.152	.500	.006	.035	.0463	.1875	2.0	BB-140500	42.25	BB-140500G	47.55	BB-140500X	48.80
.140	.152	.600	.003	.035	.0463	.1875	2.0	BB3-140600	42.25	BB3-140600G	49.20	BB3-140600X	49.20
.140	.152	.600	.006	.035	.0463	.1875	2.0	BB-140600	42.25	BB-140600G	47.55	BB-140600X	48.80
.140	.152	.700	.003	.035	.0463	.1875	2.0	BB3-140700	42.25			BB3-140700X	49.20
.140	.152	.700	.006	.035	.0463	.1875	2.0	BB-140700	42.25	BB-140700G	47.55	BB-140700X	48.80
.140	.152	.750	.003	.035	.0463	.1875	2.0	BB3-140750	42.25	BB3-140750G	49.20	BB3-140750X	49.20
.140	.152	.750	.006	.035	.0463	.1875	2.0	BB-140750	42.25	BB-140750G	47.55	BB-140750X	48.80
.140	.152	.800	.003	.035	.0463	.1875	2.0	BB3-140800	42.25			BB3-140800X	49.20
.140	.152	.800	.006	.035	.0463	.1875	2.0	BB-140800	42.25	BB-140800G	47.55	BB-140800X	48.80
.140	.152	.900	.003	.035	.0463	.1875	2.0	BB3-140900	42.25			BB3-140900X	49.20
.140	.152	.900	.006	.035	.0463	.1875	2.0	BB6-140900	42.25	BB6-140900G	49.20	BB6-140900X	49.20
.160	.176	.250	.003	.040	.0663	.1875	2.0	BB3-160250	42.25	BB3-160250G	49.20	BB3-160250X	49.20
.160	.176	.250	.006	.040	.0663	.1875	2.0	BB-160250	42.25	BB-160250G	47.55	BB-160250X	48.80
.160	.176	.400	.003	.040	.0663	.1875	2.0	BB3-160400	42.25	BB3-160400G	49.20	BB3-160400X	49.20
.160	.176	.400	.006	.040	.0663	.1875	2.0	BB-160400	42.25	BB-160400G	47.55	BB-160400X	48.80
.160	.176	.500	.003	.040	.0663	.1875	2.0	BB3-160500	42.25	BB3-160500G	49.20	BB3-160500X	49.20
.160	.176	.500	.006	.040	.0663	.1875	2.0	BB-160500	42.25	BB-160500G	47.55	BB-160500X	48.80
.160	.176	.600	.003	.040	.0663	.1875	2.0	BB3-160600	42.25	BB3-160600G	49.20	BB3-160600X	49.20
.160	.176	.600	.006	.040	.0663	.1875	2.0	BB-160600	42.25	BB-160600G	47.55	BB-160600X	48.80

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

Continued on next page

See pages 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	Proj.	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 #	USD$	Tool #	USD$	Tool #	USD$
	.160	.176	.700	.003	.040	.0663	.1875	2.0	BB3-160700	42.25	BB3-160700G	49.20	BB3-160700X	49.20
	.160	.176	.700	.006	.040	.0663	.1875	2.0	BB6-160700	42.25			BB6-160700X	49.20
	.160	.176	.750	.003	.040	.0663	.1875	2.0	BB3-160750	42.25	BB3-160750G	49.20	BB3-160750X	49.20
	.160	.176	.750	.006	.040	.0663	.1875	2.0	BB-160750	42.25	BB-160750G	47.55	BB-160750X	48.80
	.160	.176	.800	.003	.040	.0663	.1875	2.0	BB3-160800	42.25			BB3-160800X	49.20
	.160	.176	.800	.006	.040	.0663	.1875	2.0	BB6-160800	42.25			BB6-160800X	49.20
	.160	.176	.900	.003	.040	.0663	.1875	2.0	BB3-160900	42.25	BB3-160900G	49.20	BB3-160900X	49.20
	.160	.176	.900	.006	.040	.0663	.1875	2.0	BB-160900	42.25	BB-160900G	47.55	BB-160900X	48.80
	.160	.176	1.000	.003	.040	.0663	.1875	2.0	BB3-1601000	42.25	BB3-1601000G	49.20	BB3-1601000X	49.20
	.160	.176	1.000	.006	.040	.0663	.1875	2.0	BB-1601000	42.25	BB-1601000G	47.55	BB-1601000X	48.80
	.160	.176	1.250	.006	.040	.0663	.1875	2.5	BB6-1601250	44.15	BB6-1601250G	51.50	BB6-1601250X	51.50
NEW	.180	.196	.350	.003	.045	.0550	.2500	2.5	BB3-180350	45.75			BB3-180350X	53.70
	.180	.196	.350	.006	.045	.0550	.2500	2.5	BB-180350	45.70	BB-180350G	53.05	BB-180350X	54.40
NEW	.180	.196	.500	.003	.045	.0550	.2500	2.5	BB3-180500	45.75			BB3-180500X	53.70
	.180	.196	.500	.006	.045	.0550	.2500	2.5	BB-180500	45.70	BB-180500G	53.05	BB-180500X	54.40
	.180	.196	.500	.012	.045	.0550	.2500	2.5	BB12-180500	45.70	BB12-180500G	54.40	BB12-180500X	54.40
NEW	.180	.196	.600	.003	.045	.0550	.2500	2.5	BB3-180600	45.75			BB3-180600X	53.70
	.180	.196	.600	.006	.045	.0550	.2500	2.5	BB-180600	45.70	BB-180600G	53.05	BB-180600X	54.40
NEW	.180	.196	.750	.003	.045	.0550	.2500	2.5	BB3-180750	45.75			BB3-180750X	53.70
	.180	.196	.750	.006	.045	.0550	.2500	2.5	BB-180750	45.70	BB-180750G	53.05	BB-180750X	54.40
	.180	.196	.750	.012	.045	.0550	.2500	2.5	BB12-180750	45.70	BB12-180750G	54.40	BB12-180750X	54.40
NEW	.180	.196	.900	.003	.045	.0550	.2500	2.5	BB3-180900	45.75			BB3-180900X	53.70
	.180	.196	.900	.006	.045	.0550	.2500	2.5	BB-180900	45.70	BB-180900G	53.05	BB-180900X	54.40
NEW	.180	.196	1.000	.003	.045	.0550	.2500	2.5	BB3-1801000	45.75			BB3-1801000X	53.70
	.180	.196	1.000	.006	.045	.0550	.2500	2.5	BB-1801000	45.70	BB-1801000G	53.05	BB-1801000X	54.40
	.180	.196	1.000	.012	.045	.0550	.2500	2.5	BB12-1801000	45.70	BB12-1801000G	54.40	BB12-1801000X	54.40
NEW	.180	.196	1.100	.003	.045	.0550	.2500	2.5	BB3-1801100	45.75			BB3-1801100X	53.70
	.180	.196	1.100	.006	.045	.0550	.2500	2.5	BB-1801100	45.70	BB-1801100G	53.05	BB-1801100X	54.40
NEW	.180	.196	1.250	.003	.045	.0550	.2500	2.5	BB3-1801250	45.75			BB3-1801250X	53.70
	.180	.196	1.250	.006	.045	.0550	.2500	2.5	BB-1801250	45.70	BB-1801250G	53.05	BB-1801250X	54.40
NEW	.180	.196	1.500	.003	.045	.0550	.2500	2.5	BB3-1801500	45.75			BB3-1801500X	53.70
	.180	.196	1.500	.006	.045	.0550	.2500	2.5	BB-1801500	45.70	BB-1801500G	53.05	BB-1801500X	54.40
NEW	.180	.196	1.750	.003	.045	.0550	.2500	3.0	BB3-1801750	45.75			BB3-1801750X	53.70
NEW	.180	.196	1.750	.006	.045	.0550	.2500	3.0	BB6-1801750	45.75			BB6-1801750X	53.70
	.200	.216	.400	.006	.050	.0750	.2500	2.5	BB-200400	45.70	BB-200400G	53.05	BB-200400X	54.40
	.200	.216	.500	.006	.050	.0750	.2500	2.5	BB-200500	45.70	BB-200500G	53.05	BB-200500X	54.40
	.200	.216	.500	.012	.050	.0750	.2500	2.5	BB12-200500	45.70	BB12-200500G	54.40	BB12-200500X	54.40
	.200	.216	.600	.006	.050	.0750	.2500	2.5	BB-200600	45.70	BB-200600G	53.05	BB-200600X	54.40
	.200	.216	.700	.006	.050	.0750	.2500	2.5	BB-200700	45.70	BB-200700G	53.05	BB-200700X	54.40
	.200	.216	.750	.006	.050	.0750	.2500	2.5	BB6-200750	45.70	BB6-200750G	54.40	BB6-200750X	54.40
	.200	.216	.750	.012	.050	.0750	.2500	2.5	BB12-200750	45.70	BB12-200750G	54.40	BB12-200750X	54.40
	.200	.216	.800	.006	.050	.0750	.2500	2.5	BB-200800	45.70	BB-200800G	53.05	BB-200800X	54.40
	.200	.216	.900	.006	.050	.0750	.2500	2.5	BB-200900	45.70	BB-200900G	53.05	BB-200900X	54.40
	.200	.216	1.000	.006	.050	.0750	.2500	2.5	BB-2001000	45.70	BB-2001000G	53.05	BB-2001000X	54.40
	.200	.216	1.000	.012	.050	.0750	.2500	2.5	BB12-2001000	45.70	BB12-2001000G	54.40	BB12-2001000X	54.40
	.200	.216	1.100	.006	.050	.0750	.2500	2.5	BB-2001100	45.70			BB-2001100X	54.40
	.200	.216	1.200	.006	.050	.0750	.2500	2.5	BB-2001200	45.70	BB-2001200G	53.05	BB-2001200X	54.40
	.200	.216	1.300	.006	.050	.0750	.2500	2.5	BB-2001300	45.70	BB-2001300G	53.05	BB-2001300X	54.40
	.200	.216	1.500	.006	.050	.0750	.2500	2.5	BB6-2001500	45.70	BB6-2001500G	54.40	BB6-2001500X	54.40

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

Continued on next page

See pages 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	Proj.	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 #	USD$	Tool #	USD$	Tool #	USD$
.230	.250	.400	.006	.057	.0738	.3125	2.5	BB-230400	61.35	BB-230400G	71.80	BB-230400X	71.80
.230	.250	.500	.006	.057	.0738	.3125	2.5	BB-230500	61.35	BB-230500G	71.80	BB-230500X	71.80
.230	.250	.500	.012	.057	.0738	.3125	2.5	BB12-230500	61.35	BB12-230500G	71.80	BB12-230500X	71.80
.230	.250	.600	.006	.057	.0738	.3125	2.5	BB-230600	61.35	BB-230600G	71.80	BB-230600X	71.80
.230	.250	.700	.006	.057	.0738	.3125	2.5	BB-230700	61.35	BB-230700G	71.80	BB-230700X	71.80
.230	.250	.750	.006	.057	.0738	.3125	2.5	BB6-230750	61.35	BB6-230750G	71.80	BB6-230750X	71.80
.230	.250	.750	.012	.057	.0738	.3125	2.5	BB12-230750	61.35	BB12-230750G	71.80	BB12-230750X	71.80
.230	.250	.800	.006	.057	.0738	.3125	2.5	BB-230800	61.35	BB-230800G	71.80	BB-230800X	71.80
.230	.250	.900	.006	.057	.0738	.3125	2.5	BB-230900	61.35	BB-230900G	71.80	BB-230900X	71.80
.230	.250	1.000	.006	.057	.0738	.3125	2.5	BB-2301000	61.35	BB-2301000G	71.80	BB-2301000X	71.80
.230	.250	1.000	.012	.057	.0738	.3125	2.5	BB12-2301000	61.35	BB12-2301000G	71.80	BB12-2301000X	71.80
.230	.250	1.100	.006	.057	.0738	.3125	2.5	BB-2301100	61.35	BB-2301100G	71.80	BB-2301100X	71.80
.230	.250	1.150	.006	.057	.0738	.3125	2.5	BB-2301150	61.35	BB-2301150G	71.80	BB-2301150X	71.80
.230	.250	1.200	.006	.057	.0738	.3125	2.5	BB-2301200	61.35	BB-2301200G	71.80	BB-2301200X	71.80
.230	.250	1.250	.006	.057	.0738	.3125	2.5	BB-2301250	61.35	BB-2301250G	71.80	BB-2301250X	71.80
.230	.250	1.400	.006	.057	.0738	.3125	2.5	BB-2301400	61.35	BB-2301400G	71.80	BB-2301400X	71.80
.230	.250	1.500	.006	.057	.0738	.3125	2.5	BB-2301500	61.35	BB-2301500G	71.80	BB-2301500X	71.80
.230	.250	1.600	.006	.057	.0738	.3125	2.5	BB-2301600	61.35	BB-2301600G	71.80	BB-2301600X	71.80
.230	.250	1.750	.006	.057	.0738	.3125	3.0	BB6-2301750	63.10	BB6-2301750G	73.65	BB6-2301750X	73.65
.260	.280	.400	.006	.065	.1038	.3125	2.5	BB6-260400	61.35	BB6-260400G	71.80	BB6-260400X	71.80
.260	.280	.500	.006	.065	.1038	.3125	2.5	BB6-260500	61.35			BB6-260500X	71.80
.260	.280	.600	.006	.065	.1038	.3125	2.5	BB6-260600	61.35	BB6-260600G	71.80		
.260	.280	.700	.006	.065	.1038	.3125	2.5	BB6-260700	61.35	BB6-260700G	71.80	BB6-260700X	71.80
.260	.280	.750	.006	.065	.1038	.3125	2.5	BB6-260750	61.35	BB6-260750G	71.80	BB6-260750X	71.80
.260	.280	.750	.012	.065	.1038	.3125	2.5	BB12-260750	61.35	BB12-260750G	71.80	BB12-260750X	71.80
.260	.280	.800	.006	.065	.1038	.3125	2.5	BB6-260800	61.35			BB6-260800X	71.80
.260	.280	.900	.006	.065	.1038	.3125	2.5	BB6-260900	61.35	BB6-260900G	71.80	BB6-260900X	71.80
.260	.280	1.000	.006	.065	.1038	.3125	2.5	BB6-2601000	61.35			BB6-2601000X	71.80
.260	.280	1.000	.012	.065	.1038	.3125	2.5	BB12-2601000	61.35	BB12-2601000G	71.80	BB12-2601000X	71.80
.260	.280	1.250	.006	.065	.1038	.3125	2.5	BB6-2601250	61.35	BB6-2601250G	71.80	BB6-2601250X	71.80
.260	.280	1.250	.012	.065	.1038	.3125	2.5	BB12-2601250	61.35	BB12-2601250G	71.80	BB12-2601250X	71.80
.290	.310	.500	.006	.072	.1338	.3125	2.5	BB-290500	61.35	BB-290500G	71.80	BB-290500X	71.80
.290	.310	.600	.006	.072	.1338	.3125	2.5	BB-290600	61.35	BB-290600G	71.80	BB-290600X	71.80
.290	.310	.750	.006	.072	.1338	.3125	2.5	BB-290750	61.35	BB-290750G	71.80	BB-290750X	71.80
.290	.310	.750	.012	.072	.1338	.3125	2.5	BB12-290750	61.35	BB12-290750G	71.80	BB12-290750X	71.80
.290	.310	.900	.006	.072	.1338	.3125	2.5	BB-290900	61.35	BB-290900G	71.80	BB-290900X	71.80
.290	.310	1.000	.006	.072	.1338	.3125	2.5	BB-2901000	61.35	BB-2901000G	71.80	BB-2901000X	71.80
.290	.310	1.000	.012	.072	.1338	.3125	2.5	BB12-2901000	61.35	BB12-2901000G	71.80	BB12-2901000X	71.80
.290	.310	1.100	.006	.072	.1338	.3125	2.5	BB-2901100	61.35	BB-2901100G	71.80	BB-2901100X	71.80
.290	.310	1.250	.006	.072	.1338	.3125	2.5	BB-2901250	61.35	BB-2901250G	71.80	BB-2901250X	71.80
.290	.310	1.250	.012	.072	.1338	.3125	2.5	BB12-2901250	61.35	BB12-2901250G	71.80	BB12-2901250X	71.80
.290	.310	1.350	.006	.072	.1338	.3125	2.5	BB-2901350	61.35	BB-2901350G	71.80	BB-2901350X	71.80
.290	.310	1.500	.006	.072	.1338	.3125	2.5	BB-2901500	61.35	BB-2901500G	71.80	BB-2901500X	71.80
.290	.310	1.600	.006	.072	.1338	.3125	2.5	BB-2901600	61.35	BB-2901600G	71.80	BB-2901600X	71.80
.290	.310	1.750	.006	.072	.1338	.3125	2.5	BB-2901750	61.35	BB-2901750G	71.80	BB-2901750X	71.80
.290	.310	2.000	.006	.072	.1338	.3125	3.0	BB6-2902000	63.10	BB6-2902000G	73.65	BB6-2902000X	73.65
.320	.340	.500	.006	.080	.1325	.3750	2.5	BB-320500	83.65	BB-320500G	95.05	BB-320500X	96.15
.320	.340	.600	.006	.080	.1325	.3750	2.5	BB-320600	83.65			BB-320600X	96.15

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

Continued on next page

See pages 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	Proj.	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 #	USD$	Tool #	USD$	Tool #	USD$
.320	.340	.750	.006	.080	.1325	.3750	2.5	BB-320750	83.65	BB-320750G	95.05	BB-320750X	96.15
.320	.340	.750	.012	.080	.1325	.3750	2.5	BB12-320750	83.65	BB12-320750G	96.15	BB12-320750X	96.15
.320	.340	.900	.006	.080	.1325	.3750	2.5	BB-320900	83.65	BB-320900G	95.05	BB-320900X	96.15
.320	.340	1.000	.006	.080	.1325	.3750	2.5	BB-3201000	83.65	BB-3201000G	95.05	BB-3201000X	96.15
.320	.340	1.000	.012	.080	.1325	.3750	2.5	BB12-3201000	83.65	BB12-3201000G	96.15	BB12-3201000X	96.15
.320	.340	1.100	.006	.080	.1325	.3750	2.5	BB-3201100	83.65	BB-3201100G	95.05	BB-3201100X	96.15
.320	.340	1.250	.006	.080	.1325	.3750	2.5	BB-3201250	83.65	BB-3201250G	95.05	BB-3201250X	96.15
.320	.340	1.250	.012	.080	.1325	.3750	2.5	BB12-3201250	83.65	BB12-3201250G	96.15	BB12-3201250X	96.15
.320	.340	1.500	.006	.080	.1325	.3750	2.5	BB-3201500	83.65	BB-3201500G	95.05	BB-3201500X	96.15
.320	.340	1.600	.006	.080	.1325	.3750	2.5	BB-3201600	83.65	BB-3201600G	95.05	BB-3201600X	96.15
.320	.340	1.800	.006	.080	.1325	.3750	2.5	BB-3201800	83.65	BB-3201800G	95.05	BB-3201800X	96.15
.320	.340	2.000	.006	.080	.1325	.3750	4.0	BB-3202000	106.90	BB-3202000G	120.25	BB-3202000X	120.25
.320	.340	2.500	.006	.080	.1325	.3750	4.0	BB-3202500	106.90	BB-3202500G	120.25	BB-3202500X	120.25
.320	.340	3.000	.006	.080	.1325	.3750	4.0	BB-3203000	106.90			BB-3203000X	120.25
.360	.380	.500	.006	.090	.1725	.3750	2.5	BB-360500	83.65	BB-360500G	95.05	BB-360500X	96.15
.360	.380	.600	.006	.090	.1725	.3750	2.5	BB-360600	83.65	BB-360600G	95.05		
.360	.380	.750	.006	.090	.1725	.3750	2.5	BB-360750	83.65	BB-360750G	95.05	BB-360750X	96.15
.360	.380	.750	.012	.090	.1725	.3750	2.5	BB12-360750	83.65	BB12-360750G	96.15	BB12-360750X	96.15
.360	.380	.900	.006	.090	.1725	.3750	2.5	BB-360900	83.65			BB-360900X	96.15
.360	.380	1.000	.006	.090	.1725	.3750	2.5	BB-3601000	83.65	BB-3601000G	95.05	BB-3601000X	96.15
.360	.380	1.000	.012	.090	.1725	.3750	2.5	BB12-3601000	83.65	BB12-3601000G	96.15	BB12-3601000X	96.15
.360	.380	1.150	.006	.090	.1725	.3750	2.5	BB-3601150	83.65	BB-3601150G	95.05	BB-3601150X	96.15
.360	.380	1.250	.006	.090	.1725	.3750	2.5	BB-3601250	83.65	BB-3601250G	95.05	BB-3601250X	96.15
.360	.380	1.250	.012	.090	.1725	.3750	2.5	BB12-3601250	83.65	BB12-3601250G	96.15	BB12-3601250X	96.15
.360	.380	1.500	.006	.090	.1725	.3750	2.5	BB-3601500	83.65	BB-3601500G	95.05	BB-3601500X	96.15
.360	.380	1.600	.006	.090	.1725	.3750	2.5	BB-3601600	83.65	BB-3601600G	95.05	BB-3601600X	96.15
.360	.380	1.800	.006	.090	.1725	.3750	2.5	BB-3601800	83.65	BB-3601800G	95.05	BB-3601800X	96.15
.360	.380	2.000	.006	.090	.1725	.3750	4.0	BB-3602000	106.90	BB-3602000G	120.25	BB-3602000X	120.25
.360	.380	2.500	.006	.090	.1725	.3750	4.0	BB-3602500	106.90			BB-3602500X	120.25
.360	.380	3.000	.006	.090	.1725	.3750	4.0	BB-3603000	106.90			BB-3603000X	120.25
.410	.430	.750	.006	.104	.1600	.5000	3.0	BB6-410750	116.50	BB6-410750G	133.35	BB6-410750X	133.35
.410	.430	1.000	.006	.104	.1600	.5000	3.0	BB6-4101000	116.50	BB6-4101000G	133.35	BB6-4101000X	133.35
.410	.430	1.250	.006	.104	.1600	.5000	3.0	BB6-4101250	116.50	BB6-4101250G	133.35	BB6-4101250X	133.35
.410	.430	1.500	.006	.104	.1600	.5000	3.0	BB6-4101500	116.50	BB6-4101500G	133.35	BB6-4101500X	133.35
.460	.480	1.000	.006	.115	.2100	.5000	3.0			BB6-4601000G	133.35		
.460	.480	1.500	.006	.115	.2100	.5000	3.0	BB6-4601500	116.50	BB6-4601500G	133.35	BB6-4601500X	133.35
.460	.480	2.000	.006	.115	.2100	.5000	3.0	BB6-4602000	116.50	BB6-4602000G	133.35	BB6-4602000X	133.35
.490	.510	.750	.006	.122	.2400	.5000	3.0	BB-490750	116.50	BB-490750G	130.75	BB-490750X	133.35
.490	.510	1.000	.006	.122	.2400	.5000	3.0	BB-4901000	116.50			BB-4901000X	133.35
.490	.510	1.250	.006	.122	.2400	.5000	3.0	BB-4901250	116.50				
.490	.510	1.500	.006	.122	.2400	.5000	3.0	BB-4901500	116.50			BB-4901500X	133.35
.490	.510	2.000	.006	.122	.2400	.5000	4.0	BB-4902000	127.70	BB-4902000G	144.35	BB-4902000X	145.95
.490	.510	2.500	.006	.122	.2400	.5000	4.0	BB-4902500	127.70	BB-4902500G	144.35	BB-4902500X	145.95
.490	.510	2.750	.006	.122	.2400	.5000	4.0	BB-4902750	127.70	BB-4902750G	144.35		
.490	.510	3.000	.006	.122	.2400	.5000	6.0	BB-4903000	160.30			BB-4903000X	181.45
.490	.510	3.500	.006	.122	.2400	.5000	6.0	BB-4903500	160.30			BB-4903500X	181.45
.490	.510	4.000	.006	.122	.2400	.5000	6.0	BB-4904000	160.30			BB-4904000X	181.45
.490	.510	4.500	.006	.122	.2400	.5000	6.0	BB-4904500	160.30			BB-4904500X	181.45

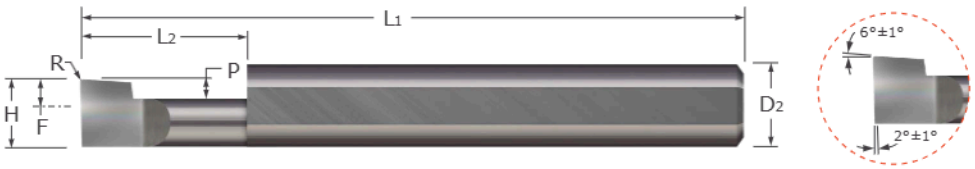
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pages 39-47 for standard tool holders

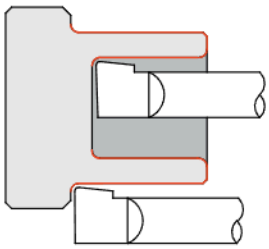
Standard – Boring Tools

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		L_2 $^{+.050"}_{-.000"}$	R $^{+.003"}_{-.000"}$	P	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$	Tool #	USD$
.050	.055	.150	.003	.012	-.0125	.1250	1.5	BBL-050150	39.80			BBL-050150X	45.50
.050	.055	.200	.003	.012	-.0125	.1250	1.5	BBL-050200	39.80				
.060	.070	.150	.003	.015	-.0025	.1250	1.5	BBL-060150	39.80				
.060	.070	.200	.003	.015	-.0025	.1250	1.5	BBL-060200	39.80			BBL-060200X	45.50
.060	.070	.300	.003	.015	-.0025	.1250	1.5					BBL-060300X	45.50
.080	.090	.150	.003	.020	.0175	.1250	1.5			BBL-080150G	44.60		
.080	.090	.200	.003	.020	.0175	.1250	1.5	BBL-080200	39.80				
.080	.090	.300	.003	.020	.0175	.1250	1.5	BBL-080300	39.80				
.080	.090	.400	.003	.020	.0175	.1250	1.5	BBL-080400	39.80	BBL-080400G	44.60	BBL-080400X	45.50
.080	.090	.500	.003	.020	.0175	.1250	1.5			BBL-080500G	44.60	BBL-080500X	45.50
.100	.110	.150	.003	.025	.0375	.1250	1.5	BBL-100150	39.80				
.100	.110	.300	.003	.025	.0375	.1250	1.5			BBL-100300G	44.60		
.100	.110	.500	.003	.025	.0375	.1250	1.5	BBL-100500	39.80	BBL-100500G	44.60	BBL-100500X	45.50
.100	.110	.600	.003	.025	.0375	.1250	1.5	BBL-100600	39.80				
.100	.110	.700	.003	.025	.0375	.1250	1.5					BBL-100700X	45.50
.110	.122	.200	.003	.027	.0475	.1250	1.5			BBL-110200G	44.60		
.110	.122	.300	.003	.027	.0475	.1250	1.5	BBL-110300	39.80				
.110	.122	.400	.003	.027	.0475	.1250	1.5	BBL-110400	39.80				
.120	.132	.250	.006	.030	.0263	.1875	2.0	BBL-120250	42.25			BBL-120250X	48.80
.120	.132	.500	.006	.030	.0263	.1875	2.0	BBL-120500	42.25			BBL-120500X	48.80
.120	.132	.600	.006	.030	.0263	.1875	2.0	BBL-120600	42.25			BBL-120600X	48.80
.120	.132	.700	.006	.030	.0263	.1875	2.0	BBL-120700	42.25				

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$	Tool #	USD$
.140	.152	.250	.006	.035	.0463	.1875	2.0	BBL-140250	42.25	BBL-140250G	47.55	BBL-140250X	48.80
.140	.152	.400	.006	.035	.0463	.1875	2.0					BBL-140400X	48.80
.140	.152	.500	.006	.035	.0463	.1875	2.0	BBL-140500	42.25			BBL-140500X	48.80
.140	.152	.600	.006	.035	.0463	.1875	2.0	BBL-140600	42.25				
.140	.152	.700	.006	.035	.0463	.1875	2.0	BBL-140700	42.25				
.140	.152	.800	.006	.035	.0463	.1875	2.0	BBL-140800	42.25				
.160	.176	.500	.006	.040	.0663	.1875	2.0	BBL-160500	42.25			BBL-160500X	48.80
.160	.176	.600	.006	.040	.0663	.1875	2.0					BBL-160600X	48.80
.160	.176	.750	.006	.040	.0663	.1875	2.0	BBL-160750	42.25				
.160	.176	.900	.006	.040	.0663	.1875	2.0	BBL-160900	42.25	BBL-160900G	47.55	BBL-160900X	48.80
.160	.176	1.000	.006	.040	.0663	.1875	2.0	BBL-1601000	42.25			BBL-1601000X	48.80
.180	.196	.350	.006	.045	.0550	.2500	2.5	BBL-180350	45.70				
.180	.196	.500	.006	.045	.0550	.2500	2.5	BBL-180500	45.70			BBL-180500X	54.40
.180	.196	.600	.006	.045	.0550	.2500	2.5	BBL-180600	45.70	BBL-180600G	53.05	BBL-180600X	54.40
.180	.196	.750	.006	.045	.0550	.2500	2.5	BBL-180750	45.70	BBL-180750G	53.05		
.180	.196	.900	.006	.045	.0550	.2500	2.5	BBL-180900	45.70				
.180	.196	1.000	.006	.045	.0550	.2500	2.5	BBL-1801000	45.70			BBL-1801000X	54.40
.180	.196	1.100	.006	.045	.0550	.2500	2.5	BBL-1801100	45.70				
.180	.196	1.500	.006	.045	.0550	.2500	2.5	BBL-1801500	45.70			BBL-1801500X	54.40
.200	.216	.400	.006	.050	.0750	.2500	2.5	BBL-200400	45.70	BBL-200400G	53.05	BBL-200400X	54.40
.200	.216	.500	.006	.050	.0750	.2500	2.5	BBL-200500	45.70			BBL-200500X	54.40
.200	.216	.600	.006	.050	.0750	.2500	2.5	BBL-200600	45.70	BBL-200600G	53.05		
.200	.216	.700	.006	.050	.0750	.2500	2.5	BBL-200700	45.70			BBL-200700X	54.40
.200	.216	.800	.006	.050	.0750	.2500	2.5	BBL-200800	45.70	BBL-200800G	53.05	BBL-200800X	54.40
.200	.216	1.000	.006	.050	.0750	.2500	2.5	BBL-2001000	45.70			BBL-2001000X	54.40
.200	.216	1.100	.006	.050	.0750	.2500	2.5	BBL-2001100	45.70				
.200	.216	1.200	.006	.050	.0750	.2500	2.5	BBL-2001200	45.70				
.200	.216	1.300	.006	.050	.0750	.2500	2.5	BBL-2001300	45.70				
.230	.250	.600	.006	.057	.0738	.3125	2.5	BBL-230600	61.35			BBL-230600X	71.80
.230	.250	.700	.006	.057	.0738	.3125	2.5	BBL-230700	61.35				
.230	.250	.800	.006	.057	.0738	.3125	2.5	BBL-230800	61.35			BBL-230800X	71.80
.230	.250	.900	.006	.057	.0738	.3125	2.5	BBL-230900	61.35			BBL-230900X	71.80
.230	.250	1.000	.006	.057	.0738	.3125	2.5	BBL-2301000	61.35			BBL-2301000X	71.80
.230	.250	1.250	.006	.057	.0738	.3125	2.5	BBL-2301250	61.35				
.230	.250	1.500	.006	.057	.0738	.3125	2.5	BBL-2301500	61.35			BBL-2301500X	71.80
.230	.250	1.600	.006	.057	.0738	.3125	2.5	BBL-2301600	61.35				
.290	.310	.500	.006	.072	.1338	.3125	2.5	BBL-290500	61.35				
.290	.310	.750	.006	.072	.1338	.3125	2.5	BBL-290750	61.35				
.290	.310	.900	.006	.072	.1338	.3125	2.5	BBL-290900	61.35				
.290	.310	1.000	.006	.072	.1338	.3125	2.5	BBL-2901000	61.35			BBL-2901000X	71.80
.290	.310	1.250	.006	.072	.1338	.3125	2.5	BBL-2901250	61.35				
.290	.310	1.350	.006	.072	.1338	.3125	2.5	BBL-2901350	61.35				
.290	.310	1.500	.006	.072	.1338	.3125	2.5	BBL-2901500	61.35			BBL-2901500X	71.80

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$	Tool #	USD$
.320	.340	.600	.006	.080	.1325	.3750	2.5	BBL-320600	83.65	BBL-320600G	95.05		
.320	.340	.750	.006	.080	.1325	.3750	2.5	BBL-320750	83.65			BBL-320750X	96.15
.320	.340	1.000	.006	.080	.1325	.3750	2.5	BBL-3201000	83.65			BBL-3201000X	96.15
.320	.340	1.500	.006	.080	.1325	.3750	2.5	BBL-3201500	83.65			BBL-3201500X	96.15
.320	.340	2.000	.006	.080	.1325	.3750	4.0	BBL-3202000	106.90			BBL-3202000X	120.25
.320	.340	2.500	.006	.080	.1325	.3750	4.0	BBL-3202500	106.90				
.320	.340	3.000	.006	.080	.1325	.3750	4.0					BBL-3203000X	120.25
.360	.380	.750	.006	.090	.1725	.3750	2.5	BBL-360750	83.65			BBL-360750X	96.15
.360	.380	1.000	.006	.090	.1725	.3750	2.5	BBL-3601000	83.65				
.360	.380	1.500	.006	.090	.1725	.3750	2.5	BBL-3601500	83.65				
.360	.380	1.800	.006	.090	.1725	.3750	2.5	BBL-3601800	83.65				
.360	.380	3.000	.006	.090	.1725	.3750	4.0					BBL-3603000X	120.25
.490	.510	1.500	.006	.122	.2400	.5000	3.0	BBL-4901500	116.50			BBL-4901500X	133.35
.490	.510	3.500	.006	.122	.2400	.5000	6.0	BBL-4903500	160.30				

*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

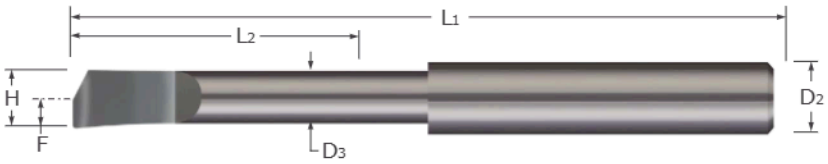
SCAN

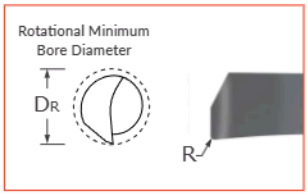
See pages 39-47 for standard tool holders

HBBC

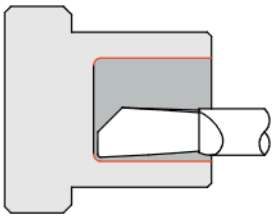
Standard – Boring Tools

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	DR	L2 +.032" −.000"	R +.001" −.001"	D3 +.000" −.002"	F	D2 (h6)	L1	Tool #	USD$
.0275	.030	.187	.004	.025	.0150	.1250	1.5	HBBC-030187-004	52.90
.0275	.030	.250	.004	.025	.0150	.1250	1.5	HBBC-030250-004	52.90
.0325	.035	.125	.004	.030	.0175	.1250	1.5	HBBC-035125-004	41.45
.0325	.035	.250	.004	.030	.0175	.1250	1.5	HBBC-035250-004	41.45
.0375	.040	.187	.004	.035	.0200	.1250	1.5	HBBC-040187-004	41.45
.0375	.040	.250	.004	.035	.0200	.1250	1.5	HBBC-040250-004	41.45
.0375	.040	.312	.004	.035	.0200	.1250	1.5	HBBC-040312-004	41.45
.0450	.050	.187	.004	.040	.0250	.1250	1.5	HBBC-050187-004	41.45
.0450	.050	.375	.004	.040	.0250	.1250	1.5	HBBC-050375-004	41.45
.0550	.060	.250	.004	.050	.0300	.1250	1.5	HBBC-060250-004	41.45
.0550	.060	.375	.004	.050	.0300	.1250	1.5	HBBC-060375-004	41.45
.0550	.060	.500	.004	.050	.0300	.1250	1.5	HBBC-060500-004	41.45
.0650	.070	.312	.004	.060	.0350	.1250	1.5	HBBC-070312-004	41.45
.0650	.070	.562	.004	.060	.0350	.1250	1.5	HBBC-070562-004	41.45
.0750	.080	.375	.004	.070	.0400	.1250	1.5	HBBC-080375-004	41.45
.0750	.080	.500	.004	.070	.0400	.1250	1.5	HBBC-080500-004	41.45
.0750	.080	.625	.004	.070	.0400	.1250	1.5	HBBC-080625-004	41.45
.0850	.090	.375	.004	.080	.0450	.1250	1.5	HBBC-090375-004	41.45
.0850	.090	.500	.004	.080	.0450	.1250	1.5	HBBC-090500-004	41.45
.0850	.090	.687	.004	.080	.0450	.1250	1.5	HBBC-090687-004	41.45
.0950	.100	.437	.004	.090	.0500	.1250	1.5	HBBC-100437-004	41.45
.0950	.100	.562	.004	.090	.0500	.1250	1.5	HBBC-100562-004	41.45
.0950	.100	.750	.004	.090	.0500	.1250	1.5	HBBC-100750-004	41.45
.1100	.120	.500	.004	.100	.0600	.1250	1.5	HBBC-120500-004	41.45
.1100	.120	.625	.004	.100	.0600	.1250	1.5	HBBC-120625-004	41.45
.1100	.120	1.000	.004	.100	.0600	.1250	1.5	HBBC-1201000-004	41.45

Continued on next page

See pags 39-47 for standard tool holders

Standard – Boring Tools

Helical Back Rake – Corner Radius (cont.)

HBBC

Continued from previous page

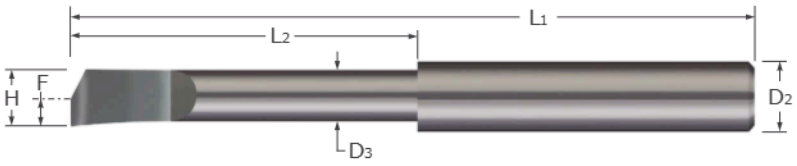
Head Width	Rotational Minimum Bore Diameter	Maximum Bore Depth	Radius	Neck Diameter	Centerline Offset	Shank Diameter	Overall Length	Uncoated	
H	D_R	L_2 $^{+.032"}_{-.000"}$	R $^{+.001"}_{-.001"}$	D_3 $^{+.000"}_{-.002"}$	F	D_2 (h6)	L_1	Tool #	USD$
.1225	.135	.562	.004	.110	.0675	.1875	2.0	HBBC-135562-004	44.40
.1225	.135	.750	.004	.110	.0675	.1875	2.0	HBBC-135750-004	44.40
.1225	.135	1.000	.004	.110	.0675	.1875	2.0	HBBC-1351000-004	44.40
.1400	.150	.625	.004	.130	.0750	.1875	2.0	HBBC-150625-004	44.40
.1400	.150	1.000	.004	.130	.0750	.1875	2.0	HBBC-1501000-004	44.40
.1400	.150	1.250	.004	.130	.0750	.1875	2.0	HBBC-1501250-004	44.40
.1700	.180	1.000	.004	.160	.0900	.1875	2.0	HBBC-1801000-004	44.40
.1700	.180	1.250	.004	.160	.0900	.1875	2.0	HBBC-1801250-004	44.40
.1700	.180	1.500	.004	.160	.0900	.1875	2.0	HBBC-1801500-004	44.40
.1975	.210	1.000	.004	.185	.1050	.2500	2.5	HBBC-2101000-004	47.90
.1975	.210	1.250	.004	.185	.1050	.2500	2.5	HBBC-2101250-004	47.90
.1975	.210	1.500	.004	.185	.1050	.2500	2.5	HBBC-2101500-004	47.90
.2275	.240	1.000	.004	.215	.1200	.2500	2.5	HBBC-2401000-004	47.90
.2275	.240	1.500	.004	.215	.1200	.2500	2.5	HBBC-2401500-004	47.90
.2275	.240	1.750	.004	.215	.1200	.2500	2.5	HBBC-2401750-004	47.90
.2750	.300	1.000	.004	.250	.1500	.3125	2.5	HBBC-3001000-004	64.80
.2750	.300	1.500	.004	.250	.1500	.3125	2.5	HBBC-3001500-004	64.80
.2750	.300	1.750	.004	.250	.1500	.3125	2.5	HBBC-3001750-004	64.80
.3400	.360	1.000	.004	.320	.1800	.3750	2.5	HBBC-3601000-004	88.95
.3400	.360	1.500	.004	.320	.1800	.3750	2.5	HBBC-3601500-004	88.95
.3400	.360	2.000	.004	.320	.1800	.3750	4.0	HBBC-3602000-004	113.70
.3400	.360	2.500	.004	.320	.1800	.3750	4.0	HBBC-3602500-004	113.70

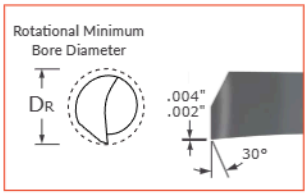
See pages 39-47 for standard tool holders

HBB / HBM

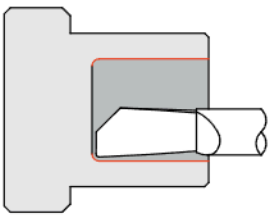
Standard – Boring Tools

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 #	USD$	Tool #	USD$
.0175		.0175	.020	.063	.015	.0100	.1250	1.5	HBB-020062	50.70	HBB-020062X	56.75
.0225		.0225	.025	.125	.020	.0125	.1250	1.5	HBB-025125	50.70		
	0.65 mm	.0256	0.7 mm	3 mm	0.6 mm	0.35 mm	3 mm	38 mm	HBM-007003	46.00		
.0275		.0275	.030	.188	.025	.0150	.1250	1.5	HBB-030187	50.70	HBB-030187X	56.75
	0.75 mm	.0295	0.8 mm	4 mm	0.7 mm	0.40 mm	3 mm	38 mm	HBM-008004	46.00		
.0325		.0325	.035	.188	.030	.0175	.1250	1.5	HBB-035187	38.90	HBB-035187X	44.85
	0.90 mm	.0354	1.0 mm	6 mm	0.8 mm	0.50 mm	3 mm	38 mm	HBM-010006	35.65		
.0375		.0375	.040	.188	.035	.0200	.1250	1.5	HBB-040187	38.90	HBB-040187X	44.85
.0375		.0375	.040	.250	.035	.0200	.1250	1.5			HBB-040250X	44.85
.0450		.0450	.050	.313	.040	.0250	.1250	1.5			HBB-050312X	44.85
	1.35 mm	.0531	1.5 mm	9 mm	1.2 mm	0.75 mm	3 mm	38 mm	HBM-015009	35.65		
.0550		.0550	.060	.375	.050	.0300	.1250	1.5	HBB-060375	38.90	HBB-060375X	44.85
	1.63 mm	.0642	1.75 mm	10 mm	1.5 mm	0.875 mm	3 mm	38 mm	HBM-017510	35.65		
.0650		.0650	.070	.438	.060	.0350	.1250	1.5	HBB-070437	38.90	HBB-070437X	44.85
.0750		.0750	.080	.500	.070	.0400	.1250	1.5	HBB-080500	38.90	HBB-080500X	44.85
	2.05 mm	.0807	2.26 mm	12 mm	1.9 mm	1.13 mm	3 mm	38 mm	HBM-022512	35.65		
.0850		.0850	.090	.500	.080	.0450	.1250	1.5	HBB-090500	38.90	HBB-090500X	44.85
.0950		.0950	.100	.563	.090	.0500	.1250	1.5	HBB-100562	38.90	HBB-100562X	44.85
	2.75 mm	.1083	3.0 mm	16 mm	2.5 mm	1.50 mm	4 mm	50 mm	HBM-030016	36.70		
.1100		.1100	.120	.625	.100	.0600	.1250	1.5	HBB-120625	38.90	HBB-120625X	44.85
.1100		.1100	.120	1.000	.100	.0600	.1250	1.5	HBB-1201000	38.90	HBB-1201000X	44.85
.1225		.1225	.135	.750	.110	.0675	.1875	2.0	HBB-135750	41.85	HBB-135750X	48.30
.1225		.1225	.135	1.000	.110	.0675	.1875	2.0	HBB-1351000	41.85	HBB-1351000X	48.30

Continued on next page

See pages 39-47 for standard tool holders

Standard – Boring Tools

Helical Back Rake (cont.)

HBB / HBM

Continued from previous page

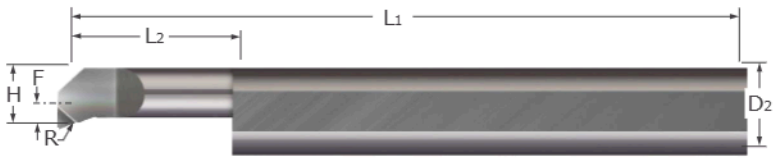
Head Width		Rotational Min. Bore Diameter	Max. Bore Depth	Neck Diameter	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H	decimal equiv.	D_R	L_2 +.032" −.000" +.81 mm −.00 mm	D_3 +.000" −.002" +.00 mm −.05 mm	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.1400	.1400	.150	1.000	.130	.0750	.1875	2.0	HBB-1501000	41.85	HBB-1501000X	48.30
.1400	.1400	.150	1.250	.130	.0750	.1875	2.0	HBB-1501250	41.85	HBB-1501250X	48.30
3.65 mm	.1437	4.0 mm	25 mm	3.3 mm	2.00 mm	6 mm	57 mm			HBM-040025X	56.65
.1700	.1700	.180	1.000	.160	.0900	.1875	2.0	HBB-1801000	41.85	HBB-1801000X	48.30
.1700	.1700	.180	1.250	.160	.0900	.1875	2.0	HBB-1801250	41.85	HBB-1801250X	48.30
.1700	.1700	.180	1.500	.160	.0900	.1875	2.0	HBB-1801500	41.85	HBB-1801500X	48.30
.1975	.1975	.210	1.000	.185	.1050	.2500	2.5	HBB-2101000	45.30	HBB-2101000X	54.05
.1975	.1975	.210	1.250	.185	.1050	.2500	2.5	HBB-2101250	45.30	HBB-2101250X	54.05
.1975	.1975	.210	1.500	.185	.1050	.2500	2.5	HBB-2101500	45.30	HBB-2101500X	54.05
.2275	.2275	.240	1.000	.215	.1200	.2500	2.5	HBB-2401000	45.30	HBB-2401000X	54.05
.2275	.2275	.240	1.500	.215	.1200	.2500	2.5	HBB-2401500	45.30	HBB-2401500X	54.05
.2275	.2275	.240	1.750	.215	.1200	.2500	2.5	HBB-2401750	45.30	HBB-2401750X	54.05
.2750	.2750	.300	1.000	.250	.1500	.3125	2.5	HBB-3001000	61.90	HBB-3001000X	72.35
.2750	.2750	.300	1.500	.250	.1500	.3125	2.5	HBB-3001500	61.90	HBB-3001500X	72.35
.2750	.2750	.300	1.750	.250	.1500	.3125	2.5	HBB-3001750	61.90	HBB-3001750X	72.35
.3400	.3400	.360	1.000	.320	.1800	.3750	2.5	HBB-3601000	85.85		
.3400	.3400	.360	1.500	.320	.1800	.3750	2.5	HBB-3601500	85.85	HBB-3601500X	98.30
.3400	.3400	.360	2.000	.320	.1800	.3750	4.0	HBB-3602000	110.60	HBB-3602000X	123.95
.3400	.3400	.360	2.250	.320	.1800	.3750	4.0	HBB-3602250	110.60		
.3400	.3400	.360	2.500	.320	.1800	.3750	4.0	HBB-3602500	110.60	HBB-3602500X	123.95
.4600	.4600	.480	2.500	.440	.2400	.5000	4.0	HBB-4802500	132.75		
.4600	.4600	.480	3.000	.440	.2400	.5000	4.0	HBB-4803000	132.75		

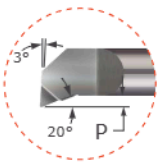
See pages 39-47 for standard tool holders

PBT

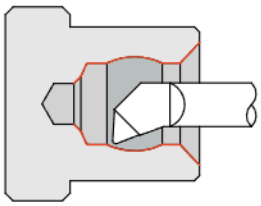
Standard – Boring Tools

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 #	USD$	Tool #	USD$
.0500	.0550	.150	.002	.005	-.0125	.1250	1.5	PBT2-050150	41.70	PBT2-050150X	47.75
.0500	.0550	.200	.002	.005	-.0125	.1250	1.5			PBT2-050200X	47.75
.0500	.0550	.400	.002	.005	-.0125	.1250	1.5	PBT2-050400	41.70	PBT2-050400X	47.75
.0500	.0550	.500	.002	.005	-.0125	.1250	1.5	PBT2-050500	41.70	PBT2-050500X	47.75
.0600	.0700	.150	.002	.010	-.0025	.1250	1.5			PBT2-060150X	47.75
.0600	.0700	.200	.002	.010	-.0025	.1250	1.5	PBT2-060200	41.70	PBT2-060200X	47.75
.0600	.0700	.400	.002	.010	-.0025	.1250	1.5	PBT2-060400	41.70	PBT2-060400X	47.75
.0600	.0700	.500	.002	.010	-.0025	.1250	1.5	PBT2-060500	41.70	PBT2-060500X	47.75
.0700	.0800	.150	.002	.015	.0075	.1250	1.5			PBT2-070150X	46.85
.0700	.0800	.200	.002	.015	.0075	.1250	1.5	PBT2-070200	40.70	PBT2-070200X	46.65
.0700	.0800	.400	.002	.015	.0075	.1250	1.5	PBT2-070400	40.70	PBT2-070400X	46.65
.0700	.0800	.600	.002	.015	.0075	.1250	1.5	PBT2-070600	40.70	PBT2-070600X	46.65
.0800	.0900	.200	.002	.015	.0175	.1250	1.5	PBT2-080200	40.70	PBT2-080200X	46.85
.0800	.0900	.400	.002	.015	.0175	.1250	1.5	PBT2-080400	40.70	PBT2-080400X	46.65
.0900	.1000	.200	.002	.015	.0275	.1250	1.5	PBT2-090200	40.70	PBT2-090200X	46.85
.0900	.1000	.400	.002	.015	.0275	.1250	1.5	PBT2-090400	40.70	PBT2-090400X	46.85
.1000	.1100	.200	.002	.015	.0375	.1250	1.5	PBT2-100200	40.70	PBT2-100200X	46.85
.1000	.1100	.400	.002	.015	.0375	.1250	1.5	PBT2-100400	40.70	PBT2-100400X	46.65
.1100	.1220	.250	.004	.020	.0475	.1250	1.5	PBT4-110250	40.70	PBT4-110250X	46.65
.1100	.1220	.500	.004	.020	.0475	.1250	1.5	PBT4-110500	40.70	PBT4-110500X	46.65
.1100	.1220	.750	.004	.020	.0475	.1250	1.5	PBT4-110750	40.70	PBT4-110750X	46.65
.1200	.1320	.250	.004	.020	.0263	.1875	2.0	PBT-120250	42.35	PBT-120250X	49.30
.1200	.1320	.375	.004	.020	.0263	.1875	2.0	PBT4-120375	42.35	PBT4-120375X	49.30
.1200	.1320	.500	.004	.020	.0263	.1875	2.0	PBT-120500	42.35	PBT-120500X	49.30
.1200	.1320	.750	.004	.020	.0263	.1875	2.0	PBT-120750	42.35	PBT-120750X	49.30
.1200	.1320	1.000	.004	.020	.0263	.1875	2.0	PBT-1201000	42.35	PBT-1201000X	49.30
.1400	.1520	.250	.002	.025	.0463	.1875	2.0	PBT2-140250	42.35	PBT2-140250X	49.30
.1400	.1520	.250	.004	.025	.0463	.1875	2.0	PBT4-140250	42.35	PBT4-140250X	49.30
.1400	.1520	.375	.002	.025	.0463	.1875	2.0	PBT2-140375	42.35	PBT2-140375X	49.30
.1400	.1520	.375	.004	.025	.0463	.1875	2.0	PBT4-140375	42.35	PBT4-140375X	49.30
.1400	.1520	.500	.002	.025	.0463	.1875	2.0	PBT2-140500	42.35	PBT2-140500X	49.30
.1400	.1520	.500	.004	.025	.0463	.1875	2.0	PBT4-140500	42.35	PBT4-140500X	49.30

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
.1600	.1760	.375	.006	.025	.0663	.1875	2.0	PBT6-160375	42.35	PBT6-160375X	49.30
.1600	.1760	.500	.006	.025	.0663	.1875	2.0	PBT-160500	42.35	PBT-160500X	49.30
.1600	.1760	.750	.006	.025	.0663	.1875	2.0	PBT-160750	42.35	PBT-160750X	49.30
.1600	.1760	1.000	.006	.025	.0663	.1875	2.0	PBT6-1601000	42.35	PBT6-1601000X	49.30
.1600	.1760	1.250	.006	.025	.0663	.1875	2.0	PBT6-1601250	42.35	PBT6-1601250X	49.30
.1800	.1960	.375	.006	.030	.0550	.2500	2.5	PBT6-180375	54.25	PBT6-180375X	63.10
.1800	.1960	.500	.006	.030	.0550	.2500	2.5	PBT-180500	54.25	PBT-180500X	63.10
.1800	.1960	.750	.006	.030	.0550	.2500	2.5	PBT6-180750	54.25	PBT6-180750X	63.10
.1800	.1960	1.000	.006	.030	.0550	.2500	2.5	PBT-1801000	54.25	PBT-1801000X	63.10
.1800	.1960	1.250	.006	.030	.0550	.2500	2.5	PBT6-1801250	54.25	PBT6-1801250X	63.10
.1800	.1960	1.500	.006	.030	.0550	.2500	2.5	PBT6-1801500	54.25	PBT6-1801500X	63.10
.2000	.2160	.375	.006	.030	.0750	.2500	2.5	PBT6-200375	54.25	PBT6-200375X	63.10
.2000	.2160	.600	.006	.030	.0750	.2500	2.5	PBT-200600	54.25	PBT-200600X	63.10
.2000	.2160	.750	.006	.030	.0750	.2500	2.5	PBT6-200750	54.25	PBT6-200750X	63.10
.2000	.2160	1.000	.006	.030	.0750	.2500	2.5	PBT-2001000	54.25	PBT-2001000X	63.10
.2000	.2160	1.250	.006	.030	.0750	.2500	2.5	PBT6-2001250	54.25	PBT6-2001250X	63.10
.2000	.2160	1.500	.006	.030	.0750	.2500	2.5	PBT6-2001500	54.25	PBT6-2001500X	63.10
.2300	.2500	.500	.004	.040	.0738	.3125	2.5	PBT4-230500	67.10	PBT4-230500X	77.60
.2300	.2500	.500	.006	.040	.0738	.3125	2.5	PBT6-230500	67.10	PBT6-230500X	77.60
.2300	.2500	.750	.004	.040	.0738	.3125	2.5	PBT4-230750	67.10	PBT4-230750X	77.60
.2300	.2500	.750	.006	.040	.0738	.3125	2.5	PBT-230750	67.10	PBT-230750X	77.60
.2300	.2500	1.100	.006	.040	.0738	.3125	2.5	PBT6-2301100	67.10	PBT6-2301100X	77.60
.2300	.2500	1.300	.006	.040	.0738	.3125	2.5	PBT6-2301300	67.10	PBT6-2301300X	77.60
.2300	.2500	1.600	.006	.040	.0738	.3125	3.0	PBT-2301600	79.80	PBT-2301600X	90.35
.2600	.2800	.500	.004	.045	.1038	.3125	2.5	PBT4-260500	67.10	PBT4-260500X	77.60
.2600	.2800	.500	.006	.045	.1038	.3125	2.5	PBT6-260500	67.10	PBT6-260500X	77.60
.2600	.2800	.750	.004	.045	.1038	.3125	2.5	PBT4-260750	67.10	PBT4-260750X	77.60
.2600	.2800	.750	.006	.045	.1038	.3125	2.5	PBT6-260750	67.10	PBT6-260750X	77.60
.3000	.3200	.750	.006	.050	.1125	.3750	2.5	PBT6-300750	81.20	PBT6-300750X	93.65
.3000	.3200	1.000	.006	.050	.1125	.3750	2.5	PBT-3001000	81.20	PBT-3001000X	93.65
.3000	.3200	1.250	.006	.050	.1125	.3750	2.5	PBT6-3001250	81.20	PBT6-3001250X	93.65
.3000	.3200	1.600	.006	.050	.1125	.3750	3.0	PBT6-3001600	81.20	PBT6-3001600X	93.65
.3000	.3200	2.100	.006	.050	.1125	.3750	3.5	PBT6-3002100	81.20	PBT6-3002100X	94.55

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

See pages 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

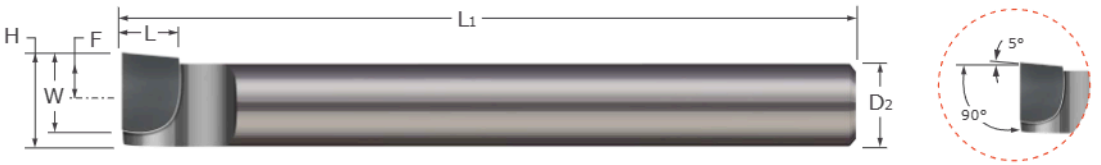
Head Width	Width	Length	Centerline Offset	Shank Diameter	Overall Length	Brazed Style	
H	W	L	F	D_2 $^{+.000"}_{-.003"}$	L_1	Tool #	USD$
.320	.250	.188	.195	.2500	4.0	TBB-250	32.10
.413	.313	.250	.257	.3125	5.0	TBB-312	33.45
.463	.313	.250	.276	.3750	6.0	TBB-375	35.75
.625	.500	.250	.375	.5000	7.0	TBB-500	44.65
.795	.500	.250	.483	.6250	8.0	TBB-625	48.20
.935	.625	.250	.560	.7500	9.0	TBB-750	49.80
1.233	.750	.375	.733	1.0000	10.0	TBB-001	60.65

See pages 39-47 for standard tool holders
See page 304 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

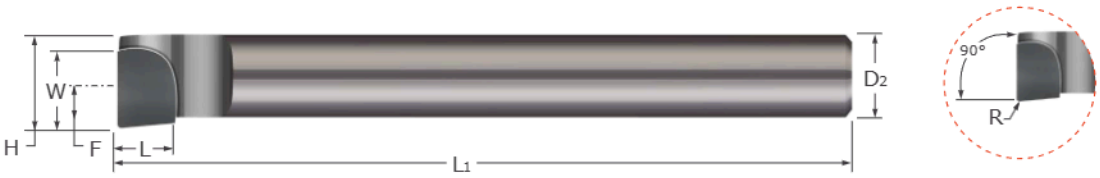
Head Width	Width	Length	Centerline Offset	Shank Diameter	Overall Length	Brazed Style	
H	W	L	F	D_2 $^{+.000"}_{-.003"}$	L_1	Tool #	USD$
.320	.250	.188	.195	.2500	4.0	TBBL-250	31.05
.413	.313	.250	.257	.3125	5.0	TBBL-312	32.10
.463	.313	.250	.276	.3750	6.0	TBBL-375	34.25
.625	.500	.250	.375	.5000	7.0	TBBL-500	44.35
.795	.500	.250	.483	.6250	8.0	TBBL-625	47.45
.935	.625	.250	.560	.7500	9.0	TBBL-750	48.55
1.233	.750	.375	.733	1.0000	10.0	TBBL-001	60.65

See pages 39-47 for standard tool holders
See page 304 for tool set options

Standard – Boring Tools

TBBC

Right Hand – Brazed – Corner Radius



- 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	D_2 $^{+.0000"}_{-.0030"}$	L_1	Tool #	USD$
.320	.008	.250	.188	.195	.2500	4.0	TBBC-250-008	34.40
.413	.008	.313	.250	.257	.3125	5.0	TBBC-312-008	35.75
.463	.008	.313	.250	.276	.3750	6.0	TBBC-375-008	38.25
.625	.008	.500	.250	.375	.5000	7.0	TBBC-500-008	47.00
.795	.008	.500	.250	.483	.6250	8.0	TBBC-625-008	50.65
.935	.008	.625	.250	.560	.7500	9.0	TBBC-750-008	52.10
1.233	.008	.750	.375	.733	1.0000	10.0	TBBC-001-008	60.65

See pages 39-47 for standard tool holders

Standard – Boring Tools

TBBCL

Left Hand – Brazed – Corner Radius

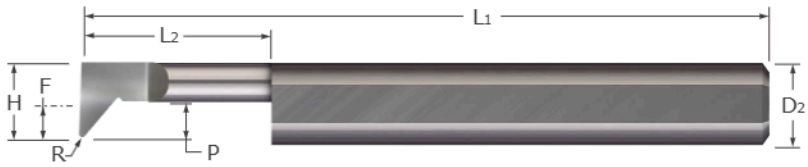
- Designed for left hand facing and boring applications in bores .320" and larger
- Long shank enables flexible reach options (preset at any length)
- Corner radius profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- CNC ground in the USA

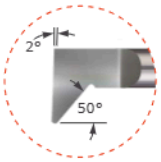
Head Width	Radius	Width	Length	Centerline Offset	Shank Diameter	Overall Length	Brazed Style	
H	$R^{+.001"}_{-.001"}$	W	L	F	D_2 $^{+.0000"}_{-.0030"}$	L_1	Tool #	USD$
.320	.008	.250	.188	.195	.2500	4.0	TBBCL-250-008	34.40
.413	.008	.313	.250	.257	.3125	5.0	TBBCL-312-008	35.75
.463	.008	.313	.250	.276	.3750	6.0	TBBCL-375-008	38.25
.625	.008	.500	.250	.375	.5000	7.0	TBBCL-500-008	47.00
.795	.008	.500	.250	.483	.6250	8.0	TBBCL-625-008	50.65
.935	.008	.625	.250	.560	.7500	9.0	TBBCL-750-008	52.10
1.233	.008	.750	.375	.733	1.0000	10.0	TBBCL-001-008	60.65

See pages 39-47 for standard tool holders

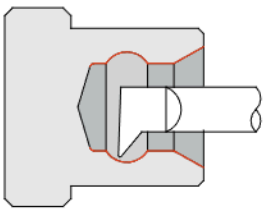
PR

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 #	USD$	Tool #	USD$
.0500	.0550	.150	.002	.015	-.0125	.1250	1.5	PR2-050150	41.85	PR2-050150X	47.90
.0500	.0550	.200	.002	.015	-.0125	.1250	1.5	PR2-050200	41.85	PR2-050200X	47.90
.0600	.0700	.150	.002	.020	-.0025	.1250	1.5	PR2-060150	41.85	PR2-060150X	47.90
.0600	.0700	.200	.002	.020	-.0025	.1250	1.5	PR2-060200	41.85	PR2-060200X	47.90
.0700	.0800	.150	.002	.025	.0075	.1250	1.5	PR2-070150	40.85	PR2-070150X	46.95
.0700	.0800	.200	.002	.025	.0075	.1250	1.5	PR2-070200	40.85	PR2-070200X	46.95
.0700	.0800	.200	.005	.025	.0075	.1250	1.5	PR-070200	40.85	PR-070200X	46.95
.0700	.0800	.300	.002	.025	.0075	.1250	1.5	PR2-070300	40.85	PR2-070300X	46.95
.0700	.0800	.500	.002	.025	.0075	.1250	1.5	PR2-070500	40.85	PR2-070500X	46.95
.0700	.0800	.500	.005	.025	.0075	.1250	1.5	PR-070500	40.85	PR-070500X	46.95
.0800	.0900	.200	.002	.030	.0175	.1250	1.5	PR2-080200	40.85	PR2-080200X	46.95
.0800	.0900	.300	.002	.030	.0175	.1250	1.5	PR2-080300	40.85	PR2-080300X	46.95
.0900	.1000	.200	.002	.030	.0275	.1250	1.5	PR2-090200	40.85	PR2-090200X	46.95
.0900	.1000	.300	.002	.030	.0275	.1250	1.5	PR2-090300	40.85	PR2-090300X	46.95
.1000	.1100	.200	.002	.035	.0375	.1250	1.5	PR2-100200	40.85	PR2-100200X	46.95
.1000	.1100	.200	.005	.035	.0375	.1250	1.5	PR5-100200	40.85	PR5-100200X	46.95
.1000	.1100	.300	.002	.035	.0375	.1250	1.5	PR2-100300	40.85	PR2-100300X	46.95
.1000	.1100	.300	.005	.035	.0375	.1250	1.5	PR5-100300	40.85	PR5-100300X	46.95
.1100	.1240	.250	.005	.040	.0475	.1250	1.5	PR-110250	40.85	PR-110250X	46.95
.1100	.1240	.375	.005	.040	.0475	.1250	1.5	PR5-110375	40.85	PR5-110375X	46.95
.1100	.1240	.500	.005	.040	.0475	.1250	1.5	PR5-110500	40.85	PR5-110500X	46.95
.1200	.1340	.250	.008	.050	.0263	.1875	2.0	PR-120250	42.55	PR-120250X	49.45
.1200	.1340	.375	.005	.050	.0263	.1875	2.0	PR5-120375	42.55	PR5-120375X	49.45
.1200	.1340	.375	.008	.050	.0263	.1875	2.0	PR8-120375	42.55	PR8-120375X	49.45
.1200	.1340	.500	.008	.050	.0263	.1875	2.0	PR-120500	42.55	PR-120500X	49.45
.1200	.1340	.750	.005	.050	.0263	.1875	2.0	PR5-120750	42.55	PR5-120750X	49.45
.1200	.1340	.750	.008	.050	.0263	.1875	2.0	PR8-120750	42.55	PR8-120750X	49.45

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

Continued on next page

See pages 39-47 for standard tool holders

NEW!

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 #	USD$	Tool #	USD$	
.1400	.1540	.375	.005	.050	.0463	.1875	2.0	PR5-140375	42.55	PR5-140375X	49.45	
.1400	.1540	.375	.008	.050	.0463	.1875	2.0	PR8-140375	42.55	PR8-140375X	49.45	
.1400	.1540	.500	.005	.050	.0463	.1875	2.0	PR5-140500	42.55	PR5-140500X	49.45	
.1400	.1540	.500	.008	.050	.0463	.1875	2.0	PR8-140500	42.55	PR8-140500X	49.45	
.1600	.1780	.375	.005	.050	.0663	.1875	2.0	PR5-160375	42.45	PR5-160375X	48.90	
.1600	.1780	.375	.008	.050	.0663	.1875	2.0	PR8-160375	42.55	PR8-160375X	49.45	
.1600	.1780	.500	.005	.050	.0663	.1875	2.0	PR5-160500	42.45	PR5-160500X	48.90	
.1600	.1780	.500	.008	.050	.0663	.1875	2.0	PR-160500	42.55	PR-160500X	49.45	
.1600	.1780	.750	.005	.050	.0663	.1875	2.0	PR5-160750	42.45	PR5-160750X	48.90	NEW
.1600	.1780	.750	.008	.050	.0663	.1875	2.0	PR8-160750	42.55	PR8-160750X	49.45	
.1600	.1780	1.000	.005	.050	.0663	.1875	2.0	PR5-1601000	42.45	PR5-1601000X	48.90	NEW
.1600	.1780	1.000	.008	.050	.0663	.1875	2.0	PR8-1601000	42.55	PR8-1601000X	49.45	
.1800	.1980	.375	.005	.080	.0550	.2500	2.5	PR5-180375	54.45	PR5-180375X	62.45	NEW
.1800	.1980	.375	.008	.080	.0550	.2500	2.5	PR8-180375	54.40	PR8-180375X	63.30	
.1800	.1980	.500	.005	.080	.0550	.2500	2.5	PR5-180500	54.45	PR5-180500X	62.45	NEW
.1800	.1980	.500	.008	.080	.0550	.2500	2.5	PR-180500	54.40	PR-180500X	63.30	
.1800	.1980	.750	.005	.080	.0550	.2500	2.5	PR5-180750	54.45	PR5-180750X	62.45	NEW
.1800	.1980	.750	.008	.080	.0550	.2500	2.5	PR-180750	54.40	PR-180750X	63.30	
.1800	.1980	1.000	.005	.080	.0550	.2500	2.5	PR5-1801000	54.45	PR5-1801000X	62.45	NEW
.1800	.1980	1.000	.008	.080	.0550	.2500	2.5	PR8-1801000	54.40	PR8-1801000X	63.30	
.2000	.2180	.500	.005	.080	.0750	.2500	2.5	PR5-200500	54.40	PR5-200500X	63.30	
.2000	.2180	.500	.008	.080	.0750	.2500	2.5	PR8-200500	54.40	PR8-200500X	63.30	
.2000	.2180	.750	.005	.080	.0750	.2500	2.5	PR5-200750	54.40	PR5-200750X	63.30	
.2000	.2180	.750	.008	.080	.0750	.2500	2.5	PR8-200750	54.40	PR8-200750X	63.30	
.2000	.2180	1.000	.005	.080	.0750	.2500	2.5	PR5-2001000	54.45	PR5-2001000X	62.45	NEW
.2000	.2180	1.000	.008	.080	.0750	.2500	2.5	PR8-2001000	54.45	PR8-2001000X	62.45	NEW
.2300	.2520	.500	.008	.080	.0738	.3125	2.5	PR8-230500	67.10	PR8-230500X	77.60	
.2300	.2520	.750	.008	.080	.0738	.3125	2.5	PR-230750	67.10	PR-230750X	77.60	
.2300	.2520	1.000	.008	.080	.0738	.3125	2.5	PR-2301000	67.10	PR-2301000X	77.60	
.2300	.2520	1.250	.008	.080	.0738	.3125	2.5	PR8-2301250	67.10	PR8-2301250X	77.60	
.2600	.2820	.750	.008	.090	.1038	.3125	2.5	PR8-260750	67.10	PR8-260750X	77.60	
.2600	.2820	1.000	.008	.090	.1038	.3125	2.5	PR8-2601000	67.10	PR8-2601000X	77.60	
.2600	.2820	1.250	.008	.090	.1038	.3125	2.5	PR8-2601250	67.15	PR8-2601250X	76.70	NEW
.3000	.3220	.750	.008	.110	.1438	.3125	2.5	PR8-300750	67.10	PR8-300750X	77.60	
.3000	.3220	1.000	.008	.110	.1438	.3125	2.5	PR-3001000	67.10	PR-3001000X	77.60	
.3000	.3220	1.250	.008	.110	.1438	.3125	2.5	PR-3001250	67.10	PR-3001250X	77.60	
.3000	.3220	1.500	.008	.110	.1438	.3125	2.5	PR8-3001500	67.15	PR8-3001500X	76.70	NEW
.3600	.3820	.750	.008	.130	.1725	.3750	2.5	PR8-360750	87.00	PR8-360750X	99.60	
.3600	.3820	1.000	.008	.130	.1725	.3750	2.5	PR-3601000	87.00	PR-3601000X	99.60	
.3600	.3820	1.250	.008	.130	.1725	.3750	2.5	PR-3601250	87.00	PR-3601250X	99.60	
.3600	.3820	1.500	.008	.130	.1725	.3750	2.5	PR8-3601500	87.00	PR8-3601500X	98.50	NEW
.4600	.4820	.750	.008	.150	.2100	.5000	3.0	PR8-460750	119.95	PR8-460750X	136.95	
.4600	.4820	1.000	.008	.150	.2100	.5000	3.0	PR8-4601000	119.95	PR8-4601000X	136.95	

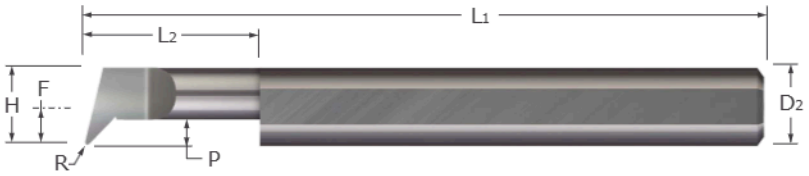
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

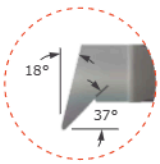
See pages 39-47 for standard tool holders

PA

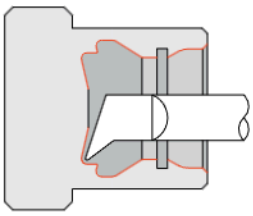
Standard – Profiling Tools

Angled Profiling





- Designed for both radial and axial profiling
- Unique design maximizes tool versatility 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 #	USD$	Tool #	USD$
.0500	.0550	.150	.0020	.015	-.0125	.1250	1.5	PA2-050150	41.85	PA2-050150X	47.90
.0500	.0550	.200	.0020	.015	-.0125	.1250	1.5	PA2-050200	41.85	PA2-050200X	47.90
.0600	.0700	.150	.0020	.020	-.0025	.1250	1.5	PA2-060150	41.85	PA2-060150X	47.90
.0600	.0700	.200	.0020	.020	-.0025	.1250	1.5	PA2-060200	41.85	PA2-060200X	47.90
.0700	.0800	.150	.0020	.020	.0075	.1250	1.5	PA2-070150	40.85	PA2-070150X	46.95
.0700	.0800	.200	.0020	.020	.0075	.1250	1.5	PA2-070200	40.85	PA2-070200X	46.95
.0800	.0900	.200	.0020	.025	.0175	.1250	1.5	PA2-080200	40.85	PA2-080200X	46.95
.0800	.0900	.300	.0020	.025	.0175	.1250	1.5	PA2-080300	40.85	PA2-080300X	46.95
.0900	.1000	.200	.0020	.030	.0275	.1250	1.5	PA2-090200	40.85	PA2-090200X	46.95
.0900	.1000	.300	.0020	.030	.0275	.1250	1.5	PA2-090300	40.85	PA2-090300X	46.95
.1000	.1100	.200	.0020	.030	.0375	.1250	1.5	PA2-100200	40.85	PA2-100200X	46.95
.1000	.1100	.200	.0050	.030	.0375	.1250	1.5	PA5-100200	40.85	PA5-100200X	46.95
.1000	.1100	.300	.0020	.030	.0375	.1250	1.5	PA2-100300	40.85	PA2-100300X	46.95
.1000	.1100	.300	.0050	.030	.0375	.1250	1.5	PA5-100300	40.85	PA5-100300X	46.95
.1100	.1240	.250	.0050	.035	.0475	.1250	1.5	PA5-110250	40.85	PA5-110250X	46.95
.1100	.1240	.375	.0050	.035	.0475	.1250	1.5	PA5-110375	40.85	PA5-110375X	46.95
.1200	.1340	.250	.0050	.035	.0263	.1875	2.0	PA5-120250	42.55	PA5-120250X	49.45
.1200	.1340	.375	.0050	.035	.0263	.1875	2.0	PA5-120375	42.55	PA5-120375X	49.45
.1400	.1540	.375	.0050	.040	.0463	.1875	2.0	PA5-140375	42.55	PA5-140375X	49.45
.1400	.1540	.500	.0050	.040	.0463	.1875	2.0	PA5-140500	42.55	PA5-140500X	49.45
.1600	.1780	.375	.0050	.050	.0663	.1875	2.0	PA5-160375	42.55	PA5-160375X	49.45
.1600	.1780	.500	.0050	.050	.0663	.1875	2.0	PA5-160500	42.55	PA5-160500X	49.45
.1800	.1980	.375	.0050	.055	.0550	.2500	2.5	PA5-180375	54.40	PA5-180375X	63.30
.1800	.1980	.500	.0050	.055	.0550	.2500	2.5	PA5-180500	54.40	PA5-180500X	63.30

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
.2000	.2180	.500	.0050	.060	.0750	.2500	2.5	PA5-200500	54.40	PA5-200500X	63.30
.2000	.2180	.500	.0080	.060	.0750	.2500	2.5	PA8-200500	54.40	PA8-200500X	63.30
.2000	.2180	.750	.0050	.060	.0750	.2500	2.5	PA5-200750	54.40	PA5-200750X	63.30
.2000	.2180	.750	.0080	.060	.0750	.2500	2.5	PA8-200750	54.40	PA8-200750X	63.30
.2300	.2520	.500	.0080	.070	.0738	.3125	2.5	PA8-230500	67.10	PA8-230500X	77.60
.2300	.2520	.750	.0080	.070	.0738	.3125	2.5	PA8-230750	67.10	PA8-230750X	77.60
.2600	.2820	.750	.0080	.080	.1038	.3125	2.5	PA8-260750	67.10	PA8-260750X	77.60
.2600	.2820	1.000	.0080	.080	.1038	.3125	2.5	PA8-2601000	67.10	PA8-2601000X	77.60
.3000	.3220	.750	.0080	.090	.1438	.3125	2.5	PA8-300750	67.10	PA8-300750X	77.60
.3000	.3220	1.000	.0080	.090	.1438	.3125	2.5	PA8-3001000	67.10	PA8-3001000X	77.60
.3600	.3820	.750	.0080	.110	.1725	.3750	2.5	PA8-360750	87.00	PA8-360750X	99.60
.3600	.3820	1.000	.0080	.110	.1725	.3750	2.5	PA8-3601000	87.00	PA8-3601000X	99.60
.4100	.4320	.750	.0080	.120	.1600	.5000	3.0	PA8-410750	121.90		
.4100	.4320	1.250	.0080	.120	.1600	.5000	3.0	PA8-4101250	121.90	PA8-4101250X	138.90
.4600	.4820	.750	.0080	.140	.2100	.5000	3.0	PA8-460750	121.90	PA8-460750X	138.90
.4600	.4820	1.000	.0080	.140	.2100	.5000	3.0	PA8-4601000	121.90	PA8-4601000X	138.90

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

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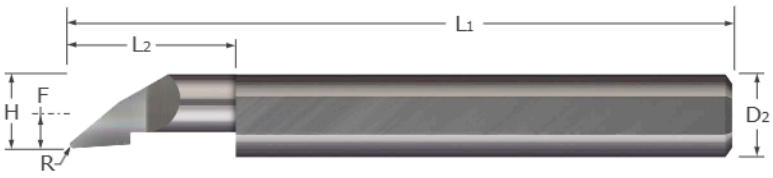
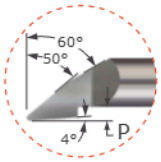
See pgs 39-47 for standard tool holders

PF

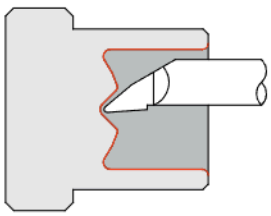
Standard – Profiling Tools

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 #	USD$	Tool #	USD$
.0500	.0550	.150	.005	.005	-.0125	.1250	1.5	PF5-050150	41.85	PF5-050150X	47.90
.0500	.0550	.200	.005	.005	-.0125	.1250	1.5	PF5-050200	41.85	PF5-050200X	47.90
.0600	.0700	.200	.005	.005	-.0025	.1250	1.5			PF5-060200X	47.90
.0600	.0700	.250	.005	.005	-.0025	.1250	1.5	PF5-060250	40.85	PF5-060250X	46.95
.0700	.0800	.400	.005	.010	.0075	.1250	1.5	PF-070400	40.85	PF-070400X	46.95
.0700	.0800	.500	.005	.010	.0075	.1250	1.5	PF-070500	40.85	PF-070500X	46.95
.0800	.0900	.150	.005	.010	.0175	.1250	1.5	PF5-080150	40.85	PF5-080150X	46.95
.0800	.0900	.200	.005	.010	.0175	.1250	1.5	PF5-080200	40.85		
.0800	.0900	.250	.005	.010	.0175	.1250	1.5	PF5-080250	40.85	PF5-080250X	46.95
.0900	.1000	.200	.005	.010	.0275	.1250	1.5	PF5-090200	40.85	PF5-090200X	46.95
.0900	.1000	.300	.005	.010	.0275	.1250	1.5	PF5-090300	40.85	PF5-090300X	46.95
.1000	.1100	.300	.005	.015	.0375	.1250	1.5	PF5-100300	40.85	PF5-100300X	46.95
.1000	.1100	.400	.005	.015	.0375	.1250	1.5	PF5-100400	40.85	PF5-100400X	46.95
.1100	.1220	.250	.005	.015	.0475	.1250	1.5	PF-110250	40.85	PF-110250X	46.95
.1100	.1220	.375	.005	.015	.0475	.1250	1.5	PF5-110375	40.85	PF5-110375X	46.95
.1100	.1220	.500	.005	.015	.0475	.1250	1.5	PF-110500	40.85	PF-110500X	46.95
.1100	.1220	.750	.005	.015	.0475	.1250	1.5	PF-110750	40.85	PF-110750X	46.95
.1200	.1320	.250	.005	.020	.0263	.1875	2.0	PF5-120250	42.55	PF5-120250X	49.45
.1200	.1320	.250	.008	.020	.0263	.1875	2.0	PF-120250	42.55	PF-120250X	49.45
.1200	.1320	.375	.005	.020	.0263	.1875	2.0	PF5-120375	42.55	PF5-120375X	49.45
.1200	.1320	.375	.008	.020	.0263	.1875	2.0	PF8-120375	42.55	PF8-120375X	49.45
.1200	.1320	.500	.008	.020	.0263	.1875	2.0	PF-120500	42.55	PF-120500X	49.45
.1200	.1320	.750	.008	.020	.0263	.1875	2.0	PF-120750	42.55	PF-120750X	49.45
.1400	.1520	.375	.008	.020	.0463	.1875	2.0	PF8-140375	42.55	PF8-140375X	49.45
.1400	.1520	.500	.008	.020	.0463	.1875	2.0	PF8-140500	42.55	PF8-140500X	49.45

*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 – 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 #	USD$	Tool #	USD$
.1600	.1760	.375	.008	.030	.0663	.1875	2.0	PF8-160375	42.55	PF8-160375X	49.45
.1600	.1760	.500	.008	.030	.0663	.1875	2.0	PF-160500	42.55	PF-160500X	49.45
.1600	.1760	.750	.008	.030	.0663	.1875	2.0	PF-160750	42.55	PF-160750X	49.45
.1800	.1960	.375	.008	.030	.0550	.2500	2.5	PF8-180375	54.40	PF8-180375X	63.30
.1800	.1960	.500	.008	.030	.0550	.2500	2.5	PF-180500	54.40	PF-180500X	63.30
.1800	.1960	.750	.008	.030	.0550	.2500	2.5	PF-180750	54.40	PF-180750X	63.30
.1800	.1960	1.000	.008	.030	.0550	.2500	2.5	PF-1801000	54.40	PF-1801000X	63.30
.2000	.2160	.400	.008	.030	.0750	.2500	2.5	PF8-200400	54.40	PF8-200400X	63.30
.2000	.2160	.600	.008	.030	.0750	.2500	2.5	PF-200600	54.40	PF-200600X	63.30
.2000	.2160	.800	.008	.030	.0750	.2500	2.5	PF8-200800	54.40	PF8-200800X	63.30
.2000	.2160	1.000	.008	.030	.0750	.2500	2.5	PF-2001000	54.40	PF-2001000X	63.30
.2300	.2500	.500	.008	.030	.0738	.3125	2.5	PF8-230500	67.10	PF8-230500X	77.60
.2300	.2500	.750	.008	.030	.0738	.3125	2.5	PF-230750	67.10	PF-230750X	77.60
.2300	.2500	1.000	.008	.030	.0738	.3125	2.5	PF-2301000	67.10	PF-2301000X	77.60
.2300	.2500	1.250	.008	.030	.0738	.3125	2.5	PF-2301250	67.10	PF-2301250X	77.60
.2600	.2800	.750	.008	.030	.1038	.3125	2.5	PF8-260750	67.10	PF8-260750X	77.60
.3000	.3200	1.000	.008	.030	.1438	.3125	2.5	PF-3001000	67.10	PF-3001000X	77.60
.3600	.3800	.750	.008	.030	.1725	.3750	2.5	PF8-360750	87.00	PF8-360750X	99.60
.3600	.3800	1.000	.008	.030	.1725	.3750	2.5	PF-3601000	87.00	PF-3601000X	99.60
.4100	.4300	.750	.008	.040	.1600	.5000	3.0	PF8-410750	119.95	PF8-410750X	136.95
.4100	.4300	1.000	.008	.040	.1600	.5000	3.0	PF8-4101000	119.95	PF8-4101000X	136.95
.4600	.4800	.750	.008	.050	.2100	.5000	3.0	PF8-460750	119.95	PF8-460750X	136.95
.4600	.4800	1.000	.008	.050	.2100	.5000	3.0	PF8-4601000	119.95	PF8-4601000X	136.95

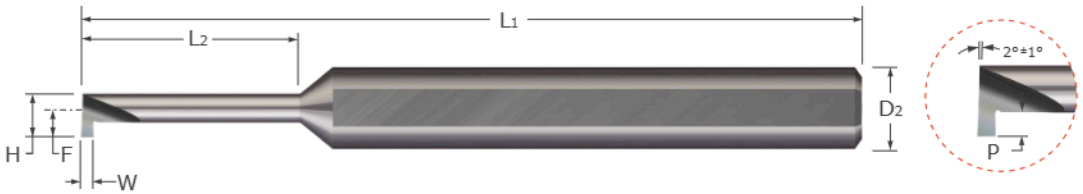
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

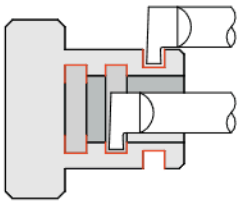
See pages 39-47 for standard tool holders

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 #	USD$	Tool #	USD$
.015	.0600	.0700	.150	.020	.0400	.1250	1.5	MRR-015-150-060	47.25	MRR-015-150-060X	53.30
.015	.0600	.0700	.250	.020	.0400	.1250	1.5	MRR-015-250-060	47.25	MRR-015-250-060X	53.30
.020	.0600	.0700	.150	.020	.0400	.1250	1.5	MRR-020-150-060	47.25	MRR-020-150-060X	53.30
.020	.0600	.0700	.250	.020	.0400	.1250	1.5	MRR-020-250-060	47.25	MRR-020-250-060X	53.30
.020	.0700	.0800	.100	.020	.0450	.1250	1.5	MRR-020-100-070	47.25	MRR-020-100-070X	53.30
.020	.0700	.0800	.150	.020	.0450	.1250	1.5	MRR-020-150-070	47.25	MRR-020-150-070X	53.30
.020	.0800	.0900	.150	.025	.0525	.1250	1.5	MRR-020-150-080	47.25	MRR-020-150-080X	53.30
.020	.0800	.0900	.250	.025	.0525	.1250	1.5	MRR-020-250-080	47.25	MRR-020-250-080X	53.30
.020	.0900	.1000	.150	.025	.0575	.1250	1.5	MRR-020-150-090	47.25	MRR-020-150-090X	53.30
.020	.0900	.1000	.250	.025	.0575	.1250	1.5	MRR-020-250-090	47.25	MRR-020-250-090X	53.30
.020	.1000	.1100	.150	.030	.0650	.1875	2.0	MRR-020-150-100	50.05	MRR-020-150-100X	56.75
.020	.1000	.1100	.250	.030	.0650	.1875	2.0	MRR-020-250-100	50.05	MRR-020-250-100X	56.75
.020	.1200	.1340	.150	.040	.0800	.1875	2.0	MRR-020-150-120	50.05	MRR-020-150-120X	56.75
.020	.1200	.1340	.250	.040	.0800	.1875	2.0	MRR-020-250-120	50.05	MRR-020-250-120X	56.75
.030	.0700	.0800	.100	.020	.0450	.1250	1.5	MRR-030-100-070	47.25	MRR-030-100-070X	53.30
.030	.0700	.0800	.150	.020	.0450	.1250	1.5	MRR-030-150-070	47.25	MRR-030-150-070X	53.30
.030	.0800	.0900	.150	.025	.0525	.1250	1.5	MRR-030-150-080	47.25	MRR-030-150-080X	53.30
.030	.0800	.0900	.250	.025	.0525	.1250	1.5	MRR-030-250-080	47.25	MRR-030-250-080X	53.30
.030	.0900	.1000	.150	.025	.0575	.1250	1.5	MRR-030-150-090	47.25	MRR-030-150-090X	53.30
.030	.0900	.1000	.250	.025	.0575	.1250	1.5	MRR-030-250-090	47.25	MRR-030-250-090X	53.30
.030	.1000	.1100	.150	.030	.0650	.1875	2.0	MRR-030-150-100	50.05	MRR-030-150-100X	56.75
.030	.1000	.1100	.250	.030	.0650	.1875	2.0	MRR-030-250-100	50.05	MRR-030-250-100X	56.75
.030	.1200	.1340	.150	.040	.0800	.1875	2.0	MRR-030-150-120	50.05	MRR-030-150-120X	56.75
.030	.1200	.1340	.250	.040	.0800	.1875	2.0	MRR-030-250-120	50.05	MRR-030-250-120X	56.75

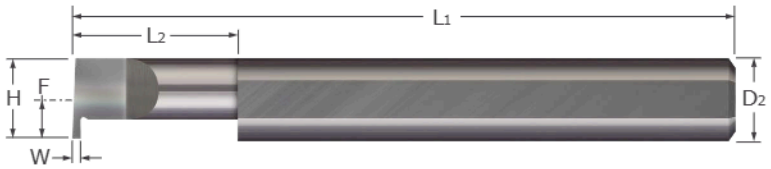
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

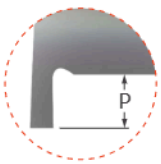
See pages 39-47 for standard tool holders

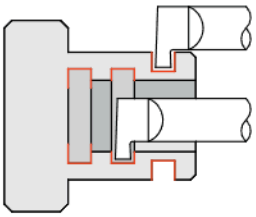
Standard – Grooving Tools

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 #	USD$	Tool #	USD$	Tool #	USD$
0.3 mm	.0118	3 mm	3.35 mm	10 mm	0.60 mm	1.5 mm	4 mm	50 mm	RRM-030-10	44.90			RRM-030-10X	51.85
0.3 mm	.0118	3 mm	3.35 mm	15 mm	0.60 mm	1.5 mm	4 mm	50 mm	RRM-030-15	44.90			RRM-030-15X	51.85
0.4 mm	.0157	4 mm	4.45 mm	10 mm	0.80 mm	2 mm	4 mm	50 mm	RRM-040-10	44.90			RRM-040-10X	51.85
0.4 mm	.0157	4 mm	4.45 mm	15 mm	0.80 mm	2 mm	4 mm	50 mm	RRM-040-15	44.90			RRM-040-15X	51.85
0.4 mm	.0157	4 mm	4.45 mm	20 mm	0.80 mm	2 mm	4 mm	50 mm	RRM-040-20	44.90	RRM-040-20G	50.35	RRM-040-20X	51.85
.017	.0170	.187	.205	.250	.030	.0937	.1875	2.0	RR-017-250-187	48.90			RR-017-250-187X	55.80
.017	.0170	.187	.205	.375	.030	.0937	.1875	2.0	RR-017-375-187	48.90			RR-017-375-187X	55.80
.017	.0170	.187	.205	.500	.030	.0937	.1875	2.0	RR-017-500-187	48.90				
.017	.0170	.187	.205	.625	.030	.0937	.1875	2.0	RR-017-625-187	48.90			RR-017-625-187X	55.80
.017	.0170	.250	.272	.250	.050	.1250	.2500	2.5	RR-017-4	53.20			RR-017-4X	62.00
.017	.0170	.250	.272	.375	.050	.1250	.2500	2.5	RR-017-6	53.20			RR-017-6X	62.00
.017	.0170	.250	.272	.500	.050	.1250	.2500	2.5	RR-017-8	53.20			RR-017-8X	62.00
.017	.0170	.250	.272	.625	.050	.1250	.2500	2.5	RR-017-10	53.20			RR-017-10X	62.00
0.5 mm	.0200	6 mm	6.55 mm	10 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-050-10	52.35			RRM-050-10X	61.25
0.5 mm	.0200	6 mm	6.55 mm	20 mm	1.24 mm	3 mm	6 mm	57 mm					RRM-050-20X	61.05
0.5 mm	.0200	6 mm	6.55 mm	25 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-050-25	52.35			RRM-050-25X	61.25
.020	.0200	.120	.134	.150	.030	.0262	.1875	2.0	RR-020-150-120	48.90			RR-020-150-120X	55.80
.020	.0200	.120	.134	.250	.030	.0262	.1875	2.0	RR-020-250-120	48.90			RR-020-250-120X	55.80
.020	.0200	.140	.154	.250	.030	.0462	.1875	2.0	RR-020-250-140	48.90			RR-020-250-140X	55.80
.020	.0200	.140	.154	.375	.030	.0462	.1875	2.0	RR-020-375-140	48.90			RR-020-375-140X	55.80
.020	.0200	.160	.178	.250	.030	.0662	.1875	2.0	RR-020-250-160	48.90			RR-020-250-160X	55.80
.020	.0200	.160	.178	.375	.030	.0662	.1875	2.0	RR-020-375-160	48.90				
.020	.0200	.187	.205	.250	.030	.0937	.1875	2.0	RR-020-250-187	48.90			RR-020-250-187X	55.80
.020	.0200	.187	.205	.375	.030	.0937	.1875	2.0	RR-020-375-187	48.90			RR-020-375-187X	55.80
.020	.0200	.187	.205	.500	.030	.0937	.1875	2.0	RR-020-500-187	48.90			RR-020-500-187X	55.80
.020	.0200	.187	.205	.625	.030	.0937	.1875	2.0	RR-020-625-187	48.90			RR-020-625-187X	55.80
.020	.0200	.250	.272	.250	.050	.1250	.2500	2.5	RR-020-250-250	53.20			RR-020-250-250X	62.00
.020	.0200	.250	.272	.375	.050	.1250	.2500	2.5	RR-020-375-250	53.20			RR-020-375-250X	62.00
.020	.0200	.250	.272	.500	.050	.1250	.2500	2.5	RR-020-500-250	53.20			RR-020-500-250X	62.00
.020	.0200	.250	.272	.625	.050	.1250	.2500	2.5	RR-020-625-250	53.20			RR-020-625-250X	62.00

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

Continued on next page

See pages 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 +.001" −.000" +.025mm −.000mm	dec. equiv.	H		L2 +.050" −.000" +1.25mm −.00mm	P	F	D2 (h6)	L1	Tool #	USD$	Tool #	USD$	Tool #	USD$
.025	.0250	.250	.272	.250	.050	.1250	.2500	2.5	RR-025-4	53.20			RR-025-4X	62.00
.025	.0250	.250	.272	.375	.050	.1250	.2500	2.5	RR-025-6	53.20			RR-025-6X	62.00
.025	.0250	.250	.272	.500	.050	.1250	.2500	2.5	RR-025-8	53.20			RR-025-8X	62.00
.025	.0250	.250	.272	.625	.050	.1250	.2500	2.5	RR-025-10	53.20			RR-025-10X	62.00
.025	.0250	.250	.272	.750	.050	.1250	.2500	2.5	RR-025-750-250	53.20			RR-025-750-250X	62.00
.025	.0250	.250	.272	1.000	.050	.1250	.2500	2.5	RR-025-1000-250	53.20			RR-025-1000-250X	62.00
0.7 mm	.0280	6 mm	6.55 mm	10 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-070-10	52.35				
0.7 mm	.0280	6 mm	6.55 mm	20 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-070-20	52.35				
0.7 mm	.0280	6 mm	6.55 mm	25 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-070-25	52.35	RRM-070-25G	60.00		
.029	.0290	.250	.272	.250	.050	.1250	.2500	2.5	RR-029-250-250	53.20			RR-029-250-250X	62.00
.029	.0290	.250	.272	.500	.050	.1250	.2500	2.5	RR-029-500-250	53.20			RR-029-500-250X	62.00
.030	.0300	.120	.134	.150	.030	.0262	.1875	2.0	RR-030-150-120	48.90			RR-030-150-120X	55.80
.030	.0300	.120	.134	.250	.030	.0262	.1875	2.0	RR-030-250-120	48.90			RR-030-250-120X	55.80
.030	.0300	.140	.154	.250	.030	.0462	.1875	2.0	RR-030-250-140	48.90			RR-030-250-140X	55.80
.030	.0300	.140	.154	.375	.030	.0462	.1875	2.0	RR-030-375-140	48.90			RR-030-375-140X	55.80
.030	.0300	.140	.154	.375	.050	.0462	.1875	2.0	RR-6757	48.90			RR-6757X	55.80
.030	.0300	.160	.178	.250	.030	.0662	.1875	2.0	RR-030-250-160	48.90			RR-030-250-160X	55.80
.030	.0300	.160	.178	.375	.030	.0662	.1875	2.0	RR-030-375-160	48.90			RR-030-375-160X	55.80
.030	.0300	.160	.178	.375	.050	.0662	.1875	2.0	RR-3565	48.90			RR-3565X	55.80
.030	.0300	.187	.205	.250	.030	.0937	.1875	2.0	RR-030-250-187	48.90			RR-030-250-187X	55.80
.030	.0300	.187	.205	.250	.050	.0937	.1875	2.0	RR-0495	48.90			RR-0495X	55.80
.030	.0300	.187	.205	.500	.030	.0937	.1875	2.0	RR-030-500-187	48.90			RR-030-500-187X	55.80
.030	.0300	.187	.205	.500	.050	.0937	.1875	2.0	RR-5911	48.90			RR-5911X	55.80
.030	.0300	.250	.272	.250	.050	.1250	.2500	2.5	RR-030-4	53.20			RR-030-4X	62.00
.030	.0300	.250	.272	.375	.050	.1250	.2500	2.5	RR-030-6	53.20			RR-030-6X	62.00
.030	.0300	.250	.272	.500	.050	.1250	.2500	2.5	RR-030-8	53.20			RR-030-8X	62.00
.030	.0300	.250	.272	.625	.050	.1250	.2500	2.5	RR-030-10	53.20			RR-030-10X	62.00
.030	.0300	.250	.272	.750	.050	.1250	.2500	2.5	RR-030-750-250	53.20			RR-030-750-250X	62.00
.030	.0300	.250	.272	1.000	.050	.1250	.2500	2.5	RR-030-1000-250	53.20			RR-030-1000-250X	62.00
.030	.0300	.312	.334	.500	.100	.1562	.3125	2.5	RR-030-500-312	66.45			RR-030-500-312X	76.90
.030	.0300	.312	.334	.750	.100	.1562	.3125	2.5	RR-030-750-312	66.45			RR-030-750-312X	76.90
.031	.0310	.250	.272	.250	.050	.1250	.2500	2.5	RR-031-250-250	53.20			RR-031-250-250X	62.00
.031	.0310	.250	.272	.500	.050	.1250	.2500	2.5	RR-031-500-250	53.20			RR-031-500-250X	62.00
0.8 mm	.0310	6 mm	6.55 mm	15 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-080-15	52.35	RRM-080-15G	60.00		
0.8 mm	.0310	6 mm	6.55 mm	25 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-080-25	52.35	RRM-080-25G	60.00	RRM-080-25X	61.25
.033	.0330	.312	.334	.250	.100	.1562	.3125	2.5	RR-033-4	66.45			RR-033-4X	76.90
.033	.0330	.312	.334	.375	.100	.1562	.3125	2.5	RR-033-6	66.45			RR-033-6X	76.90
.033	.0330	.312	.334	.500	.100	.1562	.3125	2.5	RR-033-8	66.45			RR-033-8X	76.90
.033	.0330	.312	.334	.750	.100	.1562	.3125	2.5	RR-033-12	66.45			RR-033-12X	76.90
.033	.0330	.312	.334	1.000	.100	.1562	.3125	2.5	RR-033-1000-312	66.45			RR-033-1000-312X	76.90
.033	.0330	.312	.334	1.250	.100	.1562	.3125	2.5	RR-033-1250-312	66.45			RR-033-1250-312X	76.90

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

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See pages 39-47 for standard tool holders

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 +.001" −.000" dec. equiv. +.025mm −.000mm		H		L2 +.050" −.000" +1.25mm −.00mm	P	F	D2 (h6)	L1	Tool #	USD$	Tool #	USD$	Tool #	USD$
0.9 mm	.0350	8 mm	8.55 mm	20 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-090-20	63.00				
0.9 mm	.0350	8 mm	8.55 mm	30 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-090-30	63.00				
.038	.0380	.250	.272	.250	.050	.1250	.2500	2.5	RR-038-250-250	53.20			RR-038-250-250X	62.00
.038	.0380	.250	.272	.500	.050	.1250	.2500	2.5	RR-038-500-250	53.20			RR-038-500-250X	62.00
.038	.0380	.250	.272	.500	.080	.1250	.2500	2.5	RR-9076	53.20			RR-9076X	62.00
.038	.0380	.312	.334	.250	.100	.1562	.3125	2.5	RR-038-4	66.45			RR-038-4X	76.90
.038	.0380	.312	.334	.375	.100	.1562	.3125	2.5	RR-038-6	66.45			RR-038-6X	76.90
.038	.0380	.312	.334	.500	.100	.1562	.3125	2.5	RR-038-8	66.45			RR-038-8X	76.90
.038	.0380	.312	.334	.750	.100	.1562	.3125	2.5	RR-038-12	66.45			RR-038-12X	76.90
.038	.0380	.312	.334	1.000	.100	.1562	.3125	2.5	RR-038-1000-312	66.45			RR-038-1000-312X	76.90
.038	.0380	.312	.334	1.250	.100	.1562	.3125	2.5	RR-038-1250-312	66.45			RR-038-1250-312X	76.90

W +.002" −.000" dec. equiv. +.050mm −.000mm		H		L2 +.050" −.000" +1.25mm −.00mm	P	F	D2 (h6)	L1	Tool #	USD$	Tool #	USD$	Tool #	USD$
.039	.0390	.187	.205	.250	.030	.0937	.1875	2.0	RR-039-250-187	48.90			RR-039-250-187X	55.80
.039	.0390	.187	.205	.250	.060	.0937	.1875	2.0	RR-5824	48.90			RR-5824X	55.80
.039	.0390	.187	.205	.500	.030	.0937	.1875	2.0	RR-039-500-187	48.90			RR-039-500-187X	55.80
.039	.0390	.187	.205	.500	.060	.0937	.1875	2.0	RR-1828	48.90			RR-1828X	55.80
.039	.0390	.250	.272	.250	.050	.1250	.2500	2.5	RR-039-250-250	53.20			RR-039-250-250X	62.00
.039	.0390	.250	.272	.250	.080	.1250	.2500	2.5	RR-8363	53.20			RR-8363X	62.00
.039	.0390	.250	.272	.500	.050	.1250	.2500	2.5	RR-039-500-250	53.20			RR-039-500-250X	62.00
.039	.0390	.250	.272	.500	.080	.1250	.2500	2.5	RR-1774	53.20			RR-1774X	62.00
.039	.0390	.375	.397	.250	.100	.1875	.3750	2.5	RR-039-4	86.45				
.039	.0390	.375	.397	.375	.100	.1875	.3750	2.5	RR-039-6	86.45			RR-039-6X	99.00
.039	.0390	.375	.397	.500	.100	.1875	.3750	2.5	RR-039-8	86.45			RR-039-8X	99.00
.039	.0390	.375	.397	.750	.100	.1875	.3750	2.5	RR-039-12	86.45			RR-039-12X	99.00
.039	.0390	.375	.397	1.000	.100	.1875	.3750	2.5	RR-039-16	86.45			RR-039-16X	99.00
.039	.0390	.375	.397	1.250	.100	.1875	.3750	2.5	RR-039-20	86.45			RR-039-20X	99.00
.039	.0390	.375	.397	1.500	.100	.1875	.3750	2.5	RR-039-1500-375	86.45			RR-039-1500-375X	99.00
1 mm	.0390	8 mm	8.55 mm	10 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-100-10	63.00				
1 mm	.0390	8 mm	8.55 mm	20 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-100-20	63.00				
1 mm	.0390	8 mm	8.55 mm	40 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-100-40	63.00				
.040	.0400	.250	.272	.250	.050	.1250	.2500	2.5	RR-040-250-250	53.20			RR-040-250-250X	62.00
.040	.0400	.250	.272	.250	.080	.1250	.2500	2.5	RR-1248	53.20			RR-1248X	62.00
.040	.0400	.250	.272	.500	.050	.1250	.2500	2.5	RR-040-500-250	53.20			RR-040-500-250X	62.00
.040	.0400	.250	.272	.500	.080	.1250	.2500	2.5	RR-3030	53.20			RR-3030X	62.00
1.1 mm	.0430	8 mm	8.55 mm	10 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-110-10	63.00				
1.1 mm	.0430	8 mm	8.55 mm	20 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-110-20	63.00				
1.1 mm	.0430	8 mm	8.55 mm	40 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-110-40	63.00			RRM-110-40X	75.55
.046	.0460	.312	.334	.500	.100	.1562	.3125	2.5	RR-046-500-312	66.45			RR-046-500-312X	76.90
.046	.0460	.312	.334	.750	.100	.1562	.3125	2.5	RR-046-750-312	66.45			RR-046-750-312X	76.90
.046	.0460	.375	.397	.250	.100	.1875	.3750	2.5	RR-046-4	86.45			RR-046-4X	99.00
.046	.0460	.375	.397	.375	.100	.1875	.3750	2.5	RR-046-6	86.45			RR-046-6X	99.00
.046	.0460	.375	.397	.500	.100	.1875	.3750	2.5	RR-046-8	86.45			RR-046-8X	99.00

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

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See pages 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 #	USD$	Tool #	USD$	Tool #	USD$
.046	.0460	.375	.397	.750	.100	.1875	.3750	2.5	RR-046-12	86.45			RR-046-12X	99.00
.046	.0460	.375	.397	1.000	.100	.1875	.3750	2.5	RR-046-16	86.45			RR-046-16X	99.00
.046	.0460	.375	.397	1.250	.100	.1875	.3750	2.5	RR-046-20	86.45			RR-046-20X	99.00
1.2 mm	.0470	10 mm	10.55 mm	20 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-120-20	88.80				
1.3 mm	.0510	10 mm	10.55 mm	30 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-130-30	88.80				
.055	.0550	.250	.272	.250	.050	.1250	.2500	2.5	RR-055-250-250	53.20			RR-055-250-250X	62.00
.055	.0550	.250	.272	.500	.050	.1250	.2500	2.5	RR-055-500-250	53.20			RR-055-500-250X	62.00
.055	.0550	.250	.272	.500	.080	.1250	.2500	2.5	RR-4257	53.20			RR-4257X	62.00
.055	.0550	.375	.397	.250	.100	.1875	.3750	2.5	RR-055-4	86.45				
.055	.0550	.375	.397	.375	.100	.1875	.3750	2.5	RR-055-6	86.45			RR-055-6X	99.00
.055	.0550	.375	.397	.500	.100	.1875	.3750	2.5	RR-055-8	86.45			RR-055-8X	99.00
.055	.0550	.375	.397	.500	.150	.1875	.3750	2.5	RR-1660	86.45			RR-1660X	99.00
.055	.0550	.375	.397	.750	.100	.1875	.3750	2.5	RR-055-12	86.45			RR-055-12X	99.00
.055	.0550	.375	.397	.750	.150	.1875	.3750	2.5	RR-5000	86.45			RR-5000X	99.00
.055	.0550	.375	.397	1.000	.100	.1875	.3750	2.5	RR-055-16	86.45			RR-055-16X	99.00
.055	.0550	.375	.397	1.250	.100	.1875	.3750	2.5	RR-055-20	86.45			RR-055-20X	99.00
.055	.0550	.375	.397	1.500	.100	.1870	.3750	2.5	RR-055-1500-375	86.45			RR-055-1500-375X	99.00
.056	.0560	.250	.272	.250	.050	.1250	.2500	2.5	RR-056-250-250	53.20			RR-056-250-250X	62.00
.056	.0560	.250	.272	.500	.050	.1250	.2500	2.5	RR-056-500-250	53.20			RR-056-500-250X	62.00
.059	.0590	.375	.397	.500	.100	.1870	.3750	2.5	RR-059-500-375	86.45			RR-059-500-375X	99.00
.059	.0590	.375	.397	1.000	.100	.1870	.3750	2.5	RR-059-1000-375	86.45			RR-059-1000-375X	99.00
.062	.0620	.187	.205	.250	.030	.0937	.1875	2.0	RR-062-250-187	48.90			RR-062-250-187X	55.80
.062	.0620	.187	.205	.250	.070	.0937	.1875	2.0	RR-7865	48.90			RR-7865X	55.80
.062	.0620	.187	.205	.500	.030	.0937	.1875	2.0	RR-062-500-187	48.90			RR-062-500-187X	55.80
.062	.0620	.187	.205	.500	.070	.0937	.1875	2.0	RR-4145	48.90			RR-4145X	55.80
.062	.0620	.250	.272	.250	.050	.1250	.2500	2.5	RR-062-250-250	53.20			RR-062-250-250X	62.00
.062	.0620	.250	.272	.250	.090	.1250	.2500	2.5	RR-6681	53.20			RR-6681X	62.00
.062	.0620	.250	.272	.500	.050	.1250	.2500	2.5	RR-062-500-250	53.20			RR-062-500-250X	62.00
.062	.0620	.250	.272	.500	.090	.1250	.2500	2.5	RR-2685	53.20			RR-2685X	62.00
.062	.0620	.250	.272	.750	.050	.1250	.2500	2.5	RR-062-750-250	53.20			RR-062-750-250X	62.00
.062	.0620	.250	.272	.750	.090	.1250	.2500	2.5	RR-2795	53.20			RR-2795X	62.00
.062	.0620	.312	.334	.500	.100	.1562	.3125	2.5	RR-062-500-312	66.45			RR-062-500-312X	76.90
.062	.0620	.312	.334	.750	.100	.1562	.3125	2.5	RR-062-750-312	66.45			RR-062-750-312X	76.90
.062	.0620	.312	.334	1.000	.100	.1562	.3125	2.5	RR-062-1000-312	66.45			RR-062-1000-312X	76.90
.062	.0620	.375	.397	.250	.100	.1875	.3750	2.5	RR-062-4	86.45			RR-062-4X	99.00
.062	.0620	.375	.397	.375	.100	.1875	.3750	2.5	RR-062-6	86.45			RR-062-6X	99.00
.062	.0620	.375	.397	.500	.100	.1875	.3750	2.5	RR-062-8	86.45			RR-062-8X	99.00
.062	.0620	.375	.397	.500	.150	.1875	.3750	2.5	RR-0824	86.45			RR-0824X	99.00
.062	.0620	.375	.397	.750	.100	.1875	.3750	2.5	RR-062-12	86.45			RR-062-12X	99.00
.062	.0620	.375	.397	.750	.150	.1875	.3750	2.5	RR-6068	86.45			RR-6068X	99.00
.062	.0620	.375	.397	1.000	.100	.1875	.3750	2.5	RR-062-16	86.45			RR-062-16X	99.00
.062	.0620	.375	.397	1.250	.100	.1875	.3750	2.5	RR-062-20	86.45			RR-062-20X	99.00
.062	.0620	.375	.397	1.500	.100	.1875	.3750	2.5	RR-062-1500-375	86.45			RR-062-1500-375X	99.00

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

Continued on next page

See pages 39-47 for standard tool holders

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 #	USD$	Tool #	USD$	Tool #	USD$
1.6 mm	.0630	10 mm	10.55 mm	30 mm	2.74 mm	5 mm	10 mm	72 mm		RRM-160-30	88.80				
.069	.0690	.375	.397	.375	.100	.1875	.3750	2.5		RR-069-6	86.45			RR-069-6X	99.00
.069	.0690	.375	.397	.500	.100	.1875	.3750	2.5		RR-069-8	86.45			RR-069-8X	99.00
.069	.0690	.375	.397	.750	.100	.1875	.3750	2.5		RR-069-12	86.45			RR-069-12X	99.00
.069	.0690	.375	.397	.750	.150	.1875	.3750	2.5		RR-7828	86.45			RR-7828X	99.00
.069	.0690	.375	.397	1.000	.100	.1875	.3750	2.5		RR-069-16	86.45			RR-069-16X	99.00
.069	.0690	.375	.397	1.000	.150	.1875	.3750	2.5		RR-4609	86.45			RR-4609X	99.00
.069	.0690	.375	.397	1.250	.100	.1875	.3750	2.5		RR-069-20	86.45			RR-069-20X	99.00
.079	.0790	.375	.397	.500	.100	.1875	.3750	2.5		RR-079-500-375	86.45			RR-079-500-375X	99.00
.079	.0790	.375	.397	1.000	.100	.1875	.3750	2.5		RR-079-1000-375	86.45			RR-079-1000-375X	99.00
2 mm	.0790	10 mm	10.55 mm	20 mm	2.74 mm	5 mm	10 mm	72 mm		RRM-200-20	88.80	RRM-200-20G	100.55		
2 mm	.0790	10 mm	10.55 mm	30 mm	2.74 mm	5 mm	10 mm	72 mm		RRM-200-30	88.80	RRM-200-30G	100.55		
.087	.0870	.250	.272	.250	.050	.1250	.2500	2.5		RR-087-250-250	53.20			RR-087-250-250X	62.00
.087	.0870	.250	.272	.500	.050	.1250	.2500	2.5		RR-087-500-250	53.20			RR-087-500-250X	62.00
.087	.0870	.250	.272	.750	.050	.1250	.2500	2.5		RR-087-750-250	53.20			RR-087-750-250X	62.00
.087	.0870	.312	.334	.500	.100	.1562	.3125	2.5		RR-087-500-312	66.45			RR-087-500-312X	76.90
.087	.0870	.312	.334	.750	.100	.1562	.3125	2.5		RR-087-750-312	66.45			RR-087-750-312X	76.90
.087	.0870	.375	.397	.250	.100	.1875	.3750	2.5		RR-087-4	86.45			RR-087-4X	99.00
.087	.0870	.375	.397	.375	.100	.1875	.3750	2.5		RR-087-6	86.45			RR-087-6X	99.00
.087	.0870	.375	.397	.500	.100	.1875	.3750	2.5		RR-087-8	86.45			RR-087-8X	99.00
.087	.0870	.375	.397	.500	.150	.1875	.3750	2.5		RR-7847	86.45			RR-7847X	99.00
.087	.0870	.375	.397	.750	.100	.1875	.3750	2.5		RR-087-12	86.45			RR-087-12X	99.00
.087	.0870	.375	.397	.750	.150	.1875	.3750	2.5		RR-4895	86.45			RR-4895X	99.00
.087	.0870	.375	.397	1.000	.100	.1875	.3750	2.5		RR-087-16	86.45			RR-087-16X	99.00
.087	.0870	.375	.397	1.250	.100	.1875	.3750	2.5		RR-087-20	86.45			RR-087-20X	99.00
.087	.0870	.375	.397	1.500	.100	.1875	.3750	2.5		RR-087-1500-375	86.45			RR-087-1500-375X	99.00
.093	.0930	.375	.397	.750	.100	.1875	.3750	2.5		RR-093-750-375	86.45			RR-093-750-375X	99.00
.093	.0930	.375	.397	1.000	.100	.1875	.3750	2.5		RR-093-1000-375	86.45			RR-093-1000-375X	99.00
.093	.0930	.375	.397	1.250	.100	.1875	.3750	2.5		RR-093-1250-375	86.45			RR-093-1250-375X	99.00
.093	.0930	.500	.522	.500	.150	.2500	.5000	3.0		RR-093-8	121.40			RR-093-8X	138.25
.093	.0930	.500	.522	.750	.150	.2500	.5000	3.0		RR-093-12	121.40			RR-093-12X	138.25
.093	.0930	.500	.522	1.000	.150	.2500	.5000	3.0		RR-093-16	121.40			RR-093-16X	138.25
.093	.0930	.500	.522	1.250	.150	.2500	.5000	3.0		RR-093-20	121.40			RR-093-20X	138.25
.093	.0930	.500	.522	1.500	.150	.2500	.5000	3.0		RR-093-24	121.40			RR-093-24X	138.25
.093	.0930	.500	.522	1.750	.150	.2500	.5000	3.0		RR-093-1750-500	121.40			RR-093-1750-500X	138.25
3 mm	.1180	12 mm	12.55 mm	30 mm	3.76 mm	6 mm	12 mm	83 mm		RRM-300-30	113.70			RRM-300-30X	131.90
3 mm	.1180	12 mm	12.55 mm	40 mm	3.76 mm	6 mm	12 mm	83 mm		RRM-300-40	113.70	RRM-300-40G	129.85		
.125	.1250	.375	.397	.750	.100	.1875	.3750	2.5		RR-125-750-375	86.45			RR-125-750-375X	99.00
.125	.1250	.375	.397	.750	.150	.1875	.3750	2.5		RR-3068	86.45			RR-3068X	99.00
.125	.1250	.375	.397	1.000	.100	.1875	.3750	2.5		RR-125-1000-375	86.45			RR-125-1000-375X	99.00
.125	.1250	.375	.397	1.000	.150	.1875	.3750	2.5		RR-5586	86.45			RR-5586X	99.00
.125	.1250	.375	.397	1.250	.100	.1875	.3750	2.5		RR-125-1250-375	86.45			RR-125-1250-375X	99.00
.125	.1250	.375	.397	1.250	.150	.1875	.3750	2.5		RR-0965	86.45			RR-0965X	99.00

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

Continued on next page

See pages 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" dec. equiv. +.050mm −.000mm		H		L2 +.050" −.000" +1.25mm −.00mm	P	F	D2 (h6)	L1	Tool #	USD$	Tool #	USD$	Tool #	USD$
.125	.1250	.500	.522	.500	.150	.2500	.5000	3.0	RR-125-8	121.40			RR-125-8X	138.25
.125	.1250	.500	.522	.750	.150	.2500	.5000	3.0	RR-125-12	121.40			RR-125-12X	138.25
.125	.1250	.500	.522	.750	.200	.2500	.5000	3.0	RR-5199	121.40			RR-5199X	138.25
.125	.1250	.500	.522	1.000	.150	.2500	.5000	3.0	RR-125-16	121.40			RR-125-16X	138.25
.125	.1250	.500	.522	1.250	.150	.2500	.5000	3.0	RR-125-20	121.40			RR-125-20X	138.25
.125	.1250	.500	.522	1.250	.200	.2500	.5000	3.0	RR-7934	121.40			RR-7934X	138.25
.125	.1250	.500	.522	1.500	.150	.2500	.5000	3.0	RR-125-24	121.40			RR-125-24X	138.25
.125	.1250	.500	.522	1.750	.150	.2500	.5000	3.0	RR-125-1750-500	121.40			RR-125-1750-500X	138.25
.156	.1560	.500	.522	.750	.150	.2500	.5000	3.0	RR-156-12	121.40				
.156	.1560	.500	.522	.750	.200	.2500	.5000	3.0	RR-1563	121.40			RR-1563X	138.25
.156	.1560	.500	.522	1.000	.150	.2500	.5000	3.0	RR-156-16	121.40			RR-156-16X	138.25
.156	.1560	.500	.522	1.250	.150	.2500	.5000	3.0	RR-156-20	121.40			RR-156-20X	138.25
.156	.1560	.500	.522	1.250	.200	.2500	.5000	3.0	RR-9832	121.40			RR-9832X	138.25
.156	.1560	.500	.522	1.500	.150	.2500	.5000	3.0	RR-156-24	121.40			RR-156-24X	138.25
4 mm	.1570	12 mm	12.55 mm	50 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-400-50	113.70				
.187	.1870	.500	.522	.750	.150	.2500	.5000	3.0	RR-187-12	121.40				
.187	.1870	.500	.522	1.000	.150	.2500	.5000	3.0	RR-187-16	121.40				
.187	.1870	.500	.522	1.250	.150	.2500	.5000	3.0	RR-187-20	121.40				
.187	.1870	.500	.522	1.500	.150	.2500	.5000	3.0	RR-187-24	121.40			RR-187-24X	138.25
5 mm	.1970	12 mm	12.55 mm	20 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-500-20	113.70				
5 mm	.1970	12 mm	12.55 mm	50 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-500-50	113.70			RRM-500-50X	131.90
.250	.2500	.500	.522	.750	.150	.2500	.5000	3.0	RR-250-12	121.40				
.250	.2500	.500	.522	1.000	.150	.2500	.5000	3.0	RR-250-16	121.40			RR-250-16X	138.25
.250	.2500	.500	.522	1.250	.150	.2500	.5000	3.0	RR-250-20	121.40			RR-250-20X	138.25
.250	.2500	.500	.522	1.500	.150	.2500	.5000	3.0	RR-250-24	121.40				

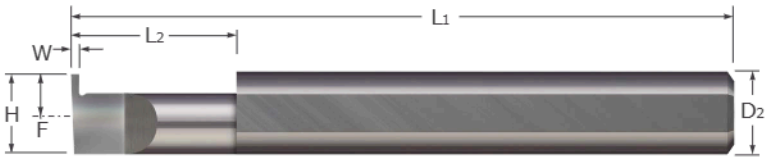
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

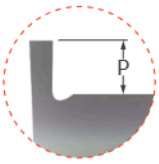
See pages 39-47 for standard tool holders

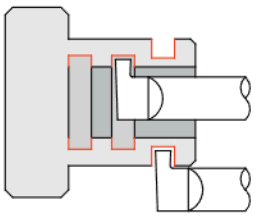
Standard – Grooving Tools

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 #	USD$	Tool #	USD$
.017	.250	.272	.250	.050	.1250	.2500	2.5	RRL-017-4	53.20	RRL-017-4X	62.00
.017	.250	.272	.500	.050	.1250	.2500	2.5	RRL-017-8	53.20	RRL-017-8X	62.00
.025	.250	.272	.250	.050	.1250	.2500	2.5	RRL-025-4	53.20		
.025	.250	.272	.500	.050	.1250	.2500	2.5	RRL-025-8	53.20		
.030	.250	.272	.250	.050	.1250	.2500	2.5	RRL-030-4	53.20	RRL-030-4X	62.00
.030	.250	.272	.375	.050	.1250	.2500	2.5	RRL-030-6	53.20	RRL-030-6X	62.00
.030	.250	.272	.500	.050	.1250	.2500	2.5	RRL-030-8	53.20	RRL-030-8X	62.00
.030	.250	.272	.625	.050	.1250	.2500	2.5	RRL-030-10	53.20	RRL-030-10X	62.00
.033	.312	.334	.250	.100	.1562	.3125	2.5	RRL-033-4	66.45	RRL-033-4X	76.90
.033	.312	.334	.375	.100	.1562	.3125	2.5	RRL-033-6	66.45		
.033	.312	.334	.750	.100	.1562	.3125	2.5	RRL-033-12	66.45		
.038	.312	.334	.250	.100	.1562	.3125	2.5	RRL-038-4	66.45		
.038	.312	.334	.375	.100	.1562	.3125	2.5	RRL-038-6	66.45		
.038	.312	.334	.500	.100	.1562	.3125	2.5	RRL-038-8	66.45	RRL-038-8X	76.90
.038	.312	.334	.750	.100	.1562	.3125	2.5	RRL-038-12	66.45	RRL-038-12X	76.90

W +.002" −.000"	H		L2 +.050" −.000"	P	F	D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.039	.375	.397	.250	.100	.1875	.3750	2.5	RRL-039-4	86.45	RRL-039-4X	99.00
.039	.375	.397	.500	.100	.1875	.3750	2.5	RRL-039-8	86.45	RRL-039-8X	99.00
.039	.375	.397	.750	.100	.1875	.3750	2.5	RRL-039-12	86.45		
.046	.375	.397	.250	.100	.1875	.3750	2.5	RRL-046-4	86.45	RRL-046-4X	99.00
.046	.375	.397	.375	.100	.1875	.3750	2.5	RRL-046-6	86.45		
.046	.375	.397	.750	.100	.1875	.3750	2.5	RRL-046-12	86.45	RRL-046-12X	99.00
.046	.375	.397	1.000	.100	.1875	.3750	2.5	RRL-046-16	86.45	RRL-046-16X	99.00
.046	.375	.397	1.250	.100	.1875	.3750	2.5	RRL-046-20	86.45		
.055	.375	.397	.250	.100	.1875	.3750	2.5	RRL-055-4	86.45		
.055	.375	.397	.500	.100	.1875	.3750	2.5	RRL-055-8	86.45		
.055	.375	.397	.750	.100	.1875	.3750	2.5	RRL-055-12	86.45		
.055	.375	.397	1.000	.100	.1875	.3750	2.5	RRL-055-16	86.45		

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
.062	.375	.397	.250	.100	.1875	.3750	2.5	RRL-062-4	86.45		
.062	.375	.397	.500	.100	.1875	.3750	2.5	RRL-062-8	86.45	RRL-062-8X	99.00
.062	.375	.397	.750	.100	.1875	.3750	2.5	RRL-062-12	86.45	RRL-062-12X	99.00
.062	.375	.397	1.250	.100	.1875	.3750	2.5	RRL-062-20	86.45		
.069	.375	.397	.250	.100	.1875	.3750	2.5	RRL-069-4	86.45		
.069	.375	.397	.500	.100	.1875	.3750	2.5	RRL-069-8	86.45		
.069	.375	.397	1.000	.100	.1875	.3750	2.5	RRL-069-16	86.45		
.087	.375	.397	.375	.100	.1875	.3750	2.5	RRL-087-6	86.45		
.087	.375	.397	.500	.100	.1875	.3750	2.5	RRL-087-8	86.45		
.087	.375	.397	.750	.100	.1875	.3750	2.5	RRL-087-12	86.45	RRL-087-12X	99.00
.087	.375	.397	1.000	.100	.1875	.3750	2.5	RRL-087-16	86.45		
.087	.375	.397	1.250	.100	.1875	.3750	2.5	RRL-087-20	86.45	RRL-087-20X	99.00
.093	.500	.522	.750	.150	.2500	.5000	3.0	RRL-093-12	121.40	RRL-093-12X	138.25
.093	.500	.522	1.000	.150	.2500	.5000	3.0	RRL-093-16	121.40	RRL-093-16X	138.25
.093	.500	.522	1.500	.150	.2500	.5000	3.0	RRL-093-24	121.40	RRL-093-24X	138.25
.125	.500	.522	.500	.150	.2500	.5000	3.0	RRL-125-8	121.40		
.125	.500	.522	.750	.150	.2500	.5000	3.0	RRL-125-12	121.40		
.125	.500	.522	1.000	.150	.2500	.5000	3.0	RRL-125-16	121.40		
.125	.500	.522	1.500	.150	.2500	.5000	3.0	RRL-125-24	121.40	RRL-125-24X	138.25
.156	.500	.522	.500	.150	.2500	.5000	3.0	RRL-156-8	121.40		
.187	.500	.522	1.000	.150	.2500	.5000	3.0	RRL-187-16	121.40		
.187	.500	.522	1.250	.150	.2500	.5000	3.0	RRL-187-20	121.40		
.250	.500	.522	1.250	.150	.2500	.5000	3.0	RRL-250-20	121.40		

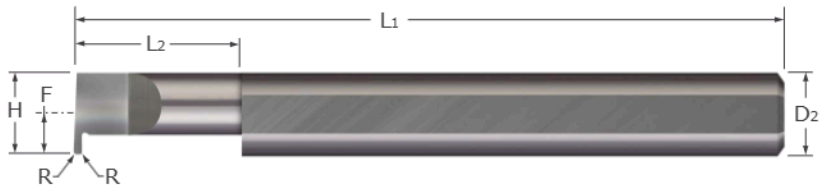
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

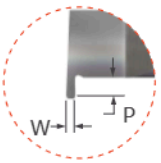
See pages 39-47 for standard tool holders

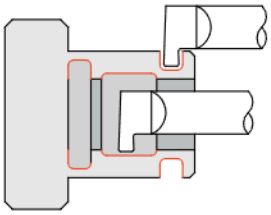
Standard – Grooving Tools

RRC

Retaining Ring – Corner Radius – Right Hand







- 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 #	USD$	Tool #	USD$
.017	.187	.205	.250	.003	.030	.0937	.1875	2.0	RRC3-017-250-187	56.75	RRC3-017-250-187X	63.65
.017	.187	.205	.375	.003	.030	.0937	.1875	2.0	RRC3-017-375-187	56.75	RRC3-017-375-187X	63.65
.017	.250	.272	.250	.003	.050	.1250	.2500	2.5			RRC3-017-250-250X	69.80
.017	.250	.272	.375	.003	.050	.1250	.2500	2.5	RRC3-017-375-250	61.25	RRC3-017-375-250X	69.80
.020	.187	.205	.250	.003	.030	.0937	.1875	2.0	RRC3-020-250-187	56.75	RRC3-020-250-187X	63.65
.020	.187	.205	.375	.003	.030	.0937	.1875	2.0	RRC3-020-375-187	56.75	RRC3-020-375-187X	63.65
.020	.250	.272	.250	.003	.050	.1250	.2500	2.5	RRC3-020-250-250	61.25	RRC3-020-250-250X	69.80
.020	.250	.272	.375	.003	.050	.1250	.2500	2.5	RRC3-020-375-250	61.25	RRC3-020-375-250X	69.80
.025	.250	.272	.250	.003	.050	.1250	.2500	2.5	RRC3-025-250-250	61.25	RRC3-025-250-250X	69.80
.025	.250	.272	.375	.003	.050	.1250	.2500	2.5	RRC3-025-375-250	61.25	RRC3-025-375-250X	69.80
.030	.187	.205	.250	.003	.030	.0937	.1875	2.0	RRC3-030-250-187	56.75	RRC3-030-250-187X	63.65
.030	.187	.205	.500	.003	.030	.0937	.1875	2.0	RRC3-030-500-187	56.75	RRC3-030-500-187X	63.65
.030	.250	.272	.250	.003	.050	.1250	.2500	2.5	RRC3-030-250-250	61.25	RRC3-030-250-250X	69.80
.030	.250	.272	.375	.003	.050	.1250	.2500	2.5	RRC3-030-375-250	61.25	RRC3-030-375-250X	69.80
.030	.312	.334	.500	.003	.100	.1562	.3125	2.5	RRC3-030-500-312	76.35	RRC3-030-500-312X	86.90
.030	.312	.334	.750	.003	.100	.1562	.3125	2.5	RRC3-030-750-312	76.35	RRC3-030-750-312X	86.90
.033	.312	.334	.500	.003	.100	.1562	.3125	2.5			RRC3-033-500-312X	86.90
.033	.312	.334	.750	.003	.100	.1562	.3125	2.5	RRC3-033-750-312	76.35	RRC3-033-750-312X	86.90
.038	.312	.334	.500	.003	.100	.1562	.3125	2.5	RRC3-038-500-312	76.35	RRC3-038-500-312X	86.90
.038	.312	.334	.750	.003	.100	.1562	.3125	2.5	RRC3-038-750-312	76.35	RRC3-038-750-312X	86.90
W +.002" −.000"	H		L2 +.050" −.000"	R +.001" −.001"	P	F	D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.039	.375	.397	.500	.003	.100	.1875	.3750	2.5	RRC3-039-500-375	96.70	RRC3-039-500-375X	109.20
.039	.375	.397	.750	.003	.100	.1875	.3750	2.5	RRC3-039-750-375	96.70	RRC3-039-750-375X	109.20
.039	.375	.397	1.000	.003	.100	.1875	.3750	2.5	RRC3-039-1000-375	96.70	RRC3-039-1000-375X	109.20
.062	.375	.397	.500	.003	.100	.1875	.3750	2.5	RRC3-062-500-375	96.70	RRC3-062-500-375X	109.20
.062	.375	.397	.500	.006	.100	.1875	.3750	2.5	RRC6-062-500-375	96.70	RRC6-062-500-375X	109.20
.062	.375	.397	.750	.003	.100	.1875	.3750	2.5	RRC3-062-750-375	96.70	RRC3-062-750-375X	109.20

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

Continued on next page

See pages 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		L_2 +.050" −.000"	R +.001" −.001"	P	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.062	.375	.397	.750	.006	.100	.1875	.3750	2.5	RRC6-062-750-375	96.70	RRC6-062-750-375X	109.20
.062	.375	.397	1.000	.003	.100	.1875	.3750	2.5	RRC3-062-1000-375	96.70	RRC3-062-1000-375X	109.20
.062	.375	.397	1.000	.006	.100	.1875	.3750	2.5	RRC6-062-1000-375	96.70	RRC6-062-1000-375X	109.20
.087	.375	.397	.500	.003	.100	.1875	.3750	2.5	RRC3-087-500-375	96.70	RRC3-087-500-375X	109.20
.087	.375	.397	.500	.006	.100	.1875	.3750	2.5	RRC6-087-500-375	96.70	RRC6-087-500-375X	109.20
.087	.375	.397	.750	.003	.100	.1875	.3750	2.5	RRC3-087-750-375	96.70	RRC3-087-750-375X	109.20
.087	.375	.397	.750	.006	.100	.1875	.3750	2.5	RRC6-087-750-375	96.70	RRC6-087-750-375X	109.20
.087	.375	.397	1.000	.003	.100	.1875	.3750	2.5	RRC3-087-1000-375	96.70	RRC3-087-1000-375X	109.20
.087	.375	.397	1.000	.006	.100	.1875	.3750	2.5	RRC6-087-1000-375	96.70	RRC6-087-1000-375X	109.20
.093	.500	.522	.750	.003	.150	.2500	.5000	3.0	RRC3-093-750-500	132.85	RRC3-093-750-500X	149.80
.093	.500	.522	.750	.006	.150	.2500	.5000	3.0	RRC6-093-750-500	132.85	RRC6-093-750-500X	149.80
.093	.500	.522	1.000	.003	.150	.2500	.5000	3.0	RRC3-093-1000-500	132.85	RRC3-093-1000-500X	149.80
.093	.500	.522	1.000	.006	.150	.2500	.5000	3.0	RRC6-093-1000-500	132.85	RRC6-093-1000-500X	149.80
.125	.500	.522	.750	.003	.150	.2500	.5000	3.0	RRC3-125-750-500	132.85	RRC3-125-750-500X	149.80
.125	.500	.522	.750	.006	.150	.2500	.5000	3.0	RRC6-125-750-500	132.85	RRC6-125-750-500X	149.80
.125	.500	.522	1.000	.003	.150	.2500	.5000	3.0	RRC3-125-1000-500	132.85	RRC3-125-1000-500X	149.80
.125	.500	.522	1.000	.006	.150	.2500	.5000	3.0	RRC6-125-1000-500	132.85	RRC6-125-1000-500X	149.80

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

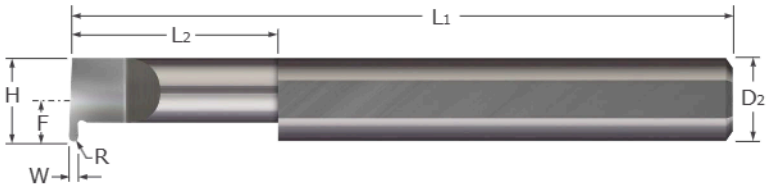
See pages 39-47 for standard tool holders

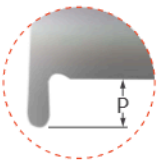
NEW!

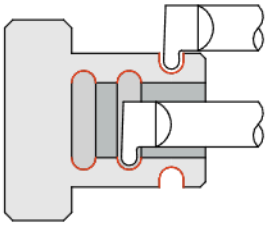
Standard – Grooving Tools

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 #	USD$	Tool #	USD$	
.017	.0085	.187	.205	.250	.030	.0937	.1875	2.0	FR-017-4-187	56.75	FR-017-4-187X	63.65	
.017	.0085	.187	.205	.375	.030	.0937	.1875	2.0	FR-017-6-187	56.75	FR-017-6-187X	63.65	
.017	.0085	.187	.205	.500	.030	.0937	.1875	2.0	FR-017-8-187	56.75	FR-017-8-187X	63.65	
.017	.0085	.187	.205	.625	.030	.0937	.1875	2.0	FR-017-10-187	56.75	FR-017-10-187X	63.65	
.017	.0085	.250	.272	.250	.050	.1250	.2500	2.5	FR-017-4	61.25	FR-017-4X	69.80	
.017	.0085	.250	.272	.375	.050	.1250	.2500	2.5	FR-017-6	61.25	FR-017-6X	69.80	
.017	.0085	.250	.272	.500	.050	.1250	.2500	2.5	FR-017-8	61.25	FR-017-8X	69.80	
.017	.0085	.250	.272	.625	.050	.1250	.2500	2.5	FR-017-10	61.25	FR-017-10X	69.80	
.020	.0100	.187	.205	.250	.030	.0937	.1875	2.0	FR-020-4-187	56.75	FR-020-4-187X	63.65	
.020	.0100	.187	.205	.375	.030	.0937	.1875	2.0	FR-020-6-187	56.75	FR-020-6-187X	63.65	
.020	.0100	.187	.205	.500	.030	.0937	.1875	2.0	FR-020-8-187	56.75	FR-020-8-187X	63.65	
.020	.0100	.187	.205	.625	.030	.0937	.1875	2.0	FR-020-10-187	56.75	FR-020-10-187X	63.65	
.025	.0125	.250	.272	.250	.050	.1250	.2500	2.5	FR-025-4	61.25	FR-025-4X	69.80	
.025	.0125	.250	.272	.375	.050	.1250	.2500	2.5	FR-025-6	61.25	FR-025-6X	69.80	
.025	.0125	.250	.272	.500	.050	.1250	.2500	2.5	FR-025-8	61.25			
.025	.0125	.250	.272	.625	.050	.1250	.2500	2.5	FR-025-10	61.25	FR-025-10X	69.80	
.025	.0125	.250	.272	.750	.050	.1250	.2500	2.5	FR-025-12	61.25	FR-025-12X	69.35	NEW
.030	.0150	.250	.272	.250	.050	.1250	.2500	2.5	FR-030-4	61.25	FR-030-4X	69.80	
.030	.0150	.250	.272	.375	.050	.1250	.2500	2.5	FR-030-6	61.25	FR-030-6X	69.80	
.030	.0150	.250	.272	.500	.050	.1250	.2500	2.5	FR-030-8	61.25	FR-030-8X	69.80	
.030	.0150	.250	.272	.625	.050	.1250	.2500	2.5	FR-030-10	61.25	FR-030-10X	69.80	
.030	.0150	.250	.272	.750	.050	.1250	.2500	2.5	FR-030-12	61.25	FR-030-12X	69.35	NEW
.033	.0165	.312	.334	.250	.100	.1562	.3125	2.5	FR-033-4	76.35	FR-033-4X	86.90	
.033	.0165	.312	.334	.375	.100	.1562	.3125	2.5	FR-033-6	76.35	FR-033-6X	86.90	
.033	.0165	.312	.334	.500	.100	.1562	.3125	2.5	FR-033-8	76.35	FR-033-8X	86.90	
.033	.0165	.312	.334	.625	.100	.1562	.3125	2.5	FR-033-10	76.35	FR-033-10X	86.90	
.033	.0165	.313	.335	.750	.100	.1562	.3125	2.5	FR-033-12	76.35	FR-033-12X	86.05	NEW
.038	.0190	.312	.334	.250	.100	.1562	.3125	2.5	FR-038-4	76.35	FR-038-4X	86.90	
.038	.0190	.312	.334	.375	.100	.1562	.3125	2.5	FR-038-6	76.35	FR-038-6X	86.90	
.038	.0190	.312	.334	.500	.100	.1562	.3125	2.5	FR-038-8	76.35	FR-038-8X	86.90	
.038	.0190	.312	.334	.625	.100	.1562	.3125	2.5	FR-038-10	76.35	FR-038-10X	86.90	
.038	.0190	.313	.335	.750	.100	.1562	.3125	2.5	FR-038-12	76.35	FR-038-12X	86.05	NEW
.039	.0195	.375	.397	.250	.100	.1875	.3750	2.5	FR-039-4	96.70	FR-039-4X	109.20	
.039	.0195	.375	.397	.375	.100	.1875	.3750	2.5	FR-039-6	96.70	FR-039-6X	109.20	
.039	.0195	.375	.397	.500	.100	.1875	.3750	2.5	FR-039-8	96.70	FR-039-8X	109.20	
.039	.0195	.375	.397	.750	.100	.1875	.3750	2.5	FR-039-12	96.70	FR-039-12X	109.20	
.039	.0195	.375	.397	1.000	.100	.1875	.3750	2.5	FR-039-16	96.70	FR-039-16X	109.20	
.039	.0195	.375	.397	1.250	.100	.1875	.3750	2.5	FR-039-20	96.70	FR-039-20X	109.20	

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
.046	.0230	.375	.397	.250	.100	.1875	.3750	2.5	FR-046-4	96.70		
.046	.0230	.375	.397	.375	.100	.1875	.3750	2.5	FR-046-6	96.70	FR-046-6X	109.20
.046	.0230	.375	.397	.500	.100	.1875	.3750	2.5	FR-046-8	96.70	FR-046-8X	109.20
.046	.0230	.375	.397	.750	.100	.1875	.3750	2.5	FR-046-12	96.70	FR-046-12X	109.20
.046	.0230	.375	.397	1.000	.100	.1875	.3750	2.5	FR-046-16	96.70	FR-046-16X	109.20
.046	.0230	.375	.397	1.250	.100	.1875	.3750	2.5	FR-046-20	96.70	FR-046-20X	109.20
.055	.0275	.375	.397	.250	.100	.1875	.3750	2.5	FR-055-4	96.70	FR-055-4X	109.20
.055	.0275	.375	.397	.375	.100	.1875	.3750	2.5	FR-055-6	96.70		
.055	.0275	.375	.397	.500	.100	.1875	.3750	2.5	FR-055-8	96.70	FR-055-8X	109.20
.055	.0275	.375	.397	.750	.100	.1875	.3750	2.5	FR-055-12	96.70	FR-055-12X	109.20
.055	.0275	.375	.397	1.000	.100	.1875	.3750	2.5	FR-055-16	96.70	FR-055-16X	109.20
.055	.0275	.375	.397	1.250	.100	.1875	.3750	2.5	FR-055-20	96.70		
.062	.0310	.375	.397	.250	.100	.1875	.3750	2.5	FR-062-4	96.70	FR-062-4X	109.20
.062	.0310	.375	.397	.375	.100	.1875	.3750	2.5	FR-062-6	96.70	FR-062-6X	109.20
.062	.0310	.375	.397	.500	.100	.1875	.3750	2.5	FR-062-8	96.70	FR-062-8X	109.20
.062	.0310	.375	.397	.750	.100	.1875	.3750	2.5	FR-062-12	96.70	FR-062-12X	109.20
.062	.0310	.375	.397	1.000	.100	.1875	.3750	2.5	FR-062-16	96.70	FR-062-16X	109.20
.062	.0310	.375	.397	1.250	.100	.1875	.3750	2.5	FR-062-20	96.70	FR-062-20X	109.20
NEW .062	.0310	.375	.397	1.500	.100	.1875	.3750	2.5	FR-062-24	96.70	FR-062-24X	108.15
.069	.0345	.375	.397	.250	.100	.1875	.3750	2.5	FR-069-4	96.70	FR-069-4X	109.20
.069	.0345	.375	.397	.500	.100	.1875	.3750	2.5	FR-069-8	96.70		
.069	.0345	.375	.397	.750	.100	.1875	.3750	2.5	FR-069-12	96.70	FR-069-12X	109.20
.069	.0345	.375	.397	1.000	.100	.1875	.3750	2.5	FR-069-16	96.70	FR-069-16X	109.20
.069	.0345	.375	.397	1.250	.100	.1875	.3750	2.5	FR-069-20	96.70		
.087	.0435	.375	.397	.250	.100	.1875	.3750	2.5	FR-087-4	96.70	FR-087-4X	109.20
.087	.0435	.375	.397	.375	.100	.1875	.3750	2.5	FR-087-6	96.70	FR-087-6X	109.20
.087	.0435	.375	.397	.500	.100	.1875	.3750	2.5	FR-087-8	96.70	FR-087-8X	109.20
.087	.0435	.375	.397	.500	.150	.1875	.3750	2.5	FR-7847	96.70	FR-7847X	109.20
.087	.0435	.375	.397	.750	.100	.1875	.3750	2.5	FR-087-12	96.70	FR-087-12X	109.20
.087	.0435	.375	.397	.750	.150	.1875	.3750	2.5	FR-4895	96.70	FR-4895X	109.20
.087	.0435	.375	.397	1.000	.100	.1875	.3750	2.5	FR-087-16	96.70	FR-087-16X	109.20
.087	.0435	.375	.397	1.250	.100	.1875	.3750	2.5	FR-087-20	96.70	FR-087-20X	109.20
.093	.0465	.500	.522	.500	.150	.2500	.5000	3.0	FR-093-8	132.85	FR-093-8X	149.80
.093	.0465	.500	.522	.750	.150	.2500	.5000	3.0	FR-093-12	132.85		
.093	.0465	.500	.522	1.000	.150	.2500	.5000	3.0	FR-093-16	132.85	FR-093-16X	149.80
.093	.0465	.500	.522	1.250	.150	.2500	.5000	3.0	FR-093-20	132.85	FR-093-20X	149.80
.093	.0465	.500	.522	1.500	.150	.2500	.5000	3.0	FR-093-24	132.85	FR-093-24X	149.80
.125	.0625	.375	.397	1.000	.150	.1875	.3750	2.5	FR-5586	96.70	FR-5586X	109.20
.125	.0625	.375	.397	1.250	.150	.1875	.3750	2.5	FR-0965	96.70	FR-0965X	109.20
.125	.0625	.500	.522	.500	.150	.2500	.5000	3.0	FR-125-8	132.85	FR-125-8X	149.80
.125	.0625	.500	.522	.750	.150	.2500	.5000	3.0	FR-125-12	132.85	FR-125-12X	149.80
.125	.0625	.500	.522	1.000	.150	.2500	.5000	3.0	FR-125-16	132.85	FR-125-16X	149.80
.125	.0625	.500	.522	1.000	.200	.2500	.5000	3.0	FR-7934	132.85	FR-7934X	149.80
.125	.0625	.500	.522	1.250	.150	.2500	.5000	3.0	FR-125-20	132.85	FR-125-20X	149.80
.125	.0625	.500	.522	1.250	.200	.2500	.5000	3.0	FR-0271	132.85	FR-0271X	149.80
.125	.0625	.500	.522	1.500	.150	.2500	.5000	3.0	FR-125-24	132.85	FR-125-24X	149.80
.187	.0935	.500	.522	.500	.150	.2500	.5000	3.0			FR-187-8X	149.80
.187	.0935	.500	.522	.750	.150	.2500	.5000	3.0	FR-187-12	132.85		
.187	.0935	.500	.522	1.000	.150	.2500	.5000	3.0	FR-187-16	132.85		
.187	.0935	.500	.522	1.000	.200	.2500	.5000	3.0	FR-5272	132.85	FR-5272X	149.80
.187	.0935	.500	.522	1.250	.150	.2500	.5000	3.0	FR-187-20	132.85		
.187	.0935	.500	.522	1.500	.150	.2500	.5000	3.0	FR-187-24	132.85		

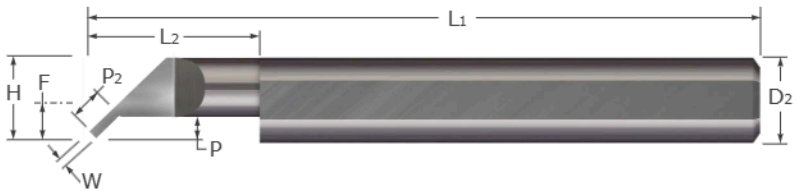
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

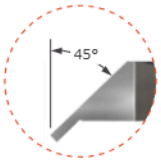
See pages 39-47 for standard tool holders

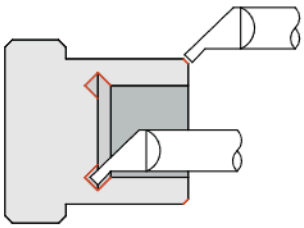
Standard – Grooving Tools

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 #	USD$	Tool #	USD$
.030	.060	.080	.240	.262	.500	.1150	.2500	2.5	UC-25030-8	55.25	UC-25030-8X	63.95
.050	.083	.120	.303	.325	.500	.1467	.3125	2.5	UC-31050-8	68.90	UC-31050-8X	79.45
.062	.083	.120	.303	.325	1.000	.1467	.3125	2.5	UC-31062-16	68.90	UC-31062-16X	79.45
.062	.083	.120	.303	.325	1.250	.1467	.3125	2.5	UC-31062-20	68.90	UC-31062-20X	79.45
.062	.095	.130	.365	.387	1.000	.1775	.3750	2.5	UC-37062-16	90.75		
.062	.125	.180	.490	.512	1.000	.2400	.5000	3.0	UC-50062-16	127.15		
.062	.125	.180	.490	.512	1.500	.2400	.5000	3.0	UC-50062-24	127.15		
.093	.095	.130	.365	.387	1.000	.1775	.3750	2.5	UC-37093-16	90.75	UC-37093-16X	103.15
.093	.125	.180	.490	.512	1.500	.2400	.5000	3.0	UC-50093-24	127.15	UC-50093-24X	144.15
.125	.095	.130	.365	.387	1.000	.1775	.3750	2.5	UC-37125-16	90.75	UC-37125-16X	103.15
.125	.095	.130	.365	.387	1.250	.1775	.3750	2.5	UC-37125-20	90.75		
.125	.125	.180	.490	.512	1.000	.2400	.5000	3.0	UC-50125-16	127.15		
.125	.125	.180	.490	.512	1.500	.2400	.5000	3.0	UC-50125-24	127.15	UC-50125-24X	144.15

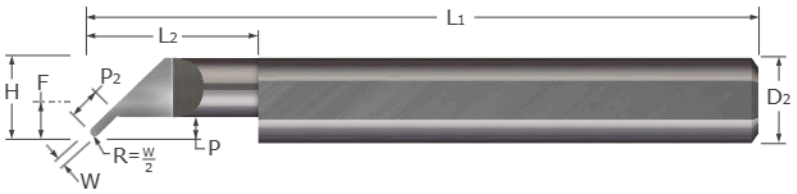
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

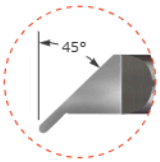
See pages 39-47 for standard tool holders

UP

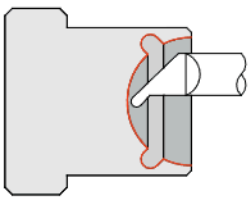
Standard – Grooving Tools

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 #	USD$	Tool #	USD$
.020	.050	.077	.180	.198	.375	.0862	.1875	2.0	UP-18020-6	58.95	UP-18020-6X	65.90
.020	.050	.077	.180	.198	.500	.0862	.1875	2.0	UP-18020-8	58.95	UP-18020-8X	65.90
.025	.050	.078	.180	.198	.375	.0862	.1875	2.0	UP-18025-6	58.95	UP-18025-6X	65.90
.025	.050	.078	.180	.198	.500	.0862	.1875	2.0	UP-18025-8	58.95	UP-18025-8X	65.90
.025	.060	.092	.240	.262	.375	.1150	.2500	2.5	UP-25025-6	63.40	UP-25025-6X	72.25
.025	.060	.092	.240	.262	.500	.1150	.2500	2.5	UP-25025-8	63.40	UP-25025-8X	72.25
.030	.050	.079	.180	.198	.375	.0862	.1875	2.0	UP-18030-6	58.95	UP-18030-6X	65.90
.030	.050	.079	.180	.198	.500	.0862	.1875	2.0	UP-18030-8	58.95	UP-18030-8X	65.90
.030	.060	.094	.240	.262	.500	.1150	.2500	2.5	UP-25030-8	63.40	UP-25030-8X	72.25
.030	.060	.094	.240	.262	1.000	.1150	.2500	2.5	UP-25030-16	63.40	UP-25030-16X	72.25
.039	.050	.082	.180	.198	.375	.0862	.1875	2.0	UP-18039-6	58.95	UP-18039-6X	65.90
.039	.060	.096	.240	.262	.500	.1150	.2500	2.5	UP-25039-8	63.40	UP-25039-8X	72.25
.039	.060	.096	.240	.262	1.000	.1150	.2500	2.5	UP-25039-16	63.40	UP-25039-16X	72.25
.050	.083	.132	.303	.325	.500	.1467	.3125	2.5	UP-31050-8	78.95	UP-31050-8X	89.50
.050	.083	.132	.303	.325	1.000	.1467	.3125	2.5	UP-31050-16	78.95	UP-31050-16X	89.50
.062	.083	.136	.303	.325	1.000	.1467	.3125	2.5	UP-31062-16	78.95	UP-31062-16X	89.50
.062	.083	.136	.303	.325	1.250	.1467	.3125	2.5	UP-31062-20	78.95	UP-31062-20X	89.50
.062	.095	.153	.365	.387	1.000	.1775	.3750	2.5	UP-37062-16	100.95	UP-37062-16X	113.50
.062	.095	.153	.365	.387	1.250	.1775	.3750	2.5	UP-37062-20	100.95	UP-37062-20X	113.50
.062	.125	.195	.490	.512	1.000	.2400	.5000	3.0	UP-50062-16	139.35	UP-50062-16X	156.35
.062	.125	.195	.490	.512	1.500	.2400	.5000	3.0	UP-50062-24	139.35	UP-50062-24X	156.35
.093	.095	.162	.365	.387	1.000	.1775	.3750	2.5	UP-37093-16	100.95	UP-37093-16X	113.50
.093	.125	.204	.490	.512	1.000	.2400	.5000	3.0	UP-50093-16	139.35	UP-50093-16X	156.35
.093	.125	.204	.490	.512	1.500	.2400	.5000	3.0	UP-50093-24	139.35	UP-50093-24X	156.35
.125	.095	.171	.365	.387	1.000	.1775	.3750	2.5	UP-37125-16	100.95		
.125	.095	.171	.365	.387	1.250	.1775	.3750	2.5	UP-37125-20	100.95	UP-37125-20X	113.50
.125	.125	.213	.490	.512	1.000	.2400	.5000	3.0	UP-50125-16	139.35	UP-50125-16X	156.35
.125	.125	.213	.490	.512	1.500	.2400	.5000	3.0	UP-50125-24	139.35	UP-50125-24X	156.35

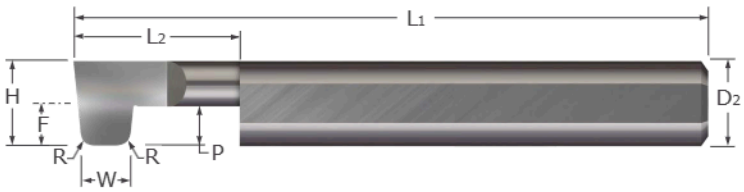
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

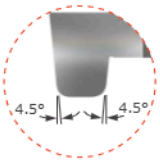
See pages 39-47 for standard tool holders

Standard – Grooving Tools

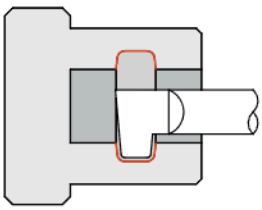
O-Ring Grooving

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 #	USD$	Tool #	USD$
.096	.250	.272	.500	.010	.100	.1250	.2500	2.5	OR-096-8	53.20	OR-096-8X	62.00
.141	.250	.272	.562	.035	.100	.1250	.2500	2.5	OR-141-9	53.20		
.144	.250	.272	.625	.035	.100	.1250	.2500	2.5	OR-144-10	53.20		
.174	.375	.397	.750	.010	.115	.1875	.3750	2.5	OR-174-12	87.30	OR-174-12X	99.85
.208	.375	.397	.812	.035	.115	.1875	.3750	2.5	OR-208-13	87.30		
.241	.375	.397	.938	.035	.115	.1875	.3750	2.5	OR-241-15	87.30		

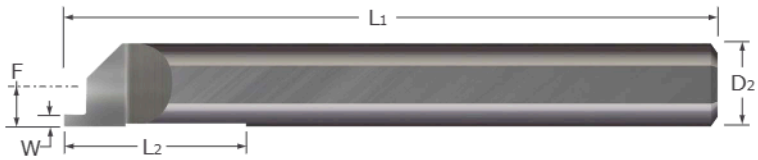
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

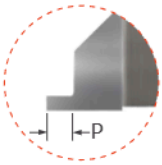
See pages 39-47 for standard tool holders

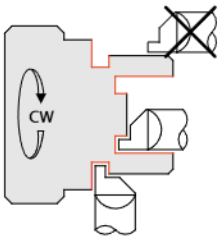
FG

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 #	USD$	Tool #	USD$
	.015	.025	.197	.750	.0937	.1875	2.0	FG-187-015-025	38.25	FG-187-015-025X	44.85
	.015	.025	.260	1.000	.1250	.2500	2.5	FG-250-015-025	42.65	FG-250-015-025X	51.50
	.017	.025	.197	.750	.0937	.1875	2.0	FG-187-017-025	38.25	FG-187-017-025X	44.85
	.017	.025	.260	1.000	.1250	.2500	2.5	FG-250-017-025	42.65	FG-250-017-025X	51.50
	.020	.025	.135	.375	.0625	.1250	1.5	FG-125-020-025	37.15	FG-125-020-025X	42.90
	.020	.025	.197	.750	.0937	.1875	2.0	FG-187-020-025	38.25	FG-187-020-025X	44.85
	.020	.025	.260	1.000	.1250	.2500	2.5	FG-250-020-025	42.65	FG-250-020-025X	51.50
	.020	.050	.190	.750	.0862	.1875	2.0	FG-180-020	38.25	FG-180-020X	44.85
	.020	.050	.197	.750	.0937	.1875	2.0	FG-187-020-050	38.25	FG-187-020-050X	44.85
	.020	.050	.240	1.000	.1200	.2500	2.5	FG-230-020	42.65	FG-230-020X	49.35
	.020	.050	.260	1.000	.1250	.2500	2.5	FG-250-020	42.65	FG-250-020X	51.50
	.025	.025	.135	.375	.0625	.1250	1.5	FG-125-025-025	37.15	FG-125-025-025X	42.90
	.025	.025	.197	.750	.0937	.1875	2.0	FG-187-025-025	38.25	FG-187-025-025X	44.85
	.025	.025	.260	1.000	.1250	.2500	2.5	FG-250-025-025	42.65	FG-250-025-025X	51.50
	.025	.050	.197	.750	.0937	.1875	2.0	FG-187-025-050	38.25	FG-187-025-050X	44.85
	.025	.050	.260	1.000	.1250	.2500	2.5	FG-250-025-050	42.65	FG-250-025-050X	51.50
	.030	.050	.135	.375	.0625	.1250	1.5	FG-125-030-050	37.15	FG-125-030-050X	42.90
	.030	.050	.190	.750	.0862	.1875	2.0	FG-180-030	38.25	FG-180-030X	45.20
	.030	.050	.197	.750	.0937	.1875	2.0	FG-187-030-050	38.25	FG-187-030-050X	44.85
	.030	.050	.260	1.000	.1250	.2500	2.5	FG-250-030	42.65	FG-250-030X	51.50
	.030	.050	.322	1.125	.1563	.3125	2.5	FG-312-030	58.25	FG-312-030X	68.80
	.030	.050	.385	1.250	.1875	.3750	2.5	FG-375-030	81.35	FG-375-030X	93.75
	.030	.075	.197	.750	.0937	.1875	2.0	FG-187-030-075	38.25	FG-187-030-075X	44.85
	.030	.075	.260	1.000	.1250	.2500	2.5	FG-250-030-075	42.65	FG-250-030-075X	51.50
	.030	.075	.322	1.125	.1563	.3125	2.5	FG-4363	58.25	FG-4363X	68.80
NEW	.030	.075	.385	1.250	.1875	.3750	2.5	FG-4747	74.05	FG-4747X	85.45
	.039	.050	.197	.750	.0937	.1875	2.0	FG-187-039-050	38.25	FG-187-039-050X	44.85
	.039	.050	.260	1.000	.1250	.2500	2.5	FG-250-039-050	42.65	FG-250-039-050X	51.50
	.039	.050	.385	1.250	.1875	.3750	2.5	FG-375-039-050	81.35	FG-375-039-050X	93.75
	.039	.075	.197	.750	.0937	.1875	2.0	FG-187-039-075	38.25	FG-187-039-075X	44.85
	.039	.075	.260	1.000	.1250	.2500	2.5	FG-250-039-075	42.65	FG-250-039-075X	51.50
	.040	.050	.197	.750	.0937	.1875	2.0	FG-187-040-050	38.25	FG-187-040-050X	44.85
	.040	.050	.260	1.000	.1250	.2500	2.5	FG-250-040	42.65	FG-250-040X	51.50
	.040	.050	.322	1.125	.1563	.3125	2.5	FG-312-040	58.25	FG-312-040X	68.80
	.040	.050	.385	1.250	.1875	.3750	2.5	FG-375-040-050	81.35	FG-375-040-050X	93.75
	.040	.075	.197	.750	.0937	.1875	2.0	FG-187-040-075	38.25	FG-187-040-075X	44.85
	.040	.075	.260	1.000	.1250	.2500	2.5	FG-250-040-075	42.65	FG-250-040-075X	51.50
	.040	.075	.322	1.125	.1563	.3125	2.5	FG-4322	58.25	FG-4322X	68.80
	.050	.050	.197	.750	.0937	.1875	2.0	FG-187-050-050	38.25	FG-187-050-050X	44.85
	.050	.050	.260	1.000	.1250	.2500	2.5	FG-250-050	42.65	FG-250-050X	51.50
	.050	.050	.322	1.125	.1563	.3125	2.5	FG-312-050	58.25	FG-312-050X	68.80

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

Continued on next page

See pages 39-47 for standard tool holders

NEW!

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 #	USD$	Tool #	USD$	
.050	.050	.385	1.250	.1875	.3750	2.5	FG-375-050-050	81.35	FG-375-050-050X	93.75	
.050	.075	.197	.750	.0937	.1875	2.0	FG-187-050-075	38.25	FG-187-050-075X	44.85	
.050	.075	.260	1.000	.1250	.2500	2.5	FG-250-050-075	42.65	FG-250-050-075X	51.50	
.050	.075	.322	1.125	.1563	.3125	2.5	FG-312-050-075	58.25	FG-312-050-075X	68.80	
.059	.075	.197	.750	.0937	.1875	2.0	FG-187-059-075	38.25	FG-187-059-075X	44.85	
.059	.075	.260	1.000	.1250	.2500	2.5	FG-250-059-075	42.65	FG-250-059-075X	51.50	
.059	.075	.385	1.250	.1875	.3750	2.5	FG-375-059-075	81.35	FG-375-059-075X	93.75	
.059	.100	.197	.750	.0937	.1875	2.0	FG-187-059-100	38.25	FG-187-059-100X	44.85	
.059	.100	.260	1.000	.1250	.2500	2.5	FG-250-059-100	42.65			
.062	.075	.197	.750	.0937	.1875	2.0	FG-187-062-075	38.25	FG-187-062-075X	44.85	
.062	.075	.260	1.000	.1250	.2500	2.5	FG-250-062-075	42.65	FG-250-062-075X	51.50	
.062	.075	.322	1.125	.1563	.3125	2.5	FG-312-062	58.25	FG-312-062X	68.80	
.062	.075	.385	1.250	.1875	.3750	2.5	FG-375-062	81.35	FG-375-062X	93.75	
.062	.075	.510	1.250	.2500	.5000	3.0	FG-500-062	91.85	FG-500-062X	108.85	
.062	.075	.635	1.500	.3125	.6250	3.5	FG-625-062	150.00			
.062	.100	.197	.750	.0937	.1875	2.0	FG-187-062-100	38.25	FG-187-062-100X	44.85	
.062	.100	.260	1.000	.1250	.2500	2.5	FG-250-062-100	42.65	FG-250-062-100X	51.50	
.062	.100	.322	1.125	.1563	.3125	2.5	FG-312-062-100	58.25	FG-312-062-100X	68.80	
.062	.100	.385	1.250	.1875	.3750	2.5	FG-375-062-100	81.35	FG-375-062-100X	93.75	
.062	.100	.510	1.250	.2500	.5000	3.0	FG-4909	91.85	FG-4909X	108.85	
.062	.150	.197	.750	.0937	.1875	2.0	FG-187-062-150	38.25	FG-187-062-150X	44.85	
.062	.150	.260	1.000	.1250	.2500	2.5	FG-250-062-150	42.65	FG-250-062-150X	51.50	
.062	.150	.322	1.125	.1563	.3125	2.5	FG-312-062-150	58.25	FG-312-062-150X	68.80	
.062	.150	.385	1.250	.1875	.3750	2.5	FG-375-062-150	81.35	FG-375-062-150X	93.75	
.062	.150	.510	1.250	.2500	.5000	3.0	FG-2828	91.85	FG-2828X	108.85	
.078	.100	.260	1.000	.1250	.2500	2.5	FG-250-078-100	42.65	FG-250-078-100X	51.50	
.078	.100	.322	1.125	.1563	.3125	2.5	FG-312-078-100	58.25	FG-312-078-100X	68.80	
.078	.100	.385	1.250	.1875	.3750	2.5	FG-375-078	81.35	FG-375-078X	93.75	
.078	.150	.260	1.000	.1250	.2500	2.5	FG-4825	38.70	FG-4825X	46.85	NEW
.078	.150	.322	1.125	.1563	.3125	2.5	FG-4979	53.00	FG-4979X	62.70	NEW
.078	.150	.385	1.250	.1875	.3750	2.5	FG-5607	74.05	FG-5607X	85.45	NEW
.093	.100	.385	1.250	.1875	.3750	2.5	FG-375-093	81.35	FG-375-093X	93.75	
.093	.100	.510	1.250	.2500	.5000	3.0	FG-500-093	91.85	FG-500-093X	108.85	
.093	.100	.635	1.500	.3125	.6250	3.5	FG-625-093	150.00	FG-625-093X	170.95	
.093	.100	.760	1.750	.3750	.7500	4.0	FG-750-093	238.35			
.093	.150	.322	1.125	.1563	.3125	2.5	FG-312-093-150	58.25	FG-312-093-150X	68.80	
.093	.150	.385	1.250	.1875	.3750	2.5	FG-375-093-150	81.35	FG-375-093-150X	93.75	
.118	.150	.385	1.250	.1875	.3750	2.5	FG-375-118-150	81.35	FG-375-118-150X	93.75	
.118	.150	.510	1.250	.2500	.5000	3.0	FG-6133	83.50	FG-6133X	99.10	NEW
.118	.250	.385	1.250	.1875	.3750	2.5	FG-0184	74.05	FG-0184X	85.45	NEW
.118	.250	.510	1.250	.2500	.5000	3.0	FG-9544	83.50	FG-9544X	99.10	NEW
.125	.100	.385	1.250	.1875	.3750	2.5	FG-375-125	81.35	FG-375-125X	93.75	
.125	.100	.510	1.250	.2500	.5000	3.0	FG-500-125	91.85	FG-500-125X	108.85	
.125	.100	.760	1.750	.3750	.7500	4.0	FG-750-125	238.35	FG-750-125X	263.50	
.125	.200	.385	1.250	.1875	.3750	2.5	FG-375-125-200	81.35	FG-375-125-200X	93.75	
.125	.200	.510	1.250	.2500	.5000	3.0	FG-3140	91.85	FG-3140X	108.85	
.125	.250	.385	1.250	.1875	.3750	2.5	FG-0531	81.35	FG-0531X	93.75	
.156	.100	.510	1.250	.2500	.5000	3.0	FG-500-156	91.85	FG-500-156X	108.85	
.156	.100	.635	1.500	.3125	.6250	3.5	FG-625-156	150.00	FG-625-156X	170.95	
.156	.100	.760	1.750	.3750	.7500	4.0	FG-750-156	238.35			
.156	.200	.510	1.250	.2500	.5000	3.0	FG-5610	91.85	FG-5610X	108.85	
.187	.150	.635	1.500	.3125	.6250	3.5	FG-625-187	150.00	FG-625-187X	170.95	
.187	.150	.760	1.750	.3750	.7500	4.0	FG-750-187	238.35			
.250	.250	.760	.625	.3750	.7500	4.0	FG-750-250	238.35			

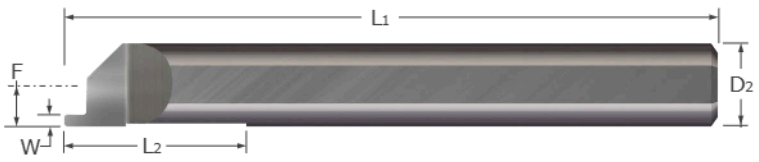
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

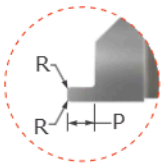
See pages 39-47 for standard tool holders

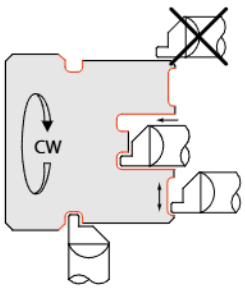
FGC

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 #	USD$	Tool #	USD$
.015	.025	.197	.003	.750	.0938	.1875	2.0	FGC3-187-015-025	41.20	FGC3-187-015-025X	47.65
.015	.025	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-015-025	45.55	FGC3-250-015-025X	54.25
.017	.025	.197	.003	.750	.0938	.1875	2.0	FGC3-187-017-025	41.20	FGC3-187-017-025X	47.65
.017	.025	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-017-025	45.55	FGC3-250-017-025X	54.25
.020	.025	.135	.003	.375	.0625	.1250	1.5	FGC3-125-020-025	39.80	FGC3-125-020-025X	45.50
.020	.025	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-020-025	45.55	FGC3-250-020-025X	54.25
.025	.025	.135	.003	.375	.0625	.1250	1.5			FGC3-125-025-025X	45.50
.025	.025	.197	.003	.750	.0938	.1875	2.0	FGC3-187-025-025	41.20	FGC3-187-025-025X	47.65
.025	.025	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-025-025	45.55	FGC3-250-025-025X	54.25
.030	.050	.135	.003	.375	.0625	.1250	1.5	FGC3-125-030-050	39.80	FGC3-125-030-050X	45.50
.030	.050	.197	.003	.750	.0938	.1875	2.0	FGC3-187-030-050	41.20	FGC3-187-030-050X	47.65
.030	.050	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-030-050	45.55	FGC3-250-030-050X	54.25
.030	.050	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-030-050	61.25	FGC3-312-030-050X	71.65
.030	.050	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-030-050	83.95	FGC3-375-030-050X	96.40
.039	.050	.197	.003	.750	.0938	.1875	2.0	FGC3-187-039-050	41.20	FGC3-187-039-050X	47.65
.039	.050	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-039-050	45.55	FGC3-250-039-050X	54.25
.039	.050	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-039-050	83.95	FGC3-375-039-050X	96.40
.040	.050	.197	.003	.750	.0938	.1875	2.0	FGC3-187-040-050	41.20	FGC3-187-040-050X	47.65
.040	.050	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-040-050	45.55	FGC3-250-040-050X	54.25
.040	.050	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-040-050	61.25	FGC3-312-040-050X	71.65
.040	.050	.385	.003	1.250	.1875	.3750	2.5			FGC3-375-040-050X	96.40
.050	.050	.197	.003	.750	.0938	.1875	2.0	FGC3-187-050-050	41.20	FGC3-187-050-050X	47.65
.050	.050	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-050-050	45.55	FGC3-250-050-050X	54.25
.050	.050	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-050-050	61.25	FGC3-312-050-050X	71.65
.050	.050	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-050-050	83.95	FGC3-375-050-050X	96.40
.059	.075	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-059-075	83.95	FGC3-375-059-075X	96.40

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
.062	.075	.197	.003	.750	.0938	.1875	2.0	FGC3-187-062-075	41.20	FGC3-187-062-075X	47.65
.062	.075	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-062-075	45.55	FGC3-250-062-075X	54.25
.062	.075	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-062-075	61.25	FGC3-312-062-075X	71.65
.062	.075	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-062-075	83.95	FGC3-375-062-075X	96.40
.062	.100	.197	.003	.750	.0938	.1875	2.0	FGC3-187-062-100	41.20	FGC3-187-062-100X	47.65
.062	.100	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-062-100	45.55	FGC3-250-062-100X	54.25
.078	.100	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-078-100	45.55	FGC3-250-078-100X	54.25
.078	.100	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-078-100	61.25	FGC3-312-078-100X	71.65
.078	.100	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-078-100	83.95	FGC3-375-078-100X	96.40
.093	.100	.385	.006	1.250	.1875	.3750	2.5	FGC6-375-093-100	83.95	FGC6-375-093-100X	96.40
.093	.150	.322	.006	1.125	.1563	.3125	2.5	FGC6-312-093-150	61.25	FGC6-312-093-150X	71.65
.118	.150	.385	.006	1.250	.1875	.3750	2.5	FGC6-375-118-150	83.95	FGC6-375-118-150X	96.40
.125	.100	.385	.006	1.250	.1875	.3750	2.5	FGC6-375-125-100	83.95	FGC6-375-125-100X	96.40

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

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Up to 50 Tools at Once

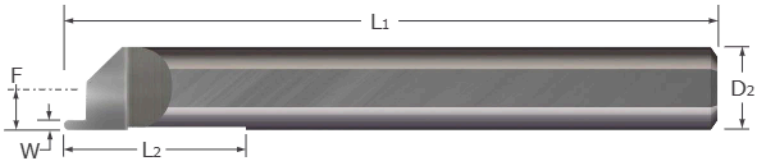
On Micro100.com/check-stock

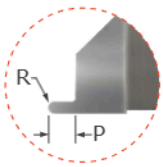
See pages 39-47 for standard tool holders

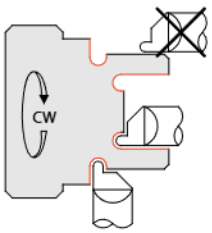
FGF

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 #	USD$	Tool #	USD$
	.015	.0075	.025	.197	.750	.0937	.1875	2.0	FGF-187-015-025	39.25	FGF-187-015-025X	45.50
	.015	.0075	.025	.260	1.000	.1250	.2500	2.5	FGF-250-015-025	44.05	FGF-250-015-025X	52.90
	.017	.0085	.025	.197	.750	.0937	.1875	2.0	FGF-187-017-025	39.25	FGF-187-017-025X	45.50
	.017	.0085	.025	.260	1.000	.1250	.2500	2.5	FGF-250-017-025	44.05	FGF-250-017-025X	52.90
	.020	.0100	.050	.135	.375	.0625	.1250	1.5	FGF-125-020-050	37.85	FGF-125-020-050X	43.70
	.020	.0100	.050	.190	.750	.0860	.1875	2.0	FGF-180-020	39.25	FGF-180-020X	45.50
	.020	.0100	.050	.197	.750	.0937	.1875	2.0	FGF-187-020-050	39.25	FGF-187-020-050X	45.50
	.020	.0100	.050	.240	1.000	.1050	.2500	2.5	FGF-230-020	44.05	FGF-230-020X	52.90
	.020	.0100	.050	.260	1.000	.1250	.2500	2.5	FGF-250-020	44.05	FGF-250-020X	52.90
	.025	.0125	.050	.135	.375	.0625	.1250	1.5	FGF-125-025-050	37.85	FGF-125-025-050X	43.70
	.025	.0125	.050	.197	.750	.0937	.1875	2.0	FGF-187-025-050	39.25	FGF-187-025-050X	45.50
	.025	.0125	.050	.260	1.000	.1250	.2500	2.5	FGF-250-025-050	44.05	FGF-250-025-050X	52.90
	.030	.0150	.050	.135	.375	.0625	.1250	1.5	FGF-125-030-050	37.85	FGF-125-030-050X	43.70
	.030	.0150	.050	.190	.750	.0860	.1875	2.0	FGF-180-030	39.25	FGF-180-030X	45.50
	.030	.0150	.050	.197	.750	.0937	.1875	2.0	FGF-187-030-050	39.25	FGF-187-030-050X	45.50
	.030	.0150	.050	.260	1.000	.1250	.2500	2.5	FGF-250-030	44.05	FGF-250-030X	52.90
NEW	.030	.0150	.075	.260	1.000	.1250	.2500	2.5	FGF-6624	44.05	FGF-6624X	52.15
	.039	.0195	.075	.197	.750	.0937	.1875	2.0	FGF-187-039-075	39.25	FGF-187-039-075X	45.50
	.039	.0195	.075	.260	1.000	.1250	.2500	2.5	FGF-250-039-075	44.05	FGF-250-039-075X	52.90
	.040	.0200	.050	.260	1.000	.1250	.2500	2.5	FGF-250-040	44.05	FGF-250-040X	52.90
	.040	.0200	.075	.197	.750	.0937	.1875	2.0	FGF-187-040-075	39.25	FGF-187-040-075X	45.50
	.040	.0200	.075	.260	1.000	.1250	.2500	2.5	FGF-250-040-075	44.05	FGF-250-040-075X	52.90
	.050	.0250	.050	.322	1.125	.1563	.3125	2.5	FGF-312-050	60.20	FGF-312-050X	70.70
	.050	.0250	.075	.197	.750	.0937	.1875	2.0	FGF-187-050-075	39.25	FGF-187-050-075X	45.50
	.050	.0250	.075	.260	1.000	.1250	.2500	2.5	FGF-250-050-075	44.05	FGF-250-050-075X	52.90
	.050	.0250	.075	.322	1.125	.1563	.3125	2.5	FGF-312-050-075	60.20	FGF-312-050-075X	70.70
	.062	.0310	.075	.322	1.125	.1563	.3125	2.5	FGF-312-062	60.20	FGF-312-062X	70.70
	.062	.0310	.075	.385	1.250	.1875	.3750	2.5	FGF-375-062	83.65	FGF-375-062X	96.15
	.062	.0310	.100	.197	.750	.0937	.1875	2.0	FGF-187-062-100	39.25	FGF-187-062-100X	45.50
	.062	.0310	.100	.260	1.000	.1250	.2500	2.5	FGF-250-062-100	44.05	FGF-250-062-100X	52.90
	.062	.0310	.100	.322	1.125	.1563	.3125	2.5	FGF-312-062-100	60.20	FGF-312-062-100X	70.70
	.062	.0310	.100	.385	1.250	.1875	.3750	2.5	FGF-375-062-100	83.65	FGF-375-062-100X	96.15
	.078	.0390	.100	.385	1.250	.1875	.3750	2.5	FGF-375-078	83.65	FGF-375-078X	96.15
NEW	.078	.0390	.150	.385	1.250	.1875	.3750	2.5	FGF-5607	83.75	FGF-5607X	95.10
	.093	.0465	.100	.385	1.250	.1875	.3750	2.5	FGF-375-093	83.65	FGF-375-093X	96.15
NEW	.093	.0465	.150	.385	1.250	.1875	.3750	2.5	FGF-6432	83.75	FGF-6432X	95.10
	.125	.0625	.100	.385	1.250	.1875	.3750	2.5	FGF-375-125	83.65	FGF-375-125X	96.15
NEW	.125	.0625	.150	.385	1.250	.1875	.3750	2.5	FGF-0923	83.75	FGF-0923X	95.10

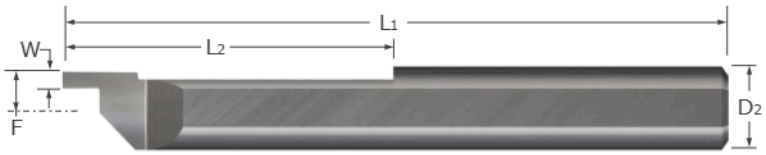
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

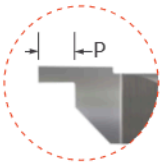
See pages 39-47 for standard tool holders

Standard – Grooving Tools

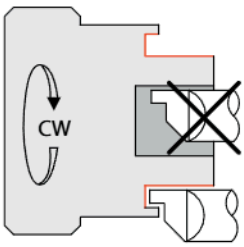
FGI

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 #	USD$	Tool #	USD$
.020	.040	.260	.750	.1150	.2500	2.5	FGI-8240	44.30	FGI-8240X	53.20
.020	.040	.260	1.250	.1150	.2500	2.5	FGI-6198	44.30	FGI-6198X	53.20
.020	.040	.322	.750	.1463	.3125	2.5	FGI-9800	60.60	FGI-9800X	71.10
.020	.040	.322	1.250	.1463	.3125	2.5	FGI-6738	60.60	FGI-6738X	71.10
.030	.060	.260	.750	.1150	.2500	2.5	FGI-6600	44.30	FGI-6600X	53.20
.030	.060	.260	1.250	.1150	.2500	2.5	FGI-3461	44.30	FGI-3461X	53.20
.030	.060	.322	.750	.1463	.3125	2.5	FGI-5774	60.60	FGI-5774X	71.10
.030	.060	.322	1.250	.1463	.3125	2.5	FGI-1413	60.60	FGI-1413X	71.10
.040	.080	.260	.750	.1150	.2500	2.5	FGI-6481	44.30	FGI-6481X	53.20
.040	.080	.260	1.250	.1150	.2500	2.5	FGI-9741	44.30	FGI-9741X	53.20
.040	.080	.322	.750	.1463	.3125	2.5	FGI-8157	60.60	FGI-8157X	71.10
.040	.080	.322	1.250	.1463	.3125	2.5	FGI-9114	60.60	FGI-9114X	71.10
.050	.100	.260	.750	.1150	.2500	2.5	FGI-1311	44.30	FGI-1311X	53.20
.050	.100	.260	1.250	.1150	.2500	2.5	FGI-7516	44.30	FGI-7516X	53.20
.050	.100	.322	.750	.1463	.3125	2.5	FGI-5336	60.60	FGI-5336X	71.10
.050	.100	.322	1.250	.1463	.3125	2.5	FGI-9489	60.60	FGI-9489X	71.10
.062	.125	.322	.750	.1463	.3125	2.5	FGI-2609	60.60	FGI-2609X	71.10
.062	.125	.322	1.250	.1463	.3125	2.5	FGI-0720	60.60	FGI-0720X	71.10
.062	.125	.385	.750	.1775	.3750	2.5	FGI-3852	84.35	FGI-3852X	96.80
.062	.125	.385	1.250	.1775	.3750	2.5	FGI-8466	84.35	FGI-8466X	96.80
.078	.156	.322	.750	.1463	.3125	2.5	FGI-4397	60.60	FGI-4397X	71.10
.078	.156	.322	1.250	.1463	.3125	2.5	FGI-3465	60.60	FGI-3465X	71.10
.078	.156	.385	.750	.1775	.3750	2.5	FGI-2855	84.35	FGI-2855X	96.80
.078	.156	.385	1.250	.1775	.3750	2.5	FGI-2684	84.35	FGI-2684X	96.80
.093	.187	.322	.750	.1463	.3125	2.5	FGI-5482	60.60	FGI-5482X	71.10
.093	.187	.322	1.250	.1463	.3125	2.5	FGI-2378	60.60	FGI-2378X	71.10
.093	.187	.385	.750	.1775	.3750	2.5	FGI-1641	84.35	FGI-1641X	96.80
.093	.187	.385	1.250	.1775	.3750	2.5	FGI-1707	84.35	FGI-1707X	96.80

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
.118	.236	.385	.750	.1775	.3750	2.5	FGI-4674	84.35	FGI-4674X	96.80
.118	.236	.385	1.250	.1775	.3750	2.5	FGI-2969	84.35	FGI-2969X	96.80
.118	.236	.510	1.000	.2400	.5000	3.0	FGI-6754	95.45	FGI-6754X	112.40
.118	.236	.510	1.500	.2400	.5000	3.0	FGI-3667	95.45	FGI-3667X	112.40
.125	.250	.385	.750	.1775	.3750	2.5	FGI-1535	84.35	FGI-1535X	96.80
.125	.250	.385	1.250	.1775	.3750	2.5	FGI-7015	84.35	FGI-7015X	96.80
.125	.250	.510	1.000	.2400	.5000	3.0	FGI-4349	95.45	FGI-4349X	112.40
.125	.250	.510	1.500	.2400	.5000	3.0	FGI-4098	95.45	FGI-4098X	112.40

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

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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!

SCAN

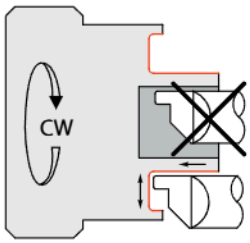
See pages 39-47 for standard tool holders

Standard – Grooving Tools

Face Grooving – Internal Tooth – Corner Radius

FGIC

- 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 #	USD$	Tool #	USD$
.020	.003	.040	.260	1.250	.1150	.2500	2.5	FGIC3-6198	45.20	FGIC3-6198X	53.90
.020	.003	.040	.322	1.250	.1463	.3125	2.5	FGIC3-6738	61.60	FGIC3-6738X	72.10
.030	.003	.060	.260	1.250	.1150	.2500	2.5	FGIC3-3461	45.20	FGIC3-3461X	53.90
.030	.003	.060	.322	1.250	.1463	.3125	2.5	FGIC3-1413	61.60	FGIC3-1413X	72.10
.040	.003	.080	.260	1.250	.1150	.2500	2.5	FGIC3-9741	45.20	FGIC3-9741X	53.90
.040	.003	.080	.322	1.250	.1463	.3125	2.5	FGIC3-9114	61.60	FGIC3-9114X	72.10
.050	.003	.100	.260	1.250	.1150	.2500	2.5	FGIC3-7516	45.20	FGIC3-7516X	53.90
.050	.003	.100	.322	1.250	.1463	.3125	2.5	FGIC3-9489	61.60	FGIC3-9489X	72.10
.062	.003	.125	.322	1.250	.1463	.3125	2.5	FGIC3-0720	61.60	FGIC3-0720X	72.10
.062	.003	.125	.385	1.250	.1775	.3750	2.5	FGIC3-8466	85.75	FGIC3-8466X	98.20
.078	.003	.156	.322	1.250	.1463	.3125	2.5	FGIC3-3465	61.60	FGIC3-3465X	72.10
.078	.003	.156	.385	1.250	.1775	.3750	2.5	FGIC3-2684	85.75	FGIC3-2684X	98.20
.093	.006	.187	.322	1.250	.1463	.3125	2.5	FGIC6-2378	61.60	FGIC6-2378X	72.10
.093	.006	.187	.385	1.250	.1775	.3750	2.5	FGIC6-1707	85.75	FGIC6-1707X	98.20
.118	.006	.236	.385	1.250	.1775	.3750	2.5	FGIC6-2969	85.75	FGIC6-2969X	98.20
.125	.006	.250	.385	1.250	.1775	.3750	2.5	FGIC6-7015	85.75	FGIC6-7015X	98.20

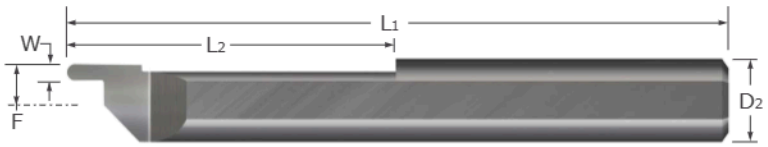
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

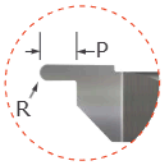
See pages 39-47 for standard tool holders

FGIF

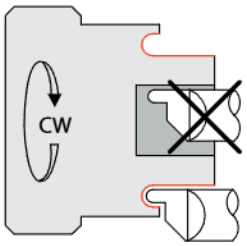
Standard – Grooving Tools

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 #	USD$	Tool #	USD$
.020	.0100	.040	.260	1.250	.1150	.2500	2.5	FGIF-6198	45.70	FGIF-6198X	54.40
.020	.0100	.040	.322	1.250	.1463	.3125	2.5	FGIF-6738	62.25	FGIF-6738X	72.80
.030	.0150	.060	.260	1.250	.1150	.2500	2.5	FGIF-3461	45.70	FGIF-3461X	54.40
.030	.0150	.060	.322	1.250	.1463	.3125	2.5	FGIF-1413	62.25	FGIF-1413X	72.80
.040	.0200	.080	.260	1.250	.1150	.2500	2.5	FGIF-9741	45.70	FGIF-9741X	54.40
.040	.0200	.080	.322	1.250	.1463	.3125	2.5	FGIF-9114	62.25	FGIF-9114X	72.80
.050	.0250	.100	.260	1.250	.1150	.2500	2.5	FGIF-7516	45.70	FGIF-7516X	54.40
.050	.0250	.100	.322	1.250	.1463	.3125	2.5	FGIF-9489	62.25	FGIF-9489X	72.80
.062	.0310	.125	.322	1.250	.1463	.3125	2.5	FGIF-0720	62.25	FGIF-0720X	72.80
.062	.0310	.125	.385	1.250	.1775	.3750	2.5	FGIF-8466	86.90	FGIF-8466X	99.45
.078	.0390	.156	.322	1.250	.1463	.3125	2.5	FGIF-3465	62.25	FGIF-3465X	72.80
.078	.0390	.156	.385	1.250	.1775	.3750	2.5	FGIF-2684	86.90	FGIF-2684X	99.45
.093	.0465	.187	.322	1.250	.1463	.3125	2.5	FGIF-2378	62.25	FGIF-2378X	72.80
.093	.0465	.187	.385	1.250	.1775	.3750	2.5	FGIF-1707	86.90	FGIF-1707X	99.45
.118	.0590	.236	.385	1.250	.1775	.3750	2.5	FGIF-2969	86.90	FGIF-2969X	99.45
.125	.0625	.250	.385	1.250	.1775	.3750	2.5	FGIF-7015	86.90	FGIF-7015X	99.45

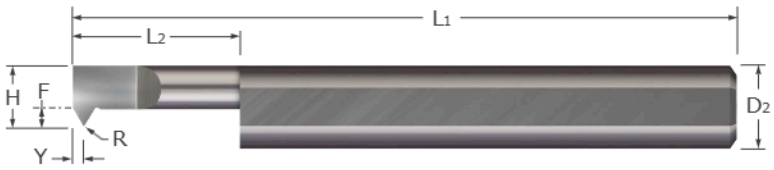
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

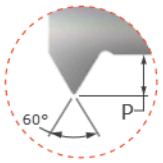
See pages 39-47 for standard tool holders

Standard – Threading Tools

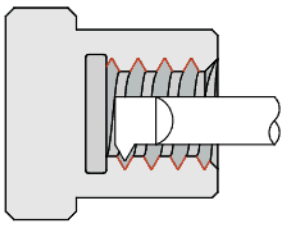
IT

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 #	USD$	Tool #	USD$
40-72	.040	.045	.075	.009	.015	.001	-.0225	.1250	1.5	IT-040075	62.15	IT-040075X	68.25
40-72	.040	.045	.100	.009	.015	.001	-.0225	.1250	1.5	IT-040100	62.15	IT-040100X	68.25
40-72	.040	.045	.150	.009	.015	.001	-.0225	.1250	1.5	IT-040150	62.15	IT-040150X	68.25
28-72	.050	.055	.100	.012	.020	.001	-.0125	.1250	1.5	IT-050100	62.15		
28-72	.050	.055	.150	.012	.020	.001	-.0125	.1250	1.5	IT-050150	62.15	IT-050150X	68.25
28-72	.050	.055	.200	.012	.020	.001	-.0125	.1250	1.5	IT-050200	62.15	IT-050200X	68.25
28-72	.050	.055	.250	.012	.020	.001	-.0125	.1250	1.5	IT-050250	62.15	IT-050250X	68.25
28-56	.060	.070	.150	.012	.020	.001	-.0025	.1250	1.5	IT-060150	54.15	IT-060150X	60.30
28-56	.060	.070	.200	.012	.020	.001	-.0025	.1250	1.5	IT-060200	54.15	IT-060200X	60.30
28-56	.060	.070	.250	.012	.020	.001	-.0025	.1250	1.5	IT-060250	54.15	IT-060250X	60.30
28-56	.060	.070	.300	.012	.020	.001	-.0025	.1250	1.5	IT-060300	54.15	IT-060300X	60.30
28-56	.060	.070	.350	.012	.020	.001	-.0025	.1250	1.5	IT-060350	54.15	IT-060350X	60.30
28-56	.080	.090	.200	.012	.020	.002	.0175	.1250	1.5	IT-080200	49.30	IT-080200X	55.55
28-56	.080	.090	.250	.012	.020	.002	.0175	.1250	1.5	IT-080250	49.30	IT-080250X	55.55
28-56	.080	.090	.350	.012	.020	.002	.0175	.1250	1.5	IT-080350	49.30	IT-080350X	55.55
28-56	.080	.090	.500	.012	.020	.002	.0175	.1250	1.5	IT-080500	49.30	IT-080500X	55.55
28-56	.080	.090	.600	.012	.020	.002	.0175	.1250	2.0	IT-080600	51.05	IT-080600X	57.10
24-56	.100	.110	.250	.014	.025	.002	.0375	.1250	1.5	IT-100250	49.30	IT-100250X	55.55
24-56	.100	.110	.350	.014	.025	.002	.0375	.1250	1.5	IT-100350	49.30	IT-100350X	55.55
24-56	.100	.110	.500	.014	.025	.002	.0375	.1250	1.5	IT-100500	49.30	IT-100500X	55.55
24-56	.100	.110	.600	.014	.025	.002	.0375	.1250	1.5	IT-100600	49.30	IT-100600X	55.55
24-56	.100	.110	.750	.014	.025	.002	.0375	.1250	2.0	IT-100750	51.05	IT-100750X	57.10
20-56	.110	.126	.250	.017	.030	.002	.0475	.1250	1.5	IT-110250	49.30	IT-110250X	55.55
20-56	.110	.126	.400	.017	.030	.002	.0475	.1250	1.5	IT-110400	49.30	IT-110400X	55.55
20-56	.110	.126	.500	.017	.030	.002	.0475	.1250	1.5	IT-110500	49.30	IT-110500X	55.55
20-56	.110	.126	.600	.017	.030	.002	.0475	.1250	1.5	IT-110600	49.30	IT-110600X	55.55
20-56	.110	.126	.750	.017	.030	.002	.0475	.1250	2.0	IT-110750	51.05	IT-110750X	57.10
20-56	.120	.136	.250	.017	.030	.002	.0263	.1875	2.0	IT-120250	52.65	IT-120250X	59.55
20-56	.120	.136	.400	.017	.030	.002	.0263	.1875	2.0	IT-120400	52.65	IT-120400X	59.55

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

Continued on next page

See pages 39-47 for standard tool holders
See page 303 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 #	USD$	Tool #	USD$
20-56	.120	.136	.500	.017	.030	.002	.0263	.1875	2.0	IT-120500	52.65	IT-120500X	59.55
20-56	.120	.136	.600	.017	.030	.002	.0263	.1875	2.0	IT-120600	52.65	IT-120600X	59.55
20-56	.120	.136	.750	.017	.030	.002	.0263	.1875	2.0	IT-120750	52.65	IT-120750X	59.55
16-56	.140	.156	.250	.020	.035	.002	.0463	.1875	2.0	IT-140250	52.65	IT-140250X	59.55
16-56	.140	.156	.400	.020	.035	.002	.0463	.1875	2.0	IT-140400	52.65	IT-140400X	59.55
16-56	.140	.156	.500	.020	.035	.002	.0463	.1875	2.0	IT-140500	52.65	IT-140500X	59.55
16-56	.140	.156	.750	.020	.035	.002	.0463	.1875	2.0	IT-140750	52.65	IT-140750X	59.55
16-56	.140	.156	.875	.020	.035	.002	.0463	.1875	2.0	IT-140875	52.65	IT-140875X	59.55
14-56	.160	.182	.250	.023	.040	.002	.0663	.1875	2.0	IT-160250	52.65	IT-160250X	59.55
14-56	.160	.182	.400	.023	.040	.002	.0663	.1875	2.0	IT-160400	52.65	IT-160400X	59.55
14-56	.160	.182	.500	.023	.040	.002	.0663	.1875	2.0	IT-160500	52.65	IT-160500X	59.55
14-56	.160	.182	.750	.023	.040	.002	.0663	.1875	2.0	IT-160750	52.65	IT-160750X	59.55
14-56	.160	.182	1.000	.023	.040	.002	.0663	.1875	2.0	IT-1601000	52.65	IT-1601000X	59.55
14-56	.180	.202	.350	.023	.040	.002	.0550	.2500	2.5	IT-180350	56.10	IT-180350X	64.80
14-56	.180	.202	.500	.023	.040	.002	.0550	.2500	2.5	IT-180500	56.10	IT-180500X	64.80
14-56	.180	.202	.750	.023	.040	.002	.0550	.2500	2.5	IT-180750	56.10	IT-180750X	64.80
14-56	.180	.202	1.000	.023	.040	.002	.0550	.2500	2.5	IT-1801000	56.10	IT-1801000X	64.80
14-56	.180	.202	1.125	.023	.040	.002	.0550	.2500	2.5	IT-1801125	56.10	IT-1801125X	64.80
13-56	.200	.222	.400	.026	.045	.002	.0750	.2500	2.5	IT-200400	56.10	IT-200400X	64.80
13-56	.200	.222	.600	.026	.045	.002	.0750	.2500	2.5	IT-200600	56.10	IT-200600X	64.80
13-56	.200	.222	.750	.026	.045	.002	.0750	.2500	2.5	IT-200750	56.10	IT-200750X	64.80
13-56	.200	.222	1.000	.026	.045	.002	.0750	.2500	2.5	IT-2001000	56.10	IT-2001000X	64.80
13-56	.200	.222	1.125	.026	.045	.002	.0750	.2500	2.5	IT-2001125	56.10	IT-2001125X	64.80
10-48	.230	.252	.400	.032	.055	.002	.0738	.3125	2.5	IT-230400	70.30	IT-230400X	80.75
10-48	.230	.252	.600	.032	.055	.002	.0738	.3125	2.5	IT-230600	70.30	IT-230600X	80.75
10-48	.230	.252	.750	.032	.055	.002	.0738	.3125	2.5	IT-230750	70.30	IT-230750X	80.75
10-48	.230	.252	1.000	.032	.055	.002	.0738	.3125	2.5	IT-2301000	70.30	IT-2301000X	80.75
10-48	.230	.252	1.250	.032	.055	.002	.0738	.3125	2.5	IT-2301250	70.30	IT-2301250X	80.75
10-48	.230	.252	1.500	.032	.055	.002	.0738	.3125	2.5	IT-2301500	70.30	IT-2301500X	80.75
10-48	.230	.252	1.750	.032	.055	.002	.0738	.3125	3.0	IT-2301750	71.65	IT-2301750X	82.15
8-40	.290	.312	.500	.040	.070	.002	.1338	.3125	2.5	IT-290500	70.30	IT-290500X	80.75
8-40	.290	.312	.750	.040	.070	.002	.1338	.3125	2.5	IT-290750	70.30	IT-290750X	80.75
8-40	.290	.312	1.000	.040	.070	.002	.1338	.3125	2.5	IT-2901000	70.30	IT-2901000X	80.75
8-40	.290	.312	1.250	.040	.070	.002	.1338	.3125	2.5	IT-2901250	70.30	IT-2901250X	80.75
8-40	.290	.312	1.500	.040	.070	.002	.1338	.3125	2.5	IT-2901500	70.30	IT-2901500X	80.75
8-40	.290	.312	1.750	.040	.070	.002	.1338	.3125	2.5	IT-2901750	70.30	IT-2901750X	80.75
8-40	.320	.342	.500	.043	.075	.002	.1325	.3750	2.5	IT-320500	91.40	IT-320500X	104.00
8-40	.320	.342	.750	.043	.075	.002	.1325	.3750	2.5	IT-320750	91.40	IT-320750X	104.00
8-40	.320	.342	1.000	.043	.075	.002	.1325	.3750	2.5	IT-3201000	91.40	IT-3201000X	104.00
8-40	.320	.342	1.250	.043	.075	.002	.1325	.3750	2.5	IT-3201250	91.40	IT-3201250X	104.00
8-40	.320	.342	1.500	.043	.075	.002	.1325	.3750	2.5	IT-3201500	91.40	IT-3201500X	104.00
8-40	.320	.342	1.750	.043	.075	.002	.1325	.3750	3.0	IT-3201750	93.75	IT-3201750X	106.20
8-40	.320	.342	1.800	.043	.075	.002	.1325	.3750	2.5	IT-3201800	91.40	IT-3201800X	104.00

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

Continued on next page

See pages 39-47 for standard tool holders
See page 303 for tool set options

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 #	USD$	Tool #	USD$
7-32	.360	.382	.500	.049	.085	.002	.1725	.3750	2.5	IT-360500	91.40	IT-360500X	104.00
7-32	.360	.382	.750	.049	.085	.002	.1725	.3750	2.5	IT-360750	91.40	IT-360750X	104.00
7-32	.360	.382	1.000	.049	.085	.002	.1725	.3750	2.5	IT-3601000	91.40	IT-3601000X	104.00
7-32	.360	.382	1.250	.049	.085	.002	.1725	.3750	2.5	IT-3601250	91.40	IT-3601250X	104.00
7-32	.360	.382	1.500	.049	.085	.002	.1725	.3750	2.5	IT-3601500	91.40	IT-3601500X	104.00
7-32	.360	.382	1.750	.049	.085	.002	.1725	.3750	3.0	IT-3601750	93.75	IT-3601750X	106.20
7-32	.360	.382	1.800	.049	.085	.002	.1725	.3750	3.0	IT-3601800	91.40	IT-3601800X	104.00
7-32	.360	.382	2.000	.049	.085	.002	.1725	.3750	4.0	IT-3602000	95.10	IT-3602000X	108.55
5-32	.460	.482	.750	.069	.120	.002	.2100	.5000	3.0	IT-460750	93.75	IT-460750X	110.80
5-32	.460	.482	1.500	.069	.120	.002	.2100	.5000	3.0	IT-4601500	93.75	IT-4601500X	110.80
5-32	.460	.482	2.000	.069	.120	.002	.2100	.5000	3.0	IT-4602000	128.30	IT-4602000X	145.25
5-32	.490	.512	.750	.069	.120	.002	.2400	.5000	3.0	IT-490750	128.30	IT-490750X	145.25
5-32	.490	.512	1.125	.069	.120	.002	.2400	.5000	3.0	IT-4901125	128.30	IT-4901125X	145.25
5-32	.490	.512	1.500	.069	.120	.002	.2400	.5000	3.0	IT-4901500	128.30	IT-4901500X	145.25
5-32	.490	.512	2.000	.069	.120	.002	.2400	.5000	3.0	IT-4902000	128.30	IT-4902000X	145.25
5-32	.490	.512	2.500	.069	.120	.002	.2400	.5000	4.0	IT-4902500	131.30	IT-4902500X	149.35

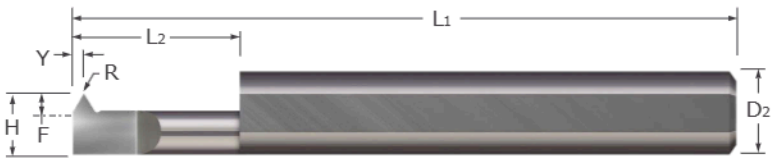
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

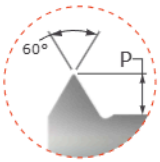
See pages 39-47 for standard tool holders
See page 303 for tool set options

ITL

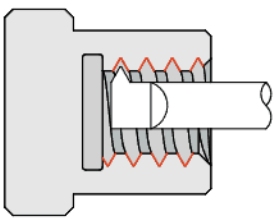
Standard – Threading Tools

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 #	USD$	Tool #	USD$
40-72	.040	.045	.150	.009	.015	.001	-.0225	.1250	1.5	ITL-040150	62.15		
28-72	.050	.055	.200	.012	.020	.001	-.0125	.1250	1.5	ITL-050200	62.15		
28-56	.060	.070	.200	.012	.020	.001	-.0025	.1250	1.5	ITL-060200	54.15		
28-56	.060	.070	.250	.012	.020	.001	-.0025	.1250	1.5	ITL-060250	54.15		
28-56	.060	.070	.300	.012	.020	.001	-.0025	.1250	1.5	ITL-060300	54.15	ITL-060300X	60.30
28-56	.080	.090	.250	.012	.020	.002	.0175	.1250	1.5	ITL-080250	49.30		
28-56	.080	.090	.350	.012	.020	.002	.0175	.1250	1.5	ITL-080350	49.30	ITL-080350X	55.55
28-56	.080	.090	.500	.012	.020	.002	.0175	.1250	1.5	ITL-080500	49.30		
24-56	.100	.110	.250	.014	.025	.002	.0375	.1250	1.5	ITL-100250	49.30	ITL-100250X	55.55
24-56	.100	.110	.350	.014	.025	.002	.0375	.1250	1.5	ITL-100350	49.30		
24-56	.100	.110	.500	.014	.025	.002	.0375	.1250	1.5	ITL-100500	49.30	ITL-100500X	55.55
20-56	.120	.136	.250	.017	.030	.002	.0263	.1875	2.0	ITL-120250	52.65	ITL-120250X	59.55
20-56	.120	.136	.400	.017	.030	.002	.0263	.1875	2.0	ITL-120400	52.65	ITL-120400X	59.55
20-56	.120	.136	.500	.017	.030	.002	.0263	.1875	2.0	ITL-120500	52.65		
20-56	.120	.136	.600	.017	.030	.002	.0263	.1875	2.0	ITL-120600	52.65		
20-56	.120	.136	.750	.017	.030	.002	.0263	.1875	2.0	ITL-120750	52.65	ITL-120750X	59.55
16-56	.140	.156	.250	.020	.035	.002	.0463	.1875	2.0	ITL-140250	52.65		
16-56	.140	.156	.400	.020	.035	.002	.0463	.1875	2.0	ITL-140400	52.65	ITL-140400X	59.55
16-56	.140	.156	.500	.020	.035	.002	.0463	.1875	2.0	ITL-140500	52.65		
16-56	.140	.156	.750	.020	.035	.002	.0463	.1875	2.0	ITL-140750	52.65	ITL-140750X	59.55

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
14-56	.160	.182	.250	.023	.040	.002	.0663	.1875	2.0			ITL-160250X	59.55
14-56	.160	.182	.400	.023	.040	.002	.0663	.1875	2.0	ITL-160400	52.65		
14-56	.160	.182	.500	.023	.040	.002	.0663	.1875	2.0	ITL-160500	52.65	ITL-160500X	59.55
14-56	.160	.182	.750	.023	.040	.002	.0663	.1875	2.0	ITL-160750	52.65	ITL-160750X	59.55
14-56	.180	.202	.350	.023	.040	.002	.0550	.2500	2.5	ITL-180350	56.10	ITL-180350X	64.80
14-56	.180	.202	.500	.023	.040	.002	.0550	.2500	2.5	ITL-180500	56.10	ITL-180500X	64.80
14-56	.180	.202	.750	.023	.040	.002	.0550	.2500	2.5	ITL-180750	56.10	ITL-180750X	64.80
14-56	.180	.202	1.000	.023	.040	.002	.0550	.2500	2.5	ITL-1801000	56.10	ITL-1801000X	64.80
13-56	.200	.222	.400	.026	.045	.002	.0750	.2500	2.5	ITL-200400	56.10	ITL-200400X	64.80
13-56	.200	.222	.600	.026	.045	.002	.0750	.2500	2.5	ITL-200600	56.10		
13-56	.200	.222	.750	.026	.045	.002	.0750	.2500	2.5	ITL-200750	56.10	ITL-200750X	64.80
13-56	.200	.222	1.000	.026	.045	.002	.0750	.2500	2.5	ITL-2001000	56.10	ITL-2001000X	64.80
10-48	.230	.252	.400	.032	.055	.002	.0738	.3125	2.5	ITL-230400	70.30	ITL-230400X	80.75
10-48	.230	.252	.600	.032	.055	.002	.0738	.3125	2.5	ITL-230600	70.30	ITL-230600X	80.75
10-48	.230	.252	.750	.032	.055	.002	.0738	.3125	2.5	ITL-230750	70.30	ITL-230750X	80.75
10-48	.230	.252	1.000	.032	.055	.002	.0738	.3125	2.5	ITL-2301000	70.30	ITL-2301000X	80.75
8-40	.290	.312	.500	.040	.070	.002	.1338	.3125	2.5	ITL-290500	70.30	ITL-290500X	80.75
8-40	.290	.312	.750	.040	.070	.002	.1338	.3125	2.5	ITL-290750	70.30	ITL-290750X	80.75
8-40	.290	.312	1.000	.040	.070	.002	.1338	.3125	2.5	ITL-2901000	70.30	ITL-2901000X	80.75
8-40	.290	.312	1.250	.040	.070	.002	.1338	.3125	2.5	ITL-2901250	70.30	ITL-2901250X	80.75
8-40	.320	.342	.500	.043	.075	.002	.1325	.3750	2.5	ITL-320500	91.40	ITL-320500X	104.00
8-40	.320	.342	.750	.043	.075	.002	.1325	.3750	2.5	ITL-320750	91.40	ITL-320750X	104.00
8-40	.320	.342	1.000	.043	.075	.002	.1325	.3750	2.5	ITL-3201000	91.40	ITL-3201000X	104.00
8-40	.320	.342	1.250	.043	.075	.002	.1325	.3750	2.5	ITL-3201250	91.40	ITL-3201250X	104.00
7-32	.360	.382	.500	.049	.085	.002	.1725	.3750	2.5			ITL-360500X	104.00
7-32	.360	.382	.750	.049	.085	.002	.1725	.3750	2.5	ITL-360750	91.40	ITL-360750X	104.00
7-32	.360	.382	1.000	.049	.085	.002	.1725	.3750	2.5	ITL-3601000	91.40	ITL-3601000X	104.00
7-32	.360	.382	1.250	.049	.085	.002	.1725	.3750	2.5	ITL-3601250	91.40	ITL-3601250X	104.00
7-32	.360	.382	1.800	.049	.085	.002	.1725	.3750	2.5	ITL-3601800	91.40	ITL-3601800X	104.00
5-32	.490	.512	.750	.069	.120	.002	.2400	.5000	3.0	ITL-490750	128.30	ITL-490750X	145.25
5-32	.490	.512	1.500	.069	.120	.002	.2400	.5000	3.0	ITL-4901500	128.30	ITL-4901500X	145.25
5-32	.490	.512	2.000	.069	.120	.002	.2400	.5000	3.0	ITL-4902000	128.30	ITL-4902000X	145.25

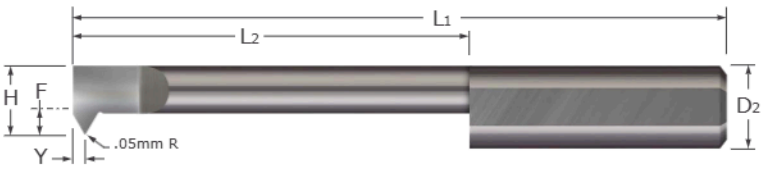
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

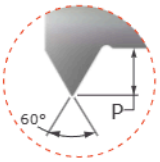
See pages 39-47 for standard tool holders

ITM

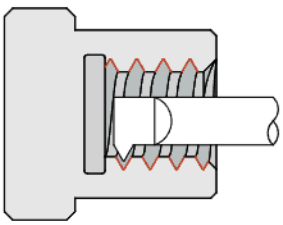
Standard – Threading Tools

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	L_2 $^{+1.24mm}_{-0.00mm}$		Y $^{+.25mm}_{-.00mm}$	P	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$	Tool #	USD$
.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	55.35	ITM-064613G	63.20	ITM-064613X	64.05
.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	55.35			ITM-064625X	64.05
.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	55.35			ITM-065115X	64.05
.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	55.35			ITM-065128X	64.05
.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	66.85			ITM-085815X	79.30
.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	66.85			ITM-085825X	79.30
.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	66.85				
.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	66.85	ITM-087420G	77.55		
.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	66.85			ITM-087432X	79.30
.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	66.85	ITM-087446G	77.55	ITM-087446X	79.30
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	93.75				
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	120.15				

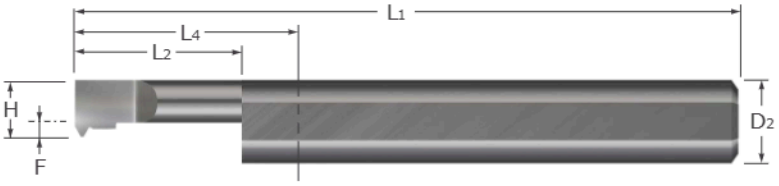
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

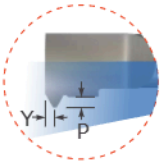
See pages 39-47 for standard tool holders

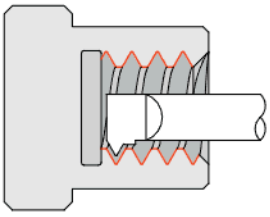
Standard – Threading Tools

UN Topping – Single Point

TT







- 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		L_2 +.050" −.000"	Y +.005" −.000"	P +.0000" −.0020"	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
2-56	.050	.055	.150	.012	.0097	-.0125	.1250	1.5	TT-000256-015	63.30	TT-000256-015X	69.35
2-56	.050	.055	.200	.012	.0097	-.0125	.1250	1.5	TT-000256-020	63.30	TT-000256-020X	69.35
4-40	.065	.075	.200	.014	.0135	.0025	.1250	1.5	TT-000440-020	63.30	TT-000440-020X	69.35
4-40	.065	.075	.250	.014	.0135	.0025	.1250	1.5	TT-000440-025	50.30	TT-000440-025X	56.35
5-44	.080	.090	.200	.014	.0123	.0175	.1250	1.5	TT-000544-020	50.30	TT-000544-020X	56.35
5-44	.080	.090	.250	.014	.0123	.0175	.1250	1.5	TT-000544-025	50.30	TT-000544-025X	56.35
6-32	.080	.090	.250	.017	.0169	.0175	.1250	1.5	TT-000632-025	50.30	TT-000632-025X	56.35
6-32	.080	.090	.350	.017	.0169	.0175	.1250	1.5	TT-000632-035	50.30	TT-000632-035X	56.35
8-32	.100	.110	.250	.017	.0169	.0375	.1250	1.5	TT-000832-025	50.30	TT-000832-025X	56.35
8-32	.100	.110	.350	.017	.0169	.0375	.1250	1.5	TT-000832-035	50.30	TT-000832-035X	56.35
10-24	.120	.136	.250	.021	.0226	.0263	.1875	1.5	TT-001024-025	53.55	TT-001024-025X	60.45
10-24	.120	.136	.400	.021	.0226	.0263	.1875	1.5	TT-001024-040	53.55	TT-001024-040X	60.45
10-32	.120	.136	.250	.017	.0169	.0263	.1875	1.5	TT-001032-025	53.55	TT-001032-025X	60.45
10-32	.120	.136	.400	.017	.0169	.0263	.1875	1.5	TT-001032-040	53.55	TT-001032-040X	60.45
1/4-20	.160	.182	.400	.024	.0271	.0663	.1875	1.5	TT-014020-040	53.55	TT-014020-040X	60.45
1/4-20	.160	.182	.500	.024	.0271	.0663	.1875	1.5	TT-014020-050	53.55	TT-014020-050X	60.45
1/4-28	.180	.202	.500	.018	.0193	.0550	.2500	2.0	TT-014028-050	57.35	TT-014028-050X	65.45
1/4-28	.180	.202	.750	.018	.0193	.0550	.2500	2.0	TT-014028-075	57.35	TT-014028-075X	65.45
5/16-18	.220	.242	.750	.026	.0301	.0638	.3125	2.0	TT-051618-075	71.65	TT-051618-075X	81.60
5/16-18	.220	.242	1.000	.026	.0301	.0638	.3125	2.0	TT-051618-100	71.65	TT-051618-100X	81.60
5/16-24	.220	.242	.750	.021	.0226	.0638	.3125	2.0	TT-051624-075	71.65	TT-051624-075X	81.60
5/16-24	.220	.242	1.000	.021	.0226	.0638	.3125	2.0	TT-051624-100	71.65	TT-051624-100X	81.60
3/8-16	.280	.302	.750	.028	.0338	.1238	.3125	2.0	TT-038016-075	71.65	TT-038016-075X	81.60
3/8-16	.280	.302	1.000	.028	.0338	.1238	.3125	2.0	TT-038016-100	71.65	TT-038016-100X	81.60
3/8-24	.300	.322	.750	.021	.0226	.1438	.3125	2.0	TT-038024-075	71.65	TT-038024-075X	81.60
3/8-24	.300	.322	1.000	.021	.0226	.1438	.3125	2.0	TT-038024-100	71.65	TT-038024-100X	81.60

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
7/16-14	.310	.332	.750	.032	.0387	.1538	.3125	2.0	TT-071614-075	71.65	TT-071614-075X	81.60
7/16-14	.310	.332	1.000	.032	.0387	.1538	.3125	2.0	TT-071614-100	71.65	TT-071614-100X	81.60
7/16-20	.350	.372	1.000	.024	.0271	.1625	.3750	2.0	TT-071620-100	93.45	TT-071620-100X	105.20
7/16-20	.350	.372	1.250	.024	.0271	.1625	.3750	2.5	TT-071620-125	93.45	TT-071620-125X	105.90
1/2-13	.380	.402	1.000	.034	.0416	.1300	.5000	3.0	TT-012013-100	130.90	TT-012013-100X	147.75
1/2-13	.380	.402	1.250	.034	.0416	.1300	.5000	3.0	TT-012013-125	130.90	TT-012013-125X	147.75
1/2-20	.410	.432	1.000	.024	.0271	.1600	.5000	3.0	TT-012020-100	130.90	TT-012020-100X	147.75
1/2-20	.410	.432	1.250	.024	.0271	.1600	.5000	3.0	TT-012020-125	130.90	TT-012020-125X	147.75
9/16-12	.410	.432	1.000	.036	.0451	.1600	.5000	3.0	TT-091612-100	130.90	TT-091612-100X	147.75
9/16-12	.410	.432	1.250	.036	.0451	.1600	.5000	3.0	TT-091612-125	130.90	TT-091612-125X	147.75
9/16-18	.460	.482	1.000	.026	.0301	.2100	.5000	3.0	TT-091618-100	130.90	TT-091618-100X	147.75
9/16-18	.460	.482	1.250	.026	.0301	.2100	.5000	3.0	TT-091618-125	130.90	TT-091618-125X	147.75
5/8-11	.490	.512	1.000	.039	.0492	.2400	.5000	3.0	TT-058011-100	130.90	TT-058011-100X	147.75
5/8-11	.490	.512	1.250	.039	.0492	.2400	.5000	3.0	TT-058011-125	130.90	TT-058011-125X	147.75
3/4-16	.490	.512	1.000	.028	.0338	.2400	.5000	3.0	TT-034016-100	130.90	TT-034016-100X	147.75
3/4-16	.490	.512	1.250	.028	.0338	.2400	.5000	3.0	TT-034016-125	130.90	TT-034016-125X	147.75

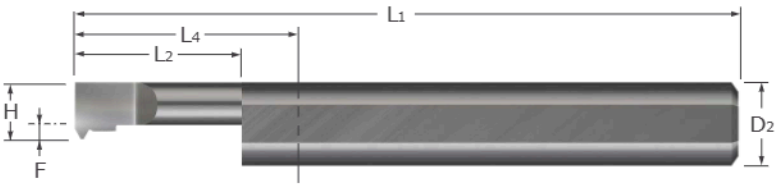
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

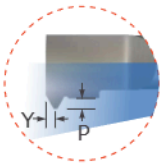
See pages 39-47 for standard tool holders

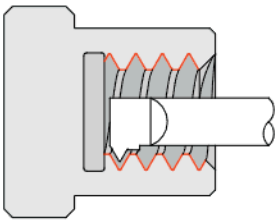
Standard – Threading Tools

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

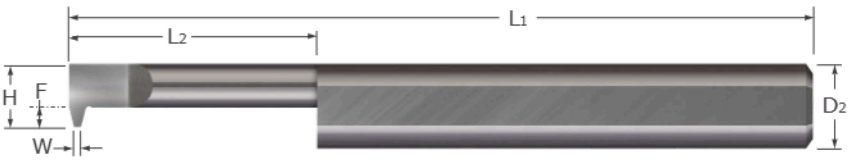
Threads Size	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
	H		L2 +1.27mm −.000mm	Y +.127mm −.000mm	P +.000mm −.051mm	F	D2 (h6)	L1	Tool #	USD$	Tool #	USD$
M2.5x0.45	1.50 mm	1.70 mm	5.00 mm	.300 mm	.244 mm	-0.09 mm	.1250	1.5	TMT-025045-05	63.30	TMT-025045-05X	69.35
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	63.30	TMT-025045-07X	69.35
M3x0.50	2.00 mm	2.20 mm	6.00 mm	.319 mm	.271 mm	0.41 mm	.1250	1.5	TMT-030050-06	50.30	TMT-030050-06X	56.35
M3x0.50	2.00 mm	2.20 mm	8.00 mm	.319 mm	.271 mm	0.41 mm	.1250	1.5	TMT-030050-08	50.30	TMT-030050-08X	56.35
M4x0.70	2.50 mm	2.70 mm	7.00 mm	.396 mm	.379 mm	0.91 mm	.1250	1.5	TMT-040070-07	50.30	TMT-040070-07X	56.35
M4x0.70	2.50 mm	2.70 mm	10.00 mm	.396 mm	.379 mm	0.91 mm	.1250	1.5	TMT-040070-10	50.30	TMT-040070-10X	56.35
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	53.55	TMT-045075-06X	59.65
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	53.55	TMT-045075-09X	59.65
M5x0.80	3.00 mm	3.40 mm	6.00 mm	.434 mm	.433 mm	0.62 mm	.1875	1.5	TMT-050080-06	53.55	TMT-050080-06X	59.65
M5x0.80	3.00 mm	3.40 mm	9.00 mm	.434 mm	.433 mm	0.62 mm	.1875	1.5	TMT-050080-09	53.55	TMT-050080-09X	59.65
M6x1.00	4.00 mm	4.50 mm	10.00 mm	.511 mm	.541 mm	1.62 mm	.1875	1.5	TMT-060100-10	53.55	TMT-060100-10X	59.65
M6x1.00	4.00 mm	4.50 mm	14.00 mm	.511 mm	.541 mm	1.62 mm	.1875	2.0	TMT-060100-14	55.35	TMT-060100-14X	61.45
M8x1.25	5.50 mm	6.00 mm	14.00 mm	.607 mm	.677 mm	1.53 mm	.3125	2.0	TMT-080125-14	71.65	TMT-080125-14X	77.75
M8x1.25	5.50 mm	6.00 mm	22.00 mm	.607 mm	.677 mm	1.53 mm	.3125	2.0	TMT-080125-22	71.65	TMT-080125-22X	77.75
M10x1.50	7.50 mm	8.00 mm	24.00 mm	.703 mm	.812 mm	3.53 mm	.3125	2.0	TMT-100150-24	71.65	TMT-100150-24X	77.75
M10x1.50	7.50 mm	8.00 mm	31.00 mm	.703 mm	.812 mm	3.53 mm	.3125	2.5	TMT-100150-31	71.65	TMT-100150-31X	77.75
M12x1.75	9.00 mm	9.50 mm	22.00 mm	.804 mm	.957 mm	4.24 mm	.3750	2.0	TMT-120175-22	93.45	TMT-120175-22X	99.60
M12x1.75	9.00 mm	9.50 mm	31.00 mm	.804 mm	.957 mm	4.24 mm	.3750	2.5	TMT-120175-31	95.00	TMT-120175-31X	101.10
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	130.90	TMT-160200-31X	136.95
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	130.90	TMT-160200-44X	136.95
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	130.90	TMT-200250-31X	136.95
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	130.90	TMT-200250-44X	136.95

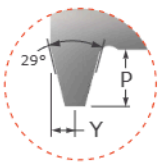
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pages 39-47 for standard tool holders

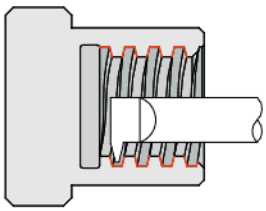
IAT

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 #	USD$	Tool #	USD$
16	.165	.187	.400	.035	.045	.021	.0400	.2500	2.5	IAT2-400-16	56.10		
16	.165	.187	.600	.024	.050	.021	.0400	.2500	2.5	IAT2-600-16	56.10		
16	.165	.187	.750	.035	.045	.021	.0400	.2500	2.5	IAT2-750-16	56.10		
16	.165	.187	1.000	.035	.045	.021	.0400	.2500	2.5	IAT2-1000-16	56.10		
16	.200	.222	.400	.035	.045	.021	.0750	.2500	2.5	IAT-400-16	56.10		
16	.200	.222	.600	.024	.045	.021	.0750	.2500	2.5	IAT-600-16	56.10		
16	.200	.222	.750	.035	.045	.021	.0750	.2500	2.5	IAT-750-16	56.10	IAT-750-16X	64.80
16	.200	.222	1.000	.035	.045	.021	.0750	.2500	2.5	IAT-1000-16	56.10	IAT-1000-16X	64.80
14	.219	.241	.500	.043	.070	.024	.0627	.3125	2.5	IAT2-500-14	69.45		
14	.219	.241	.750	.030	.070	.024	.0627	.3125	2.5	IAT2-750-14	69.45		
14	.219	.241	1.000	.043	.070	.024	.0627	.3125	2.5	IAT2-1000-14	69.45		
14	.219	.241	1.250	.043	.070	.024	.0627	.3125	2.5	IAT2-1250-14	69.45		
14	.255	.277	.500	.043	.070	.024	.0988	.3125	2.5	IAT-500-14	69.45	IAT-500-14X	80.00
14	.255	.277	.750	.030	.070	.024	.0988	.3125	2.5	IAT-750-14	69.45	IAT-750-14X	80.00
14	.255	.277	1.000	.043	.070	.024	.0988	.3125	2.5	IAT-1000-14	69.45	IAT-1000-14X	80.00
14	.255	.277	1.250	.043	.070	.024	.0988	.3125	2.5	IAT-1250-14	69.45	IAT-1250-14X	80.00
12	.269	.291	.750	.049	.085	.028	.0815	.3750	2.5	IAT2-750-12	91.40		
12	.269	.291	1.000	.036	.085	.028	.0815	.3750	2.5	IAT2-1000-12	91.40		
12	.269	.291	1.250	.049	.085	.028	.0815	.3750	2.5	IAT2-1250-12	91.40		
12	.269	.291	1.800	.049	.085	.028	.0815	.3750	4.0	IAT2-1800-12	91.40		
12	.360	.382	.750	.049	.085	.028	.1725	.3750	2.5	IAT-750-12	91.40	IAT-750-12X	104.00
12	.360	.382	1.000	.036	.085	.028	.1725	.3750	2.5	IAT-1000-12	91.40	IAT-1000-12X	104.00
12	.360	.382	1.250	.049	.085	.028	.1725	.3750	2.5	IAT-1250-12	91.40	IAT-1250-12X	104.00
12	.360	.382	1.800	.049	.085	.028	.1725	.3750	2.5	IAT-1800-12	91.40	IAT-1800-12X	104.00
10	.378	.400	.750	.060	.120	.032	.1280	.5000	3.0	IAT2-750-10	128.30		
10	.378	.400	1.500	.060	.120	.032	.1280	.5000	3.0	IAT2-1500-10	128.30		
10	.378	.400	2.000	.060	.120	.032	.1280	.5000	3.0	IAT2-2000-10	128.30		
10	.490	.512	.750	.060	.120	.032	.2400	.5000	3.0	IAT-750-10	128.30	IAT-750-10X	145.25
10	.490	.512	1.500	.060	.120	.032	.2400	.5000	3.0	IAT-1500-10	128.30	IAT-1500-10X	145.25
10	.490	.512	2.000	.060	.120	.032	.2400	.5000	3.0	IAT-2000-10	128.30	IAT-2000-10X	145.25

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

Continued on next page

See pages 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 #	USD$	Tool #	USD$
8	.478	.500	.750	.064	.120	.041	.2280	.5000	3.0	IAT2-750-8	128.30		
8	.478	.500	1.500	.064	.120	.041	.2280	.5000	3.0	IAT2-1500-8	128.30		
8	.478	.500	2.000	.064	.120	.041	.2280	.5000	3.0	IAT2-2000-8	128.30		
8	.490	.512	.750	.064	.120	.041	.2400	.5000	3.0	IAT-750-8	128.30	IAT-750-8X	145.25
8	.490	.512	1.500	.064	.120	.041	.2400	.5000	3.0	IAT-1500-8	128.30	IAT-1500-8X	145.25
8	.490	.512	2.000	.064	.120	.041	.2400	.5000	3.0	IAT-2000-8	128.30	IAT-2000-8X	145.25
6	.490	.512	.750	.072	.120	.057	.2400	.5000	3.0	IAT-750-6	128.30	IAT-750-6X	145.25
6	.490	.512	1.500	.072	.120	.057	.2400	.5000	3.0	IAT-1500-6	128.30	IAT-1500-6X	145.25
6	.490	.512	2.000	.072	.120	.057	.2400	.5000	3.0	IAT-2000-6	128.30	IAT-2000-6X	145.25
5	.490	.512	1.500	.078	.120	.069	.2400	.5000	3.0	IAT-1500-5	128.30	IAT-1500-5X	145.25
5	.490	.512	2.000	.078	.120	.069	.2400	.5000	3.0	IAT-2000-5	128.30	IAT-2000-5X	145.25

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

Technical Resources on Micro100.com

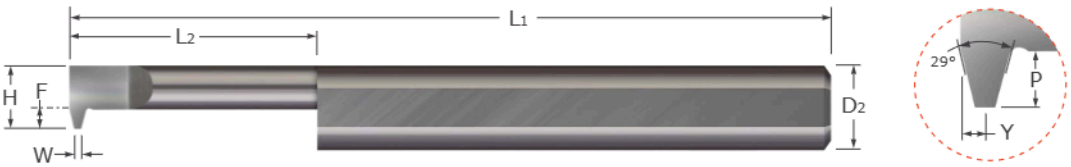
Find Simulation Files, Speeds & Feeds, Torque Recommendations, Programs, Blogs, and more at micro100.com/resources

SCAN

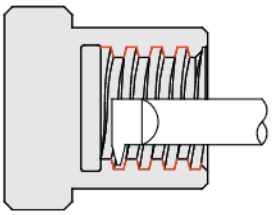
See pages 39-47 for standard tool holders

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 #	USD$	Tool #	USD$
16	.200	.222	.400	.024	.045	.024	.0750	.2500	2.5	SAT-400-16	56.10		
16	.200	.222	.600	.024	.045	.024	.0750	.2500	2.5	SAT-600-16	56.10	SAT-600-16X	64.80
16	.200	.222	.750	.024	.045	.024	.0750	.2500	2.5	SAT-750-16	56.10	SAT-750-16X	64.80
16	.200	.222	1.000	.024	.045	.024	.0750	.2500	2.5	SAT-1000-16	56.10	SAT-1000-16X	64.80
14	.235	.257	.500	.045	.070	.028	.0788	.3125	2.5	SAT-500-14	69.45	SAT-500-14X	80.00
14	.235	.257	.750	.045	.070	.028	.0788	.3125	2.5	SAT-750-14	69.45	SAT-750-14X	80.00
14	.235	.257	1.000	.045	.070	.028	.0788	.3125	2.5	SAT-1000-14	69.45	SAT-1000-14X	80.00
14	.235	.257	1.750	.045	.070	.028	.0788	.3125	2.5	SAT-1750-14	69.45	SAT-1750-14X	80.00
12	.360	.382	.500	.051	.085	.033	.1725	.3750	2.5	SAT-500-12	91.40		
12	.360	.382	.750	.051	.085	.033	.1725	.3750	2.5	SAT-750-12	91.40	SAT-750-12X	104.00
12	.360	.382	1.000	.051	.085	.033	.1725	.3750	2.5	SAT-1000-12	91.40	SAT-1000-12X	104.00
12	.360	.382	1.250	.051	.085	.033	.1725	.3750	2.5	SAT-1250-12	91.40		
12	.360	.382	1.800	.051	.085	.033	.1725	.3750	2.5	SAT-1800-12	91.40		
10	.490	.512	.750	.062	.120	.037	.2400	.5000	3.0	SAT-750-10	128.30	SAT-750-10X	145.25
10	.490	.512	1.500	.062	.120	.037	.2400	.5000	3.0	SAT-1500-10	128.30	SAT-1500-10X	145.25
10	.490	.512	2.000	.062	.120	.037	.2400	.5000	3.0	SAT-2000-10	128.30		
9	.490	.512	2.000	.052	.120	.042	.2400	.5000	3.0	SAT-2000-9	128.30	SAT-2000-9X	145.25
8	.490	.512	.750	.068	.120	.048	.2400	.5000	3.0	SAT-750-8	128.30		
8	.490	.512	1.500	.068	.120	.048	.2400	.5000	3.0	SAT-1500-8	128.30	SAT-1500-8X	145.25
8	.490	.512	2.000	.068	.120	.048	.2400	.5000	3.0	SAT-2000-8	128.30	SAT-2000-8X	145.25
7	.490	.512	2.000	.059	.120	.055	.2400	.5000	3.0	SAT-2000-7	128.30	SAT-2000-7X	145.25
6	.490	.512	2.000	.076	.120	.065	.2400	.5000	3.0	SAT-2000-6	128.30	SAT-2000-6X	145.25
5	.490	.512	.750	.083	.120	.079	.2400	.5000	3.0	SAT-750-5	128.30		
5	.490	.512	1.500	.083	.120	.079	.2400	.5000	3.0	SAT-1500-5	128.30	SAT-1500-5X	145.25
5	.490	.512	2.000	.083	.120	.079	.2400	.5000	3.0	SAT-2000-5	128.30		

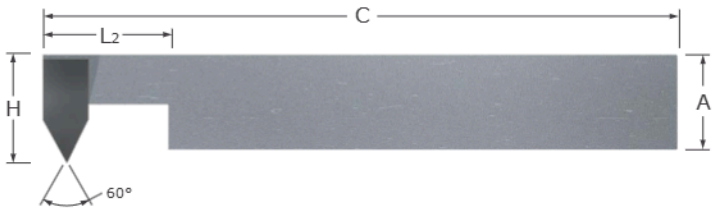
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pages 39-47 for standard tool holders

Standard – Threading Tools

IDRT

UN Threads – Right Hand – Brazed



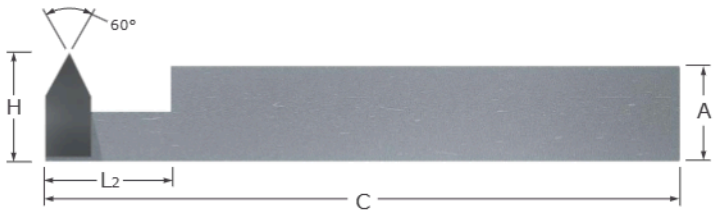
- Designed for threading multiple thread pitches (ANSI, UN and Metric 60°)
- Designed for single point threading where a square shank tool is required in .450" bores and larger
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- Solid carbide tipped with zinc coated steel shank 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 #	USD$
.450	.615	.3750	2.50	IDRT-60	81.20
.450	1.115	.3750	2.50	IDRT-61	81.20
.575	.875	.5000	3.52	IDRT-80	81.85
.575	1.395	.5000	3.52	IDRT-81	75.40

Standard – Threading Tools

IDLT

UN Threads – Left Hand – Brazed



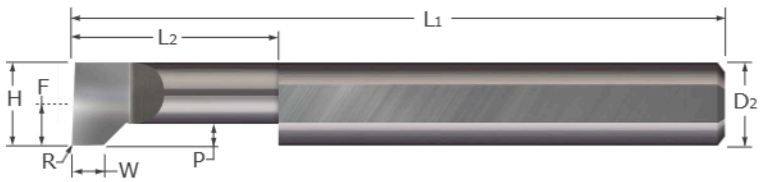
- Designed for threading multiple thread pitches (ANSI, UN, and Metric 60°) in a left hand threading application
- Designed for single point threading where a square shank tool is required in .450" bores and larger
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- Solid carbide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

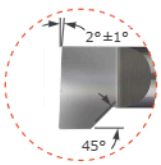
Head Width	Maximum Bore Depth	Square Shank	Overall Length	Brazed Style	
H	$L_2{}^{+.050"}_{-.000"}$	$A^{+.0000"}_{-.0030"}$	C	Tool #	USD$
.450	.615	.3750	2.50	IDLT-60	81.20
.450	1.115	.3750	2.50	IDLT-61	81.20
.575	.875	.5000	3.52	IDLT-80	81.85
.575	1.395	.5000	3.52	IDLT-81	81.85

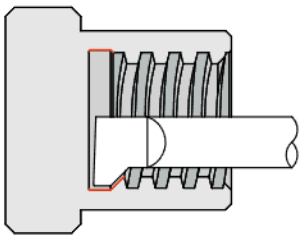
LTR

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

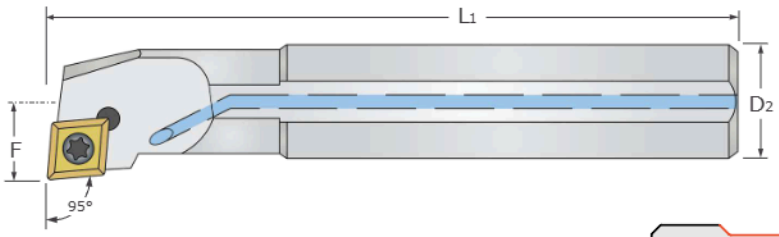
Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Flat	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
H		L_2 +.050" −.000"	W +.002" −.002"	R +.002" −.000"	P	F	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.094	.104	.250	.049	.002	.040	.0315	.1250	1.5	LTR-094-4	40.85	LTR-094-4X	46.95
.094	.104	.375	.049	.002	.040	.0315	.1250	1.5	LTR-094-6	40.85		
.125	.139	.375	.063	.002	.040	.0625	.1250	1.5	LTR-125-6	40.85		
.125	.139	.500	.063	.002	.040	.0625	.1250	1.5	LTR-125-8	40.85	LTR-125-8X	46.95
.156	.174	.375	.063	.005	.040	.0625	.1875	2.0	LTR-156-6	46.95	LTR-156-6X	53.90
.156	.174	.500	.063	.005	.040	.0625	.1875	2.0	LTR-156-8	46.95	LTR-156-8X	53.90
.187	.205	.375	.078	.005	.040	.0938	.1875	2.0	LTR-187-6	46.95	LTR-187-6X	53.90
.187	.205	.500	.078	.005	.040	.0938	.1875	2.0	LTR-187-8	46.95	LTR-187-8X	53.90
.187	.205	.750	.078	.005	.040	.0938	.1875	2.0	LTR-187-12	46.95	LTR-187-12X	53.90
.187	.205	1.000	.078	.005	.040	.0938	.1875	2.0	LTR-187-16	46.95	LTR-187-16X	53.90
.250	.272	.500	.094	.005	.050	.1250	.2500	2.5	LTR-250-8	56.10	LTR-250-8X	64.80
.250	.272	.750	.094	.005	.050	.1250	.2500	2.5	LTR-250-12	56.10		
.250	.272	1.000	.094	.005	.050	.1250	.2500	2.5	LTR-250-16	56.10	LTR-250-16X	64.80
.250	.272	1.250	.094	.005	.050	.1250	.2500	2.5	LTR-250-20	56.10	LTR-250-20X	64.80
.312	.334	.750	.094	.005	.075	.1563	.3125	2.5	LTR-312-12	70.30	LTR-312-12X	80.75
.312	.334	1.250	.094	.005	.075	.1563	.3125	2.5	LTR-312-20	70.30	LTR-312-20X	80.75
.375	.397	.750	.125	.005	.100	.1875	.3750	2.5	LTR-375-12	92.50	LTR-375-12X	104.95
.375	.397	1.250	.125	.005	.100	.1875	.3750	2.5	LTR-375-20	92.50		
.500	.522	1.000	.156	.010	.125	.2500	.5000	3.0	LTR-500-16	131.05	LTR-500-16X	147.85
.500	.522	1.500	.156	.010	.125	.2500	.5000	3.0	LTR-500-24	131.05	LTR-500-24X	147.85

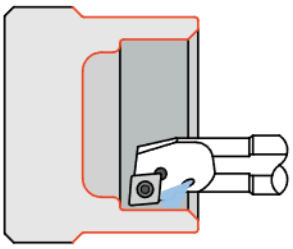
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pages 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

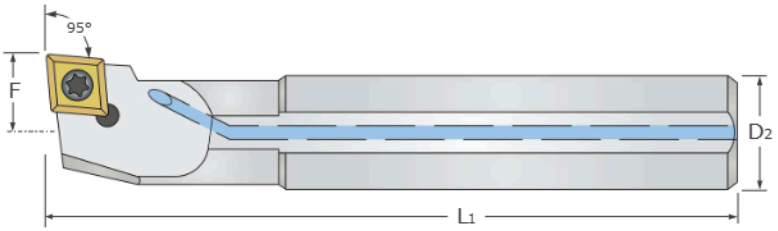
Minimum Bore Diameter*	Centerline Offset	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
	F	D2	L1			Tool #	USD$
.330	.177	.2500	3.1	50-1100	A04F SCLCR 2	20-0821	106.40
.380	.197	.3125	3.9	50-1100	A05H SCLCR 2	20-0823	109.10
.490	.275	.3750	4.5	50-1100	A06J SCLCR 2	20-0825	113.90
.630	.354	.5000	4.9	50-1100	A08K SCLCR 2	20-0827	118.60
.630	.354	.5000	4.9	50-1105	A08K SCLCR 3	20-0850	123.40
.775	.433	.6250	5.9	50-1100	A10M SCLCR 2	20-0829	126.70
.775	.433	.6250	5.9	50-1105	A10M SCLCR 3	20-0852	131.50
.925	.511	.7500	7.1	50-1105	A12Q SCLCR 3	20-0854	142.40

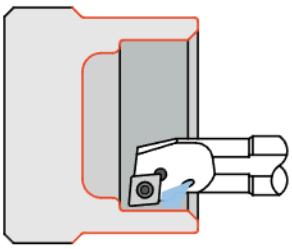
*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

See page 314 for indexable insert accessories
See pages 306-310 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	D_2	L_1			Tool #	USD$
.330	.177	.2500	3.1	50-1100	A04F SCLCL 2	20-0822	106.40
.380	.197	.3125	3.9	50-1100	A05H SCLCL 2	20-0824	109.10
.490	.275	.3750	4.5	50-1100	A06J SCLCL 2	20-0826	113.90
.630	.354	.5000	4.9	50-1100	A08K SCLCL 2	20-0828	118.60
.630	.354	.5000	4.9	50-1105	A08K SCLCL 3	20-0851	123.40
.775	.433	.6250	5.9	50-1100	A10M SCLCL 2	20-0830	126.70
.775	.433	.6250	5.9	50-1105	A10M SCLCL 3	20-0853	131.50
.925	.511	.7500	7.1	50-1105	A12Q SCLCL 3	20-0855	142.40

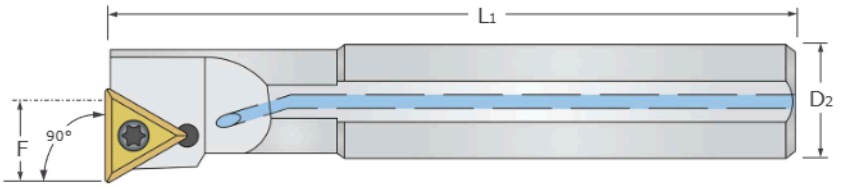
*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

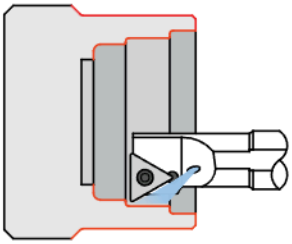
See pag 314 for indexable insert accessories

See pages 306-310 for tool set options

Indexable – Boring Bars

Facing – Coolant Through – Right Hand





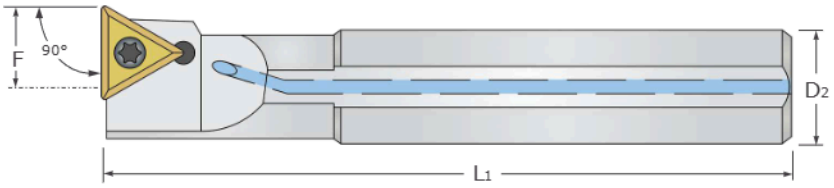
- Coolant through boring bar for left hand boring and facing with 0° approach (lead) angle, which allows for deeper roughing passes
- Made from precision ground heat treated steel
- Coolant through design for improved chip removal
- Insert not included

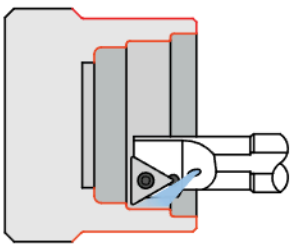
Minimum Bore Diameter*	Centerline Offset	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
	F	D2	L1			Tool #	USD$
.490	.275	.3750	4.3	50-1300	A06J STFCR 2	20-1031	111.00
.633	.354	.5000	4.9	50-1300	A08K STFCR 2	20-1033	117.60
.775	.433	.6250	5.9	50-1300	A10M STFCR 2	20-1035	119.20

*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 #	USD$
.633	.354	.5000	4.9	50-1300	A08K STFCL 2	20-1034	117.60
.775	.433	.6250	5.9	50-1300	A10M STFCL 2	20-1036	119.20

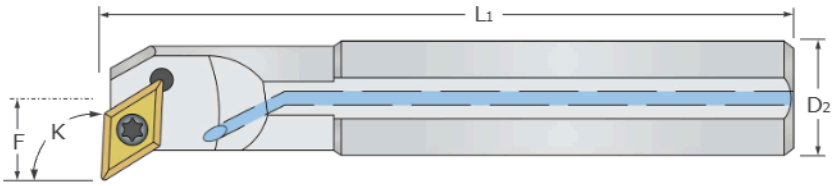
*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

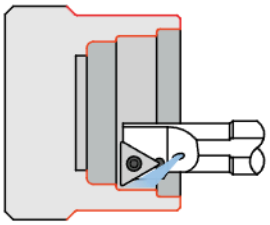
See page 314 for indexable insert accessories

See pages 306-310 for tool set options

Indexable – Boring Bars

Profiling – Coolant Through – Right Hand





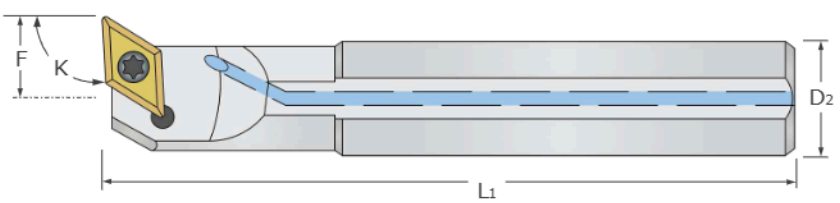
- Coolant through boring bar for right hand boring, facing, and profiling
- Made from precision ground heat treated steel
- Coolant through design for improved chip removal
- Insert not included

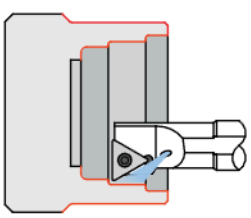
Minimum Bore Diameter*	Centerline Offset	K Angle	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
	F	K	D_2	L_1			Tool #	USD$
.563	.197	107.5°	.3125	3.9	50-1200	A05H SDQCR 2	20-0901	106.85
.622	.275	93°	.3750	4.5	50-1200	A06J SDUCR 2	20-0931	111.00
.732	.354	93°	.5000	4.9	50-1200	A08K SDUCR 2	20-0933	117.60
.868	.433	93°	.6250	5.9	50-1200	A10M SDUCR 2	20-0935	119.20

*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	D_2	L_1			Tool #	USD$
.563	.197	107.5°	.3125	3.9	50-1200	A05H SDQCL 2	20-0902	106.85
.622	.275	93°	.3750	4.5	50-1200	A06J SDUCL 2	20-0932	111.00
.732	.354	93°	.5000	4.9	50-1200	A08K SDUCL 2	20-0934	117.60
.868	.433	93°	.6250	5.9	50-1200	A10M SDUCL 2	20-0936	119.20

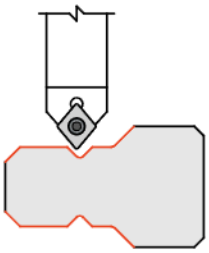
*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

See page 314 for indexable insert accessories

See pages 306-310 for tool set options

Indexable – Tool Holders

Chamfering & Turning – Style SCMCN

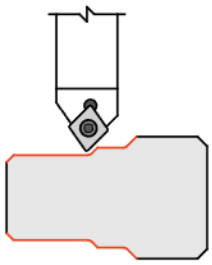


- Turning, profiling, and chamfering insertable holder utilizing 50° right hand and 50° left hand cutting edges
- Made from precision ground heat treated steel
- Insert not included

Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	USD$
.157	.2500	2.4	50-1100	SCMCN 0404 D2	10-3311	58.05
.157	.3125	2.4	50-1100	SCMCN 0505 D2	10-3312	62.85
.189	.3750	2.8	50-1100	SCMCN 0606 E2	10-3313	70.65
.250	.5000	3.2	50-1100	SCMCN 0808 F2	10-3314	77.45
.315	.6250	3.9	50-1100	SCMCN 1010 H2	10-3315	85.70

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

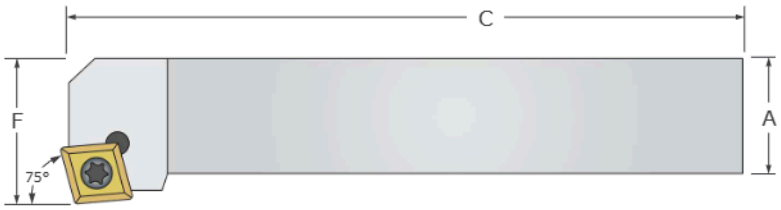
Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	USD$
.157	.2500	2.4	50-1100	SCSCR 0404 D2	10-3351	58.05
.157	.3125	2.4	50-1100	SCSCR 0505 D2	10-3353	62.85
.189	.3750	2.8	50-1100	SCSCR 0606 E2	10-3355	70.65
.250	.5000	3.2	50-1100	SCSCR 0808 F2	10-3357	77.45
.315	.6250	3.9	50-1100	SCSCR 1010 H2	10-3359	85.70
.390	.7500	4.9	50-1100	SCSCR 1212 J3	10-3365	100.70

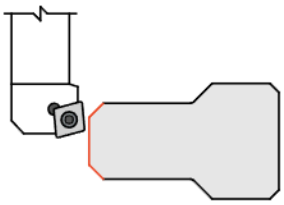
See page 314 for indexable insert accessories

See pages 306-310 for tool set options

Indexable – Tool Holders

Facing & Turning – Axial – Right Hand – Style SCKCR





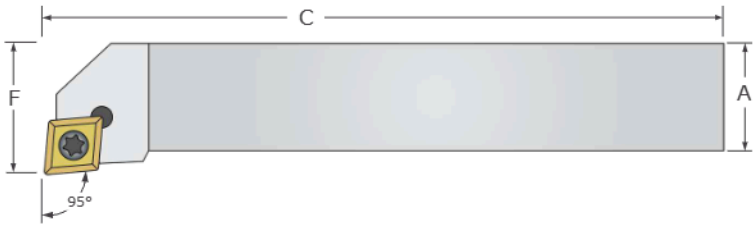
- 75° facing and chamfering holder utilizing 100° unused left hand cutting edge of insert
- Made from precision ground heat treated steel
- Insert not included

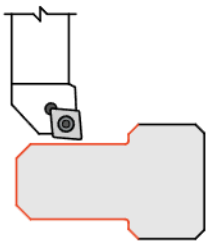
Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	USD$
.394	.2500	2.4	50-1100	SCKCR 0404 D2	10-3211	58.05
.472	.3750	2.8	50-1100	SCKCR 0606 E2	10-3213	70.65
.630	.5000	3.2	50-1100	SCKCR 0808 F2	10-3215	77.45
.787	.6250	3.9	50-1100	SCKCR 1010 H2	10-3217	85.70

See page 314 for indexable insert accessories
See pages 306-310 for tool set options

Indexable – Tool Holders

Facing & Turning – Radial – Right Hand – Style SCLCR



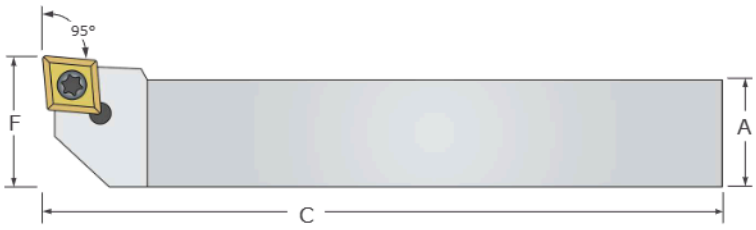


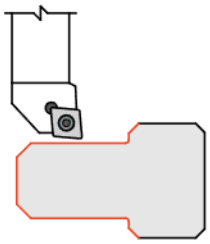
- Turning and facing indexable right hand holder with 95° approach
- Made from precision ground heat treated steel
- Insert not included

Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	USD$
.394	.2500	2.4	50-1100	SCLCR 0404 D2	10-3231	58.05
.394	.3125	2.4	50-1100	SCLCR 0404 D2	10-3233	62.85
.472	.3750	2.8	50-1100	SCLCR 0606 E2	10-3235	70.65
.628	.5000	3.2	50-1100	SCLCR 0808 F2	10-3237	77.45
.787	.6250	3.9	50-1100	SCLCR 1010 H2	10-3241	85.70
1.000	.7500	4.9	50-1105	SCLCR 1212 J3	10-3251	100.70

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

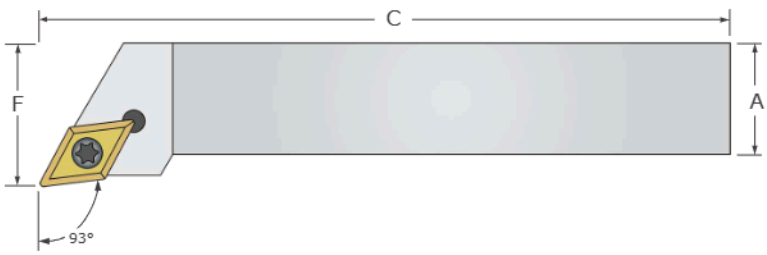
Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	USD$
.394	.2500	2.4	50-1100	SCLCL 0404 D2	10-3232	58.05
.394	.3125	2.4	50-1100	SCLCL 0505 D2	10-3234	62.85
.472	.3750	2.8	50-1100	SCLCL 0606 E2	10-3236	70.65
.600	.5000	3.2	50-1100	SCLCL 0808 F2	10-3238	77.45
.787	.6250	3.9	50-1100	SCLCL 1010 H2	10-3242	85.70
1.000	.7500	4.9	50-1105	SCLCL 1212 J3	10-3252	100.70

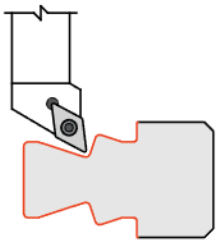
See page 314 for indexable insert accessories

See pages 306-310 for tool set options

Indexable – Tool Holders

Facing & Turning – Radial – Right Hand – Style SDJCR



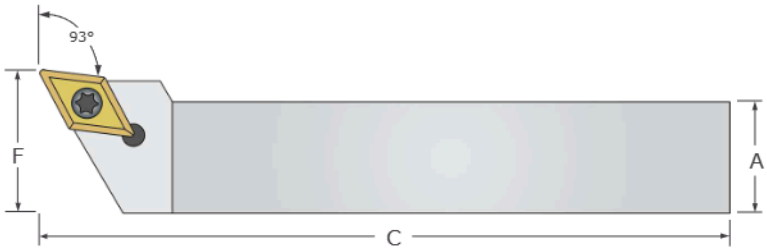


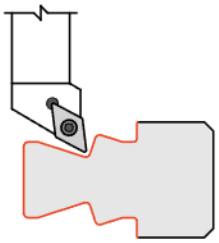
- Turning and profiling right hand holder
- Made from precision ground heat treated steel
- Insert not included

Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	USD$
.394	.3125	3.9	50-1200	SDJCR 0505 H2	10-3641	70.65
.472	.3750	3.9	50-1200	SDJCR 0606 H2	10-3651	82.75
.629	.5000	3.9	50-1200	SDJCR 0808H2	10-3653	87.15
.787	.6250	3.9	50-1200	SDJCR 1010 H2	10-3615	96.65

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

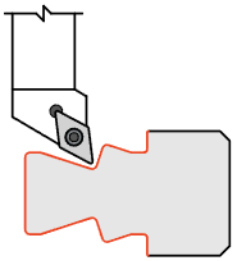
Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	USD$
.394	.3125	3.9	50-1200	SDJCL 0505 H2	10-3642	70.65
.472	.3750	3.9	50-1200	SDJCL 0606 H2	10-3652	82.75
.629	.7500	3.9	50-1200	SDJCL 0808H2	10-3654	87.15
.787	.6250	3.9	50-1200	SDJCL 1010 H2	10-3616	96.65

See page 314 for indexable insert accessories

See pages 306-310 for tool set options

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 #	USD$
.157	.3125	3.9	50-1200	SDNCN 0505 H2	10-3761	70.65
.189	.3750	3.9	50-1200	SDNCN 0606 H2	10-3762	82.75
.250	.5000	3.9	50-1200	SDNCN 0808 H2	10-3763	87.15
.313	.6250	3.9	50-1200	SDNCN 1010 H2	10-3764	96.65

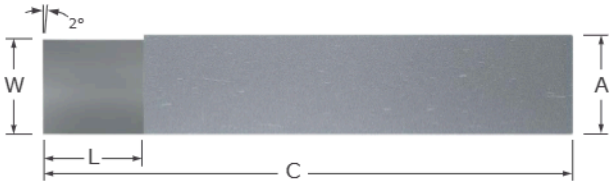
See page 314 for indexable insert accessories

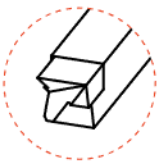
See pages 306-310 for tool set options

BT

Brazed – Box Turning Tools

BT Style





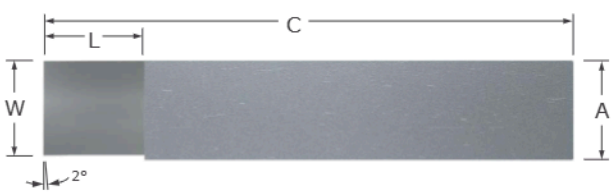
- Designed to be used for outside diameter (OD) turning with roller box turning attachments in automatic screw machines and turret lathes
- Ground to provide high metal removal rates improved finish and concentricity, when used in conjunction with a properly adjusted roller box turning attachment
- Solid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

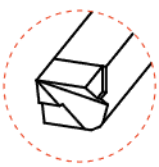
Width	Length	Square Shank	Overall Length	BT Style	
W +.040" −.000"	L	A +.0000" −.0100"	C	Tool #	USD$
.200	.185	.2500	1.50	BT-4	44.25
.263	.185	.3125	1.75	BT-5	52.00
.325	.310	.3750	2.00	BT-6	46.85
.388	.310	.4375	2.25	BT-7	75.70
.450	.375	.5000	2.50	BT-8	51.20
.513	.375	.5625	2.75	BT-9	91.20
.575	.500	.6250	3.00	BT-10	79.25

BTL

Brazed – Box Turning Tools

BTL Style





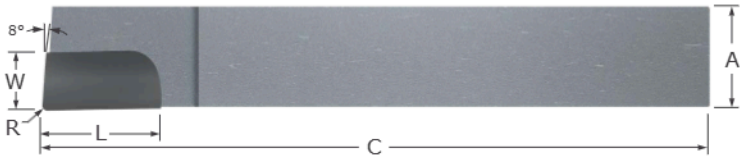
- Designed to be used for left hand outside diameter (OD) turning with roller box turning attachments in automatic screw machines and turret lathes
- Ground to provide high metal removal rates, improved finish, and concentricity when used in conjunction with a properly adjusted roller box turning attachment
- 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 #	USD$
.263	.185	.3125	1.75	BTL-5	72.85
.388	.310	.4375	2.25	BTL-7	76.65
.450	.375	.5000	2.50	BTL-8	76.05
.513	.375	.5625	2.75	BTL-9	91.55
.575	.500	.6250	3.00	BTL-10	97.25

Brazed – Forming Tools

AR

AR Style



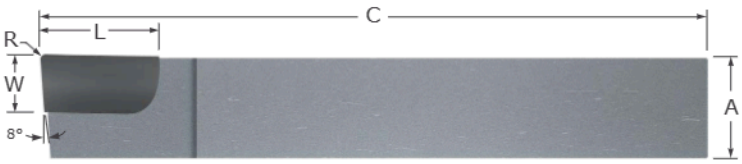
- Designed for right hand turning and facing in lathe applications
- Ground with side rake to provide a positive cutting action and better chip evacuation
- Corner radius profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard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

Radius	Width	Length	Square Shank	Overall Length	AR Style	
R	W	L	A $^{+.0000"}_{-.0050"}$	C	Tool #	USD$
.015	.170	.250	.2500	2.00	AR-4	27.10
.015	.233	.312	.3125	2.25	AR-5	28.75
.015	.240	.500	.3750	2.50	AR-6	16.05
.015	.233	.500	.4375	3.00	AR-7	29.70
.015	.235	.625	.5000	3.50	AR-8	18.75
.015	.360	.750	.6250	4.00	AR-10	30.95
.015	.420	.812	.7500	4.50	AR-12	43.15

Brazed – Forming Tools

AL

AL Style



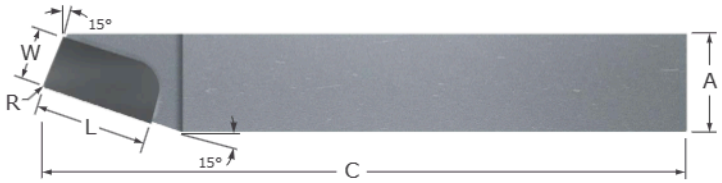
- Designed for left hand turning and facing on the outside diameter (OD) in lathe applications
- Ground with side rake to provide a positive cutting action and better chip evacuation
- Corner radius profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- 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 #	USD$
.015	.170	.250	.2500	2.00	AL-4	27.10
.015	.233	.312	.3125	2.25	AL-5	28.75
.015	.240	.500	.3750	2.50	AL-6	16.05
.015	.233	.500	.4375	3.00	AL-7	29.70
.015	.235	.625	.5000	3.50	AL-8	18.75
.015	.360	.750	.6250	4.00	AL-10	30.95
.015	.420	.812	.7500	4.50	AL-12	43.15

BR

Brazed – Forming Tools

BR Style



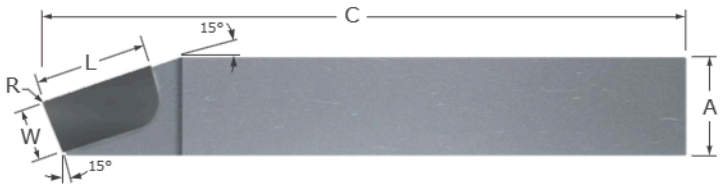
- Designed with a 15° side cutting edge angle for right hand turning in lathe applications
- Ground with side rake to provide a positive cutting action and better chip evacuation
- Side cutting edge angle allow for higher feed rates
- Corner radius profile
- Solid carbide tipped with zinc coated steel 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 #	USD$
.015	.250	.500	.3750	2.5	BR-6	18.00
.015	.250	.500	.4375	3.0	BR-7	22.10
.015	.250	.625	.5000	3.5	BR-8	18.25
.015	.375	.750	.6250	4.0	BR-10	32.55
.015	.438	.813	.7500	4.5	BR-12	45.25

BL

Brazed – Forming Tools

BL Style



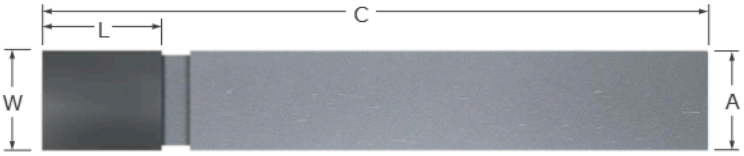
- Designed with a 15° side cutting edge angle for right hand turning in lathe applications
- Ground with side rake to provide a positive cutting action and better chip evacuation
- Side cutting edge angle allow for higher feed rates
- Corner radius profile
- Solid carbide tipped with zinc coated steel 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 #	USD$
.015	.250	.500	.3750	2.5	BL-6	18.10
.015	.250	.500	.4375	3.0	BL-7	22.30
.015	.250	.625	.5000	3.5	BL-8	20.85
.015	.375	.750	.6250	4.0	BL-10	32.55
.015	.438	.813	.7500	4.5	BL-12	51.80

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 #	USD$
.235	.250	.2350	6.00	C-250	41.05
.235	.250	.2350	2.00	C-4	15.45
.281	.375	.2812	6.00	C-281	62.20
.312	.375	.3125	6.00	C-312	34.50
.313	.375	.3125	2.25	C-5	17.40
.375	.500	.3750	2.50	C-6	17.75
.375	.500	.3750	6.00	C-375	28.75
.437	.500	.4375	6.00	C-437	51.80
.438	.500	.4375	3.00	C-7	25.65
.500	.500	.5000	3.50	C-8	22.10
.500	.500	.5000	6.00	C-500	35.15
.625	.625	.6250	4.00	C-10	38.25
.750	.750	.7500	4.00	C-750	75.05
.750	.750	.7500	4.50	C-12	45.95

Brazed

Brazed – Forming Tools

CRT

CRT Style – Full Radius (Concave)

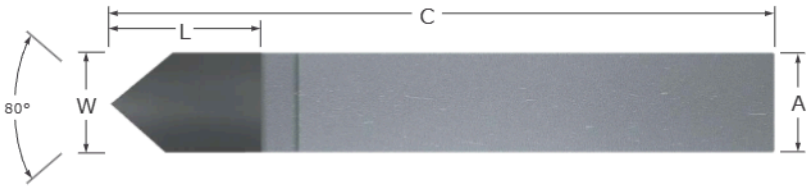
- Designed for forming a convex radius on the outside diameter (OD) of a part
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Width	Square Shank	Overall Length	CRT Style	
R +.0005" −.0005"	W +.004" −.004"	A +.0000" −.0050"	C	Tool #	USD$
.0625	.129	.3750	2.5	CRT-2	67.55
.2500	.504	.7500	4.5	CRT-8	121.90

D

Brazed – Forming Tools

D Style



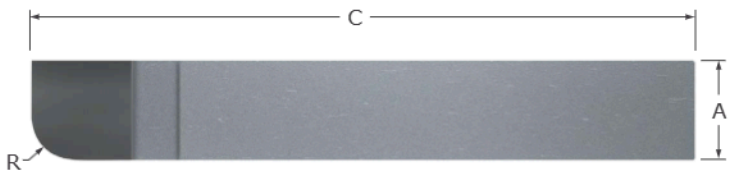
- Designed as a multi-functional tool for a manual lathe
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Length	Square Shank	Overall Length	D Style	
W	L	$A^{+.0000"}_{-.0030"}$	C	Tool #	USD$
.2500	.313	.2500	2.00	D-4	14.55
.3125	.375	.3125	2.25	D-5	18.90
.3750	.500	.3750	2.50	D-6	32.15
.4375	.500	.4375	3.00	D-7	22.55
.5000	.500	.5000	3.50	D-8	17.65
.6250	.625	.6250	4.00	D-10	31.45
.7500	.725	.7500	4.50	D-12	41.90

RXD

Brazed – Forming Tools

90° Radius Convex – Right Hand



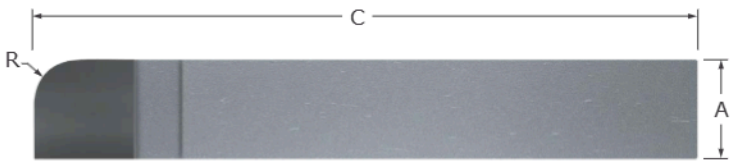
- Designed for forming a concave radius
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Square Shank	Overall Length	Brazed	
$R^{+.0005"}_{-.0005"}$	$A^{+.0000"}_{-.0050"}$	C	Tool #	USD$
.0312	.3750	2.5	RXD-1	66.60
.1875	.3750	2.5	RXD-6	66.60
.2188	.3750	2.5	RXD-7	66.60
.2500	.3750	2.5	RXD-8	66.60
.2812	.5000	3.5	RXD-9	72.45
.4062	.7500	4.5	RXD-13	81.70
.4688	.7500	4.5	RXD-15	81.70

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 #	USD$
.0312	.3750	2.5	RXL-1	66.60
.0938	.3750	2.5	RXL-3	66.60
.1562	.3750	2.5	RXL-5	66.60
.2188	.3750	2.5	RXL-7	66.60
.3125	.5000	3.5	RXL-10	83.15
.3438	.5000	3.5	RXL-11	83.15
.4062	.7500	4.5	RXL-13	81.70
.4688	.7500	4.5	RXL-15	81.70

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 #	USD$
.0312	.3750	2.5	RAD-1	66.60
.0625	.3750	2.5	RAD-2	66.60
.0938	.3750	2.5	RAD-3	66.60
.1250	.3750	2.5	RAD-4	66.60
.1562	.3750	2.5	RAD-5	66.60
.1875	.3750	2.5	RAD-6	66.60
.2188	.3750	2.5	RAD-7	66.60
.2500	.3750	2.5	RAD-8	66.60
.2812	.5000	3.5	RAD-9	72.45
.3125	.5000	3.5	RAD-10	72.45
.3438	.5000	3.5	RAD-11	72.45
.3750	.5000	3.5	RAD-12	72.45
.4062	.7500	4.5	RAD-13	81.70
.4375	.7500	4.5	RAD-14	81.70
.4688	.7500	4.5	RAD-15	81.70
.5000	.7500	4.5	RAD-16	81.70

See page 305 for tool set options

Brazed – Forming Tools

90° Radius Concave – Left Hand

RAL

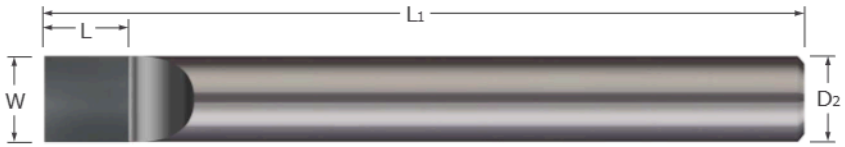
- Left hand tool designed for forming a convex radius
- Tangential 5° blend angles
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

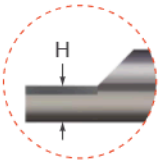
Radius	Square Shank	Overall Length	Brazed	
$R^{+.0005"}_{-.0005"}$	$A^{+.0000"}_{-.0050"}$	C	Tool #	USD$
.0312	.3750	2.5	RAL-1	66.60
.0625	.3750	2.5	RAL-2	66.60
.0938	.3750	2.5	RAL-3	66.60
.1250	.3750	2.5	RAL-4	66.60
.1562	.3750	2.5	RAL-5	66.60
.1875	.3750	2.5	RAL-6	66.60
.2188	.3750	2.5	RAL-7	66.60
.2500	.3750	2.5	RAL-8	66.60
.2812	.5000	3.5	RAL-9	72.45
.3438	.5000	3.5	RAL-11	72.45
.3750	.5000	3.5	RAL-12	72.45
.4062	.7500	4.5	RAL-13	81.70
.4375	.7500	4.5	RAL-14	81.70
.4688	.7500	4.5	RAL-15	81.70

TRG

Brazed – Forming Tools

Round Shank





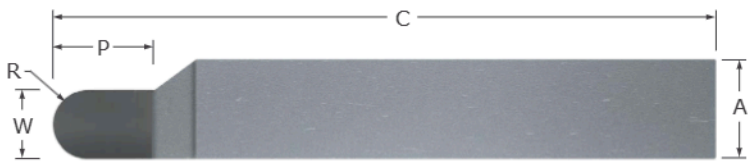
- Carbide tipped design allows for modification into a round shank special
- Carbide is mounted .031" above centerline to allow for grinding
- Neutral design allows for right and left hand modifications
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available 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 #	USD$
.2500	.253	.156	.2500	2.5	TRG-4	37.35
.3125	.375	.187	.3125	3.0	TRG-5	39.85
.3750	.500	.219	.3750	3.5	TRG-6	43.15
.4375	.500	.250	.4375	4.0	TRG-7	46.85
.5000	.500	.281	.5000	5.0	TRG-8	46.85
.6250	.625	.344	.6250	6.0	TRG-10	58.90

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

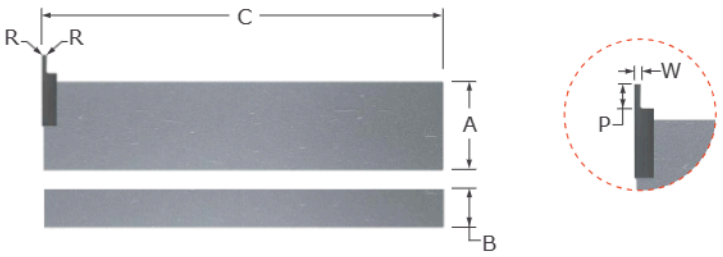
Radius	Width	Projection	Square Shank	Overall Length	Brazed	
R +.0005" −.0005"	W +.001" −.001"	P +.015" −.015"	A +.0000" −.0050"	C	Tool #	USD$
.0312	.063	1.000	.3750	2.5	FRT-1	70.80

R +.0005" −.0005"	W +.001" −.001"	P +.031" −.031"	A +.0000" −.0050"	C	Tool #	USD$
.0625	.125	.375	.3750	2.5	FRT-2	70.80
.0938	.188	.375	.3750	2.5	FRT-3	70.80
.1250	.250	.375	.3750	2.5	FRT-4	70.80
.1563	.313	.375	.3750	2.5	FRT-5	70.80
.1875	.375	.500	.5000	3.5	FRT-6	87.55
.2500	.500	.500	.5000	3.5	FRT-8	87.55
.3125	.625	.625	.6250	4.0	FRT-10	116.35
.3750	.750	.750	.7500	4.5	FRT-12	127.70

Brazed – Grooving Tools

GR

GR Style – Square



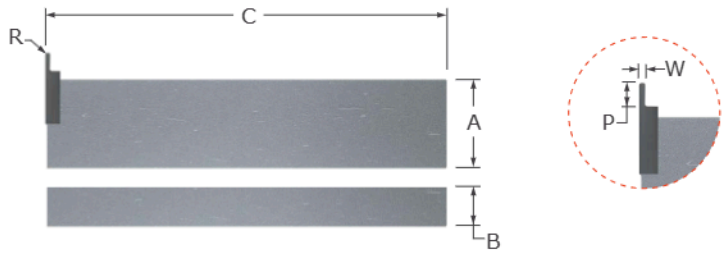
- Designed for plunging outside diameter (OD) grooves when the tool is held parallel to the axis
- Square profile with .003" corner radius for added strength
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- 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 #	USD$
.012	.030	.003	.7500	.3750	4.0	GR-012002	61.90
.018	.060	.003	.7500	.3750	4.0	GR-018002	61.90
.022	.090	.003	.7500	.3750	4.0	GR-022002	61.90
.028	.090	.003	.7500	.3750	4.0	GR-028002	61.90
.038	.120	.003	.7500	.3750	4.0	GR-038002	61.90
.046	.150	.003	.7500	.3750	4.0	GR-046002	61.90
.054	.180	.003	.7500	.3750	4.0	GR-054002	61.90
.080	.270	.003	.7500	.3750	4.0	GR-080002	61.90
.090	.300	.003	.7500	.3750	4.0	GR-090002	61.90
.096	.300	.003	.7500	.3750	4.0	GR-096002	61.90
.102	.400	.003	.7500	.3750	4.0	GR-102002	61.90
.114	.400	.003	.7500	.3750	4.0	GR-114002	61.90
.120	.400	.003	.7500	.3750	4.0	GR-120002	61.90
.122	.400	.003	.7500	.3750	4.0	GR-122002	61.90

GR-F

Brazed – Grooving Tools

GR Style – Full Radius



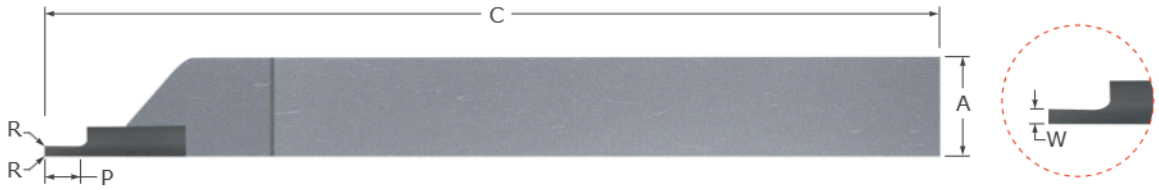
- Designed for plunging full radius outside diameter (OD) grooves when the tool is held parallel to the axis
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

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 #	USD$
.006	.012	.030	.7500	.3750	4.0	GR-012F	64.60
.009	.018	.060	.7500	.3750	4.0	GR-018F	64.60
.011	.022	.090	.7500	.3750	4.0	GR-022F	64.60
.027	.054	.180	.7500	.3750	4.0	GR-054F	64.60
.030	.060	.210	.7500	.3750	4.0	GR-060F	64.60
.040	.080	.270	.7500	.3750	4.0	GR-080F	64.60
.045	.090	.300	.7500	.3750	4.0	GR-090F	64.60
.057	.114	.400	.7500	.3750	4.0	GR-114F	64.60
.060	.120	.400	.7500	.3750	4.0	GR-120F	64.60
.061	.122	.400	.7500	.3750	4.0	GR-122F	64.60

Brazed – Grooving Tools

GS Style – Square

GS



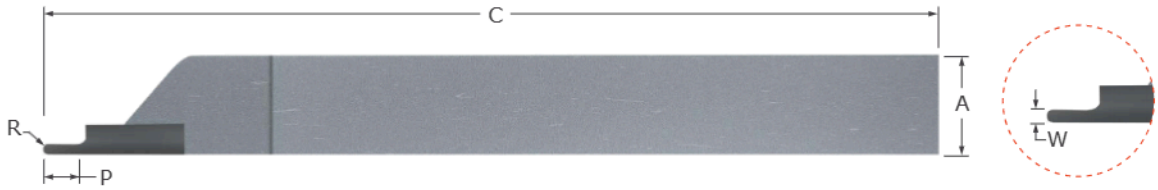
- Designed for plunging grooves when on the outside diameter of a part
- Square profile with .003" corner radius for added strength
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Projection	Radius	Square Shank	Overall Length	GS Style	
W +.002" −.000"	P +.030" −.000"	R (max)	A +.0000" −.0050"	C	Tool #	USD$
.012	.030	.003	.3750	3.0	GS-012002	50.25
.018	.060	.003	.3750	3.0	GS-018002	50.25
.022	.090	.003	.3750	3.0	GS-022002	50.25
.028	.090	.003	.3750	3.0	GS-028002	50.25
.038	.120	.003	.3750	3.0	GS-038002	50.25
.040	.150	.003	.3750	3.0	GS-040002	50.25
.046	.150	.003	.3750	3.0	GS-046002	50.25
.054	.180	.003	.3750	3.0	GS-054002	50.25
.060	.210	.003	.3750	3.0	GS-060002	50.25
.068	.210	.003	.3750	3.0	GS-068002	50.25
.072	.240	.003	.3750	3.0	GS-072002	50.25
.080	.270	.003	.3750	3.0	GS-080002	50.25
.086	.270	.003	.3750	3.0	GS-086002	50.25
.090	.300	.003	.3750	3.0	GS-090002	50.25
.096	.300	.003	.3750	3.0	GS-096002	50.25
.102	.400	.003	.3750	3.0	GS-102002	50.25
.120	.400	.003	.3750	3.0	GS-120002	50.25
.122	.400	.003	.3750	3.0	GS-122002	50.25

GS-F

Brazed – Grooving Tools

GS Style – Full Radius



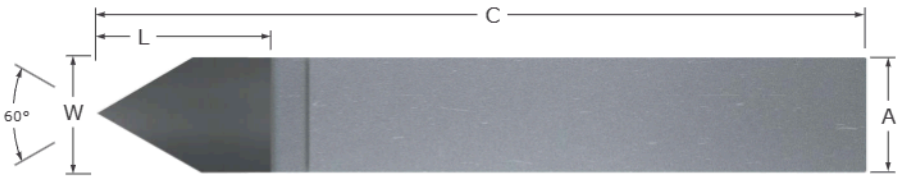
- Designed for generating full radius outside diameter (OD) grooves
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Radius	Width	Projection	Square Shank	Overall Length	GS-F Style	
R +.001" −.000"	W +.002" −.000"	P +.000" −.030"	A +.0000" −.0050"	C	Tool #	USD$
.006	.012	.030	.3750	3.0	GS-012F	55.45
.009	.018	.060	.3750	3.0	GS-018F	55.45
.011	.022	.090	.3750	3.0	GS-022F	55.45
.014	.028	.090	.3750	3.0	GS-028F	55.45
.020	.040	.150	.3750	3.0	GS-040F	55.45
.023	.046	.150	.3750	3.0	GS-046F	55.45
.027	.054	.180	.3750	3.0	GS-054F	55.45
.030	.060	.210	.3750	3.0	GS-060F	55.45
.034	.068	.210	.3750	3.0	GS-068F	55.45
.036	.072	.240	.3750	3.0	GS-072F	55.45
.040	.080	.270	.3750	3.0	GS-080F	55.45
.045	.090	.300	.3750	3.0	GS-090F	55.45
.048	.096	.300	.3750	3.0	GS-096F	55.45

Brazed – Threading Tools

E

E Style



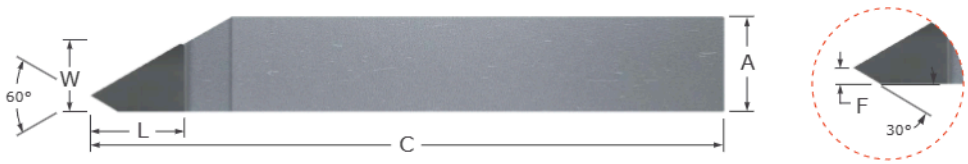
- Designed for outside diameter (OD) general purpose threading
- Neutral design allows for right and left hand threading applications
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Length	Square Shank	Overall Length	E Style	
W	L	A $^{+.0000"}_{-.0050"}$	C	Tool #	USD$
.3125	.363	.3125	2.25	E-5	20.20
.3750	.568	.3750	2.50	E-6	16.05
.5000	.568	.5000	3.50	E-8	17.40
.6250	.653	.6250	4.00	E-10	31.95
.7500	.778	.7500	4.50	E-12	37.00

Brazed – Threading Tools

ER

ER Style

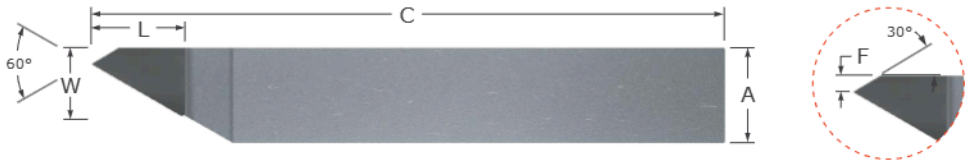


- Designed for right hand threading on the outside diameter (OD), close to a shoulder
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Point Offset	Width	Length	Square Shank	Overall Length	ER Style	
F $^{+.010"}_{-.010"}$	W	L	A $^{+.0000"}_{-.0050"}$	C	Tool #	USD$
.063	.266	.360	.3750	2.50	ER-6	18.25
.063	.270	.360	.3125	2.25	ER-5	19.10
.094	.444	.610	.6250	4.00	ER-10	30.65
.094	.446	.610	.5000	3.50	ER-8	21.80
.125	.558	.750	.7500	4.50	ER-12	47.30

EL

Brazed – Threading Tools
EL Style

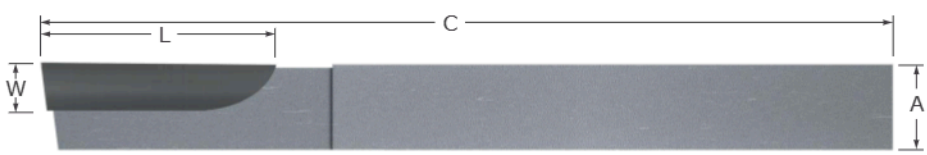


- Designed for left hand threading on the outside diameter (OD), close to a shoulder
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Point Offset	Width	Length	Square Shank	Overall Length	EL Style	
F $^{+.010"}_{-.010"}$	W	L	A $^{+.0000"}_{-.0050"}$	C	Tool #	USD$
.063	.266	.360	.3750	2.50	EL-6	19.20
.063	.270	.360	.3125	2.25	EL-5	19.00
.094	.444	.610	.6250	4.00	EL-10	30.65
.094	.446	.610	.5000	3.50	EL-8	22.80

RT / LT

Brazed – Screw Machining Tools
Turning



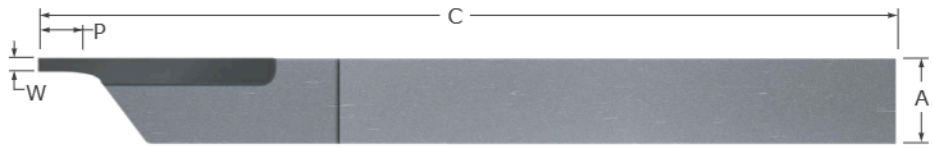
- Designed for general purpose turning; RT for right hand and LT for left hand
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Length	Square Shank	Overall Length	Right Hand		Left Hand	
W	L	A $^{+.0000"}_{-.0050"}$	C	Tool #	USD$	Tool #	USD$
.128	1.075	.2500	6.0	RT-250	63.00	LT-250	59.90
.174	1.200	.2812	6.0	RT-281	63.00	LT-281	55.25
.188	1.200	.3750	6.0	RT-375	24.50	LT-375	48.80
.190	1.200	.3125	6.0	RT-312	47.30	LT-312	23.40
.253	1.345	.5000	6.0	RT-500	31.70	LT-500	39.30
.260	1.345	.4375	6.0	RT-437	57.30	LT-437	51.00
.263	1.345	.6250	4.0	RT-625	56.60		
.263	1.345	.7500	4.0	RT-750	61.40	LT-750	59.55

Brazed – Screw Machine Tools

Cut Off

RC / LC



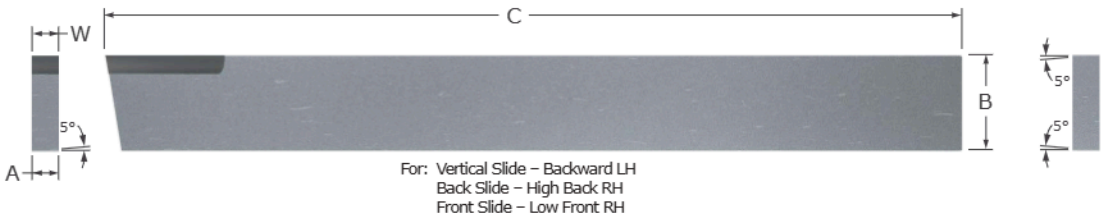
- Designed for cut off applications; RC for right hand and LC for left hand
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Projection	Square Shank	Overall Length	Right Hand		Left Hand	
W $^{+.000"}_{-.005"}$	P (min)	A $^{+.0000"}_{-.0050"}$	C	Tool #	USD$	Tool #	USD$
.040	.120	.2500	6.0	RC-250040	65.70	LC-250040	64.70
.040	.120	.2812	6.0	RC-281040	66.40	LC-281040	67.80
.040	.120	.3125	6.0	RC-312040	42.90	LC-312040	47.10
.040	.120	.3750	6.0	RC-375040	26.45	LC-375040	48.45
.060	.180	.2500	6.0	RC-250060	66.00	LC-250060	37.95
.060	.180	.2812	6.0	RC-281060	66.40	LC-281060	67.80
.060	.180	.3125	6.0	RC-312060	29.00	LC-312060	29.80
.060	.180	.3750	6.0	RC-375060	25.45	LC-375060	31.95
.060	.180	.4375	6.0	RC-437060	51.30	LC-437060	49.40
.060	.180	.5000	6.0	RC-500060	31.25	LC-500060	31.55
.060	.180	.6250	4.0	RC-625060	41.05	LC-625060	48.90
.060	.180	.7500	4.0	RC-750060	57.50	LC-750060	57.50
.080	.240	.2812	6.0	RC-281080	66.00	LC-281080	47.55
.080	.240	.3125	6.0	RC-312080	39.65	LC-312080	26.35
.080	.240	.3750	6.0	RC-375080	25.45	LC-375080	37.70
.080	.240	.4375	6.0	RC-437080	51.30	LC-437080	54.85
.080	.240	.5000	6.0	RC-500080	31.45	LC-500080	31.70
.080	.240	.6250	4.0	RC-625080	43.50	LC-625080	52.50
.080	.240	.7500	4.0	RC-750080	57.95	LC-750080	61.00
.100	.300	.2812	6.0	RC-281100	66.40	LC-281100	34.50
.100	.300	.3125	6.0	RC-312100	46.30	LC-312100	26.35
.100	.300	.3750	6.0	RC-375100	26.05	LC-375100	34.70
.100	.300	.4375	6.0	RC-437100	51.90	LC-437100	58.45
.100	.300	.5000	6.0	RC-500100	31.45	LC-500100	32.65
.100	.300	.6250	4.0	RC-625100	41.80	LC-625100	43.50
.100	.300	.7500	4.0	RC-750100	48.80	LC-750100	60.35
.120	.360	.3750	6.0	RC-375120	28.85	LC-375120	43.50
.120	.360	.4375	6.0	RC-437120	51.90	LC-437120	50.75
.120	.360	.5000	6.0	RC-500120	30.95	LC-500120	33.80
.125	.375	.6250	4.0	RC-625125	41.80	LC-625125	54.65
.125	.375	.7500	4.0	RC-750125	50.65	LC-750125	60.65
.187	.561	.6250	4.0	RC-625187	54.50	LC-625187	54.50
.187	.561	.7500	4.0	RC-750187	61.00	LC-750187	61.30

CR

Brazed – Cut Off Tools

CR Style



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

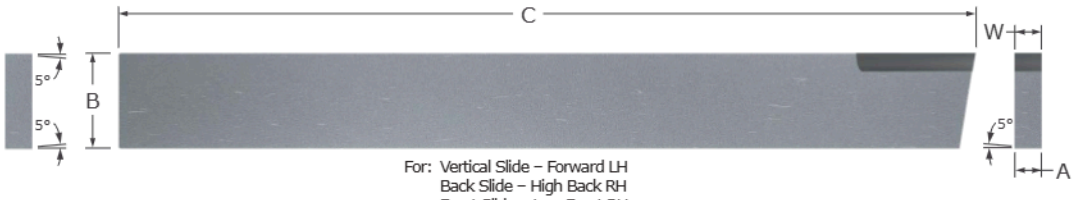
- Right hand cut-off blades for Brown & Sharpe automatic screw machines
- Designed for use in Pratt & Whitney holders and dovetail slot holders
- Carbide tipped with hardened and precision ground steel blade
- Ground in the USA

Width	Shank Width	Shank Height	Overall Length	CR Style	
W +.0000" −.0050"	A +.0000" −.0050"	B +.0000" −.0050"	C	Tool #	USD$
.0781	.0580	.5000	4.5	CR-101	102.05
.0938	.0730	.5000	4.5	CR-102	79.95
.0938	.0730	.6875	5.0	CR-104	113.30
.0938	.0730	.8125	6.0	CR-108	127.05
.0938	.0730	1.0000	6.0	CR-113	163.10
.1250	.1050	.5000	4.5	CR-103	77.55
.1250	.1050	.6875	5.0	CR-105	107.25
.1250	.1050	.8125	6.0	CR-109	93.90
.1562	.1360	.6875	5.0	CR-106	113.40
.1562	.1360	.8125	6.0	CR-110	183.55
.1875	.1670	.6875	5.0	CR-107	118.20
.1875	.1670	.8125	6.0	CR-111	184.80

Brazed – Cut Off Tools

CL Style

CL



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

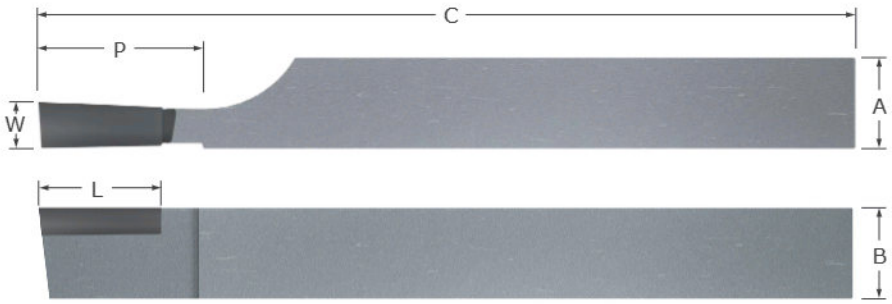
- Left hand cut-off blades for Brown & Sharpe automatic screw machines
- Designed for use in Pratt & Whitney holders and dovetail slot holders
- Carbide tipped with hardened and precision ground steel blade
- Ground in the USA

Width	Shank Width	Shank Height	Overall Length	CL Style	
W +.0000" −.0050"	A +.0000" −.0050"	B +.0000" −.0050"	C	Tool #	USD$
.0781	.0580	.5000	4.5	CL-101	102.45
.0938	.0730	.5000	4.5	CL-102	103.40
.0938	.0730	.6875	5.0	CL-104	120.55
.0938	.0730	.8125	6.0	CL-108	138.65
.0938	.0730	1.0000	6.0	CL-113	119.95
.1250	.1050	.5000	4.5	CL-103	105.85
.1250	.1050	.6875	5.0	CL-105	130.70
.1250	.1050	.8125	6.0	CL-109	132.30
.1562	.1360	.6875	5.0	CL-106	124.95
.1562	.1360	.8125	6.0	CL-110	174.05
.1875	.1670	.8125	6.0	CL-111	119.95

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 #	USD$
.187	.813	.750	.5000	1.0000	5.0	CT-122	40.95
.250	1.000	.750	.5000	1.0000	5.0	CT-121	45.60
.312	1.000	.500	.5000	1.0000	5.0	CT-120	59.45
.375	1.250	.500	.6250	1.2500	5.0	CT-130	60.50
.375	1.250	.625	.7500	1.5000	6.0	CT-140	66.00

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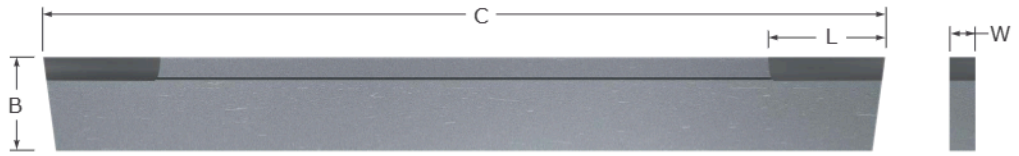
Brazed – Cut Off Tools

T

T Style – Regular



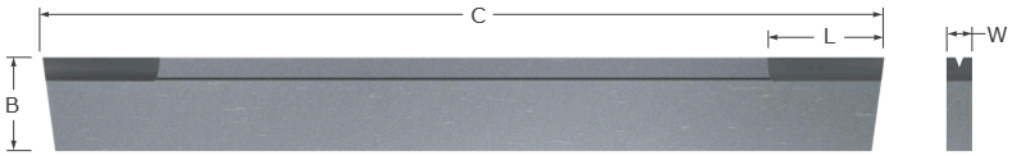
- Double end " T" style cut-off tool that is parallel ground to help achieve a straighter cut
- Tops are hollow ground to help curl the chip to center for better evacuation
- Carbide tipped with hardened and precision ground steel blade
- Ground in the USA

Width	Length	Shank Height	Overall Length	T Style	
W $^{+.001"}_{-.001"}$	L	B	C	Tool #	USD$
.062	.750	.5000	4.5	T-100	101.05
.078	.750	.5000	4.5	T-101	102.65
.093	.750	.5000	4.5	T-102	98.30
.093	.750	.6875	5.0	T-104	108.80
.125	.750	.5000	4.5	T-103	97.05
.125	.750	.6875	5.0	T-105	107.55
.125	.750	.7500	5.0	T-108	111.35
.125	.750	.8750	6.0	T-111	122.35
.156	.750	.6875	5.0	T-106	132.00
.156	.750	.7500	5.0	T-109	117.35
.156	.750	.8750	6.0	T-112	122.15
.187	.750	.6875	5.0	T-107	136.30
.187	.750	.7500	5.0	T-110	109.40
.187	.750	.8750	6.0	T-113	142.70
.187	.750	1.1250	6.0	T-116	147.80

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 #	USD$
.062	.760	.5000	4.5	T-100-V	105.25
.078	.760	.5000	4.5	T-101-V	106.75
.093	.760	.5000	4.5	T-102-V	102.45
.093	.760	.6875	5.0	T-104-V	112.80
.125	.750	.5000	4.5	T-103-V	101.05
.125	.760	.6875	5.0	T-105-V	111.55
.125	.750	.7500	5.0	T-108-V	115.25
.125	.750	.8750	6.0	T-111-V	126.35
.156	.750	.6875	5.0	T-106-V	136.10
.156	.750	.7500	5.0	T-109-V	121.30
.156	.750	.8750	6.0	T-112-V	126.25
.187	.750	.6875	5.0	T-107-V	140.25
.187	.750	.7500	5.0	T-110-V	113.50
.187	.750	.8750	6.0	T-113-V	146.65
.187	.750	1.1250	6.0	T-116-V	151.90

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HOLEMAKING & THREADING TOOLS

Drills 230

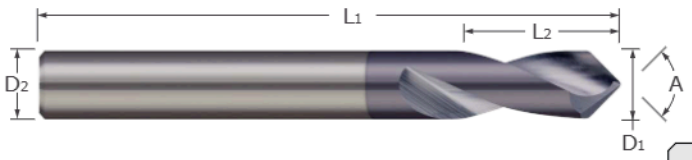
Combined Drill & Countersink 235

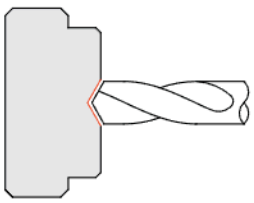
Thread Mill Cutters 236

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 $^{+1°}_{-1°}$	D1 $^{+.0000"}_{-.0005"}$	L2 $^{+.031"}_{-.031"}$	D2 (h6)	L1	Tool #	USD$	Tool #	USD$
82°	.0937	.279	.1250	1.5	SPD-093-082	37.35	SPD-093-082X	43.40
	.1250	.375	.1250	1.5	SPD-125-082	37.35	SPD-125-082X	43.40
	.1875	.625	.1875	2.0	SPD-187-082	39.15	SPD-187-082X	46.00
	.2500	.750	.2500	2.5	SPD-250-082	40.15	SPD-250-082X	49.00
	.3125	.750	.3125	2.5	SPD-312-082	46.95	SPD-312-082X	57.50
	.3750	1.000	.3750	2.5	SPD-375-082	59.10	SPD-375-082X	71.65
	.5000	1.000	.5000	2.5	SPD-500-082	88.10	SPD-500-082X	105.10
	.6250	1.125	.6250	3.0	SPD1-625-082	157.10	SPD1-625-082X	176.90
	.7500	1.125	.7500	2.5	SPD-750-082	236.25		
	.7500	1.125	.7500	3.0	SPD1-750-082	238.50	SPD1-750-082X	261.85
90°	.0937	.279	.1250	1.5	SPD-093-090	37.35	SPD-093-090X	43.40
	.1250	.375	.1250	1.5	SPD-125-090	37.35	SPD-125-090X	43.40
	.1875	.625	.1875	2.0	SPD-187-090	39.15	SPD-187-090X	46.00
	.2500	.750	.2500	2.5	SPD-250-090	40.15	SPD-250-090X	49.00
	.3125	.750	.3125	2.5	SPD-312-090	46.95	SPD-312-090X	57.50
	.3750	1.000	.3750	2.5	SPD-375-090	59.10	SPD-375-090X	71.65
	.5000	1.000	.5000	2.5	SPD-500-090	88.10	SPD-500-090X	105.10
	.6250	1.125	.6250	3.0	SPD1-625-090	157.10	SPD1-625-090X	176.90
	.7500	1.125	.7500	2.5	SPD-750-090	236.25		
	.7500	1.125	.7500	3.0	SPD1-750-090	238.50	SPD1-750-090X	261.85
	1.0000	1.250	1.0000	3.0	SPD1-001-090	361.55		
100°	.0937	.279	.1250	1.5	SPD-093-100	37.35	SPD-093-100X	43.40
	.1250	.375	.1250	1.5	SPD-125-100	37.35	SPD-125-100X	43.40
	.1875	.625	.1875	2.0	SPD-187-100	39.15	SPD-187-100X	46.00
	.2500	.750	.2500	2.5	SPD-250-100	40.15	SPD-250-100X	49.00
	.3125	.750	.3125	2.5	SPD-312-100	46.95	SPD-312-100X	57.50
	.3750	1.000	.3750	2.5	SPD-375-100	59.10	SPD-375-100X	71.65
	.5000	1.000	.5000	2.5	SPD-500-100	88.10	SPD-500-100X	105.10
	.6250	1.125	.6250	3.0	SPD1-625-100	157.10	SPD1-625-100X	176.90
	.7500	1.125	.7500	3.0	SPD1-750-100	238.50	SPD1-750-100X	261.85
	1.0000	1.250	1.0000	3.0	SPD1-001-100	361.55		

Continued on next page

SPD

Drills

Spotting & Centering Drill (cont.)

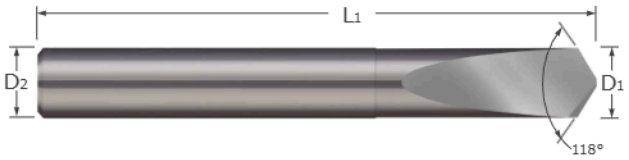
Continued from previous page

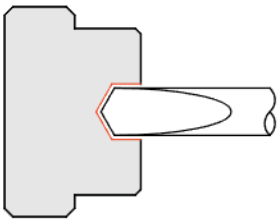
Included Angle	Drill Diameter	Flute Length	Shank Diameter	Overall Length	Uncoated		AlTiN	
$A^{+1°}_{-1°}$	$D_1{}^{+.0000"}_{-.0005"}$	$L_2{}^{+.031"}_{-.031"}$	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
120°	.0937	.279	.1250	1.5	SPD-093-120	37.35	SPD-093-120X	43.40
	.1250	.375	.1250	1.5	SPD-125-120	37.35	SPD-125-120X	43.40
	.1875	.625	.1875	2.0	SPD-187-120	39.15	SPD-187-120X	46.00
	.2500	.750	.2500	2.5	SPD-250-120	40.15	SPD-250-120X	49.00
	.3125	.750	.3125	2.5	SPD-312-120	46.95	SPD-312-120X	57.50
	.3750	1.000	.3750	2.5	SPD-375-120	59.10	SPD-375-120X	71.65
	.5000	1.000	.5000	2.5	SPD-500-120	88.10	SPD-500-120X	105.10
	.6250	1.125	.6250	3.0	SPD1-625-120	157.10	SPD1-625-120X	176.90
	.7500	1.125	.7500	3.0	SPD1-750-120	238.50	SPD1-750-120X	261.85
140°	.0937	.279	.1250	1.5	SPD-093-140	37.35	SPD-093-140X	43.40
	.1250	.375	.1250	1.5	SPD-125-140	37.35	SPD-125-140X	43.40
	.1875	.625	.1875	2.0	SPD-187-140	39.15	SPD-187-140X	46.00
	.2500	.750	.2500	2.5	SPD-250-140	40.70	SPD-250-140X	49.45
	.3125	.750	.3125	2.5	SPD-312-140	47.35	SPD-312-140X	58.00
	.3750	1.000	.3750	2.5	SPD-375-140	59.65	SPD-375-140X	72.25
	.5000	1.000	.5000	2.5	SPD-500-140	88.80	SPD-500-140X	105.75

Drills

Spade Drill

SD



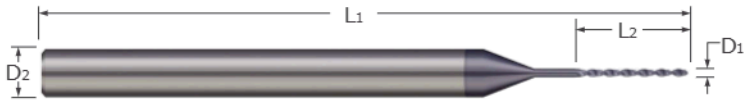


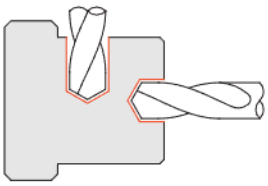
- Designed for drilling in hardened materials
- Excellent option when requiring holes free of retract marks in non-ferrous materials
- Solid carbide
- CNC ground in the USA

Drill Diameter	Web Thickness	Shank Diameter	Overall Length	Uncoated	
D_1 $^{+.0000''}_{-.0005''}$	$^{+.002''}_{-.002''}$	D_2 (h6)	L_1	Tool #	USD$
.0312	.010	.0312	1.25	SD-031	22.65
.0625	.012	.0625	1.50	SD-062	23.60
.0937	.016	.0938	1.50	SD-093	24.15
.1250	.020	.1250	1.50	SD-125	26.55
.1562	.025	.1562	2.00	SD-156	29.00
.1875	.028	.1875	2.00	SD-187	33.90
.2188	.030	.2188	2.00	SD-218	39.65
.2500	.035	.2500	2.00	SD-250	45.55
.3125	.040	.3125	2.50	SD-312	63.00
.3750	.046	.3750	2.50	SD-375	75.80
.5000	.060	.5000	2.50	SD-500	106.05

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 India

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 #	USD$	Tool #	USD$
.0039	#102	.100 mm	.026	.1250	1.5	DR01-0039*	41.00		
.0051	#99	.130 mm	.056	.1250	1.5	DR02-0051	39.95		
.0059	#97	.150 mm	.066	.1250	1.5	DR02-0059	37.15		
.0071	#94		.106	.1250	1.5	DR02-0071	34.00		
.0079	#92	.200 mm	.160	.1250	1.5	DR02-0079	28.50	DR02-0079X	34.55
.0091	#89		.160	.1250	1.5	DR02-0091	27.60	DR02-0091X	33.70
.0098		.250 mm	.160	.1250	1.5	DR02-0098	27.60	DR02-0098X	33.70
.0100	#87		.160	.1250	1.5	DR02-0100	27.60	DR02-0100X	33.70
.0110	#85		.160	.1250	1.5	DR02-0110	27.60	DR02-0110X	33.70
.0118		.300 mm	.180	.1250	1.5	DR02-0118	27.60	DR02-0118X	33.70
.0120	#83		.230	.1250	1.5	DR02-0120	25.00	DR02-0120X	31.05
.0130	#81		.230	.1250	1.5	DR02-0130	25.00	DR02-0130X	31.05
.0135	#80		.270	.1250	1.5	DR02-0135	24.45	DR02-0135X	30.55
.0145	#79		.270	.1250	1.5	DR02-0145	24.45	DR02-0145X	30.55
.0157		.400 mm	.270	.1250	1.5	DR02-0157	24.45	DR02-0157X	30.55
.0160	#78		.270	.1250	1.5	DR02-0160	24.45	DR02-0160X	30.55
.0180	#77		.270	.1250	1.5	DR02-0180	22.65	DR02-0180X	28.75
.0197		.500 mm	.275	.1250	1.5	DR02-0197	22.65	DR02-0197X	28.75
.0200	#76		.275	.1250	1.5	DR02-0200	22.65	DR02-0200X	28.75
.0210	#75		.275	.1250	1.5	DR02-0210	22.65	DR02-0210X	28.75
.0225	#74		.275	.1250	1.5	DR02-0225	22.65	DR02-0225X	28.75
.0236		.600 mm	.275	.1250	1.5	DR02-0236	22.65	DR02-0236X	28.75
.0240	#73		.275	.1250	1.5	DR02-0240	22.65	DR02-0240X	28.75
.0250	#72		.275	.1250	1.5	DR02-0250	22.65	DR02-0250X	28.75
.0260	#71		.275	.1250	1.5	DR02-0260	22.65	DR02-0260X	28.75
.0276		.700 mm	.335	.1250	1.5	DR02-0276	22.65	DR02-0276X	28.75
.0280	#70		.335	.1250	1.5	DR02-0280	22.65	DR02-0280X	28.75
.0292	#69		.335	.1250	1.5	DR02-0292	22.65	DR02-0292X	28.75
.0310	#68		.395	.1250	1.5	DR02-0310	21.30	DR02-0310X	27.35
.0312			.395	.1250	1.5	DR02-0312	21.30	DR02-0312X	27.35
.0315		.800 mm	.395	.1250	1.5	DR02-0315	21.30	DR02-0315X	27.35
.0320	#67		.395	.1250	1.5	DR02-0320	21.30	DR02-0320X	27.35
.0330	#66		.395	.1250	1.5	DR02-0330	21.30	DR02-0330X	27.35
.0350	#65		.395	.1250	1.5	DR02-0350	21.30	DR02-0350X	27.35

* 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 page 50

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 #	USD$	Tool #	USD$
.0354		.900 mm	.395	.1250	1.5	DR02-0354	21.30	DR02-0354X	27.35
.0360	#64		.395	.1250	1.5	DR02-0360	21.30	DR02-0360X	27.35
.0370	#63		.395	.1250	1.5	DR02-0370	21.30	DR02-0370X	27.35
.0380	#62		.395	.1250	1.5	DR02-0380	21.30	DR02-0380X	27.35
.0390	#61		.395	.1250	1.5	DR02-0390	21.30	DR02-0390X	27.35
.0394		1.000 mm	.395	.1250	1.5	DR02-0394	21.30	DR02-0394X	27.35
.0400	#60		.395	.1250	1.5	DR02-0400	21.30	DR02-0400X	27.35
.0410	#59		.395	.1250	1.5	DR02-0410	21.30	DR02-0410X	27.35
.0420	#58		.395	.1250	1.5	DR02-0420	21.30	DR02-0420X	27.35
.0430	#57		.395	.1250	1.5	DR02-0430	21.30	DR02-0430X	27.35
.0433		1.100 mm	.395	.1250	1.5	DR02-0433	21.30	DR02-0433X	27.35
.0440			.395	.1250	1.5	DR02-0440	21.30	DR02-0440X	27.35
.0469			.395	.1250	1.5	DR02-0469	21.30	DR02-0469X	27.35
.0472		1.200 mm	.395	.1250	1.5	DR02-0472	21.30	DR02-0472X	27.35
.0500		1.270 mm	.395	.1250	1.5	DR02-0500	21.30	DR02-0500X	27.35
.0512		1.300 mm	.413	.1250	1.5	DR01-0512	21.30	DR01-0512X	27.35
.0520	#55		.413	.1250	1.5	DR01-0520	21.30	DR01-0520X	27.35
.0550	#54		.413	.1250	1.5	DR01-0550	21.30	DR01-0550X	27.35
.0571		1.450 mm	.413	.1250	1.5	DR01-0571	21.30	DR01-0571X	27.35
.0591		1.500 mm	.413	.1250	1.5	DR01-0591	21.30	DR01-0591X	27.35
.0625			.413	.1250	1.5	DR01-0625	21.30	DR01-0625X	27.35

D_1 +.0000" *** −.0005"		decimal equiv.	L_2	D_2	L_1	Tool #	USD$	Tool #	USD$
.0635	#52		.413	.1250	1.5	DR01-0635	21.30	DR01-0635X	27.35
.0670	#51		.413	.1250	1.5	DR01-0670	21.30	DR01-0670X	27.35
.0700	#50		.413	.1250	1.5	DR01-0700	21.30	DR01-0700X	27.35
.0730	#49		.413	.1250	1.5	DR01-0730	21.30	DR01-0730X	27.35
.0760	#48		.413	.1250	1.5	DR01-0760	21.30	DR01-0760X	27.35
.0781			.413	.1250	1.5	DR01-0781	21.30	DR01-0781X	27.35
.0787		2.000 mm	.413	.1250	1.5	DR01-0787	21.30	DR01-0787X	27.35
.0810	#46		.413	.1250	1.5	DR01-0810	21.30	DR01-0810X	27.35
.0860	#44		.413	.1250	1.5	DR01-0860	21.30	DR01-0860X	27.35
.0890	#43		.413	.1250	1.5	DR01-0890	21.30	DR01-0890X	27.35
.0938			.413	.1250	1.5	DR01-0938	21.30	DR01-0938X	27.35
.0960	#41		.413	.1250	1.5	DR01-0960	21.30	DR01-0960X	27.35
.0980	#40		.413	.1250	1.5	DR01-0980	21.30	DR01-0980X	27.35
.0995	#39		.413	.1250	1.5	DR01-0995	21.30	DR01-0995X	27.35
.1065	#36		.413	.1250	1.5	DR01-1065	21.30	DR01-1065X	27.35
.1094			.413	.1250	1.5	DR01-1094	21.30	DR01-1094X	27.35
.1110	#34		.413	.1250	1.5	DR01-1110	21.30	DR01-1110X	27.35
.1130	#33		.413	.1250	1.5	DR01-1130	21.30	DR01-1130X	27.35
.1181		3.000 mm	.413	.1250	1.5	DR01-1181	21.30	DR01-1181X	27.35
.1200	#31		.413	.1250	1.5	DR01-1200	21.30	DR01-1200X	27.35
.1250			.413	.1250	1.5	DR01-1250	21.30	DR01-1250X	27.35

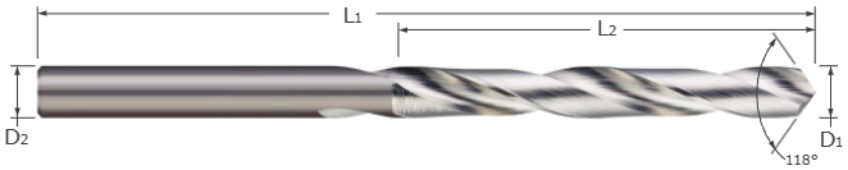
* Total overhang from shank transition is .250" ** Tolerance for AlTiN coating is +.002"/-.0003" *** Tolerance for AlTiN coating is +.0002/-.0005

Taper Integrated holders can be found on page 50

DR

Drills

Jobber Length Drills

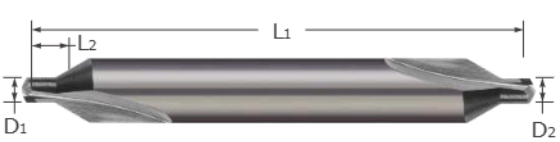


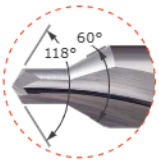
- 118° included point jobber drills can be used for general purpose drilling
- Solid carbide
- CNC ground in the USA

Drill Diameter	Flute Length	Shank Diameter	Overall Length	Uncoated	
D_1 $^{+.0000"}_{-.0005"}$	L_2 $^{+.062"}_{-.062"}$	D_2 (h6)	L_1	Tool #	USD$
.0312	.500	.0312	1.25	DR-031-2	20.25
.0469	.750	.0469	1.50	DR-046-2	26.80
.0625	.750	.0625	1.50	DR-062-2	27.35
.1094	1.250	.1094	2.25	DR-109-2	34.65
.1250	1.250	.1250	2.25	DR-125-2	36.70
.1875	1.625	.1875	2.75	DR-187-2	53.90
.2500	2.000	.2500	3.25	DR-250-2	80.10
.3125	2.375	.3125	3.75	DR-312-2	106.50

Combined Drill & Countersinks

DC / DCM





- 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

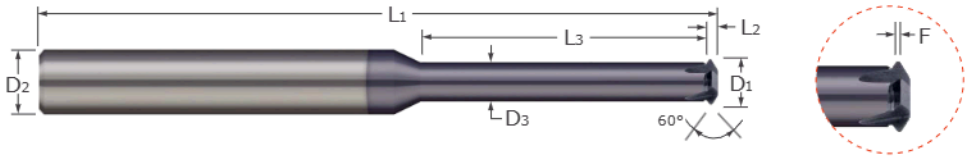
Drill Diameter			Drill Length	Shank Diameter	Overall Length	Uncoated	
D_1 +.0030" −.0000"	+.08 mm −.00 mm	decimal equiv.	L_2	D_2 (h6)	L_1	Tool #	USD$
.0250		.0250	.030	.1250	1.500	DC-00	40.15
.0312		.0312	.038	.1250	1.500	DC-01	40.15
	1.0 mm	.0390	1.3 mm	3.15 mm	35 mm	DCM-010	38.80
.0469		.0469	.047	.1250	1.500	DC-1	40.15
.0781		.0781	.078	.1875	1.875	DC-2	63.40
	2.5 mm	.0980	3.1 mm	6.3 mm	45 mm	DCM-025	68.05
.1094		.1094	.109	.2500	2.000	DC-3	70.85
.1250		.1250	.125	.3125	2.125	DC-4	94.75
.1875		.1875	.188	.4375	2.750	DC-5	142.65
.2188		.2188	.219	.5000	3.000	DC-6	182.90

See page 311 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

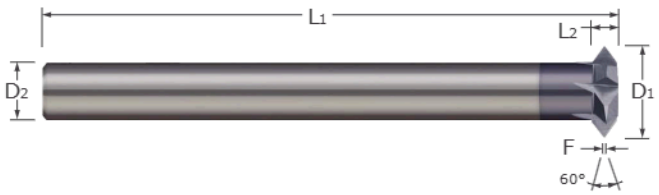
Threads Per Inch	Cutter Diameter	Neck Length	Neck Diameter	Flat	Cutter Width	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
TPI	D_1 +.000" −.005"	L_3 +.015" −.000"	D_3	F +.0010" −.0000"	L_2		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
56 - 80	.060	.250	.030	SHARP	.017	2	.1250	1.5	TM-060-4	103.15	TM-060-4X	106.70
56 - 80	.060	.375	.030	SHARP	.017	2	.1250	1.5	TM-060-6	103.15	TM-060-6X	106.70
40 - 64	.080	.250	.035	SHARP	.026	2	.1250	1.5	TM-080-4	96.90	TM-080-4X	100.55
40 - 64	.080	.500	.035	SHARP	.026	2	.1250	1.5	TM-080-8	96.90	TM-080-8X	100.55
32 - 64	.100	.375	.050	SHARP	.029	2	.1250	1.5	TM-100-6	83.55	TM-100-6X	87.50
32 - 64	.100	.500	.050	SHARP	.029	2	.1250	1.5	TM-100-8	83.55		
32 - 64	.100	.625	.050	SHARP	.029	2	.1250	2.0	TM-100-10	83.55	TM-100-10X	87.50
32 - 56	.120	.375	.070	.0010	.030	3	.1875	2.0	TM-120-6	98.75	TM-120-6X	103.20
32 - 56	.120	.500	.070	.0010	.030	3	.1875	2.0	TM-120-8	98.75	TM-120-8X	103.20
32 - 56	.120	.625	.070	.0010	.030	3	.1875	2.0	TM-120-10	98.75	TM-120-10X	103.20
24 - 56	.140	.500	.075	.0010	.038	3	.1875	2.0	TM-140-8	98.75	TM-140-8X	103.20
24 - 56	.140	.750	.075	.0010	.038	3	.1875	2.0	TM-140-12	98.75	TM-140-12X	103.20
18 - 56	.180	.500	.090	.0015	.055	4	.2500	2.5	TM-180-8	116.30	TM-180-8X	123.90
18 - 56	.180	.750	.090	.0015	.055	4	.2500	2.5	TM-180-12	116.30	TM-180-12X	123.90
18 - 56	.180	1.000	.090	.0015	.055	4	.2500	2.5	TM-180-16	116.30	TM-180-16X	123.90
16 - 48	.240	1.500	.150	.0015	.055	4	.3125	3.5	TM-250-24	129.65	TM-250-24X	141.05
14 - 48	.250	1.000	.100	.0015	.065	4	.2500	2.5	TM-250-16	116.30	TM-250-16X	123.90
16 - 48	.250	1.125	.150	.0015	.060	4	.2500	2.5	TM-250-18	116.30	TM-250-18X	123.90
14 - 40	.290	1.000	.170	.0020	.071	4	.3750	4.0	TM-290-16	144.15	TM-290-16X	157.60
12 - 32	.360	1.000	.210	.0020	.085	4	.3750	4.0	TM-360-16	144.15	TM-360-16X	157.60
11 - 32	.490	1.000	.300	.0020	.095	5	.5000	4.0	TM-490-16	166.55	TM-490-16X	183.60
11 - 32	.490	1.250	.300	.0020	.095	5	.5000	4.0	TM-490-20	166.55	TM-490-20X	183.60
10 - 32	.600	1.000	.420	.0020	.100	6	.6250	4.0	TM-600-16	207.15	TM-600-16X	228.25
10 - 32	.600	1.250	.420	.0020	.100	6	.6250	4.0	TM-600-20	207.15	TM-600-20X	228.25

TPI	D_1 +.000" −.005"	L_3 +.015" −.000"	D_3	F +.0030" −.0000"	L_2		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
5 - 12	.720	1.250	.360	.0045	.200	6	.7500	4.0	TM-720-20	237.95	TM-720-20X	261.35
5 - 12	.720	2.000	.360	.0045	.200	6	.7500	4.0	TM-720-32	237.95	TM-720-32X	261.35
5 - 12	.720	2.500	.360	.0045	.200	6	.7500	4.0	TM-720-40	237.95	TM-720-40X	261.35

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 #	USD$	Tool #	USD$
12-32	.375	.0020	.093	4	.2500	2.59	TM-375*	129.00	TM-375X*	136.50
11-32	.500	.0020	.125	5	.3125	2.63	TM-500*	156.90	TM-500X*	167.70
7-16	.750	.0040	.156	6	.3750	2.65	TM-750	194.70	TM-750X	205.15
5-12	1.000	.0045	.187	7	.5000	3.20	TM-001	254.20	TM-001X	266.60

* 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 #	USD$	Tool #	USD$
4-40	.0800	.1875	2	.2500	2.0			TM-112-40X	227.10
6-32	.1000	.2500	2	.2500	2.0	TM-138-32	222.15	TM-138-32X	225.55
8-32	.1150	.2500	3	.2500	2.0			TM-164-32X	227.10
10-24	.1200	.3125	3	.2500	2.0	TM-190-24	231.90	TM-190-24X	235.10
10-32	.1200	.3125	3	.2500	2.0	TM-190-32	231.90	TM-190-32X	235.10
1/4-20	.1800	.5000	3	.2500	2.5	TM-250-20	241.95	TM-250-20X	248.55
1/4-28	.1800	.5000	3	.2500	2.5			TM-250-28X	248.55
5/16-18	.2350	.6250	3	.2500	2.5	TM-312-18	265.15	TM-312-18X	271.40
5/16-24	.2350	.6250	3	.2500	2.5			TM-312-24X	271.40
3/8-16	.2850	.7500	4	.3125	2.5	TM-375-16	319.70	TM-375-16X	330.20
3/8-24	.2850	.7500	4	.3125	2.5	TM-375-24	319.70	TM-375-24X	330.20
7/16-14	.3050	.7500	4	.3125	2.5	TM-437-14	319.70	TM-437-14X	330.20
7/16-20	.3350	.8750	4	.3750	3.0	TM-437-20	335.85	TM-437-20X	344.90
1/2-13	.3500	.8750	4	.3750	3.0	TM-500-13	335.85	TM-500-13X	344.90
9/16-12	.3700	.8750	4	.3750	3.0			TM-562-12X	344.00
9/16-18	.3700	.8750	4	.3750	3.0	TM-562-18	335.85	TM-562-18X	344.90
5/8-11	.4700	1.2500	4	.5000	4.0			TM-625-11X	401.80
3/4-10	.4950	1.2500	4	.5000	4.0	TM-750-10	384.60	TM-750-10X	399.40
3/4-12	.4950	1.2500	4	.5000	4.0	TM-750-12	384.60	TM-750-12X	399.40
3/4-16	.4950	1.2500	4	.5000	4.0	TM-750-16	384.60	TM-750-16X	399.40
7/8-14	.4900	1.2500	4	.5000	4.0	TM-875-14	385.95	TM-875-14X	401.00
7/8-9	.6200	1.3750	4	.6250	4.0			TM-875-09X	429.25
1-8	.6200	1.3750	4	.6250	4.0	TM-001-08	414.10	TM-001-08X	435.30

* 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 #	USD$	Tool #	USD$
1/16 & 1/8-27 NPT	.2450	.437	3	.2500	2.5	TM-27NPT	265.95	TM-27NPTX	272.25
1/4 & 3/8-18 NPT	.3050	.625	4	.3125	3.0	TM-18NPT	320.45	TM-18NPTX	331.10
1/2 & 3/4-14 NPT	.4950	.875	4	.5000	4.0	TM-14NPT	322.90	TM-14NPTX	338.25
1 & 2-11.5 NPT	.6200	1.125	4	.6250	4.0	TM-11NPT	430.05	TM-11NPTX	448.20

* 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 #	USD$	Tool #	USD$
1/16 & 1/8-27 NPTF	.2450	.437	3	.2500	2.5	TM-27NPTF	302.25	TM-27NPTFX	308.30
1/4 & 3/8-18 NPTF	.3050	.625	4	.3125	3.0			TM-18NPTFX	353.15
1/2 & 3/4-14 NPTF	.4950	.875	4	.5000	4.0	TM-14NPTF	371.65		

* Length of cut measured to last full tooth.

Thread Milling Cutters

TMM

Multi-Form – Metric Threads

- 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

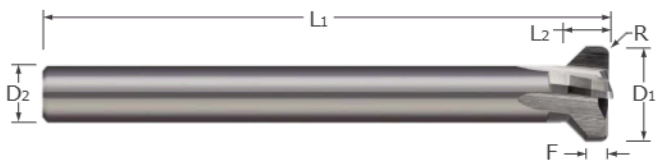
Thread Size	Cutter Diameter	Length of Cut*	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
	D_1 (h8)	L_2 $^{+1.3\ mm}_{-0.0\ mm}$		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
M5.0x0.80	3.00 mm	8 mm	3	6 mm	57 mm			TMM-050080X	226.55
M6.0x1.00	4.30 mm	12 mm	3	6 mm	57 mm			TMM-060100X	251.75
M8.0x0.75	6.00 mm	16 mm	3	6 mm	57 mm	TMM-080075	307.30	TMM-080075X	313.25
M8.0x1.25	6.00 mm	16 mm	3	6 mm	57 mm			TMM-080125X	312.65
M10.0x1.50	7.62 mm	20 mm	4	8 mm	100 mm			TMM-100150X	356.40
M12.0x1.00	9.15 mm	22 mm	4	10 mm	100 mm			TMM-120100X	361.05
M12.0x1.75	9.15 mm	22 mm	4	10 mm	100 mm			TMM-120175X	360.15
M18.0x1.50	11.94 mm	32 mm	4	12 mm	100 mm			TMM-180150X	444.55
M20.0x2.50	11.94 mm	32 mm	4	12 mm	100 mm			TMM-200250X	444.55
M24.0x3.00	15.75 mm	35 mm	4	16 mm	100 mm	TMM-240300	497.45		

* Length of cut measured to last full tooth.

Thread Milling Cutters

MTR

Thread Relief Cutter



- 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 #	USD$
.375	.141	.075	.010	4	.2500	2.64	MTR-375	131.15
.500	.195	.100	.010	5	.3125	2.72	MTR-500	160.00
.750	.250	.125	.015	6	.3750	2.75	MTR-750	198.45
1.000	.250	.125	.015	7	.5000	3.25	MTR-001	258.95

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			L2		D2 (h6)	L1				
+.0005" −.0005"	+.00 mm −.02 mm	decimal equiv.	+.010" −.000" +.25 mm −.00 mm				Tool #	USD$	Tool #	USD$
.0050		.0050	.007	2	.1250	1.5	SME-005-2	77.90	SME-005-2X	81.65
.0060		.0060	.009	2	.1250	1.5	SME-006-2	77.90	SME-006-2X	81.65
.0070		.0070	.010	2	.1250	1.5	SME-007-2	66.00	SME-007-2X	69.95
	0.2 mm	.0079	0.4 mm	2	3 mm	38 mm	RMEM-002-2	54.95		
	0.2 mm	.0079	0.4 mm	2	4 mm	50 mm			AMRM-002-2X	63.75
.0080		.0080	.012	2	.1250	1.5	SME-008-2	66.00		
.0090		.0090	.013	2	.1250	1.5	SME-009-2	60.10		
.0100		.0100	.015	2	.1250	1.5	SME-010-2	60.10	SME-010-2X	64.00
.0100		.0100	.030	2	.1250	1.5	RME-010-2	62.75	RME-010-2X	66.80
.0110		.0110	.033	2	.1250	1.5			RME-011-2X	60.70
	0.3 mm	.0118	0.9 mm	2	3 mm	38 mm	RMEM-003-2	47.25	RMEM-003-2X	51.40
	0.3 mm	.0118	0.9 mm	2	4 mm	50 mm	AMRM-003-2	51.95	AMRM-003-2X	56.80
.0120		.0120	.036	2	.1250	1.5			RME-012-2X	60.70
.0130		.0130	.019	2	.1250	1.5	SME-013-2	46.10	SME-013-2X	50.20
.0130		.0130	.039	2	.1250	1.5	RME-013-2	48.35		
.0140		.0140	.021	2	.1250	1.5	SME-014-2	46.10		
.0140		.0140	.042	2	.1250	1.5	RME-014-2	48.35	RME-014-2X	52.25
.0150		.0150	.022	2	.1250	1.5	SME-015-2	36.70	SME-015-2X	40.95
.0150		.0150	.045	2	.1250	1.5	RME-015-2	38.25	RME-015-2X	42.40
	0.4 mm	.0157	1.2 mm	2	3 mm	38 mm	RMEM-004-2	34.65		
	0.4 mm	.0157	1.2 mm	2	4 mm	50 mm	AMRM-004-2	39.50		
.0160		.0160	.024	2	.1250	1.5	SME-016-2	36.70	SME-016-2X	40.95
.0160		.0160	.048	2	.1250	1.5	RME-016-2	38.25	RME-016-2X	42.40
.0170		.0170	.025	2	.1250	1.5	SME-017-2	36.70		
.0170		.0170	.051	2	.1250	1.5	RME-017-2	38.25	RME-017-2X	42.40
.0180		.0180	.027	2	.1250	1.5	SME-018-2	36.70	SME-018-2X	40.95
.0180		.0180	.054	2	.1250	1.5	RME-018-2	38.25	RME-018-2X	42.40
.0190		.0190	.028	2	.1250	1.5	SME-019-2	36.70		
.0190		.0190	.057	2	.1250	1.5			RME-019-2X	42.40
	0.5 mm	.0197	1.5 mm	2	3 mm	38 mm	RMEM-005-2	32.05		
	0.5 mm	.0197	1.5 mm	2	4 mm	50 mm	AMRM-005-2	34.65		
.0200		.0200	.030	2	.1250	1.5	SME-020-2	33.90	SME-020-2X	38.05
.0200		.0200	.060	2	.1250	1.5	RME-020-2	35.20	RME-020-2X	39.55
.0210		.0210	.063	2	.1250	1.5			RME-021-2X	39.15
.0220		.0220	.033	2	.1250	1.5	SME-022-2	33.90		
.0220		.0220	.066	2	.1250	1.5	RME-022-2	35.20	RME-022-2X	39.55

*.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

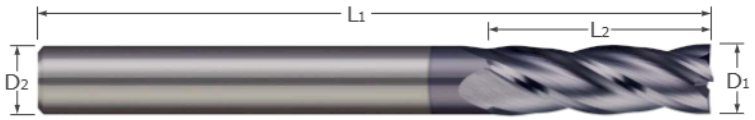
Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0005" −.0005"	+.00 mm −.02 mm	decimal equiv.	L_2 +.010" −.000" +.25 mm −.00 mm		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.0230		.0230	.034	2	.1250	1.5	SME-023-2	33.90	SME-023-2X	38.05
.0230		.0230	.069	2	.1250	1.5	RME-023-2	35.20	RME-023-2X	39.55
	0.6 mm	.0236	1.8 mm	2	3 mm	38 mm	RMEM-006-2	32.05	RMEM-006-2X	36.25
.0240		.0240	.072	2	.1250	1.5			RME-024-2X	39.55
.0250		.0250	.037	2	.1250	1.5	SME-025-2	33.90	SME-025-2X	38.05
.0250		.0250	.075	2	.1250	1.5	RME-025-2	35.20	RME-025-2X	39.55
.0270		.0270	.040	2	.1250	1.5	SME-027-2	29.65		
.0270		.0270	.081	2	.1250	1.5	RME-027-2	29.85	RME-027-2X	34.05
	0.7 mm	.0276	2.1 mm	2	3 mm	38 mm	RMEM-007-2	28.75		
.0280		.0280	.042	2	.1250	1.5			SME-028-2X	33.50
.0280		.0280	.084	2	.1250	1.5			RME-028-2X	34.05
.0290		.0290	.087	2	.1250	1.5	RME-029-2	29.85	RME-029-2X	34.05
.0300		.0300	.045	2	.1250	1.5	SME-030-2	29.65	SME-030-2X	33.95
.0300		.0300	.090	2	.1250	1.5	RME-030-2	29.85	RME-030-2X	34.05
.0310		.0310	.047	2	.1250	1.5	SME-031-2	29.65	SME-031-2X	33.95
	0.8 mm	.0315	2.4 mm	2	3 mm	38 mm	RMEM-008-2	28.75		
	0.8 mm	.0315	2.4 mm	2	4 mm	50 mm	AMRM-008-2	31.05		
.0320		.0320	.096	2	.1250	1.5	RME-032-2	29.85	RME-032-2X	34.05
.0340		.0340	.102	2	.1250	1.5			RME-034-2X	34.05
.0350		.0350	.105	2	.1250	1.5	RME-035-2	29.85	RME-035-2X	34.05
	0.9 mm	.0354	2.7 mm	2	3 mm	38 mm	RMEM-009-2	28.75	RMEM-009-2X	33.05
	1 mm	.0394	3 mm	2	3 mm	38 mm	RMEM-010-2	28.75		
	1 mm	.0394	3 mm	2	4 mm	50 mm	AMRM-010-2	31.05	AMRM-010-2X	36.10
.0400		.0400	.060	2	.1250	1.5	SME-040-2	29.65	SME-040-2X	33.95
.0400		.0400	.120	2	.1250	1.5	RME-040-2	29.85		
	1.1 mm	.0433	3.3 mm	2	4 mm	50 mm	AMRM-011-2	31.05		
.0450		.0450	.135	2	.1250	1.5			RME-045-2X	33.70
	1.2 mm	.0472	3.8 mm	2	3 mm	38 mm	RMEM-012-2	28.75	RMEM-012-2X	33.05
	1.2 mm	.0472	3.8 mm	2	4 mm	50 mm	AMRM-012-2	31.05		
.0500		.0500	.075	2	.1250	1.5	SME-050-2	29.65	SME-050-2X	33.95
.0500		.0500	.150	2	.1250	1.5	RME-050-2	29.85	RME-050-2X	34.05
	1.3 mm	.0512	3.9 mm	2	3 mm	38 mm	RMEM-013-2	28.75	RMEM-013-2X	33.05
	1.3 mm	.0512	3.9 mm	2	4 mm	50 mm	AMRM-013-2	31.05		
	1.4 mm	.0551	4.2 mm	2	3 mm	38 mm	RMEM-014-2	28.75		
	1.5 mm	.0591	4.2 mm	2	3 mm	38 mm	RMEM-015-2	28.75		
	1.6 mm	.0630	4.8 mm	2	3 mm	38 mm	RMEM-016-2	26.55		
	1.6 mm	.0630	4.8 mm	2	4 mm	50 mm	AMRM-016-2	31.05		
	1.7 mm	.0669	5.1 mm	2	4 mm	50 mm			AMRM-017-2X	36.10
	1.8 mm	.0709	5.3 mm	2	3 mm	38 mm	RMEM-018-2	26.55		
	1.8 mm	.0709	5.3 mm	2	4 mm	50 mm	AMRM-018-2	31.05	AMRM-018-2X	36.10
	1.9 mm	.0748	5.7 mm	2	3 mm	38 mm			RMEM-019-2X	30.85
	2 mm	.0787	6 mm	2	3 mm	38 mm	RMEM-020-2	26.55		
	2 mm	.0787	6 mm	2	4 mm	50 mm	AMRM-020-2	31.05		
	2.5 mm	.0984	8 mm	2	3 mm	38 mm	RMEM-025-2	26.55		
	2.5 mm	.0984	8 mm	2	4 mm	50 mm			AMRM-025-2X	35.65
	3 mm	.1181	9 mm	2	4 mm	50 mm			AMRM-030-2X	35.65

*.0005" / .013 mm max TIR

End Mills – Square

2, 3, 4 Flute

GEM / GEMM
SEM / AEMM



- 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	
D1 +.0000" −.0020"	(h9)	decimal equiv.	L2 +.030" −.000" +.78 mm −.00 mm		D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.0312		.0312	.063	2	.1250	1.5	SEM-031-02	25.40		
.0312		.0312	.063	3	.1250	1.5	SEM-031-03	25.40		
.0312		.0312	.063	4	.1250	1.5	SEM-031-04	25.40	SEM-031-04X	29.90
.0312		.0312	.078	2	.1250	1.5	GEM-031-2	26.80	GEM-031-2X	31.00
.0312		.0312	.078	3	.1250	1.5	GEM-031-3	26.80	GEM-031-3X	31.00
.0312		.0312	.078	4	.1250	1.5	GEM-031-4	26.80	GEM-031-4X	31.00
	1 mm	.0394	3 mm	2	3 mm	38 mm	GEMM-010-2	25.65	GEMM-010-2X	30.05
	1 mm	.0394	3 mm	3	3 mm	38 mm	GEMM-010-3	25.65	GEMM-010-3X	30.05
	1 mm	.0394	3 mm	4	3 mm	38 mm	GEMM-010-4	25.65		
	1 mm	.0394	4 mm	2	4 mm	50 mm			AEMM-010-2X	36.10
	1 mm	.0394	4 mm	3	4 mm	50 mm	AEMM-010-3	31.05		
	1 mm	.0394	4 mm	4	4 mm	50 mm	AEMM-010-4	31.05	AEMM-010-4X	36.10
.0469		.0469	.094	2	.1250	1.5	SEM-046-02	25.40		
.0469		.0469	.094	3	.1250	1.5	SEM-046-03	25.40	SEM-046-03X	29.90
.0469		.0469	.094	4	.1250	1.5	SEM-046-04	25.40	SEM-046-04X	29.90
.0469		.0469	.109	2	.1250	1.5	GEM-046-2	26.80		
.0469		.0469	.109	3	.1250	1.5	GEM-046-3	26.80	GEM-046-3X	31.00
.0469		.0469	.109	4	.1250	1.5	GEM-046-4	26.80	GEM-046-4X	31.00
	1.5 mm	.0591	4 mm	2	4 mm	50 mm	AEMM-015-2	31.05		
	1.5 mm	.0591	4 mm	3	4 mm	50 mm	AEMM-015-3	31.05	AEMM-015-3X	36.10
	1.5 mm	.0591	4 mm	4	4 mm	50 mm	AEMM-015-4	31.05	AEMM-015-4X	36.10
.0625		.0625	.125	2	.1250	1.5	SEM-062-02	23.10	SEM-062-02X	27.55
.0625		.0625	.125	3	.1250	1.5	SEM-062-03	23.10	SEM-062-03X	27.55
.0625		.0625	.125	4	.1250	1.5	SEM-062-04	23.10	SEM-062-04X	27.55
.0625		.0625	.188	2	.1250	1.5	GEM-062-2	24.45	GEM-062-2X	28.80
.0625		.0625	.188	3	.1250	1.5	GEM-062-3	24.45	GEM-062-3X	28.80
.0625		.0625	.188	4	.1250	1.5	GEM-062-4	24.45	GEM-062-4X	28.80
.0781		.0781	.156	2	.1250	1.5	SEM-078-02	23.10		
.0781		.0781	.156	3	.1250	1.5	SEM-078-03	23.10	SEM-078-03X	27.55
.0781		.0781	.156	4	.1250	1.5	SEM-078-04	23.10	SEM-078-04X	27.55
.0781		.0781	.188	2	.1250	1.5	GEM-078-2	24.45	GEM-078-2X	28.80
.0781		.0781	.188	3	.1250	1.5	GEM-078-3	24.45	GEM-078-3X	28.80
.0781		.0781	.188	4	.1250	1.5	GEM-078-4	24.45	GEM-078-4X	28.80

*.0005" / .013 mm max TIR

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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	
D1 +.0000" −.0020"	(h9)	decimal equiv.	L2 +.030" −.000" +.78 mm −.00 mm		D2 (h6)	L1	Tool #	USD$	Tool #	USD$
	2 mm	.0787	5 mm	2	4 mm	50 mm	AEMM-020-2	31.05	AEMM-020-2X	36.10
	2 mm	.0787	5 mm	3	4 mm	50 mm	AEMM-020-3	31.05	AEMM-020-3X	36.10
	2 mm	.0787	5 mm	4	4 mm	50 mm			AEMM-020-4X	36.10
	2 mm	.0787	6 mm	2	3 mm	38 mm	GEMM-020-2	23.35	GEMM-020-2X	27.65
	2 mm	.0787	6 mm	3	3 mm	38 mm			GEMM-020-3X	27.65
	2 mm	.0787	7 mm	4	3 mm	38 mm	GEMM-020-4	23.35	GEMM-020-4X	27.65
.0938		.0938	.188	2	.1250	1.5	SEM-093-02	23.10	SEM-093-02X	27.55
.0938		.0938	.188	3	.1250	1.5	SEM-093-03	23.10	SEM-093-03X	27.55
.0938		.0938	.188	4	.1250	1.5	SEM-093-04	23.10	SEM-093-04X	27.55
.0938		.0938	.375	2	.1250	1.5	GEM-093-2	24.45	GEM-093-2X	28.80
.0938		.0938	.375	3	.1250	1.5	GEM-093-3	24.45	GEM-093-3X	28.80
.0938		.0938	.375	4	.1250	1.5	GEM-093-4	24.45	GEM-093-4X	28.80
	2.5 mm	.0984	6 mm	2	4 mm	50 mm			AEMM-025-2X	36.10
	2.5 mm	.0984	6 mm	3	4 mm	50 mm	AEMM-025-3	31.05	AEMM-025-3X	36.10
	2.5 mm	.0984	6 mm	4	4 mm	50 mm	AEMM-025-4	31.05	AEMM-025-4X	36.10
.1094		.1094	.188	2	.1250	1.5	SEM-109-02	23.10		
.1094		.1094	.188	3	.1250	1.5	SEM-109-03	23.10	SEM-109-03X	27.55
.1094		.1094	.188	4	.1250	1.5	SEM-109-04	23.10	SEM-109-04X	27.55
.1094		.1094	.375	2	.1250	1.5	GEM-109-2	24.45	GEM-109-2X	28.80
.1094		.1094	.375	3	.1250	1.5	GEM-109-3	24.45	GEM-109-3X	28.80
.1094		.1094	.375	4	.1250	1.5	GEM-109-4	24.45	GEM-109-4X	28.80
	3 mm	.1181	7 mm	3	3 mm	38 mm	GEMM-030-3	20.80	GEMM-030-3X	25.25
	3 mm	.1181	8 mm	4	3 mm	38 mm	GEMM-030-4	20.80	GEMM-030-4X	25.25
	3 mm	.1181	8 mm	2	6 mm	57 mm	AEMM-030-2	38.90	AEMM-030-2X	47.60
	3 mm	.1181	8 mm	3	6 mm	57 mm	AEMM-030-3	38.90		
	3 mm	.1181	8 mm	4	6 mm	57 mm	AEMM-030-4	38.90	AEMM-030-4X	47.60
.1250		.1250	.250	2	.1250	1.5	SEM-125-02	20.55	SEM-125-02X	25.10
.1250		.1250	.250	3	.1250	1.5	SEM-125-03	20.55	SEM-125-03X	25.10
.1250		.1250	.250	4	.1250	1.5	SEM-125-04	20.55	SEM-125-04X	25.10
.1250		.1250	.500	2	.1250	1.5	GEM-125-2	21.85	GEM-125-2X	26.15
.1250		.1250	.500	3	.1250	1.5	GEM-125-3	21.85	GEM-125-3X	26.15
.1250		.1250	.500	4	.1250	1.5	GEM-125-4	21.85	GEM-125-4X	26.15
	3.5 mm	.1378	10 mm	3	6 mm	57 mm	AEMM-035-3	38.90	AEMM-035-3X	47.60
	3.5 mm	.1378	10 mm	4	6 mm	57 mm	AEMM-035-4	38.90		
.1406		.1406	.250	2	.1875	1.5	SEM-140-02	32.95	SEM-140-02X	37.95
.1406		.1406	.250	3	.1875	1.5	SEM-140-03	32.95	SEM-140-03X	37.95
.1406		.1406	.250	4	.1875	1.5	SEM-140-04	32.95	SEM-140-04X	37.95
.1406		.1406	.500	2	.1875	2.0	GEM-140-2	34.55	GEM-140-2X	39.55
.1406		.1406	.500	3	.1875	2.0	GEM-140-3	34.55	GEM-140-3X	39.55
.1406		.1406	.500	4	.1875	2.0	GEM-140-4	34.55	GEM-140-4X	39.55
.1562		.1562	.313	2	.1875	1.5	SEM-156-02	32.95	SEM-156-02X	37.95
.1562		.1562	.313	3	.1875	1.5	SEM-156-03	32.95		
.1562		.1562	.313	4	.1875	1.5	SEM-156-04	32.95	SEM-156-04X	37.95
.1562		.1562	.563	2	.1875	2.0	GEM-156-2	34.55	GEM-156-2X	39.55
.1562		.1562	.563	3	.1875	2.0	GEM-156-3	34.55	GEM-156-3X	39.55
.1562		.1562	.563	4	.1875	2.0	GEM-156-4	34.55	GEM-156-4X	39.55

*.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 #	USD$	Tool #	USD$
	4 mm	.1575	8 mm	2	4 mm	50 mm	GEMM-040-2	31.05		
	4 mm	.1575	8 mm	3	4 mm	50 mm	GEMM-040-3	31.05		
	4 mm	.1575	11 mm	4	4 mm	50 mm	GEMM-040-4	31.05	GEMM-040-4X	36.10
	4 mm	.1575	11 mm	2	6 mm	57 mm	AEMM-040-2	38.90	AEMM-040-2X	47.60
	4 mm	.1575	11 mm	3	6 mm	57 mm	AEMM-040-3	38.90		
	4 mm	.1575	11 mm	4	6 mm	57 mm	AEMM-040-4	38.90	AEMM-040-4X	47.60
.1719		.1719	.313	3	.1875	1.5	SEM-171-03	32.95	SEM-171-03X	37.95
.1719		.1719	.313	4	.1875	1.5	SEM-171-04	32.95	SEM-171-04X	37.95
.1719		.1719	.625	2	.1875	2.0			GEM-171-2X	39.55
.1719		.1719	.625	4	.1875	2.0	GEM-171-4	34.55	GEM-171-4X	39.55
	4.5 mm	.1772	11 mm	3	6 mm	57 mm			AEMM-045-3X	47.60
	4.5 mm	.1772	11 mm	4	6 mm	57 mm	AEMM-045-4	38.90	AEMM-045-4X	47.60
.1875		.1875	.375	2	.1875	1.5	SEM-187-02	32.95	SEM-187-02X	37.95
.1875		.1875	.375	3	.1875	1.5	SEM-187-03	32.95	SEM-187-03X	37.95
.1875		.1875	.375	4	.1875	1.5	SEM-187-04	32.95	SEM-187-04X	37.95
.1875		.1875	.625	2	.1875	2.0	GEM-187-2	34.55	GEM-187-2X	39.55
.1875		.1875	.625	3	.1875	2.0	GEM-187-3	34.55	GEM-187-3X	39.55
.1875		.1875	.625	4	.1875	2.0	GEM-187-4	34.55	GEM-187-4X	39.55
	5 mm	.1969	13 mm	4	6 mm	57 mm			GEMM-050-4X	38.20
	5 mm	.1969	16 mm	2	6 mm	57 mm	AEMM-050-2	38.90		
	5 mm	.1969	16 mm	4	6 mm	57 mm	AEMM-050-4	38.90	AEMM-050-4X	47.60
.2031		.2031	.375	3	.2500	2.0	SEM-203-03	40.85		
.2031		.2031	.375	4	.2500	2.0	SEM-203-04	40.85	SEM-203-04X	45.90
.2031		.2031	.625	2	.2500	2.5	GEM-203-2	43.25		
.2031		.2031	.625	4	.2500	2.5	GEM-203-4	43.25	GEM-203-4X	51.95
	5.5 mm	.2165	16 mm	2	6 mm	57 mm	AEMM-055-2	38.90		
	5.5 mm	.2165	16 mm	4	6 mm	57 mm	AEMM-055-4	38.90	AEMM-055-4X	47.60
.2187		.2187	.438	4	.2500	2.0	SEM-218-04	40.85	SEM-218-04X	45.90
.2187		.2187	.625	2	.2500	2.5	GEM-218-2	43.25	GEM-218-2X	51.95
.2187		.2187	.625	4	.2500	2.5	GEM-218-4	43.25		
.2344		.2344	.438	4	.2500	2.0	SEM-234-04	40.85		
	6 mm	.2362	10 mm	2	6 mm	57 mm	GEMM-060-2	38.90	GEMM-060-2X	47.60
	6 mm	.2362	13 mm	4	6 mm	57 mm	GEMM-060-4	38.90	GEMM-060-4X	47.60
	6 mm	.2362	16 mm	2	6 mm	57 mm	AEMM-060-2	38.90	AEMM-060-2X	47.60
	6 mm	.2362	16 mm	4	6 mm	57 mm	AEMM-060-4	38.90	AEMM-060-4X	47.60
.2500		.2500	.500	2	.2500	2.0	SEM-250-02	40.85	SEM-250-02X	45.90
.2500		.2500	.500	3	.2500	2.0	SEM-250-03	40.85	SEM-250-03X	45.90
.2500		.2500	.500	4	.2500	2.0	SEM-250-04	40.85	SEM-250-04X	45.90
.2500		.2500	.750	2	.2500	2.5	GEM-250-2	43.25	GEM-250-2X	51.95
.2500		.2500	.750	3	.2500	2.5	GEM-250-3	43.25	GEM-250-3X	51.95
.2500		.2500	.750	4	.2500	2.5	GEM-250-4	43.25	GEM-250-4X	51.95

*.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

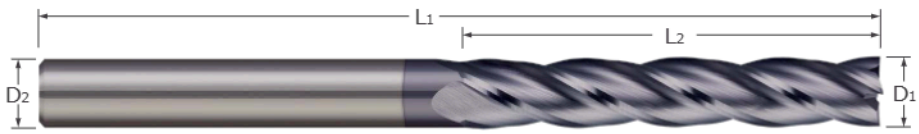
Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0030"	D_1 (h9)	D_1 decimal equiv.	L_2 +.030" −.000" +.78 mm −.00 mm		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.2656		.2656	.500	4	.3125	2.0	SEM-265-04	45.30	SEM-265-04X	55.05
	7 mm	.2756	22 mm	3	8 mm	63 mm			AEMM-070-3X	60.00
	7 mm	.2756	22 mm	4	8 mm	63 mm	AEMM-070-4	48.35	AEMM-070-4X	60.00
.2812		.2812	.500	4	.3125	2.0	SEM-281-04	45.30	SEM-281-04X	55.05
.2812		.2812	.750	2	.3125	2.5	GEM-281-2	50.30	GEM-281-2X	60.75
.2812		.2812	.750	3	.3125	2.5	GEM-281-3	50.30	GEM-281-3X	60.75
.2812		.2812	.750	4	.3125	2.5	GEM-281-4	50.30	GEM-281-4X	60.75
.3125		.3125	.500	4	.3125	2.0	SEM-312-04	45.30	SEM-312-04X	55.05
.3125		.3125	.813	2	.3125	2.5	GEM-312-2	50.30	GEM-312-2X	60.75
.3125		.3125	.813	4	.3125	2.5	GEM-312-4	50.30	GEM-312-4X	60.75
	8 mm	.3150	19 mm	4	8 mm	63 mm	GEMM-080-4	48.35		
	8 mm	.3150	22 mm	2	8 mm	63 mm	AEMM-080-2	48.35		
	8 mm	.3150	22 mm	3	8 mm	63 mm	AEMM-080-3	48.35		
	8 mm	.3150	22 mm	4	8 mm	63 mm	AEMM-080-4	48.35	AEMM-080-4X	60.00
.3281		.3281	.500	2	.3750	2.0	SEM-328-02	54.05	SEM-328-02X	64.00
.3281		.3281	.500	4	.3750	2.0	SEM-328-04	54.05		
.3750		.3750	.625	2	.3750	2.0	SEM-375-02	54.05		
.3750		.3750	.625	3	.3750	2.0	SEM-375-03	54.05	SEM-375-03X	62.90
.3750		.3750	.625	4	.3750	2.0	SEM-375-04	54.05	SEM-375-04X	62.90
.3750		.3750	.875	2	.3750	2.5	GEM-375-2	56.85	GEM-375-2X	68.75
.3750		.3750	.875	3	.3750	2.5	GEM-375-3	56.85		
.3750		.3750	.875	4	.3750	2.5	GEM-375-4	56.85	GEM-375-4X	68.75
.3906		.3906	.625	4	.4375	2.5	SEM-390-04	80.75		
	10 mm	.3937	25 mm	2	10 mm	72 mm	AEMM-100-2	56.75	AEMM-100-2X	68.60
	10 mm	.3937	25 mm	3	10 mm	72 mm	AEMM-100-3	56.75	AEMM-100-3X	68.60
	10 mm	.3937	25 mm	4	10 mm	72 mm	AEMM-100-4	56.75	AEMM-100-4X	68.60
	11 mm	.4331	30 mm	3	12 mm	83 mm	AEMM-110-3	90.65		
.4375		.4375	1.000	4	.4375	2.5	GEM-437-4	89.70	GEM-437-4X	103.65
	12 mm	.4724	22 mm	2	12 mm	83 mm	GEMM-120-2	90.65	GEMM-120-2X	108.85
	12 mm	.4724	22 mm	3	12 mm	83 mm	GEMM-120-3	90.65		
	12 mm	.4724	30 mm	2	12 mm	83 mm	AEMM-120-2	90.65		
	12 mm	.4724	30 mm	4	12 mm	83 mm	AEMM-120-4	90.65	AEMM-120-4X	108.85
.5000		.5000	.625	2	.5000	2.5	SEM-500-02	89.20	SEM-500-02X	102.75
.5000		.5000	.625	3	.5000	2.5	SEM-500-03	89.20	SEM-500-03X	102.75
.5000		.5000	.625	4	.5000	2.5	SEM-500-04	89.20	SEM-500-04X	102.75
.5000		.5000	1.000	2	.5000	3.0	GEM-500-2	99.00	GEM-500-2X	112.75
.5000		.5000	1.000	3	.5000	3.0	GEM-500-3	99.00	GEM-500-3X	112.75
.5000		.5000	1.000	4	.5000	3.0	GEM-500-4	99.00	GEM-500-4X	112.75
.5000		.5000	1.250	4	.5000	3.5			GEM-5125-4X	114.60
	14 mm	.5512	26 mm	4	14 mm	83 mm	GEMM-140-4	105.10		
	14 mm	.5512	35 mm	2	14 mm	83 mm			AEMM-140-2X	123.20
	14 mm	.5512	35 mm	4	14 mm	83 mm	AEMM-140-4	105.10		
.5625		.5625	1.250	2	.5625	3.5	GEM-562-2	151.80		
.5625		.5625	1.250	4	.5625	3.5	GEM-562-4	151.80		
.6250		.6250	1.250	4	.6250	3.5	GEM-625-4	174.55	GEM-625-4X	195.60
	16 mm	.6299	32 mm	4	16 mm	92 mm	GEMM-160-4	167.75		
	16 mm	.6299	35 mm	3	16 mm	92 mm			AEMM-160-3X	188.45
	18 mm	.7087	32 mm	4	18 mm	92 mm	GEMM-180-4	225.35		
.7500		.7500	1.500	2	.7500	4.0	GEM-750-2	266.10		
.7500		.7500	1.500	4	.7500	4.0	GEM-750-4	266.10	GEM-750-4X	289.05
.8750		.8750	1.500	4	.8750	4.0	GEM-875-4	368.75		
1.0000		1.0000	1.500	4	1.0000	4.0	GEM-001-4	403.00		

*.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	
D_1 +.0000" −.0020"	(h9)	decimal equiv.	L_2 +.031" −.000" +.79 mm −.00 mm		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
	4 mm	.1575	20 mm	2	6 mm	75 mm			AELM-040-2X	57.50
	6 mm	.2362	25 mm	3	6 mm	75 mm	GELM-060-3	54.25		
	6 mm	.2362	25 mm	4	6 mm	75 mm	GELM-060-4	54.25		

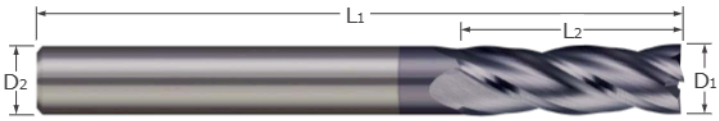
D_1 +.0000" −.0030"	(h9)	decimal equiv.	L_2 +.031" −.000" +.79 mm −.00 mm		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
	8 mm	.3150	30 mm	3	8 mm	75 mm	GELM-080-3	65.45		
	8 mm	.3150	40 mm	2	8 mm	100 mm	AELM-080-2	85.60		
	20 mm	.7874	75 mm	2	20 mm	150 mm			AELM-200-2X	453.70

*.0005" / .013 mm max TIR

EMS / EMSM

End Mills – Square

2, 3, 4, 6 Flute – NC Tolerance



- 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 #	USD$	Tool #	USD$
.0312		.0312	.078	2	.1250	1.5	EMS-031-2	32.20		
.0312		.0312	.078	3	.1250	1.5	EMS-031-3	32.20		
.0312		.0312	.078	4	.1250	1.5	EMS-031-4	32.20	EMS-031-4X	36.35
.0625		.0625	.188	2	.1250	1.5			EMS-062-2X	33.45
.0625		.0625	.188	3	.1250	1.5	EMS-062-3	29.30	EMS-062-3X	33.45
.0625		.0625	.188	4	.1250	1.5	EMS-062-4	29.30	EMS-062-4X	33.45
.0938		.0938	.375	3	.1250	1.5	EMS-093-3	29.30	EMS-093-3X	33.45
.0938		.0938	.375	4	.1250	1.5	EMS-093-4	29.30	EMS-093-4X	33.45
.1250		.1250	.500	2	.1250	1.5	EMS-125-2	26.10	EMS-125-2X	30.50
.1250		.1250	.500	3	.1250	1.5	EMS-125-3	26.10	EMS-125-3X	30.50
.1250		.1250	.500	4	.1250	1.5	EMS-125-4	26.10		
.1562		.1562	.563	4	.1875	2.0	EMS-156-4	41.30	EMS-156-4X	46.05
.1875		.1875	.625	2	.1875	2.0	EMS-187-2	41.30		
.1875		.1875	.625	4	.1875	2.0	EMS-187-4	41.30	EMS-187-4X	46.05
	6 mm	.2362	18 mm	4	6 mm	57 mm	EMSM-060-4	43.10	EMSM-060-4X	51.85
.2500		.2500	.750	3	.2500	2.5			EMS-250-3X	60.15
.2500		.2500	.750	4	.2500	2.5	EMS-250-4	51.85	EMS-250-4X	60.15
.3125		.3125	.813	4	.3125	2.5	EMS-312-4	60.20	EMS-312-4X	70.70
.3750		.3750	.875	2	.3750	2.5			EMS-375-2X	79.85
.3750		.3750	.875	3	.3750	2.5	EMS-375-3	68.35		
.3750		.3750	.875	4	.3750	2.5	EMS-375-4	68.35	EMS-375-4X	79.85
.5000		.5000	1.000	2	.5000	3.0			EMS-500-2X	131.95
.5000		.5000	1.000	3	.5000	3.0	EMS-500-3	118.20	EMS-500-3X	131.95
.5000		.5000	1.000	4	.5000	3.0	EMS-500-4	118.20		
.6250		.6250	1.250	4	.6250	3.5	EMS-625-4	209.35		
.7500		.7500	1.500	2	.7500	4.0	EMS-750-2	319.30		
.7500		.7500	1.500	4	.7500	4.0	EMS-750-4	319.30		
1.0000		1.0000	2.500	3	1.0000	5.0	EMS-001-3	483.35		
1.0000		1.0000	2.500	6	1.0000	5.0	EMS-001-6	483.35		

*.0005" / .013 mm max TIR

End Mills – Ball

2, 3, 4 Flute – Stub & Standard

BMR / BMRM / BMS
BMSM / BEM / BEMM

- 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 #	USD$	Tool #	USD$
.0100		.0100	.015	2	.1250	1.5	BMS-010-2	68.90	BMS-010-2X	72.85
.0100		.0100	.030	2	.1250	1.5	BMR-010-2	72.10	BMR-010-2X	75.95
.0110		.0110	.033	2	.1250	1.5	BMR-011-2	65.45	BMR-011-2X	69.40
	0.3 mm	.0118	0.5 mm	2	3 mm	38 mm	BMSM-003-2	51.95	BMSM-003-2X	56.00
.0120		.0120	.018	2	.1250	1.5			BMS-012-2X	65.90
.0120		.0120	.036	2	.1250	1.5	BMR-012-2	65.45		
.0130		.0130	.019	2	.1250	1.5	BMS-013-2	53.00	BMS-013-2X	57.05
.0140		.0140	.021	2	.1250	1.5	BMS-014-2	53.00	BMS-014-2X	57.05
.0140		.0140	.042	2	.1250	1.5	BMR-014-2	55.65		
.0150		.0150	.022	2	.1250	1.5	BMS-015-2	42.25	BMS-015-2X	46.30
.0150		.0150	.045	2	.1250	1.5	BMR-015-2	43.90	BMR-015-2X	48.00
	0.4 mm	.0157	0.6 mm	2	3 mm	38 mm	BMSM-004-2	38.35	BMSM-004-2X	42.60
.0160		.0160	.024	2	.1250	1.5	BMS-016-2	42.25	BMS-016-2X	46.30
.0160		.0160	.048	2	.1250	1.5	BMR-016-2	43.90	BMR-016-2X	48.00
.0180		.0180	.027	2	.1250	1.5	BMS-018-2	42.25	BMS-018-2X	46.30
.0180		.0180	.054	2	.1250	1.5	BMR-018-2	43.90		
.0190		.0190	.028	2	.1250	1.5	BMS-019-2	42.25		
.0190		.0190	.057	2	.1250	1.5	BMR-019-2	43.90		
	0.5 mm	.0197	0.8 mm	2	3 mm	38 mm	BMSM-005-2	35.50	BMSM-005-2X	39.70
	0.5 mm	.0197	1.5 mm	2	4 mm	50 mm	BMRM-005-2	38.80	BMRM-005-2X	43.55
.0200		.0200	.030	2	.1250	1.5	BMS-020-2	38.90	BMS-020-2X	43.20
.0200		.0200	.060	2	.1250	1.5	BMR-020-2	40.85	BMR-020-2X	44.95
.0220		.0220	.033	2	.1250	1.5			BMS-022-2X	43.20
.0220		.0220	.066	2	.1250	1.5	BMR-022-2	40.85	BMR-022-2X	44.95
.0230		.0230	.034	2	.1250	1.5	BMS-023-2	38.90		
.0230		.0230	.069	2	.1250	1.5	BMR-023-2	40.85		
	0.6 mm	.0236	0.9 mm	2	3 mm	38 mm	BMSM-006-2	35.50		
.0240		.0240	.072	2	.1250	1.5	BMR-024-2	40.85		
.0250		.0250	.037	2	.1250	1.5	BMS-025-2	38.90	BMS-025-2X	43.20
.0250		.0250	.075	2	.1250	1.5	BMR-025-2	40.85	BMR-025-2X	44.95
.0260		.0260	.039	2	.1250	1.5			BMS-026-2X	39.25
.0260		.0260	.078	2	.1250	1.5	BMR-026-2	37.15	BMR-026-2X	41.40
	0.7 mm	.0276	1.1 mm	2	3 mm	38 mm	BMSM-007-2	33.70		
	0.7 mm	.0276	2.1 mm	2	4 mm	50 mm	BMRM-007-2	38.80		
.0280		.0280	.042	2	.1250	1.5	BMS-028-2	35.50	BMS-028-2X	39.70
.0280		.0280	.084	2	.1250	1.5	BMR-028-2	37.15	BMR-028-2X	41.40
.0300		.0300	.045	2	.1250	1.5	BMS-030-2	35.50	BMS-030-2X	39.70
.0300		.0300	.090	2	.1250	1.5	BMR-030-2	37.15	BMR-030-2X	41.40
.0310		.0310	.047	2	.1250	1.5	BMS-031-2	35.50	BMS-031-2X	39.70
.0310		.0310	.093	2	.1250	1.5	BMR-031-2	37.15	BMR-031-2X	41.40

*.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 +.0005" −.0005"	+.00 mm −.02 mm	decimal equiv.	L_2		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.0313		.0313	.078	2	.1250	1.5	BEM-031-02	30.90	BEM-031-02X	35.15
.0313		.0313	.078	3	.1250	1.5	BEM-031-03	30.90	BEM-031-03X	35.15
.0313		.0313	.078	4	.1250	1.5	BEM-031-04	30.90	BEM-031-04X	35.15
	0.8 mm	.0315	1.2 mm	2	3 mm	38 mm	BMSM-008-2	33.70		
.0320		.0320	.048	2	.1250	1.5	BMS-032-2	35.50	BMS-032-2X	39.70
.0320		.0320	.096	2	.1250	1.5	BMR-032-2	37.15		
.0330		.0330	.050	2	.1250	1.5			BMS-033-2X	39.25
.0350		.0350	.053	2	.1250	1.5	BMS-035-2	35.50	BMS-035-2X	39.70
.0350		.0350	.105	2	.1250	1.5			BMR-035-2X	41.40
	0.9 mm	.0354	1.4 mm	2	3 mm	38 mm	BMSM-009-2	33.70	BMSM-009-2X	38.05
	0.9 mm	.0354	2.7 mm	2	4 mm	50 mm	BMRM-009-2	38.80	BMRM-009-2X	43.55
	1 mm	.0394	1.5 mm	2	3 mm	38 mm	BMSM-010-2	32.95	BMSM-010-2X	37.20
	1 mm	.0394	1.5 mm	4	3 mm	38 mm	BMSM-010-4	32.95	BMSM-010-4X	37.20
	1 mm	.0394	3 mm	2	4 mm	50 mm			BMRM-010-2X	40.55
	1 mm	.0394	3 mm	4	4 mm	50 mm			BMRM-010-4X	40.55
.0400		.0400	.060	2	.1250	1.5	BMS-040-2	35.50	BMS-040-2X	39.70
.0400		.0400	.120	2	.1250	1.5	BMR-040-2	37.15	BMR-040-2X	41.40
.0450		.0450	.135	2	.1250	1.5	BMR-045-2	37.15	BMR-045-2X	41.40
.0468		.0468	.109	2	.1250	1.5	BEM-046-02	30.90	BEM-046-02X	35.15
.0468		.0468	.109	3	.1250	1.5	BEM-046-03	30.90	BEM-046-03X	35.15
.0468		.0468	.109	4	.1250	1.5	BEM-046-04	30.90	BEM-046-04X	35.15
.0500		.0500	.075	2	.1250	1.5			BMS-050-2X	39.70
.0500		.0500	.150	2	.1250	1.5	BMR-050-2	37.15	BMR-050-2X	41.40
	1.4 mm	.0551	2.1 mm	2	3 mm	38 mm	BMSM-014-2	32.95	BMSM-014-2X	37.20
	1.5 mm	.0591	2.3 mm	2	3 mm	38 mm			BMSM-015-2X	37.20
	1.5 mm	.0591	4.2 mm	2	4 mm	50 mm	BMRM-015-2	35.80	BMRM-015-2X	40.55
	1.5 mm	.0591	4.2 mm	4	4 mm	50 mm	BMRM-015-4	35.80	BMRM-015-4X	40.55
.0625		.0625	.188	2	.1250	1.5	BEM-062-02	27.70	BEM-062-02X	32.25
.0625		.0625	.188	3	.1250	1.5	BEM-062-03	27.70	BEM-062-03X	32.25
.0625		.0625	.188	4	.1250	1.5	BEM-062-04	27.70	BEM-062-04X	32.25
	1.6 mm	.0630	2.4 mm	2	3 mm	38 mm	BMSM-016-2	30.25		
	1.7 mm	.0669	2.5 mm	4	3 mm	38 mm			BMSM-017-4X	34.60
	1.8 mm	.0709	2.7 mm	2	3 mm	38 mm	BMSM-018-2	30.25	BMSM-018-2X	34.60
.0781		.0781	.188	2	.1250	1.5	BEM-078-02	27.70	BEM-078-02X	32.25
.0781		.0781	.188	3	.1250	1.5	BEM-078-03	27.70	BEM-078-03X	32.25
.0781		.0781	.188	4	.1250	1.5	BEM-078-04	27.70	BEM-078-04X	32.25
	2 mm	.0787	3 mm	2	3 mm	38 mm	BMSM-020-2	30.25	BMSM-020-2X	34.60
	2 mm	.0787	6 mm	2	4 mm	50 mm	BMRM-020-2	35.80	BMRM-020-2X	40.55
	2 mm	.0787	6 mm	4	4 mm	50 mm			BMRM-020-4X	40.55
.0937		.0937	.375	2	.1250	1.5	BEM-093-02	27.70	BEM-093-02X	32.25
.0937		.0937	.375	3	.1250	1.5	BEM-093-03	27.70	BEM-093-03X	32.25
.0937		.0937	.375	4	.1250	1.5	BEM-093-04	27.70	BEM-093-04X	32.25
	2.5 mm	.0984	3.8 mm	2	3 mm	38 mm	BMSM-025-2	30.25	BMSM-025-2X	34.60

*.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

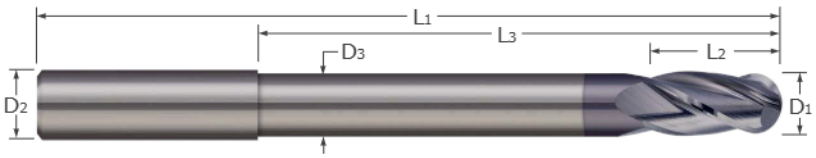
Continued from previous page

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 #	USD$	Tool #	USD$
.1093		.1093	.375	2	.1250	1.5	BEM-109-02	27.70		
	3 mm	.1181	15 mm	2	3 mm	38 mm	BEMM-030-2	22.80		
	3 mm	.1181	15 mm	3	3 mm	38 mm	BEMM-030-3	22.80	BEMM-030-3X	27.30
	3 mm	.1181	15 mm	4	3 mm	38 mm	BEMM-030-4	22.80		
	3 mm	.1181	9 mm	2	4 mm	50 mm	BMRM-030-2	35.80	BMRM-030-2X	40.55
	3 mm	.1181	9 mm	4	4 mm	50 mm			BMRM-030-4X	40.55
.1250		.1250	.500	2	.1250	1.5	BEM-125-02	24.85	BEM-125-02X	29.20
.1250		.1250	.500	3	.1250	1.5	BEM-125-03	24.85	BEM-125-03X	29.20
.1250		.1250	.500	4	.1250	1.5	BEM-125-04	24.85	BEM-125-04X	29.20
	3.5 mm	.1378	10.5 mm	2	4 mm	50 mm			BMRM-035-2X	40.55
.1562		.1562	.563	2	.1875	2.0	BEM-156-02	39.50	BEM-156-02X	44.60
.1562		.1562	.563	3	.1875	2.0			BEM-156-03X	44.60
.1562		.1562	.563	4	.1875	2.0	BEM-156-04	39.50	BEM-156-04X	44.60
	4 mm	.1575	18 mm	2	4 mm	50 mm	BEMM-040-2	34.10	BEMM-040-2X	38.95
	4 mm	.1575	18 mm	3	4 mm	50 mm	BEMM-040-3	34.10		
	4 mm	.1575	18 mm	4	4 mm	50 mm	BEMM-040-4	34.10		
.1875		.1875	.625	2	.1875	2.0	BEM-187-02	39.50		
.1875		.1875	.625	3	.1875	2.0	BEM-187-03	39.50	BEM-187-03X	44.60
.1875		.1875	.625	4	.1875	2.0	BEM-187-04	39.50	BEM-187-04X	44.60
.2187		.2187	.625	2	.2500	2.5	BEM-218-02	49.55	BEM-218-02X	57.95
.2187		.2187	.625	4	.2500	2.5	BEM-218-04	49.55	BEM-218-04X	57.95
	6 mm	.2362	18 mm	4	6 mm	57 mm			BEMM-060-4X	51.85
.2500		.2500	.750	3	.2500	2.5	BEM-250-03	49.55		
.2500		.2500	.750	4	.2500	2.5	BEM-250-04	49.55	BEM-250-04X	57.95
.2812		.2812	.750	4	.3125	2.5			BEM-281-04X	68.25
.3125		.3125	.813	2	.3125	2.5	BEM-312-02	57.70	BEM-312-02X	68.25
.3125		.3125	.813	4	.3125	2.5	BEM-312-04	57.70	BEM-312-04X	68.25
	8 mm	.3150	22 mm	2	8 mm	63 mm	BEMM-080-2	53.00	BEMM-080-2X	64.75
.3750		.3750	.875	2	.3750	2.5			BEM-375-02X	77.10
.3750		.3750	.875	3	.3750	2.5	BEM-375-03	65.60	BEM-375-03X	77.10
.3750		.3750	.875	4	.3750	2.5	BEM-375-04	65.60	BEM-375-04X	77.10
.4370		.4370	1.000	2	.4375	2.5			BEM-437-02X	118.10
	12 mm	.4724	30 mm	4	12 mm	83 mm	BEMM-120-4	99.60		
.5000		.5000	1.000	3	.5000	3.0	BEM-500-03	113.50		
.5000		.5000	1.000	4	.5000	3.0	BEM-500-04	113.50	BEM-500-04X	127.10
.6250		.6250	1.250	4	.6250	3.5	BEM-625-04	200.60		
	18 mm	.7087	45 mm	2	18 mm	92 mm			BEMM-180-2X	273.15
.8750		.8750	1.500	2	.8750	4.0	BEM-875-02	423.90		

*.0005" / .013 mm max TIR

BLR / BLRM
SFBM / MMBM

End Mills – Ball
2, 3, 4 Flute – Reduced Neck



- 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 #	USD$	Tool #	USD$
0.2 mm	.0078	0.3 mm	0.3 mm	-	2	6 mm	57 mm	SFBM-002-0	110.35		
0.3 mm	.0118	0.3 mm	3.0 mm	0.28 mm	2	4 mm	50 mm			MMBM-003-3X	88.65
0.4 mm	.0157	0.4 mm	3.0 mm	0.38 mm	2	4 mm	50 mm	MMBM-004-3	72.35	MMBM-004-3X	76.85
0.4 mm	.0157	0.4 mm	8.0 mm	0.38 mm	2	4 mm	50 mm	MMBM-004-8	72.35	MMBM-004-8X	76.85
0.5 mm	.0197	0.5 mm	5.0 mm	0.48 mm	2	4 mm	50 mm			MMBM-005-5X	68.30
0.5 mm	.0197	0.5 mm	10.0 mm	0.48 mm	2	4 mm	50 mm			MMBM-005-10X	68.30
0.6 mm	.0236	0.6 mm	12.0 mm	0.58 mm	2	4 mm	50 mm			MMBM-006-12X	67.75
0.6 mm	.0236	0.6 mm	5.0 mm	0.58 mm	2	4 mm	50 mm	MMBM-006-5	63.65	MMBM-006-5X	68.30
0.7 mm	.0276	0.7 mm	5.0 mm	0.68 mm	2	4 mm	50 mm	MMBM-007-5	63.65		
0.8 mm	.0315	0.8 mm	5.0 mm	0.78 mm	2	4 mm	50 mm			MMBM-008-5X	59.45
0.8 mm	.0315	0.8 mm	8.0 mm	0.75 mm	2	6 mm	57 mm			SFBM-008-8X	102.25
1.0 mm	.0394	1.0 mm	6.0 mm	0.95 mm	2	6 mm	57 mm	MMBM-010-6	60.10	MMBM-010-6X	68.20
1.0 mm	.0394	1.0 mm	11.0 mm	0.95 mm	2	6 mm	57 mm	MMBM-010-11	60.10	MMBM-010-11X	68.20
1.0 mm	.0394	1.0 mm	12.0 mm	0.95 mm	2	6 mm	57 mm			MMBM-010-12X	68.20
1.0 mm	.0394	1.0 mm	15.0 mm	0.95 mm	2	6 mm	57 mm			MMBM-010-15X	68.20
1.0 mm	.0394	1.0 mm	20.0 mm	0.95 mm	2	6 mm	57 mm	MMBM-010-20	60.10	MMBM-010-20X	68.20
1.2 mm	.0472	1.2 mm	7.0 mm	1.15 mm	2	6 mm	57 mm			MMBM-012-7X	67.65
1.2 mm	.0472	1.2 mm	15.0 mm	1.15 mm	2	6 mm	57 mm			MMBM-012-15X	68.20
1.2 mm	.0472	1.2 mm	20.0 mm	1.15 mm	2	6 mm	57 mm	MMBM-012-20	60.10		
1.5 mm	.0591	1.5 mm	7.0 mm	1.45 mm	2	6 mm	57 mm	MMBM-015-7	60.10	MMBM-015-7X	68.20
1.5 mm	.0591	1.5 mm	15.0 mm	1.45 mm	2	6 mm	57 mm			MMBM-015-15X	68.20
1.5 mm	.0591	1.5 mm	20.0 mm	1.45 mm	2	6 mm	57 mm			MMBM-015-20X	68.20
2.0 mm	.0787	2.0 mm	7.0 mm	1.9 mm	2	6 mm	57 mm	MMBM-020-7	60.10	MMBM-020-7X	68.20
2.0 mm	.0787	2.0 mm	15.0 mm	1.9 mm	2	6 mm	57 mm	MMBM-020-15	60.10	MMBM-020-15X	68.20
2.0 mm	.0787	2.0 mm	20.0 mm	1.9 mm	2	6 mm	57 mm			MMBM-020-20X	68.20
2.0 mm	.0787	2.5 mm	9.5 mm	1.95 mm	2	6 mm	57 mm			SFBM-020-9X	83.55

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

Continued on next page

End Mills – Ball

2, 3, 4 Flute – Reduced Neck (cont.)

BLR / BLRM
SFBM / MMBM

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 #	USD$	Tool #	USD$
	3.0 mm	.1181	3.0 mm	12.0 mm	2.9 mm	2	6 mm	57 mm			MMBM-030-12X	68.20
	3.0 mm	.1181	3.0 mm	15.0 mm	2.9 mm	2	6 mm	57 mm	MMBM-030-15	60.10	MMBM-030-15X	68.20
	3.0 mm	.1181	8.0 mm	30.0 mm	2.5 mm	2	6 mm	75 mm			BLRM-030-2X	62.20
	3.0 mm	.1181	8.0 mm	30.0 mm	2.5 mm	4	6 mm	75 mm	BLRM-030-4	53.90		
	4.0 mm	.1575	4.0 mm	15.0 mm	3.8 mm	2	6 mm	57 mm	MMBM-040-15	60.10	MMBM-040-15X	68.20
	4.0 mm	.1575	8.0 mm	30.0 mm	3.5 mm	2	6 mm	75 mm	BLRM-040-2	53.90	BLRM-040-2X	62.20
	4.0 mm	.1575	8.0 mm	30.0 mm	3.5 mm	4	6 mm	75 mm	BLRM-040-4	53.90		

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 #	USD$	Tool #	USD$
.1875		.1875	.375	2.00	.1675	4	.1875	3.0			BLR-187-4X	69.60
	5 mm	.1969	6.0 mm	11.0 mm	4.9 mm	2	6 mm	57 mm			SFBM-050-11X	71.10
	6 mm	.2362	7.5 mm	12.2 mm	5.9 mm	2	6 mm	57 mm	SFBM-060-12	62.75	SFBM-060-12X	70.90
.2500		.2500	.500	2.50	.2300	2	.2500	4.0			BLR-250-2X	84.75
.3750		.3750	.750	2.75	.3550	4	.3750	4.0	BLR-375-4	101.75		
	10 mm	.3937	18.0 mm	65.0 mm	9.5 mm	4	10 mm	120 mm			BLRM-100-4X	122.80
	12 mm	.4724	22.0 mm	80.0 mm	11.5 mm	3	12 mm	130 mm			BLRM-120-3X	169.60
	12 mm	.4724	22.0 mm	80.0 mm	11.5 mm	4	12 mm	130 mm			BLRM-120-4X	167.20

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

AECM / GEC

End Mills – Corner Radius

2, 3, 4 Flute

- 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 #	USD$	Tool #	USD$
.0312		.0312	.078	.005	2	.1250	1.5	GEC-031-2-005	30.90		
.0312		.0312	.078	.005	3	.1250	1.5	GEC-031-3-005	30.90	GEC-031-3-005X	35.15
.0312		.0312	.078	.005	4	.1250	1.5			GEC-031-4-005X	35.15
	1 mm	.0394	4 mm	0.1 mm	4	4 mm	50 mm			AECM-0101-4X	38.85
	1 mm	.0394	4 mm	0.2 mm	4	4 mm	50 mm			AECM-0102-4X	38.85
.0625		.0625	.188	.005	2	.1250	1.5	GEC-062-2-005	27.70		
.0625		.0625	.188	.005	3	.1250	1.5			GEC-062-3-005X	31.70
.0625		.0625	.188	.005	4	.1250	1.5			GEC-062-4-005X	32.25
.0625		.0625	.188	.010	3	.1250	1.5	GEC-062-3-010	27.70	GEC-062-3-010X	32.25
.0625		.0625	.188	.010	4	.1250	1.5	GEC-062-4-010	27.70	GEC-062-4-010X	32.25
	2 mm	.0787	5 mm	0.2 mm	4	4 mm	50 mm			AECM-0202-4X	38.85
	2 mm	.0787	5 mm	0.5 mm	4	4 mm	50 mm			AECM-0205-4X	38.85
.0938		.0938	.375	.005	4	.1250	1.5			GEC-093-4-005X	32.25
.0938		.0938	.375	.010	2	.1250	1.5	GEC-093-2-010	27.70		
.0938		.0938	.375	.010	3	.1250	1.5	GEC-093-3-010	27.70	GEC-093-3-010X	32.25
.0938		.0938	.375	.010	4	.1250	1.5			GEC-093-4-010X	32.25
	3 mm	.1181	8 mm	0.5 mm	4	6 mm	57 mm			AECM-0305-4X	51.40
.1250		.1250	.500	.010	3	.1250	1.5	GEC-125-3-010	27.70	GEC-125-3-010X	32.25
.1250		.1250	.500	.010	4	.1250	1.5	GEC-125-4-010	27.70	GEC-125-4-010X	32.25
.1250		.1250	.500	.020	2	.1250	1.5			GEC-125-2-020X	32.25
.1250		.1250	.500	.020	3	.1250	1.5	GEC-125-3-020	27.70	GEC-125-3-020X	32.25
.1250		.1250	.500	.020	4	.1250	1.5	GEC-125-4-020	27.70	GEC-125-4-020X	32.25
	4 mm	.1575	11 mm	0.2 mm	4	6 mm	57 mm			AECM-0402-4X	51.40
.1875		.1875	.625	.010	4	.1875	2.0			GEC-187-4-010X	44.05
.1875		.1875	.625	.030	2	.1875	2.0	GEC-187-2-030	39.50		
.1875		.1875	.625	.030	3	.1875	2.0	GEC-187-3-030	39.50		
.1875		.1875	.625	.030	4	.1875	2.0			GEC-187-4-030X	44.05
	6 mm	.2362	16 mm	0.3 mm	4	6 mm	57 mm			AECM-0603-4X	51.40
	6 mm	.2362	16 mm	0.5 mm	4	6 mm	57 mm	AECM-0605-4	43.10	AECM-0605-4X	51.40
	6 mm	.2362	16 mm	1.0 mm	4	6 mm	57 mm			AECM-0610-4X	51.40

*.0005" / .013 mm max TIR

Continued on next page

End Mills – Corner Radius

2, 3, 4 Flute (cont.)

AECM / GEC

Continued from previous page

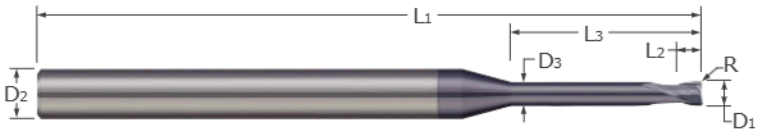
Cutter Diameter*			Length of Cut	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D_1 +.0000" −.0020"	(h9)	decimal equiv.	L_2 +.031" −.000" +.79 mm −.00 mm	R +.0000" −.0005" +.000 mm −.013 mm		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.2500		.2500	.750	.010	4	.2500	2.5	GEC-250-4-010	49.55	GEC-250-4-010X	57.95
.2500		.2500	.750	.020	3	.2500	2.5			GEC-250-3-020X	57.95
.2500		.2500	.750	.020	4	.2500	2.5			GEC-250-4-020X	57.95
.2500		.2500	.750	.030	3	.2500	2.5	GEC-250-3-030	49.55	GEC-250-3-030X	57.95
.2500		.2500	.750	.030	4	.2500	2.5	GEC-250-4-030	49.55	GEC-250-4-030X	57.95
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 #	USD$	Tool #	USD$
.3125		.3125	.813	.010	4	.3125	2.5	GEC-312-4-010	57.70	GEC-312-4-010X	68.25
	8 mm	.3150	22 mm	1.0 mm	2	8 mm	63 mm	AECM-0810-2	53.00		
.3750		.3750	.875	.010	2	.3750	2.5	GEC-375-2-010	65.60		
.3750		.3750	.875	.010	4	.3750	2.5	GEC-375-4-010	65.60	GEC-375-4-010X	77.10
.3750		.3750	.875	.030	3	.3750	2.5	GEC-375-3-030	65.60	GEC-375-3-030X	77.10
.3750		.3750	.875	.030	4	.3750	2.5			GEC-375-4-030X	77.10
	10 mm	.3937	25 mm	0.5 mm	4	10 mm	72 mm	AECM-1005-4	62.55		
	12 mm	.4724	30 mm	1.5 mm	4	12 mm	83 mm			AECM-1215-4X	117.90
.5000		.5000	1.000	.010	4	.5000	3.0	GEC-500-4-010	113.50	GEC-500-4-010X	127.10
.5000		.5000	1.000	.030	3	.5000	3.0	GEC-500-3-030	113.50		
.6250		.6250	1.250	.090	2	.6250	3.5	GEC-625-2-090	200.60		
1.0000		1.0000	1.500	.060	2	1.0000	4.0	GEC-001-2-060	463.45		

*.0005" / .013 mm max TIR

MMRM

End Mills – Corner Radius

2 Flute – Reduced Neck



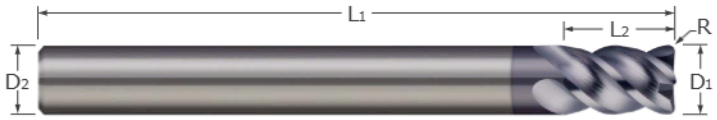
- Designed for mold making applications
- Manufactured to tighter cutter diameter tolerance (h8) for mold making applications
- Long reach for deep pocket milling
- Reduced neck diameter to avoid heeling
- Corner radius profile
- 30° helix ■ Center cutting
- AlTiN coating option for added lubricity and 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 #	USD$	Tool #	USD$
0.8 mm	0.8 mm	0.1 mm	10 mm	0.78 mm	4 mm	50 mm	MMRM-008-10	49.30	MMRM-008-10X	54.20
1.5 mm	1.5 mm	0.15 mm	7 mm	1.45 mm	6 mm	57 mm	MMRM-015-7	54.55		
1.5 mm	1.5 mm	0.15 mm	15 mm	1.45 mm	6 mm	57 mm	MMRM-015-15	54.55		
1.5 mm	1.5 mm	0.15 mm	25 mm	1.45 mm	6 mm	72 mm	MMRM-015-25	54.55	MMRM-015-25X	62.80
4 mm	4 mm	0.25 mm	15 mm	3.8 mm	6 mm	57 mm			MMRM-040-15X	62.80

*.0005" / .013 mm max TIR

End Mills For Hardened Steels

HMCM
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 #	USD$	Tool #	USD$
3 mm	8 mm	0.5 mm	6 mm	57 mm			HMCM-0305-4X	123.00
4 mm	11 mm	0.5 mm	6 mm	57 mm	HMCM-0405-4	115.15		
8 mm	19 mm	2.0 mm	8 mm	75 mm	HMCM-0820-4	133.95		
10 mm	22 mm	0.5 mm	10 mm	80 mm	HMCM-1005-4	147.50		
12 mm	26 mm	0.5 mm	12 mm	100 mm			HMCM-1205-4X	203.45
20 mm	38 mm	2.0 mm	20 mm	125 mm	HMCM-2020-4	546.45		

*.0005" / .013 mm max TIR

MEF / MEFM

End Mills For Steels & High Temp Alloys

Square – 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
- 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 #	USD$	Tool #	USD$
	0.1 mm	.0039	0.15 mm	(1.5x)	2	3 mm	38 mm			MEFM-001-015K	120.25
.0100		.0100	.015	(1.5x)	2	.1250	1.5	MEF-010-015	67.65		
	0.3 mm	.0118	0.45 mm	(1.5x)	2	3 mm	38 mm	MEFM-003-045	67.65		
.0150		.0150	.023	(1.6x)	2	.1250	1.5	MEF-015-023	60.10	MEF-015-023K	66.15
.0150		.0150	.023	(1.6x)	3	.1250	1.5	MEF-015-023-3	60.10	MEF-015-023-3K	66.15
	0.4 mm	.0157	0.6 mm	(1.5x)	2	3 mm	38 mm	MEFM-004-060	60.10		
.0300		.0300	.045	(1.5x)	2	.1250	1.5	MEF-030-045	38.65		
.0300		.0300	.045	(1.5x)	3	.1250	1.5	MEF-030-045-3	38.65	MEF-030-045-3K	44.75
.0313		.0313	.047	(1.6x)	2	.1250	1.5			MEF-031-047K	44.75
.0313		.0313	.047	(1.6x)	3	.1250	1.5			MEF-031-047-3K	44.75
.0400		.0400	.060	(1.5x)	2	.1250	1.5			MEF-040-060K	44.75
.0500		.0500	.075	(1.5x)	2	.1250	1.5	MEF-050-075	38.65		
.0500		.0500	.075	(1.5x)	3	.1250	1.5			MEF-050-075-3K	44.75
	4 mm	.1575	5 mm	(1.3x)	2	6 mm	57 mm			MEFM-040-500K	59.75
.1875		.1875	.200	(1.1x)	2	.2500	2.5			MEF-187-250K	63.95

D_1 +.0000" −.0010"	decimal equiv.	L_2 +.015" −.000"		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.2500	.2500	.250	2	.2500	2.5			MEF-250-250K	59.75

*.0005" / .013 mm max TIR

End Mills For Steels & High Temp Alloys

Square – 2 & 3 Flute – Long Reach, 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
- 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			L2	L3	D3		D2 (h6)	L1	Tool #	USD$	Tool #	USD$
+.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	+.015" −.000" +.38 mm −.00 mm	+.010" −.010" +.25 mm −.00 mm								
.0100		.0100	.015	.050 (5x)	.009	2	.1250	1.5	MEF-010-050	76.65		
.0100		.0100	.015	.075 (7.5x)	.009	3	.1250	1.5	MEF-010-075-3	76.65		
.0150		.0150	.023	.100 (6.7x)	.014	3	.1250	1.5	MEF-015-100-3	68.90		
.0150		.0150	.023	.200 (13.4x)	.014	3	.1250	1.5	MEF-015-200-3	70.85		
.0200		.0200	.030	.250 (12.5x)	.019	2	.1250	1.5	MEF-020-250	52.90		
.0200		.0200	.030	.250 (12.5x)	.019	3	.1250	1.5	MEF-020-250-3	52.90		
.0250		.0250	.038	.250 (10x)	.024	3	.1250	1.5	MEF-025-250-3	52.90	MEF-025-250-3K	58.95
.0250		.0250	.038	.250 (10x)	.024	2	.1250	1.5	MEF-025-250	52.90		
.0300		.0300	.045	.200 (6.7x)	.028	2	.1250	1.5	MEF-030-200	49.30		
.0313		.0313	.047	.100 (3.2x)	.029	2	.1250	1.5			MEF-031-100K	53.70
.0313		.0313	.047	.200 (6.4x)	.029	2	.1250	1.5	MEF-031-200	49.30		
.0313		.0313	.047	.375 (12x)	.029	2	.1250	1.5	MEF-031-375	54.70		
.0350		.0350	.053	.150 (4.3x)	.033	2	.1250	1.5	MEF-035-150	47.60		
	1 mm	.0394	1.5 mm	7 mm (7x)	0.95 mm	2	3 mm	38 mm	MEFM-010-700	55.65		
.0400		.0400	.060	.250 (6.3x)	.038	3	.1250	1.5	MEF-040-250-3	49.30		
.0450		.0450	.068	.150 (3.4x)	.043	2	.1250	1.5			MEF-045-150K	53.70
.0450		.0450	.068	.500 (11.2x)	.043	3	.1250	1.5			MEF-045-500-3K	64.30
.0469		.0469	.071	.250 (5.4x)	.045	2	.1250	1.5			MEF-047-250K	55.90
.0469		.0469	.071	.500 (10.7x)	.045	2	.1250	1.5	MEF-047-500	58.25		
.0500		.0500	.075	.200 (4x)	.048	3	.1250	1.5			MEF-050-200-3K	53.70
.0500		.0500	.075	.550 (11x)	.048	3	.1250	1.5			MEF-050-550-3K	64.80
	1.5 mm	.0591	2.2 mm	10 mm (6.7x)	1.4 mm	2	3 mm	38 mm	MEFM-015-1000	62.85		
	1.5 mm	.0591	2.2 mm	12 mm (8x)	1.4 mm	2	3 mm	38 mm	MEFM-015-1200	67.65		
.0600		.0600	.090	.500 (8.4x)	.056	3	.1250	1.5	MEF-060-500-3	58.25		
.0625		.0625	.093	.200 (3.2x)	.058	2	.1250	1.5	MEF-062-200	47.60	MEF-062-200K	53.70
.0625		.0625	.093	.350 (5.6x)	.058	2	.1250	1.5			MEF-062-350K	57.10
.0625		.0625	.093	.350 (5.6x)	.058	3	.1250	1.5			MEF-062-350-3K	57.10
.0625		.0625	.093	.550 (8.8x)	.058	2	.1250	1.5	MEF-062-550	58.25	MEF-062-550K	64.30
.0625		.0625	.093	.750 (12x)	.058	2	.1250	2.0	MEF-062-750	67.40		
.0625		.0625	.093	.750 (12x)	.058	3	.1250	2.0			MEF-062-750-3K	73.45

*.0005" / .013 mm max TIR

Continued on next page

MEF / MEFM

End Mills For Steels & High Temp Alloys

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

Continued from previous page

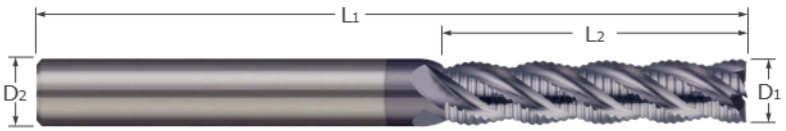
Cutter Diameter*			Length of Cut	Overall Reach		Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	L_3 +.010" −.010" +.25 mm −.00 mm		D_3		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.0750		.0750	.113	.250	(3.4x)	.071	2	.1250	1.5	MEF-075-250	47.60		
.0750		.0750	.113	.400	(5.4x)	.071	3	.1250	1.5	MEF-075-400-3	51.05		
.0750		.0750	.113	.900	(12x)	.071	2	.1250	2.0			MEF-075-900K	76.10
.0781		.0781	.117	.250	(3.3x)	.074	2	.1250	1.5	MEF-078-250	47.60	MEF-078-250K	53.70
.0781		.0781	.117	.650	(8.4x)	.074	2	.1250	2.0	MEF-078-650	58.25		
.0781		.0781	.117	.900	(11.6x)	.074	3	.1250	2.0	MEF-078-900-3	70.05		
	2 mm	.0787	2.5 mm	7 mm	(3.5x)	1.9 mm	2	3 mm	38 mm	MEFM-020-700	55.65		
	2 mm	.0787	2.5 mm	20 mm	(10x)	1.9 mm	2	3 mm	50 mm	MEFM-020-2000	89.60		
.0900		.0900	.125	.400	(4.5x)	.086	2	.1250	1.5	MEF-090-400	51.05		
.0938		.0938	.125	.250	(2.7x)	.089	2	.1250	1.5	MEF-093-250	47.60		
.0938		.0938	.125	1.000	(10.7x)	.089	2	.1250	2.0	MEF-093-1000	67.40		
	3 mm	.1181	3 mm	15 mm	(5x)	2.9 mm	2	6 mm	57 mm	MEFM-030-1500	73.45		
.1250		.1250	.125	1.000	(8x)	.121	2	.1875	2.0	MEF-125-1000	67.40		
.1250		.1250	.125	1.500	(12x)	.121	2	.1875	3.0	MEF-125-1500	77.00		
.1875		.1875	.200	1.000	(5.4x)	.183	2	.2500	2.5			MEF-187-1000K	94.85

*.0005" / .013 mm max TIR

End Mills For Steels & High Temp Alloys

Square – 4 Flute – Chipbreaker Rougher

SHR / SHRM
SHL / SHLM



- 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 #	USD$	Tool #	USD$
.2500		.2500	.750	4	.2500	2.5			SHR-250-4X	74.00
.2500		.2500	1.125	4	.2500	3.0			SHL-250-4X	91.55
.3125		.3125	.813	4	.3125	2.5			SHR-312-4X	84.90
.3125		.3125	1.125	4	.3125	3.0			SHL-312-4X	105.80
	8 mm	.3150	22 mm	4	8 mm	63 mm			SHRM-080-4X	80.45
.3750		.3750	.875	4	.3750	2.5	SHR-375-4	92.40	SHR-375-4X	103.65
.3750		.3750	1.250	4	.3750	3.0			SHL-375-4X	130.85
	10 mm	.3937	25 mm	4	10 mm	72 mm			SHRM-100-4X	104.75
	10 mm	.3937	38 mm	4	10 mm	100 mm			SHLM-100-4X	138.20
	12 mm	.4724	50 mm	4	12 mm	100 mm			SHLM-120-4X	185.30
.5000		.5000	1.000	4	.5000	3.0	SHR-500-4	134.90	SHR-500-4X	148.40
.5000		.5000	2.000	4	.5000	4.5			SHL-500-4X	190.50
.6250		.6250	1.250	4	.6250	3.5	SHR-625-4	239.75	SHR-625-4X	260.90
.6250		.6250	2.500	4	.6250	5.0			SHL-625-4X	328.65
	16 mm	.6299	35 mm	4	16 mm	92 mm			SHRM-160-4X	243.20
.7500		.7500	1.500	4	.7500	4.0			SHR-750-4X	359.90
.7500		.7500	2.500	4	.7500	5.0			SHL-750-4X	455.45

*.0005" / .013 mm max TIR

ASM / ASMM
ARM / ARMM

End Mills For Steels & High Temp Alloys

Square – 5 Flute – Stub & Standard

- 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	
D_1 +.0000" −.0020"	(h9)	decimal equiv.	L_2 +.031" −.000" +.79 mm −.00 mm		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
	3 mm	.1181	6 mm	5	6 mm	57 mm	ASMM-030-5	46.20	ASMM-030-5X	54.95
	4 mm	.1575	15 mm	5	6 mm	57 mm	ARMM-040-5	48.75		
.1875		.1875	.625	5	.1875	2.0	ARM-187-5	41.30		

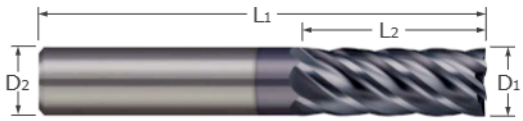
D_1 +.0000" −.0030"	(h9)	decimal equiv.	L_2 +.031" −.000" +.79 mm −.00 mm		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
	8 mm	.3150	16 mm	5	8 mm	63 mm	ASMM-080-5	54.95		
.3750		.3750	.625	5	.3750	2.0	ASM-375-5	64.05		
	10 mm	.3937	19 mm	5	10 mm	72 mm	ASMM-100-5	65.05		
	10 mm	.3937	25 mm	5	10 mm	72 mm	ARMM-100-5	68.05	ARMM-100-5X	79.75
.5000		.5000	.625	5	.5000	2.5	ASM-500-5	100.65	ASM-500-5X	114.30
.5000		.5000	1.000	5	.5000	3.0			ARM-500-5X	127.40

*.0005" / .013 mm max TIR

End Mills For Steels & High Temp Alloys

Square – 4 & 6 Flute

EMH / EMHM



- 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 #	USD$	Tool #	USD$
	6 mm	.2362	18 mm	6	6 mm	57 mm	EMHM-060-6	38.90		

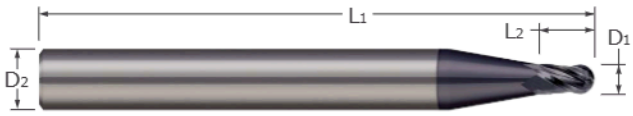
D_1 +.0000" −.0003"	(h9)	decimal equiv.	L_2 +.030" −.000" +.78 mm −.00 mm		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
	8 mm	.3150	20 mm	4	8 mm	63 mm	EMHM-080-4	48.35	EMHM-080-4X	60.00
	10 mm	.3937	22 mm	6	10 mm	72 mm			EMHM-100-6X	68.00
	14 mm	.5512	30 mm	6	14 mm	83 mm	EMHM-140-6	110.35		
	16 mm	.6299	35 mm	6	16 mm	92 mm			EMHM-160-6X	182.90

*.0005" / .013 mm max TIR

BEF / BEFM

End Mills For Steels & High Temp Alloys

Ball – 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
- 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

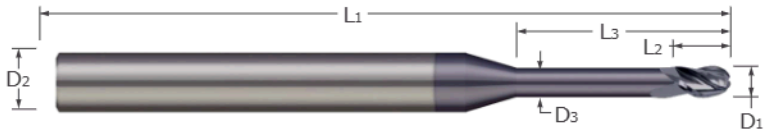
Cutter Diameter*			Length of Cut		Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm			D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.0150		.0150	.023	(1.6x)	2	.1250	1.5			BEF-015-023K	77.75
.0313		.0313	.047	(1.6x)	3	.1250	1.5	BEF-031-047-3	45.85		
.0400		.0400	.060	(1.5x)	2	.1250	1.5			BEF-040-060K	51.95
.0400		.0400	.060	(1.5x)	3	.1250	1.5	BEF-040-060-3	45.85		
	1.2 mm	.0472	1.8 mm	(1.5x)	2	3 mm	38 mm			BEFM-012-180K	49.00
.0500		.0500	.075	(1.5x)	3	.1250	1.5			BEF-050-075-3K	51.95
.0600		.0600	.090	(1.5x)	3	.1250	1.5	BEF-060-090-3	45.85	BEF-060-090-3K	51.95
.0625		.0625	.093	(1.5x)	3	.1250	1.5	BEF-062-093-3	45.85		
.0750		.0750	.113	(1.6x)	3	.1250	1.5			BEF-075-113-3K	51.95
.0900		.0900	.125	(1.4x)	2	.1250	1.5			BEF-090-125K	51.95
.0938		.0938	.125	(1.4x)	2	.1250	1.5	BEF-093-125	45.85		
	2.5 mm	.0984	3 mm	(1.2x)	2	3 mm	38 mm	BEFM-025-300	45.85		
.1875		.1875	.200	(1.1x)	2	.2500	2.5			BEF-187-250K	74.95
	5 mm	.1969	6 mm	(1.2x)	2	6 mm	57 mm	BEFM-050-600	66.15	BEFM-050-600K	74.95

*.0005" / .013 mm max TIR

End Mills For Steels & High Temp Alloys

Ball – 2 & 3 Flute – Long Reach, 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
- 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	
D1 +.0000" −.0005"	+.000 mm −.013 mm	decimal equiv.	L2 +.015" −.000"	+.38 mm −.00 mm	L3 +.010" −.000"	+.25 mm −.00 mm	D3		D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.0150		.0150	.023	(1.6x)	.200	(13.4x)	.014	2	.1250	1.5	BEF-015-200	81.05		
	0.5 mm	.0197	0.7 mm	(1.4x)	3 mm	(6x)	0.45 mm	2	3 mm	38 mm	BEFM-005-300	58.70		
	0.5 mm	.0197	0.7 mm	(1.4x)	6 mm	(12x)	0.45 mm	2	3 mm	38 mm			BEFM-005-600K	68.90
.0200		.0200	.030	(1.5x)	.150	(7.5x)	.019	3	.1250	1.5	BEF-020-150-3	58.70		
.0250		.0250	.038	(1.6x)	.150	(6x)	.024	2	.1250	1.5			BEF-025-150K	64.80
.0250		.0250	.038	(1.6x)	.250	(10x)	.024	2	.1250	1.5			BEF-025-250K	66.60
.0250		.0250	.038	(1.6x)	.250	(10x)	.024	3	.1250	1.5			BEF-025-250-3K	66.60
.0300		.0300	.045	(1.5x)	.125	(4.2x)	.028	2	.1250	1.5	BEF-030-100	54.70		
.0300		.0300	.045	(1.5x)	.200	(6.7x)	.028	3	.1250	1.5	BEF-030-200-3	56.45		
.0313		.0313	.047	(1.6x)	.375	(12x)	.029	3	.1250	1.5	BEF-031-375-3	61.70		
.0350		.0350	.053	(1.6x)	.400	(11.5x)	.033	2	.1250	1.5	BEF-035-400	61.70		
.0400		.0400	.060	(1.5x)	.250	(6.3x)	.038	3	.1250	1.5			BEF-040-250-3K	62.55
.0400		.0400	.060	(1.5x)	.500	(12.5x)	.038	2	.1250	1.5			BEF-040-500K	71.80
.0400		.0400	.060	(1.5x)	.500	(12.5x)	.038	3	.1250	1.5	BEF-040-500-3	65.45		
.0450		.0450	.068	(1.6x)	.500	(11.2x)	.043	3	.1250	1.5	BEF-045-500-3	65.45		
.0469		.0469	.071	(1.6x)	.250	(5.4x)	.045	2	.1250	1.5	BEF-047-250	56.45		
.0500		.0500	.075	(1.5x)	.200	(4x)	.048	2	.1250	1.5			BEF-050-200K	60.90
.0500		.0500	.075	(1.5x)	.300	(6x)	.048	2	.1250	1.5	BEF-050-300	56.45	BEF-050-300K	62.55
.0500		.0500	.075	(1.5x)	.300	(6x)	.048	3	.1250	1.5			BEF-050-300-3K	62.55
.0500		.0500	.075	(1.5x)	.550	(11x)	.048	3	.1250	1.5			BEF-050-550-3K	71.50
	1.5 mm	.0591	2.2 mm	(1.5x)	6 mm	(4x)	1.4 mm	2	3 mm	38 mm	BEFM-015-600	56.45	BEFM-015-600K	62.55
.0625		.0625	.093	(1.5x)	.550	(8.8x)	.058	3	.1250	1.5			BEF-062-550-3K	71.50
.0625		.0625	.093	(1.5x)	.750	(12x)	.058	2	.1250	2.0	BEF-062-750	74.30		
.0781		.0781	.117	(1.5x)	.400	(5.2x)	.074	2	.1250	1.5	BEF-078-400	65.45		
.0781		.0781	.117	(1.5x)	.400	(5.2x)	.074	3	.1250	1.5			BEF-078-400-3K	71.50
.0781		.0781	.117	(1.5x)	.650	(8.4x)	.074	2	.1250	2.0			BEF-078-650K	78.70
.0781		.0781	.117	(1.5x)	.650	(8.4x)	.074	3	.1250	2.0			BEF-078-650-3K	78.70

*.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 #	USD$	Tool #	USD$
	2 mm	.0787	2.5 mm	(1.3x)	25 mm	(12.5x)	1.9 mm	2	3 mm	50 mm	BEFM-020-2500	99.60		
.0938		.0938	.125	(1.4x)	.250	(2.7x)	.089	2	.1250	1.5	BEF-093-250	54.70		
.0938		.0938	.125	(1.4x)	.750	(8x)	.089	2	.1250	2.0			BEF-093-750K	80.45
.0938		.0938	.125	(1.4x)	1.000	(10.7x)	.089	2	.1250	2.0			BEF-093-1000K	84.50
.1250		.1250	.125	(1x)	1.000	(8x)	.121	2	.1875	2.0	BEF-125-1000	78.40		
.1250		.1250	.125	(1x)	1.500	(12x)	.121	2	.1875	3.0	BEF-125-1500	84.20		
.1875		.1875	.200	(1.1x)	1.000	(5.4x)	.183	2	.2500	2.5	BEF-187-1000	86.05		
.1875		.1875	.200	(1.1x)	1.500	(8x)	.183	2	.2500	3.0			BEF-187-1500K	107.70

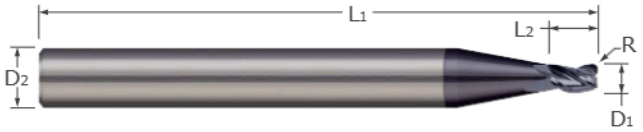
D_1 +.0000" −.0010"	decimal equiv.	L_2 +.015" −.000"		L_3 +.010" −.000"		D_3		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.2500	.2500	.250	(1x)	1.000	(4x)	.246	2	.2500	2.5	BEF-250-1000	86.05		

*.0005" / .013 mm max TIR

End Mills For Steels & High Temp Alloys

Corner Radius – 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
- 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 #	USD$	Tool #	USD$
.0200		.0200	.030	(1.5x)	.002	3	.1250	1.5			MEF-020-030-3-002K	56.20
.0300		.0300	.045	(1.5x)	.010	2	.1250	1.5	MEF-030-045-010	45.85	MEF-030-045-010K	51.95
.0300		.0300	.045	(1.5x)	.010	3	.1250	1.5			MEF-030-045-3-010K	52.20
.0400		.0400	.060	(1.5x)	.005	2	.1250	1.5	MEF-040-060-005	45.85		
.0450		.0450	.068	(1.6x)	.005	2	.1250	1.5			MEF-045-068-005K	51.95
.0500		.0500	.075	(1.5x)	.005	2	.1250	1.5			MEF-050-075-005K	51.95
	1.5 mm	.0591	2.2 mm	(1.5x)	0.15 mm	2	3 mm	38 mm	MEFM-015-220-15	45.85		
.0625		.0625	.093	(1.5x)	.015	2	.1250	1.5	MEF-062-093-015	45.85	MEF-062-093-015K	51.95
.0781		.0781	.117	(1.5x)	.005	2	.1250	1.5			MEF-078-117-005K	51.95
.0781		.0781	.117	(1.5x)	.005	3	.1250	1.5			MEF-078-117-3-005K	51.95
.0781		.0781	.117	(1.5x)	.010	2	.1250	1.5	MEF-078-117-010	45.85		
.0938		.0938	.125	(1.4x)	.005	2	.1250	1.5	MEF-093-125-005	45.85		
.0938		.0938	.125	(1.4x)	.010	2	.1250	1.5			MEF-093-125-010K	51.95
.1250		.1250	.125	(1x)	.005	2	.1875	2.0			MEF-125-125-005K	56.20
	4 mm	.1575	5 mm	(1.3x)	0.25 mm	2	6 mm	57 mm	MEFM-040-500-25	66.15		

*.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 #	USD$	Tool #	USD$
.0150	.0150	.023	(1.6x)	.002	.200	(13.4x)	.014	2	.1250	1.5	MEF-015-200-002	81.05		
.0150	.0150	.023	(1.6x)	.002	.200	(13.4x)	.014	3	.1250	1.5			MEF-015-200-3-002K	87.10
0.5 mm	.0197	0.7 mm	(1.4x)	0.05 mm	6 mm	(12x)	0.45 mm	2	3 mm	38 mm	MEFM-005-600-05	61.70		
.0200	.0200	.030	(1.5x)	.002	.150	(7.5x)	.019	2	.1250	1.5			MEF-020-150-002K	64.80
.0200	.0200	.030	(1.5x)	.002	.250	(12.5x)	.019	2	.1250	1.5	MEF-020-250-002	60.45		
.0200	.0200	.030	(1.5x)	.002	.250	(12.5x)	.019	3	.1250	1.5			MEF-020-250-3-002K	66.60
.0300	.0300	.045	(1.5x)	.005	.375	(12.5x)	.028	2	.1250	1.5			MEF-030-375-005K	67.75
.0300	.0300	.045	(1.5x)	.010	.200	(6.7x)	.028	2	.1250	1.5	MEF-030-200-010	56.45		
.0300	.0300	.045	(1.5x)	.010	.375	(12.5x)	.028	3	.1250	1.5	MEF-030-375-3-010	61.70	MEF-030-375-3-010K	67.75
.0313	.0313	.047	(1.6x)	.005	.375	(12x)	.029	3	.1250	1.5	MEF-031-375-3-005	61.70	MEF-031-375-3-005K	67.75
.0313	.0313	.047	(1.6x)	.010	.200	(6.4x)	.029	2	.1250	1.5			MEF-031-200-010K	62.55
.0313	.0313	.047	(1.6x)	.010	.375	(12x)	.029	2	.1250	1.5	MEF-031-375-010	61.70		
0.8 mm	.0315	1.2 mm	(1.5x)	0.05 mm	7 mm	(8.8x)	0.75 mm	2	3 mm	38 mm	MEFM-008-700-05	61.05		
.0350	.0350	.053	(1.6x)	.005	.150	(4.3x)	.033	2	.1250	1.5	MEF-035-150-005	54.70		
.0350	.0350	.053	(1.6x)	.010	.400	(11.5x)	.033	3	.1250	1.5	MEF-035-400-3-010	61.70		
1 mm	.0394	1.5 mm	(1.5x)	0.2 mm	7 mm	(7x)	0.95 mm	2	3 mm	38 mm			MEFM-010-700-20K	67.10
1 mm	.0394	1.5 mm	(1.5x)	0.2 mm	9 mm	(9x)	0.95 mm	2	3 mm	38 mm	MEFM-010-900-20	67.95		
.0400	.0400	.060	(1.5x)	.005	.150	(3.8x)	.038	3	.1250	1.5	MEF-040-150-3-005	54.70		
.0400	.0400	.060	(1.5x)	.005	.250	(6.3x)	.038	3	.1250	1.5			MEF-040-250-3-005K	62.55
.0400	.0400	.060	(1.5x)	.010	.250	(6.3x)	.038	3	.1250	1.5	MEF-040-250-3-010	56.45		
.0450	.0450	.068	(1.6x)	.005	.500	(11.2x)	.043	2	.1250	1.5			MEF-045-500-005K	71.50
.0450	.0450	.068	(1.6x)	.010	.500	(11.2x)	.043	3	.1250	1.5			MEF-045-500-3-010K	71.50
.0469	.0469	.071	(1.6x)	.005	.500	(10.7x)	.045	3	.1250	1.5	MEF-047-500-3-005	65.45		
.0500	.0500	.075	(1.5x)	.005	.550	(11x)	.048	2	.1250	1.5	MEF-050-550-005	65.45		
.0500	.0500	.075	(1.5x)	.010	.200	(4x)	.048	3	.1250	1.5	MEF-050-200-3-010	54.70	MEF-050-200-3-010K	60.90
.0500	.0500	.075	(1.5x)	.010	.300	(6x)	.048	3	.1250	1.5	MEF-050-300-3-010	58.25	MEF-050-300-3-010K	64.30
.0500	.0500	.075	(1.5x)	.010	.550	(11x)	.048	3	.1250	1.5	MEF-050-550-3-010	65.45		
1.5 mm	.0591	2.2 mm	(1.5x)	0.25 mm	12 mm	(8x)	1.4 mm	2	3 mm	38 mm	MEFM-015-1200-25	73.95		
.0600	.0600	.090	(1.5x)	.010	.350	(5.9x)	.056	3	.1250	1.5	MEF-060-350-3-010	58.25		
.0600	.0600	.090	(1.5x)	.015	.500	(8.4x)	.056	3	.1250	1.5	MEF-060-500-3-015	65.45		
.0600	.0600	.090	(1.5x)	.015	.750	(12.5x)	.056	2	.1250	2.0	MEF-060-750-015	74.30		

*.0005" / .013 mm max TIR

Continued on next page

End Mills For Steels & High Temp Alloys

MEF / MEFM

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

Continued from previous page

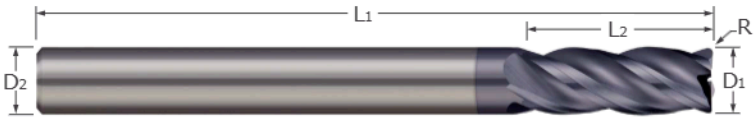
Cutter Diameter*		Length of Cut		Corner Radius	Overall Reach		Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D_1 +.0000"+.000mm −.0005"−.013mm		L_2 +.015" −.000" +.38mm −.00mm		R +.0000" −.0005" +.000mm −.013mm	L_3 +.010" −.010" +.25mm −.00mm		D_3		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.0625	.0625	.093	(1.5x)	.005	.350	(5.6x)	.058	2	.1250	1.5	MEF-062-350-005	58.25		
.0625	.0625	.093	(1.5x)	.005	.350	(5.6x)	.058	3	.1250	1.5	MEF-062-350-3-005	58.25		
.0625	.0625	.093	(1.5x)	.005	.750	(12x)	.058	2	.1250	2.0			MEF-062-750-005K	80.45
.0625	.0625	.093	(1.5x)	.010	.200	(3.2x)	.058	3	.1250	1.5	MEF-062-200-3-010	54.70		
.0625	.0625	.093	(1.5x)	.010	.350	(5.6x)	.058	2	.1250	1.5	MEF-062-350-010	58.25		
.0625	.0625	.093	(1.5x)	.010	.550	(8.8x)	.058	3	.1250	1.5	MEF-062-550-3-010	65.45		
.0625	.0625	.093	(1.5x)	.015	.200	(3.2x)	.058	2	.1250	1.5			MEF-062-200-015K	60.90
.0625	.0625	.093	(1.5x)	.015	.350	(5.6x)	.058	3	.1250	1.5	MEF-062-350-3-015	57.50	MEF-062-350-3-015K	63.55
.0750	.0750	.113	(1.6x)	.005	.400	(5.4x)	.071	3	.1250	1.5			MEF-075-400-3-005K	64.30
.0750	.0750	.113	(1.6x)	.010	.900	(12x)	.071	3	.1250	2.0	MEF-075-900-3-010	78.40		
.0750	.0750	.113	(1.6x)	.015	.600	(8x)	.071	3	.1250	2.0			MEF-075-600-3-015K	71.50
.0781	.0781	.117	(1.5x)	.010	.250	(3.3x)	.074	2	.1250	1.5	MEF-078-250-010	54.70		
.0781	.0781	.117	(1.5x)	.010	.650	(8.4x)	.074	2	.1250	2.0			MEF-078-650-010K	71.50
.0781	.0781	.117	(1.5x)	.015	.250	(3.3x)	.074	2	.1250	1.5			MEF-078-250-015K	60.90
.0781	.0781	.117	(1.5x)	.015	.900	(11.6x)	.074	3	.1250	2.0			MEF-078-900-3-015K	84.50
2 mm	.0787	2.5 mm	(1.3x)	0.15 mm	12 mm	(6x)	1.9 mm	2	3 mm	38 mm	MEFM-020-1200-15	73.95		
2 mm	.0787	2.5 mm	(1.3x)	0.25 mm	12 mm	(6x)	1.9 mm	2	3 mm	38 mm			MEFM-020-1200-25K	80.00
.0900	.0900	.125	(1.4x)	.015	.650	(7.3x)	.086	2	.1250	2.0			MEF-090-650-015K	71.50
.0938	.0938	.125	(1.4x)	.005	.750	(8x)	.089	2	.1250	2.0	MEF-093-750-005	74.30	MEF-093-750-005K	80.45
.0938	.0938	.125	(1.4x)	.005	1.000	(10.7x)	.089	2	.1250	2.0			MEF-093-1000-005K	84.50
.0938	.0938	.125	(1.4x)	.010	.250	(2.7x)	.089	2	.1250	1.5	MEF-093-250-010	54.70	MEF-093-250-010K	60.90
.0938	.0938	.125	(1.4x)	.010	.500	(5.4x)	.089	2	.1250	1.5	MEF-093-500-010	65.45		
.0938	.0938	.125	(1.4x)	.015	.250	(2.7x)	.089	2	.1250	1.5	MEF-093-250-015	54.70		
.1250	.1250	.125	(1x)	.005	.375	(3x)	.121	2	.1875	2.0			MEF-125-375-005K	65.20
.1250	.1250	.125	(1x)	.005	.750	(6x)	.121	2	.1875	2.0	MEF-125-750-005	68.90		
.1250	.1250	.125	(1x)	.005	1.000	(8x)	.121	2	.1875	2.0	MEF-125-1000-005	78.05		
.1250	.1250	.125	(1x)	.005	1.500	(12x)	.121	2	.1875	3.0	MEF-125-1500-005	84.20		
.1250	.1250	.125	(1x)	.010	.750	(6x)	.121	2	.1875	2.0			MEF-125-750-010K	75.80
.1250	.1250	.125	(1x)	.010	1.500	(12x)	.121	2	.1875	3.0	MEF-125-1500-010	84.20		

*.0005" / .013 mm max TIR

VHS / VHSM
VHM / VHMM

End Mills For Steels & High Temp Alloys

Corner Radius – 4 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
- 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 #	USD$	Tool #	USD$
	3 mm		8 mm	0.5 mm	4	4 mm	50 mm			VHMM-030-4X	33.20
	4 mm	.1575	8 mm	0.5 mm	4	4 mm	50 mm			VHSM-040-4X	41.25
	5 mm	.1969	16 mm	0.5 mm	4	6 mm	57 mm	VHMM-050-4	47.90		

D1 +.0000" −.0030"	(h9)	decimal equiv.	L2 +.031" −.000" +.79 mm −.00 mm	R +.0000" −.0005" +.000 mm −.013 mm		D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.2500		.2500	.500	.020	4	.2500	2.5			VHS-250-4X	51.00
	10 mm	.3937	22 mm	0.6 mm	4	10 mm	72 mm			VHMM-100-4X	82.80
.4375		.4375	1.000	.020	4	.4375	2.5	VHM-437-4	98.05	VHM-437-4X	112.70
	12 mm	.4724	22 mm	0.6 mm	4	12 mm	83 mm			VHSM-120-4X	109.75
	12 mm	.4724	26 mm	0.6 mm	4	12 mm	83 mm			VHMM-120-4X	119.85
.5000		.5000	1.250	.030	4	.5000	3.5	VHM-5125-4	114.20		
	25 mm	.9843	38 mm	0.8 mm	4	25 mm	127 mm			VHMM-250-4X	512.30

*.0005" / .013 mm max TIR

End Mills For Steels & High Temp Alloys

VLM

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

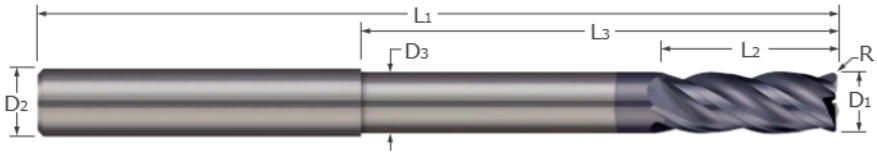
Cutter Diameter	Length of Cut	Corner Radius	Flutes	Shank Dia.	Overall Length	AlTiN Coated		nACRo® Coated	
D1 +.0000" −.0020"	L2 +.030" −.000"	R +.0000" −.0005"		D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.1875	.750	.0100	4	.1875	2.5	VLM-187-4X	55.00		

D1 +.0000" −.0030"	L2 +.030" −.000"	R +.0000" −.0005"		D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.3750	1.250	.0200	5	.3750	3.0			VLM-375-5-020K	103.05

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	
D1 +.0000" −.0020"	(h9)	decimal equiv.	L2 +.010" −.000" +.25 mm −.00 mm	R +.0000" −.0005" +.000mm −.013mm	L3 +.015" −.000" +.38 mm −.00 mm	D3		D2 (h6)	L1	Tool #	USD$	Tool #	USD$
6 mm		.2362	8 mm (1.4x)	0.5 mm	30 mm (5x)	5.49 mm	4	6 mm	75 mm			VLRM-060-4X	89.55

D1 +.0000" −.0030"	(h9)	decimal equiv.	L2 +.010" −.000" +.25 mm −.00 mm	R +.0000" −.0005" +.000mm −.013mm	L3 +.015" −.000" +.38 mm −.00 mm	D3		D2 (h6)	L1	Tool #	USD$	Tool #	USD$
.3750		.3750	.750 (2x)	.020	2.750 (7.4x)	.355	4	.3750	4.0			VLR-375-4X	131.60
.5000		.5000	1.000 (2x)	.030	4.500 (9x)	.480	4	.5000	6.0			VLR-500-4X	236.90
.6250		.6250	1.250 (2x)	.030	4.500 (7.2x)	.605	4	.6250	6.0	VLR-625-4	334.10		

*.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

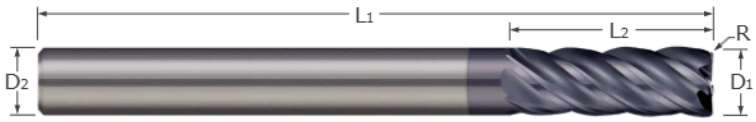
Cutter Diameter	Length of Cut	Corner Radius	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D_1 $^{+.0000''}_{-.0020''}$	L_2 $^{+.030''}_{-.000''}$	R $^{+.0000''}_{-.0005''}$		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.1875	.625	.0100	5	.1875	2.0	ARC-187-5-010	47.75		
.1875	.625	.0300	5	.1875	2.0	ARC-187-5-030	47.75		

D_1 $^{+.0000''}_{-.0030''}$	L_2 $^{+.030''}_{-.000''}$	R $^{+.0000''}_{-.0005''}$		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.3750	.875	.0600	5	.3750	2.5	ARC-375-5-060	75.40		
.5000	1.000	.0100	5	.5000	3.0	ARC-500-5-010	130.25		
.6250	1.250	.0900	5	.6250	3.5			ARC-625-5-090X	240.95
.7500	1.500	.0200	5	.7500	4.0			ARC-750-5-020X	356.05

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 #	USD$	Tool #	USD$
	3 mm	.1181	6 mm	0.3 mm	5	4 mm	50 mm			VHSM-030-5K	35.05
	4 mm	.1575	8 mm	0.3 mm	5	4 mm	50 mm	VHSM-040-5	39.95		
	4 mm	.1575	11 mm	0.3 mm	5	4 mm	50 mm	VHMM-040-5	44.30		
	6 mm	.2362	10 mm	0.5 mm	5	6 mm	57 mm	VHSM-060-5	47.25	VHSM-060-5K	56.10

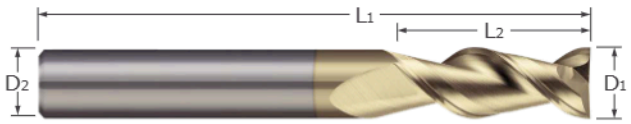
D_1 +.0000" −.0030"	(h9)	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	R +.0000" −.0005" +.000 mm −.013 mm		D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.3750		.3750	.625	.020	5	.3750	2.5			VHS-375-5-020K	77.90
.3750		.3750	.875	.020	5	.3750	2.5			VHM-375-5-020K	85.05
	12 mm	.4724	22 mm	0.5 mm	5	12 mm	83 mm	VHSM-120-5	98.45		
	12 mm	.4724	26 mm	0.5 mm	5	12 mm	83 mm			VHMM-120-5K	127.45
.5000		.5000	.625	.030	5	.5000	3.0			VHS-500-5-030K	123.30
.5000		.5000	.625	.090	5	.5000	3.0	VHS-500-5-090	106.50		
.7500		.7500	1.500	.125	5	.7500	4.0	VHM-750-5-125	328.25		

*.0005" / .013 mm max TIR

ASM / ASMM
ARM / ARMM

End Mills For Aluminum Alloys

Square – 2 & 3 Flute – Stub & Standard



- 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

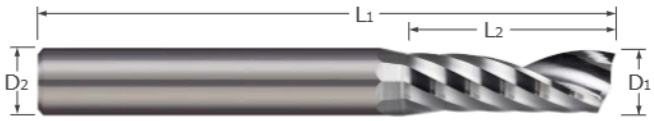
Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		ZrN Coated	
D1			L2		D2 (h6)	L1				
+.0000" −.0030"	+.00 mm −.08 mm	decimal equiv.	+.030" −.000" +.51 mm −.00 mm				Tool #	USD$	Tool #	USD$
.2813		.2813	.750	2	.3125	2.5	ARM-281-2	55.65		
	8 mm	.3150	25 mm	2	8 mm	63 mm			ARMM-080-2S	68.05
	8 mm	.3150	25 mm	3	8 mm	63 mm	ARMM-080-3	55.65		
	12 mm	.4724	30 mm	3	12 mm	83 mm	ARMM-120-3	104.25		
.5000		.5000	.625	2	.5000	2.5			ASM-500-2S	115.25
.5000		.5000	1.250	3	.5000	3.5	ARM-5125-3	114.45		
	16 mm	.6299	35 mm	2	16 mm	92 mm	ARMM-160-2	194.35		

*.0005" / .013 mm max TIR

End Mills For Aluminum Alloys

Square – Single Flute – Upcut Router

SFA / SFAM



- 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 #	USD$
.0625		.0625	.250	.1250	1.5	SFA-062-22	47.35
.0625		.0625	.250	.2500	2.0	SFA-062-42	55.80
	2 mm	.0787	6 mm	6 mm	57 mm	SFAM-020020	52.35
	3 mm	.1181	12 mm	6 mm	57 mm	SFAM-030020	52.35
.1250		.1250	.250	.1250	1.5	SFA-125-22	41.85
.1250		.1250	.250	.2500	2.0	SFA-125-42	48.75
.1250		.1250	.500	.1250	1.5	SFA-125-24	41.85
.1250		.1250	.500	.2500	2.0	SFA-125-44	48.75
.1562		.1562	.625	.2500	2.0	SFA-156-45	48.75
	4 mm	.1575	16 mm	6 mm	57 mm	SFAM-040020	52.35
.1875		.1875	.500	.1875	2.0	SFA-187-33	46.20
.1875		.1875	.500	.2500	2.0	SFA-187-44	48.75
.1875		.1875	.625	.1875	2.0	SFA-187-35	46.20
.1875		.1875	.625	.2500	2.0	SFA-187-45	48.75
	5 mm	.1969	20 mm	6 mm	57 mm	SFAM-050025	52.35
.2188		.2188	.750	.2500	2.5	SFA-218-46	48.75
	6 mm	.2362	20 mm	6 mm	100 mm	SFAM-060100	78.40
	6 mm	.2362	25 mm	6 mm	57 mm	SFAM-060030	52.35
.2500		.2500	.375	.2500	2.5	SFA-250-43	48.75
.2500		.2500	.750	.2500	2.5	SFA-250-46	48.75
.2500		.2500	1.250	.2500	3.0	SFA-250-410	54.95
	8 mm	.3150	20 mm	8 mm	100 mm	SFAM-080100	100.25
	8 mm	.3150	30 mm	8 mm	75 mm	SFAM-080040	80.35
.3750		.3750	1.125	.3750	3.0	SFA-375-69	73.00
	10 mm	.3937	25 mm	10 mm	120 mm	SFAM-100100	122.10
	10 mm	.3937	35 mm	10 mm	90 mm	SFAM-100050	106.80
	12 mm	.4724	40 mm	12 mm	90 mm	SFAM-120050	132.45
.5000		.5000	1.000	.5000	3.0	SFA-500-88	121.10
.5000		.5000	1.500	.5000	4.0	SFA-500-812	127.15

*.0005" / .013 mm 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 #	USD$
	1 mm	.0394	5 mm	3 mm	57 mm	SFPM-010-10	45.30
.0625		.0625	.250	.1250	1.50	SFP-062-22	47.35
.0625		.0625	.250	.2500	2.00	SFP-062-42	55.80
	2 mm	.0787	6 mm	3 mm	57 mm	SFPM-020-10	45.30
	2 mm	.0787	10 mm	3 mm	38 mm	SFPM-020-20	41.00
	2 mm	.0787	14 mm	3 mm	75 mm	SFPM-020-40	52.35
	3 mm	.1181	8 mm	3 mm	57 mm	SFPM-030-10	45.30
	3 mm	.1181	8 mm	6 mm	57 mm	SFPM-030-50	49.65
	3 mm	.1181	12 mm	3 mm	38 mm	SFPM-030-20	41.00
	3 mm	.1181	18 mm	6 mm	57 mm	SFPM-030-60	53.55
.1250		.1250	.250	.1250	1.50	SFP-125-22	41.85
.1250		.1250	.250	.2500	2.00	SFP-125-42	48.75
.1250		.1250	.500	.1250	1.50	SFP-125-24	41.85
.1250		.1250	.500	.2500	2.00	SFP-125-44	48.75
.1562		.1562	.625	.2500	2.00	SFP-156-45	48.75
	4 mm	.1575	12 mm	4 mm	50 mm	SFPM-040-10	48.20
	4 mm	.1575	12 mm	6 mm	57 mm	SFPM-040-50	49.65
	4 mm	.1575	15 mm	4 mm	50 mm	SFPM-040-20	44.30
	4 mm	.1575	20 mm	6 mm	57 mm	SFPM-040-60	53.55
	4 mm	.1575	20 mm	6 mm	75 mm	SFPM-040-70	65.60
	4 mm	.1575	20 mm	8 mm	100 mm	SFPM-040-80	74.85
.1875		.1875	.500	.1875	2.00	SFP-187-33	46.20
.1875		.1875	.500	.2500	2.00	SFP-187-44	48.75
.1875		.1875	.625	.1875	2.00	SFP-187-35	46.20
.1875		.1875	.625	.2500	2.00	SFP-187-45	48.75
	5 mm	.1969	16 mm	5 mm	50 mm	SFPM-050-10	61.45
	5 mm	.1969	16 mm	6 mm	57 mm	SFPM-050-40	64.20
	5 mm	.1969	20 mm	8 mm	95 mm	SFPM-050-70	74.85
	5 mm	.1969	28 mm	6 mm	57 mm	SFPM-050-50	64.20
	5 mm	.1969	28 mm	6 mm	75 mm	SFPM-050-60	68.90

*.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

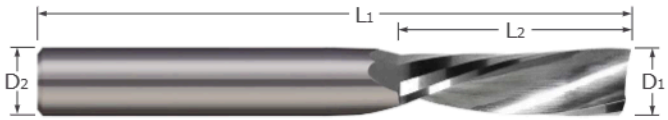
Cutter Diameter*			Length of Cut	Shank Diameter	Overall Length	Uncoated	
D_1 +.0000" −.0020"	+.00 mm −.05 mm	decimal equiv.	L_2 +.015" −.000" +.38 mm −.00 mm	D_2 (h6)	L_1	Tool #	USD$
	6 mm	.2362	16 mm	6 mm	57 mm	SFPM-060-10	64.20
	6 mm	.2362	20 mm	6 mm	57 mm	SFPM-060-20	65.60
	6 mm	.2362	20 mm	8 mm	95 mm	SFPM-060-60	74.85
	6 mm	.2362	35 mm	6 mm	75 mm	SFPM-060-30	68.90
	6 mm	.2362	35 mm	8 mm	75 mm	SFPM-060-50	78.95
.2500		.2500	.375	.2500	2.50	SFP-250-43	48.75
.2500		.2500	.750	.2500	2.50	SFP-250-46	48.75
.2500		.2500	1.250	.2500	3.00	SFP-250-410	54.95
	8 mm	.3150	18 mm	8 mm	50 mm	SFPM-080-10	57.70
	8 mm	.3150	22 mm	8 mm	63 mm	SFPM-080-20	62.40
	8 mm	.3150	30 mm	8 mm	75 mm	SFPM-080-30	74.85
	8 mm	.3150	40 mm	8 mm	100 mm	SFPM-080-40	95.45
.3750		.3750	1.125	.3750	3.00	SFP-375-69	73.00
	10 mm	.3937	25 mm	10 mm	72 mm	SFPM-100-10	80.20
	10 mm	.3937	55 mm	10 mm	100 mm	SFPM-100-20	113.70
	12 mm	.4724	30 mm	12 mm	83 mm	SFPM-120-10	122.35
	12 mm	.4724	40 mm	12 mm	150 mm	SFPM-120-20	182.40
.5000		.5000	1.000	.5000	3.00	SFP-500-88	121.10
.5000		.5000	1.500	.5000	4.00	SFP-500-812	127.15

*.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	
D1 +.0000" −.0020"	+.00 mm −.05 mm	decimal equiv.	L2 +.015" −.000" +.38 mm −.00 mm		D2 (h6)	L1	Tool #	USD$
	1 mm	.0394	5 mm	(5x)	3 mm	57 mm	SFLM-010-10	45.30
.0625		.0625	.250	(4x)	.2500	2.0	SFL-062-42	55.80
	2 mm	.0787	6 mm	(3x)	3 mm	57 mm	SFLM-020-10	45.30
	3 mm	.1181	8 mm	(2.7x)	3 mm	57 mm	SFLM-030-10	45.30
	3 mm	.1181	12 mm	(4x)	3 mm	38 mm	SFLM-030-20	41.00
.1250		.1250	.250	(2x)	.1250	1.5	SFL-125-22	41.85
.1250		.1250	.250	(2x)	.2500	2.0	SFL-125-42	48.75
.1250		.1250	.500	(4x)	.1250	1.5	SFL-125-24	41.85
.1250		.1250	.500	(4x)	.2500	2.0	SFL-125-44	48.75
	4 mm	.1575	15 mm	(3.8x)	4 mm	40 mm	SFLM-040-20	44.30
	4 mm	.1575	20 mm	(5x)	6 mm	57 mm	SFLM-040-60	53.55
	4 mm	.1575	20 mm	(5x)	8 mm	95 mm	SFLM-040-80	74.85
.1875		.1875	.500	(2.7x)	.1875	2.0	SFL-187-33	46.20
.1875		.1875	.625	(3.4x)	.1875	2.0	SFL-187-35	46.20
	5 mm	.1969	20 mm	(4x)	8 mm	95 mm	SFLM-050-70	74.85
	5 mm	.1969	28 mm	(5.6x)	6 mm	75 mm	SFLM-050-60	68.90
.2188		.2188	.750	(3.5x)	.2500	2.5	SFL-218-46	48.75
	6 mm	.2362	16 mm	(2.7x)	6 mm	57 mm	SFLM-060-10	64.20
	6 mm	.2362	20 mm	(3.4x)	8 mm	95 mm	SFLM-060-60	74.85
	6 mm	.2362	20 mm	(3.4x)	6 mm	57 mm	SFLM-060-20	65.60
.2500		.2500	.375	(1.5x)	.2500	2.5	SFL-250-43	48.75
.2500		.2500	.750	(3x)	.2500	2.5	SFL-250-46	48.75
.2500		.2500	1.250	(5x)	.2500	3.0	SFL-250-410	54.95
.3750		.3750	1.125	(3x)	.3750	3.0	SFL-375-69	73.00
.5000		.5000	1.500	(3x)	.5000	4.0	SFL-500-812	127.15

*.0005" / .013 mm 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 #	USD$
.0625	.188	.1250	1.5	RDB-10	24.15
.0938	.375	.1250	1.5	RDB-20	24.15
.1250	.500	.1250	1.5	RDB-30	24.15
.1875	.625	.1875	2.0	RDB-40	34.35
.2500	.750	.2500	2.0	RDB-60	41.45
.2500	.750	.2500	2.5	RDB-70	44.15
.2500	1.000	.2500	3.0	RDB-80	58.00
.3750	1.000	.3750	2.5	RDB-100	102.55
.5000	1.000	.5000	3.0	RDB-110	135.75

*.0005" max TIR

End Mills For Plastics & Composites

Diamond Cut – End Mill Cut

RDC

- 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

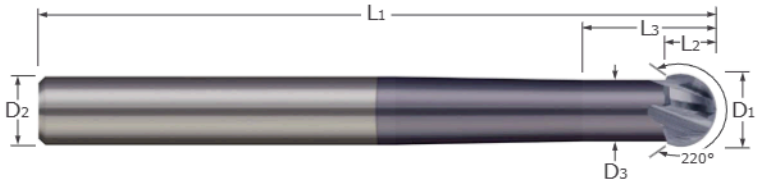
Cutter Diameter*	Length of Cut	Shank Dia.	Overall Length	Uncoated	
D_1 $^{+.0000"}_{-.0030"}$	L_2 $^{+.030"}_{-.000"}$	D_2 (h6)	L_1	Tool #	USD$
.0938	.375	.1250	1.5	RDC-20	24.15
.1250	.500	.1250	1.5	RDC-30	24.15
.1875	.625	.1875	2.0	RDC-40	34.35
.1875	.625	.2500	2.0	RDC-50	38.90
.2500	.750	.2500	2.0	RDC-60	41.45
.2500	.750	.2500	2.5	RDC-70	44.15
.2500	1.000	.2500	3.0	RDC-80	58.00

*.0005" max TIR

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 #	USD$	Tool #	USD$
	2 mm	.0787	1.3 mm	6 mm	1.3 mm	2	6 mm	75 mm			SBMM-020-206X	138.65
	2 mm	.0787	1.3 mm	6 mm	1.3 mm	4	6 mm	75 mm	SBMM-020-406	131.05	SBMM-020-406X	138.65
	2 mm	.0787	1.3 mm	10 mm	1.3 mm	2	6 mm	75 mm			SBMM-020-210X	138.65
	2 mm	.0787	1.3 mm	10 mm	1.3 mm	4	6 mm	75 mm	SBMM-020-410	131.05	SBMM-020-410X	138.65
	2 mm	.0787	1.3 mm	16 mm	1.3 mm	3	6 mm	75 mm	SBMM-020-316	131.05		
	2 mm	.0787	1.3 mm	16 mm	1.3 mm	4	6 mm	75 mm			SBMM-020-416X	138.65
	3 mm	.1181	2.0 mm	9 mm	2.0 mm	4	6 mm	75 mm			SBMM-030-409X	138.65
	3 mm	.1181	2.0 mm	15 mm	2.0 mm	2	6 mm	75 mm	SBMM-030-215	131.05		
	3 mm	.1181	2.0 mm	15 mm	2.0 mm	4	6 mm	75 mm			SBMM-030-415X	138.65
	3 mm	.1181	2.0 mm	21 mm	2.0 mm	4	6 mm	75 mm			SBMM-030-421X	138.65
.1250		.1250	.100	.250	.100	4	.2500	3.0	SBM-125-4	131.05	SBM-125-4X	138.65
	4 mm	.1575	2.7 mm	12 mm	2.7 mm	2	6 mm	75 mm	SBMM-040-212	131.05	SBMM-040-212X	138.65
	4 mm	.1575	2.7 mm	12 mm	2.7 mm	4	6 mm	75 mm			SBMM-040-412X	138.25
	4 mm	.1575	2.7 mm	20 mm	2.7 mm	4	6 mm	75 mm	SBMM-040-420	131.05	SBMM-040-420X	138.65
	4 mm	.1575	2.7 mm	32 mm	2.7 mm	2	6 mm	100 mm	SBMM-040-232	131.05	SBMM-040-232X	138.65
	4 mm	.1575	2.7 mm	32 mm	2.7 mm	4	6 mm	100 mm			SBMM-040-432X	138.20
.1875		.1875	.150	.350	.150	4	.2500	3.0	SBM-187-4	131.05	SBM-187-4X	138.65
	6 mm	.2362	4.0 mm	18 mm	4.0 mm	4	6 mm	75 mm	SBMM-060-418	131.05	SBMM-060-418X	138.65
	6 mm	.2362	4.0 mm	30 mm	4.0 mm	4	6 mm	75 mm	SBMM-060-430	131.05	SBMM-060-430X	138.65
	6 mm	.2362	4.0 mm	32 mm	4.0 mm	2	6 mm	100 mm	SBMM-060-248	131.05		
	6 mm	.2362	4.0 mm	32 mm	4.0 mm	4	6 mm	100 mm	SBMM-060-448	131.05	SBMM-060-448X	138.20
.2500		.2500	.200	.500	.200	2	.2500	3.0	SBM-250-2	131.05	SBM-250-2X	138.65
.2500		.2500	.200	.500	.200	3	.2500	3.0	SBM-250-3	131.05	SBM-250-3X	138.65
.2500		.2500	.200	.500	.200	4	.2500	3.0	SBM-250-4	131.05	SBM-250-4X	138.65

*.0005" / .013 mm max TIR

Continued on next page

Undercutting End Mills

220° (cont.)

SBM / SBMM

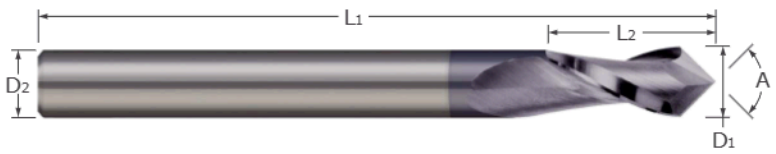
Continued from previous page

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 #	USD$	Tool #	USD$
	8 mm	.3150	5.4 mm	24 mm	5.4 mm	4	8 mm	100 mm	SBMM-080-424	164.90	SBMM-080-424X	178.30
	8 mm	.3150	5.4 mm	40 mm	5.4 mm	3	8 mm	100 mm	SBMM-080-340	164.90		
	8 mm	.3150	5.4 mm	40 mm	5.4 mm	4	8 mm	100 mm			SBMM-080-440X	178.30
	8 mm	.3150	5.4 mm	55 mm	5.4 mm	2	8 mm	100 mm			SBMM-080-264X	178.30
	8 mm	.3150	5.4 mm	55 mm	5.4 mm	4	8 mm	100 mm			SBMM-080-464X	178.30
.3750		.3750	.300	.800	.300	4	.3750	4.0	SBM-375-4	211.75	SBM-375-4X	225.10
	10 mm	.3937	6.7 mm	30 mm	6.7 mm	2	10 mm	100 mm	SBMM-100-230	222.15		
	10 mm	.3937	6.7 mm	30 mm	6.7 mm	4	10 mm	100 mm			SBMM-100-430X	235.20
	10 mm	.3937	6.7 mm	50 mm	6.7 mm	4	10 mm	100 mm			SBMM-100-450X	235.20
	10 mm	.3937	6.7 mm	55 mm	6.7 mm	4	10 mm	100 mm			SBMM-100-472X	235.20
	12 mm	.4724	8.0 mm	36 mm	8.0 mm	2	12 mm	100 mm			SBMM-120-236X	276.00
	12 mm	.4724	8.0 mm	36 mm	8.0 mm	4	12 mm	100 mm	SBMM-120-436	260.05	SBMM-120-436X	276.00
	12 mm	.4724	8.0 mm	55 mm	8.0 mm	4	12 mm	100 mm			SBMM-120-472X	276.00
.5000		.5000	.400	.900	.400	2	.5000	4.0	SBM-500-2	263.35		
.5000		.5000	.400	.900	.400	4	.5000	4.0	SBM-500-4	263.35		

*.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 #	USD$	Tool #	USD$
90°	3 mm	8 mm	4	3 mm	38 mm	DMM-030-490	30.35		
	.1250	.500	2	.1250	1.5	DM-125-290	29.15	DM-125-290X	33.35
	.1250	.500	4	.1250	1.5	DM-125-490	30.35	DM-125-490X	34.85
	4 mm	11 mm	4	4 mm	50 mm	DMM-040-490	42.25		
	.1875	.625	2	.1875	2.0	DM-187-290	40.70	DM-187-290X	45.60
	.1875	.625	4	.1875	2.0	DM-187-490	42.55	DM-187-490X	47.45
	5 mm	13 mm	2	6 mm	57 mm	DMM-050-290	50.95		
	.2500	.750	2	.2500	2.5	DM-250-290	50.95	DM-250-290X	59.35
	.2500	.750	4	.2500	2.5	DM-250-490	53.30	DM-250-490X	61.65
	.3125	.813	2	.3125	2.5	DM-312-290	63.40	DM-312-290X	73.95
	.3125	.813	4	.3125	2.5	DM-312-490	66.60	DM-312-490X	77.00
	8 mm	22 mm	2	8 mm	63 mm	DMM-080-290	63.40	DMM-080-290X	75.00
	8 mm	22 mm	4	8 mm	63 mm	DMM-080-490	66.15	DMM-080-490X	77.70
	.3750	1.000	2	.3750	2.5	DM-375-290	79.55	DM-375-290X	90.95
	.3750	1.000	4	.3750	2.5	DM-375-490	83.55	DM-375-490X	95.05
	.5000	1.000	2	.5000	3.0	DM-500-290	119.95	DM-500-290X	133.65
	.5000	1.000	4	.5000	3.0	DM-500-490	131.30	DM-500-490X	144.95
	.6250	1.250	2	.6250	3.5	DM-625-290	240.95	DM-625-290X	262.10
	.6250	1.250	4	.6250	3.5	DM-625-490	252.15	DM-625-490X	273.30
	.7500	1.500	2	.7500	4.0	DM-750-290	354.35	DM-750-290X	376.50
	.7500	1.500	4	.7500	4.0	DM-750-490	371.05	DM-750-490X	393.05
	20 mm	45 mm	4	20 mm	104 mm			DMM-200-490X	417.20

* .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 #	USD$	Tool #	USD$
120°	3 mm	8 mm	4	3 mm	38 mm			DMM-030-4120X	34.85
	.1250	.500	2	.1250	1.5			DM-125-2120X	33.35
	.1250	.500	4	.1250	1.5	DM-125-4120	30.35	DM-125-4120X	34.85
	4 mm	11 mm	2	4 mm	50 mm	DMM-040-2120	40.70	DMM-040-2120X	45.60
	4 mm	11 mm	4	4 mm	50 mm	DMM-040-4120	42.25		
	.1875	.625	2	.1875	2.0	DM-187-2120	40.70	DM-187-2120X	45.60
	.1875	.625	4	.1875	2.0	DM-187-4120	42.55	DM-187-4120X	47.45
	.2500	.750	2	.2500	2.5	DM-250-2120	50.95		
	.3125	.813	2	.3125	2.5	DM-312-2120	63.40	DM-312-2120X	73.95
	8 mm	22 mm	4	8 mm	63 mm	DMM-080-4120	66.15		
	.3750	1.000	2	.3750	2.5	DM-375-2120	79.55		
	.3750	1.000	4	.3750	2.5	DM-375-4120	83.55	DM-375-4120X	95.05
	10 mm	25 mm	2	10 mm	72 mm	DMM-100-2120	79.55		
	12 mm	30 mm	2	12 mm	83 mm	DMM-120-2120	119.95		
	.5000	1.000	2	.5000	3.0	DM-500-2120	119.95	DM-500-2120X	133.65
	.5000	1.000	4	.5000	3.0	DM-500-4120	131.30	DM-500-4120X	144.95
	.7500	1.500	2	.7500	4.0	DM-750-2120	354.35		
	.7500	1.500	4	.7500	4.0	DM-750-4120	371.05		

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

CS

Chamfer Cutters

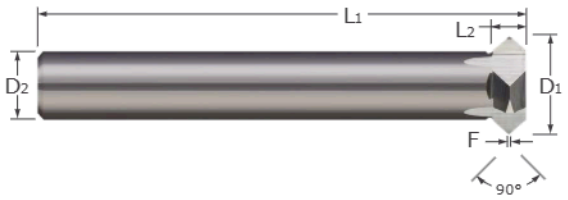
- Designed for chamfer milling, countersinking, and deburring
- Double-ended
- Available in 60°, 82°, 90°, 100°, and 120° included angles
- Tip Diameter (D1) is non-cutting
- Multi-tooth for greater metal removal rates
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine 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 #	USD$	Tool #	USD$
60°	.030	.082	3	.1250	1.5	CS-125-060	42.10	CS-125-060X	48.20
	.040	.128	4	.1875	2.0			CS-187-060X	57.00
	.050	.173	6	.2500	2.5	CS-250-060	55.05	CS-250-060X	68.20
	.060	.219	6	.3125	2.5	CS-312-060	77.00	CS-312-060X	96.45
	.070	.264	6	.3750	2.5	CS-375-060	87.80	CS-375-060X	106.55
	.080	.364	6	.5000	3.0	CS-500-060	127.60	CS-500-060X	144.60
82°	.030	.055	3	.1250	1.5	CS-125-082	42.10		
	.040	.085	4	.1875	2.0			CS-187-082X	57.00
	.050	.115	6	.2500	2.5	CS-250-082	55.05	CS-250-082X	68.20
	.060	.145	6	.3125	2.5	CS-312-082	77.00	CS-312-082X	96.45
	.070	.175	6	.3750	2.5	CS-375-082	87.80		
	.080	.242	6	.5000	3.0	CS-500-082	127.60	CS-500-082X	144.60
90°	.030	.047	3	.1250	1.5	CS-125-090	42.10	CS-125-090X	48.20
	.040	.074	4	.1875	2.0	CS-187-090	50.30	CS-187-090X	57.00
	.050	.100	6	.2500	2.5	CS-250-090	55.05	CS-250-090X	68.20
	.060	.126	6	.3125	2.5	CS-312-090	77.00	CS-312-090X	96.45
	.070	.152	6	.3750	2.5	CS-375-090	87.80	CS-375-090X	106.55
	.080	.210	6	.5000	3.0	CS-500-090	127.60	CS-500-090X	144.60
100°	.030	.040	3	.1250	1.5	CS-125-100	42.10	CS-125-100X	48.20
	.040	.062	4	.1875	2.0	CS-187-100	50.30	CS-187-100X	57.00
	.060	.106	6	.3125	2.5	CS-312-100	77.00	CS-312-100X	96.45
	.070	.128	6	.3750	2.5			CS-375-100X	106.55
	.080	.176	6	.5000	3.0	CS-500-100	127.60	CS-500-100X	144.60
120°	.030	.027	3	.1250	1.5	CS-125-120	42.10	CS-125-120X	48.20
	.050	.058	6	.2500	2.5			CS-250-120X	68.20
	.070	.088	6	.3750	2.5			CS-375-120X	106.55
	.080	.121	6	.5000	3.0			CS-500-120X	144.60

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 #	USD$
.375	.125	.031	4	.2500	2.63	MBC-375	128.85
.500	.125	.031	5	.3125	2.63	MBC-500	157.00
.750	.156	.031	6	.3750	2.66	MBC-750	194.80
1.000	.188	.031	7	.5000	3.19	MBC-001	254.10

Runner Cutters

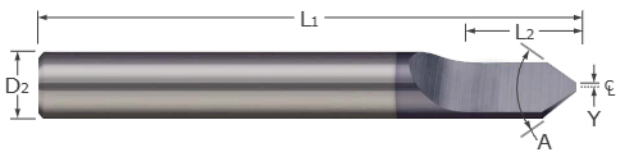
MRF / MRT

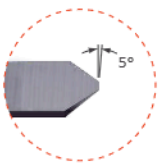
- Designed to mill 20° and 30° channels in molds
- 2 helical flutes
- Center cutting
- Solid carbide
- CNC ground in the USA

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 #	USD$
20°	.0312	.383	2	.1875	2.0	MRT-187-031	68.35
	.0469	.308	2	.1875	2.0	MRT-187-046	68.35
	.0625	.414	2	.2500	2.5	MRT-250-062	75.70
	.1094	.366	2	.3125	2.5	MRT-312-109	92.15
30°	.0312	.262	2	.1875	2.0	MRF-187-031	68.35
	.0625	.287	2	.2500	2.5	MRF-250-062	75.70
	.0781	.243	2	.2500	2.5	MRF-250-078	75.70

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 #	USD$	Tool #	USD$
30°	3 mm	0.10 mm	7 mm	38 mm	RTCM-030-1	23.45	RTCM-030-1X	27.85
	.1250	.004	.375	1.5	RTC-125-1	32.05	RTC-125-1X	34.50
	.1250	.004	.375	3.0	RTC-125-13	33.15	RTC-125-13X	36.80
	4 mm	0.10 mm	10 mm	50 mm	RTCM-040-1	29.85	RTCM-040-1X	34.95
	.1875	.004	.437	2.0	RTC-187-1	39.80		
	6 mm	0.10 mm	12 mm	57 mm	RTCM-060-1	36.20	RTCM-060-1X	44.90
	.2500	.004	.500	2.5	RTC-250-1	43.10	RTC-250-1X	59.45
	.2500	.004	.500	4.0	RTC-250-14	62.85		
	.2500	.010	.500	2.5	RTC-250-120	41.55		
	.2500	.022	.500	2.5	RTC-250-145	54.55		
	.3125	.004	.500	2.5	RTC-312-1	80.45		
	8 mm	0.10 mm	12 mm	63 mm	RTCM-080-1	58.00		
	3 mm	0.10 mm	5 mm	38 mm	RSCM-030-1	23.45	RSCM-030-1X	27.85
	.1250	.004	.375	1.5	RSC-125-1	31.60	RSC-125-1X	33.35
	.1250	.004	.375	3.0	RSC-125-13	33.70		
	4 mm	0.10 mm	6 mm	50 mm	RSCM-040-1	29.85		
60°	.1875	.004	.375	2.0	RSC-187-1	38.65	RSC-187-1X	48.70
	.1875	.004	.375	3.0	RSC-187-13	41.00		
	6 mm	0.10 mm	8 mm	57 mm	RSCM-060-1	36.20	RSCM-060-1X	44.90
	.2500	.004	.375	2.5	RSC-250-1	46.00		
	.2500	.004	.375	4.0	RSC-250-14	68.35		
	.2500	.010	.375	2.5	RSC-250-120	45.70	RSC-250-120X	59.45
	.2500	.015	.375	2.5	RSC-250-130	50.80		
	.2500	.022	.375	2.5	RSC-250-145	54.55		
	.2500	.030	.375	2.5	RSC-250-160	54.55		
	.3125	.004	.500	2.5	RSC-312-1	80.20		
	8 mm	0.10 mm	10 mm	63 mm	RSCM-080-1	58.00		
	.3750	.004	.500	2.5	RSC-375-1	98.75		
	.3750	.004	.500	4.0	RSC-375-14	142.95		

Continued on next page

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 $^{+0°30'}_{-0°30'}$	D_2 (h6)	Y $^{+.001"}_{-.001"}$ $^{+.02\ mm}_{-.02\ mm}$	L_2 $^{+.015"}_{-.000"}$ $^{+.38\ mm}_{-.00\ mm}$	L_1	Tool #	USD$	Tool #	USD$
	3 mm	0.10 mm	5 mm	38 mm	RNCM-030-1	23.45	RNCM-030-1X	27.85
	.1250	.004	.375	1.5	RNC-125-1	29.65	RNC-125-1X	41.10
	.1250	.004	.375	3.0	RNC-125-13	38.90		
	4 mm	0.10 mm	6 mm	50 mm	RNCM-040-1	29.85	RNCM-040-1X	34.95
	.1875	.004	.375	2.0	RNC-187-1	41.85		
	.1875	.004	.375	3.0	RNC-187-13	43.60	RNC-187-13X	50.95
	6 mm	0.10 mm	8 mm	57 mm	RNCM-060-1	36.20	RNCM-060-1X	44.90
	.2500	.004	.375	2.5	RNC-250-1	47.75	RNC-250-1X	49.50
90°	.2500	.004	.375	4.0	RNC-250-14	57.90	RNC-250-14X	73.40
	.2500	.015	.375	2.5	RNC-250-130	54.55		
	.2500	.022	.375	2.5	RNC-250-145	54.55		
	.2500	.030	.375	2.5	RNC-250-160	54.55		
	.3125	.004	.500	2.5	RNC-312-1	65.05		
	8 mm	0.10 mm	10 mm	63 mm			RNCM-080-1X	69.65
	.3750	.004	.500	2.5	RNC-375-1	94.85		
	12 mm	0.10 mm	14 mm	83 mm			RNCM-120-1X	138.25
	.5000	.004	.625	3.0	RNC-500-1	153.60		

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 #	USD$	Tool #	USD$
30°	3 mm	0.10 mm	7 mm	38 mm	RTCM-030-2	31.20	RTCM-030-2X	37.35
	.1250	.004	.375	2.0	RTC-125-2	37.55	RTC-125-2X	50.65
	.1250	.004	.375	3.0	RTC-125-23	46.95	RTC-125-23X	59.25
	4 mm	0.10 mm	10 mm	50 mm	RTCM-040-2	39.95		
	.1875	.004	.437	2.0	RTC-187-2	49.45	RTC-187-2X	62.45
	.1875	.004	.437	3.0	RTC-187-23	57.10		
	5 mm	0.10 mm	12 mm	50 mm	RTCM-050-2	44.90		
	6 mm	0.10 mm	12 mm	57 mm	RTCM-060-2	49.20	RTCM-060-2X	62.80
	.2500	.004	.500	2.5	RTC-250-2	57.70	RTC-250-2X	72.85
	.2500	.004	.500	4.0	RTC-250-24	80.20		
	.2500	.010	.500	2.5	RTC-250-220	61.05	RTC-250-220X	74.25
	.2500	.015	.500	2.5	RTC-250-230	53.30		
	.2500	.022	.500	2.5	RTC-250-245	68.05		
	.3125	.004	.500	2.5	RTC-312-2	101.10		
	8 mm	0.10 mm	12 mm	63 mm	RTCM-080-2	77.90	RTCM-080-2X	90.35
	.3750	.004	.500	2.5	RTC-375-2	125.55		
	.3750	.004	.500	4.0	RTC-375-24	158.80		
	.5000	.004	.625	3.0	RTC-500-2	172.35		
60°	3 mm	0.10 mm	5 mm	38 mm	RSCM-030-2	31.20	RSCM-030-2X	37.35
	.1250	.004	.375	2.0	RSC-125-2	39.25	RSC-125-2X	45.30
	.1250	.004	.375	3.0	RSC-125-23	46.60		
	4 mm	0.10 mm	6 mm	50 mm	RSCM-040-2	39.95	RSCM-040-2X	46.85
	.1875	.004	.375	2.0	RSC-187-2	47.75	RSC-187-2X	54.55
	.1875	.004	.375	3.0	RSC-187-23	59.30		
	6 mm	0.10 mm	8 mm	57 mm	RSCM-060-2	49.20	RSCM-060-2X	62.80
	.2500	.004	.375	2.5	RSC-250-2	59.95	RSC-250-2X	76.40
	.2500	.004	.375	4.0	RSC-250-24	87.40		
	.2500	.010	.375	2.5	RSC-250-220	60.45	RSC-250-220X	76.95
	.2500	.015	.375	2.5	RSC-250-230	61.70		
	.2500	.030	.375	2.5	RSC-250-260	68.05		
	.3125	.004	.500	2.5	RSC-312-2	103.45		

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′	D2 (h6)	Y +.001" −.001" +.02 mm −.02 mm	L2 +.015" −.015" +.38 mm −.38 mm	L1	Tool #	USD$	Tool #	USD$
60°	.3125	.004	.500	4.0	RSC-312-24	123.05		
	.3750	.004	.500	2.5	RSC-375-2	120.25		
	.3750	.004	.500	4.0	RSC-375-24	157.85		
	.5000	.004	.625	3.0	RSC-500-2	184.95		
90°	3 mm	0.10 mm	5 mm	38 mm	RNCM-030-2	31.20	RNCM-030-2X	37.35
	.1250	.004	.375	2.0	RNC-125-2	39.80	RNC-125-2X	53.65
	.1250	.004	.375	3.0	RNC-125-23	48.65		
	4 mm	0.10 mm	6 mm	50 mm	RNCM-040-2	39.95		
	.1875	.004	.375	2.0	RNC-187-2	49.30	RNC-187-2X	56.20
	.1875	.004	.375	3.0	RNC-187-23	58.15		
	6 mm	0.10 mm	8 mm	57 mm	RNCM-060-2	49.20	RNCM-060-2X	62.80
	.2500	.004	.375	2.5	RNC-250-2	61.25	RNC-250-2X	74.35
	.2500	.004	.375	4.0	RNC-250-24	80.20	RNC-250-24X	97.85
	.2500	.010	.375	2.5	RNC-250-220	60.60		
	.2500	.015	.375	2.5	RNC-250-230	63.30	RNC-250-230X	79.75
	.2500	.030	.375	2.5	RNC-250-260	68.05		
	.3125	.004	.500	2.5	RNC-312-2	98.55		
	.3125	0.004	.500	4.0	RNC-312-24	123.05		
	.3750	.004	.500	2.5	RNC-375-2	124.55		
	.3750	.004	.500	4.0	RNC-375-24	155.35		
	.5000	.004	.625	3.0	RNC-500-2	180.95	RNC-500-2X	197.90
	.5000	.004	.625	4.0	RNC-500-24	259.90		

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 #	USD$	Tool #	USD$
.0938	.010	.047	.019	.140	4	.1250	1.5	KC-093-140-010	68.80		
.0938	.015	.047	.019	.140	4	.1250	1.5	KC-093-140-015	65.05	KC-093-140-015X	68.95
.0938	.040	.047	.019	.140	4	.1250	1.5	KC-093-140-040	65.05		
.1250	.025	.062	.028	.190	6	.1250	1.5	KC-125-190-025	65.05		
.1250	.030	.062	.028	.190	6	.1250	1.5	KC-125-190-030	65.05		
.1250	.045	.062	.028	.190	6	.1250	1.5	KC-125-190-045	65.05	KC-125-190-045X	68.95
.1250	.060	.062	.028	.190	6	.1250	1.5	KC-125-190-060	65.05	KC-125-190-060X	68.95
.1250	.062	.062	.028	.190	6	.1250	1.5	KC-125-190-062	65.05		
.1250	.093	.062	.028	.190	6	.1250	1.5	KC-125-190-093	65.05		
.1875	.029	.090	.045	.300	6	.1875	2.0	KC-187-300-029	68.80		
.5000	.093	.250	.121	1.500	8	.5000	3.0	KC-500-1500-093	155.35		
.5000	.118	.250	.121	1.500	8	.5000	3.0	KC-500-1500-118	155.35		
.5000	.156	.250	.121	1.500	8	.5000	3.0	KC-500-1500-156	155.35		

Corner Rounding End Mills

CRE

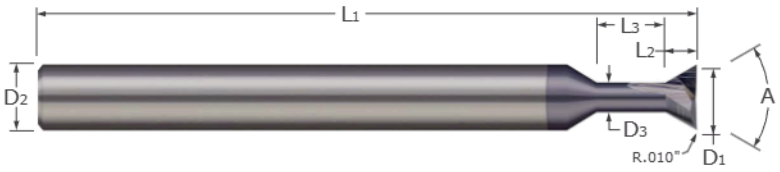
3 Flute – Double-Ended

- 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 #	USD$	Tool #	USD$
.060	.0100	.005	.1250	2.0	CRE-125-010	59.10	CRE-125-010X	65.20
.060	.0156	.005	.1250	2.0	CRE-125-015	59.10	CRE-125-015X	65.20
.060	.0200	.005	.1250	2.0	CRE-125-020	59.10	CRE-125-020X	65.20
.060	.0250	.005	.1250	2.0	CRE-125-025	59.10	CRE-125-025X	65.20
.060	.0300	.005	.1250	2.0	CRE-125-030	59.10	CRE-125-030X	65.20
.060	.0312	.005	.1250	2.0	CRE-125-031	59.10	CRE-125-031X	65.20
.060	.0350	.005	.1875	2.0	CRE-187-035	63.75	CRE-187-035X	70.70
.060	.0400	.005	.1875	2.0	CRE-187-040	63.75	CRE-187-040X	70.70
.060	.0450	.005	.1875	2.0	CRE-187-045	63.75	CRE-187-045X	70.70
.060	.0469	.005	.1875	2.0	CRE-187-047	63.75	CRE-187-047X	70.70
.060	.0500	.005	.1875	2.0	CRE-187-050	63.75	CRE-187-050X	70.70
.060	.0550	.005	.1875	2.0	CRE-187-055	63.75	CRE-187-055X	70.70
.060	.0600	.005	.1875	2.0	CRE-187-060	63.75	CRE-187-060X	70.70
.060	.0625	.005	.1875	2.0	CRE-187-062	63.75	CRE-187-062X	70.70
D_1 $^{+.000''}_{-.003''}$	R $^{+.0000''}_{-.0005''}$	L_4	D_2 (h6)	L_1	Tool #	USD$	Tool #	USD$
.060	.0700	.005	.2500	2.5	CRE-250-070	82.50	CRE-250-070X	91.30
.060	.0750	.005	.2500	2.5	CRE-250-075	82.50	CRE-250-075X	91.30
.060	.0781	.005	.2500	2.5	CRE-250-078	82.50	CRE-250-078X	91.30
.060	.0800	.005	.2500	2.5	CRE-250-080	82.50	CRE-250-080X	91.30
.060	.0900	.005	.2500	2.5	CRE-250-090	82.50	CRE-250-090X	91.30
.060	.0938	.005	.2500	2.5	CRE-250-093	82.50	CRE-250-093X	91.30
.060	.1000	.005	.3125	2.5	CRE-312-100	99.70	CRE-312-100X	119.45
.060	.1094	.005	.3125	2.5	CRE-312-109	99.70	CRE-312-109X	119.45
.060	.1250	.005	.3125	2.5	CRE-312-125	99.70	CRE-312-125X	119.45
.060	.1406	.005	.3750	2.5	CRE-375-140	135.65	CRE-375-140X	148.00
.060	.1562	.005	.3750	2.5	CRE-375-156	135.65	CRE-375-156X	148.00
.120	.1718	.010	.5000	3.0	CRE-500-171	209.95	CRE-500-171X	226.90
.120	.1875	.010	.5000	3.0	CRE-500-187	209.95	CRE-500-187X	226.90
.120	.2031	.010	.6250	3.5	CRE-625-203	225.00	CRE-625-203X	246.05
.120	.2188	.010	.6250	3.5	CRE-625-218	225.00	CRE-625-218X	246.05
.120	.2344	.010	.6250	3.5	CRE-625-234	225.00	CRE-625-234X	246.05
.120	.2500	.010	.6250	3.5	CRE-625-250	225.00	CRE-625-250X	246.05
.120	.2812	.010	.7500	4.0	CRE-750-281	315.55		
.120	.3125	.010	.7500	4.0	CRE-750-312	315.55	CRE-750-312X	340.70
.120	.3750	.010	1.0000	4.0	CRE-001-375	588.75	CRE-001-375X	625.05
.120	.4370	.010	1.0000	4.0	CRE-001-437	588.75	CRE-001-437X	625.05

DT

Dovetail Cutters



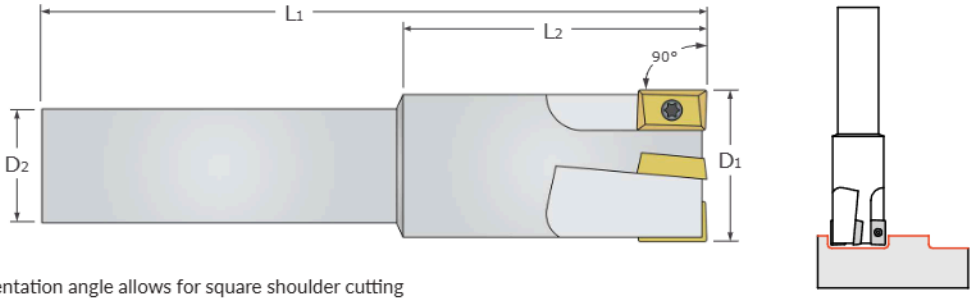
- Designed to mill dovetail grooves into a part
- Offered with 30°, 60°, and 90° included angles
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

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 #	USD$	Tool #	USD$
30°	.1250	.095	.080	.125	.010	2	.1250	1.5	DT-125-030-010	93.15		
	.1875	.127	.125	.125	.010	2	.1875	2.0	DT-187-030-010	99.70	DT-187-030-010X	104.05
	.2500	.161	.170	.125	.010	2	.2500	2.5	DT-250-030-010	125.80		
	.3125	.221	.200	.312	.010	2	.3125	2.5	DT-312-030-010	136.00	DT-312-030-010X	146.55
	.3750	.263	.240	.375	.010	3	.3750	2.5	DT-375-030-010	143.65	DT-375-030-010X	154.60
	.5000	.347	.320	.500	.010	3	.5000	3.0	DT-500-030-010	186.10	DT-500-030-010X	199.35
60°	.1250	.065	.065	.125	.010	2	.1250	1.5	DT-125-060-010	93.15	DT-125-060-010X	96.85
	.1875	.093	.095	.125	.010	2	.1875	2.0	DT-187-060-010	99.70	DT-187-060-010X	104.05
	.2500	.125	.120	.125	.010	2	.2500	2.5	DT-250-060-010	125.80	DT-250-060-010X	133.30
	.3125	.162	.140	.312	.010	2	.3125	2.5	DT-312-060-010	136.00	DT-312-060-010X	146.55
	.3750	.190	.170	.375	.010	3	.3750	2.5	DT-375-060-010	143.65	DT-375-060-010X	154.60
	.5000	.255	.220	.500	.010	3	.5000	3.0	DT-500-060-010	186.10	DT-500-060-010X	199.35
90°	.1250	.042	.070	.125	.010	2	.1250	1.5	DT-125-090-010	93.15	DT-125-090-010X	96.85
	.1875	.048	.120	.125	.010	2	.1875	2.0	DT-187-090-010	99.70	DT-187-090-010X	104.05
	.2500	.064	.150	.125	.010	2	.2500	2.5	DT-250-090-010	125.80	DT-250-090-010X	133.30
	.3125	.095	.150	.312	.010	2	.3125	2.5	DT-312-090-010	136.00	DT-312-090-010X	146.55
	.3750	.127	.150	.375	.010	3	.3750	2.5	DT-375-090-010	143.65	DT-375-090-010X	154.60
	.5000	.164	.200	.500	.010	3	.5000	3.0	DT-500-090-010	186.10	DT-500-090-010X	199.35

* .0005" max TIR

Indexable

Milling – Tool Holders



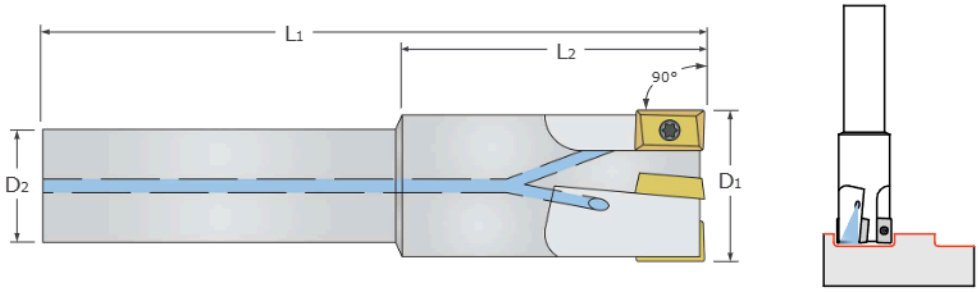
- 90° orientation angle allows for square shoulder cutting
- Utilizes ANSI standard APKT style inserts (not included)
- Each tool holder includes a M2.5 x T-8 torx screw and torx key (part # 16-1020)
- Non coolant-through
- Insert not included

Cutter Diameter	Body Length	Flutes	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
D1	L2		D2	L1			Tool #	USD$
.375	1.500	1	.5000	3.0	50-2100	BAAP 1216 2	31-1216	164.55
.500	1.500	1	.5000	3.0	50-2100	BAAP 1616 2	31-1616	183.75
.625	1.500	2	.5000	3.0	50-2100	BAAP 1816 2	31-1816	203.10
.750	2.000	3	.7500	4.4	50-2100	BAAP 2424 2	31-2424	280.55
1.000	2.000	4	.7500	4.4	50-2100	BAAP 3224 2	31-3224	299.75
1.250	2.000	5	.7500	4.4	50-2100	BAAP 4024 2	31-4024	446.70

See page 314 for indexable insert accessories

Indexable

Milling – Tool Holders – Coolant Through

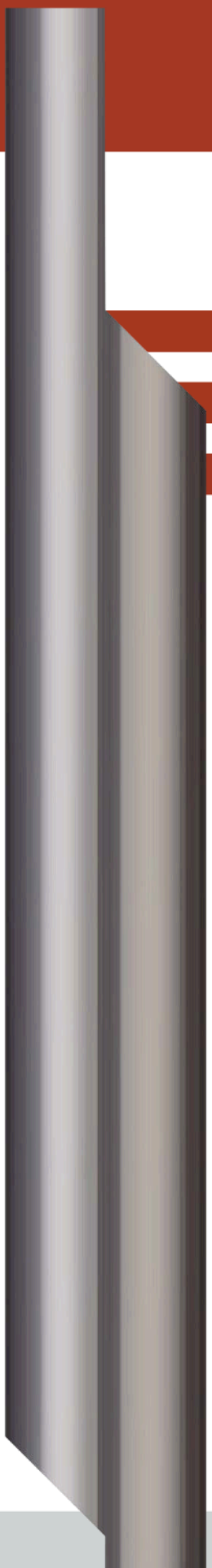


- Coolant-through milling tool holders designed to enhance chip evacuation
- 90° orientation angle allows for square shoulder cutting
- Utilizes ANSI standard APKT style inserts (not included)
- Each tool holder includes a M2.5 x T-8 torx screw and torx key (part # 16-1020)
- Insert not included

Cutter Diameter	Body Length	Flutes	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
D1	L2		D2	L1			Tool #	USD$
.375	1.500	1	.5000	3.0	50-2100	AAAP 1216 2	30-1216	203.10
.500	1.500	1	.5000	3.0	50-2100	AAAP 1616 2	30-1616	222.35
.625	1.500	2	.5000	3.0	50-2100	AAAP 1816 2	30-1816	242.75
.750	2.000	3	.7500	4.4	50-2100	AAAP 2424 2	30-2424	285.80
1.000	2.000	4	.7500	4.4	50-2100	AAAP 3224 2	30-3224	458.30
1.250	2.000	5	.7500	4.4	50-2100	AAAP 4024 2	30-4024	491.20

See page 314 for indexable insert accessories
See page 311 for tool set options

BLANKS SETS & ACCESSORIES



Blanks 296

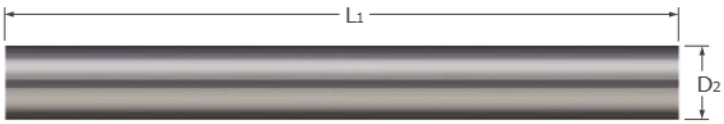
Sets 300

Accessories NEW! 312

Blanks

Round Blanks

SR / SRM



- Round style
- Finish ground blanks
- Solid carbide

Shank Diameter			Overall Length	Round Blank	
D2 (h6)			L1	Tool #	USD$
	1 mm	.0394	30 mm	SRM-010-030	7.85
	1 mm	.0394	310 mm	SRM-010-310	22.20
	1.5 mm	.0591	100 mm	SRM-015-100	10.75
.0625		.0625	1.0	SR-062-1	11.75
.0625		.0625	2.0	SR-062-2	11.55
.0625		.0625	3.0	SR-062-3	11.45
.0625		.0625	4.0	SR-062-4	10.75
.0625		.0625	12.0	SR-062-12	30.15
	2 mm	.0787	38 mm	SRM-020-038	8.95
	2 mm	.0787	100 mm	SRM-020-100	13.65
	2 mm	.0787	310 mm	SRM-020-310	29.95
.0938		.0938	1.0	SR-093-1	12.85
.0938		.0938	3.0	SR-093-3	15.00
.0938		.0938	6.0	SR-093-6	19.25
.0938		.0938	12.0	SR-093-12	28.00
	2.5 mm	.0984	100 mm	SRM-025-100	13.65
	3 mm	.1181	38 mm	SRM-030-038	9.80
	3 mm	.1181	100 mm	SRM-030-100	16.45
	3 mm	.1181	310 mm	SRM-030-310	40.15
.1250		.1250	1.5	SR-125-1.5	10.55
.1250		.1250	2.0	SR-125-2	11.55
.1250		.1250	3.0	SR-125-3	13.85
.1250		.1250	4.0	SR-125-4	17.55
.1250		.1250	6.0	SR-125-6	26.70
.1250		.1250	12.0	SR-125-12	45.55
.1562		.1562	1.5	SR-156-1.5	12.60
.1562		.1562	2.0	SR-156-2	15.90
.1562		.1562	3.0	SR-156-3	20.70
.1562		.1562	4.0	SR-156-4	23.90
.1562		.1562	6.0	SR-156-6	41.45
	4 mm	.1575	50 mm	SRM-040-050	11.45
	4 mm	.1575	100 mm	SRM-040-100	23.35
	4 mm	.1575	310 mm	SRM-040-310	57.50
.1875		.1875	1.5	SR-187-1.5*	12.95
.1875		.1875	2.0	SR-187-2*	15.00
.1875		.1875	4.0	SR-187-4	29.00
.1875		.1875	6.0	SR-187-6	41.85
.1875		.1875	12.0	SR-187-12	75.10
	5 mm	.1969	50 mm	SRM-050-050	14.20
	5 mm	.1969	100 mm	SRM-050-100	31.95
	5 mm	.1969	310 mm	SRM-050-310	92.00
	5.5 mm	.2165	100 mm	SRM-055-100	34.90

*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 #	USD$
	6 mm	.2362	57 mm	SRM-060-057	21.55
	6 mm	.2362	100 mm	SRM-060-100	42.35
	6 mm	.2362	310 mm	SRM-060-310	108.95
.2500		.2500	2.0	SR-250-2*	22.20
.2500		.2500	2.5	SR-250-2.5*	26.45
.2500		.2500	3.0	SR-250-3*	27.70
.2500		.2500	4.0	SR-250-4	42.25
.2500		.2500	6.0	SR-250-6	60.45
.2500		.2500	12.0	SR-250-12	112.70
	7 mm	.2756	100 mm	SRM-070-100	55.95
.3125		.3125	2.0	SR-312-2*	28.30
.3125		.3125	2.5	SR-312-2.5*	34.25
.3125		.3125	4.0	SR-312-4*	62.00
.3125		.3125	6.0	SR-312-6	86.35
.3125		.3125	12.0	SR-312-12	155.80
	8 mm	.3150	100 mm	SRM-080-100	56.65
	8 mm	.3150	310 mm	SRM-080-310	147.30
	9 mm	.3543	100 mm	SRM-090-100	58.00
.3750		.3750	2.0	SR-375-2*	34.55
.3750		.3750	2.5	SR-375-2.5*	42.55
.3750		.3750	4.0	SR-375-4*	69.45
.3750		.3750	6.0	SR-375-6	105.75
.3750		.3750	12.0	SR-375-12	202.15
	10 mm	.3937	72 mm	SRM-100-072	51.35
	10 mm	.3937	100 mm	SRM-100-100	84.70
	10 mm	.3937	310 mm	SRM-100-310	239.35
.4375		.4375	2.5	SR-437-2.5*	126.50
.4375		.4375	4.0	SR-437-4	126.50
.4375		.4375	6.0	SR-437-6	193.80
.4375		.4375	12.0	SR-437-12	298.70
	12 mm	.4724	310 mm	SRM-120-310	318.05
.5000		.5000	2.5	SR-500-2.5*	85.35
.5000		.5000	3.0	SR-500-3*	70.20
.5000		.5000	4.0	SR-500-4	107.25
.5000		.5000	6.0	SR-500-6	163.65
.5000		.5000	12.0	SR-500-12	368.75
	13 mm	.5118	310 mm	SRM-130-310	324.00
	14 mm	.5512	100 mm	SRM-140-100	159.55
.5625		.5625	3.5	SR-562-3.5*	134.60
.6250		.6250	3.5	SR-625-3.5*	166.55
.6250		.6250	4.0	SR-625-4	167.00
.6250		.6250	12.0	SR-625-12	463.95
	16 mm	.6299	310 mm	SRM-160-310	470.20
.7500		.7500	4.0	SR-750-4*	199.30
.7500		.7500	6.0	SR-750-6	381.45
.7500		.7500	12.0	SR-750-12	624.00
	20 mm	.7874	100 mm	SRM-200-100	242.65
1.0000		1.0000	12.0	SR-001-12	1084.75

*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	
L2			D2 (h6)	L1		
+.015" −.000"	+1.0 mm −0.0 mm	decimal equiv.			Tool #	USD$
	6 mm	.2362	4 mm	50 mm	RSM-040-1	20.45
	8 mm	.3150	6 mm	57 mm	RSM-060-1	29.95
.375		.3750	.1250	1.5	RS-125-1	25.65
.375		.3750	.1875	2.0	RS-187-1	31.35
.375		.3750	.1875	3.0	RS-187-13	42.95
.375		.3750	.2500	2.5	RS-250-1	40.60
	10 mm	.3937	8 mm	63 mm	RSM-080-1	56.35
	12 mm	.4724	10 mm	72 mm	RSM-100-1	74.40
.500		.5000	.3125	2.5	RS-312-1	60.45
.500		.5000	.3125	4.0	RS-312-14	92.15
.500		.5000	.3750	2.5	RS-375-1	79.15
.625		.6250	.5000	3.0	RS-500-1	134.60
.625		.6250	.5000	4.0	RS-500-14	185.05

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

RS /RSM

Blanks

Split End – Double-Ended

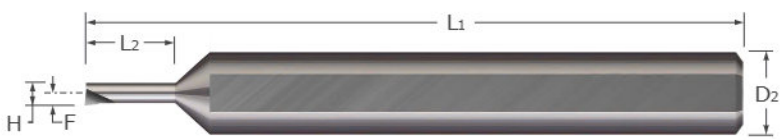
- Precision ground blank designed for custom profiles requiring a split face
- Double-ended allows for maximum utilization of the blank
- Precision manufactured in the USA

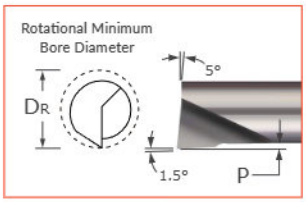
Split Length*			Shank Diameter	Overall Length	Double-Ended Blank	
L_2 +.015" −.015"	+1.0 mm −0.0 mm	decimal equiv.	D_2 (h6)	L_1	Tool #	USD$
	4 mm	.1575	2 mm	38 mm	RSM-020-2	20.45
	5 mm	.1969	3 mm	38 mm	RSM-030-2	21.85
	6 mm	.2362	4 mm	50 mm	RSM-040-2	27.05
	8 mm	.3150	6 mm	57 mm	RSM-060-2	39.95
.375		.3750	.1250	2.0000	RS-125-2	35.65
.375		.3750	.1250	3.0000	RS-125-23	38.25
.375		.3750	.1875	2.0000	RS-187-2	43.50
.375		.3750	.1875	3.0000	RS-187-23	53.55
.375		.3750	.2500	2.5000	RS-250-2	54.80
.375		.3750	.2500	4.0000	RS-250-24	75.55
	10 mm	.3937	8 mm	63 mm	RSM-080-2	71.80
	12 mm	.4724	10 mm	72 mm	RSM-100-2	100.15
.500		.5000	.3125	2.5000	RS-312-2	80.45
.500		.5000	.3750	2.5000	RS-375-2	99.35
.500		.5000	.3750	4.0000	RS-375-24	148.20
.625		.6250	.5000	3.0000	RS-500-2	159.65

* 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 #	USD$
.0180	.020	.075	.0020	.0100	.1250	1.5	MBB-020075	MBB-0	306.30
.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		
.0365	.040	.150	.0035	.0200	.1250	1.5	MBB-040150		
.0405	.045	.150	.0045	.0225	.1250	1.5	MBB-045150		

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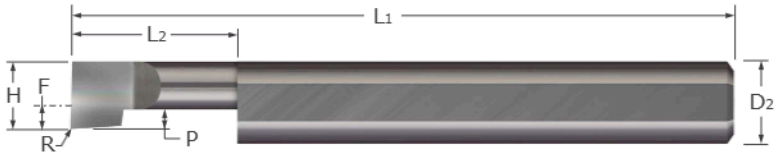
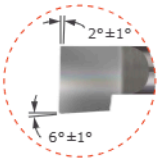
SCAN

Sets

Standard – Boring Tools – Right Hand





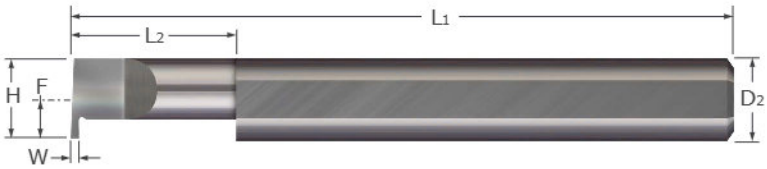
- Designed for facing and boring applications in bores .050" and larger
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split geometry makes the tool as rigid as possible
- Corner radius profile
- Lockdown flat automatically locates tool on center
- Coating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

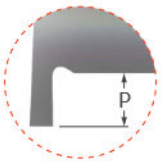
Shank Dia.	Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Overall Length	Uncoated	Set	
D_2 (h6)	H		L_2 $^{+.050"}_{-.000"}$	R $^{+.003"}_{-.000"}$	P	F	L_1	Tool #	Set #	USD$
1/8	.050	.060	.300	.003	.012	-.0125	1.5	BB-050300	BB-1	234.40
	.060	.070	.300	.003	.015	-.0025	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 #	USD$
3/16	.120	.132	.500	.006	.030	.0263	2.0	BB-120500	BB-2	247.55
	.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	268.20
	.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	360.40
	.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	490.90
	.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





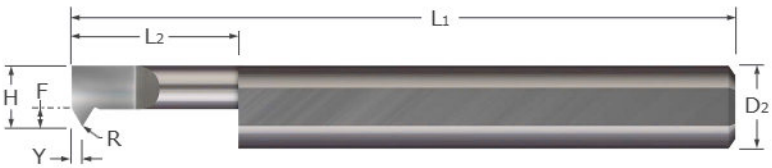
- Designed for generating retaining ring grooves
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- Coating options provide added lubricity and increased wear resistance in difficult 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 #	USD$
.017	.250	.272	.250	.050	.1250	.2500	2.5	RR-017-4	RR-1	338.30
.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 #	USD$
.039	.375	.397	.750	.100	.1875	.3750	2.5	RR-039-12	RR-2	508.30
.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		

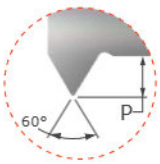
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

Sets

Standard – Threading Tools – UN Threads – Single Point – Right Hand



- Designed for threading multiple 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

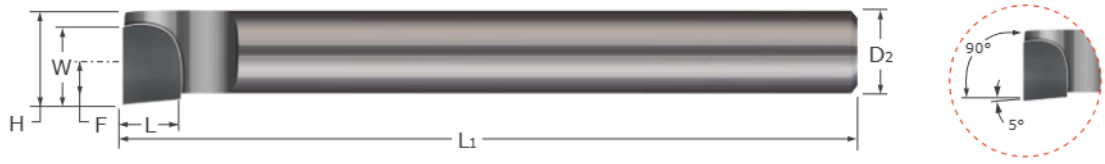


Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Radius	Centerline Offset	Shank Diameter	Overall Length	Uncoated	Set	
TPI	H		L_2 $^{+.050"}_{-.000"}$	$Y^{+.010"}_{-.000"}$	P	$R^{+.001"}_{-.000"}$	F	D_2 (h6)	L_1	Tool #	Set #	USD$
24-56	.180	.202	.500	.023	.040	.002	.0550	.2500	2.5	IT-180500	IT-1	426.35
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 #	USD$
.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	206.55
.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 #	USD$
.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	201.40
.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 #	USD$
.0625	.3750	2.5	RAD-2	RAD-21	251.10
.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	507.35
.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	546.55
.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	1094.55
.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 #	USD$
3 STFCR Tool Holders 3/8", 1/2", and 5/8" Shank Diameters	A06J STFCR 2	20-1031	40-2100	347.80
	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 #	USD$
4 SCLCR Tool Holders 1/4", 5/16", 3/8", and 1/2" Shank Diameters	A04F SCLCR 2	20-0821	40-0100	413.65
	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	492.80
	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 #	USD$
3 SDUCR Tool Holders 3/8", 1/2", and 5/8" Shank Diameters	A06J SDUCR 2	20-0931	40-2400	347.80
	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 #	USD$
6 Assorted Tool Holders 1/4" Square Shank	SCLCR 0404 D2	10-3231	40-7101	374.10
	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	385.35
	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	404.05
	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	432.55
	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 #	USD$
6 Assorted Tool Holders 5/8" Square Shank	SCLCR 1010 H2	10-3241	40-7105	582.90
	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 #	USD$
3 Tool Holders 3/4" Square Shank	SCLCR 1212 J3	10-3251	40-7150	627.15
	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 #	USD$
3 Assorted Tool Holders 5/16″ Square Shank	SDJCR 0505 H2	10-3641	40-7200	305.65
	SDJCL 0505 H2	10-3642		
	SDNCN 0505 H2	10-3761		
1 Boring Bar 5/16" Shank Diameter	A05H SDQCR 2	20-0901		
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	40-7201	338.35
	SDJCL 0606 H2	10-3652		
	SDNCN 0606 H2	10-3762		
1 Boring Bar 3/8" Shank Diameter	A06J SDUCR 2	21-1031		
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	40-7202	374.10
	SDJCL 0808H2	10-3654		
	SDNCN 0808 H2	10-3763		
1 Boring Bar 1/2" Shank Diameter	A08K SDUCR 2	21-1033		
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	40-7203	460.60
	SDJCL 1010 H2	10-3616		
	SDNCN 1010 H2	10-3764		
1 Boring Bar 5/8" Shank Diameter	A10M SDUCR 2	21-1035		
4 Inserts	-	50-1200		
4 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		

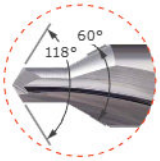
Sets

Indexable – Milling – Tool Holders – Coolant Through

Set Contents	Holder Nomenclature	Part Number	Set	
		Tool #	Set #	USD$
3 Tool Holders 1/2" Shank Diameters	AAAP 1216 2	30-1216	60-3003	460.60
	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 #	USD$
.0469	.047	.1250	1.500	DC-1	DC-0	540.70
.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		

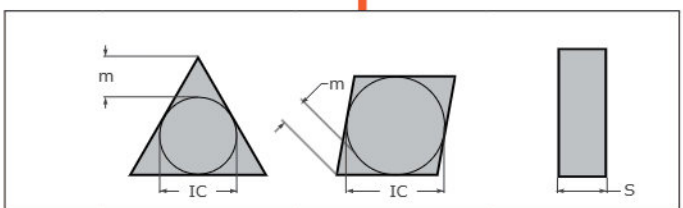
Insert Designation Chart

PCD - Turning Inserts

Symbol	Shape
C	80° Rhombus
D	55° Rhombus
T	60° Triangle
V	35° Rhombus

Symbol	Relief Angle
B	5°
C	7°
P	11°

V B G W



Symbol	Nose Height m Tolerance	Inscribed Circle IC Tolerance	Thickness S Tolerance
G	±.001	±.001	±.005

Symbol	Geomerty and Clamping System
N	
T	
W	

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Insert Designation Chart

PCD - Turning Inserts

Inch		Metric			
Insert Size	Inscribed Circle Diameter	T	D	C	V
2	.250	11	06	07	11
3	.375	16	09	11	16
4	.500	22	12	15	22

Inch	Thickness (Inch)	Metric Symbol
1.5	.094	02
2	.125	03
2.5	.156	T3
3	.187	04

Inch	Corner Radius	Metric
0.2	.004	01
0.5	.008	02
1	.016	04
2	.031	08
3	.047	12

Geometry Designation	
LF	Laser Finish Chipbreaker

Grade	
P	PCD Tipped General Purpose for Non-Ferrous Material

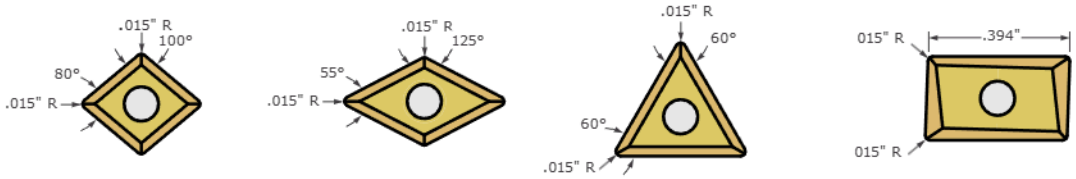
Technical Resources on Micro100.com

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

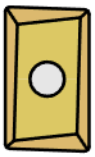
SCAN

Indexable Inserts

Indexable Cutters – Inserts



- Solid carbide

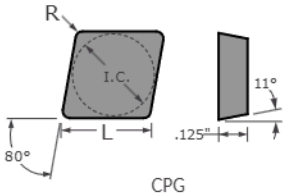
Insert Type	Insert*	
	Tool #	USD$
	50-1100	17.55
	50-1105	21.30
	50-1200	18.65
	50-1300	16.05
	50-2100	19.35

*Must be ordered in quantities of 10.

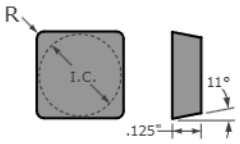
CPG / SPG

Indexable Inserts

Indexable Cutters – Generic Inserts – Diamond Style



CPG



SPG

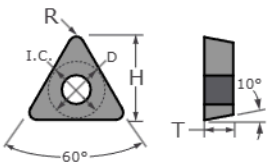
- 80° diamond insert with radius on corner
- For use in clamp locking style holder
- Solid carbide - Uncoated

Inscribed Circle	Length	Radius	Style	Diamond Style Insert	
IC +.001" −.001"	L +.001" −.001"	R +.003" −.003"		Tool #	USD$
.464	.471	.031	CPG	CPG-4622	24.45
.500	.508	.015	CPG	CPG-421	21.95
.500	.508	.031	CPG	CPG-422	18.50
.375	-	.031	SPG	SPG-322	22.10
.500	-	.031	SPG	SPG-422	19.60

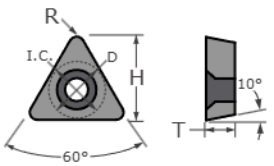
TPG / TP / TD

Indexable Inserts

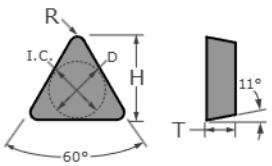
Indexable Cutters – Generic Inserts – Triangle Style



TP



TD-6P



TPG

- 60° triangular insert with radius on corner
- For use with clamp locking style holder
- Solid carbide - Uncoated

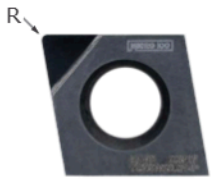
Inscribed Circle	Thickness	Height	Radius	Hole Diameter	Set Screw UN	Style	Triangle Style Insert	
IC +.001" −.001"	T +.005" −.005"	H	R +.003" −.003"	D +.003" −.003"			Tool #	USD$
.250	.094	.3438	.031	.137	4-40	TP	TP-42	21.00
.250	.094	.3600	.015	.137	4-40	TP	TP-41	14.65
.250	.125	.3440	.031			TPG	TPG-222	15.50
.375	.125	.5324	.031			TPG	TPG-322	18.50
.375	.125	.5324	.031	.163	6-32	TP	TP-62	24.25
.375	.125	.5324	.031	.125	4-40	TD	TD-6P-2	24.25
.375	.125	.5479	.015			TPG	TPG-321	17.40
.375	.125	.5479	.015	.163	6-32	TP	TP-61	24.25
.375	.125	.5480	.015	.125	4-40	TD	TD-6P-1	24.25
.500	.188	.7030	.047			TPG	TPG-433	28.30
.500	.188	.7199	.031			TPG	TPG-432	20.45

NEW!

Indexable Inserts

Indexable Cutters – PCD Tipped Inserts

ANSI/ISO-PCD



- PCD diamond brazed on a solid carbide insert
- For use with screw-locking style holders
- Designed for non-ferrous applications
- Precision manufactured in the USA

ANSI Nomenclature	ISO Nomenclature	Corner Radius	Grade	PCD Diamond Coated		
		R		Tool #	USD$	
CCGW 21.50.5	CCGW 060202	.008	P	70-3523	95.60	NEW
CCGW 21.51	CCGW 060204	.016	P	70-4836	95.60	NEW
CCGW 21.52	CCGW 060208	.031	P	70-1213	95.60	NEW
CCGW 32.50.5	CCGW 09T302	.008	P	70-9883	95.60	NEW
CCGW 32.51	CCGW 09T304	.016	P	70-6226	95.60	NEW
CCGW 32.52	CCGW 09T308	.031	P	70-5517	95.60	NEW
CCGW 431	CCGW 120404	.016	P	70-0785	95.60	NEW
CCGW 432	CCGW 120408	.031	P	70-9646	95.60	NEW
CCGW 433	CCGW 120412	.047	P	70-3634	95.60	NEW
CPGW 21.50.5	CPGW 060202	.008	P	70-4128	95.60	NEW
CPGW 21.51	CPGW 060204	.016	P	70-8469	95.60	NEW
CPGW 21.52	CPGW 060208	.031	P	70-9980	95.60	NEW
CPGW 32.50.5	CPGW 09T302	.008	P	70-7625	95.60	NEW
CPGW 32.51	CPGW 09T304	.016	P	70-9409	95.60	NEW
CPGW 32.52	CPGW 09T308	.031	P	70-3337	95.60	NEW
DCGW 21.50.2	DCGW 070201	.004	P	70-4220	95.60	NEW
DCGW 21.50.5	DCGW 070202	.008	P	70-9434	95.60	NEW
DCGW 21.51	DCGW 070204	.016	P	70-1555	95.60	NEW
DCGW 21.52	DCGW 070208	.031	P	70-9120	95.60	NEW
DCGW 32.50.2	DCGW 11T301	.004	P	70-2289	95.60	NEW
DCGW 32.50.5	DCGW 11T302	.008	P	70-3689	95.60	NEW
DCGW 32.51	DCGW 11T304	.016	P	70-5069	95.60	NEW
DCGW 32.52	DCGW 11T308	.031	P	70-2277	95.60	NEW
TCGW 21.50.5	TCGW 110202	.008	P	70-5897	95.60	NEW
TCGW 21.51	TCGW 110204	.016	P	70-5190	95.60	NEW
TCGW 21.52	TCGW 110208	.031	P	70-7808	95.60	NEW
TCGW 32.51	TCGW 16T304	.016	P	70-6200	95.60	NEW
TCGW 32.52	TCGW 16T308	.031	P	70-9125	95.60	NEW
TPGN 21.51	TPGN 110204	.016	P	70-2084	95.60	NEW
TPGN 21.52	TPGN 110208	.031	P	70-8101	95.60	NEW
TPGN 220.5	TPGN 110302	.008	P	70-2591	95.60	NEW
TPGN 221	TPGN 110304	.016	P	70-4754	95.60	NEW

Continued on next page

See pgs 312-313 for PCD Insert Designation Chart

ANSI/ISO-PCD

Indexable Inserts

Indexable Cutters – PCD Tipped Inserts (cont.)

Continued from previous page

	ANSI Nomenclature	ISO Nomenclature	Corner Radius	Grade	PCD Diamond Coated	
			R		Tool #	USD$
NEW	VBGW 21.50.2	VBGW 110201	.004	P	70-3044	95.60
NEW	VBGW 21.50.5	VBGW 110202	.008	P	70-0994	95.60
NEW	VBGW 21.51	VBGW 110204	.016	P	70-2522	95.60
NEW	VBGW 21.52	VBGW 110208	.031	P	70-8950	95.60
NEW	VBGW 330.2	VBGW 160401	.004	P	70-1301	95.60
NEW	VBGW 330.5	VBGW 160402	.008	P	70-9144	95.60
NEW	VBGW 331	VBGW 160404	.016	P	70-4984	95.60
NEW	VBGW 332	VBGW 160408	.031	P	70-2803	95.60
NEW	VCGW 220.2	VCGW 110301	.004	P	70-5756	95.60
NEW	VCGW 220.5	VCGW 110302	.008	P	70-1121	95.60
NEW	VCGW 221	VCGW 110304	.016	P	70-2477	95.60
NEW	VCGW 222	VCGW 110308	.031	P	70-7380	95.60
NEW	VCGW 330.2	VCGW 160401	.004	P	70-0724	95.60
NEW	VCGW 330.5	VCGW 160402	.008	P	70-2048	95.60
NEW	VCGW 331	VCGW 160404	.016	P	70-4588	95.60
NEW	VCGW 332	VCGW 160408	.031	P	70-8082	95.60
NEW	VCGW 333	VCGW 160412	.047	P	70-5740	133.80

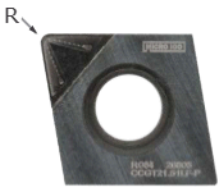
See pgs 312-313 for PCD Insert Designation Chart

NEW!

Indexable Inserts

ANSI/ISO-PCD

Indexable Cutters – PCD Tipped Inserts - Chip Former

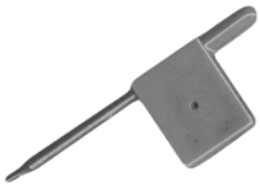


- PCD diamond brazed on a solid carbide insert
- Chip former for enhanced chip control
- For use with screw-locking style holders
- Designed for non-ferrous applications
- Precision manufactured in the USA

ANSI Nomenclature	ISO Nomenclature	Corner Radius	Grade	PCD Diamond Coated		
		R		Tool #	USD$	
CCGT 21.51	CCGT 060204	.016	P	71-9927	133.80	NEW
CCGT 21.52	CCGT 060208	.031	P	71-0898	133.80	NEW
CCGT 32.51	CCGT 09T304	.016	P	71-4571	133.80	NEW
CCGT 32.52	CCGT 09T308	.031	P	71-3396	133.80	NEW
DCGT 21.51	DCGT 070204	.016	P	71-0393	133.80	NEW
DCGT 21.52	DCGT 070208	.031	P	71-5154	133.80	NEW
DCGT 32.51	DCGT 11T304	.016	P	71-1758	133.80	NEW
DCGT 32.52	DCGT 11T308	.031	P	71-9631	133.80	NEW
TCGT 21.50.5	TCGT 110202	.008	P	71-9549	133.80	NEW
TCGT 21.51	TCGT 110204	.016	P	71-5008	133.80	NEW
TCGT 32.51	TCGT 16T304	.016	P	71-8598	133.80	NEW
TCGT 32.52	TCGT 16T308	.031	P	71-4675	133.80	NEW
VCGT 220.2	VCGT 110301	.004	P	71-5531	133.80	NEW
VCGT 220.5	VCGT 110302	.008	P	71-7371	133.80	NEW
VCGT 221	VCGT 110304	.016	P	71-0379	133.80	NEW
VCGT 330.2	VCGT 160401	.004	P	71-2646	133.80	NEW
VCGT 330.5	VCGT 160402	.008	P	71-5753	133.80	NEW
VCGT 331	VCGT 160404	.016	P	71-3844	133.80	NEW

See pgs 312-313 for PCD Insert Designation Chart

Accessories
Indexable Accessories

Accessory Type	Compatibility	Description	Accessory	
			Tool #	USD$
	Inserts 50-1100 50-1200 50-1300 50-2100	Torx Screw M2.5 x T-8	16-1020	5.85
	Inserts 50-1105	Torx Screw M3.5 x T-15	16-1030	6.75
	Screw 16-1020	Torx Key M2.5 x TK-8	16-1060	5.30
	Screw 16-1030	Torx Key M3.5 x TK-15	16-1070	6.30

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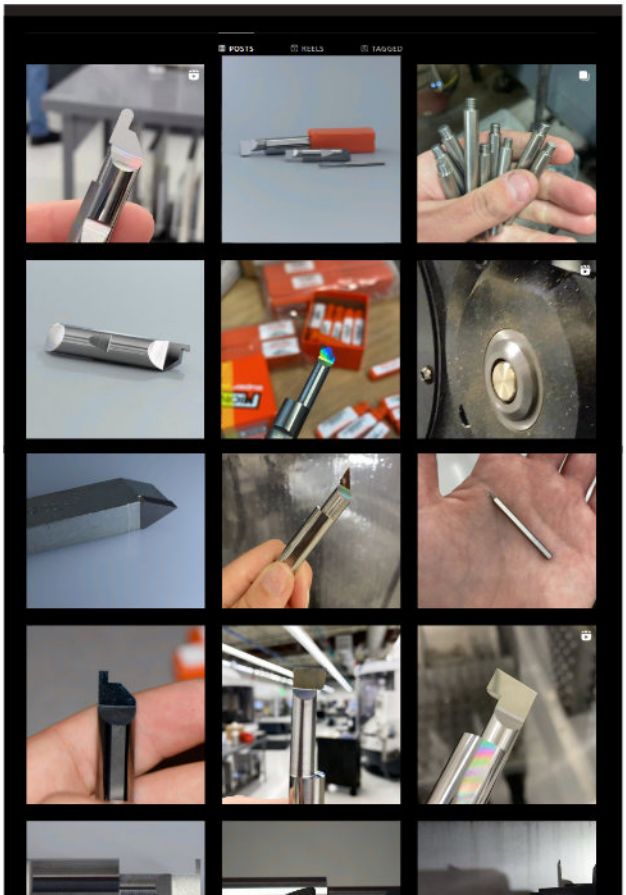

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Coatings Chart

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 abrasion 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:	0.50	0.60	0.45	0.50
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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PCD Tipped Inserts
pg 316

Chip Former
pg 318

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PCD Tipped Top Rake Chipbreaker
pg 79

PCD Tipped Right Hand Boring Tools
pg 74

New Insert Designation Chart for quick identification of PCD turning insert specifications. pg 312-313

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