

MICRO 100[®]

Make More With Micro 100

NEW!
INTERACTIVE PDF
Click on the underlined text



45° Coolant Adapter

Straight Coolant Adapter

90° Coolant Adapter

Quick Change Straight Tool Holder

Right Hand Grooving Tool

Get maximum machine compatibility and best-in-class coolant delivery options by pairing our line of Quick Change Tool Holders with new accessories on page 78.

2022 Catalog



Make More with Micro 100

Endurance & Quality

Micro 100 tooling is engineered using the latest CNC grinding technology and manufacturing practices to create the industry's highest quality products.

Powerful Performance

Micro 100 tooling is designed to excel at vastly increased speed and feed rates while providing exceptional results in a wide array of difficult-to-machine materials.

Earned Reputation

Micro 100 has built, and earned, an international reputation for manufacturing high quality solid carbide turning tools that are built to last.

Harvey Performance Company combines the leading Harvey Tool, Helical Solutions, Micro 100, Titan USA, and CoreHog brands to provide world class tooling, unmatched service, and innovative solutions that increase productivity for our customers.




Think Harvey Tool First




More than 26,000 miniature and specialty end mills. Ship today, in your machine tomorrow.

HARVEY PERFORMANCE COMPANY



Let Helical Impress You



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



Make More with Micro 100



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



Trust in Titan USA



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



Innovative Tools for Innovative Materials



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

Our Make More Promise

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.

**Turning
Quick Change**
pg 11



**Turning
Standard**
pg 80



Milling
pg 177



**Holemaking
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pg 272



Micro 100 Technical Resources

Sim Files and Speeds & Feeds for all quick change and standard turning tools available for download at micro100.com/resources

Tools with the below icons now have downloadable files on micro100.com



Speeds & Feeds online



SIM Files online

New Sizes and Accessories

Quick Change
Boring Tools
Right Hand

pg 17

Accessories for
Quick Change Tool
Holders

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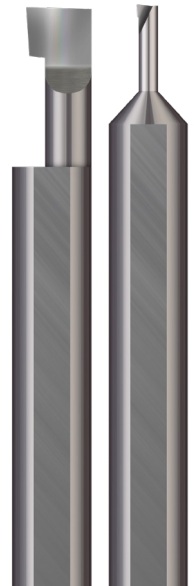
Standard
Boring Tools
Right Hand

pg 80



Find coolant fittings and additional accessories to better expand the possibilities when using Micro 100's quick change tool holders

- Coolant Adapters
- Coolant Reducer
- Plumbed Plug
- Port Plug
- Coolant Extension
- Locating / Locking Screws



TURNING

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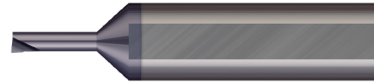
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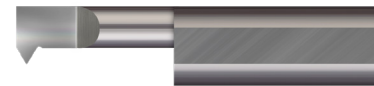
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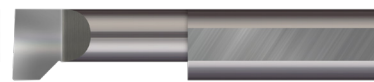
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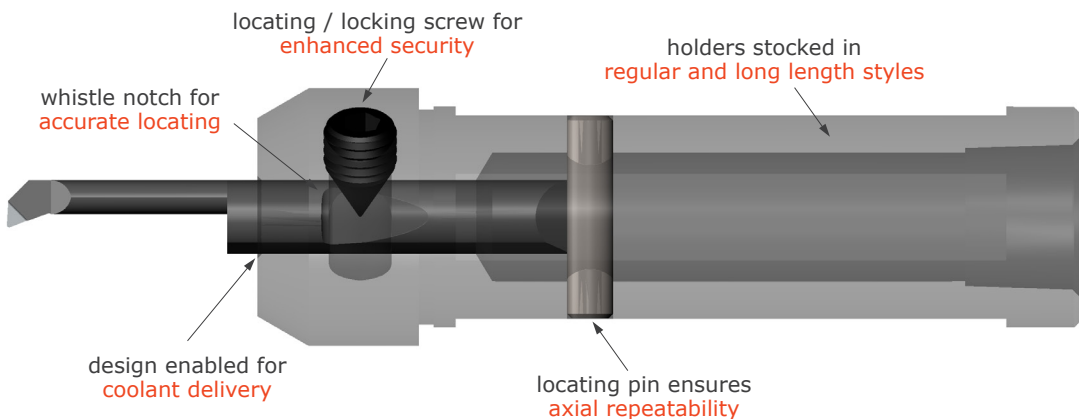
Micro 100 Micro-Quik

Radial and axial repeatability. Tip-to-tip consistency. Part-to-part accuracy.

Micro 100's Micro-Quik is a breakthrough tool change system that saves machinists countless hours by allowing for incredibly fast tool changes without sacrificing locational repeatability or machining accuracy. This fool proof system delivers impressive radial and axial repeatability, tip-to-tip consistency, and part-to-part accuracy.

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, even those employing new and up-and-coming machinists.



A Unique Design

Micro 100's Micro-Quik features a whistle notch configuration, proven to enhance axial accuracy over the standard set screw design used by other quick change system manufacturers. The whistle notch used by Micro 100 ensures that the tool is always held in location, anchored accurately in place, and pushed completely against the locating mechanism.

This axial consistency prevents all-too-common tool failures, scrap parts, and lost machine time due to improperly secured tools.

Incredible Benefits

Micro-Quik users have long enjoyed the benefits it provides: tool changes in less than 30 seconds, fewer tool change errors, impressive radial and axial repeatability, and increased machine up-time.

Learn which quick change tool holder is best for you on pg 10

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.

Easy 3-Step Process

1. Remove the existing tool by loosening the locating/locking screw.
2. Remove the used tool.
3. Insert the new tool and retighten the locating/locking screw.



Quick Change Tooling begins on pg 12

Vast Holder Offering

- Standard Length Tool Holders
- Long Length Tool Holders
- Double-Ended Tool Holders
- Holders for Star Swiss Machines
- Imperial and Metric Tool Shanks
- Plumbed and Ported Coolant Access Options
- Tool Holders for Grinding Custom Profiles

Expansive Tool Offering

- 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

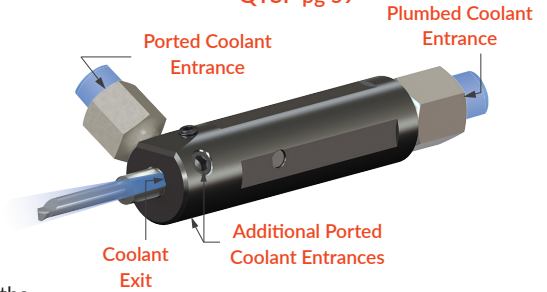
More Than 1,900 Stocked Quick Change Tools!

Quick Change Tool Holders

Begins on pg 59

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

Plumbed & Ported
QTSP pg 59



Straight Quick Change Tool Holders

- Enhanced application flexibility and headless design
- Optimized for use in any Swiss, standard lathe, or multi-function lathe
- Offered with ported, plumbed, or ported & plumbed coolant access options
- Designed for ease of installation through the back side of the tooling block
- Stocked in standard and long length styles

Choose from 5 time-saving Quick Change holder styles!

Find Our New Accessories
Starting on Page 76

Headless tool holders engineered for use in any Swiss, standard, or multi-function lathe machine. Designed for ease of installation through the back side of the tooling block.

See pages 59-61

	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.
	pages 59-60	page 61	pages 62-63	pages 64-65	pages 66-67
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		✓		✓	
Modular & Double-Ended for Added Versatility					✓
Locating/locking screw Number/Orientation	1/Top	1/Top	1/Side	1/Side	1/Side

TURNING

Internal Diameter & Outside Diameter

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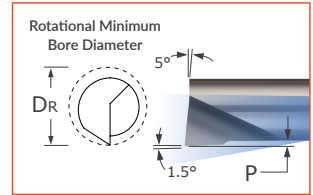
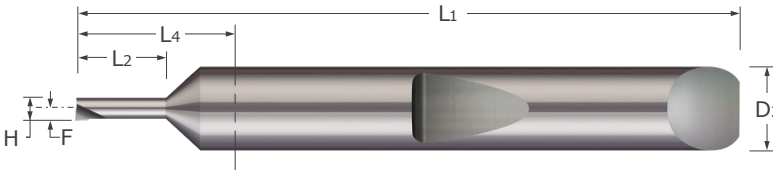
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Quick Change – Boring Tools

Right Hand – Sharp – Miniature

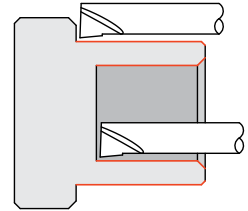
Tech Resources Available Online

QMBB



Quick Change – Boring Tools

- 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 geometry makes the tool as rigid as possible
- 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	
								Tool #	Price	Tool #	Price
H	DR	L2 ^{+0.030"} _{-.000"}	P	L4	F	D2 (h6)	L1				
.0135	.0150	.050	.0015	.590	.0075	.1875	1.5	QMBB-015050	44.00	QMBB-015050X	46.85
.0135	.0150	.075	.0015	.590	.0075	.1875	1.5	QMBB-015075	44.00	QMBB-015075X	48.50 NEW
.0180	.0200	.050	.0020	.590	.0100	.1875	1.5	QMBB-020050	44.00	QMBB-020050X	48.50 NEW
.0180	.0200	.075	.0020	.590	.0100	.1875	1.5	QMBB-020075	44.00	QMBB-020075X	46.85
.0180	.0200	.100	.0020	.590	.0100	.1875	1.5	QMBB-020100	44.00	QMBB-020100X	48.50 NEW
.0225	.0250	.050	.0025	.590	.0125	.1875	1.5	QMBB-025050	38.75	QMBB-025050X	43.25 NEW
.0225	.0250	.075	.0025	.590	.0125	.1875	1.5	QMBB-025075	38.75	QMBB-025075X	43.25 NEW
.0225	.0250	.100	.0025	.590	.0125	.1875	1.5	QMBB-025100	38.75	QMBB-025100X	41.50
.0225	.0250	.125	.0025	.590	.0125	.1875	1.5	QMBB-025125	38.75	QMBB-025125X	43.25 NEW
.0275	.0300	.075	.0025	.590	.0150	.1875	1.5	QMBB-030075	38.75	QMBB-030075X	43.25 NEW
.0275	.0300	.100	.0025	.590	.0150	.1875	1.5	QMBB-030100	38.75	QMBB-030100X	41.50
.0275	.0300	.125	.0025	.590	.0150	.1875	1.5	QMBB-030125	38.75	QMBB-030125X	43.25 NEW
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.0320	.0350	.075	.0030	.590	.0175	.1875	1.5	QMBB-035075	38.75	QMBB-035075X	43.25 NEW
.0320	.0350	.100	.0030	.590	.0175	.1875	1.5	QMBB-035100	38.75	QMBB-035100X	41.50
.0320	.0350	.150	.0030	.590	.0175	.1875	1.5	QMBB-035150	38.75	QMBB-035150X	41.50
.0320	.0350	.200	.0030	.590	.0175	.1875	1.5	QMBB-035200	38.75	QMBB-035200X	43.25 NEW
.0365	.0400	.100	.0035	.590	.0200	.1875	1.5	QMBB-040100	38.75	QMBB-040100X	43.25 NEW
.0365	.0400	.150	.0035	.590	.0200	.1875	1.5	QMBB-040150	38.75	QMBB-040150X	41.50
.0365	.0400	.200	.0035	.590	.0200	.1875	1.5	QMBB-040200	38.75	QMBB-040200X	41.50
.0405	.0450	.100	.0045	.590	.0225	.1875	1.5	QMBB-045100	38.75	QMBB-045100X	43.25 NEW
.0405	.0450	.150	.0045	.590	.0225	.1875	1.5	QMBB-045150	38.75	QMBB-045150X	41.50
.0405	.0450	.200	.0045	.590	.0225	.1875	1.5	QMBB-045200	38.75	QMBB-045200X	41.50
.0440	.0500	.100	.0060	.590	.0250	.1875	1.5	QMBB-050100	30.30	QMBB-050100X	34.80 NEW
.0440	.0500	.150	.0060	.590	.0250	.1875	1.5	QMBB-050150	30.30	QMBB-050150X	32.90
.0440	.0500	.200	.0060	.590	.0250	.1875	1.5	QMBB-050200	30.30	QMBB-050200X	32.90
.0440	.0500	.300	.0060	.590	.0250	.1875	1.5	QMBB-050300	30.30	QMBB-050300X	32.90
.0525	.0600	.150	.0075	.590	.0300	.1875	1.5	QMBB-060150	30.30	QMBB-060150X	32.90
.0525	.0600	.200	.0075	.590	.0300	.1875	1.5	QMBB-060200	30.30	QMBB-060200X	32.90
.0525	.0600	.300	.0075	.590	.0300	.1875	1.5	QMBB-060300	30.30	QMBB-060300X	32.90
.0525	.0600	.400	.0075	.590	.0300	.1875	1.5	QMBB-060400	30.30	QMBB-060400X	32.90
.0525	.0600	.500	.0075	.590	.0300	.1875	1.5	QMBB-060500	30.30	QMBB-060500X	32.90

Continued on next page

See pg 59-72 for quick change holder options

QMBB



Quick Change – Boring Tools

Right Hand – Sharp – Miniature (cont.)

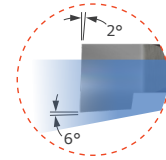
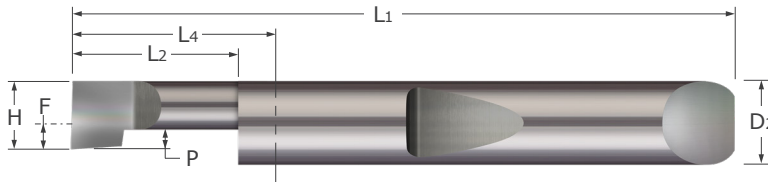
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Head Width	Rotational Minimum Bore Dia.	Max. Bore Depth	Projection	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AITIN Coated	
								Tool #	Price	Tool #	Price
H	D _R		P	L ₄	F		L ₁				
.0625	.0700	.150	.0075	.590	.0350	.1875	1.5	QMBB-070150	30.30	QMBB-070150X	32.90
.0625	.0700	.200	.0075	.590	.0350	.1875	1.5	QMBB-070200	30.30	QMBB-070200X	32.90
.0625	.0700	.300	.0075	.590	.0350	.1875	1.5	QMBB-070300	30.30	QMBB-070300X	32.90
.0625	.0700	.400	.0075	.590	.0350	.1875	1.5	QMBB-070400	30.30	QMBB-070400X	32.90
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.0700	.0800	.150	.0100	.590	.0400	.1875	1.5	QMBB-080150	30.30	QMBB-080150X	32.90
.0700	.0800	.200	.0100	.590	.0400	.1875	1.5	QMBB-080200	30.30	QMBB-080200X	32.90
.0700	.0800	.300	.0100	.590	.0400	.1875	1.5	QMBB-080300	30.30	QMBB-080300X	32.90
.0700	.0800	.500	.0100	.590	.0400	.1875	1.5	QMBB-080500	30.30	QMBB-080500X	32.90
.0700	.0800	.600	.0100	1.090	.0400	.1875	2.0	QMBB-080600	30.30	QMBB-080600X	32.90
NEW	.0800	.0900	.200	.0100	.590	.0450	1.5	QMBB-090200	30.30	QMBB-090200X	34.80
	.0800	.0900	.300	.0100	.590	.0450	1.5	QMBB-090300	30.30	QMBB-090300X	32.90
	.0800	.0900	.500	.0100	.590	.0450	1.5	QMBB-090500	30.30	QMBB-090500X	32.90
	.0800	.0900	.700	.0100	1.090	.0450	2.0	QMBB-090700	30.30	QMBB-090700X	32.90
NEW	.0875	.1000	.200	.0125	.590	.0500	1.5	QMBB-100200	30.30	QMBB-100200X	34.80
	.0875	.1000	.300	.0125	.590	.0500	1.5	QMBB-100300	30.30	QMBB-100300X	32.90
	.0875	.1000	.500	.0125	.590	.0500	1.5	QMBB-100500	30.30	QMBB-100500X	32.90
	.0875	.1000	.700	.0125	1.090	.0500	2.0	QMBB-100700	30.30	QMBB-100700X	32.90
	.0875	.1000	.800	.0125	1.090	.0500	2.0	QMBB-100800	30.30	QMBB-100800X	32.90

See pg [59-72](#) for quick change holder options

Quick Change – Boring Tools

Right Hand – Sharp

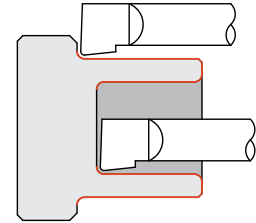


- Designed for facing and boring applications in bores .055" and larger
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split geometry makes the tool as rigid as possible
- Coolant fed enabled shank design
- Sharp corner profile
- Proprietary Micro-Quik 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

Coolant Groove Style



QBB-050s thru 120s



Quick Change – Boring Tools

Head Width	Min. Bore Diameter*	Max. Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
								Tool #	Price	Tool #	Price
H		L2 +.030" - .000"	P	L4	F	D2 (h6)	L1				
.0500	.0550	.150	.013	.590	-.0438	.1875	1.5	QBB-050150	30.30	QBB-050150X	32.90
.0500	.0550	.200	.013	.590	-.0438	.1875	1.5	QBB-050200	30.30	QBB-050200X	32.90
.0500	.0550	.300	.013	.590	-.0438	.1875	1.5	QBB-050300	30.30	QBB-050300X	32.90
.0500	.0550	.400	.013	.590	-.0438	.1875	1.5	QBB-050400	30.30	QBB-050400X	32.90
.0600	.0700	.150	.015	.590	-.0338	.1875	1.5	QBB-060150	30.30	QBB-060150X	32.90
.0600	.0700	.200	.015	.590	-.0338	.1875	1.5	QBB-060200	30.30	QBB-060200X	32.90
.0600	.0700	.300	.015	.590	-.0338	.1875	1.5	QBB-060300	30.30	QBB-060300X	32.90
.0600	.0700	.400	.015	.590	-.0338	.1875	1.5	QBB-060400	30.30	QBB-060400X	32.90
.0600	.0700	.500	.015	.590	-.0338	.1875	1.5	QBB-060500	30.30	QBB-060500X	32.90
.0700	.0800	.150	.015	.590	-.0238	.1875	1.5	QBB-070150-000	30.30	QBB-070150-000X	34.80 NEW
.0700	.0800	.200	.015	.590	-.0238	.1875	1.5	QBB-070200-000	30.30	QBB-070200-000X	34.80 NEW
.0700	.0800	.300	.015	.590	-.0238	.1875	1.5	QBB-070300-000	30.30	QBB-070300-000X	34.80 NEW
.0800	.0900	.150	.020	.590	-.0138	.1875	1.5	QBB-080150-000	30.30	QBB-080150-000X	34.80 NEW
.0800	.0900	.200	.020	.590	-.0138	.1875	1.5	QBB-080200	30.30	QBB-080200X	32.90
.0800	.0900	.300	.020	.590	-.0138	.1875	1.5	QBB-080300	30.30	QBB-080300X	32.90
.0800	.0900	.400	.020	.590	-.0138	.1875	1.5	QBB-080400-000	30.30	QBB-080400-000X	34.80 NEW
.0800	.0900	.500	.020	.590	-.0138	.1875	1.5	QBB-080500	30.30	QBB-080500X	32.90
.0800	.0900	.600	.020	1.090	-.0138	.1875	2.0	QBB-080600	30.30	QBB-080600X	32.90
.0900	.1000	.150	.020	.590	-.0038	.1875	1.5	QBB-090150-000	32.10	QBB-090150-000X	36.60 NEW
.0900	.1000	.200	.020	.590	-.0038	.1875	1.5	QBB-090200-000	32.10	QBB-090200-000X	36.60 NEW
.0900	.1000	.300	.020	.590	-.0038	.1875	1.5	QBB-090300-000	32.10	QBB-090300-000X	36.60 NEW
.0900	.1000	.400	.020	.590	-.0038	.1875	1.5	QBB-090400-000	32.10	QBB-090400-000X	36.60 NEW
.0900	.1000	.500	.020	.590	-.0038	.1875	1.5	QBB-090500-000	32.10	QBB-090500-000X	36.60 NEW
.1000	.1100	.150	.025	.590	.0063	.1875	1.5	QBB-100150-000	32.10	QBB-100150-000X	36.60 NEW
.1000	.1100	.200	.025	.590	.0063	.1875	1.5	QBB-100200	32.10	QBB-100200X	34.70
.1000	.1100	.300	.025	.590	.0063	.1875	1.5	QBB-100300	32.10	QBB-100300X	34.70

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

Continued on next page

See pg 59-72 for quick change holder options

See pg 12 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 22-25



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	L ₂ ^{+0.030"} _{-.000"}	P	L ₄	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price
NEW	.1000	.1100	.400	.025	.590	.0063	.1875	1.5	QBB-100400-000	32.10	QBB-100400-000X	36.60
	.1000	.1100	.500	.025	.590	.0063	.1875	1.5	QBB-100500	32.10	QBB-100500X	34.70
NEW	.1000	.1100	.600	.025	1.090	.0063	.1875	2.0	QBB-100600-000	33.40	QBB-100600-000X	37.90
	.1000	.1100	.700	.025	1.090	.0063	.1875	2.0	QBB-100700	32.10	QBB-100700X	34.70
NEW	.1100	.1220	.150	.028	.590	.0163	.1875	1.5	QBB-110150-000	32.10	QBB-110150-000X	36.60
NEW	.1100	.1220	.200	.028	.590	.0163	.1875	1.5	QBB-110200-000	32.10	QBB-110200-000X	36.60
	.1100	.1220	.300	.028	.590	.0163	.1875	1.5	QBB-110300-000	32.10	QBB-110300-000X	35.75
NEW	.1100	.1220	.400	.028	.590	.0163	.1875	1.5	QBB-110400-000	32.10	QBB-110400-000X	36.60
NEW	.1100	.1220	.500	.028	.590	.0163	.1875	1.5	QBB-110500-000	32.10	QBB-110500-000X	36.60
NEW	.1100	.1220	.600	.028	1.090	.0163	.1875	2.0	QBB-110600-000	33.40	QBB-110600-000X	37.90
NEW	.1100	.1220	.700	.028	1.090	.0163	.1875	2.0	QBB-110700-000	33.40	QBB-110700-000X	37.90
	.1200	.1320	.250	.030	.590	.0263	.1875	1.5	QBB-120250-000	32.10	QBB-120250-000X	35.75
	.1200	.1320	.350	.030	.590	.0263	.1875	1.5	QBB-120350-000	32.10	QBB-120350-000X	35.75
	.1200	.1320	.500	.030	.590	.0263	.1875	1.5	QBB-120500-000	32.10	QBB-120500-000X	35.75
NEW	.1200	.1320	.600	.030	1.090	.0263	.1875	2.0	QBB-120600-000	33.40	QBB-120600-000X	37.90
NEW	.1200	.1320	.700	.030	1.090	.0263	.1875	2.0	QBB-120700-000	33.40	QBB-120700-000X	37.90
	.1200	.1320	.800	.030	1.090	.0263	.1875	2.0	QBB-120800-000	33.40	QBB-120800-000X	37.90
	.1400	.1520	.250	.035	.590	.0463	.1875	1.5	QBB-140250-000	32.10	QBB-140250-000X	35.75
	.1400	.1520	.400	.035	.590	.0463	.1875	1.5	QBB-140400-000	32.10	QBB-140400-000X	35.75
	.1400	.1520	.500	.035	.590	.0463	.1875	1.5	QBB-140500-000	32.10	QBB-140500-000X	35.75
NEW	.1400	.1520	.600	.035	1.090	.0463	.1875	2.0	QBB-140600-000	33.40	QBB-140600-000X	37.90
NEW	.1400	.1520	.700	.035	1.090	.0463	.1875	2.0	QBB-140700-000	33.40	QBB-140700-000X	37.90
NEW	.1400	.1520	.750	.035	1.090	.0463	.1875	2.0	QBB-140750-000	33.40	QBB-140750-000X	37.90
	.1400	.1520	.800	.035	1.090	.0463	.1875	2.0	QBB-140800-000	33.40	QBB-140800-000X	37.90
NEW	.1400	.1520	.900	.035	1.090	.0463	.1875	2.0	QBB-140900-000	33.40	QBB-140900-000X	37.90
NEW	.1600	.1760	.250	.040	.590	.0663	.1875	1.5	QBB-160250-000	32.10	QBB-160250-000X	36.60
	.1600	.1760	.400	.040	.590	.0663	.1875	1.5	QBB-160400-000	32.10	QBB-160400-000X	35.75
	.1600	.1760	.500	.040	.590	.0663	.1875	1.5	QBB-160500-000	32.10	QBB-160500-000X	35.75
	.1600	.1760	.600	.040	1.090	.0663	.1875	2.0	QBB-160600-000	32.10	QBB-160600-000X	35.75
NEW	.1600	.1760	.750	.040	1.090	.0663	.1875	2.0	QBB-160750-000	33.40	QBB-160750-000X	37.90
NEW	.1600	.1760	.900	.040	1.090	.0663	.1875	2.0	QBB-160900-000	33.40	QBB-160900-000X	37.90
	.1600	.1760	1.000	.040	1.090	.0663	.1875	2.0	QBB-1601000-000	32.10	QBB-1601000-000X	35.75
	.1800	.1960	.350	.045	.853	.0550	.2500	2.0	QBB-180350-000	36.00	QBB-180350-000X	41.40
	.1800	.1960	.500	.045	.853	.0550	.2500	2.0	QBB-180500-000	36.00	QBB-180500-000X	41.40
	.1800	.1960	.600	.045	.853	.0550	.2500	2.0	QBB-180600-000	36.00	QBB-180600-000X	41.40
	.1800	.1960	.750	.045	.853	.0550	.2500	2.0	QBB-180750-000	36.00	QBB-180750-000X	41.40
NEW	.1800	.1960	.900	.045	1.353	.0550	.2500	2.5	QBB-180900-000	37.35	QBB-180900-000X	43.10
NEW	.1800	.1960	1.000	.045	1.353	.0550	.2500	2.5	QBB-1801000-000	37.35	QBB-1801000-000X	43.10
NEW	.1800	.1960	1.250	.045	1.353	.0550	.2500	2.5	QBB-1801250-000	37.35	QBB-1801250-000X	43.10
NEW	.1800	.1960	1.500	.045	1.853	.0550	.2500	3.0	QBB-1801500-000	38.80	QBB-1801500-000X	44.55

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

Continued on next page

See pg 59-72 for quick change holder options

See pg 12 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 22-25

Quick Change – Boring Tools

Right Hand – Sharp (cont.)



QBB

Quick Change – Boring Tools

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	
								Tool #	Price	Tool #	Price
H	L ₂	$L_2^{+.030" / -.000"}$	P	L ₄	F	D ₂ (h6)	L ₁				
.2000	.2160	.400	.050	.853	.0750	.2500	2.0	QBB-200400-000	36.00	QBB-200400-000X	41.40
.2000	.2160	.500	.050	.853	.0750	.2500	2.0	QBB-200500-000	36.00	QBB-200500-000X	41.40
.2000	.2160	.600	.050	.853	.0750	.2500	2.0	QBB-200600-000	36.00	QBB-200600-000X	41.40
.2000	.2160	.700	.050	.853	.0750	.2500	2.0	QBB-200700-000	36.00	QBB-200700-000X	41.40
.2000	.2160	.750	.050	.853	.0750	.2500	2.0	QBB-200750-000	36.00	QBB-200750-000X	41.40
.2000	.2160	1.000	.050	1.353	.0750	.2500	2.5	QBB-2001000-000	36.00	QBB-2001000-000X	41.75
.2300	.2500	.400	.058	.853	.0738	.3125	2.0	QBB-230400-000	46.20	QBB-230400-000X	52.70
.2300	.2500	.500	.058	.853	.0738	.3125	2.0	QBB-230500-000	46.20	QBB-230500-000X	52.70
.2300	.2500	.600	.058	.853	.0738	.3125	2.0	QBB-230600-000	46.20	QBB-230600-000X	52.70
.2300	.2500	.700	.058	.853	.0738	.3125	2.0	QBB-230700-000	46.20	QBB-230700-000X	52.70
.2300	.2500	.750	.058	.853	.0738	.3125	2.0	QBB-230750-000	46.20	QBB-230750-000X	52.70
.2300	.2500	.800	.058	1.353	.0738	.3125	2.5	QBB-230800-000	47.55	QBB-230800-000X	54.45
.2300	.2500	.900	.058	1.353	.0738	.3125	2.5	QBB-230900-000	47.55	QBB-230900-000X	54.45
.2300	.2500	1.000	.058	1.353	.0738	.3125	2.5	QBB-2301000-000	46.20	QBB-2301000-000X	53.10
.2300	.2500	1.500	.058	1.853	.0738	.3125	3.0	QBB-2301500-000	46.20	QBB-2301500-000X	53.10
.2600	.2800	.500	.065	.853	.1038	.3125	2.0	QBB-260500-000	46.20	QBB-260500-000X	52.70
.2600	.2800	.750	.065	.853	.1038	.3125	2.0	QBB-260750-000	46.20	QBB-260750-000X	52.70
.2600	.2800	1.000	.065	1.353	.1038	.3125	2.5	QBB-2601000-000	47.55	QBB-2601000-000X	54.45
.2600	.2800	1.250	.065	1.353	.1038	.3125	2.5	QBB-2601250-000	47.55	QBB-2601250-000X	54.45
.2900	.3100	.500	.073	.853	.1338	.3125	2.0	QBB-290500-000	46.20	QBB-290500-000X	52.70
.2900	.3100	.600	.073	.853	.1338	.3125	2.0	QBB-290600-000	46.20	QBB-290600-000X	52.70
.2900	.3100	.750	.073	.853	.1338	.3125	2.0	QBB-290750-000	46.20	QBB-290750-000X	52.70
.2900	.3100	.900	.073	1.353	.1338	.3125	2.5	QBB-290900-000	47.55	QBB-290900-000X	54.45
.2900	.3100	1.000	.073	1.353	.1338	.3125	2.5	QBB-2901000-000	47.55	QBB-2901000-000X	54.45
.2900	.3100	1.250	.073	1.353	.1338	.3125	2.5	QBB-2901250-000	47.55	QBB-2901250-000X	54.45
.3200	.3400	.500	.080	.853	.1325	.3750	2.0	QBB-320500-000	63.40	QBB-320500-000X	71.10
.3200	.3400	1.000	.080	1.353	.1325	.3750	2.5	QBB-3201000-000	67.00	QBB-3201000-000X	75.20
.3200	.3400	1.500	.080	1.853	.1325	.3750	3.0	QBB-3201500-000	70.45	QBB-3201500-000X	78.65

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

See pg 59-72 for quick change holder options

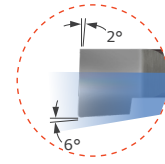
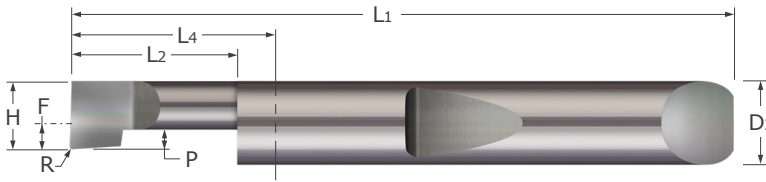
See pg 12 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 22-25

QBB

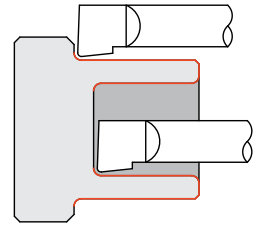


Quick Change – Boring Tools Right Hand



- Designed for facing and boring applications in bores .055" and larger
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split 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
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide ■ CNC ground in the USA

Coolant Groove Styles



Quick Change – Boring Tools

	Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
										H	L2	R	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
NEW	.0500	.0550	.150	.003	.013	.590	-.0438	.1875	1.5	QBB3-050150	33.80	QBB3-050150X	38.30
NEW	.0500	.0550	.200	.003	.013	.590	-.0438	.1875	1.5	QBB3-050200	33.80	QBB3-050200X	38.30
NEW	.0500	.0550	.300	.003	.013	.590	-.0438	.1875	1.5	QBB3-050300	33.80	QBB3-050300X	38.30
NEW	.0500	.0550	.400	.003	.013	.590	-.0438	.1875	1.5	QBB3-050400	33.80	QBB3-050400X	38.30
NEW	.0600	.0700	.150	.003	.015	.590	-.0338	.1875	1.5	QBB3-060150	33.80	QBB3-060150X	38.30
NEW	.0600	.0700	.200	.003	.015	.590	-.0338	.1875	1.5	QBB3-060200	33.80	QBB3-060200X	38.30
NEW	.0600	.0700	.300	.003	.015	.590	-.0338	.1875	1.5	QBB3-060300	33.80	QBB3-060300X	38.30
NEW	.0600	.0700	.400	.003	.015	.590	-.0338	.1875	1.5	QBB3-060400	33.80	QBB3-060400X	38.30
NEW	.0600	.0700	.500	.003	.015	.590	-.0338	.1875	1.5	QBB3-060500	33.80	QBB3-060500X	38.30
NEW	.0700	.0800	.150	.003	.015	.590	-.0238	.1875	1.5	QBB3-070150	33.80	QBB3-070150X	38.30
NEW	.0700	.0800	.200	.003	.015	.590	-.0238	.1875	1.5	QBB3-070200	33.80	QBB3-070200X	38.30
NEW	.0700	.0800	.300	.003	.015	.590	-.0238	.1875	1.5	QBB3-070300	33.80	QBB3-070300X	38.30
NEW	.0800	.0900	.150	.003	.020	.590	-.0138	.1875	1.5	QBB3-080150	33.80	QBB3-080150X	38.30
NEW	.0800	.0900	.200	.003	.020	.590	-.0138	.1875	1.5	QBB3-080200	33.80	QBB3-080200X	38.30
NEW	.0800	.0900	.300	.003	.020	.590	-.0138	.1875	1.5	QBB3-080300	33.80	QBB3-080300X	38.30
NEW	.0800	.0900	.400	.003	.020	.590	-.0138	.1875	1.5	QBB3-080400	33.80	QBB3-080400X	38.30
NEW	.0800	.0900	.500	.003	.020	.590	-.0138	.1875	1.5	QBB3-080500	33.80	QBB3-080500X	38.30
NEW	.0800	.0900	.600	.003	.020	1.090	-.0138	.1875	2.0	QBB3-080600	35.10	QBB3-080600X	39.60
NEW	.0900	.1000	.150	.003	.020	.590	-.0038	.1875	1.5	QBB3-090150	33.80	QBB3-090150X	38.30
NEW	.0900	.1000	.200	.003	.020	.590	-.0038	.1875	1.5	QBB3-090200	33.80	QBB3-090200X	38.30
NEW	.0900	.1000	.300	.003	.020	.590	-.0038	.1875	1.5	QBB3-090300	33.80	QBB3-090300X	38.30
NEW	.0900	.1000	.400	.003	.020	.590	-.0038	.1875	1.5	QBB3-090400	33.80	QBB3-090400X	38.30
NEW	.0900	.1000	.500	.003	.020	.590	-.0038	.1875	1.5	QBB3-090500	33.80	QBB3-090500X	38.30
NEW	.1000	.1100	.150	.003	.025	.590	.0063	.1875	1.5	QBB3-100150	32.10	QBB3-100150X	36.60
NEW	.1000	.1100	.200	.003	.025	.590	.0063	.1875	1.5	QBB3-100200	32.10	QBB3-100200X	36.60

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

Continued on next page

See pg 59-72 for quick change holder options

See pg 12 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 22-25

Quick Change – Boring Tools

Right Hand (cont.)



Quick Change – Boring Tools

Continued from previous page

Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
									Tool #	Price	Tool #	Price
H	L ₂	+ .030" / - .000"	R	+ .001" / - .001"	P	L ₄	F	D ₂ (h6)	L ₁			
.1000	.1100	.300	.003	.025	.590	.0063	.1875	1.5	QBB3-100300	32.10	QBB3-100300X	36.60
.1000	.1100	.400	.003	.025	.590	.0063	.1875	1.5	QBB3-100400	32.10	QBB3-100400X	36.60
.1000	.1100	.500	.003	.025	.590	.0063	.1875	1.5	QBB3-100500	32.10	QBB3-100500X	36.60
.1000	.1100	.600	.003	.025	1.090	.0063	.1875	2.0	QBB3-100600	33.40	QBB3-100600X	37.90
.1000	.1100	.700	.003	.025	1.090	.0063	.1875	2.0	QBB3-100700	33.40	QBB3-100700X	37.90
.1100	.1220	.150	.003	.028	.590	.0163	.1875	1.5	QBB3-110150	32.10	QBB3-110150X	36.60
.1100	.1220	.200	.003	.028	.590	.0163	.1875	1.5	QBB3-110200	32.10	QBB3-110200X	36.60
.1100	.1220	.300	.003	.028	.590	.0163	.1875	1.5	QBB-110300	32.10	QBB-110300X	34.70
.1100	.1220	.400	.003	.028	.590	.0163	.1875	1.5	QBB3-110400	32.10	QBB3-110400X	36.60
.1100	.1220	.500	.003	.028	.590	.0163	.1875	1.5	QBB-110500	32.10	QBB-110500X	34.70
.1100	.1220	.600	.003	.028	1.090	.0163	.1875	2.0	QBB3-110600	33.40	QBB3-110600X	37.90
.1100	.1220	.700	.003	.028	1.090	.0163	.1875	2.0	QBB-110700	32.10	QBB-110700X	34.70
.1200	.1320	.250	.003	.030	.590	.0263	.1875	1.5	QBB-120250	32.10	QBB-120250X	34.70
.1200	.1320	.250	.005	.030	.590	.0263	.1875	1.5	QBB5-120250	32.10	QBB5-120250X	36.60
.1200	.1320	.350	.003	.030	.590	.0263	.1875	1.5	QBB-120350	32.10	QBB-120350X	34.70
.1200	.1320	.350	.005	.030	.590	.0263	.1875	1.5	QBB5-120350	32.10	QBB5-120350X	36.60
.1200	.1320	.500	.003	.030	.590	.0263	.1875	1.5	QBB-120500	32.10	QBB-120500X	34.70
.1200	.1320	.500	.005	.030	.590	.0263	.1875	1.5	QBB5-120500	32.10	QBB5-120500X	36.60
.1200	.1320	.600	.003	.030	1.090	.0263	.1875	2.0	QBB3-120600	33.40	QBB3-120600X	37.90
.1200	.1320	.600	.005	.030	1.090	.0263	.1875	2.0	QBB5-120600	33.40	QBB5-120600X	37.90
.1200	.1320	.700	.003	.030	1.090	.0263	.1875	2.0	QBB-120700	32.10	QBB-120700X	34.70
.1200	.1320	.700	.005	.030	1.090	.0263	.1875	2.0	QBB5-120700	33.40	QBB5-120700X	37.90
.1200	.1320	.800	.003	.030	1.090	.0263	.1875	2.0	QBB-120800	32.10	QBB-120800X	34.70
.1200	.1320	.800	.005	.030	1.090	.0263	.1875	2.0	QBB5-120800	33.40	QBB5-120800X	37.90
.1400	.1520	.250	.003	.035	.590	.0463	.1875	1.5	QBB3-140250	32.10	QBB3-140250X	36.60
.1400	.1520	.250	.005	.035	.590	.0463	.1875	1.5	QBB5-140250	32.10	QBB5-140250X	36.60
.1400	.1520	.400	.003	.035	.590	.0463	.1875	1.5	QBB-140400	32.10	QBB-140400X	34.70
.1400	.1520	.400	.005	.035	.590	.0463	.1875	1.5	QBB5-140400	32.10	QBB5-140400X	36.60
.1400	.1520	.500	.003	.035	.590	.0463	.1875	1.5	QBB3-140500	32.10	QBB3-140500X	36.60
.1400	.1520	.500	.005	.035	.590	.0463	.1875	1.5	QBB5-140500	32.10	QBB5-140500X	36.60
.1400	.1520	.600	.003	.035	1.090	.0463	.1875	2.0	QBB-140600	32.10	QBB-140600X	34.70
.1400	.1520	.600	.005	.035	1.090	.0463	.1875	2.0	QBB5-140600	33.40	QBB5-140600X	37.90
.1400	.1520	.700	.003	.035	1.090	.0463	.1875	2.0	QBB3-140700	33.40	QBB3-140700X	37.90
.1400	.1520	.700	.005	.035	1.090	.0463	.1875	2.0	QBB5-140700	33.40	QBB5-140700X	37.90
.1400	.1520	.750	.003	.035	1.090	.0463	.1875	2.0	QBB3-140750	33.40	QBB3-140750X	37.90
.1400	.1520	.750	.005	.035	1.090	.0463	.1875	2.0	QBB5-140750	33.40	QBB5-140750X	37.90
.1400	.1520	.800	.003	.035	1.090	.0463	.1875	2.0	QBB-140800	32.10	QBB-140800X	34.70
.1400	.1520	.800	.005	.035	1.090	.0463	.1875	2.0	QBB5-140800	33.40	QBB5-140800X	37.90
.1400	.1520	.900	.003	.035	1.090	.0463	.1875	2.0	QBB3-140900	33.40	QBB3-140900X	37.90
.1400	.1520	.900	.005	.035	1.090	.0463	.1875	2.0	QBB5-140900	33.40	QBB5-140900X	37.90

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

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See pg 59-72 for quick change holder options

See pg 12 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 22-25

QBB



Quick Change – Boring Tools

Right Hand (cont.)

Continued from previous page

	Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AITIN Coated		
										Tool #	Price	Tool #	Price	
	H	L2	$+.030''$ $-.000''$	R	$+.001''$ $-.001''$	P	L4	F	D2 (h6)	L1				
NEW	.1600	.1760	.250	.003	.040	.590	.0663	.1875	1.5	QBB3-160250	32.10	QBB3-160250X	36.60	
NEW	.1600	.1760	.250	.005	.040	.590	.0663	.1875	1.5	QBB5-160250	32.10	QBB5-160250X	36.60	
	.1600	.1760	.400	.003	.040	.590	.0663	.1875	1.5	QBB-160400	32.10	QBB-160400X	34.70	
NEW	.1600	.1760	.400	.005	.040	.590	.0663	.1875	1.5	QBB5-160400	32.10	QBB5-160400X	36.60	
NEW	.1600	.1760	.500	.003	.040	.590	.0663	.1875	1.5	QBB3-160500	32.10	QBB3-160500X	36.60	
NEW	.1600	.1760	.500	.005	.040	.590	.0663	.1875	1.5	QBB5-160500	32.10	QBB5-160500X	36.60	
	.1600	.1760	.600	.003	.040	1.090	.0663	.1875	2.0	QBB-160600	32.10	QBB-160600X	34.70	
NEW	.1600	.1760	.600	.005	.040	1.090	.0663	.1875	2.0	QBB5-160600	33.40	QBB5-160600X	37.90	
NEW	.1600	.1760	.700	.003	.040	1.090	.0663	.1875	2.0	QBB3-160700	33.40	QBB3-160700X	37.90	
NEW	.1600	.1760	.700	.005	.040	1.090	.0663	.1875	2.0	QBB5-160700	33.40	QBB5-160700X	37.90	
	.1600	.1760	.750	.003	.040	1.090	.0663	.1875	2.0	QBB-160750	32.10	QBB-160750X	34.70	
NEW	.1600	.1760	.750	.005	.040	1.090	.0663	.1875	2.0	QBB5-160750	33.40	QBB5-160750X	37.90	
NEW	.1600	.1760	.800	.003	.040	1.090	.0663	.1875	2.0	QBB3-160800	33.40	QBB3-160800X	37.90	
NEW	.1600	.1760	.800	.005	.040	1.090	.0663	.1875	2.0	QBB5-160800	33.40	QBB5-160800X	37.90	
NEW	.1600	.1760	.900	.003	.040	1.090	.0663	.1875	2.0	QBB3-160900	33.40	QBB3-160900X	37.90	
NEW	.1600	.1760	.900	.005	.040	1.090	.0663	.1875	2.0	QBB5-160900	33.40	QBB5-160900X	37.90	
	.1600	.1760	1.000	.003	.040	1.090	.0663	.1875	2.0	QBB-1601000	32.10	QBB-1601000X	34.70	
NEW	.1600	.1760	1.000	.005	.040	1.090	.0663	.1875	2.0	QBB5-1601000	33.40	QBB5-1601000X	37.90	
	.1800	.1960	.350	.005	.045	.853	.0550	.2500	2.0	QBB5-180350	33.40	QBB5-180350X	38.80	
	.1800	.1960	.500	.005	.045	.853	.0550	.2500	2.0	QBB-180500	34.65	QBB-180500X	39.45	
NEW	.1800	.1960	.600	.005	.045	.853	.0550	.2500	2.0	QBB5-180600	34.65	QBB5-180600X	40.05	
	.1800	.1960	.750	.005	.045	.853	.0550	.2500	2.0	QBB-180750	34.65	QBB-180750X	39.45	
NEW	.1800	.1960	.900	.005	.045	1.353	.0550	.2500	2.5	QBB5-180900	35.90	QBB5-180900X	41.65	
	.1800	.1960	1.000	.005	.045	1.353	.0550	.2500	2.5	QBB-1801000	34.65	QBB-1801000X	39.45	
	.1800	.1960	1.250	.005	.045	1.353	.0550	.2500	2.5	QBB-1801250	34.65	QBB-1801250X	39.45	
	.1800	.1960	1.500	.005	.045	1.853	.0550	.2500	3.0	QBB-1801500	40.65	QBB-1801500X	45.60	
NEW	.2000	.2160	.400	.005	.050	.853	.0750	.2500	2.0	QBB5-200400	34.65	QBB5-200400X	40.05	
	.2000	.2160	.500	.005	.050	.853	.0750	.2500	2.0	QBB-200500	34.65	QBB-200500X	39.45	
NEW	.2000	.2160	.600	.005	.050	.853	.0750	.2500	2.0	QBB5-200600	34.65	QBB5-200600X	40.05	
NEW	.2000	.2160	.700	.005	.050	.853	.0750	.2500	2.0	QBB5-200700	34.65	QBB5-200700X	40.05	
	.2000	.2160	.750	.005	.050	.853	.0750	.2500	2.0	QBB-200750	34.65	QBB-200750X	39.45	
NEW	.2000	.2160	.800	.005	.050	1.353	.0750	.2500	2.5	QBB5-200800	35.90	QBB5-200800X	41.65	
NEW	.2000	.2160	.900	.005	.050	1.353	.0750	.2500	2.5	QBB5-200900	35.90	QBB5-200900X	41.65	
	.2000	.2160	1.000	.005	.050	1.353	.0750	.2500	2.5	QBB-2001000	34.65	QBB-2001000X	39.45	
NEW	.2000	.2160	1.100	.005	.050	1.353	.0750	.2500	2.5	QBB5-2001100	35.90	QBB5-2001100X	41.65	
	.2000	.2160	1.200	.005	.050	1.353	.0750	.2500	2.5	QBB-2001200	34.65	QBB-2001200X	39.45	
NEW	.2000	.2160	1.300	.005	.050	1.853	.0750	.2500	3.0	QBB5-2001300	35.90	QBB5-2001300X	41.65	
	.2000	.2160	1.500	.005	.050	1.853	.0750	.2500	3.0	QBB-2001500	40.65	QBB-2001500X	45.60	
NEW	.2300	.2500	.400	.005	.058	.853	.0738	.3125	2.0	QBB5-230400	46.50	QBB5-230400X	53.00	
	.2300	.2500	.500	.005	.058	.853	.0738	.3125	2.0	QBB-230500	46.50	QBB-230500X	51.85	

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

Continued on next page

See pg 59-72 for quick change holder options

See pg 12 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 22-25

Quick Change – Boring Tools

Right Hand (cont.)



QBB

Continued from previous page

Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AITIN Coated			
									Tool #	Price	Tool #	Price		
H	L ₂	$^{+.030"}_{-.000"}$	R	$^{+.001"}_{-.001"}$	P	L ₄	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price	
.2300	.2500	.600	.005	.058	.853	.0738	.3125	2.0	OBBS-230600	46.50	OBBS-230600X	53.00	NEW	
.2300	.2500	.700	.005	.058	.853	.0738	.3125	2.0	OBBS-230700	46.50	OBBS-230700X	53.00	NEW	
.2300	.2500	.750	.005	.058	.853	.0738	.3125	2.0	OBB-230750	46.50	OBB-230750X	51.85		
.2300	.2500	.800	.005	.058	1.353	.0738	.3125	2.5	OBBS-230800	47.75	OBBS-230800X	54.65	NEW	
.2300	.2500	.900	.005	.058	1.353	.0738	.3125	2.5	OBBS-230900	47.75	OBBS-230900X	54.65	NEW	
.2300	.2500	1.000	.005	.058	1.353	.0738	.3125	2.5	OBB-2301000	46.50	OBB-2301000X	53.40		
.2300	.2500	1.100	.005	.058	1.353	.0738	.3125	2.5	OBBS-2301100	47.75	OBBS-2301100X	54.65	NEW	
.2300	.2500	1.150	.005	.058	1.353	.0738	.3125	2.5	OBBS-2301150	47.75	OBBS-2301150X	54.65	NEW	
.2300	.2500	1.200	.005	.058	1.353	.0738	.3125	2.5	OBBS-2301200	47.75	OBBS-2301200X	54.65	NEW	
.2300	.2500	1.250	.005	.058	1.353	.0738	.3125	2.5	OBB-2301250	46.50	OBB-2301250X	53.40		
.2300	.2500	1.400	.005	.058	1.853	.0738	.3125	3.0	OBBS-2301400	53.45	OBBS-2301400X	60.35	NEW	
.2300	.2500	1.500	.005	.058	1.853	.0738	.3125	3.0	OBB-2301500	53.45	OBB-2301500X	60.35		
.2300	.2500	1.600	.005	.058	1.853	.0738	.3125	3.0	OBB-2301600	53.45	OBB-2301600X	60.35		
.2600	.2800	.400	.005	.065	.853	.1038	.3125	2.0	OBBS-260400	46.50	OBBS-260400X	53.00	NEW	
.2600	.2800	.500	.005	.065	.853	.1038	.3125	2.0	OBBS-260500	46.50	OBBS-260500X	53.00	NEW	
.2600	.2800	.600	.005	.065	.853	.1038	.3125	2.0	OBBS-260600	46.50	OBBS-260600X	53.00	NEW	
.2600	.2800	.700	.005	.065	.853	.1038	.3125	2.0	OBBS-260700	46.50	OBBS-260700X	53.00	NEW	
.2600	.2800	.750	.005	.065	.853	.1038	.3125	2.0	OBBS-260750	46.50	OBBS-260750X	53.00	NEW	
.2600	.2800	.800	.005	.065	1.353	.1038	.3125	2.5	OBBS-260800	47.75	OBBS-260800X	54.65	NEW	
.2600	.2800	.900	.005	.065	1.353	.1038	.3125	2.5	OBBS-260900	47.75	OBBS-260900X	54.65	NEW	
.2600	.2800	1.000	.005	.065	1.353	.1038	.3125	2.5	OBBS-2601000	47.75	OBBS-2601000X	54.65	NEW	
.2600	.2800	1.250	.005	.065	1.353	.1038	.3125	2.5	OBBS-2601250	47.75	OBBS-2601250X	54.65	NEW	
.2900	.3100	.500	.005	.073	.853	.1338	.3125	2.0	OBB-290500	46.50	OBB-290500X	51.85		
.2900	.3100	.600	.005	.073	.853	.1338	.3125	2.0	OBBS-290600	46.50	OBBS-290600X	53.00	NEW	
.2900	.3100	.750	.005	.073	.853	.1338	.3125	2.0	OBB-290750	46.50	OBB-290750X	51.85		
.2900	.3100	.900	.005	.073	1.353	.1338	.3125	2.5	OBBS-290900	47.75	OBBS-290900X	54.65	NEW	
.2900	.3100	1.000	.005	.073	1.353	.1338	.3125	2.5	OBB-2901000	46.50	OBB-2901000X	53.40		
.2900	.3100	1.100	.005	.073	1.353	.1338	.3125	2.5	OBBS-2901100	47.75	OBBS-2901100X	54.65	NEW	
.2900	.3100	1.250	.005	.073	1.353	.1338	.3125	2.5	OBB-2901250	46.50	OBB-2901250X	53.40		
.2900	.3100	1.350	.005	.073	1.853	.1338	.3125	3.0	OBBS-2901350	53.45	OBBS-2901350X	60.35	NEW	
.2900	.3100	1.500	.005	.073	1.853	.1338	.3125	3.0	OBB-2901500	53.45	OBB-2901500X	60.35		
.2900	.3100	1.600	.005	.073	1.853	.1338	.3125	3.0	OBBS-2901600	53.45	OBBS-2901600X	60.35	NEW	
.2900	.3100	1.750	.005	.073	1.853	.1338	.3125	3.0	OBB-2901750	53.45	OBB-2901750X	60.35		
.3200	.3400	.500	.005	.080	.853	.1325	.3750	2.0	OBB-320500	63.40	OBB-320500X	69.05		
.3200	.3400	.600	.005	.080	.853	.1325	.3750	2.0	OBBS-320600	63.40	OBBS-320600X	71.10	NEW	
.3200	.3400	.750	.005	.080	.853	.1325	.3750	2.0	OBB-320750	63.40	OBB-320750X	69.05		
.3200	.3400	.900	.005	.080	1.353	.1325	.3750	2.5	OBBS-320900	65.00	OBBS-320900X	73.20	NEW	
.3200	.3400	1.000	.005	.080	1.353	.1325	.3750	2.5	OBB-3201000	63.40	OBB-3201000X	70.75		
.3200	.3400	1.100	.005	.080	1.353	.1325	.3750	2.5	OBBS-3201100	65.00	OBBS-3201100X	73.20	NEW	
.3200	.3400	1.250	.005	.080	1.353	.1325	.3750	2.5	OBB-3201250	63.40	OBB-3201250X	70.75		
.3200	.3400	1.500	.005	.080	1.853	.1325	.3750	3.0	OBB-3201500	70.45	OBB-3201500X	77.95		

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

Continued on next page

See pg 59-72 for quick change holder options

See pg 12 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 22-25

QBB



Quick Change – Boring Tools

Right Hand (cont.)

Continued from previous page

	Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AITIN Coated		
										Tool #	Price	Tool #	Price	
	H	L ₂	$L_2^{+.030''}_{-.000''}$	R	$R^{+.001''}_{-.001''}$	P	L ₄	F	D ₂ (h6)	L ₁				
NEW	.3200	.3400	1.600	.005	.080	1.853	.1325	.3750	3.0	QBB5-3201600	70.45	QBB5-3201600X	78.65	
	.3200	.3400	1.800	.005	.080	1.853	.1325	.3750	3.0	QBB-3201800	70.45	QBB-3201800X	77.95	
	.3200	.3400	2.000	.005	.080	2.353	.1325	.3750	3.5	QBB-3202000	76.75	QBB-3202000X	85.55	
	.3200	.3400	2.500	.005	.080	2.853	.1325	.3750	4.0	QBB-3202500	81.05	QBB-3202500X	89.85	
NEW	.3600	.3800	.500	.005	.090	.853	.1725	.3750	2.0	QBB5-360500	63.40	QBB5-360500X	71.10	
	.3600	.3800	.750	.005	.090	.853	.1725	.3750	2.0	QBB-360750	63.40	QBB-360750X	69.05	
NEW	.3600	.3800	.900	.005	.090	1.353	.1725	.3750	2.5	QBB5-360900	63.40	QBB5-360900X	71.60	
	.3600	.3800	1.000	.005	.090	1.353	.1725	.3750	2.5	QBB-3601000	63.40	QBB-3601000X	70.75	
	.3600	.3800	1.250	.005	.090	1.353	.1725	.3750	2.5	QBB-3601250	63.40	QBB-3601250X	70.75	
	.3600	.3800	1.500	.005	.090	1.853	.1725	.3750	3.0	QBB-3601500	70.45	QBB-3601500X	77.95	
	.3600	.3800	1.800	.005	.090	1.853	.1725	.3750	3.0	QBB-3601800	70.45	QBB-3601800X	77.95	
	.3600	.3800	2.000	.005	.090	2.353	.1725	.3750	3.5	QBB-3602000	76.75	QBB-3602000X	85.55	
	.3600	.3800	2.500	.005	.090	2.853	.1725	.3750	4.0	QBB-3602500	81.05	QBB-3602500X	89.85	
NEW	.4100	.4300	.750	.005	.104	1.040	.1600	.5000	2.5	QBB5-410750	88.30	QBB5-410750X	99.45	
NEW	.4100	.4300	1.000	.005	.104	1.040	.1600	.5000	2.5	QBB5-4101000	88.30	QBB5-4101000X	99.45	
NEW	.4100	.4300	1.250	.005	.104	1.540	.1600	.5000	3.0	QBB5-4101250	90.60	QBB5-4101250X	101.75	
NEW	.4100	.4300	1.500	.005	.104	1.540	.1600	.5000	3.0	QBB5-4101500	90.60	QBB5-4101500X	101.75	
	.4600	.4800	1.000	.005	.115	1.040	.2100	.5000	2.5	QBB-4601000	88.30	QBB-4601000X	97.55	
	.4600	.4800	1.250	.005	.115	1.540	.2100	.5000	3.0	QBB-4601250	88.30	QBB-4601250X	97.55	
	.4600	.4800	1.500	.005	.115	1.540	.2100	.5000	3.0	QBB-4601500	88.30	QBB-4601500X	97.55	
	.4600	.4800	2.000	.005	.115	2.040	.2100	.5000	3.5	QBB-4602000	96.90	QBB-4602000X	108.60	
	.4600	.4800	2.500	.005	.115	2.540	.2100	.5000	4.0	QBB-4602500	102.55	QBB-4602500X	114.35	
	.4600	.4800	3.000	.005	.115	3.040	.2100	.5000	4.5	QBB-4603000	107.45	QBB-4603000X	120.30	
	.4900	.5100	1.000	.005	.123	1.040	.2400	.5000	2.5	QBB-4901000	88.30	QBB-4901000X	97.55	
	.4900	.5100	1.250	.005	.123	1.540	.2400	.5000	3.0	QBB-4901250	88.30	QBB-4901250X	97.55	
	.4900	.5100	1.500	.005	.123	1.540	.2400	.5000	3.0	QBB-4901500	88.30	QBB-4901500X	97.55	
	.4900	.5100	2.000	.005	.123	2.040	.2400	.5000	3.5	QBB-4902000	96.90	QBB-4902000X	108.60	
	.4900	.5100	2.500	.005	.123	2.540	.2400	.5000	4.0	QBB-4902500	102.55	QBB-4902500X	114.35	
	.4900	.5100	3.000	.005	.123	3.040	.2400	.5000	4.5	QBB-4903000	107.45	QBB-4903000X	120.30	

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

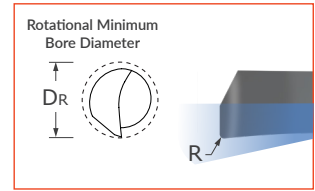
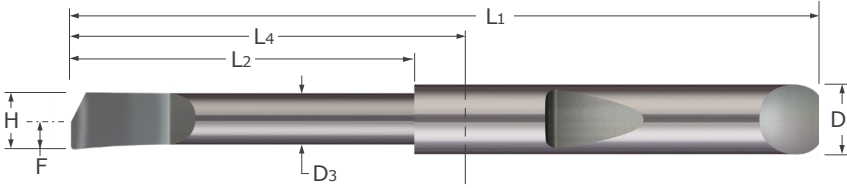
See pg 59-72 for quick change holder options

See pg 12 for miniature sizes

For better chip control and freer cutting action, see Helical Back Rake and Top Rake Chipbreaker tools on pgs 22-25

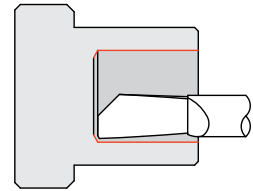
Quick Change – Boring Tools

Helical Back Rake – Corner Radius



Quick Change – Boring Tools

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



Head Width	Rotational Min. Bore Diameter	Maximum Bore Depth	Radius	Length From Holder	Neck Diameter	Centerline Offset	Shank Diameter	Overall Length	Uncoated	
H	D _r	L ₂ ^{+ .050"} _{- .000"}	R ^{+ .003"} _{- .000"}	L ₄	D ₃ ^{+ .000"} _{- .002"}	F	D ₂ (h6)	L ₁	Tool #	Price
.0275	.030	.187	.004	.590	.025	.0150	.1875	1.5	QBBC-030187-004	32.15
.0275	.030	.250	.004	.590	.025	.0150	.1875	1.5	QBBC-030250-004	32.15
.0325	.035	.125	.004	.590	.030	.0175	.1875	1.5	QBBC-035125-004	32.15
.0325	.035	.187	.004	.590	.030	.0175	.1875	1.5	QBBC-035187-004	32.15
.0325	.035	.250	.004	.590	.030	.0175	.1875	1.5	QBBC-035250-004	32.15
.0375	.040	.187	.004	.590	.035	.0200	.1875	1.5	QBBC-040187-004	32.15
.0375	.040	.250	.004	.590	.035	.0200	.1875	1.5	QBBC-040250-004	32.15
.0375	.040	.312	.004	.590	.035	.0200	.1875	1.5	QBBC-040312-004	32.15
.0450	.050	.187	.004	.590	.040	.0250	.1875	1.5	QBBC-050187-004	32.15
.0450	.050	.312	.004	.590	.040	.0250	.1875	1.5	QBBC-050312-004	32.15
.0450	.050	.375	.004	.590	.040	.0250	.1875	1.5	QBBC-050375-004	32.15
.0550	.060	.250	.004	.590	.050	.0300	.1875	1.5	QBBC-060250-004	32.15
.0550	.060	.375	.004	.590	.050	.0300	.1875	1.5	QBBC-060375-004	32.15
.0550	.060	.500	.004	.590	.050	.0300	.1875	1.5	QBBC-060500-004	32.15
.0650	.070	.312	.004	.590	.060	.0350	.1875	1.5	QBBC-070312-004	32.15
.0650	.070	.437	.004	.590	.060	.0350	.1875	1.5	QBBC-070437-004	32.15
.0650	.070	.562	.004	1.090	.060	.0350	.1875	2.0	QBBC-070562-004	32.15
.0750	.080	.375	.004	.590	.070	.0400	.1875	1.5	QBBC-080375-004	32.15
.0750	.080	.500	.004	.590	.070	.0400	.1875	1.5	QBBC-080500-004	32.15
.0750	.080	.625	.004	1.090	.070	.0400	.1875	2.0	QBBC-080625-004	32.15
.0850	.090	.375	.004	.590	.080	.0450	.1875	1.5	QBBC-090375-004	32.15
.0850	.090	.500	.004	.590	.080	.0450	.1875	1.5	QBBC-090500-004	32.15
.0850	.090	.687	.004	1.090	.080	.0450	.1875	2.0	QBBC-090687-004	32.15
.0950	.100	.437	.004	.590	.090	.0500	.1875	1.5	QBBC-100437-004	32.15
.0950	.100	.562	.004	1.090	.090	.0500	.1875	2.0	QBBC-100562-004	32.15
.0950	.100	.750	.004	1.090	.090	.0500	.1875	2.0	QBBC-100750-004	32.15
.1100	.120	.500	.004	.590	.100	.0600	.1875	1.5	QBBC-120500-004	32.15
.1100	.120	.625	.004	1.090	.100	.0600	.1875	2.0	QBBC-120625-004	32.15
.1100	.120	1.000	.004	1.090	.100	.0600	.1875	2.0	QBBC-1201000-004	32.15

Continued on next page

See pg 59-72 for quick change holder options

Quick Change – Boring Tools

Helical Back Rake – Corner Radius (cont.)

Continued from previous page

Head Width	Rotational Min. Bore Diameter	Maximum Bore Depth	Radius	Length From Holder	Neck Diameter	Centerline Offset	Shank Diameter	Overall Length	Uncoated	
H	D _r	L ₂ ^{+ .050"} _{- .000"}	R ^{+ .003"} _{- .000"}	L ₄	D ₃ ^{+ .000"} _{- .002"}	F	D ₂ (h6)	L ₁	Tool #	Price
.1225	.135	.562	.004	1.090	.110	.0675	.1875	2.0	QHBBC-135562-004	32.15
.1225	.135	.750	.004	1.090	.110	.0675	.1875	2.0	QHBBC-135750-004	32.15
.1225	.135	1.000	.004	1.090	.110	.0675	.1875	2.0	QHBBC-1351000-004	32.15
.1400	.150	.625	.004	1.090	.130	.0750	.1875	2.0	QHBBC-1500625-004	32.15
.1400	.150	1.000	.004	1.090	.130	.0750	.1875	2.0	QHBBC-1501000-004	32.15
.1400	.150	1.250	.004	1.590	.130	.0750	.1875	2.5	QHBBC-1501250-004	32.15
.1700	.180	1.000	.004	1.090	.160	.0900	.1875	2.0	QHBBC-1801000-004	32.15
.1700	.180	1.250	.004	1.590	.160	.0900	.1875	2.5	QHBBC-1801250-004	32.15
.1700	.180	1.500	.004	1.590	.160	.0900	.1875	2.5	QHBBC-1801500-004	32.15
.1975	.210	1.000	.004	1.353	.185	.1050	.2500	2.5	QHBBC-2101000-004	36.45
.1975	.210	1.250	.004	1.353	.185	.1050	.2500	2.5	QHBBC-2101250-004	36.45
.1975	.210	1.500	.004	1.853	.185	.1050	.2500	3.0	QHBBC-2101500-004	36.45
.2275	.240	1.000	.004	1.353	.215	.1200	.2500	2.5	QHBBC-2401000-004	36.45
.2275	.240	1.500	.004	1.853	.215	.1200	.2500	3.0	QHBBC-2401500-004	36.45
.2275	.240	1.750	.004	1.853	.215	.1200	.2500	3.0	QHBBC-2401750-004	36.45
.2750	.300	1.000	.004	1.353	.250	.1500	.3125	2.5	QHBBC-3001000-004	48.00
.2750	.300	1.500	.004	1.853	.250	.1500	.3125	3.0	QHBBC-3001500-004	48.00
.2750	.300	1.750	.004	1.853	.250	.1500	.3125	3.0	QHBBC-3001750-004	48.00
.3400	.360	1.000	.004	1.353	.320	.1800	.3750	2.5	QHBBC-3601000-004	65.35
.3400	.360	1.500	.004	1.853	.320	.1800	.3750	3.0	QHBBC-3601500-004	65.35
.3400	.360	2.000	.004	2.353	.320	.1800	.3750	3.5	QHBBC-3602000-004	81.60
.3400	.360	2.500	.004	2.853	.320	.1800	.3750	4.0	QHBBC-3602500-004	81.60

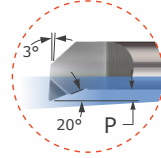
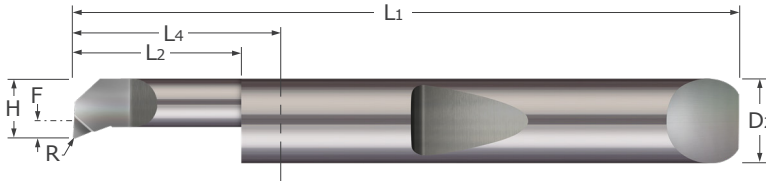
See pg [59-72](#) for quick change holder options

Quick Change – Boring Tools

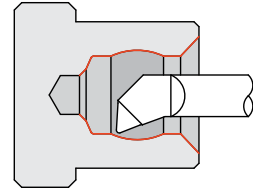
Top Rake Chipbreaker



QBT



- 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



Quick Change – Boring Tools

Head Width	Min. Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H		L2 ^{+0.030"} _{-.000"}	R ^{+0.0005"} _{-.0005"}	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.0500	.0550	.200	.002	.005	.590	-.0438	.1875	1.5	OBT-050200	32.30	OBT-050200X	34.95
.0500	.0550	.400	.002	.005	.590	-.0438	.1875	1.5	OBT-050400	32.30	OBT-050400X	34.95
.0500	.0550	.500	.002	.005	.590	-.0438	.1875	1.5	OBT-050500	32.30	OBT-050500X	34.95
.0600	.0700	.200	.002	.010	.590	-.0338	.1875	1.5	OBT-060200	32.30	OBT-060200X	34.95
.0600	.0700	.400	.002	.010	.590	-.0338	.1875	1.5	OBT-060400	32.30	OBT-060400X	34.95
.0600	.0700	.500	.002	.010	.590	-.0338	.1875	1.5	OBT-060500	32.30	OBT-060500X	34.95
.0700	.0800	.200	.004	.015	.590	-.0238	.1875	1.5	OBT-070200	32.30	OBT-070200X	34.95
.0700	.0800	.400	.004	.015	.590	-.0238	.1875	1.5	OBT-070400	32.30	OBT-070400X	34.95
.0700	.0800	.600	.004	.015	1.090	-.0238	.1875	2.0	OBT-070600	32.30	OBT-070600X	34.95
.1100	.1220	.250	.004	.020	.590	.0163	.1875	1.5	OBT-110250	32.30	OBT-110250X	34.95
.1100	.1220	.500	.004	.020	.590	.0163	.1875	1.5	OBT-110500	32.30	OBT-110500X	34.95
.1100	.1220	.750	.004	.020	1.090	.0163	.1875	2.0	OBT-110750	32.30	OBT-110750X	34.95
.1200	.1320	.250	.004	.020	.590	.0263	.1875	1.5	OBT-120250	32.30	OBT-120250X	34.95
.1200	.1320	.375	.004	.020	.590	.0263	.1875	1.5	OBT4-120375	32.30	OBT4-120375X	34.95
.1200	.1320	.500	.004	.020	.590	.0263	.1875	1.5	OBT-120500	32.30	OBT-120500X	34.95
.1200	.1320	.750	.004	.020	1.090	.0263	.1875	2.0	OBT-120750	32.30	OBT-120750X	34.95
.1200	.1320	1.000	.004	.020	1.090	.0263	.1875	2.0	OBT-1201000	32.30	OBT-1201000X	34.95
.1400	.1520	.250	.004	.025	.590	.0463	.1875	1.5	OBT4-140250	32.30	OBT4-140250X	34.95
.1400	.1520	.375	.004	.025	.590	.0463	.1875	1.5	OBT4-140375	32.30	OBT4-140375X	34.95
.1400	.1520	.500	.004	.025	.590	.0463	.1875	1.5	OBT4-140500	32.30	OBT4-140500X	34.95
.1600	.1760	.375	.006	.025	.590	.0663	.1875	1.5	OBT6-160375	32.30	OBT6-160375X	34.95
.1600	.1760	.500	.006	.025	.590	.0663	.1875	1.5	OBT-160500	32.30	OBT-160500X	34.95
.1600	.1760	.750	.006	.025	1.090	.0663	.1875	2.0	OBT-160750	32.30	OBT-160750X	34.95
.1600	.1760	1.000	.006	.025	1.090	.0663	.1875	2.0	OBT-1601000	32.30	OBT-1601000X	34.95
.1600	.1760	1.250	.006	.025	1.590	.0663	.1875	2.5	OBT-1601250	32.30	OBT-1601250X	36.05

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

Continued on next page

See pg 59-72 for quick change holder options



Quick Change – Boring Tools

Top Rake Chipbreaker (cont.)

Continued from previous page

Head Width	Min.Bore Diameter*	Max. Bore Depth	Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AITIN Coated	
									Tool #	Price	Tool #	Price
H	L ₂	$R^{+.0005''}_{-.0005''}$	P	L ₄	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price	
.1800	.1960	.375	.006	.030	.853	.0550	.2500	2.0	OBT6-180375	40.40	OBT6-180375X	45.30
.1800	.1960	.500	.006	.030	.853	.0550	.2500	2.0	OBT-180500	40.40	OBT-180500X	45.30
.1800	.1960	.750	.006	.030	.853	.0550	.2500	2.0	OBT-180750	40.40	OBT-180750X	45.30
.1800	.1960	1.000	.006	.030	1.353	.0550	.2500	2.5	OBT-1801000	40.40	OBT-1801000X	45.30
.1800	.1960	1.250	.006	.030	1.353	.0550	.2500	2.5	OBT-1801250	40.40	OBT-1801250X	45.30
.1800	.1960	1.500	.006	.030	1.853	.0550	.2500	3.0	OBT-1801500	46.45	OBT-1801500X	51.45
.2000	.2160	.375	.006	.030	.853	.0750	.2500	2.0	OBT6-200375	40.40	OBT6-200375X	45.30
.2000	.2160	.600	.006	.030	.853	.0750	.2500	2.0	OBT-200600	40.40	OBT-200600X	45.30
.2000	.2160	.750	.006	.030	.853	.0750	.2500	2.0	OBT6-200750	40.40	OBT6-200750X	45.30
.2000	.2160	1.000	.006	.030	1.353	.0750	.2500	2.5	OBT-2001000	40.40	OBT-2001000X	45.30
.2000	.2160	1.250	.006	.030	1.353	.0750	.2500	2.5	OBT-2001250	40.40	OBT-2001250X	45.30
.2000	.2160	1.500	.006	.030	1.853	.0750	.2500	3.0	OBT-2001500	46.45	OBT-2001500X	51.45
.2300	.2500	.500	.004	.040	.853	.0738	.3125	2.0	OBT4-230500	50.40	OBT4-230500X	55.80
.2300	.2500	.500	.006	.040	.853	.0738	.3125	2.0	OBT6-230500	50.40	OBT6-230500X	55.80
.2300	.2500	.750	.004	.040	.853	.0738	.3125	2.0	OBT4-230750	50.40	OBT4-230750X	55.80
.2300	.2500	.750	.006	.040	.853	.0738	.3125	2.0	OBT-230750	50.40	OBT-230750X	55.80
.2300	.2500	1.100	.006	.040	1.353	.0738	.3125	2.5	OBT-2301100	50.40	OBT-2301100X	57.30
.2300	.2500	1.300	.006	.040	1.353	.0738	.3125	2.5	OBT-2301300	50.40	OBT-2301300X	57.30
.2300	.2500	1.600	.006	.040	1.853	.0738	.3125	3.0	OBT-2301600	58.75	OBT-2301600X	65.65
.2600	.2800	.500	.004	.045	.853	.1038	.3125	2.0	OBT4-260500	50.40	OBT4-260500X	55.80
.2600	.2800	.500	.006	.045	.853	.1038	.3125	2.0	OBT6-260500	50.40	OBT6-260500X	55.80
.2600	.2800	.750	.004	.045	.853	.1038	.3125	2.0	OBT4-260750	50.40	OBT4-260750X	55.80
.2600	.2800	.750	.006	.045	.853	.1038	.3125	2.0	OBT6-260750	50.40	OBT6-260750X	55.80
.3000	.3200	.750	.006	.050	.853	.1125	.3750	2.0	OBT6-300750	50.40	OBT6-300750X	55.80
.3000	.3200	1.000	.006	.050	1.353	.1125	.3750	2.5	OBT-3001000	60.60	OBT-3001000X	67.90
.3000	.3200	1.250	.006	.050	1.353	.1125	.3750	2.5	OBT6-3001250	60.60	OBT6-3001250X	67.90
.3000	.3200	1.600	.006	.050	1.853	.1125	.3750	3.0	OBT-3001600	67.75	OBT-3001600X	75.20
.3000	.3200	2.100	.006	.050	2.853	.1125	.3750	3.5	OBT-3002100	73.80	OBT-3002100X	82.60
.3600	.3800	1.000	.006	.050	1.353	.1725	.3750	2.5	OBT-3601000	60.60	OBT-3601000X	67.90
.3600	.3800	1.600	.006	.050	1.853	.1725	.3750	3.0	OBT-3601600	67.75	OBT-3601600X	75.20
.3600	.3800	2.100	.006	.050	2.353	.1725	.3750	3.5	OBT-3602100	73.80	OBT-3602100X	82.60
.4600	.4800	1.000	.006	.075	1.040	.2100	.5000	2.5	OBT-4601000	92.05	OBT-4601000X	101.40
.4600	.4800	1.600	.006	.075	2.040	.2100	.5000	3.5	OBT-4601600	92.05	OBT-4601600X	101.40
.4600	.4800	2.100	.006	.075	2.540	.2100	.5000	4.0	OBT-4602100	97.20	OBT-4602100X	108.90
.4900	.5100	1.000	.006	.075	1.040	.2400	.5000	2.5	OBT-4901000	92.05	OBT-4901000X	101.40
.4900	.5100	1.600	.006	.075	2.040	.2400	.5000	3.5	OBT-4901600	92.05	OBT-4901600X	101.40
.4900	.5100	2.100	.006	.075	2.540	.2400	.5000	4.0	OBT-4902100	97.20	OBT-4902100X	108.90

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

See pg 59-72 for quick change holder options

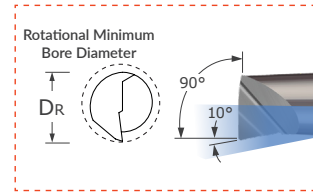
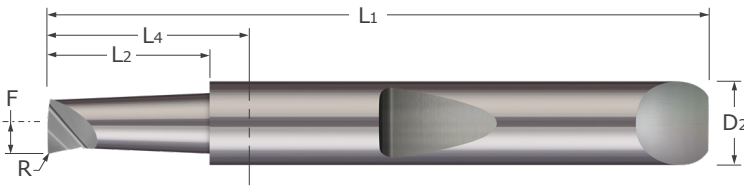
Quick Change – Boring Tools

Quick Change – Boring Tools

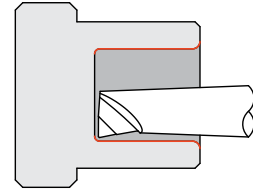
Boring Head Tools



Quick Change – Boring Tools



- 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



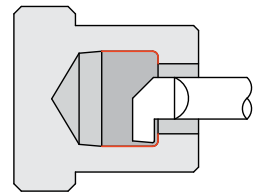
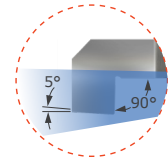
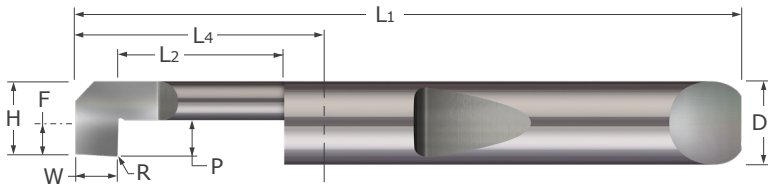
Rotational Minimum Bore Diameter	Maximum Bore Depth	Radius	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
							Tool #	Price	Tool #	Price
DR	L2 ^{+0.030"} / _{-.000"}	R ^{+0.001"} / _{-.001"}	L4	F	D2 (h6)	L1				
.1180	.500	.003	.853	.0550	.2500	2.0	OBM-118500	34.65	OBM-118500X	39.45
.1180	.750	.003	.853	.0550	.2500	2.0	OBM-118750	34.65	OBM-118750X	39.45
.1500	.500	.003	.853	.0710	.2500	2.0	OBM-150500	34.65	OBM-150500X	39.45
.1500	.750	.003	.853	.0710	.2500	2.0	OBM-150750	34.65	OBM-150750X	39.45
.2000	.500	.008	.853	.0950	.2500	2.0	OBM-200500	34.65	OBM-200500X	39.45
.2000	.750	.008	.853	.0950	.2500	2.0	OBM-200750	34.65	OBM-200750X	39.45
.2000	1.250	.008	1.353	.0950	.2500	2.5	OBM-2001250	34.65	OBM-2001250X	39.45
.2300	.750	.008	.853	.1100	.2500	2.0	OBM-230750	34.65	OBM-230750X	39.45
.2300	1.250	.008	1.353	.1100	.2500	2.5	OBM-2301250	34.65	OBM-2301250X	39.45
.2300	1.500	.008	1.853	.1100	.2500	3.0	OBM-2301500	39.20	OBM-2301500X	44.10
.3000	1.000	.008	1.353	.1450	.3750	2.5	OBM-3001000	63.40	OBM-3001000X	70.75
.3000	1.500	.008	1.853	.1450	.3750	3.0	OBM-3001500	70.45	OBM-3001500X	77.95
.3000	1.750	.008	1.853	.1450	.3750	3.0	OBM-3001750	70.45	OBM-3001750X	77.95
.3600	1.000	.008	1.353	.1750	.3750	2.5	OBM-3601000	63.40	OBM-3601000X	70.75
.3600	1.500	.008	1.853	.1750	.3750	3.0	OBM-3601500	70.45	OBM-3601500X	77.95
.3600	2.000	.008	2.353	.1750	.3750	3.5	OBM-3602000	76.75	OBM-3602000X	84.40
.4600	1.000	.008	1.040	.2250	.5000	2.5	OBM-4601000	88.30	OBM-4601000X	97.55
.4600	1.500	.008	1.540	.2250	.5000	3.0	OBM-4601500	88.30	OBM-4601500X	97.55
.4600	2.000	.008	2.040	.2250	.5000	3.5	OBM-4602000	96.90	OBM-4602000X	108.60
.4600	2.500	.008	2.540	.2250	.5000	4.0	OBM-4602500	102.55	OBM-4602500X	114.35
.4600	3.000	.008	3.040	.2250	.5000	4.5	OBM-4603000	107.45	OBM-4603000X	120.30

See pg 59-72 for quick change holder options



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 geometry makes the tool as rigid as possible
- Coolant fed enabled shank design
- Inside corner radius profile
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- AITIN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide ■ CNC ground in the USA

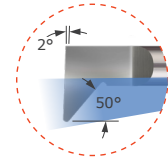
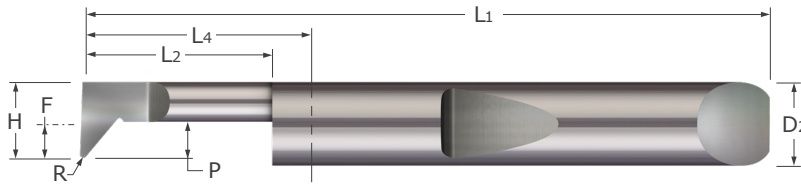
Head Width	Min. Bore Dia.*	Max. Bore Depth	Width	Radius	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AITIN Coated	
										Tool #	Price	Tool #	Price
H	L2	$L2 \begin{smallmatrix} +.015" \\ -.000" \end{smallmatrix}$	$W \begin{smallmatrix} +.002" \\ -.000" \end{smallmatrix}$	$R \begin{smallmatrix} +.001" \\ -.001" \end{smallmatrix}$	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.1560	.1720	.500	.075	.005	.060	.590	.0623	.1875	1.5	QRB-156500	32.10	QRB-156500X	34.70
.1560	.1720	.750	.075	.005	.060	1.090	.0623	.1875	2.0	QRB-156750	32.10	QRB-156750X	34.70
.1560	.1720	1.000	.075	.005	.060	1.090	.0623	.1875	2.0	QRB-1561000	32.10	QRB-1561000X	34.70
.1800	.1960	.500	.100	.005	.080	.853	.0550	.2500	2.0	QRB-180500	34.65	QRB-180500X	39.45
.1800	.1960	.750	.100	.005	.080	1.353	.0550	.2500	2.5	QRB-180750	34.65	QRB-180750X	39.45
.1800	.1960	1.000	.100	.005	.080	1.353	.0550	.2500	2.5	QRB-1801000	34.65	QRB-1801000X	39.45
.2000	.2160	.500	.113	.008	.090	.853	.0750	.2500	2.0	QRB-200500	34.65	QRB-200500X	39.45
.2000	.2160	.750	.113	.008	.090	1.353	.0750	.2500	2.5	QRB-200750	34.65	QRB-200750X	39.45
.2000	.2160	1.000	.113	.008	.090	1.353	.0750	.2500	2.5	QRB-2001000	34.65	QRB-2001000X	39.45
.2000	.2160	1.250	.113	.008	.090	1.853	.0750	.2500	3.0	QRB-2001250	40.65	QRB-2001250X	45.60
.2300	.2500	.500	.138	.008	.110	.853	.0738	.3125	2.0	QRB-230500	46.50	QRB-230500X	51.85
.2300	.2500	.750	.138	.008	.110	1.353	.0738	.3125	2.5	QRB-230750	46.50	QRB-230750X	53.40
.2300	.2500	1.000	.138	.008	.110	1.353	.0738	.3125	2.5	QRB-2301000	46.50	QRB-2301000X	53.40
.2300	.2500	1.250	.138	.008	.110	1.853	.0738	.3125	3.0	QRB-2301250	53.45	QRB-2301250X	60.35
.3000	.3200	.500	.138	.008	.110	.853	.1438	.3125	2.0	QRB-300500	46.50	QRB-300500X	51.85
.3000	.3200	.750	.138	.008	.110	1.353	.1438	.3125	2.5	QRB-300750	46.50	QRB-300750X	51.85
.3000	.3200	1.000	.138	.008	.110	1.353	.1438	.3125	2.5	QRB-3001000	46.50	QRB-3001000X	53.40
.3000	.3200	1.250	.138	.008	.110	1.853	.1438	.3125	3.0	QRB-3001250	53.45	QRB-3001250X	60.35
.3600	.3800	.750	.163	.008	.130	1.353	.1725	.3750	2.5	QRB-360750	63.40	QRB-360750X	70.75
.3600	.3800	1.000	.163	.008	.130	1.353	.1725	.3750	2.5	QRB-3601000	63.40	QRB-3601000X	70.75
.3600	.3800	1.250	.163	.008	.130	1.853	.1725	.3750	3.0	QRB-3601250	70.45	QRB-3601250X	77.95
.3600	.3800	1.500	.163	.008	.130	1.853	.1725	.3750	3.0	QRB-3601500	70.45	QRB-3601500X	78.65
.4600	.4800	1.000	.200	.008	.160	1.540	.2100	.5000	3.0	QRB-4601000	88.30	QRB-4601000X	97.55
.4600	.4800	1.250	.200	.008	.160	1.540	.2100	.5000	3.0	QRB-4601250	88.30	QRB-4601250X	99.45
.4600	.4800	1.500	.200	.008	.160	2.040	.2100	.5000	3.5	QRB-4601500	96.90	QRB-4601500X	108.60
.4600	.4800	1.800	.200	.008	.160	2.040	.2100	.5000	3.5	QRB-4601800	96.90	QRB-4601800X	108.85
.4900	.5100	1.000	.200	.008	.160	1.540	.2400	.5000	3.0	QRB-4901000	88.30	QRB-4901000X	97.55
.4900	.5100	1.250	.200	.008	.160	1.540	.2400	.5000	3.0	QRB-4901250	88.30	QRB-4901250X	99.45
.4900	.5100	1.500	.200	.008	.160	2.040	.2400	.5000	3.5	QRB-4901500	96.90	QRB-4901500X	108.60
.4900	.5100	1.800	.200	.008	.160	2.040	.2400	.5000	3.5	QRB-4901800	96.90	QRB-4901800X	108.85

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

See pg 59-72 for quick change holder options

Quick Change – Profiling Tools

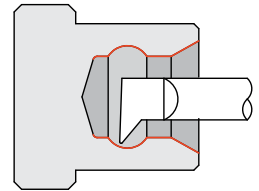
Radial Profiling



Quick Change – Profiling Tools

- Designed for radial profiling
- Excellent choice for fine finishing
- Can be used in thread relief applications
- 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
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide ■ CNC ground in the USA

Coolant Groove Styles



Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
									Tool #	Price	Tool #	Price
H	L2	$L2^{+.030"}_{-.000"}$	$R^{+.0005"}_{-.0005"}$	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.0700	.0800	.200	.0050	.025	.590	-.0238	.1875	1.5	QPR-070200	32.30	QPR-070200X	34.95
.0700	.0800	.300	.0050	.025	.590	-.0238	.1875	1.5	QPR-070300	32.30	QPR-070300X	34.95
.0700	.0800	.500	.0050	.025	.590	-.0238	.1875	1.5	QPR-070500	32.30	QPR-070500X	34.95
.1000	.1100	.200	.0050	.035	.590	.0063	.1875	1.5	QPR5-100200	32.30	QPR5-100200X	34.95
.1000	.1100	.300	.0050	.035	.590	.0063	.1875	1.5	QPR5-100300	32.30	QPR5-100300X	34.95
.1100	.1240	.250	.0050	.040	.590	.0163	.1875	1.5	QPR-110250	32.30	QPR-110250X	34.95
.1100	.1240	.375	.0050	.040	.590	.0163	.1875	1.5	QPR5-110375	32.30	QPR5-110375X	34.95
.1100	.1240	.500	.0050	.040	.590	.0163	.1875	1.5	QPR-110500	32.30	QPR-110500X	34.95
.1200	.1340	.250	.0080	.050	.590	.0263	.1875	1.5	QPR-120250	32.30	QPR-120250X	34.95
.1200	.1340	.375	.0050	.050	.590	.0263	.1875	1.5	QPR5-120375	32.30	QPR5-120375X	34.95
.1200	.1340	.375	.0080	.050	.590	.0263	.1875	1.5	QPR8-120375	32.30	QPR8-120375X	34.95
.1200	.1340	.500	.0080	.050	.590	.0263	.1875	1.5	QPR-120500	32.30	QPR-120500X	34.95
.1200	.1340	.750	.0050	.050	1.090	.0263	.1875	2.0	QPR5-120750	32.30	QPR5-120750X	34.95
.1200	.1340	.750	.0080	.050	1.090	.0263	.1875	2.0	QPR-120750	32.30	QPR-120750X	34.95
.1400	.1540	.375	.0050	.050	.590	.0463	.1875	1.5	QPR5-140375	32.30	QPR5-140375X	34.95
.1400	.1540	.375	.0080	.050	.590	.0463	.1875	1.5	QPR8-140375	32.30	QPR8-140375X	34.95
.1400	.1540	.500	.0050	.050	.590	.0463	.1875	1.5	QPR5-140500	32.30	QPR5-140500X	34.95
.1400	.1540	.500	.0080	.050	.590	.0463	.1875	1.5	QPR8-140500	32.30	QPR8-140500X	34.95
.1600	.1780	.375	.0080	.050	.590	.0663	.1875	1.5	QPR8-160375	32.30	QPR8-160375X	34.95
.1600	.1780	.500	.0080	.050	.590	.0663	.1875	1.5	QPR-160500	32.30	QPR-160500X	34.95
.1600	.1780	.750	.0080	.050	1.090	.0663	.1875	2.0	QPR-160750	32.30	QPR-160750X	34.95
.1600	.1780	1.000	.0080	.050	1.090	.0663	.1875	2.0	QPR-1601000	32.30	QPR-1601000X	34.95
.1800	.1980	.375	.0080	.080	.853	.0550	.2500	2.0	QPR8-180375	40.40	QPR8-180375X	45.30
.1800	.1980	.500	.0080	.080	.853	.0550	.2500	2.0	QPR-180500	40.40	QPR-180500X	45.30
.1800	.1980	.750	.0080	.080	.853	.0550	.2500	2.0	QPR-180750	40.40	QPR-180750X	45.30
.1800	.1980	1.000	.0080	.080	1.353	.0550	.2500	2.5	QPR-1801000	40.40	QPR-1801000X	45.30

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

Continued on next page

See pg 59-72 for quick change holder options

QPR



Quick Change – Profiling Tools

Radial Profiling (cont.)

Continued from previous page

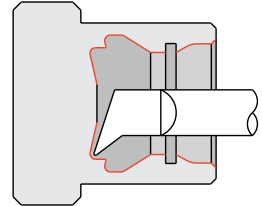
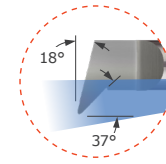
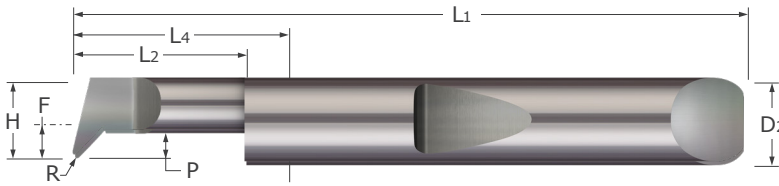
Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AITIN Coated	
									Tool #	Price	Tool #	Price
H		L2 $^{+.030''}_{-.000''}$	R $^{+.0005''}_{-.0005''}$	P	L4	F	D2 (h6)	L1				
.2000	.2180	.500	.0050	.080	.853	.0750	.2500	2.0	OPR5-200500	40.40	OPR5-200500X	45.30
.2000	.2180	.500	.0080	.080	.853	.0750	.2500	2.0	OPR8-200500	40.40	OPR8-200500X	45.30
.2000	.2180	.750	.0050	.080	.853	.0750	.2500	2.0	OPR5-200750	40.40	OPR5-200750X	45.30
.2000	.2180	.750	.0080	.080	.853	.0750	.2500	2.0	OPR8-200750	40.40	OPR8-200750X	45.30
.2300	.2520	.500	.0080	.080	.853	.0738	.3125	2.0	OPR8-230500	50.40	OPR8-230500X	55.80
.2300	.2520	.750	.0080	.080	.853	.0738	.3125	2.0	OPR-230750	50.40	OPR-230750X	55.80
.2300	.2520	1.000	.0080	.080	1.353	.0738	.3125	2.5	OPR-2301000	50.40	OPR-2301000X	57.30
.2300	.2520	1.250	.0080	.080	1.353	.0738	.3125	2.5	OPR-2301250	50.40	OPR-2301250X	57.30
.2600	.2820	.750	.0080	.090	.853	.1038	.3125	2.0	OPR8-260750	50.40	OPR8-260750X	55.80
.2600	.2820	1.000	.0080	.090	1.353	.1038	.3125	2.5	OPR8-2601000	50.40	OPR8-2601000X	57.30
.3000	.3220	.750	.0080	.110	.853	.1438	.3125	2.0	OPR8-300750	50.40	OPR8-300750X	55.80
.3000	.3220	1.000	.0080	.110	1.353	.1438	.3125	2.5	OPR-3001000	50.40	OPR-3001000X	57.30
.3000	.3220	1.250	.0080	.110	1.353	.1438	.3125	2.5	OPR-3001250	50.40	OPR-3001250X	57.30
.3600	.3820	.750	.0080	.130	.853	.1725	.3750	2.0	OPR8-360750	65.70	OPR8-360750X	71.40
.3600	.3820	1.000	.0080	.130	1.353	.1725	.3750	2.5	OPR-3601000	65.70	OPR-3601000X	73.10
.3600	.3820	1.250	.0080	.130	1.353	.1725	.3750	2.5	OPR-3601250	65.70	OPR-3601250X	73.10
.4600	.4820	.750	.0080	.150	1.040	.2100	.5000	2.5	OPR8-460750	92.05	OPR8-460750X	101.40
.4600	.4820	1.000	.0080	.150	1.540	.2100	.5000	3.0	OPR-4601000	92.05	OPR-4601000X	101.40
.4600	.4820	1.500	.0080	.150	1.540	.2100	.5000	3.0	OPR-4601500	92.05	OPR-4601500X	101.40
.4600	.4820	1.800	.0080	.150	2.040	.2100	.5000	3.5	OPR-4601800	100.50	OPR-4601800X	112.30
.4900	.5120	1.000	.0080	.150	1.540	.2400	.5000	3.0	OPR-4901000	92.05	OPR-4901000X	101.40
.4900	.5120	1.500	.0080	.150	1.540	.2400	.5000	3.0	OPR-4901500	92.05	OPR-4901500X	101.40
.4900	.5120	1.800	.0080	.150	2.040	.2400	.5000	3.5	OPR-4901800	100.50	OPR-4901800X	112.30

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

See pg 59-72 for quick change holder options

Quick Change – Profiling Tools

Angled Profiling



Quick Change – Profiling Tools

- 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	
									Tool #	Price	Tool #	Price
H	L2	$L2 \begin{smallmatrix} +.030'' \\ -.000'' \end{smallmatrix}$	$R \begin{smallmatrix} +.0005'' \\ -.0005'' \end{smallmatrix}$	P	L4	F	D2 (h6)	L1				
.0500	.0550	.150	.0020	.015	.590	-.0438	.1875	1.5	QPA2-050150	32.30	QPA2-050150X	34.95
.0500	.0550	.200	.0020	.015	.590	-.0438	.1875	1.5	QPA2-050200	32.30	QPA2-050200X	34.95
.0600	.0700	.150	.0020	.020	.590	-.0338	.1875	1.5	QPA2-060150	32.30	QPA2-060150X	34.95
.0600	.0700	.200	.0020	.020	.590	-.0338	.1875	1.5	QPA2-060200	32.30	QPA2-060200X	34.95
.0700	.0800	.150	.0020	.020	.590	-.0238	.1875	1.5	QPA2-070150	32.30	QPA2-070150X	34.95
.0700	.0800	.200	.0020	.020	.590	-.0238	.1875	1.5	QPA2-070200	32.30	QPA2-070200X	34.95
.0800	.0900	.200	.0020	.025	.590	-.0138	.1875	1.5	QPA2-080200	32.30	QPA2-080200X	34.95
.0800	.0900	.300	.0020	.025	.590	-.0138	.1875	1.5	QPA2-080300	32.30	QPA2-080300X	34.95
.0900	.1000	.200	.0020	.030	.590	-.0038	.1875	1.5	QPA2-090200	32.30	QPA2-090200X	34.95
.0900	.1000	.300	.0020	.030	.590	-.0038	.1875	1.5	QPA2-090300	32.30	QPA2-090300X	34.95
.1000	.1100	.200	.0020	.030	.590	.0063	.1875	1.5	QPA2-100200	32.30	QPA2-100200X	34.95
.1000	.1100	.200	.0050	.030	.590	.0063	.1875	1.5	QPA5-100200	32.30	QPA5-100200X	34.95
.1000	.1100	.300	.0020	.030	.590	.0063	.1875	1.5	QPA2-100300	32.30	QPA2-100300X	34.95
.1000	.1100	.300	.0050	.030	.590	.0063	.1875	1.5	QPA5-100300	32.30	QPA5-100300X	34.95
.1100	.1240	.250	.0050	.035	.590	.0163	.1875	1.5	QPA5-110250	32.30	QPA5-110250X	34.95
.1100	.1240	.375	.0050	.035	.590	.0163	.1875	1.5	QPA5-110375	32.30	QPA5-110375X	34.95
.1200	.1340	.250	.0050	.035	.590	.0263	.1875	1.5	QPA5-120250	32.30	QPA5-120250X	34.95
.1200	.1340	.375	.0050	.035	.590	.0263	.1875	1.5	QPA5-120375	32.30	QPA5-120375X	34.95
.1400	.1540	.375	.0050	.040	.590	.0463	.1875	1.5	QPA5-140375	32.30	QPA5-140375X	34.95
.1400	.1540	.500	.0050	.040	.590	.0463	.1875	1.5	QPA5-140500	32.30	QPA5-140500X	34.95
.1600	.1780	.375	.0050	.050	.590	.0663	.1875	1.5	QPA5-160375	32.30	QPA5-160375X	34.95
.1600	.1780	.500	.0050	.050	.590	.0663	.1875	1.5	QPA5-160500	32.30	QPA5-160500X	34.95
.1800	.1980	.375	.0050	.055	.853	.0550	.2500	2.0	QPA5-180375	40.40	QPA5-180375X	45.30
.1800	.1980	.500	.0050	.055	.853	.0550	.2500	2.0	QPA5-180500	40.40	QPA5-180500X	45.30

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

Continued on next page

See pg 59-72 for quick change holder options

Continued from previous page

Head Width	Minimum Bore Dia*	Maximum Bore Depth	Radius	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AITIN Coated		
									H	L2	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.2000	.2180	.500	R ^{+.030"} _{-.000"}	.0050	.060	.853	.0750	.2500	2.0	OPA5-200500	40.40	OPA5-200500X	45.30
.2000	.2180	.500	R ^{+.0005"} _{-.0005"}	.0080	.060	.853	.0750	.2500	2.0	OPA8-200500	40.40	OPA8-200500X	45.30
.2000	.2180	.750	R ^{+.030"} _{-.000"}	.0050	.060	.853	.0750	.2500	2.0	OPA5-200750	40.40	OPA5-200750X	45.30
.2000	.2180	.750	R ^{+.0005"} _{-.0005"}	.0080	.060	.853	.0750	.2500	2.0	OPA8-200750	40.40	OPA8-200750X	45.30
.2300	.2520	.500	R ^{+.030"} _{-.000"}	.0080	.070	.853	.0738	.3125	2.0	OPA8-230500	50.40	OPA8-230500X	55.80
.2300	.2520	.750	R ^{+.0005"} _{-.0005"}	.0080	.070	.853	.0738	.3125	2.0	OPA8-230750	50.40	OPA8-230750X	55.80
.2600	.2820	.750	R ^{+.030"} _{-.000"}	.0080	.080	.853	.1038	.3125	2.0	OPA8-260750	50.40	OPA8-260750X	55.80
.2600	.2820	1.000	R ^{+.0005"} _{-.0005"}	.0080	.080	1.353	.1038	.3125	2.5	OPA8-2601000	50.40	OPA8-2601000X	57.30
.3000	.3220	.750	R ^{+.030"} _{-.000"}	.0080	.090	.853	.1438	.3125	2.0	OPA8-300750	50.40	OPA8-300750X	55.80
.3000	.3220	1.000	R ^{+.0005"} _{-.0005"}	.0080	.090	1.353	.1438	.3125	2.5	OPA8-3001000	50.40	OPA8-3001000X	57.30
.3600	.3820	.750	R ^{+.030"} _{-.000"}	.0080	.110	.853	.1725	.3750	2.0	OPA8-360750	65.70	OPA8-360750X	73.10
.3600	.3820	1.000	R ^{+.0005"} _{-.0005"}	.0080	.110	1.353	.1725	.3750	2.5	OPA8-3601000	65.70	OPA8-3601000X	73.10
.4100	.4320	.750	R ^{+.030"} _{-.000"}	.0080	.120	1.040	.1600	.5000	2.5	OPA8-410750	92.05	OPA8-410750X	101.40
.4100	.4320	1.250	R ^{+.0005"} _{-.0005"}	.0080	.120	1.540	.1600	.5000	3.0	OPA8-4101250	92.05	OPA8-4101250X	101.40
.4600	.4820	.750	R ^{+.030"} _{-.000"}	.0080	.140	1.040	.2100	.5000	2.5	OPA8-460750	92.05	OPA8-460750X	101.40
.4600	.4820	1.000	R ^{+.0005"} _{-.0005"}	.0080	.140	1.040	.2100	.5000	2.5	OPA8-4601000	92.05	OPA8-4601000X	101.40

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

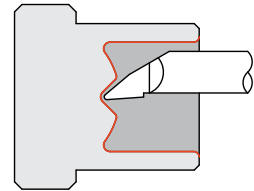
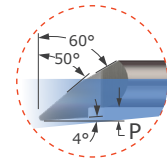
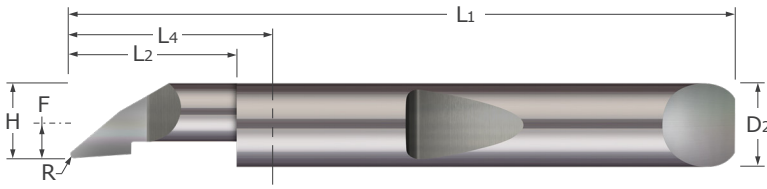
See pg [59-72](#) for quick change holder options

Quick Change – Profiling Tools

Axial Profiling



QPF



Quick Change – Profiling Tools

- 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 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
- 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	
									Tool #	Price	Tool #	Price
H	L2	R	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	
.0500	.0550	.150	.0050	.005	.590	-.0438	.1875	1.5	QPF5-050150	32.30	QPF5-050150X	34.95
.0500	.0550	.200	.0050	.005	.590	-.0438	.1875	1.5	QPF-050200	32.30	QPF-050200X	34.95
.0500	.0550	.400	.0050	.005	.590	-.0438	.1875	1.5	QPF-050400	32.30	QPF-050400X	34.95
.0500	.0550	.500	.0050	.005	.590	-.0438	.1875	1.5	QPF-050500	32.30	QPF-050500X	34.95
.0600	.0700	.200	.0050	.005	.590	-.0338	.1875	1.5	QPF-060200	32.30	QPF-060200X	34.95
.0600	.0700	.400	.0050	.005	.590	-.0338	.1875	1.5	QPF-060400	32.30	QPF-060400X	34.95
.0600	.0700	.500	.0050	.005	.590	-.0338	.1875	1.5	QPF-060500	32.30	QPF-060500X	34.95
.0700	.0800	.150	.0050	.010	.590	-.0238	.1875	1.5	QPF5-070150	32.30	QPF5-070150X	34.95
.0700	.0800	.200	.0050	.010	.590	-.0238	.1875	1.5	QPF-070200	32.30	QPF-070200X	34.95
.0700	.0800	.300	.0050	.010	.590	-.0238	.1875	1.5	QPF5-070300	32.30	QPF5-070300X	34.95
.0700	.0800	.400	.0050	.010	.590	-.0238	.1875	1.5	QPF-070400	32.30	QPF-070400X	34.95
.0700	.0800	.500	.0050	.010	.590	-.0238	.1875	1.5	QPF-070500	32.30	QPF-070500X	34.95
.0700	.0800	.600	.0050	.010	1.090	-.0238	.1875	2.0	QPF-070600	32.30	QPF-070600X	34.95
.0800	.0900	.150	.0050	.010	.590	-.0138	.1875	1.5	QPF5-080150	32.30	QPF5-080150X	34.95
.0800	.0900	.200	.0050	.010	.590	-.0138	.1875	1.5	QPF5-080200	32.30	QPF5-080200X	34.95
.0800	.0900	.250	.0050	.010	.590	-.0138	.1875	1.5	QPF5-080250	32.30	QPF5-080250X	34.95
.0900	.1000	.200	.0050	.010	.590	-.0038	.1875	1.5	QPF5-090200	32.30	QPF5-090200X	34.95
.0900	.1000	.300	.0050	.010	.590	-.0038	.1875	1.5	QPF5-090300	32.30	QPF5-090300X	34.95
.1000	.1100	.300	.0050	.015	.590	.0063	.1875	1.5	QPF5-100300	32.30	QPF5-100300X	34.95
.1000	.1100	.400	.0050	.015	.590	.0063	.1875	1.5	QPF5-100400	32.30	QPF5-100400X	34.95
.1100	.1220	.250	.0050	.015	.590	.0163	.1875	1.5	QPF-110250	32.30	QPF-110250X	34.95
.1100	.1220	.375	.0050	.015	.590	.0163	.1875	1.5	QPF5-110375	32.30	QPF5-110375X	34.95
.1100	.1220	.500	.0050	.015	.590	.0163	.1875	1.5	QPF-110500	32.30	QPF-110500X	34.95
.1100	.1220	.750	.0050	.015	1.090	.0163	.1875	2.0	QPF-110750	32.30	QPF-110750X	34.95
.1200	.1320	.250	.0080	.020	.590	.0263	.1875	1.5	QPF-120250	32.30	QPF-120250X	34.95
.1200	.1320	.375	.0050	.020	.590	.0263	.1875	1.5	QPF5-120375	32.30	QPF5-120375X	34.95
.1200	.1320	.500	.0080	.020	.590	.0263	.1875	1.5	QPF-120500	32.30	QPF-120500X	34.95
.1200	.1320	.750	.0080	.020	1.090	.0263	.1875	2.0	QPF-120750	32.30	QPF-120750X	34.95
.1200	.1320	1.000	.0080	.020	1.090	.0263	.1875	2.0	QPF-1201000	32.30	QPF-1201000X	34.95

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

Continued on next page

See pg 59-72 for quick change holder options



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		A1TIN Coated	
									H	L ₂	L ₁	Tool #	Price	Tool #	Price
			$R_{\pm .0005}^{+.030}$	P	L ₄	F	D ₂ (h6)	L ₁				
.1400	.1520	.375	.0080	.020	.590	.0463	.1875	1.5	QPF8-140375	32.30	QPF8-140375X	34.95
.1400	.1520	.500	.0080	.020	.590	.0463	.1875	1.5	QPF8-140500	32.30	QPF8-140500X	34.95
.1600	.1760	.375	.0080	.030	.590	.0663	.1875	1.5	QPF8-160375	32.30	QPF8-160375X	34.95
.1600	.1760	.500	.0080	.030	.590	.0663	.1875	1.5	QPF-160500	32.30	QPF-160500X	34.95
.1600	.1760	.750	.0080	.030	1.090	.0663	.1875	2.0	QPF-160750	32.30	QPF-160750X	34.95
.1600	.1760	1.000	.0080	.030	1.090	.0663	.1875	2.0	QPF-1601000	32.30	QPF-1601000X	34.95
.1800	.1960	.375	.0080	.030	.853	.0550	.2500	2.0	QPF8-180375	40.40	QPF8-180375X	45.30
.1800	.1960	.500	.0080	.030	.853	.0550	.2500	2.0	QPF-180500	40.40	QPF-180500X	45.30
.1800	.1960	.750	.0080	.030	.853	.0550	.2500	2.0	QPF-180750	40.40	QPF-180750X	45.30
.1800	.1960	1.000	.0080	.030	1.353	.0550	.2500	2.5	QPF-1801000	40.40	QPF-1801000X	45.30
.2000	.2160	.400	.0080	.030	.853	.0750	.2500	2.0	QPF8-200400	40.40	QPF8-200400X	45.30
.2000	.2160	.600	.0080	.030	.853	.0750	.2500	2.0	QPF-200600	40.40	QPF-200600X	45.30
.2000	.2160	.800	.0080	.030	1.353	.0750	.2500	2.5	QPF8-200800	40.40	QPF8-200800X	45.30
.2000	.2160	1.000	.0080	.030	1.353	.0750	.2500	2.5	QPF-2001000	40.40	QPF-2001000X	45.30
.2300	.2500	.750	.0080	.030	.853	.0738	.3125	2.0	QPF-230750	50.40	QPF-230750X	55.80
.2300	.2500	1.000	.0080	.030	1.353	.0738	.3125	2.5	QPF-2301000	50.40	QPF-2301000X	57.30
.2300	.2500	1.100	.0080	.030	1.353	.0738	.3125	2.5	QPF-2301100	50.40	QPF-2301100X	57.30
.2300	.2500	1.250	.0080	.030	1.353	.0738	.3125	2.5	QPF-2301250	50.40	QPF-2301250X	57.30
.2600	.2800	.750	.0080	.030	.853	.1038	.3125	2.5	QPF8-260750	50.40	QPF8-260750X	57.30
.3000	.3200	1.000	.0080	.030	1.353	.1438	.3125	2.5	QPF-3001000	50.40	QPF-3001000X	57.30
.3000	.3200	1.250	.0080	.030	1.353	.1438	.3125	2.5	QPF-3001250	50.40	QPF-3001250X	57.30
.3600	.3800	.750	.0080	.030	.853	.1725	.3750	2.0	QPF8-360750	65.70	QPF8-360750X	71.40
.3600	.3800	1.000	.0080	.030	1.353	.1725	.3750	2.5	QPF-3601000	65.70	QPF-3601000X	73.10
.3600	.3800	1.250	.0080	.030	1.353	.1725	.3750	2.5	QPF-3601250	65.70	QPF-3601250X	73.10
.4100	.4300	.750	.0080	.040	1.040	.1600	.5000	2.5	QPF8-410750	92.05	QPF8-410750X	101.40
.4100	.4300	1.000	.0080	.040	1.040	.1600	.5000	2.5	QPF8-4101000	92.05	QPF8-4101000X	101.40
.4600	.4800	.750	.0080	.050	1.040	.2100	.5000	2.5	QPF8-460750	92.05	QPF8-460750X	101.40
.4600	.4800	1.000	.0080	.050	1.040	.2100	.5000	2.5	QPF-4601000	92.05	QPF-4601000X	101.40
.4600	.4800	1.600	.0080	.050	2.040	.2100	.5000	3.5			QPF-4601600X	109.70
.4900	.5100	1.800	.0080	.050	2.040	.2400	.5000	3.5			QPF-4901800X	109.70

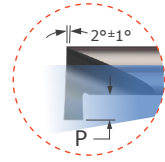
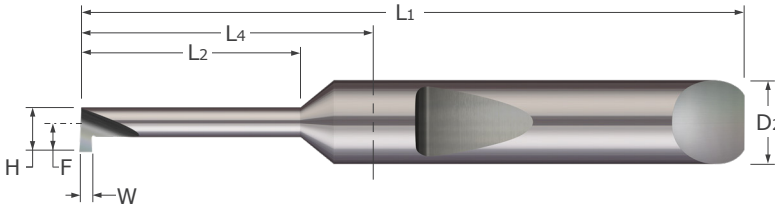
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See [pg 59-72](#) for quick change holder options

Quick Change – Profiling Tools

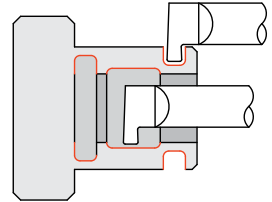
Quick Change – Grooving Tools

Retaining Ring – Square – Miniature



Quick Change – Grooving Tools

- 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	H		L2	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.010	.0600	.0700	.100	.020	.590	.0400	.1875	1.5	QMRR-010-100-060	44.95	QMRR-010-100-060X	47.80
.010	.0600	.0700	.150	.020	.590	.0400	.1875	1.5	QMRR-010-150-060	44.95	QMRR-010-150-060X	47.80
.010	.0600	.0700	.250	.020	.590	.0400	.1875	1.5	QMRR-010-250-060	44.95	QMRR-010-250-060X	47.80
.015	.0600	.0700	.100	.020	.590	.0400	.1875	1.5	QMRR-015-100-060	44.95	QMRR-015-100-060X	47.80
.015	.0600	.0700	.150	.020	.590	.0400	.1875	1.5	QMRR-015-150-060	44.95	QMRR-015-150-060X	47.80
.015	.0600	.0700	.250	.020	.590	.0400	.1875	1.5	QMRR-015-250-060	44.95	QMRR-015-250-060X	47.80
.015	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMRR-015-250-080	44.95	QMRR-015-250-080X	47.80
.015	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMRR-015-375-080	44.95	QMRR-015-375-080X	47.80
.015	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMRR-015-500-080	44.95	QMRR-015-500-080X	47.80
.015	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMRR-015-250-100	44.95	QMRR-015-250-100X	47.80
.015	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMRR-015-500-100	44.95	QMRR-015-500-100X	47.80
.015	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMRR-015-750-100	44.95	QMRR-015-750-100X	47.80
.017	.1200	.1340	.150	.040	.590	.0800	.1875	1.5	QMRR-017-150-120	44.95	QMRR-017-150-120X	47.80
.017	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMRR-017-250-120	44.95	QMRR-017-250-120X	47.80
.020	.0600	.0700	.100	.020	.590	.0400	.1875	1.5	QMRR-020-100-060	40.40	QMRR-020-100-060X	43.20
.020	.0600	.0700	.150	.020	.590	.0400	.1875	1.5	QMRR-020-150-060	40.40	QMRR-020-150-060X	43.20
.020	.0600	.0700	.250	.020	.590	.0400	.1875	1.5	QMRR-020-250-060	40.40	QMRR-020-250-060X	43.20
.020	.0700	.0800	.100	.020	.590	.0450	.1875	1.5	QMRR-020-100-070	40.40	QMRR-020-100-070X	43.20
.020	.0700	.0800	.150	.020	.590	.0450	.1875	1.5	QMRR-020-150-070	40.40	QMRR-020-150-070X	43.20
.020	.0800	.0900	.150	.025	.590	.0525	.1875	1.5	QMRR-020-150-080	40.40	QMRR-020-150-080X	43.20
.020	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMRR-020-250-080	40.40	QMRR-020-250-080X	43.20
.020	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMRR-020-375-080	40.40	QMRR-020-375-080X	43.20
.020	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMRR-020-500-080	40.40	QMRR-020-500-080X	43.20
.020	.0900	.1000	.150	.025	.590	.0575	.1875	1.5	QMRR-020-150-090	40.40	QMRR-020-150-090X	43.20
.020	.0900	.1000	.250	.025	.590	.0575	.1875	1.5	QMRR-020-250-090	40.40	QMRR-020-250-090X	43.20
.020	.1000	.1100	.150	.030	.590	.0650	.1875	1.5	QMRR-020-150-100	40.40	QMRR-020-150-100X	43.20
.020	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMRR-020-250-100	40.40	QMRR-020-250-100X	43.20
.020	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMRR-020-500-100	40.40	QMRR-020-500-100X	43.20
.020	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMRR-020-750-100	40.40	QMRR-020-750-100X	43.20

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

Continued on next page

See pg 59-72 for quick change holder options

Quick Change – Grooving Tools

Retaining Ring – Square – Miniature (cont.)

Continued from previous page

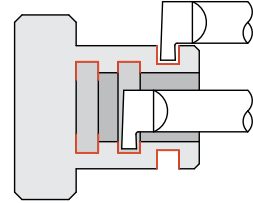
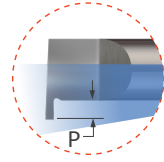
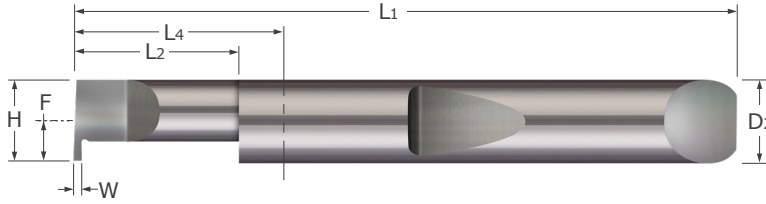
Width	Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
									Tool #	Price	Tool #	Price
W $\begin{matrix} +.002" \\ -.000" \end{matrix}$	H		L ₂ $\begin{matrix} +.030" \\ -.000" \end{matrix}$	P	L ₄	F	D ₂ (h6)	L ₁				
.020	.1200	.1340	.150	.040	.590	.0800	.1875	1.5	QMRR-020-150-120	40.40	QMRR-020-150-120X	43.20
.020	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMRR-020-250-120	40.40	QMRR-020-250-120X	43.20
.020	.1200	.1340	.375	.040	.590	.0800	.1875	1.5	QMRR-020-375-120	40.40	QMRR-020-375-120X	43.20
.020	.1200	.1340	.500	.040	.590	.0800	.1875	1.5	QMRR-020-500-120	40.40	QMRR-020-500-120X	43.20
.020	.1200	.1340	.750	.040	1.090	.0800	.1875	2.0	QMRR-020-750-120	40.40	QMRR-020-750-120X	43.20
.025	.1200	.1340	.150	.040	.590	.0800	.1875	1.5	QMRR-025-150-120	40.40	QMRR-025-150-120X	43.20
.025	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMRR-025-250-120	40.40	QMRR-025-250-120X	43.20
.030	.0700	.0800	.100	.020	.590	.0450	.1875	1.5	QMRR-030-100-070	40.40	QMRR-030-100-070X	43.20
.030	.0700	.0800	.150	.020	.590	.0450	.1875	1.5	QMRR-030-150-070	40.40	QMRR-030-150-070X	43.20
.030	.0800	.0900	.150	.025	.590	.0525	.1875	1.5	QMRR-030-150-080	40.40	QMRR-030-150-080X	43.20
.030	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMRR-030-250-080	40.40	QMRR-030-250-080X	43.20
.030	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMRR-030-375-080	40.40	QMRR-030-375-080X	43.20
.030	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMRR-030-500-080	40.40	QMRR-030-500-080X	43.20
.030	.0900	.1000	.150	.025	.590	.0575	.1875	1.5	QMRR-030-150-090	40.40	QMRR-030-150-090X	43.20
.030	.0900	.1000	.250	.025	.590	.0575	.1875	1.5	QMRR-030-250-090	40.40	QMRR-030-250-090X	43.20
.030	.1000	.1100	.150	.030	.590	.0650	.1875	1.5	QMRR-030-150-100	40.40	QMRR-030-150-100X	43.20
.030	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMRR-030-250-100	40.40	QMRR-030-250-100X	43.20
.030	.1000	.1100	.375	.030	.590	.0650	.1875	1.5	QMRR-030-375-100	40.40	QMRR-030-375-100X	43.20
.030	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMRR-030-500-100	40.40	QMRR-030-500-100X	43.20
.030	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMRR-030-750-100	40.40	QMRR-030-750-100X	43.20
.030	.1200	.1340	.150	.040	.590	.0800	.1875	1.5	QMRR-030-150-120	40.40	QMRR-030-150-120X	43.20
.030	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMRR-030-250-120	40.40	QMRR-030-250-120X	43.20
.030	.1200	.1340	.375	.040	.590	.0800	.1875	1.5	QMRR-030-375-120	40.40	QMRR-030-375-120X	43.20
.030	.1200	.1340	.500	.040	.590	.0800	.1875	1.5	QMRR-030-500-120	40.40	QMRR-030-500-120X	43.20
.030	.1200	.1340	.750	.040	1.090	.0800	.1875	2.0	QMRR-030-750-120	40.40	QMRR-030-750-120X	43.20

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

See [pg 59-72](#) for quick change holder options

Quick Change – Grooving Tools

Retaining Ring – Square



- 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

Quick Change – Grooving Tools

Width	Head Width	Minimum Bore Dia.*	Max. Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
									Tool #	Price	Tool #	Price
W +.002" / -.000"	H		L2 +.030" / -.000"	P	L4	F	D2 (h6)	L1				
.017	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QRR-017-4	34.35	QRR-017-4X	37.05
.017	.1800	.1980	.375	.030	.590	.0863	.1875	1.5	QRR-017-6	34.35	QRR-017-6X	37.05
.017	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QRR-017-8	34.35	QRR-017-8X	37.05
.017	.1800	.1980	.625	.030	1.090	.0863	.1875	2.0	QRR-017-10	34.35	QRR-017-10X	37.05
.017	.1800	.1980	.750	.030	1.090	.0863	.1875	2.0	QRR-017-750-180	34.35	QRR-017-750-180X	37.05
.017	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-017-250-245	40.40	QRR-017-250-245X	45.30
.017	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QRR-017-375-245	40.40	QRR-017-375-245X	45.30
.020	.1200	.1340	.150	.030	.590	.0263	.1875	1.5	QRR-020-150-120	34.35	QRR-020-150-120X	37.05
.020	.1200	.1340	.250	.030	.590	.0263	.1875	1.5	QRR-020-250-120	34.35	QRR-020-250-120X	37.05
.020	.1400	.1540	.250	.030	.590	.0463	.1875	1.5	QRR-020-250-140	34.35	QRR-020-250-140X	37.05
.020	.1400	.1540	.375	.030	.590	.0463	.1875	1.5	QRR-020-375-140	34.35	QRR-020-375-140X	37.05
.020	.1600	.1780	.250	.030	.590	.0663	.1875	1.5	QRR-020-250-160	34.35	QRR-020-250-160X	37.05
.020	.1600	.1780	.375	.030	.590	.0663	.1875	1.5	QRR-020-375-160	34.35	QRR-020-375-160X	37.05
.020	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QRR-020-4	34.35	QRR-020-4X	37.05
.020	.1800	.1980	.375	.030	.590	.0863	.1875	1.5	QRR-020-6	34.35	QRR-020-6X	37.05
.020	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QRR-020-8	34.35	QRR-020-8X	37.05
.020	.1800	.1980	.625	.030	1.090	.0863	.1875	2.0	QRR-020-10	34.35	QRR-020-10X	37.05
.020	.1800	.1980	.750	.030	1.090	.0863	.1875	2.0	QRR-020-750-180	40.40	QRR-020-750-180X	44.90
.020	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-020-250-245	40.40	QRR-020-250-245X	45.30
.020	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QRR-020-375-245	40.40	QRR-020-375-245X	45.30
.020	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-020-500-245	40.40	QRR-020-500-245X	45.30
.020	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	QRR-020-625-245	40.40	QRR-020-625-245X	45.30
.020	.3700	.3920	.625	.050	.853	.1825	.3750	2.0	QRR-020-625-370	65.70	QRR-020-625-370X	73.40
.020	.3700	.3920	1.000	.050	1.353	.1825	.3750	2.5	QRR-020-1000-370	65.70	QRR-020-1000-370X	73.90
.025	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-025-4	40.40	QRR-025-4X	45.30
.025	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QRR-025-6	40.40	QRR-025-6X	45.30
.025	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-025-8	40.40	QRR-025-8X	45.30
.025	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	QRR-025-10	40.40	QRR-025-10X	45.30
.025	.2450	.2670	.750	.050	.853	.1200	.2500	2.0	QRR-025-750-245	40.40	QRR-025-750-245X	45.30
.030	.1200	.1340	.150	.030	.590	.0263	.1875	1.5	QRR-030-150-120	34.35	QRR-030-150-120X	37.05
.030	.1200	.1340	.250	.030	.590	.0263	.1875	1.5	QRR-030-250-120	34.35	QRR-030-250-120X	37.05
.030	.1400	.1540	.250	.030	.590	.0463	.1875	1.5	QRR-030-250-140	34.35	QRR-030-250-140X	37.05

NEW
NEW

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

Continued on next page

See pg 59-72 for quick change holder options

See pg 34 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	
									Tool #	Price	Tool #	Price
W +.002" -.000"	H	L ₂ +.030" -.000"	P	L ₄	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price	
.030	.1400	.1540	.375	.030	.590	.0463	.1875	1.5	QRR-030-375-140	34.35	QRR-030-375-140X	37.05
.030	.1600	.1780	.250	.030	.590	.0663	.1875	1.5	QRR-030-250-160	34.35	QRR-030-250-160X	37.05
.030	.1600	.1780	.375	.030	.590	.0663	.1875	1.5	QRR-030-375-160	34.35	QRR-030-375-160X	37.05
.030	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QRR-030-250-180	34.35	QRR-030-250-180X	37.05
.030	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QRR-030-500-180	34.35	QRR-030-500-180X	37.05
.030	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-030-4	40.40	QRR-030-4X	45.30
.030	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QRR-030-6	40.40	QRR-030-6X	45.30
.030	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-030-8	40.40	QRR-030-8X	45.30
.030	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	QRR-030-10	40.40	QRR-030-10X	45.30
.030	.2450	.2670	.750	.050	.853	.1200	.2500	2.0	QRR-030-750-245	40.40	QRR-030-750-245X	45.30
.030	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-030-500-310	50.40	QRR-030-500-310X	55.80
.030	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-030-750-310	50.40	QRR-030-750-310X	55.80
NEW NEW	.030	.3700	.3920	.625	.050	.853	.1825	2.0	QRR-030-625-370	65.70	QRR-030-625-370X	73.40
NEW	.030	.3700	.3920	1.000	.050	1.353	.1825	2.5	QRR-030-1000-370	65.70	QRR-030-1000-370X	73.90
.033	.3100	.3320	.250	.100	.853	.1538	.3125	2.0	QRR-033-250-310	50.40	QRR-033-250-310X	55.80
.033	.3100	.3320	.375	.100	.853	.1538	.3125	2.0	QRR-033-6	50.40	QRR-033-6X	55.80
.033	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-033-8	50.40	QRR-033-8X	55.80
.033	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-033-12	50.40	QRR-033-12X	55.80
.038	.3100	.3320	.250	.100	.853	.1538	.3125	2.0	QRR-038-250-310	50.40	QRR-038-250-310X	55.80
.038	.3100	.3320	.375	.100	.853	.1538	.3125	2.0	QRR-038-6	50.40	QRR-038-6X	55.80
.038	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-038-8	50.40	QRR-038-8X	55.80
.038	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-038-12	50.40	QRR-038-12X	55.80
.039	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QRR-039-250-180	34.35	QRR-039-250-180X	37.05
.039	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QRR-039-500-180	34.35	QRR-039-500-180X	37.05
.039	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-039-250-245	40.40	QRR-039-250-245X	45.30
.039	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-039-500-245	40.40	QRR-039-500-245X	45.30
.039	.3700	.3920	.375	.100	.853	.1825	.3750	2.0	QRR-039-375-370	65.70	QRR-039-375-370X	71.40
.039	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-039-8	65.70	QRR-039-8X	71.40
.039	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-039-12	65.70	QRR-039-12X	71.40
.039	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-039-16	65.70	QRR-039-16X	73.10
.039	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-039-20	65.70	QRR-039-20X	73.10
.046	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-046-500-310	50.40	QRR-046-500-310X	55.80
.046	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-046-750-310	50.40	QRR-046-750-310X	55.80
.046	.3700	.3920	.375	.100	.853	.1825	.3750	2.0	QRR-046-375-370	65.70	QRR-046-375-370X	71.40
.046	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-046-8	65.70	QRR-046-8X	71.40
.046	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-046-12	65.70	QRR-046-12X	71.40
.046	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-046-16	65.70	QRR-046-16X	73.10
.046	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-046-20	65.70	QRR-046-20X	73.10
.055	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-055-8	65.70	QRR-055-8X	71.40
.055	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-055-12	65.70	QRR-055-12X	71.40
.055	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-055-16	65.70	QRR-055-16X	73.10
.055	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-055-20	65.70	QRR-055-20X	73.10
.059	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-059-8	65.70	QRR-059-8X	71.40
.059	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-059-12	65.70	QRR-059-12X	71.40
.059	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-059-16	65.70	QRR-059-16X	73.10
.059	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-059-20	65.70	QRR-059-20X	73.10

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

Continued on next page

See pg 59-72 for quick change holder options

See pg 34 for miniature sizes

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		AITIN Coated	
W ^{+0.002"} _{-.000"}	H	L ₂ ^{+0.030"} _{-.000"}	P	L ₄	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price	
.062	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QRR-062-250-180	34.35	QRR-062-250-180X	37.05
.062	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QRR-062-500-180	34.35	QRR-062-500-180X	37.05
.062	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QRR-062-250-245	40.40	QRR-062-250-245X	45.30
.062	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QRR-062-500-245	40.40	QRR-062-500-245X	45.30
.062	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-062-500-310	50.40	QRR-062-500-310X	55.80
.062	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-062-750-310	50.40	QRR-062-750-310X	55.80
.062	.3700	.3920	.250	.100	.853	.1825	.3750	2.0	QRR-062-250-370	65.70	QRR-062-250-370X	71.40
.062	.3700	.3920	.375	.100	.853	.1825	.3750	2.0	QRR-062-375-370	65.70	QRR-062-375-370X	71.40
.062	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-062-8	65.70	QRR-062-8X	71.40
.062	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-062-12	65.70	QRR-062-12X	71.40
.062	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-062-16	65.70	QRR-062-16X	73.10
.062	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-062-20	65.70	QRR-062-20X	73.10
.069	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-069-8	65.70	QRR-069-8X	71.40
.069	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-069-12	65.70	QRR-069-12X	71.40
.069	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-069-16	65.70	QRR-069-16X	73.10
.069	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-069-20	65.70	QRR-069-20X	73.10
.079	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-079-8	65.70	QRR-079-8X	71.40
.079	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-079-12	65.70	QRR-079-12X	71.40
.079	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-079-16	65.70	QRR-079-16X	73.10
.079	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-079-20	65.70	QRR-079-20X	73.10
.087	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QRR-087-500-310	50.40	QRR-087-500-310X	55.80
.087	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QRR-087-750-310	50.40	QRR-087-750-310X	55.80
.087	.3700	.3920	.375	.100	.853	.1825	.3750	2.0	QRR-087-375-370	65.70	QRR-087-375-370X	71.40
.087	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QRR-087-8	65.70	QRR-087-8X	71.40
.087	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-087-12	65.70	QRR-087-12X	71.40
.087	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-087-16	65.70	QRR-087-16X	73.10
.087	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-087-20	65.70	QRR-087-20X	73.10
.093	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QRR-093-12	92.05	QRR-093-12X	101.40
.093	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QRR-093-16	92.05	QRR-093-16X	101.40
.093	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-093-20	92.05	QRR-093-20X	101.40
.093	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QRR-093-24	92.05	QRR-093-24X	101.40
.118	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QRR-118-12	92.05	QRR-118-12X	101.40
.118	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QRR-118-16	92.05	QRR-118-16X	101.40
.118	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-118-20	92.05	QRR-118-20X	101.40
.118	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QRR-118-24	92.05	QRR-118-24X	101.40
.125	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QRR-125-750-370	65.70	QRR-125-750-370X	71.40
.125	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QRR-125-1000-370	65.70	QRR-125-1000-370X	73.10
.125	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QRR-125-1250-370	65.70	QRR-125-1250-370X	73.10
.125	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QRR-125-12	92.05	QRR-125-12X	101.40
.125	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QRR-125-16	92.05	QRR-125-16X	101.40
.125	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-125-20	92.05	QRR-125-20X	101.40
.125	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QRR-125-24	92.05	QRR-125-24X	101.40

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

Continued on next page

See pg 59-72 for quick change holder options

See pg 34 for miniature sizes

QRR



Quick Change – Grooving Tools

Retaining Ring – Square (cont.)

Continued from previous page

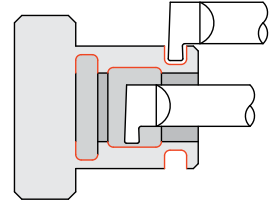
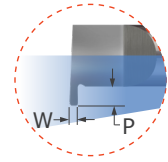
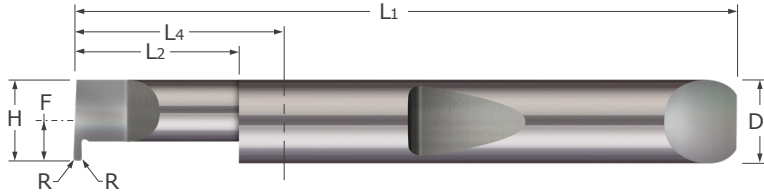
Width	Head Width	Minimum Bore Dia.*	Max. Bore Depth	Proj.	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
W $\begin{smallmatrix} +.002" \\ -.000" \end{smallmatrix}$	H		L2 $\begin{smallmatrix} +.030" \\ -.000" \end{smallmatrix}$	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.156	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QRR-156-12	92.05	QRR-156-12X	101.40
.156	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QRR-156-16	92.05	QRR-156-16X	101.40
.156	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-156-20	92.05	QRR-156-20X	101.40
.156	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QRR-156-24	92.05	QRR-156-24X	101.40
.187	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QRR-187-12	92.05	QRR-187-12X	101.40
.187	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QRR-187-16	92.05	QRR-187-16X	101.40
.187	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-187-20	92.05	QRR-187-20X	101.40
.187	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QRR-187-24	92.05	QRR-187-24X	101.40
.236	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QRR-236-12	92.05	QRR-236-12X	101.40
.236	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QRR-236-16	92.05	QRR-236-16X	101.40
.236	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-236-20	92.05	QRR-236-20X	101.40
.236	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QRR-236-24	92.05	QRR-236-24X	101.40
.250	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QRR-250-12	92.05	QRR-250-12X	101.40
.250	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QRR-250-16	92.05	QRR-250-16X	101.40
.250	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QRR-250-20	92.05	QRR-250-20X	101.40
.250	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QRR-250-24	92.05	QRR-250-24X	101.40

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

See [pg 59-72](#) for quick change holder optionsSee [pg 34](#) for miniature sizes

Quick Change – Grooving Tools

Retaining Ring - Corner Radius - Right Hand



Quick Change – Grooving Tools

- 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	
										Tool #	Price	Tool #	Price
W $^{+.001}$ / $_{-.000}$ "	H		L ₂ $^{+.030}$ / $_{-.000}$ "	R $^{+.001}$ / $_{-.001}$ "	P	L ₄	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price
.017	.1800	.1980	.250	.003	.030	.590	.0863	.1875	1.5	ORRC3-017-250-180	37.15	ORRC3-017-250-180X	39.85
.017	.1800	.1980	.375	.003	.030	.590	.0863	.1875	1.5	ORRC3-017-375-180	37.15	ORRC3-017-375-180X	39.85
.017	.2450	.2670	.250	.003	.050	.853	.1200	.2500	2.0	ORRC3-017-250-245	46.45	ORRC3-017-250-245X	51.45
.017	.2450	.2670	.375	.003	.050	.853	.1200	.2500	2.0	ORRC3-017-375-245	46.45	ORRC3-017-375-245X	51.45
.020	.1800	.1980	.250	.003	.030	.590	.0863	.1875	1.5	ORRC3-020-250-180	37.15	ORRC3-020-250-180X	39.85
.020	.1800	.1980	.375	.003	.030	.590	.0863	.1875	1.5	ORRC3-020-375-180	37.15	ORRC3-020-375-180X	39.85
.020	.2450	.2670	.250	.003	.050	.853	.1200	.2500	2.0	ORRC3-020-250-245	46.45	ORRC3-020-250-245X	51.45
.020	.2450	.2670	.375	.003	.050	.853	.1200	.2500	2.0	ORRC3-020-375-245	46.45	ORRC3-020-375-245X	51.45
.025	.2450	.2670	.250	.003	.050	.853	.1200	.2500	2.0	ORRC3-025-250-245	46.45	ORRC3-025-250-245X	51.45
.025	.2450	.2670	.375	.003	.050	.853	.1200	.2500	2.0	ORRC3-025-375-245	46.45	ORRC3-025-375-245X	51.45
.030	.1800	.1980	.250	.003	.030	.590	.0863	.1875	1.5	ORRC3-030-250-180	37.15	ORRC3-030-250-180X	39.85
.030	.1800	.1980	.500	.003	.030	.590	.0863	.1875	1.5	ORRC3-030-500-180	37.15	ORRC3-030-500-180X	39.85
.030	.2450	.2670	.250	.003	.050	.853	.1200	.2500	2.0	ORRC3-030-250-245	46.45	ORRC3-030-250-245X	51.45
.030	.2450	.2670	.375	.003	.050	.853	.1200	.2500	2.0	ORRC3-030-375-245	46.45	ORRC3-030-375-245X	51.45
.030	.3100	.3320	.500	.003	.100	.853	.1538	.3125	2.0	ORRC3-030-500-310	57.90	ORRC3-030-500-310X	63.45
.030	.3100	.3320	.750	.003	.100	.853	.1538	.3125	2.0	ORRC3-030-750-310	57.90	ORRC3-030-750-310X	63.45
.033	.3100	.3320	.500	.003	.100	.853	.1538	.3125	2.0	ORRC3-033-500-310	57.90	ORRC3-033-500-310X	63.45
.033	.3100	.3320	.750	.003	.100	.853	.1538	.3125	2.0	ORRC3-033-750-310	57.90	ORRC3-033-750-310X	63.45
.038	.3100	.3320	.500	.003	.100	.853	.1538	.3125	2.0	ORRC3-038-500-310	57.90	ORRC3-038-500-310X	63.45
.038	.3100	.3320	.750	.003	.100	.853	.1538	.3125	2.0	ORRC3-038-750-310	57.90	ORRC3-038-750-310X	63.45

W $^{+.002}$ / $_{-.000}$ "	H	L ₂ $^{+.030}$ / $_{-.000}$ "	R $^{+.001}$ / $_{-.000}$ "	P	L ₄	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price	
.039	.3700	.3920	.500	.003	.100	.853	.1825	.3750	2.0	ORRC3-039-500-370	73.30	ORRC3-039-500-370X	79.20
.039	.3700	.3920	.750	.003	.100	.853	.1825	.3750	2.0	ORRC3-039-750-370	73.30	ORRC3-039-750-370X	79.20
.039	.3700	.3920	1.000	.003	.100	1.353	.1825	.3750	2.5	ORRC3-039-1000-370	73.30	ORRC3-039-1000-370X	80.90
.062	.3700	.3920	.500	.003	.100	.853	.1825	.3750	2.0	ORRC3-062-500-370	73.30	ORRC3-062-500-370X	79.20
.062	.3700	.3920	.500	.006	.100	.853	.1825	.3750	2.0	ORRC6-062-500-370	73.30	ORRC6-062-500-370X	79.20
.062	.3700	.3920	.750	.003	.100	.853	.1825	.3750	2.0	ORRC3-062-750-370	73.30	ORRC3-062-750-370X	79.20
.062	.3700	.3920	.750	.006	.100	.853	.1825	.3750	2.0	ORRC6-062-750-370	73.30	ORRC6-062-750-370X	79.20
.062	.3700	.3920	1.000	.003	.100	1.353	.1825	.3750	2.5	ORRC3-062-1000-370	73.30	ORRC3-062-1000-370X	80.90
.062	.3700	.3920	1.000	.006	.100	1.353	.1825	.3750	2.5	ORRC6-062-1000-370	73.30	ORRC6-062-1000-370X	80.90

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

Continued on next page

See [pg 59-72](#) for quick change holder options



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		AITIN Coated	
										Tool #	Price	Tool #	Price
W $\begin{smallmatrix} +.002 \\ -.000 \end{smallmatrix}$ "	H		L ₂ $\begin{smallmatrix} +.030 \\ -.000 \end{smallmatrix}$ "	R $\begin{smallmatrix} +.001 \\ -.000 \end{smallmatrix}$ "	P	L ₄	F	D ₂ (h6)	L ₁				
.087	.3700	.3920	.500	.003	.100	.853	.1825	.3750	2.0	ORRC3-087-500-370	73.30	ORRC3-087-500-370X	79.20
.087	.3700	.3920	.500	.006	.100	.853	.1825	.3750	2.0	ORRC6-087-500-370	73.30	ORRC6-087-500-370X	79.20
.087	.3700	.3920	.750	.003	.100	.853	.1825	.3750	2.0	ORRC3-087-750-370	73.30	ORRC3-087-750-370X	79.20
.087	.3700	.3920	.750	.006	.100	.853	.1825	.3750	2.0	ORRC6-087-750-370	73.30	ORRC6-087-750-370X	79.20
.087	.3700	.3920	1.000	.003	.100	1.353	.1825	.3750	2.5	ORRC3-087-1000-370	73.30	ORRC3-087-1000-370X	80.90
.087	.3700	.3920	1.000	.006	.100	1.353	.1825	.3750	2.5	ORRC6-087-1000-370	73.30	ORRC6-087-1000-370X	80.90
.093	.4950	.5170	.750	.003	.150	1.040	.2450	.5000	2.5	ORRC3-093-750-495	100.80	ORRC3-093-750-495X	110.30
.093	.4950	.5170	.750	.006	.150	1.040	.2450	.5000	2.5	ORRC6-093-750-495	100.80	ORRC6-093-750-495X	110.30
.093	.4950	.5170	1.000	.003	.150	1.040	.2450	.5000	2.5	ORRC3-093-1000-495	100.80	ORRC3-093-1000-495X	110.30
.093	.4950	.5170	1.000	.006	.150	1.040	.2450	.5000	2.5	ORRC6-093-1000-495	100.80	ORRC6-093-1000-495X	110.30
.125	.4950	.5170	.750	.003	.150	1.040	.2450	.5000	2.5	ORRC3-125-750-495	100.80	ORRC3-125-750-495X	110.30
.125	.4950	.5170	.750	.006	.150	1.040	.2450	.5000	2.5	ORRC6-125-750-495	100.80	ORRC6-125-750-495X	110.30
.125	.4950	.5170	1.000	.003	.150	1.040	.2450	.5000	2.5	ORRC3-125-1000-495	100.80	ORRC3-125-1000-495X	110.30
.125	.4950	.5170	1.000	.006	.150	1.040	.2450	.5000	2.5	ORRC6-125-1000-495	100.80	ORRC6-125-1000-495X	110.30

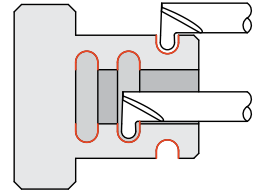
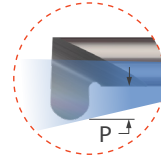
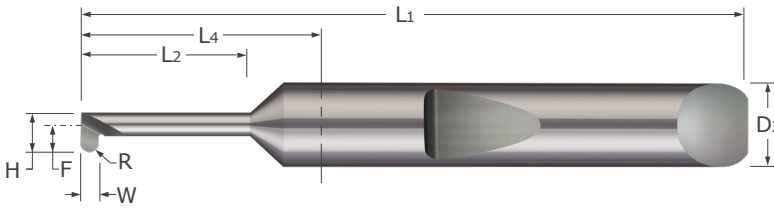
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pg [59-72](#) for quick change holder options

Quick Change – Grooving Tools

Quick Change – Grooving Tools

Full Radius – Miniature



Quick Change – Grooving Tools

- 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 ^{+0.002"} / _{-.000"}	R ^{+0.001"} / _{-.000"}	H		L2 ^{+0.030"} / _{-.000"}	P	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.015	.0075	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMFR-015-250-080	44.95	QMFR-015-250-080X	47.80
.015	.0075	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMFR-015-375-080	44.95	QMFR-015-375-080X	47.80
.015	.0075	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMFR-015-500-080	44.95	QMFR-015-500-080X	47.80
.015	.0075	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMFR-015-250-100	44.95	QMFR-015-250-100X	47.80
.015	.0075	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMFR-015-500-100	44.95	QMFR-015-500-100X	47.80
.015	.0075	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMFR-015-750-100	44.95	QMFR-015-750-100X	47.80
.020	.0100	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMFR-020-250-080	40.40	QMFR-020-250-080X	43.20
.020	.0100	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMFR-020-375-080	40.40	QMFR-020-375-080X	43.20
.020	.0100	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMFR-020-500-080	40.40	QMFR-020-500-080X	43.20
.020	.0100	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMFR-020-250-100	40.40	QMFR-020-250-100X	43.20
.020	.0100	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMFR-020-500-100	40.40	QMFR-020-500-100X	43.20
.020	.0100	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMFR-020-750-100	40.40	QMFR-020-750-100X	43.20
.020	.0100	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMFR-020-250-120	40.40	QMFR-020-250-120X	43.20
.020	.0100	.1200	.1340	.500	.040	.590	.0800	.1875	1.5	QMFR-020-500-120	40.40	QMFR-020-500-120X	43.20
.020	.0100	.1200	.1340	.750	.040	1.090	.0800	.1875	2.0	QMFR-020-750-120	40.40	QMFR-020-750-120X	43.20
.030	.0150	.0800	.0900	.250	.025	.590	.0525	.1875	1.5	QMFR-030-250-080	40.40	QMFR-030-250-080X	43.20
.030	.0150	.0800	.0900	.375	.025	.590	.0525	.1875	1.5	QMFR-030-375-080	40.40	QMFR-030-375-080X	43.20
.030	.0150	.0800	.0900	.500	.025	.590	.0525	.1875	1.5	QMFR-030-500-080	40.40	QMFR-030-500-080X	43.20
.030	.0150	.1000	.1100	.250	.030	.590	.0650	.1875	1.5	QMFR-030-250-100	40.40	QMFR-030-250-100X	43.20
.030	.0150	.1000	.1100	.500	.030	.590	.0650	.1875	1.5	QMFR-030-500-100	40.40	QMFR-030-500-100X	43.20
.030	.0150	.1000	.1100	.750	.030	1.090	.0650	.1875	2.0	QMFR-030-750-100	40.40	QMFR-030-750-100X	43.20
.030	.0150	.1200	.1340	.250	.040	.590	.0800	.1875	1.5	QMFR-030-250-120	40.40	QMFR-030-250-120X	43.20
.030	.0150	.1200	.1340	.500	.040	.590	.0800	.1875	1.5	QMFR-030-500-120	40.40	QMFR-030-500-120X	43.20
.030	.0150	.1200	.1340	.750	.040	1.090	.0800	.1875	2.0	QMFR-030-750-120	40.40	QMFR-030-750-120X	43.20

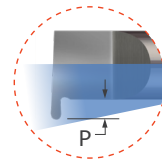
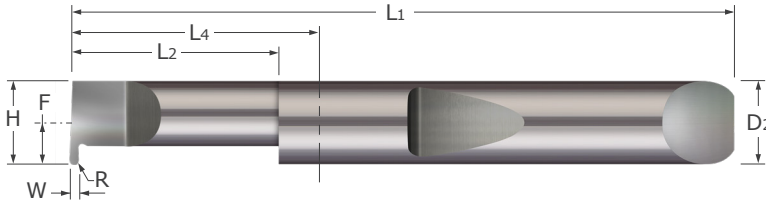
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pg 59-72 for quick change holder options

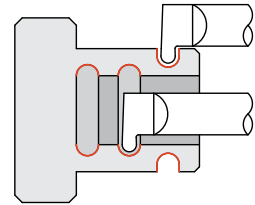


Quick Change – Grooving Tools

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



Quick Change – Grooving Tools

Width	Radius	Head Width	Min. Bore Dia.*	Max. Bore Depth	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
										Tool #	Price	Tool #	Price
W $^{+.002"}_{-.000}"$	R	H		L2 $^{+.030"}_{-.000}"$	P	L4	F	D2 (h6)	L1				
.017	.0085	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QFR-017-4	37.15	QFR-017-4X	39.85
.017	.0085	.1800	.1980	.375	.030	.590	.0863	.1875	1.5	QFR-017-6	37.15	QFR-017-6X	39.85
.017	.0085	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QFR-017-8	37.15	QFR-017-8X	39.85
.017	.0085	.1800	.1980	.625	.030	1.090	.0863	.1875	2.0	QFR-017-10	37.15	QFR-017-10X	39.85
.020	.0100	.1800	.1980	.250	.030	.590	.0863	.1875	1.5	QFR-020-4	37.15	QFR-020-4X	39.85
.020	.0100	.1800	.1980	.375	.030	.590	.0863	.1875	1.5	QFR-020-6	37.15	QFR-020-6X	39.85
.020	.0100	.1800	.1980	.500	.030	.590	.0863	.1875	1.5	QFR-020-8	37.15	QFR-020-8X	39.85
.020	.0100	.1800	.1980	.625	.030	1.090	.0863	.1875	2.0	QFR-020-10	37.15	QFR-020-10X	39.85
.025	.0125	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QFR-025-4	46.45	QFR-025-4X	51.45
.025	.0125	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QFR-025-6	46.45	QFR-025-6X	51.45
.025	.0125	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QFR-025-8	46.45	QFR-025-8X	51.45
.025	.0125	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	QFR-025-10	46.45	QFR-025-10X	51.45
.030	.0150	.2450	.2670	.250	.050	.853	.1200	.2500	2.0	QFR-030-4	46.45	QFR-030-4X	51.45
.030	.0150	.2450	.2670	.375	.050	.853	.1200	.2500	2.0	QFR-030-6	46.45	QFR-030-6X	51.45
.030	.0150	.2450	.2670	.500	.050	.853	.1200	.2500	2.0	QFR-030-8	46.45	QFR-030-8X	51.45
.030	.0150	.2450	.2670	.625	.050	.853	.1200	.2500	2.0	QFR-030-10	46.45	QFR-030-10X	51.45
.033	.0165	.3100	.3320	.375	.100	.853	.1538	.3125	2.0	QFR-033-6	57.90	QFR-033-6X	63.45
.033	.0165	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QFR-033-8	57.90	QFR-033-8X	63.45
.033	.0165	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QFR-033-12	57.90	QFR-033-12X	63.45
.038	.0190	.3100	.3320	.375	.100	.853	.1538	.3125	2.0	QFR-038-6	57.90	QFR-038-6X	63.45
.038	.0190	.3100	.3320	.500	.100	.853	.1538	.3125	2.0	QFR-038-8	57.90	QFR-038-8X	63.45
.038	.0190	.3100	.3320	.750	.100	.853	.1538	.3125	2.0	QFR-038-12	57.90	QFR-038-12X	63.45
.039	.0195	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-039-8	73.30	QFR-039-8X	79.20
.039	.0195	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-039-12	73.30	QFR-039-12X	79.20
.039	.0195	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-039-16	73.30	QFR-039-16X	80.90
.039	.0195	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-039-20	73.30	QFR-039-20X	80.90
.046	.0230	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-046-8	73.30	QFR-046-8X	79.20
.046	.0230	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-046-12	73.30	QFR-046-12X	79.20
.046	.0230	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-046-16	73.30	QFR-046-16X	80.90
.046	.0230	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-046-20	73.30	QFR-046-20X	80.90
.055	.0275	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-055-8	73.30	QFR-055-8X	79.20
.055	.0275	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-055-12	73.30	QFR-055-12X	79.20
.055	.0275	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-055-16	73.30	QFR-055-16X	80.90
.055	.0275	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-055-20	73.30	QFR-055-20X	80.90

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

Continued on next page

See pg 59-72 for quick change holder options

See pg 42 for miniature sizes

Quick Change – Grooving Tools

Full Radius (cont.)



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	
										Tool #	Price	Tool #	Price
W $\pm \begin{smallmatrix} .002 \\ -.000 \end{smallmatrix}$ "	R	H		L2 $\pm \begin{smallmatrix} .030 \\ -.000 \end{smallmatrix}$ "	P	L4	F	D2 (h6)	L1				
.059	.0295	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-059-8	73.30	QFR-059-8X	79.20
.059	.0295	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-059-12	73.30	QFR-059-12X	79.20
.059	.0295	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-059-16	73.30	QFR-059-16X	80.90
.059	.0295	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-059-20	73.30	QFR-059-20X	80.90
.062	.0310	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-062-8	73.30	QFR-062-8X	79.20
.062	.0310	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-062-12	73.30	QFR-062-12X	79.20
.062	.0310	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-062-16	73.30	QFR-062-16X	80.90
.062	.0310	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-062-20	73.30	QFR-062-20X	80.90
.069	.0345	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-069-8	73.30	QFR-069-8X	79.20
.069	.0345	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-069-12	73.30	QFR-069-12X	79.20
.069	.0345	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-069-16	73.30	QFR-069-16X	80.90
.069	.0345	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-069-20	73.30	QFR-069-20X	80.90
.079	.0395	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-079-8	73.30	QFR-079-8X	79.20
.079	.0395	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-079-12	73.30	QFR-079-12X	79.20
.079	.0395	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-079-16	73.30	QFR-079-16X	80.90
.079	.0395	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-079-20	73.30	QFR-079-20X	80.90
.087	.0435	.3700	.3920	.500	.100	.853	.1825	.3750	2.0	QFR-087-8	73.30	QFR-087-8X	79.20
.087	.0435	.3700	.3920	.750	.100	.853	.1825	.3750	2.0	QFR-087-12	73.30	QFR-087-12X	79.20
.087	.0435	.3700	.3920	1.000	.100	1.353	.1825	.3750	2.5	QFR-087-16	73.30	QFR-087-16X	80.90
.087	.0435	.3700	.3920	1.250	.100	1.353	.1825	.3750	2.5	QFR-087-20	73.30	QFR-087-20X	80.90
.093	.0465	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QFR-093-12	100.80	QFR-093-12X	110.30
.093	.0465	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QFR-093-16	100.80	QFR-093-16X	110.30
.093	.0465	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QFR-093-20	100.80	QFR-093-20X	110.30
.093	.0465	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QFR-093-24	100.80	QFR-093-24X	110.30
.118	.0590	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QFR-118-12	100.80	QFR-118-12X	110.30
.118	.0590	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QFR-118-16	100.80	QFR-118-16X	110.30
.118	.0590	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QFR-118-20	100.80	QFR-118-20X	110.30
.118	.0590	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QFR-118-24	100.80	QFR-118-24X	110.30
.125	.0625	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QFR-125-12	100.80	QFR-125-12X	110.30
.125	.0625	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QFR-125-16	100.80	QFR-125-16X	110.30
.125	.0625	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QFR-125-20	100.80	QFR-125-20X	110.30
.125	.0625	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QFR-125-24	100.80	QFR-125-24X	110.30
.156	.0780	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5			QFR-156-12X	110.30
.156	.0780	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5			QFR-156-16X	110.30
.156	.0780	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QFR-156-20	100.80	QFR-156-20X	110.30
.156	.0780	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QFR-156-24	100.80	QFR-156-24X	110.30
.187	.0935	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QFR-187-12	100.80	QFR-187-12X	110.30
.187	.0935	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QFR-187-16	100.80	QFR-187-16X	110.30
.187	.0935	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QFR-187-20	100.80	QFR-187-20X	110.30
.187	.0935	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QFR-187-24	100.80	QFR-187-24X	110.30
.236	.1180	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QFR-236-12	100.80	QFR-236-12X	110.30
.236	.1180	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QFR-236-16	100.80	QFR-236-16X	110.30
.236	.1180	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QFR-236-20	100.80	QFR-236-20X	110.30
.236	.1180	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QFR-236-24	100.80	QFR-236-24X	110.30
.250	.1250	.4950	.5170	.750	.150	1.040	.2450	.5000	2.5	QFR-250-12	100.80	QFR-250-12X	110.30
.250	.1250	.4950	.5170	1.000	.150	1.040	.2450	.5000	2.5	QFR-250-16	100.80	QFR-250-16X	110.30
.250	.1250	.4950	.5170	1.250	.150	1.540	.2450	.5000	3.0	QFR-250-20	100.80	QFR-250-20X	110.30
.250	.1250	.4950	.5170	1.500	.150	1.540	.2450	.5000	3.0	QFR-250-24	100.80	QFR-250-24X	110.30

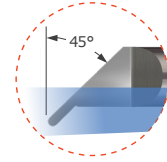
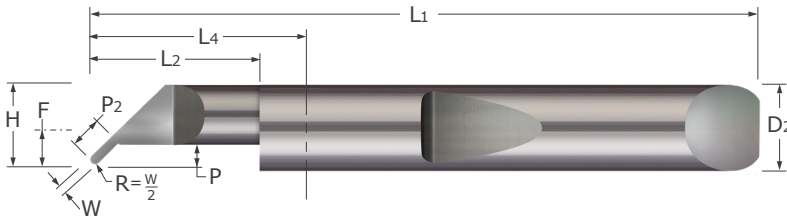
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pg 59-72 for quick change holder options

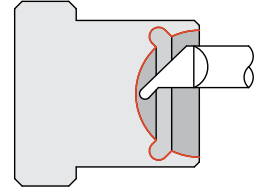
See pg 42 for miniature sizes

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



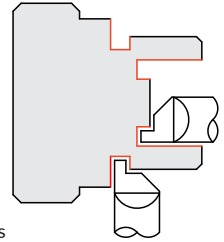
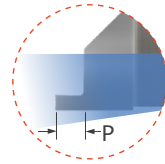
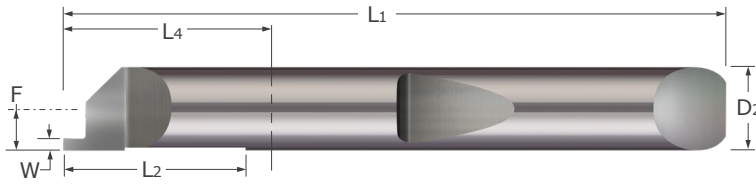
Width	Projection	Angled Projection	Head Width	Min. Bore Diameter*	Max. Bore Depth	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
W $^{+0.002}$ $_{-0.000}$ "	P	P2	H		L2 $^{+0.030}$ $_{-0.000}$ "	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.020	.050	.0765	.1800	.1980	.375	.590	.0863	.1875	1.5	QUP-18020-6	43.05	QUP-18020-6X	46.95
.020	.050	.0765	.1800	.1980	.500	.590	.0863	.1875	1.5	QUP-18020-8	43.05	QUP-18020-8X	46.95
.025	.050	.0780	.1800	.1980	.375	.590	.0863	.1875	1.5	QUP-18025-6	43.05	QUP-18025-6X	46.95
.025	.050	.0780	.1800	.1980	.500	.590	.0863	.1875	1.5	QUP-18025-8	43.05	QUP-18025-8X	46.95
.025	.060	.0921	.2400	.2620	.375	.853	.1150	.2500	2.0	QUP-25025-6	46.35	QUP-25025-6X	51.75
.025	.060	.0921	.2400	.2620	.500	.853	.1150	.2500	2.0	QUP-25025-8	46.35	QUP-25025-8X	51.75
.030	.050	.0794	.1800	.1980	.375	.590	.0863	.1875	1.5	QUP-18030-6	43.05	QUP-18030-6X	46.95
.030	.050	.0794	.1800	.1980	.500	.590	.0863	.1875	1.5	QUP-18030-8	43.05	QUP-18030-8X	46.95
.030	.060	.0936	.2400	.2620	.500	.853	.1150	.2500	2.0	QUP-25030-8	46.35	QUP-25030-8X	51.75
.030	.060	.0936	.2400	.2620	1.000	1.353	.1150	.2500	2.5	QUP-25030-16	46.35	QUP-25030-16X	52.10
.062	.083	.1355	.3030	.3250	1.000	1.353	.1468	.3125	2.5	QUP-31062-16	58.15	QUP-31062-16X	65.05
.062	.095	.1525	.3650	.3870	1.000	1.353	.1775	.3750	2.5	QUP-37062-16	74.85	QUP-37062-16X	83.05
.062	.125	.1949	.4900	.5120	1.500	1.853	.2400	.5000	3.0	QUP-50062-24	103.30	QUP-50062-24X	114.00

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

See [pg 59-72](#) for quick change holder options

Quick Change – 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 geometry makes the tool as rigid as possible
- Relief ground along Maximum Bore Depth (L₂) 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

Quick Change – Grooving Tools

Width W	Projection P	Minimum Groove Diameter*	Maximum Bore Depth L ₂	Length From Holder L ₄	Centerline Offset F	Shank Diameter D ₂ (h6)	Overall Length L ₁	Uncoated		AlTiN Coated	
								Tool #	Price	Tool #	Price
.015	.025	.197	.500	.590	.0938	.1875	1.5	QFG-187-015-025	32.40	QFG-187-015-025X	35.05
.015	.025	.260	.750	.853	.1250	.2500	2.0	QFG-250-015-025	32.40	QFG-250-015-025X	37.15
.017	.025	.197	.500	.590	.0938	.1875	1.5	QFG-187-017-025	32.40	QFG-187-017-025X	35.05
.017	.025	.260	.750	.853	.1250	.2500	2.0	QFG-250-017-025	32.40	QFG-250-017-025X	37.15
.020	.025	.197	.500	.590	.0938	.1875	1.5	QFG-187-020-025	32.40	QFG-187-020-025X	35.05
.020	.025	.260	.750	.853	.1250	.2500	2.0	QFG-250-020-025	32.40	QFG-250-020-025X	37.15
.020	.050	.190	.155	.590	.0860	.1875	1.5	QFG-180-020	32.40	QFG-180-020X	35.05
.020	.050	.197	.500	.590	.0938	.1875	1.5	QFG-187-020-050	32.40	QFG-187-020-050X	35.05
.020	.050	.240	.190	.853	.1050	.2500	2.0	QFG-230-020	32.40	QFG-230-020X	37.15
.020	.050	.260	0.19	.853	.1250	.2500	2.0	QFG-250-020	32.40	QFG-250-020X	37.15
.025	.025	.197	.500	.590	.0938	.1875	1.5	QFG-187-025-025	32.40	QFG-187-025-025X	35.05
.025	.025	.260	.750	.853	.1250	.2500	2.0	QFG-250-025-025	32.40	QFG-250-025-025X	37.15
.025	.050	.197	.500	.590	.0938	.1875	1.5	QFG-187-025-050	32.40	QFG-187-025-050X	35.05
.025	.050	.260	.750	.853	.1250	.2500	2.0	QFG-250-025-050	32.40	QFG-250-025-050X	37.15
.030	.050	.190	.155	.590	.0860	.1875	1.5	QFG-180-030	32.40	QFG-180-030X	35.05
.030	.050	.197	.500	.590	.0938	.1875	1.5	QFG-187-030-050	32.40	QFG-187-030-050X	35.05
.030	.050	.240	.190	.853	.1050	.2500	2.0	QFG-230-030	32.40	QFG-230-030X	37.15
.030	.050	.260	.190	.853	.1250	.2500	2.0	QFG-250-030	32.40	QFG-250-030X	37.15
.030	.050	.322	.225	.853	.1563	.3125	2.0	QFG-312-030	44.30	QFG-312-030X	49.60
.030	.050	.385	.750	.853	.1875	.3750	2.0	QFG-375-030-050	61.65	QFG-375-030-050X	67.30
.030	.075	.197	.500	.590	.0938	.1875	1.5	QFG-187-030-075	32.40	QFG-187-030-075X	35.05
.030	.075	.260	.750	.853	.1250	.2500	2.0	QFG-250-030-075	32.40	QFG-250-030-075X	37.15
.039	.050	.260	.750	.853	.1250	.2500	2.0	QFG-250-039-050	32.40	QFG-250-039-050X	37.15
.039	.050	.385	.750	.853	.1875	.3750	2.0	QFG-375-039-050	61.65	QFG-375-039-050X	67.30
.039	.075	.260	.750	.853	.1250	.2500	2.0	QFG-250-039-075	32.40	QFG-250-039-075X	37.15
.040	.050	.197	.500	.590	.0938	.1875	1.5	QFG-187-040-050	32.40	QFG-187-040-050X	35.05
.040	.050	.260	.750	.853	.1250	.2500	2.0	QFG-250-040-050	32.40	QFG-250-040-050X	37.15
.040	.050	.322	.225	.853	.1563	.3125	2.0	QFG-312-040	44.30	QFG-312-040X	49.60
.040	.050	.385	.750	.853	.1875	.3750	2.0	QFG-375-040-050	61.65	QFG-375-040-050X	67.30
.040	.075	.197	.500	.590	.0938	.1875	1.5	QFG-187-040-075	32.40	QFG-187-040-075X	35.05
.040	.075	.260	.750	.853	.1250	.2500	2.0	QFG-250-040-075	32.40	QFG-250-040-075X	37.15

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

Continued on next page



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		AITIN Coated	
								Tool #	Price	Tool #	Price
W $+0.002''$ $-0.000''$	P $+0.015''$ $-0.000''$	L2	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	
.050	.050	.197	.500	.590	.0938	.1875	QFG-187-050-050	32.40	QFG-187-050-050X	35.05	
.050	.050	.260	.750	.853	.1250	.2500	QFG-250-050-050	32.40	QFG-250-050-050X	37.15	
.050	.050	.385	.750	.853	.1875	.3750	QFG-375-050-050	61.65	QFG-375-050-050X	67.30	
.050	.075	.197	.500	.590	.0938	.1875	QFG-187-050-075	32.40	QFG-187-050-075X	35.05	
.050	.075	.260	.750	.853	.1250	.2500	QFG-250-050-075	32.40	QFG-250-050-075X	37.15	
.050	.075	.322	.750	.853	.1563	.3125	QFG-312-050-075	44.30	QFG-312-050-075X	49.60	
.059	.075	.197	.500	.590	.0938	.1875	QFG-187-059-075	32.40	QFG-187-059-075X	35.05	
.059	.075	.260	.750	.853	.1250	.2500	QFG-250-059-075	32.40	QFG-250-059-075X	37.15	
.059	.075	.385	.750	.853	.1875	.3750	QFG-375-059-075	61.65	QFG-375-059-075X	67.30	
.059	.100	.197	.500	.590	.0938	.1875	QFG-187-059-100	32.40	QFG-187-059-100X	35.05	
.059	.100	.260	.750	.853	.1250	.2500	QFG-250-059-100	32.40	QFG-250-059-100X	37.15	
.062	.075	.197	.500	.590	.0938	.1875	QFG-187-062-075	32.40	QFG-187-062-075X	35.05	
.062	.075	.260	.750	.853	.1250	.2500	QFG-250-062-075	32.40	QFG-250-062-075X	37.15	
.062	.075	.322	.750	.853	.1563	.3125	QFG-312-062-075	44.30	QFG-312-062-075X	49.60	
.062	.075	.385	.750	.853	.1875	.3750	QFG-375-062-075	61.65	QFG-375-062-075X	67.30	
.062	.100	.197	.500	.590	.0938	.1875	QFG-187-062-100	32.40	QFG-187-062-100X	35.05	
.062	.100	.260	.750	.853	.1250	.2500	QFG-250-062-100	32.40	QFG-250-062-100X	37.15	
.062	.100	.322	.225	.853	.1563	.3125	QFG-312-062	44.30	QFG-312-062X	49.60	
.062	.100	.385	.260	.853	.1875	.3750	QFG-375-062	61.65	QFG-375-062X	67.30	
.062	.100	.480	.335	1.040	.2200	.5000	QFG-470-062	69.80	QFG-470-062X	78.70	
.062	.100	.500	.335	1.040	.2400	.5000	QFG-490-062	69.80	QFG-490-062X	78.70	
.062	.150	.197	.500	.590	.0938	.1875	QFG-187-062-150	32.40	QFG-187-062-150X	35.05	
.062	.150	.260	.750	.853	.1250	.2500	QFG-250-062-150	32.40	QFG-250-062-150X	37.15	
.062	.150	.322	.750	.853	.1563	.3125	QFG-312-062-150	44.30	QFG-312-062-150X	49.60	
.062	.150	.385	.750	.853	.1875	.3750	QFG-375-062-150	61.65	QFG-375-062-150X	67.30	
.078	.100	.260	.750	.853	.1250	.2500	QFG-250-078-100	32.40	QFG-250-078-100X	37.15	
.078	.100	.322	.750	.853	.1563	.3125	QFG-312-078-100	44.30	QFG-312-078-100X	49.60	
.078	.100	.385	.260	.853	.1875	.3750	QFG-375-078	61.65	QFG-375-078X	67.30	
.078	.100	.480	.335	1.040	.2200	.5000	QFG-470-078	69.80	QFG-470-078X	78.70	
.078	.100	.500	.335	1.040	.2400	.5000	QFG-490-078	69.80	QFG-490-078X	78.70	
.093	.100	.385	.260	.853	.1875	.3750	QFG-375-093	61.65	QFG-375-093X	67.30	
.093	.100	.480	.335	1.040	.2200	.5000	QFG-470-093	69.80	QFG-470-093X	78.70	
.093	.100	.500	.335	1.040	.2400	.5000	QFG-490-093	69.80	QFG-490-093X	78.70	
.093	.150	.322	.750	.853	.1563	.3125	QFG-312-093-150	44.30	QFG-312-093-150X	49.60	
.093	.150	.385	.750	.853	.1875	.3750	QFG-375-093-150	61.65	QFG-375-093-150X	67.30	
.118	.150	.385	.260	.853	.1875	.3750	QFG-375-118	61.65	QFG-375-118X	67.30	
.118	.150	.480	.335	1.040	.2200	.5000	QFG-470-118	69.80	QFG-470-118X	78.70	
.118	.150	.500	.335	1.040	.2400	.5000	QFG-490-118	69.80	QFG-490-118X	78.70	
.125	.150	.385	.260	.853	.1875	.3750	QFG-375-125	61.65	QFG-375-125X	67.30	
.125	.150	.480	.335	1.040	.2200	.5000	QFG-470-125	69.80	QFG-470-125X	78.70	
.125	.150	.500	.335	1.040	.2400	.5000	QFG-490-125	69.80	QFG-490-125X	78.70	
.125	.250	.385	.750	.853	.1875	.3750	QFG-375-125-250	61.65	QFG-375-125-250X	67.30	
.156	.150	.480	.335	1.040	.2200	.5000	QFG-470-156	69.80	QFG-470-156X	78.70	
.156	.150	.500	.335	1.040	.2400	.5000	QFG-490-156	69.80	QFG-490-156X	78.70	

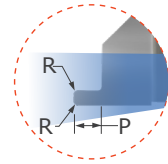
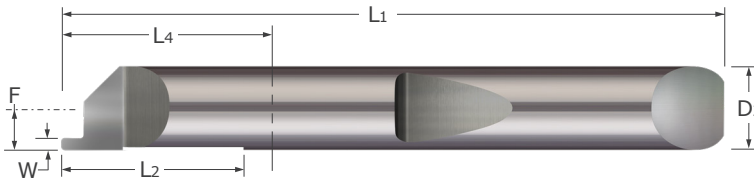
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

See pg 59-79 for quick change holder options

Quick Change – Grooving Tools

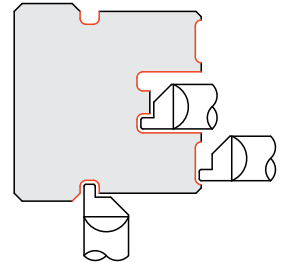
Quick Change – Grooving Tools

Face Grooving – Corner Radius



Quick Change – Grooving Tools

- 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 geometry makes the tool as rigid as possible
- Relief ground along Maximum Bore Depth (L₂) to avoid interference during deep hole applications
- Coolant fed enabled shank design
- Corner radius profile
- Proprietary Micro-Quick change system maximizes productivity through reliable accuracy and locational repeatability
- AlTiN coated option provides added lubricity and increased wear resistance in difficult to machine materials
- Solid carbide ■ CNC ground in the USA



Width	Projection	Minimum Groove Diameter*	Radius	Maximum Bore Depth	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
									Tool #	Price	Tool #	Price
W ^{+0.002"} / _{-0.000"}	P ^{+0.015"} / _{-0.000"}		R ^{+0.001"} / _{-0.001"}	L ₂	L ₄	F	D ₂ (h6)	L ₁				
.015	.025	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-015-025	29.85	QFGC3-187-015-025X	33.50
.015	.025	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-015-025	34.85	QFGC3-250-015-025X	40.25
.017	.025	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-017-025	29.85	QFGC3-187-017-025X	33.50
.017	.025	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-017-025	34.85	QFGC3-250-017-025X	40.25
.020	.025	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-020-025	29.85	QFGC3-187-020-025X	33.50
.020	.025	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-020-025	34.85	QFGC3-250-020-025X	40.25
.025	.025	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-025-025	29.85	QFGC3-187-025-025X	33.50
.025	.025	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-025-025	34.85	QFGC3-250-025-025X	40.25
.030	.050	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-030-050	29.85	QFGC3-187-030-050X	33.50
.030	.050	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-030-050	34.85	QFGC3-250-030-050X	40.25
.030	.050	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-312-030-050	45.75	QFGC3-312-030-050X	52.25
.030	.050	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-030-050	62.20	QFGC3-375-030-050X	69.90
.039	.050	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-039-050	29.85	QFGC3-187-039-050X	33.50
.039	.050	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-039-050	34.85	QFGC3-250-039-050X	40.25
.039	.050	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-039-050	62.20	QFGC3-375-039-050X	69.90
.040	.050	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-040-050	29.85	QFGC3-187-040-050X	33.50
.040	.050	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-040-050	34.85	QFGC3-250-040-050X	40.25
.040	.050	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-312-040-050	45.75	QFGC3-312-040-050X	52.25
.040	.050	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-040-050	62.20	QFGC3-375-040-050X	69.90
.050	.050	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-187-050-050	29.85	QFGC3-187-050-050X	33.50
.050	.050	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-250-050-050	34.85	QFGC3-250-050-050X	40.25
.050	.050	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-312-050-050	45.75	QFGC3-312-050-050X	52.25
.050	.050	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-050-050	62.20	QFGC3-375-050-050X	69.90
.059	.075	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-375-059-075	62.20	QFGC3-375-059-075X	69.90

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

Continued on next page

See [pg 59-72](#) for quick change holder options

Quick Change – Grooving Tools

Face Grooving – Corner Radius (cont.)

Continued from previous page

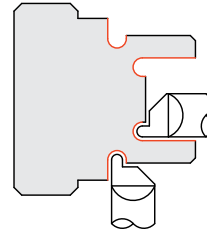
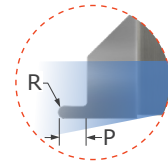
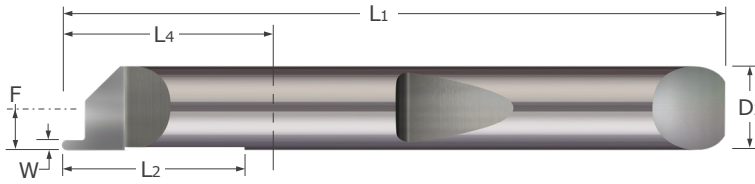
W	Projection	Minimum Groove Diameter*	Radius	Maximum Bore Depth	Length From Holder	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
									Tool #	Price	Tool #	Price
$W \begin{smallmatrix} +.002" \\ -.000" \end{smallmatrix}$	$P \begin{smallmatrix} +.015" \\ -.000" \end{smallmatrix}$		$R \begin{smallmatrix} +.001" \\ -.001" \end{smallmatrix}$	L2	L4	F	D ₂ (h6)	L1	QFGC3-187-062-075	29.85	QFGC3-187-062-075X	33.50
.062	.075	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-250-062-075	34.85	QFGC3-250-062-075X	40.25
.062	.075	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-312-062-075	45.75	QFGC3-312-062-075X	52.25
.062	.075	.322	.003	.750	.853	.1563	.3125	2.0	QFGC3-375-062-075	62.20	QFGC3-375-062-075X	69.90
.062	.075	.385	.003	.750	.853	.1875	.3750	2.0	QFGC3-187-062-100	29.85	QFGC3-187-062-100X	33.50
.062	.100	.197	.003	.500	.590	.0938	.1875	1.5	QFGC3-250-062-100	34.85	QFGC3-250-062-100X	40.25
.062	.100	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-312-078-100	45.75	QFGC3-312-078-100X	52.25
.078	.100	.260	.003	.750	.853	.1250	.2500	2.0	QFGC3-375-078-100	62.20	QFGC3-375-078-100X	69.90
.078	.100	.322	.003	.750	.853	.1563	.3125	2.0	QFGC6-375-093-100	62.20	QFGC6-375-093-100X	69.90
.078	.100	.385	.003	.750	.853	.1875	.3750	2.0	QFGC6-312-093-150	45.75	QFGC6-312-093-150X	52.25
.093	.100	.385	.006	.750	.853	.1875	.3750	2.0	QFGC6-375-118-150	62.20	QFGC6-375-118-150X	69.90
.093	.150	.322	.006	.750	.853	.1563	.3125	2.0	QFGC6-375-125-100	62.20	QFGC6-375-125-100X	69.90
.118	.150	.385	.006	.750	.853	.1875	.3750	2.0				
.125	.100	.385	.006	.750	.853	.1875	.3750	2.0				

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

See pg [59-72](#) for quick change holder options

Quick Change – Grooving Tools

Face Grooving – Full Radius



Quick Change – Grooving Tools

- 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 geometry makes the tool as rigid as possible
- Relief ground along Maximum Bore Depth (L2) 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	R	P		L2	L4	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.015	.0075	.025	.197	.500	.590	.0938	.1875	1.5	QFGF-187-015-025	30.05	QFGF-187-015-025X	33.70
.015	.0075	.025	.260	.750	.853	.1250	.2500	2.0	QFGF-250-015-025	33.60	QFGF-250-015-025X	39.00
.017	.0085	.025	.197	.500	.590	.0938	.1875	1.5	QFGF-187-017-025	30.05	QFGF-187-017-025X	33.70
.017	.0085	.025	.260	.750	.853	.1250	.2500	2.0	QFGF-250-017-025	33.60	QFGF-250-017-025X	39.00
.020	.0100	.050	.190	.155	.590	.0860	.1875	1.5	QFGF-180-020	30.05	QFGF-180-020X	33.70
.020	.0100	.050	.197	.500	.590	.0938	.1875	1.5	QFGF-187-020-050	30.05	QFGF-187-020-050X	33.70
.020	.0100	.050	.240	.190	.853	.1050	.2500	2.0	QFGF-230-020	33.60	QFGF-230-020X	39.00
.020	.0100	.050	.260	.190	.853	.1250	.2500	2.0	QFGF-250-020	33.60	QFGF-250-020X	39.00
.025	.0125	.050	.197	.500	.590	.0938	.1875	1.5	QFGF-187-025-050	30.05	QFGF-187-025-050X	33.70
.025	.0125	.050	.260	.750	.853	.1250	.2500	2.0	QFGF-250-025-050	33.60	QFGF-250-025-050X	39.00
.030	.0150	.050	.190	.155	.590	.0860	.1875	1.5	QFGF-180-030	30.05	QFGF-180-030X	33.70
.030	.0150	.050	.197	.500	.590	.0938	.1875	1.5	QFGF-187-030-050	30.05	QFGF-187-030-050X	33.70
.030	.0150	.050	.260	.190	.853	.1250	.2500	2.0	QFGF-250-030	33.60	QFGF-250-030X	39.00
.039	.0195	.075	.197	.500	.590	.0938	.1875	1.5	QFGF-187-039-075	30.05	QFGF-187-039-075X	33.70
.039	.0195	.075	.260	.750	.853	.1250	.2500	2.0	QFGF-250-039-075	33.60	QFGF-250-039-075X	39.00
.040	.0200	.050	.260	.190	.853	.1250	.2500	2.0	QFGF-250-040	33.60	QFGF-250-040X	39.00
.040	.0200	.075	.197	.500	.590	.0938	.1875	1.5	QFGF-187-040-075	30.05	QFGF-187-040-075X	33.70
.040	.0200	.075	.260	.750	.853	.1250	.2500	2.0	QFGF-250-040-075	33.60	QFGF-250-040-075X	39.00
.050	.0250	.050	.322	.225	.853	.1563	.3125	2.0	QFGF-312-050	45.80	QFGF-312-050X	52.30
.050	.0250	.075	.197	.500	.590	.0938	.1875	1.5	QFGF-187-050-075	30.05	QFGF-187-050-075X	33.70
.050	.0250	.075	.260	.750	.853	.1250	.2500	2.0	QFGF-250-050-075	33.60	QFGF-250-050-075X	39.00
.062	.0310	.075	.322	.750	.853	.1563	.3125	2.0	QFGF-312-062-075	45.80	QFGF-312-062-075X	52.30
.062	.0310	.075	.385	.750	.853	.1875	.3750	2.0	QFGF-375-062-075	63.45	QFGF-375-062-075X	70.15
.062	.0310	.100	.197	.500	.590	.0938	.1875	1.5	QFGF-187-062-100	30.05	QFGF-187-062-100X	33.70
.062	.0310	.100	.260	.750	.853	.1250	.2500	2.0	QFGF-250-062-100	33.60	QFGF-250-062-100X	39.00
.062	.0310	.100	.322	.225	.853	.1563	.3125	2.0	QFGF-312-062	45.80	QFGF-312-062X	52.30
.062	.0310	.100	.385	.260	.853	.1875	.3750	2.0	QFGF-375-062	63.45	QFGF-375-062X	70.15
.078	.0390	.100	.385	.260	.853	.1875	.3750	2.0	QFGF-375-078	63.45	QFGF-375-078X	70.15
.093	.0465	.100	.385	.260	.853	.1875	.3750	2.0	QFGF-375-093	63.45	QFGF-375-093X	70.15
.125	.0625	.150	.385	.260	.853	.1875	.3750	2.0	QFGF-375-125	63.45	QFGF-375-125X	70.15

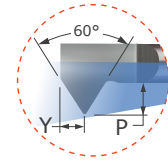
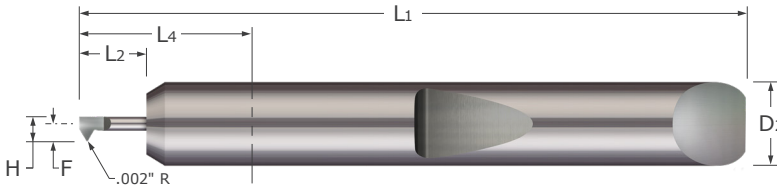
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

See pg 59-72 for quick change holder options

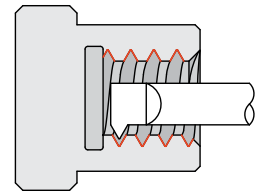


Quick Change – Threading Tools

UN Threads – Single Point – Miniature



- 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
- 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



Quick Change – Threading Tools

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	
										Tool #	Price	Tool #	Price
TPI*	H		L2	Y	P	L4	F	D2 (h6)	L1				
			$\pm .030$ $-.000$	$\pm .002$ $-.000$									
56-80	.0350	.0400	.075	.012	.015	.590	.0250	.1875	1.5	QIT-035075	47.15	QIT-035075X	50.10
56-80	.0350	.0400	.100	.012	.015	.590	.0250	.1875	1.5	QIT-035100	47.15	QIT-035100X	50.10
56-80	.0350	.0400	.150	.012	.015	.590	.0250	.1875	1.5	QIT-035150	47.15	QIT-035150X	50.10
56-80	.0400	.0450	.075	.015	.020	.590	.0300	.1875	1.5	QIT-040075	47.15	QIT-040075X	50.10
56-80	.0400	.0450	.150	.015	.020	.590	.0300	.1875	1.5	QIT-040150	47.15	QIT-040150X	50.10
48-80	.0500	.0550	.100	.015	.020	.590	.0350	.1875	1.5			QIT-050100X	42.65
48-80	.0500	.0550	.150	.015	.020	.590	.0350	.1875	1.5	QIT-050150	39.90	QIT-050150X	42.65
48-80	.0500	.0550	.200	.015	.020	.590	.0350	.1875	1.5	QIT-050200	39.90	QIT-050200X	42.65

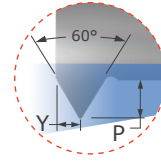
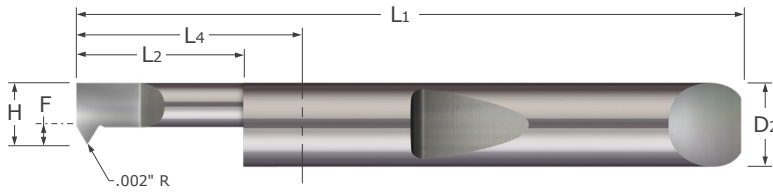
*Thread range based on height of sharp thread (.866P) and projection.

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

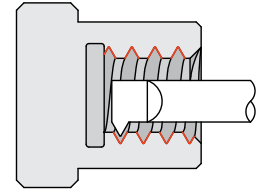
See pg [59-72](#) for quick change holder options

Quick Change – Threading Tools

UN Threads – Single Point



- Designed for threading in bores .070" 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
- Split geometry makes the tool as rigid as possible
- .002" tip radius
- Coolant fed enabled shank design
- Proprietary Micro-Quick 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



Quick Change – Threading Tools

Threads Per Inch	Head Width	Min. Bore Dia.**	Max. Bore Depth	Point Offset	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
										Tool #	Price	Tool #	Price
TPI*	H		L2	Y	P	L4	F	D2 (h6)	L1				
			$\begin{matrix} +.030'' \\ -.000'' \end{matrix}$	$\begin{matrix} +.002'' \\ -.000'' \end{matrix}$									
40-80	.0600	.0700	.200	.015	.020	.590	-.0335	.1875	1.5	QIT-060200	39.90	QIT-060200X	42.65
40-80	.0600	.0700	.250	.015	.020	.590	-.0335	.1875	1.5	QIT-060250	39.90	QIT-060250X	42.65
40-80	.0600	.0700	.300	.015	.020	.590	-.0335	.1875	1.5	QIT-060300	39.90	QIT-060300X	42.65
32-76	.0800	.0900	.250	.015	.020	.590	-.0135	.1875	1.5	QIT-080250	39.90	QIT-080250X	42.65
32-76	.0800	.0900	.350	.015	.020	.590	-.0135	.1875	1.5	QIT-080350	39.90	QIT-080350X	42.65
32-76	.0800	.0900	.500	.015	.020	.590	-.0135	.1875	1.5	QIT-080500	39.90	QIT-080500X	42.65
32-64	.1000	.1100	.250	.018	.025	.590	.0065	.1875	1.5	QIT-100250	39.90	QIT-100250X	42.65
32-64	.1000	.1100	.350	.018	.025	.590	.0065	.1875	1.5	QIT-100350	39.90	QIT-100350X	42.65
32-64	.1000	.1100	.500	.018	.025	.590	.0065	.1875	1.5	QIT-100500	39.90	QIT-100500X	42.65
32-64	.1000	.1100	.600	.018	.025	1.090	.0065	.1875	2.0	QIT-100600	39.90	QIT-100600X	42.65
32-64	.1100	.1260	.250	.020	.030	.590	.0165	.1875	1.5	QIT-110250	39.90	QIT-110250X	42.65
32-64	.1100	.1260	.400	.020	.030	.590	.0165	.1875	1.5	QIT-110400	39.90	QIT-110400X	42.65
32-64	.1100	.1260	.500	.020	.030	.590	.0165	.1875	1.5	QIT-110500	39.90	QIT-110500X	42.65
32-64	.1100	.1260	.600	.020	.030	1.090	.0165	.1875	2.0	QIT-110600	39.90	QIT-110600X	42.65
32-64	.1100	.1260	.750	.020	.030	1.090	.0165	.1875	2.0	QIT-110750	39.90	QIT-110750X	42.65
24-56	.1200	.1360	.250	.020	.030	.590	.0265	.1875	1.5	QIT-120250	39.90	QIT-120250X	42.65
24-56	.1200	.1360	.400	.020	.030	.590	.0265	.1875	1.5	QIT-120400	39.90	QIT-120400X	42.65
24-56	.1200	.1360	.500	.020	.030	.590	.0265	.1875	1.5	QIT-120500	39.90	QIT-120500X	42.65
24-56	.1200	.1360	.600	.020	.030	1.090	.0265	.1875	2.0	QIT-120600	39.90	QIT-120600X	42.65
24-56	.1200	.1360	.750	.020	.030	1.090	.0265	.1875	2.0	QIT-120750	39.90	QIT-120750X	42.65
20-56	.1400	.1560	.250	.023	.035	.590	.0465	.1875	1.5	QIT-140250	39.90	QIT-140250X	42.65
20-56	.1400	.1560	.400	.023	.035	.590	.0465	.1875	1.5	QIT-140400	39.90	QIT-140400X	42.65
20-56	.1400	.1560	.500	.023	.035	.590	.0465	.1875	1.5	QIT-140500	39.90	QIT-140500X	42.65
20-56	.1400	.1560	.750	.023	.035	1.090	.0465	.1875	2.0	QIT-140750	39.90	QIT-140750X	42.65
20-56	.1600	.1820	.250	.029	.040	.590	.0665	.1875	1.5	QIT-160250	39.90	QIT-160250X	42.65
20-56	.1600	.1820	.400	.029	.040	.590	.0665	.1875	1.5	QIT-160400	39.90	QIT-160400X	42.65
20-56	.1600	.1820	.500	.029	.040	.590	.0665	.1875	1.5	QIT-160500	39.90	QIT-160500X	42.65
20-56	.1600	.1820	.750	.029	.040	1.090	.0665	.1875	2.0	QIT-160750	39.90	QIT-160750X	42.65
20-56	.1600	.1820	1.000	.029	.040	1.090	.0665	.1875	2.0	QIT-1601000	39.90	QIT-1601000X	42.65

*Thread range based on height of sharp thread (.866P) and projection.

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

Continued on next page

See pg 59-72 for quick change holder options



Quick Change – Threading Tools

UN Threads – Single Point (cont.)

Continued from previous page

Threads Per Inch	Head Width	Min. Bore Dia.**	Max. Bore Depth	Point Offset	Projection	Length From Holder	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AITIN Coated	
										Tool #	Price	Tool #	Price
TPI*	H	L ₂	^{+.030"} _{-.000"}	^{+.002"} _{-.000"}	P	L ₄	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price
18-56	.1800	.2020	.350	.029	.040	.853	.0550	.2500	2.0	QIT-180350	42.60	QIT-180350X	47.55
18-56	.1800	.2020	.500	.029	.040	.853	.0550	.2500	2.0	QIT-180500	42.60	QIT-180500X	47.55
18-56	.1800	.2020	.750	.029	.040	.853	.0550	.2500	2.0	QIT-180750	42.60	QIT-180750X	47.55
18-56	.1800	.2020	1.000	.029	.040	1.353	.0550	.2500	2.5	QIT-1801000	42.60	QIT-1801000X	47.55
16-40	.2000	.2220	.400	.032	.045	.853	.0750	.2500	2.0	QIT-200400	42.60	QIT-200400X	47.55
16-40	.2000	.2220	.600	.032	.045	.853	.0750	.2500	2.0	QIT-200600	42.60	QIT-200600X	47.55
16-40	.2000	.2220	.750	.032	.045	.853	.0750	.2500	2.0	QIT-200750	42.60	QIT-200750X	47.55
16-40	.2000	.2220	1.000	.032	.045	1.353	.0750	.2500	2.5	QIT-2001000	42.60	QIT-2001000X	47.55
14-40	.2300	.2520	.400	.038	.055	.853	.0735	.3125	2.0	QIT-230400	53.30	QIT-230400X	58.80
14-40	.2300	.2520	.600	.038	.055	.853	.0735	.3125	2.0	QIT-230600	53.30	QIT-230600X	58.80
14-40	.2300	.2520	.750	.038	.055	.853	.0735	.3125	2.0	QIT-230750	53.30	QIT-230750X	58.80
14-40	.2300	.2520	1.000	.038	.055	1.353	.0735	.3125	2.5	QIT-2301000	53.30	QIT-2301000X	60.20
14-40	.2300	.2520	1.500	.038	.055	1.853	.0735	.3125	3.0	QIT-2301500	60.35	QIT-2301500X	67.25
12-40	.2900	.3120	.500	.046	.070	.853	.1340	.3125	2.0	QIT-290500	53.30	QIT-290500X	58.80
12-40	.2900	.3120	.750	.046	.070	.853	.1340	.3125	2.0	QIT-290750	53.30	QIT-290750X	58.80
12-40	.2900	.3120	1.000	.046	.070	1.353	.1340	.3125	2.5	QIT-2901000	53.30	QIT-2901000X	58.80
12-40	.2900	.3120	1.250	.046	.070	1.353	.1340	.3125	2.5	QIT-2901250	53.30	QIT-2901250X	60.20
12-40	.2900	.3120	1.750	.046	.070	1.853	.1340	.3125	3.0	QIT-2901750	60.35	QIT-2901750X	67.25
10-32	.3200	.3420	.500	.049	.075	.853	.1325	.3750	2.0	QIT-320500	69.40	QIT-320500X	75.20
10-32	.3200	.3420	.750	.049	.075	.853	.1325	.3750	2.0	QIT-320750	69.40	QIT-320750X	75.20
10-32	.3200	.3420	1.000	.049	.075	1.353	.1325	.3750	2.5	QIT-3201000	69.40	QIT-3201000X	76.90
10-32	.3200	.3420	1.250	.049	.075	1.353	.1325	.3750	2.5	QIT-3201250	69.40	QIT-3201250X	76.90
10-32	.3200	.3420	1.800	.049	.075	1.853	.1325	.3750	3.0	QIT-3201800	76.45	QIT-3201800X	84.05
10-32	.3600	.3820	.500	.055	.085	.853	.1725	.3750	2.0	QIT-360500	69.40	QIT-360500X	75.20
10-32	.3600	.3820	.750	.055	.085	.853	.1725	.3750	2.0	QIT-360750	69.40	QIT-360750X	75.20
10-32	.3600	.3820	1.000	.055	.085	1.353	.1725	.3750	2.5	QIT-3601000	69.40	QIT-3601000X	76.90
10-32	.3600	.3820	1.250	.055	.085	1.353	.1725	.3750	2.5	QIT-3601250	69.40	QIT-3601250X	76.90
10-32	.3600	.3820	1.800	.055	.085	1.853	.1725	.3750	3.0	QIT-3601800	76.45	QIT-3601800X	84.05
6-24	.4600	.4820	.750	.078	.120	1.040	.2100	.5000	2.5	QIT-460750	97.35	QIT-460750X	106.80
6-24	.4600	.4820	1.500	.078	.120	1.540	.2100	.5000	3.0	QIT-4601500	97.35	QIT-4601500X	106.80
6-24	.4600	.4820	2.000	.078	.120	2.040	.2100	.5000	3.5	QIT-4602000	106.20	QIT-4602000X	118.10
6-24	.4900	.5120	.750	.078	.120	1.040	.2400	.5000	2.5	QIT-490750	97.35	QIT-490750X	106.80
6-24	.4900	.5120	1.500	.078	.120	1.540	.2400	.5000	3.0	QIT-4901500	97.35	QIT-4901500X	106.80
6-24	.4900	.5120	2.000	.078	.120	2.040	.2400	.5000	3.5	QIT-4902000	106.20	QIT-4902000X	118.10

*Thread range based on height of sharp thread (.866P) and projection.

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

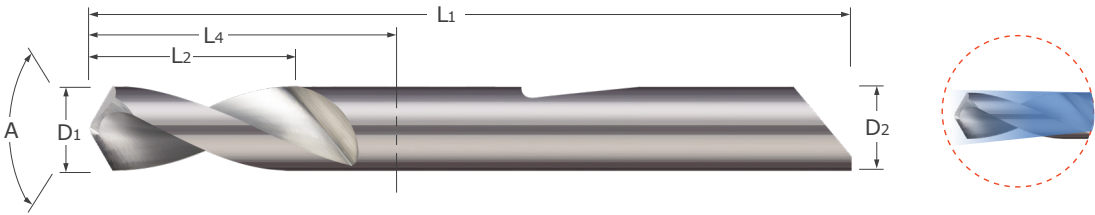
See pg 59-72 for quick change holder options

Quick Change – Holemaking Tools

Spotting Drills



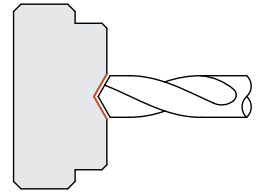
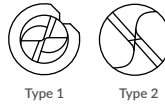
QSPD



Quick Change – Holemaking Tools

- Designed for spot drilling
- Available in 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-Quick 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	
								Tool #	Price	Tool #	Price
90°	D1 $+0.0000$ -0.0005 "	L2 $+0.010$ -0.000 "	$+0.001$ -0.001 "		L4	D2 (h6)	L1				
	.0200	.060	.002	I	.590	.1875	1.5			QSPD-020-090X	40.60
	.0250	.075	.002	I	.590	.1875	1.5	QSPD-025-090	33.65		
	.0300	.090	.003	I	.590	.1875	1.5	QSPD-030-090	33.65		
	.0350	.105	.003	I	.590	.1875	1.5	QSPD-035-090	33.65	QSPD-035-090X	36.30
	.0400	.120	.004	I	.590	.1875	1.5	QSPD-040-090	29.30	QSPD-040-090X	31.85
	.0450	.135	.004	I	.590	.1875	1.5	QSPD-045-090	29.30	QSPD-045-090X	31.85
	.0600	.180	.006	I	.590	.1875	1.5	QSPD-060-090	29.30	QSPD-060-090X	31.85
	.0900	.270	.006	I	.590	.1875	1.5	QSPD-090-090	29.30	QSPD-090-090X	31.85
	.1181	.354	.008	I	.590	.1875	1.5	QSPD-118-090	29.30	QSPD-118-090X	31.85
	.1250	.375	.010	I	.590	.1875	1.5	QSPD-125-090	29.30	QSPD-125-090X	31.85
	.1875	.625	.005	II	1.090	.1875	2.0	QSPD-187-090	29.30	QSPD-187-090X	31.85
	.2500	.750	.005	II	1.353	.2500	2.5	QSPD-250-090	34.50	QSPD-250-090X	39.25
.3750	1.000	.005	II	1.353	.3750	2.5	QSPD-375-090	46.45	QSPD-375-090X	53.50	
120°	.0150	.045	.002	I	.590	.1875	1.5	QSPD-015-120	37.85	QSPD-015-120X	40.60
	.0200	.060	.002	I	.590	.1875	1.5	QSPD-020-120	37.85	QSPD-020-120X	40.60
	.0250	.075	.002	I	.590	.1875	1.5	QSPD-025-120	33.65		
	.0300	.090	.003	I	.590	.1875	1.5	QSPD-030-120	33.65	QSPD-030-120X	36.30
	.0350	.105	.003	I	.590	.1875	1.5	QSPD-035-120	33.65	QSPD-035-120X	36.30
	.0400	.120	.004	I	.590	.1875	1.5	QSPD-040-120	29.30	QSPD-040-120X	31.85
	.0450	.135	.004	I	.590	.1875	1.5	QSPD-045-120	29.30	QSPD-045-120X	31.85
	.0500	.150	.005	I	.590	.1875	1.5			QSPD-050-120X	31.85
	.0600	.180	.006	I	.590	.1875	1.5	QSPD-060-120	29.30	QSPD-060-120X	31.85
	.0900	.270	.006	I	.590	.1875	1.5	QSPD-090-120	29.30	QSPD-090-120X	31.85
	.1181	.354	.008	I	.590	.1875	1.5	QSPD-118-120	29.30	QSPD-118-120X	31.85
	.1250	.375	.010	I	.590	.1875	1.5	QSPD-125-120	29.30	QSPD-125-120X	31.85
	.1875	.625	.005	II	1.090	.1875	2.0	QSPD-187-120	29.30	QSPD-187-120X	31.85
.2500	.750	.005	II	1.353	.2500	2.5	QSPD-250-120	34.50	QSPD-250-120X	39.25	
.3750	1.000	.005	II	1.353	.3750	2.5	QSPD-375-120	46.45	QSPD-375-120X	53.50	

Continued on next page

See pg 59-72 for quick change holder options

QSPD



Quick Change – Holmaking 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	
								Tool #	Price	Tool #	Price
A	D ₁ $\begin{matrix} +.0000'' \\ -.0005'' \end{matrix}$	L ₂ $\begin{matrix} +.010'' \\ -.001'' \end{matrix}$	$\begin{matrix} +.001'' \\ -.000'' \end{matrix}$		L ₄	D ₂ (h6)	L ₁				
140°	.0150	.045	.002	I	.590	.1875	1.5			QSPD-015-140X	40.60
	.0200	.060	.002	I	.590	.1875	1.5			QSPD-020-140X	40.60
	.0250	.075	.002	I	.590	.1875	1.5	QSPD-025-140	33.65		
	.0300	.090	.003	I	.590	.1875	1.5	QSPD-030-140	33.65	QSPD-030-140X	36.30
	.0350	.105	.003	I	.590	.1875	1.5	QSPD-035-140	33.65		
	.0400	.120	.004	I	.590	.1875	1.5	QSPD-040-140	29.30		
	.0450	.135	.004	I	.590	.1875	1.5	QSPD-045-140	29.30	QSPD-045-140X	31.85
	.0500	.150	.005	I	.590	.1875	1.5	QSPD-050-140	29.30	QSPD-050-140X	31.85
	.0600	.180	.006	I	.590	.1875	1.5	QSPD-060-140	29.30	QSPD-060-140X	31.85
	.0900	.270	.006	I	.590	.1875	1.5	QSPD-090-140	29.30	QSPD-090-140X	31.85
	.1181	.354	.008	I	.590	.1875	1.5	QSPD-118-140	29.30	QSPD-118-140X	31.85
	.1250	.375	.010	I	.590	.1875	1.5	QSPD-125-140	29.30	QSPD-125-140X	31.85
	.1875	.625	.005	II	1.090	.1875	2.0	QSPD-187-140	29.30	QSPD-187-140X	31.85
	.2500	.750	.005	II	1.353	.2500	2.5	QSPD-250-140	34.50	QSPD-250-140X	39.25
	.3750	1.000	.005	II	1.353	.3750	2.5	QSPD-375-140	46.45	QSPD-375-140X	53.50

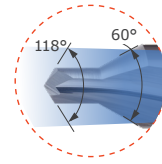
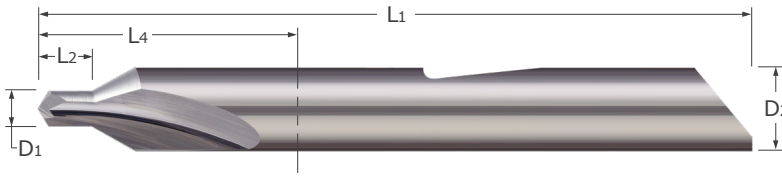
See pg [59-72](#) for quick change holder options

Quick Change – Holmaking Tools

Combined Drill & Countersink Tools

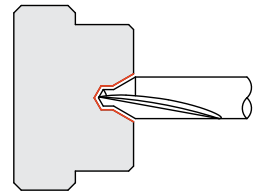


QDC



Quick Change – Holmaking Tools

- 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	
					Tool #	Price	Tool #	Price
D1 $\begin{matrix} +.003" \\ -.000" \end{matrix}$	L2 $\begin{matrix} +.015" \\ -.000" \end{matrix}$	L4	D2 (h6)	L1	QDC-00	23.15	QDC-00X	25.60
.025	.025	1.090	.1875	2.0	QDC-01	23.15	QDC-01X	25.60
.031	.031	1.090	.1875	2.0	QDC-1	23.15	QDC-1X	25.60
.047	.047	1.090	.1875	2.0				
D1 $\begin{matrix} +.003" \\ -.000" \end{matrix}$	L2 $\begin{matrix} +.030" \\ -.000" \end{matrix}$	L4	D2 (h6)	L1	Tool #	Price	Tool #	Price
.078	.078	1.090	.1875	2.0	QDC-2	23.15	QDC-2X	25.60
.109	.109	1.353	.2500	2.5	QDC-3	40.45	QDC-3X	45.35
.125	.125	1.353	.3125	2.5	QDC-4	54.05	QDC-4X	60.95
.188	.188	1.540	.5000	3.0	QDC-5	81.45	QDC-5X	90.60
.219	.219	1.540	.5000	3.0	QDC-6	81.45	QDC-6X	90.60

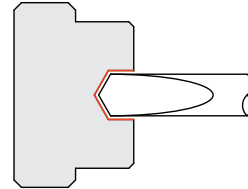
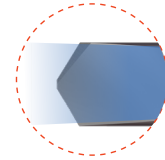
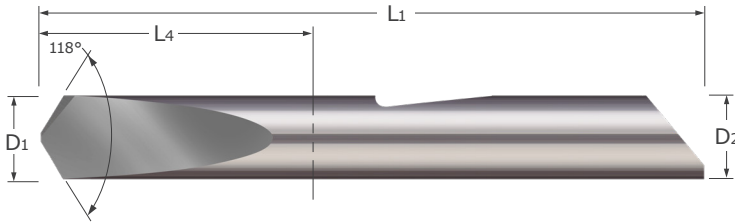
See pg [59-72](#) for quick change holder options

QSD


Tech Resources
Available Online

Quick Change – Holmaking Tools

Spade Drills



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

Quick Change – Holmaking Tools

Drill Diameter	Web Thickness	Length From Holder	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
					Tool #	Price	Tool #	Price
D1 $^{+.0000"}_{-.0005"}$	$^{+.001"}_{-.001"}$	L4	D2 (h6)	L1				
.0312	.010	.340	.1875	1.25	QSD-031	17.05	QSD-031X	19.40
.0625	.012	.590	.1875	1.50	QSD-062	17.75	QSD-062X	20.10
.0938	.016	.590	.1875	1.50	QSD-093	18.20	QSD-093X	20.55
.1250	.020	.590	.1875	1.50	QSD-125	20.00	QSD-125X	22.40
.1562	.025	1.090	.1875	2.00	QSD-156	21.85	QSD-156X	24.25
.1875	.028	1.090	.1875	2.00	QSD-187	25.45	QSD-187X	27.95
.2500	.035	.853	.2500	2.00	QSD-250	34.20	QSD-250X	36.90
.3125	.040	1.353	.3125	2.50	QSD-312	47.30	QSD-312X	50.25
.3750	.046	1.353	.3750	2.50	QSD-375	57.05	QSD-375X	60.15

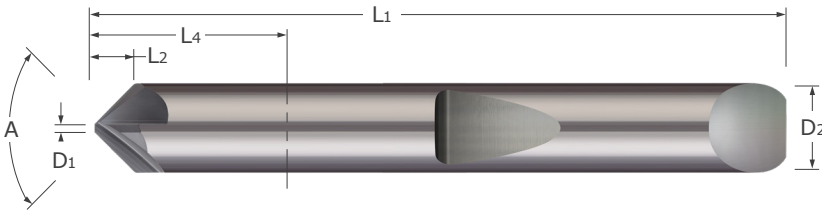
See pg [59-72](#) for quick change holder options

Quick Change – Holemaking Tools

Countersink & Chamfer Tools

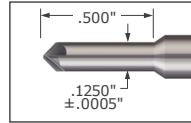


QCS

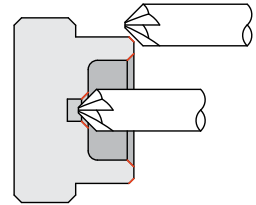


Quick Change – Holemaking Tools

- Designed for countersinking and chamfering
- Available in 60°, 82°, 90°, 100°, and 120° included angles
- Tip Diameter (D₁) 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	
							Tool #	Price	Tool #	Price
A ^{+1°} _{-1°}	D ₁ ^{+0.000} _{-0.003}	L ₂		L ₄	D ₂ (h6)	L ₁				
60°	.030	.082	3	.590	.1875	1.5	QCS-125-060*	33.40	QCS-125-060X*	36.05
	.040	.128	4	1.090	.1875	2.0	QCS-187-060	33.40	QCS-187-060X	36.05
	.050	.173	6	1.353	.2500	2.5	QCS-250-060	38.10	QCS-250-060X	43.00
	.060	.219	6	1.353	.3125	2.5	QCS-312-060	51.15	QCS-312-060X	58.05
	.070	.264	6	1.353	.3750	2.5	QCS-375-060	63.40	QCS-375-060X	70.75
	.080	.364	6	1.540	.5000	3.0	QCS-500-060	88.30	QCS-500-060X	97.55
82°	.030	.055	3	.590	.1875	1.5	QCS-125-082*	33.40	QCS-125-082X*	36.05
	.040	.085	4	1.090	.1875	2.0	QCS-187-082	33.40	QCS-187-082X	36.05
	.050	.115	6	1.353	.2500	2.5	QCS-250-082	38.10	QCS-250-082X	43.00
	.060	.145	6	1.353	.3125	2.5	QCS-312-082	51.15	QCS-312-082X	58.05
	.070	.175	6	1.353	.3750	2.5	QCS-375-082	63.40	QCS-375-082X	70.75
	.080	.242	6	1.540	.5000	3.0	QCS-500-082	88.30	QCS-500-082X	97.55
90°	.030	.047	3	.590	.1875	1.5	QCS-125-090*	33.40	QCS-125-090X*	36.05
	.040	.074	4	1.090	.1875	2.0	QCS-187-090	33.40	QCS-187-090X	36.05
	.050	.100	6	1.353	.2500	2.5	QCS-250-090	38.10	QCS-250-090X	43.00
	.060	.126	6	1.353	.3125	2.5	QCS-312-090	51.15	QCS-312-090X	58.05
	.070	.152	6	1.353	.3750	2.5	QCS-375-090	63.40	QCS-375-090X	70.75
	.080	.210	6	1.540	.5000	3.0	QCS-500-090	88.30	QCS-500-090X	97.55
100°	.030	.040	3	.590	.1875	1.5	QCS-125-100*	33.40	QCS-125-100X*	36.05
	.040	.062	4	1.090	.1875	2.0	QCS-187-100	33.40	QCS-187-100X	36.05
	.050	.084	6	1.353	.2500	2.5	QCS-250-100	38.10	QCS-250-100X	43.00
	.060	.106	6	1.353	.3125	2.5	QCS-312-100	51.15	QCS-312-100X	58.05
	.070	.128	6	1.353	.3750	2.5	QCS-375-100	63.40	QCS-375-100X	70.75
	.080	.176	6	1.540	.5000	3.0	QCS-500-100	88.30	QCS-500-100X	97.55
120°	.030	.027	3	.590	.1875	1.5	QCS-125-120*	33.40	QCS-125-120X*	36.05
	.040	.043	4	1.090	.1875	2.0	QCS-187-120	33.40	QCS-187-120X	36.05
	.050	.058	6	1.353	.2500	2.5	QCS-250-120	38.10	QCS-250-120X	43.00
	.060	.073	6	1.353	.3125	2.5	QCS-312-120	51.15	QCS-312-120X	58.05
	.070	.088	6	1.353	.3750	2.5	QCS-375-120	63.40	QCS-375-120X	70.75
	.080	.121	6	1.540	.5000	3.0	QCS-500-120	88.30	QCS-500-120X	97.55

*QCS-125 tools feature a necked down shank

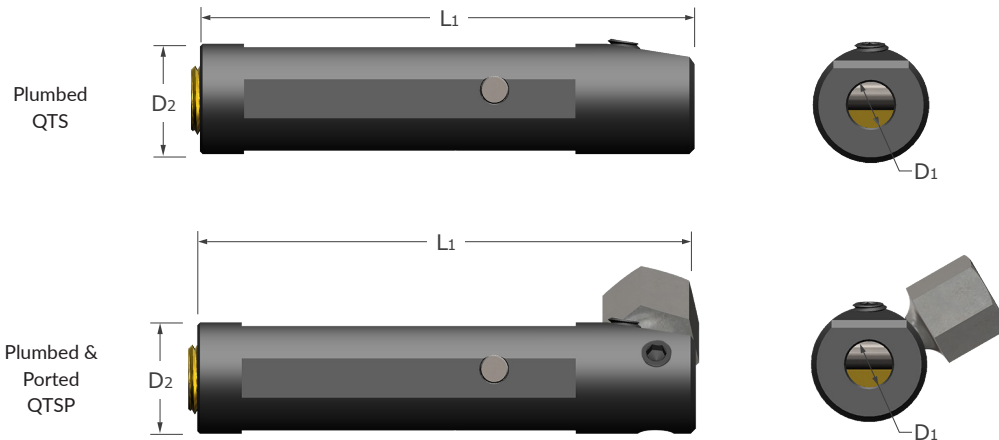
See pg 59-72 for quick change holder options

QTS / QTSP



Quick Change – Holders & Parts

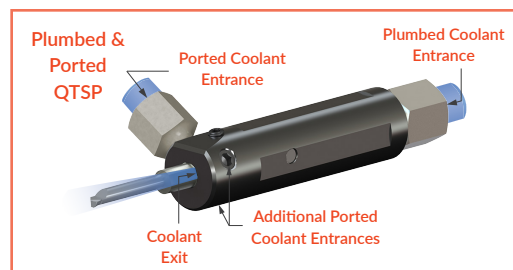
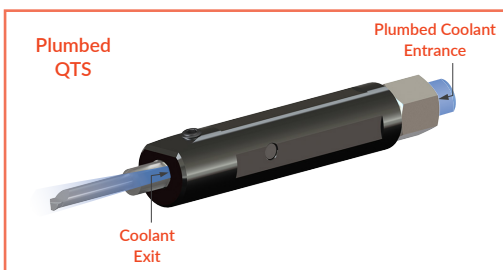
Tool Holders – Straight Holder – Standard Length



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

Internal Diameter	Shank Diameter	Ported Thread	Plumbed Thread	Overall Length	Locating Locking Screw	Tool Holder	
$D_1 \begin{matrix} +.0005'' \\ -.0000'' \end{matrix}$	$D_2 \begin{matrix} -.0003'' \\ -.0008'' \\ -.008mm \\ -.020mm \end{matrix}$			L_1		Tool #	Price
.1875	12 mm	-	1/8-27	2.8	40317	QTS-187-472	124.80
.1875	.5000	-	1/8-27	2.8	40317	QTS-187-500	124.80
.1875	.6250	-	1/8-27	2.8	40317	QTS-187-625	135.20
.1875	16 mm	-	1/8-27	2.8	40317	QTS-187-630	135.20
.1875	.7500	1/4-28 HP	1/8-27	2.8	40316	QTSP-187-750	182.00
.1875	20 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-187-787	182.00
.1875	22 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-187-866	182.00
.1875	25 mm	1/4-28 HP	1/8-27	2.8	40315	QTSP-187-984	182.00
.1875	1.0000	1/4-28 HP	1/8-27	2.8	40315	QTSP-187-1000	182.00

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Quick Change – Holders & Parts



QTS / QTSP

Tool Holders – Straight Holder – Standard Length (cont.)

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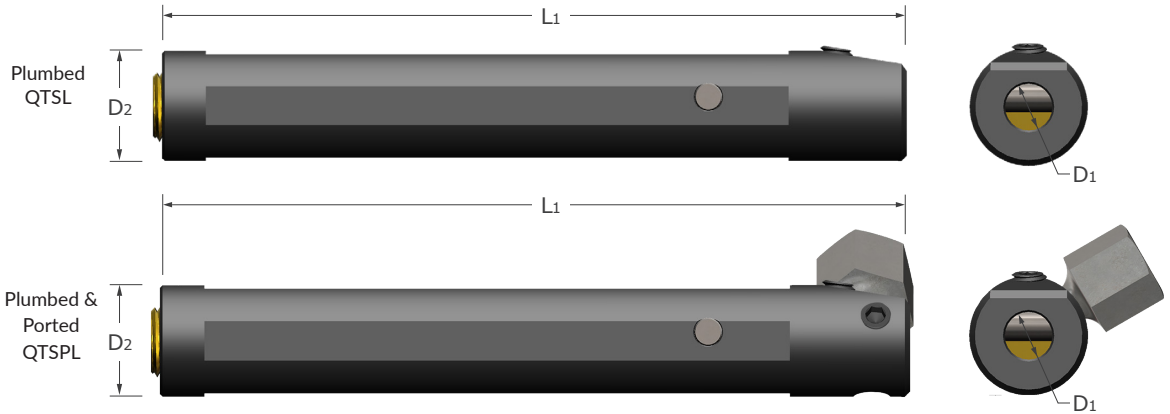
Internal Diameter	Shank Diameter	Ported Thread	Plumbed Thread	Overall Length	Locating Locking Screw	Tool Holder	
$D_1 \begin{matrix} +.0005" \\ -.0000" \end{matrix}$	$D_2 \begin{matrix} -.0003" \\ -.0008" \\ -.008mm \\ -.020mm \end{matrix}$			L1		Tool #	Price
.2500	12 mm	-	1/8-27	2.8	40317	QTS-250-472	124.80
.2500	.5000	-	1/8-27	2.8	40317	QTS-250-500	124.80
.2500	.6250	-	1/8-27	2.8	40317	QTS-250-625	135.20
.2500	16 mm	-	1/8-27	2.8	40317	QTS-250-630	135.20
.2500	.7500	1/4-28 HP	1/8-27	2.8	40316	QTSP-250-750	182.00
.2500	20 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-250-787	182.00
.2500	22 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-250-866	182.00
.2500	25 mm	1/4-28 HP	1/8-27	2.8	40316	QTSP-250-984	182.00
.2500	1.0000	1/4-28 HP	1/8-27	2.8	40315	QTSP-250-1000	182.00
.3125	.6250	-	1/4-18	2.8	40317	QTS-312-625	135.20
.3125	16 mm	-	1/4-18	2.8	40317	QTS-312-630	135.20
.3125	.7500	-	1/4-18	2.8	40317	QTS-312-750	145.60
.3125	20 mm	-	1/4-18	2.8	40317	QTS-312-787	145.60
.3125	22 mm	1/4-28 HP	1/4-18	2.8	40317	QTSP-312-866	182.00
.3125	25 mm	1/4-28 HP	1/4-18	2.8	40316	QTSP-312-984	182.00
.3125	1.0000	1/4-28 HP	1/4-18	2.8	40316	QTSP-312-1000	182.00
.3750	.6250	-	1/4-18	2.8	40317	QTS-375-625	135.20
.3750	.7500	-	1/4-18	2.8	40317	QTS-375-750	145.60
.3750	20 mm	-	1/4-18	2.8	40317	QTS-375-787	145.60
.3750	22 mm	1/4-28 HP	1/4-18	2.8	40317	QTSP-375-866	182.00
.3750	25 mm	1/4-28 HP	1/4-18	2.8	40316	QTSP-375-984	182.00
.3750	1.0000	1/4-28 HP	1/4-18	2.8	40316	QTSP-375-1000	182.00
.5000	.7500	-	3/8-18	2.8	40317	QTS-500-750	145.60
.5000	1.0000	1/4-28 HP	3/8-18	2.8	40317	QTSP-500-1000	166.40

See pg [76-79](#) for replacement parts and accessories

QTSL / QT SPL



Quick Change - Holders & Parts
Tool Holders - Straight Holder - Long Length

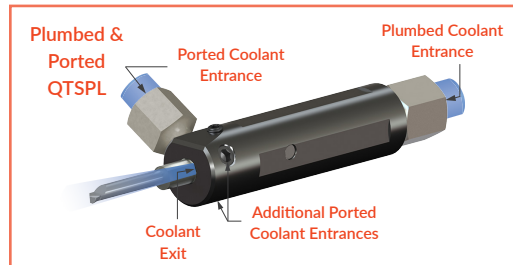
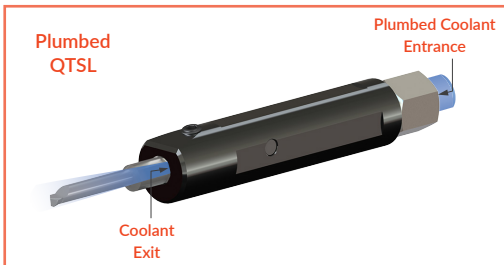


- Quick change, long length tool holder designed for applications requiring an extended reach
- Headless tool holder engineered for maximum versatility in any Swiss, standard lathe, or multi-function lathe
- Standard plumbed and 3 ported options for more enhanced coolant accessibility
- Proprietary Micro-Quik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

Quick Change - Holmaking Tools

Internal Diameter	Shank Diameter	Ported Thread	Plumbed Thread	Overall Length	Locating Locking Screw	Tool Holder	
D1 $+0.0005"$ $-0.0000"$	D2 $-0.0003"$ $-0.0008"$ $-0.08mm$ $-0.20mm$			L1		Tool #	Price
.1875	.7500	1/4-28 HP	1/8-27	5.8	40316	QT SPL-187-750	223.60
.1875	20 mm	1/4-28 HP	1/8-27	5.8	40316	QT SPL-187-787	223.60
.1875	22 mm	1/4-28 HP	1/8-27	5.8	40316	QT SPL-187-866	223.60
.1875	25 mm	1/4-28 HP	1/8-27	5.8	40315	QT SPL-187-984	223.60
.1875	1.0000	1/4-28 HP	1/8-27	5.8	40315	QT SPL-187-1000	223.60
.2500	.7500	1/4-28 HP	1/8-27	5.8	40316	QT SPL-250-750	223.60
.2500	20 mm	1/4-28 HP	1/8-27	5.8	40316	QT SPL-250-787	223.60
.2500	22 mm	1/4-28 HP	1/8-27	5.8	40316	QT SPL-250-866	223.60
.2500	25 mm	1/4-28 HP	1/8-27	5.8	40316	QT SPL-250-984	223.60
.2500	1.0000	1/4-28 HP	1/8-27	5.8	40315	QT SPL-250-1000	223.60
.3125	22 mm	1/4-28 HP	1/4-18	5.8	40316	QT SPL-312-866	223.60
.3125	25 mm	1/4-28 HP	1/4-18	5.8	40316	QT SPL-312-984	223.60
.3125	1.0000	1/4-28 HP	1/4-18	5.8	40316	QT SPL-312-1000	223.60
.3750	22 mm	-	1/4-18	5.8	40317	QT SL-375-866*	187.20
.3750	25 mm	1/4-28 HP	1/4-18	5.8	40316	QT SPL-375-984	223.60
.3750	1.0000	1/4-28 HP	1/4-18	5.8	40316	QT SPL-375-1000	223.60

*Item not ported



See pg [76-79](#) for replacement parts and accessories

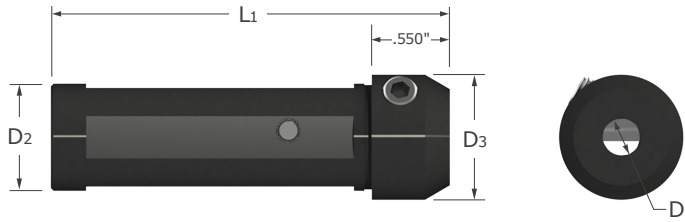
Quick Change – Holders & Parts

Tool Holders – Headed Holder – Standard Length

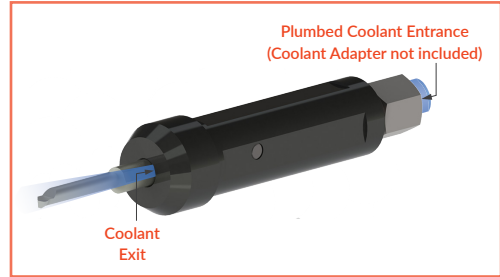


Tech Resources
Available Online

QTH / QTHM



- 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



Quick Change – Holders & Parts

Internal Diameter	Head Diameter	Plumbed Thread	Shank Diameter	Overall Length	Tool Holder	
$D_1 \begin{smallmatrix} +.0005" \\ -.0000" \end{smallmatrix}$	$D_3 \begin{smallmatrix} +.003" \\ -.003" \end{smallmatrix}$		$D_2 \begin{smallmatrix} -.0003" \\ -.0008" \\ -.008mm \\ -.020mm \end{smallmatrix}$	L_1	Tool #	Price
.1875	.750	1/8-27 NPT	12 mm	2.8	QTHM-312	114.40
.1875	.750	1/8-27 NPT	.5000	2.8	QTH-85	114.40
.1875	.750	1/8-27 NPT	.6250	2.8	QTH-105	124.80
.1875	.750	1/8-27 NPT	16 mm	2.8	QTHM-316	124.80
.1875	.875	1/4-18 NPT	.7500	2.8	QTH-205	135.20
.1875	.875	1/4-18 NPT	20 mm	2.8	QTHM-320	135.20
.1875	1.062	1/4-18 NPT	22 mm	2.8	QTHM-322	135.20
.1875	1.250	1/4-18 NPT	25 mm	2.8	QTHM-325	135.20
.1875	1.062	1/4-18 NPT	1.0000	2.8	QTH-405	135.20
.1875	-	1/4-18 NPT	1.2500	2.8	QTH-605	135.20
.1875	-	1/4-18 NPT	32 mm	2.8	QTHM-332	135.20
.2500	.750	1/8-27 NPT	12 mm	2.8	QTHM-412	114.40
.2500	.750	1/8-27 NPT	.5000	2.8	QTH-86	114.40
.2500	.750	1/8-27 NPT	.6250	2.8	QTH-106	124.80
.2500	.750	1/8-27 NPT	16 mm	2.8	QTHM-416	124.80
.2500	.875	1/4-18 NPT	.7500	2.8	QTH-206	135.20
.2500	.875	1/4-18 NPT	20 mm	2.8	QTHM-420	135.20
.2500	1.062	1/4-18 NPT	22 mm	2.8	QTHM-422	135.20
.2500	1.250	1/4-18 NPT	25 mm	2.8	QTHM-425	135.20
.2500	1.062	1/4-18 NPT	1.0000	2.8	QTH-406	135.20
.2500	-	1/4-18 NPT	1.2500	2.8	QTH-606	135.20
.2500	-	1/4-18 NPT	32 mm	2.8	QTHM-432	135.20

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See pg [76-79](#) for replacement parts and accessories

QTH / QTHM

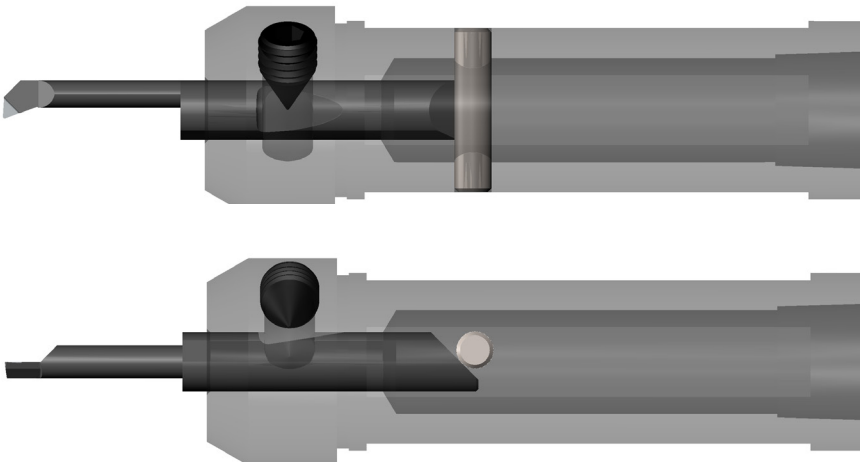


Quick Change – Holders & Parts

Tool Holders – Headed Holder – Standard Length (cont.)

Continued from previous page

Internal Diameter	Head Diameter	Plumbed Thread	Shank Diameter	Overall Length	Tool Holder	
					Tool #	Price
$D_1 \begin{smallmatrix} +.0005'' \\ -.0000'' \end{smallmatrix}$	$D_3 \begin{smallmatrix} +.003'' \\ -.003'' \end{smallmatrix}$		$D_2 \begin{smallmatrix} -.0003'' \\ -.0008'' \\ -.008\text{mm} \\ -.020\text{mm} \end{smallmatrix}$	L1		
.3125	.875	1/8-27 NPT	.6250	2.8	QTH-107	124.80
.3125	.875	1/8-27 NPT	16 mm	2.8	QTHM-516	124.80
.3125	.875	1/4-18 NPT	.7500	2.8	QTH-207	135.20
.3125	.875	1/4-18 NPT	20 mm	2.8	QTHM-520	135.20
.3125	1.062	1/4-18 NPT	22 mm	2.8	QTHM-522	135.20
.3125	1.250	1/4-18 NPT	25 mm	2.8	QTHM-525	135.20
.3125	1.062	1/4-18 NPT	1.0000	2.8	QTH-407	135.20
.3125	-	1/4-18 NPT	1.2500	2.8	QTH-607	135.20
.3125	-	1/4-18 NPT	32 mm	2.8	QTHM-532	135.20
.3750	1.000	1/8-27 NPT	.6250	2.8	QTH-108	124.80
.3750	1.000	1/8-27 NPT	16 mm	2.8	QTHM-616	124.80
.3750	1.000	1/4-18 NPT	.7500	2.8	QTH-208	135.20
.3750	1.000	1/4-18 NPT	20 mm	2.8	QTHM-620	135.20
.3750	1.062	1/4-18 NPT	22 mm	2.8	QTHM-622	135.20
.3750	1.250	1/4-18 NPT	25 mm	2.8	QTHM-625	135.20
.3750	1.062	1/4-18 NPT	1.0000	2.8	QTH-408	135.20
.3750	-	1/4-18 NPT	1.2500	2.8	QTH-608	135.20
.3750	-	1/4-18 NPT	32 mm	2.8	QTHM-632	135.20
.5000	1.062	1/4-18 NPT	.7500	2.8	QTH-210	135.20
.5000	1.062	1/4-18 NPT	20 mm	2.8	QTHM-820	135.20
.5000	1.062	1/4-18 NPT	22 mm	2.8	QTHM-822	135.20
.5000	1.250	1/4-18 NPT	25 mm	2.8	QTHM-825	135.20
.5000	1.062	1/4-18 NPT	1.0000	2.8	QTH-410	135.20
.5000	-	1/4-18 NPT	1.2500	2.8	QTH-610	135.20
.5000	-	1/4-18 NPT	32 mm	2.8	QTHM-832	135.20

See pg [76-79](#) for replacement parts and accessories

Quick Change – Holders & Parts

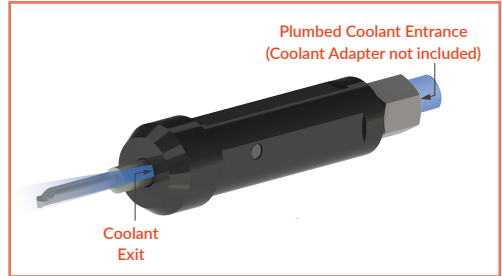
Tool Holders – Headed Holder – Long Length



QTHL / QTHML



- 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, [OC-1](#) locating/locking screw
- Precision manufactured in the USA



Quick Change – Holders & Parts

Internal Diameter	Head Diameter	Plumbed Thread	Shank Diameter	Overall Length	Tool Holder	
					Tool #	Price
D1 $^{+.0005''}$ $_{-.0000''}$	D3 $^{+.003''}$ $_{-.003''}$		D2 $^{-.0003''}$ $^{-.0008''}$ $_{-.008mm}$ $_{-.020mm}$	L1		
.1875	.750	1/8-27 NPT	12 mm	5.8	QTHM-312L	156.00
.1875	.750	1/8-27 NPT	.5000	5.8	QTH-85L	156.00
.1875	.750	1/8-27 NPT	.6250	5.8	QTH-105L	166.40
.1875	.750	1/8-27 NPT	16 mm	5.8	QTHM-316L	166.40
.1875	.875	1/4-18 NPT	.7500	5.8	QTH-205L	176.80
.1875	.875	1/4-18 NPT	20 mm	5.8	QTHM-320L	176.80
.1875	1.062	1/4-18 NPT	22 mm	5.8	QTHM-322L	176.80
.1875	1.062	1/4-18 NPT	1.0000	5.8	QTH-405L	176.80
.1875	1.250	1/4-18 NPT	25 mm	5.8	QTHM-325L	176.80
.1875	-	1/4-18 NPT	1.2500	5.8	QTH-605L	176.80
.1875	-	1/4-18 NPT	32 mm	5.8	QTHM-332L	176.80
.2500	.750	1/8-27 NPT	12 mm	5.8	QTHM-412L	156.00
.2500	.750	1/8-27 NPT	.5000	5.8	QTH-86L	156.00
.2500	.750	1/8-27 NPT	.6250	5.8	QTH-106L	166.40
.2500	.750	1/8-27 NPT	16 mm	5.8	QTHM-416L	166.40
.2500	.875	1/4-18 NPT	.7500	5.8	QTH-206L	176.80
.2500	.875	1/4-18 NPT	20 mm	5.8	QTHM-420L	176.80
.2500	1.062	1/4-18 NPT	22 mm	5.8	QTHM-422L	176.80
.2500	1.062	1/4-18 NPT	1.0000	5.8	QTH-406L	176.80
.2500	1.250	1/4-18 NPT	25 mm	5.8	QTHM-425L	176.80
.2500	-	1/4-18 NPT	1.2500	5.8	QTH-606L	176.80
.2500	-	1/4-18 NPT	32 mm	5.8	QTHM-432L	176.80

Continued on next page

See pg [76-79](#) for replacement parts and accessories

QTHL / QTHML



Quick Change – Holders & Parts

Tool Holders – Headed Holder – Long Length (cont.)

Continued from previous page

Internal Diameter	Head Diameter	Plumbed Thread	Shank Diameter	Overall Length	Tool Holder	
					Tool #	Price
$D_1 \begin{smallmatrix} +.0005'' \\ -.0000'' \end{smallmatrix}$	$D_3 \begin{smallmatrix} +.003'' \\ -.003'' \end{smallmatrix}$		$D_2 \begin{smallmatrix} -.0003'' \\ -.0008'' \\ -.008\text{mm} \\ -.020\text{mm} \end{smallmatrix}$	L1		
.3125	.875	1/8-27 NPT	.6250	5.8	QTH-107L	166.40
.3125	.875	1/8-27 NPT	16 mm	5.8	QTHM-516L	166.40
.3125	.875	1/8-27 NPT	.7500	5.8	QTH-207L	176.80
.3125	.875	1/4-18 NPT	20 mm	5.8	QTHM-520L	176.80
.3125	1.062	1/4-18 NPT	22 mm	5.8	QTHM-522L	176.80
.3125	1.062	1/4-18 NPT	1.0000	5.8	QTH-407L	176.80
.3125	1.250	1/4-18 NPT	25 mm	5.8	QTHM-525L	176.80
.3125	-	1/4-18 NPT	1.2500	5.8	QTH-607L	176.80
.3125	-	1/4-18 NPT	32 mm	5.8	QTHM-532L	176.80
.3750	1.000	1/8-27 NPT	.6250	5.8	QTH-108L	166.40
.3750	1.000	1/8-27 NPT	16 mm	5.8	QTHM-616L	166.40
.3750	1.000	1/4-18 NPT	.7500	5.8	QTH-208L	176.80
.3750	1.000	1/4-18 NPT	20 mm	5.8	QTHM-620L	176.80
.3750	1.062	1/4-18 NPT	22 mm	5.8	QTHM-622L	176.80
.3750	1.062	1/4-18 NPT	1.0000	5.8	QTH-408L	176.80
.3750	1.250	1/4-18 NPT	25 mm	5.8	QTHM-625L	176.80
.3750	-	1/4-18 NPT	1.2500	5.8	QTH-608L	176.80
.3750	-	1/4-18 NPT	32 mm	5.8	QTHM-632L	176.80
.5000	1.062	1/4-18 NPT	.7500	5.8	QTH-210L	176.80
.5000	1.062	1/4-18 NPT	20 mm	5.8	QTHM-820L	176.80
.5000	1.062	1/4-18 NPT	22 mm	5.8	QTHM-822L	176.80
.5000	1.062	1/4-18 NPT	1.0000	5.8	QTH-410L	176.80
.5000	1.250	1/4-18 NPT	25 mm	5.8	QTHM-825L	176.80
.5000	-	1/4-18 NPT	1.2500	5.8	QTH-610L	176.80
.5000	-	1/4-18 NPT	32 mm	5.8	QTHM-832L	176.80

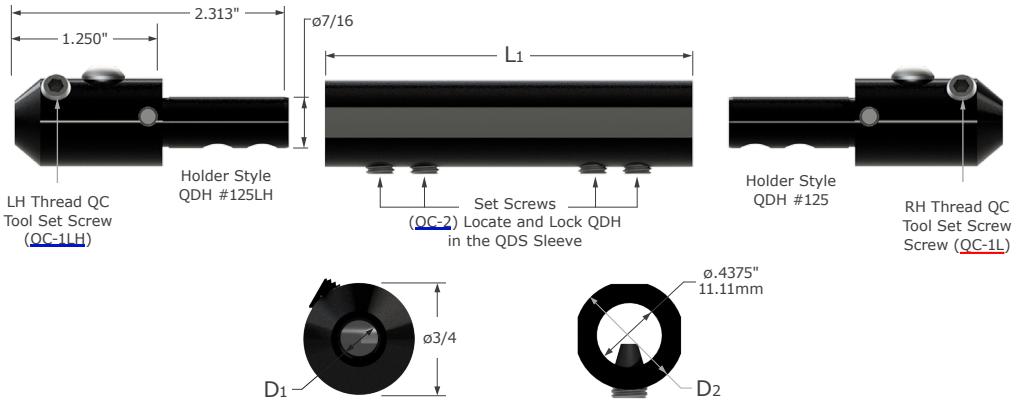
See pg [76-79](#) for replacement parts and accessories

Quick Change – Holders & Parts

Tool Holder System – Double Ended Modular

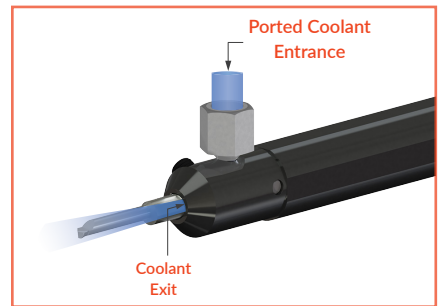


QDH / QDS / QDSM



Quick Change – Holders & Parts

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



Sleeve Diameter	Length of Sleeve	Sleeve		Internal Diameter	Ported Thread	Right Hand Tool Holder		Left Hand Tool Holder						
		Tool #	Price			Tool #	Price	Tool #	Price					
D2 -.0003" -.0008" -.008mm -.020mm	L1	Tool #	Price	D1 +.0005" -.0000"		Tool #	Price	Tool #	Price					
				.1875						1/4-28 HP	QDH-3125	119.60	QDH-3125LH	119.60
				.2500						1/4-28 HP	QDH-4125	119.60	QDH-4125LH	119.60
.7500	2.5	QDS-750-2.5	130.00	.3125	1/4-28 HP	QDH-5125	119.60	QDH-5125LH	119.60					
				.1875	1/4-28 HP	QDH-3125	119.60	QDH-3125LH	119.60					
				.2500	1/4-28 HP	QDH-4125	119.60	QDH-4125LH	119.60					
.7500	3.1	QDS-750-3.1	135.20	.3125	1/4-28 HP	QDH-5125	119.60	QDH-5125LH	119.60					
				.1875	1/4-28 HP	QDH-3125	119.60	QDH-3125LH	119.60					
				.2500	1/4-28 HP	QDH-4125	119.60	QDH-4125LH	119.60					
20 mm	64 mm	QDSM-20-64	130.00	.3125	1/4-28 HP	QDH-5125	119.60	QDH-5125LH	119.60					
				.1875	1/4-28 HP	QDH-3125	119.60	QDH-3125LH	119.60					
				.2500	1/4-28 HP	QDH-4125	119.60	QDH-4125LH	119.60					
20 mm	79 mm	QDSM-20-79	135.20	.3125	1/4-28 HP	QDH-5125	119.60	QDH-5125LH	119.60					
				.1875	1/4-28 HP	QDH-3125	119.60	QDH-3125LH	119.60					
				.2500	1/4-28 HP	QDH-4125	119.60	QDH-4125LH	119.60					
22 mm	64 mm	QDSM-22-64	135.20	.3125	1/4-28 HP	QDH-5125	119.60	QDH-5125LH	119.60					
				.1875	1/4-28 HP	QDH-3125	119.60	QDH-3125LH	119.60					
				.2500	1/4-28 HP	QDH-4125	119.60	QDH-4125LH	119.60					
22 mm	79 mm	QDSM-22-79	140.40	.3125	1/4-28 HP	QDH-5125	119.60	QDH-5125LH	119.60					
				.1875	1/4-28 HP	QDH-3125	119.60	QDH-3125LH	119.60					
				.2500	1/4-28 HP	QDH-4125	119.60	QDH-4125LH	119.60					

Continued on next page

QDH / QDS / QDSM



Quick Change – Holders & Parts

Tool Holder System – Double Ended Modular (cont.)

Continued from previous page

Sleeve Diameter D2 -.0003" -.0008" -.008mm -.020mm	Length of Sleeve L1	Sleeve		Internal Diameter D1 +.0005" -.0000"	Ported Thread	Right Hand Tool Holder		Left Hand Tool Holder	
		Tool #	Price			Tool #	Price	Tool #	Price
25 mm	64 mm	QDSM-25-64	140.40	.1875	1/4-28 HP	QDH-3125	119.60	QDH-3125LH	119.60
				.2500	1/4-28 HP	QDH-4125	119.60	QDH-4125LH	119.60
				.3125	1/4-28 HP	QDH-5125	119.60	QDH-5125LH	119.60
1.0000	2.500	QDS-1.00-2.5	140.40	.1875	1/4-28 HP	QDH-3125	119.60	QDH-3125LH	119.60
				.2500	1/4-28 HP	QDH-4125	119.60	QDH-4125LH	119.60
				.3125	1/4-28 HP	QDH-5125	119.60	QDH-5125LH	119.60
1.0000	3.100	QDS-1.00-3.1	150.80	.1875	1/4-28 HP	QDH-3125	119.60	QDH-3125LH	119.60
				.2500	1/4-28 HP	QDH-4125	119.60	QDH-4125LH	119.60
				.3125	1/4-28 HP	QDH-5125	119.60	QDH-5125LH	119.60

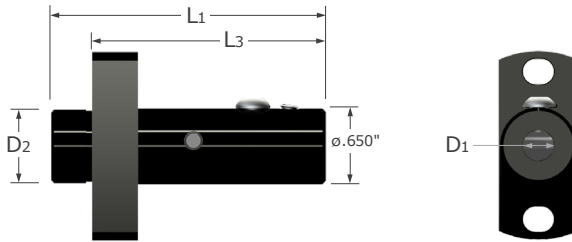
See pg [76-79](#) for replacement parts and accessories

Quick Change – Holders & Parts

Tool Holders – Star Swiss Machines – SR-10J

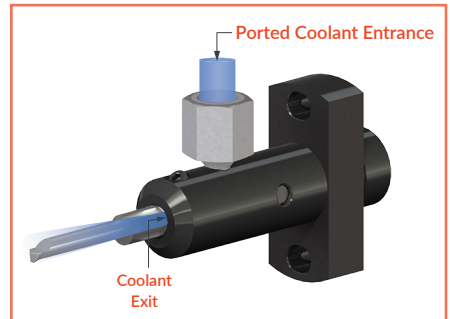


QZST



Quick Change – Holders & Parts

- 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	
$D_1 \begin{smallmatrix} +.0005" \\ -.0000" \end{smallmatrix}$	L3	D2	L1			Tool #	Price
.1875	1.956	16 mm	2.350	1/4-28 HP	40316	QZST-316L-SR10J	258.95
.2500	1.956	16 mm	2.350	1/4-28 HP	40317	QZST-416L-SR10J	258.95
.3125	1.956	16 mm	2.350	1/4-28 HP	40317	QZST-516L-SR10J	258.95

See pg 73 for Centerline Indicating Tool

See pg 76-79 for replacement parts and accessories

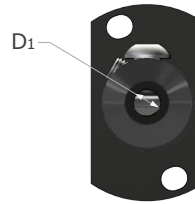
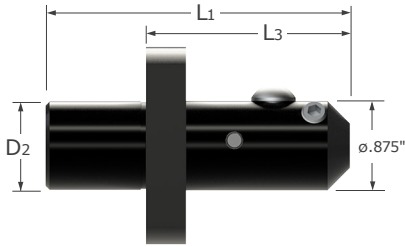
QZST



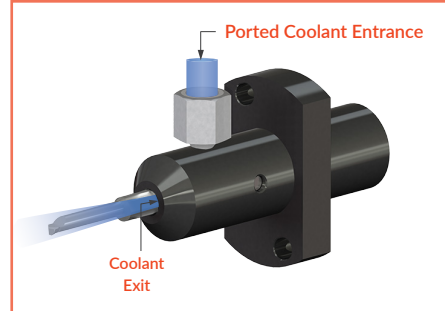
Tech Resources
Available Online

Quick Change – Holders & Parts

Tool 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-12R11, and SV-20R
- Proprietary Micro-Quik quick change system maximizes productivity through reliable accuracy and locational repeatability
- Designed for use with .1875", .2500", and .3125" diameter quick change tools
- Qualify with quick change centerline indicating tool (QI)
- Unique "3 point" locking and locating system ensures axial and radial tool repeatability, tip-to-tip consistency, and part-to-part accuracy
- Coolant delivered via external coolant port
- Heat treated and black oxide coated for durability and corrosion resistance
- Tool holder includes: hex wrench, [QC-1](#) locating/locking screw, porting plug, straight coolant adapter
- Precision manufactured in the USA



Quick Change – Holders & Parts

Internal Diameter	Overall Reach	Shank Diameter	Overall Length	Ported Thread	Tool Holder	
$D_1 \begin{matrix} +.0005" \\ -.0000" \end{matrix}$	L3	D2	L1		Tool #	Price
.1875	1.400	22 mm	2.384	1/4-28 HP	QZST-322-SR20	269.35
.1875	2.000	22 mm	2.984	1/4-28 HP	QZST-322L-SR20	269.35
.2500	1.400	22 mm	2.384	1/4-28 HP	QZST-422-SR20	269.35
.2500	2.000	22 mm	2.984	1/4-28 HP	QZST-422L-SR20	269.35
.3125	1.400	22 mm	2.384	1/4-28 HP	QZST-522-SR20	269.35
.3125	2.000	22 mm	2.984	1/4-28 HP	QZST-522L-SR20	269.35

See pg 73 for Centerline Indicating Tool

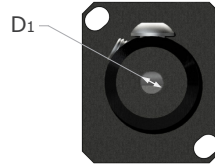
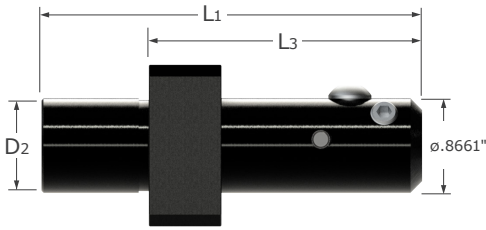
See pg [76-79](#) for replacement parts and accessories

Quick Change – Holders & Parts

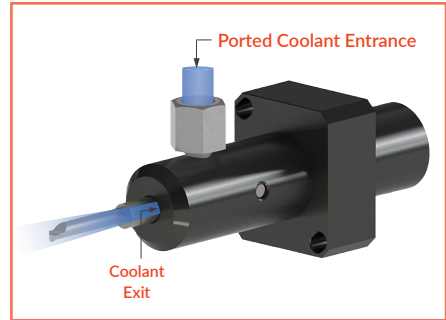
Tool Holders – Star Swiss Machines – SR-20RIV



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



Quick Change – Holders & Parts

Internal Diameter	Overall Reach	Shank Diameter	Overall Length	Ported Thread	Tool Holder	
					Tool #	Price
D1 ^{+ .0005"} _{- .0000"}	L3	D2	L1			
.1875	2.510	22 mm	3.494	1/4-28 HP	QZST-322L-SR20RIV	269.35
.2500	2.510	22 mm	3.494	1/4-28 HP	QZST-422L-SR20RIV	269.35
.3125	2.510	22 mm	3.494	1/4-28 HP	QZST-522L-SR20RIV	269.35

See pg 73 for Centerline Indicating Tool

See pg [76-79](#) for replacement parts and accessories

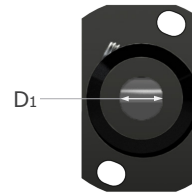
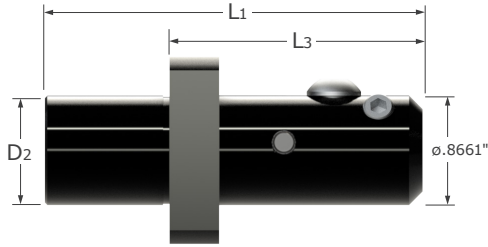
QZST



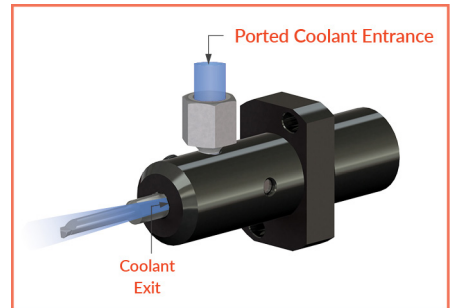
Tech Resources
Available Online

Quick Change – Holders & Parts

Tool 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



Quick Change – Holders & Parts

Internal Diameter	Overall Reach	Shank Diameter	Overall Length	Ported Thread	Tool Holder	
					Tool #	Price
$D_1 \begin{smallmatrix} +.0005" \\ -.0000" \end{smallmatrix}$	L3	D2	L1			
.1875	2.000	22 mm	2.984	1/4-28 HP	QZST-322L-SW20	269.35
.2500	2.000	22 mm	2.984	1/4-28 HP	QZST-422L-SW20	269.35
.3125	2.000	22 mm	2.984	1/4-28 HP	QZST-522L-SW20	269.35

See pg 73 for Centerline Indicating Tool

See pg [76-79](#) for replacement parts and accessories

Quick Change – Holders & Parts

QSG

Tool Holders – Grinding Holder – Square



- 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

Quick Change – Holders & Parts

Internal Diameter	Head Diameter	Square Shank	Overall Length	Tool Holder	
				Tool #	Price
D1 $\begin{matrix} +.0005'' \\ -.0000'' \end{matrix}$	D3 $\begin{matrix} +.005'' \\ -.005'' \end{matrix}$	A $\begin{matrix} +.0000'' \\ -.0010'' \end{matrix}$	L1		
.1875	.750	.5000	4.8	QSG-187-500	150.80
.1875	1.063	.7500	4.8	QSG-187-750	166.40
.2500	.750	.5000	4.8	QSG-250-500	150.80
.2500	1.063	.7500	4.8	QSG-250-750	166.40
.3125	.875	.5000	4.8	QSG-312-500	150.80
.3125	1.063	.7500	4.8	QSG-312-750	166.40
.3750	1.063	.7500	4.8	QSG-375-750	166.40
.5000	1.063	.7500	4.8	QSG-500-750	166.40

See pg [76-79](#) for replacement parts and accessories

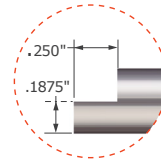
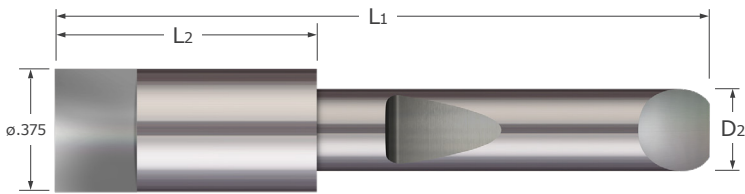
QI



Tech Resources
Available Online

Quick Change – Holders & Parts

Centerline Indicating Tool



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

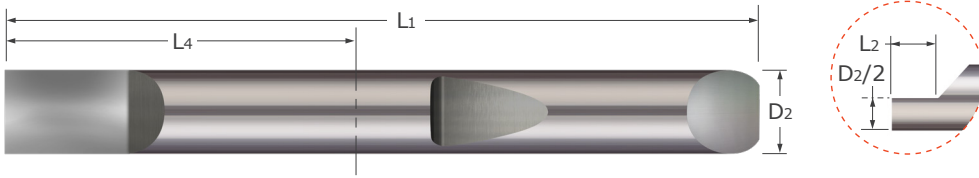
Shank Diameter	Body Length	Overall Length	Uncoated	
			Tool #	Price
D2 (h6)	$L_2 \begin{smallmatrix} +.000'' \\ -.015'' \end{smallmatrix}$	L1		
.1875	1.000	2.0	QI-187	114.00
.2500	.800	2.0	QI-250	114.00
.3125	.800	2.0	QI-312	114.00

Quick Change – Holders & Parts

Blanks - Half Round



QSP



- 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

Quick Change – Holders & Parts

Shank Diameter	Split Length*	Length from Holder	Overall Length	Tool Holder	
				Tool #	Price
D2 (h6)	L2 ^{+ .005"} / _{-.000"}	L4	L1		
.1875	.375	.590	1.5	OSP-187-1.5	20.20
.1875	.375	1.090	2.0	OSP-187-2.0	21.55
.2500	.375	.853	2.0	OSP-250-2.0	22.90
.2500	.375	1.353	2.5	OSP-250-2.5	24.95
.2500	.375	1.853	3.0	OSP-250-3.0	26.95
.3125	.500	.853	2.0	OSP-312-2.0	30.70
.3125	.500	1.353	2.5	OSP-312-2.5	32.35
.3125	.500	1.853	3.0	OSP-312-3.0	36.30
.3750	.500	.853	2.0	OSP-375-2.0	38.90
.3750	.500	1.353	2.5	OSP-375-2.5	40.35
.3750	.500	1.853	3.0	OSP-375-3.0	43.25
.3750	.500	2.353	3.5	OSP-375-3.5	44.40
.3750	.500	2.853	4.0	OSP-375-4.0	49.30
.5000	.625	1.040	2.5	OSP-500-2.5	54.40
.5000	.625	1.540	3.0	OSP-500-3.0	57.20
.5000	.625	2.040	3.5	OSP-500-3.5	59.50
.5000	.625	2.540	4.0	OSP-500-4.0	62.60
.5000	.625	3.040	4.5	OSP-500-4.5	66.05

*Centerline +.001" / -.000"

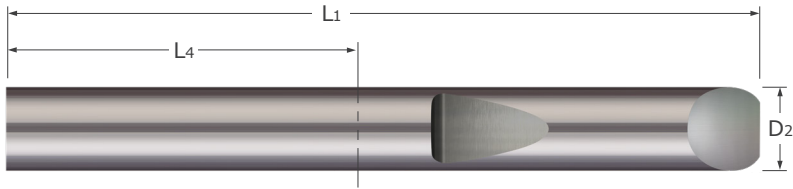
QSR



Tech Resources
Available Online

Quick Change – Holders & Parts

Blanks – Full Round



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

Shank Diameter	Length from Holder	Overall Length	Tool Holder	
			Tool #	Price
D ₂ (h6)	L ₄	L ₁		
.1875	.590	1.5	QSR-187-1.5	20.20
.1875	1.090	2.0	QSR-187-2.0	21.55
.2500	.853	2.0	QSR-250-2.0	22.90
.2500	1.353	2.5	QSR-250-2.5	24.95
.2500	1.853	3.0	QSR-250-3.0	26.95
.3125	.853	2.0	QSR-312-2.0	30.70
.3125	1.353	2.5	QSR-312-2.5	32.35
.3125	1.853	3.0	QSR-312-3.0	36.30
.3750	.853	2.0	QSR-375-2.0	38.90
.3750	1.353	2.5	QSR-375-2.5	40.35
.3750	1.853	3.0	QSR-375-3.0	43.25
.3750	2.353	3.5	QSR-375-3.5	44.40
.3750	2.853	4.0	QSR-375-4.0	49.30
.5000	1.040	2.5	QSR-500-2.5	54.40
.5000	1.540	3.0	QSR-500-3.0	57.20
.5000	2.040	3.5	QSR-500-3.5	59.50
.5000	2.540	4.0	QSR-500-4.0	62.60
.5000	3.040	4.5	QSR-500-4.5	66.05

Quick Change – Holders & Parts

Tool Holder System – Replacement Parts

QC

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

Image	Accessory Type	Compatibility	Single		Package of 10	
			Tool #	Price	Tool #	Price
	Locating / Locking Screw (Right Hand Threads)	Fits: QTH, QTHM, QZST, QSG, QDH Requires: QHT-1 Hex Key	QC-1	3.65	QC-10	26.00
	Locating / Locking Screw	Fits: QDH Requires: QHT-1 Hex Key	QC-1LH	10.50	QC-10LH	93.60
	Locating / Locking Screw	See QTS,QTSP,QTSL,QT SPL tables for compatibility	40208	3.65	41208	26.00
	Locating / Locking Screw	See QTS,QTSP,QTSL,QT SPL tables for compatibility	40215	3.65	41215	26.00
	Locating / Locking Screw	See QTS,QTSP,QTSL,QT SPL tables for compatibility	40216	3.65	41216	26.00
	Locating / Locking Screw	See QTS, QTSP, QT SPL, QTSL, QZST-SR10J tables for compatibility	40317	1.10	41317	9.00 NEW
	Locating / Locking Screw	See QTS, QTSP, QT SPL, QTSL, QZST-SR10J tables for compatibility	40316	1.10	41316	9.00 NEW
	Locating / Locking Screw	See QTS, QTSP, QT SPL, QTSL, QZST-SR10J tables for compatibility	40315	1.10	41315	9.00 NEW
	Locating / Locking Screw	See QTS, QTSP, QT SPL, QTSL, QZST-SR10J tables for compatibility	40279	1.10	41279	9.00 NEW







Quick Change – Holders & Parts

QC

Quick Change – Holders & Parts

Tool Holder System – Replacement Parts (cont.)

Continued from previous page











Accessory Type	Compatibility	Single		Package of 10	
		Tool #	Price	Tool #	Price
 <p>(Left Hand Threads) Locating / Locking Screw</p>	Fits: QDS, QDSM Requires: QHT-1 Hex Key	QC-2	3.65	QC-20	26.00
 <p>Locating / Locking Screw</p>	Fits: QZST-SR10J Requires: 3/32" Hex Key	QC-6	1.10	QC-60	9.50
 <p>Hex Wrench</p>	Fits: QC-3 , QC-4 Locking Screws	QHK-1	1.10	QHK-10	9.50
 <p>Hex Wrench</p>	Fits: QC-6 Socket Set Screws	QHK-2	1.10	QHK-20	9.50
 <p>Hex Wrench</p>	Fits: 40208 , 40215 , 40216 , Locating / Locking Screws	40213	1.10	41213	9.50
 <p>T Style Handle Hex Wrench</p>	Fits: QC-1 , QC-1LH , QC-2 Locating / Locking Screws	QHT-1	5.75	QHT-10	46.80

Quick Change – Holders & Parts

Tool Holder System – Coolant Accessories

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

Quick Change – Holders & Parts





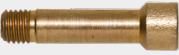



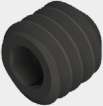

	Accessory Type	Compatibility	Coolant Access Type	Holder Thread	Coolant Supply Thread	Single		Package of 10		
						Tool #	Price	Tool #	Price	
	Straight Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/8-27 NPT	JIC 4	40301	4.50	41301	37.50	NEW
	Straight Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	JIC 4	40302	4.50	41302	37.50	NEW
	Straight Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	JIC 4	40303	6.25	41303	52.00	NEW
	Straight Coolant Adapter	Fits: QTH, QTHL, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	1/8-27 NPT	40311	6.25	41311	52.00	NEW
	Straight Coolant Adapter	Fits: QTH, QTHL, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	1/8-27 NPT	40312	6.25	41312	52.00	NEW
	90° Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/8-27 NPT	JIC 4	40304	7.50	41304	62.50	NEW
	90° Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	JIC 4	40305	7.50	41305	62.50	NEW
	90° Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	JIC 4	40306	7.50	41306	62.50	NEW
	90° Coolant Adapter	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	1/8-27 NPT	40307	10.50	41307	87.00	NEW
	NPT Coolant Reducer	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	1/8-27 NPT	40308	4.50	41308	37.50	NEW

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Quick Change – Holders & Parts

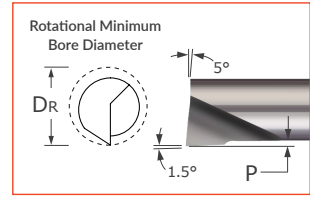
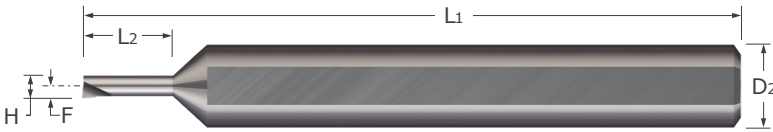
Tool Holder System – Coolant Accessories (cont.)

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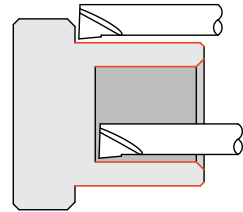
	Accessory Type	Compatibility	Coolant Access Type	Holder Thread	Coolant Supply Thread	Single		Package of 10		
						Tool #	Price	Tool #	Price	
NEW		NPT Coolant Reducer	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	1/8-27 NPT	40309	6.25	41309	52.00
NEW		Plumbed Plug	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/8-27 NPT	-	40197	3.25	41197	27.00
NEW		Plumbed Plug	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	1/4-18 NPT	-	40198	3.25	41198	27.00
NEW		Plumbed Plug	Fits: QTH, QTHL, QTHM, QTS, QTSP, QTSPL	Plumbed	3/8-18 NPT	-	40221	3.25	41221	27.00
		High Pressure Coolant Fitting	Fits: QZST, QDH, QTSP, QTSPL	Ported	1/4-28 HP	1/8-27 NPT	QN-1	6.25	QN-10	52.00
NEW		1.28" Coolant Extension	Fits: QZST, QDH, QTSP, QTSPL	Ported	1/4-28 HP	1/4-28 HP	40199	6.25	41199	52.00
NEW		45° Coolant Adapter	Fits: QZST, QDH, QTSP, QTSPL	Ported	1/4-28 HP	1/8-27 NPT	40313	6.25	41313	52.00
NEW		90° Coolant Adapter	Fits: QZST, QDH, QTSP, QTSPL	Ported	1/4-28 HP	1/8-27 NPT	40314	6.25	41314	52.00
		Button Head Screw (Port Plug)	Fits: QDH, QZST / Hex Key not stocked for this item	Ported	1/4-28 HP	-	OC-5	1.10	OC-50	9.50
		Port Plug	Fits: QTSP, QTSPL	Ported	1/4-28 HP	-	40278	3.65	41278	26.00
		Hex Wrench	Fits: 40278 Porting Plug	Ported	-	-	40249	1.10	41249	9.50

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



Standard – Boring Tools

Head Width		Rotational Minimum Bore Diameter	Maximum Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		AlTiN Coated	
H	decimal equiv.	D _R	L ₂ +.010" -.000" +.25mm -.00mm	P	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price
.0135	.0135	.015	.050	.0015	.0075	.1250	1.5	MBB-015050	38.00	MBB-015050X	41.40
.0135	.0135	.015	.075	.0015	.0075	.1250	1.5	MBB-015075	38.00	MBB-015075X	42.00
.45 mm	.0177	0.5 mm	2 mm	.05 mm	.25 mm	3 mm	38 mm	MBBM-005020	30.45	MBBM-005020X	33.70
.0180	.0180	.020	.050	.0020	.0100	.1250	1.5	MBB-020050	38.00	MBB-020050X	42.00
.0180	.0180	.020	.075	.0020	.0100	.1250	1.5	MBB-020075	38.00	MBB-020075X	41.40
.0180	.0180	.020	.100	.0020	.0100	.1250	1.5	MBB-020100	38.00	MBB-020100X	42.00
.54 mm	.0213	0.6 mm	2.5 mm	.06 mm	.30 mm	3 mm	38 mm	MBBM-006025	30.45	MBBM-006025X	33.70
.0225	.0225	.025	.050	.0025	.0125	.1250	1.5	MBB-025050	33.50	MBB-025050X	37.50
.0225	.0225	.025	.075	.0025	.0125	.1250	1.5	MBB-025075	33.50	MBB-025075X	37.50
.0225	.0225	.025	.100	.0025	.0125	.1250	1.5	MBB-025100	33.50	MBB-025100X	36.80
.0225	.0225	.025	.125	.0025	.0125	.1250	1.5	MBB-025125	33.50	MBB-025125X	37.50
.63 mm	.0248	0.7 mm	3 mm	.07 mm	.35 mm	3 mm	38 mm	MBBM-007030	30.45		
.63 mm	.0248	0.7 mm	4 mm	.07 mm	.35 mm	3 mm	38 mm	MBBM-007040	30.45		
.0275	.0275	.030	.075	.0025	.0150	.1250	1.5	MBB-030075	33.50	MBB-030075X	37.50
.0275	.0275	.030	.100	.0025	.0150	.1250	1.5	MBB-030100	33.50	MBB-030100X	36.80
.0275	.0275	.030	.125	.0025	.0150	.1250	1.5	MBB-030125	33.50	MBB-030125X	37.50
.0275	.0275	.030	.150	.0025	.0150	.1250	1.5	MBB-030150	33.50	MBB-030150X	37.50
.72 mm	.0283	0.8 mm	3 mm	.08 mm	.40 mm	3 mm	38 mm	MBBM-008030	30.45	MBBM-008030X	33.70
.72 mm	.0283	0.8 mm	4 mm	.08 mm	.40 mm	3 mm	38 mm	MBBM-008040	30.45	MBBM-008040X	33.70
.0320	.0320	.035	.075	.0030	.0175	.1250	1.5	MBB-035075	33.50	MBB-035075X	37.50
.0320	.0320	.035	.100	.0030	.0175	.1250	1.5	MBB-035100	33.50	MBB-035100X	36.80
.0320	.0320	.035	.150	.0030	.0175	.1250	1.5	MBB-035150	33.50	MBB-035150X	36.80
.0320	.0320	.035	.200	.0030	.0175	.1250	1.5	MBB-035200	33.50	MBB-035200X	37.50
.81 mm	.0317	0.9 mm	4 mm	.09 mm	.45 mm	3 mm	38 mm	MBBM-009040	30.45		
.81 mm	.0317	0.9 mm	5 mm	.09 mm	.45 mm	3 mm	38 mm	MBBM-009050	30.45		
.91 mm	.0357	1 mm	4 mm	.09 mm	.50 mm	3 mm	38 mm	MBBM-010040	30.45		
.91 mm	.0357	1 mm	5 mm	.09 mm	.50 mm	3 mm	38 mm	MBBM-010050	30.45		
.0365	.0365	.040	.100	.0035	.0200	.1250	1.5	MBB-040100	33.50	MBB-040100X	36.80
.0365	.0365	.040	.150	.0035	.0200	.1250	1.5	MBB-040150	33.50	MBB-040150X	36.80
.0365	.0365	.040	.200	.0035	.0200	.1250	1.5	MBB-040200	33.50	MBB-040200X	36.80

Continued on next page

See pg 140 for standard tool holders

MBB / MBBM



Standard – Boring Tools

Right Hand – Sharp – Miniature (cont.)

Continued from previous page

	Head Width		Rotational Minimum Bore Diameter	Maximum Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		AITIN Coated	
	H	decimal equiv.							D _R	L ₂	P	F	D_{2} (h6)	L_{1}	Tool #	Price	Tool #	Price
	.0405	.0405	.045	.100	.0045	.0225	.1250	1.5	MBB-045100	33.50	MBB-045100X	36.80
	.0405	.0405	.045	.150	.0045	.0225	.1250	1.5	MBB-045150	33.50	MBB-045150X	36.80
	.0405	.0405	.045	.200	.0045	.0225	.1250	1.5	MBB-045200	33.50	MBB-045200X	36.80
NEW	.0440	.0440	.050	.100	.0060	.0250	.1250	1.5	MBB-050100	33.50	MBB-050100X	37.50
	.0440	.0440	.050	.150	.0060	.0250	.1250	1.5	MBB-050150	33.50	MBB-050150X	36.80
NEW	.0440	.0440	.050	.200	.0060	.0250	.1250	1.5	MBB-050200	33.50	MBB-050200X	37.50
NEW	.0440	.0440	.050	.300	.0060	.0250	.1250	1.5	MBB-050300	33.50	MBB-050300X	37.50
	.0525	.0525	.060	.150	.0075	.0300	.1250	1.5	MBB-060150	33.50	MBB-060150X	36.80
	.0525	.0525	.060	.200	.0075	.0300	.1250	1.5	MBB-060200	33.50	MBB-060200X	36.80
NEW	.0525	.0525	.060	.300	.0075	.0300	.1250	1.5	MBB-060300	33.50	MBB-060300X	37.50
NEW	.0525	.0525	.060	.400	.0075	.0300	.1250	1.5	MBB-060400	33.50	MBB-060400X	37.50
NEW	.0525	.0525	.060	.500	.0075	.0300	.1250	1.5	MBB-060500	33.50	MBB-060500X	37.50
NEW	.0625	.0625	.070	.150	.0075	.0350	.1250	1.5	MBB-070150	33.50	MBB-070150X	37.50
	.0625	.0625	.070	.200	.0075	.0350	.1250	1.5	MBB-070200	33.50	MBB-070200X	36.80
	.0625	.0625	.070	.300	.0075	.0350	.1250	1.5	MBB-070300	33.50	MBB-070300X	36.80
NEW	.0625	.0625	.070	.400	.0075	.0350	.1250	1.5	MBB-070400	33.50	MBB-070400X	37.50
NEW	.0625	.0625	.070	.500	.0075	.0350	.1250	1.5	MBB-070500	33.50	MBB-070500X	37.50
	.0700	.0700	.080	.150	.0100	.0400	.1250	1.5	MBB-080150	33.50	MBB-080150X	36.80
	.0700	.0700	.080	.200	.0100	.0400	.1250	1.5	MBB-080200	33.50	MBB-080200X	36.80
NEW	.0700	.0700	.080	.300	.0100	.0400	.1250	1.5	MBB-080300	33.50	MBB-080300X	37.50
NEW	.0700	.0700	.080	.500	.0100	.0400	.1250	1.5	MBB-080500	33.50	MBB-080500X	37.50
NEW	.0700	.0700	.080	.600	.0100	.0400	.1250	1.5	MBB-080600	33.50	MBB-080600X	37.50
NEW	.0800	.0800	.090	.200	.0100	.0450	.1250	1.5	MBB-090200	33.50	MBB-090200X	37.50
	.0800	.0800	.090	.300	.0100	.0450	.1250	1.5	MBB-090300	33.50	MBB-090300X	36.80
NEW	.0800	.0800	.090	.500	.0100	.0450	.1250	1.5	MBB-090500	33.50	MBB-090500X	37.50
NEW	.0800	.0800	.090	.700	.0100	.0450	.1250	1.5	MBB-090700	33.50	MBB-090700X	37.50
	.0875	.0875	.100	.200	.0125	.0500	.1250	1.5	MBB-100200	33.50	MBB-100200X	36.80
	.0875	.0875	.100	.300	.0125	.0500	.1250	1.5	MBB-100300	33.50	MBB-100300X	36.80
NEW	.0875	.0875	.100	.500	.0125	.0500	.1250	1.5	MBB-100500	33.50	MBB-100500X	37.50
NEW	.0875	.0875	.100	.700	.0125	.0500	.1250	1.5	MBB-100700	33.50	MBB-100700X	37.50
NEW	.0875	.0875	.100	.800	.0125	.0500	.1250	2.0	MBB-100800	33.50	MBB-100800X	37.50

See pg 140 for standard tool holders

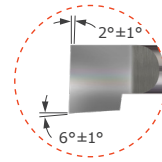
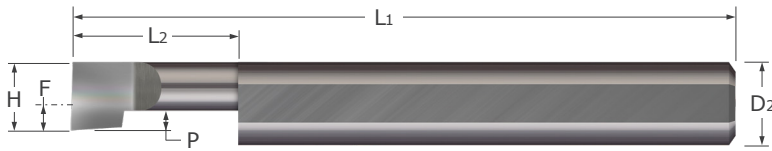
See pg 290 for tool set options

Standard – Boring Tools

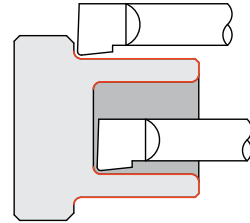
Right Hand – Sharp



BBS / BBM



- 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 geometry makes the tool as rigid as possible
- 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



Standard – Boring Tools

Head Width	Min. Bore Dia*	Max. Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TIN Coated		AITIN Coated		
							Tool #	Price	Tool #	Price	Tool #	Price	
H	decimal equiv.	L2	P	F	D2 (h6)	L1							
		+.050" -.000" +1.24mm -.00mm											
1 mm	.0394	1.12 mm	4 mm	.25 mm	-1 mm	4 mm	50 mm	BBM-040104	24.10	BBM-040104G	26.75	BBM-040104X	27.60
1 mm	.0394	1.12 mm	6 mm	.25 mm	-1 mm	4 mm	50 mm	BBM-040106	24.10	BBM-040106G	26.75	BBM-040106X	27.60
1 mm	.0394	1.12 mm	8 mm	.25 mm	-1 mm	4 mm	50 mm	BBM-040108	24.10	BBM-040108G	26.75	BBM-040108X	27.60
.050	.0500	.0600	.150	.012	-.0125	.1250	1.5	BB-050150S	24.55	BB-050150SG	27.05	BB-050150SX	27.65
.050	.0500	.0600	.200	.012	-.0125	.1250	1.5	BB-050200S	24.55	BB-050200SG	27.05	BB-050200SX	27.65
.050	.0500	.0600	.300	.012	-.0125	.1250	1.5	BB-050300S	24.55	BB-050300SG	27.05	BB-050300SX	27.65
.050	.0500	.0600	.400	.012	-.0125	.1250	1.5	BB-050400S	24.55	BB-050400SG	27.05	BB-050400SX	27.65
.060	.0600	.0700	.150	.015	-.0025	.1250	1.5	BB-060150S	24.55	BB-060150SG	27.05	BB-060150SX	27.65
.060	.0600	.0700	.200	.015	-.0025	.1250	1.5	BB-060200S	24.55	BB-060200SG	27.05	BB-060200SX	27.65
.060	.0600	.0700	.300	.015	-.0025	.1250	1.5	BB-060300S	24.55	BB-060300SG	27.05	BB-060300SX	27.65
.060	.0600	.0700	.400	.015	-.0025	.1250	1.5	BB-060400S	24.55	BB-060400SG	27.05	BB-060400SX	27.65
.060	.0600	.0700	.500	.015	-.0025	.1250	1.5	BB-060500S	24.55	BB-060500SG	27.05	BB-060500SX	27.65
.070	.0700	.0800	.150	.015	.0075	.1250	1.5	BB-070150S	24.55			BB-070150SX	27.65
.070	.0700	.0800	.200	.015	.0075	.1250	1.5	BB-070200S	24.55			BB-070200SX	27.65
.070	.0700	.0800	.300	.015	.0075	.1250	1.5	BB-070300S	24.55			BB-070300SX	27.65
2 mm	.0787	2.25 mm	4 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040204	24.10	BBM-040204G	26.75	BBM-040204X	27.60
2 mm	.0787	2.25 mm	6 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040206	24.10	BBM-040206G	26.75	BBM-040206X	27.60
2 mm	.0787	2.25 mm	8 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040208	24.10	BBM-040208G	26.75	BBM-040208X	27.60
2 mm	.0787	2.25 mm	10 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040210	24.10			BBM-040210X	27.60
2 mm	.0787	2.25 mm	13 mm	.50 mm	0 mm	4 mm	50 mm	BBM-040213	24.10	BBM-040213G	26.75	BBM-040213X	27.60
.080	.0800	.0900	.150	.020	.0175	.1250	1.5	BB-080150S	24.55	BB-080150SG	27.05	BB-080150SX	27.65
.080	.0800	.0900	.200	.020	.0175	.1250	1.5	BB-080200S	24.55	BB-080200SG	27.05	BB-080200SX	27.65
.080	.0800	.0900	.300	.020	.0175	.1250	1.5	BB-080300S	24.55	BB-080300SG	27.05	BB-080300SX	27.65

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

Continued on next page

See pg 140 for standard tool holders

Continued from previous page

	Head Width		Min. Bore Dia*	Max. Bore Depth	Projection	Centerline Offset		Shank Dia.	OAL	Uncoated		TIN Coated		AITIN Coated	
	H	decimal equiv.				P	F			D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price
	.080	.0800	.0900	.400	.020	.0175	.1250	1.5		BB-080400S	24.55	BB-080400SG	27.05	BB-080400SX	27.65
	.080	.0800	.0900	.500	.020	.0175	.1250	1.5		BB-080500S	24.55	BB-080500SG	27.05	BB-080500SX	27.65
	.080	.0800	.0900	.600	.020	.0175	.1250	1.5		BB-080600S	24.55	BB-080600SG	27.05	BB-080600SX	27.65
NEW	.090	.0900	.1000	.150	.020	.0275	.1250	1.5		BB-090150S	24.55	BB-090150SG	28.55	BB-090150SX	28.55
NEW	.090	.0900	.1000	.200	.020	.0275	.1250	1.5		BB-090200S	24.55	BB-090200SG	28.55	BB-090200SX	28.55
	.090	.0900	.1000	.300	.020	.0275	.1250	1.5		BB-090300S	24.55			BB-090300SX	27.65
NEW	.090	.0900	.1000	.400	.020	.0275	.1250	1.5		BB-090400S	24.55	BB-090400SG	28.55	BB-090400SX	28.55
NEW	.090	.0900	.1000	.500	.020	.0275	.1250	1.5		BB-090500S	24.55	BB-090500SG	28.55	BB-090500SX	28.55
	.100	.1000	.1100	.150	.025	.0375	.1250	1.5		BB-100150S	24.55	BB-100150SG	27.05	BB-100150SX	27.65
	.100	.1000	.1100	.200	.025	.0375	.1250	1.5		BB-100200S	24.55	BB-100200SG	27.05	BB-100200SX	27.65
	.100	.1000	.1100	.300	.025	.0375	.1250	1.5		BB-100300S	24.55	BB-100300SG	27.05	BB-100300SX	27.65
	.100	.1000	.1100	.400	.025	.0375	.1250	1.5		BB-100400S	24.55	BB-100400SG	27.05	BB-100400SX	27.65
	.100	.1000	.1100	.500	.025	.0375	.1250	1.5		BB-100500S	24.55	BB-100500SG	27.05	BB-100500SX	27.65
	.100	.1000	.1100	.600	.025	.0375	.1250	1.5		BB-100600S	24.55	BB-100600SG	27.05	BB-100600SX	27.65
	.100	.1000	.1100	.700	.025	.0375	.1250	1.5		BB-100700S	24.55	BB-100700SG	27.05	BB-100700SX	27.65
	.110	.1100	.1220	.150	.027	.0475	.1250	1.5		BB-110150S	24.55	BB-110150SG	27.05	BB-110150SX	27.65
	.110	.1100	.1220	.200	.027	.0475	.1250	1.5		BB-110200S	24.55	BB-110200SG	27.05	BB-110200SX	27.65
	.110	.1100	.1220	.300	.027	.0475	.1250	1.5		BB-110300S	24.55	BB-110300SG	27.05	BB-110300SX	27.65
	.110	.1100	.1220	.400	.027	.0475	.1250	1.5		BB-110400S	24.55	BB-110400SG	27.05	BB-110400SX	27.65
	.110	.1100	.1220	.500	.027	.0475	.1250	1.5		BB-110500S	24.55	BB-110500SG	27.05	BB-110500SX	27.65
	.110	.1100	.1220	.600	.027	.0475	.1250	1.5		BB-110600S	24.55	BB-110600SG	27.05	BB-110600SX	27.65
	.110	.1100	.1220	.700	.027	.0475	.1250	1.5		BB-110700S	24.55	BB-110700SG	27.05	BB-110700SX	27.65
	3 mm	.1181	3.3 mm	8 mm	.75 mm	1 mm	4 mm	50 mm		BBM-040308	24.10	BBM-040308G	26.75	BBM-040308X	27.60
	3 mm	.1181	3.3 mm	10 mm	.75 mm	1 mm	4 mm	50 mm		BBM-040310	24.10	BBM-040310G	26.75	BBM-040310X	27.60
	3 mm	.1181	3.3 mm	13 mm	.75 mm	1 mm	4 mm	50 mm		BBM-040313	24.10	BBM-040313G	26.75	BBM-040313X	27.60
	3 mm	.1181	3.3 mm	15 mm	.75 mm	1 mm	4 mm	50 mm		BBM-040315	24.10	BBM-040315G	26.75	BBM-040315X	27.60
	3 mm	.1181	3.3 mm	20 mm	.75 mm	1 mm	4 mm	50 mm		BBM-040320	24.10	BBM-040320G	26.75	BBM-040320X	27.60
	.120	.1200	.1320	.250	.030	.0263	.1875	2.0		BB-120250S	26.20	BB-120250SG	28.95	BB-120250SX	29.80
	.120	.1200	.1320	.350	.030	.0263	.1875	2.0		BB-120350S	26.20	BB-120350SG	28.95	BB-120350SX	29.80
	.120	.1200	.1320	.500	.030	.0263	.1875	2.0		BB-120500S	26.20	BB-120500SG	28.95	BB-120500SX	29.80
	.120	.1200	.1320	.600	.030	.0263	.1875	2.0		BB-120600S	26.20	BB-120600SG	28.95	BB-120600SX	29.80
	.120	.1200	.1320	.700	.030	.0263	.1875	2.0		BB-120700S	26.20	BB-120700SG	28.95	BB-120700SX	29.80
	.120	.1200	.1320	.800	.030	.0263	.1875	2.0		BB-120800S	26.20	BB-120800SG	28.95	BB-120800SX	29.80
	.140	.1400	.1520	.250	.035	.0463	.1875	2.0		BB-140250S	26.20	BB-140250SG	28.95	BB-140250SX	29.80
	.140	.1400	.1520	.400	.035	.0463	.1875	2.0		BB-140400S	26.20	BB-140400SG	28.95	BB-140400SX	29.80
	.140	.1400	.1520	.500	.035	.0463	.1875	2.0		BB-140500S	26.20	BB-140500SG	28.95	BB-140500SX	29.80
	.140	.1400	.1520	.600	.035	.0463	.1875	2.0		BB-140600S	26.20	BB-140600SG	28.95	BB-140600SX	29.80
	.140	.1400	.1520	.700	.035	.0463	.1875	2.0		BB-140700S	26.20			BB-140700SX	29.80
	.140	.1400	.1520	.750	.035	.0463	.1875	2.0		BB-140750S	26.20	BB-140750SG	28.95	BB-140750SX	29.80
	.140	.1400	.1520	.800	.035	.0463	.1875	2.0		BB-140800S	26.20	BB-140800SG	28.95	BB-140800SX	29.80
NEW	.140	.1400	.1520	.900	.035	.0463	.1875	2.0		BB-140900S	26.20	BB-140900SG	30.70	BB-140900SX	30.70

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

Continued on next page

See pg 140 for standard tool holders

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		AITIN Coated	
H	decimal equiv.	L2	L2 +.050" -.000" +1.24mm -.00mm	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price
4 mm	.1575	4.4 mm	8 mm	1 mm	2 mm	4 mm	50 mm	BBM-040408	24.10	BBM-040408G	26.75	BBM-040408X	27.60
4 mm	.1575	4.4 mm	10 mm	1 mm	2 mm	4 mm	50 mm	BBM-040410	24.10	BBM-040410G	26.75	BBM-040410X	27.60
4 mm	.1575	4.4 mm	15 mm	1 mm	2 mm	4 mm	50 mm	BBM-040415	24.10	BBM-040415G	26.75	BBM-040415X	27.60
4 mm	.1575	4.4 mm	20 mm	1 mm	2 mm	4 mm	50 mm	BBM-040420	24.10	BBM-040420G	26.75	BBM-040420X	27.60
4 mm	.1575	4.4 mm	25 mm	1 mm	2 mm	4 mm	50 mm	BBM-040425	24.10	BBM-040425G	26.75	BBM-040425X	27.60
.160	.1600	.1760	.250	.040	.0663	.1875	2.0	BB-160250S	26.20	BB-160250SG	28.95	BB-160250SX	29.80
.160	.1600	.1760	.400	.040	.0663	.1875	2.0	BB-160400S	26.20	BB-160400SG	28.95	BB-160400SX	29.80
.160	.1600	.1760	.500	.040	.0663	.1875	2.0	BB-160500S	26.20	BB-160500SG	28.95	BB-160500SX	29.80
.160	.1600	.1760	.600	.040	.0663	.1875	2.0	BB-160600S	26.20	BB-160600SG	28.95	BB-160600SX	29.80
.160	.1600	.1760	.750	.040	.0663	.1875	2.0	BB-160750S	26.20	BB-160750SG	28.95	BB-160750SX	29.80
.160	.1600	.1760	.900	.040	.0663	.1875	2.0	BB-160900S	26.20	BB-160900SG	28.95	BB-160900SX	29.80
.160	.1600	.1760	1.000	.040	.0663	.1875	2.0	BB-1601000S	26.20	BB-1601000SG	28.95	BB-1601000SX	29.80
.180	.1800	.1960	.350	.045	.0550	.2500	2.5	BB-180350S	28.30	BB-180350SG	32.35	BB-180350SX	34.05
.180	.1800	.1960	.500	.045	.0550	.2500	2.5	BB-180500S	28.30	BB-180500SG	32.35	BB-180500SX	34.05
.180	.1800	.1960	.600	.045	.0550	.2500	2.5	BB-180600S	28.30	BB-180600SG	32.35	BB-180600SX	34.05
.180	.1800	.1960	.750	.045	.0550	.2500	2.5	BB-180750S	28.30	BB-180750SG	32.35	BB-180750SX	34.05
.180	.1800	.1960	.900	.045	.0550	.2500	2.5	BB-180900S	28.30	BB-180900SG	32.35	BB-180900SX	34.05
.180	.1800	.1960	1.000	.045	.0550	.2500	2.5	BB-1801000S	28.30	BB-1801000SG	32.35	BB-1801000SX	34.05
.180	.1800	.1960	1.100	.045	.0550	.2500	2.5	BB-1801100S	28.30	BB-1801100SG	32.35	BB-1801100SX	34.05
.180	.1800	.1960	1.250	.045	.0550	.2500	2.5	BB-1801250S	28.30	BB-1801250SG	32.35	BB-1801250SX	34.05
.180	.1800	.1960	1.500	.045	.0550	.2500	2.5	BB-1801500S	28.30	BB-1801500SG	32.35	BB-1801500SX	34.05
5 mm	.1969	5.4 mm	10 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060510	26.95	BBM-060510G	30.95	BBM-060510X	32.65
5 mm	.1969	5.4 mm	15 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060515	26.95	BBM-060515G	30.95	BBM-060515X	32.65
5 mm	.1969	5.4 mm	20 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060520	26.95	BBM-060520G	30.95	BBM-060520X	32.65
5 mm	.1969	5.4 mm	25 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060525	26.95			BBM-060525X	32.65
5 mm	.1969	5.4 mm	28 mm	1.25 mm	2 mm	6 mm	57 mm	BBM-060528	26.95	BBM-060528G	30.95	BBM-060528X	32.65
.200	.2000	.2160	.400	.050	.0750	.2500	2.5	BB-200400S	28.30	BB-200400SG	32.35	BB-200400SX	34.05
.200	.2000	.2160	.500	.050	.0750	.2500	2.5	BB-200500S	28.30	BB-200500SG	32.35	BB-200500SX	34.05
.200	.2000	.2160	.600	.050	.0750	.2500	2.5	BB-200600S	28.30	BB-200600SG	32.35	BB-200600SX	34.05
.200	.2000	.2160	.700	.050	.0750	.2500	2.5	BB-200700S	28.30	BB-200700SG	32.35	BB-200700SX	34.05
.200	.2000	.2160	.800	.050	.0750	.2500	2.5	BB-200800S	28.30	BB-200800SG	32.35	BB-200800SX	34.05
.200	.2000	.2160	.900	.050	.0750	.2500	2.5	BB-200900S	28.30	BB-200900SG	32.35	BB-200900SX	34.05
.200	.2000	.2160	1.000	.050	.0750	.2500	2.5	BB-2001000S	28.30	BB-2001000SG	32.35	BB-2001000SX	34.05
.200	.2000	.2160	1.100	.050	.0750	.2500	2.5	BB-2001100S	28.30			BB-2001100SX	34.05
.200	.2000	.2160	1.200	.050	.0750	.2500	2.5	BB-2001200S	28.30			BB-2001200SX	34.05
.200	.2000	.2160	1.300	.050	.0750	.2500	2.5	BB-2001300S	28.30			BB-2001300SX	34.05
.230	.2300	.2500	.400	.057	.0738	.3125	2.5	BB-230400S	38.80	BB-230400SG	44.75	BB-230400SX	45.70
.230	.2300	.2500	.500	.057	.0738	.3125	2.5	BB-230500S	38.80	BB-230500SG	44.75	BB-230500SX	45.70
.230	.2300	.2500	.600	.057	.0738	.3125	2.5	BB-230600S	38.80	BB-230600SG	44.75	BB-230600SX	45.70
.230	.2300	.2500	.700	.057	.0738	.3125	2.5	BB-230700S	38.80	BB-230700SG	44.75	BB-230700SX	45.70
.230	.2300	.2500	.800	.057	.0738	.3125	2.5	BB-230800S	38.80	BB-230800SG	44.75	BB-230800SX	45.70
.230	.2300	.2500	.900	.057	.0738	.3125	2.5	BB-230900S	38.80	BB-230900SG	44.75	BB-230900SX	45.70
.230	.2300	.2500	1.000	.057	.0738	.3125	2.5	BB-2301000S	38.80	BB-2301000SG	44.75	BB-2301000SX	45.70
.230	.2300	.2500	1.100	.057	.0738	.3125	2.5	BB-2301100S	38.80	BB-2301100SG	44.75	BB-2301100SX	45.70
.230	.2300	.2500	1.150	.057	.0738	.3125	2.5	BB-2301150S	38.80	BB-2301150SG	44.75	BB-2301150SX	45.70

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

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Head Width		Min. Bore Dia*	Max. Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TIN Coated		AITIN Coated	
H	decimal equiv.	L ₂	+ .050" - .000" +1.24mm - .00mm	P	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price	Tool #	Price
.230	.2300	.2500	1.200	.057	.0738	.3125	2.5	BB-2301200S	38.80	BB-2301200SG	44.75	BB-2301200SX	45.70
.230	.2300	.2500	1.250	.057	.0738	.3125	2.5	BB-2301250S	38.80	BB-2301250SG	44.75	BB-2301250SX	45.70
.230	.2300	.2500	1.400	.057	.0738	.3125	2.5	BB-2301400S	38.80	BB-2301400SG	44.75	BB-2301400SX	45.70
.230	.2300	.2500	1.500	.057	.0738	.3125	2.5	BB-2301500S	38.80	BB-2301500SG	44.75	BB-2301500SX	45.70
.230	.2300	.2500	1.600	.057	.0738	.3125	2.5	BB-2301600S	38.80	BB-2301600SG	44.75	BB-2301600SX	45.70
6 mm	.2362	6.5 mm	10 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060610	26.95	BBM-060610G	30.95	BBM-060610X	32.65
6 mm	.2362	6.5 mm	15 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060615	26.95	BBM-060615G	30.95	BBM-060615X	32.65
6 mm	.2362	6.5 mm	20 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060620	26.95			BBM-060620X	32.65
6 mm	.2362	6.5 mm	25 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060625	26.95	BBM-060625G	30.95	BBM-060625X	32.65
6 mm	.2362	6.5 mm	30 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060630	26.95	BBM-060630G	30.95	BBM-060630X	32.65
6 mm	.2362	6.5 mm	35 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060635	26.95	BBM-060635G	30.95	BBM-060635X	32.65
6 mm	.2362	6.5 mm	38 mm	1.50 mm	3 mm	6 mm	57 mm	BBM-060638	26.95	BBM-060638G	30.95	BBM-060638X	32.65
NEW	.260	.2800	.500	.065	.1038	.3125	2.5	BB-260500S	38.80	BB-260500SG	45.70	BB-260500SX	45.70
NEW	.260	.2800	.750	.065	.1038	.3125	2.5	BB-260750S	38.80	BB-260750SG	45.70	BB-260750SX	45.70
NEW	.260	.2800	1.000	.065	.1038	.3125	2.5	BB-2601000S	38.80	BB-2601000SG	45.70	BB-2601000SX	45.70
NEW	.260	.2800	1.250	.065	.1038	.3125	2.5	BB-2601250S	38.80	BB-2601250SG	45.70	BB-2601250SX	45.70
7 mm	.2755	7.5 mm	15 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080715	36.80	BBM-080715G	42.70	BBM-080715X	44.75
7 mm	.2755	7.5 mm	20 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080720	36.80			BBM-080720X	44.75
7 mm	.2755	7.5 mm	25 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080725	36.80			BBM-080725X	44.75
7 mm	.2755	7.5 mm	32 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080732	36.80	BBM-080732G	42.70	BBM-080732X	44.75
7 mm	.2755	7.5 mm	38 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080738	36.80	BBM-080738G	42.70	BBM-080738X	44.75
7 mm	.2755	7.5 mm	46 mm	1.75 mm	3 mm	8 mm	63 mm	BBM-080746	36.80	BBM-080746G	42.70	BBM-080746X	44.75
.290	.2900	.3100	.500	.072	.1338	.3125	2.5	BB-290500S	38.80	BB-290500SG	44.75	BB-290500SX	45.70
.290	.2900	.3100	.600	.072	.1338	.3125	2.5	BB-290600S	38.80	BB-290600SG	44.75	BB-290600SX	45.70
.290	.2900	.3100	.750	.072	.1338	.3125	2.5	BB-290750S	38.80	BB-290750SG	44.75	BB-290750SX	45.70
.290	.2900	.3100	.900	.072	.1338	.3125	2.5	BB-290900S	38.80	BB-290900SG	44.75	BB-290900SX	45.70
.290	.2900	.3100	1.000	.072	.1338	.3125	2.5	BB-2901000S	38.80	BB-2901000SG	44.75	BB-2901000SX	45.70
.290	.2900	.3100	1.100	.072	.1338	.3125	2.5	BB-2901100S	38.80	BB-2901100SG	44.75	BB-2901100SX	45.70
.290	.2900	.3100	1.250	.072	.1338	.3125	2.5	BB-2901250S	38.80	BB-2901250SG	44.75	BB-2901250SX	45.70
.290	.2900	.3100	1.350	.072	.1338	.3125	2.5	BB-2901350S	38.80	BB-2901350SG	44.75	BB-2901350SX	45.70
.290	.2900	.3100	1.500	.072	.1338	.3125	2.5	BB-2901500S	38.80	BB-2901500SG	44.75	BB-2901500SX	45.70
.290	.2900	.3100	1.600	.072	.1338	.3125	2.5	BB-2901600S	38.80	BB-2901600SG	44.75	BB-2901600SX	45.70
.290	.2900	.3100	1.750	.072	.1338	.3125	2.5	BB-2901750S	38.80	BB-2901750SG	44.75	BB-2901750SX	45.70
8 mm	.3150	8.5 mm	13 mm	2 mm	4 mm	8 mm	63 mm	BBM-080813	36.80	BBM-080813G	42.70	BBM-080813X	44.75
8 mm	.3150	8.5 mm	20 mm	2 mm	4 mm	8 mm	63 mm	BBM-080820	36.80	BBM-080820G	42.70	BBM-080820X	44.75
8 mm	.3150	8.5 mm	25 mm	2 mm	4 mm	8 mm	63 mm	BBM-080825	36.80	BBM-080825G	42.70	BBM-080825X	44.75
8 mm	.3150	8.5 mm	32 mm	2 mm	4 mm	8 mm	63 mm	BBM-080832	36.80	BBM-080832G	42.70	BBM-080832X	44.75
8 mm	.3150	8.5 mm	38 mm	2 mm	4 mm	8 mm	63 mm	BBM-080838	36.80	BBM-080838G	42.70	BBM-080838X	44.75
8 mm	.3150	8.5 mm	46 mm	2 mm	4 mm	8 mm	63 mm	BBM-080846	36.80	BBM-080846G	42.70	BBM-080846X	44.75
8 mm	.3150	8.5 mm	50 mm	2 mm	4 mm	8 mm	63 mm	BBM-080850	36.80	BBM-080850G	42.70	BBM-080850X	44.75

Standard – Boring Tools

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

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See pg 140 for standard tool holders

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		AITIN Coated	
H	decimal equiv.	L ₂	$\begin{matrix} +.050'' \\ -.000'' \\ +1.24\text{mm} \\ -.00\text{mm} \end{matrix}$	P	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price	Tool #	Price
.320	.3200	.3400	.500	.080	.1325	.3750	2.5	BB-320500S	53.40	BB-320500SG	59.65	BB-320500SX	61.60
.320	.3200	.3400	.600	.080	.1325	.3750	2.5	BB-320600S	53.40	BB-320600SG	59.65	BB-320600SX	61.60
.320	.3200	.3400	.750	.080	.1325	.3750	2.5	BB-320750S	53.40	BB-320750SG	59.65	BB-320750SX	61.60
.320	.3200	.3400	.900	.080	.1325	.3750	2.5	BB-320900S	53.40			BB-320900SX	61.60
.320	.3200	.3400	1.000	.080	.1325	.3750	2.5	BB-3201000S	53.40	BB-3201000SG	59.65	BB-3201000SX	61.60
.320	.3200	.3400	1.100	.080	.1325	.3750	2.5	BB-3201100S	53.40	BB-3201100SG	59.65	BB-3201100SX	61.60
.320	.3200	.3400	1.250	.080	.1325	.3750	2.5	BB-3201250S	53.40	BB-3201250SG	59.65	BB-3201250SX	61.60
.320	.3200	.3400	1.500	.080	.1325	.3750	2.5	BB-3201500S	53.40	BB-3201500SG	59.65	BB-3201500SX	61.60
.320	.3200	.3400	1.600	.080	.1325	.3750	2.5	BB-3201600S	53.40	BB-3201600SG	59.65	BB-3201600SX	61.60
.320	.3200	.3400	1.800	.080	.1325	.3750	2.5	BB-3201800S	53.40	BB-3201800SG	59.65	BB-3201800SX	61.60
.320	.3200	.3400	2.000	.080	.1325	.3750	4.0	BB-3202000S	68.60	BB-3202000SG	76.15	BB-3202000SX	77.40
.320	.3200	.3400	2.500	.080	.1325	.3750	4.0	BB-3202500S	68.60	BB-3202500SG	76.15	BB-3202500SX	77.40
.320	.3200	.3400	3.000	.080	.1325	.3750	4.0	BB-3203000S	68.60	BB-3203000SG	76.15	BB-3203000SX	77.40
9 mm	.3543	9.5 mm	25 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100925	55.75	BBM-100925G	62.10	BBM-100925X	64.00
9 mm	.3543	9.5 mm	32 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100932	55.75	BBM-100932G	62.10	BBM-100932X	64.00
9 mm	.3543	9.5 mm	38 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100938	55.75	BBM-100938G	62.10	BBM-100938X	64.00
9 mm	.3543	9.5 mm	46 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100946	55.75	BBM-100946G	62.10	BBM-100946X	64.00
9 mm	.3543	9.5 mm	50 mm	2.25 mm	4mm	10 mm	72 mm	BBM-100950	55.75			BBM-100950X	64.00
.360	.3600	.3800	.500	.090	.1725	.3750	2.5	BB-360500S	53.40	BB-360500SG	59.65	BB-360500SX	61.60
.360	.3600	.3800	.600	.090	.1725	.3750	2.5	BB-360600S	53.40	BB-360600SG	59.65	BB-360600SX	61.60
.360	.3600	.3800	.750	.090	.1725	.3750	2.5	BB-360750S	53.40	BB-360750SG	59.65	BB-360750SX	61.60
.360	.3600	.3800	.900	.090	.1725	.3750	2.5	BB-360900S	53.40	BB-360900SG	59.65	BB-360900SX	61.60
.360	.3600	.3800	1.000	.090	.1725	.3750	2.5	BB-3601000S	53.40	BB-3601000SG	59.65	BB-3601000SX	61.60
.360	.3600	.3800	1.150	.090	.1725	.3750	2.5	BB-3601150S	53.40	BB-3601150SG	59.65	BB-3601150SX	61.60
.360	.3600	.3800	1.250	.090	.1725	.3750	2.5	BB-3601250S	53.40	BB-3601250SG	59.65	BB-3601250SX	61.60
.360	.3600	.3800	1.500	.090	.1725	.3750	2.5	BB-3601500S	53.40	BB-3601500SG	59.65	BB-3601500SX	61.60
.360	.3600	.3800	1.600	.090	.1725	.3750	2.5	BB-3601600S	53.40	BB-3601600SG	59.65	BB-3601600SX	61.60
.360	.3600	.3800	1.800	.090	.1725	.3750	2.5	BB-3601800S	53.40	BB-3601800SG	59.65	BB-3601800SX	61.60
.360	.3600	.3800	2.000	.090	.1725	.3750	4.0	BB-3602000S	68.60	BB-3602000SG	76.15	BB-3602000SX	77.40
.360	.3600	.3800	2.500	.090	.1725	.3750	4.0	BB-3602500S	68.60	BB-3602500SG	76.15	BB-3602500SX	77.40
.360	.3600	.3800	3.000	.090	.1725	.3750	4.0	BB-3603000S	68.60			BB-3603000SX	77.40
10 mm	.3937	10.5 mm	15 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101015	55.75	BBM-101015G	62.10	BBM-101015X	64.00
10 mm	.3937	10.5 mm	20 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101020	55.75	BBM-101020G	62.10		
10 mm	.3937	10.5 mm	25 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101025	55.75	BBM-101025G	62.10	BBM-101025X	64.00
10 mm	.3937	10.5 mm	32 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101032	55.75	BBM-101032G	62.10	BBM-101032X	64.00
10 mm	.3937	10.5 mm	38 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101038	55.75	BBM-101038G	62.10	BBM-101038X	64.00
10 mm	.3937	10.5 mm	50 mm	2.50 mm	5 mm	10 mm	72 mm	BBM-101050	55.75	BBM-101050G	62.10	BBM-101050X	64.00
11 mm	.4331	11.5 mm	15 mm	2.75 mm	5 mm	12 mm	83 mm	BBM-121115	70.30				
11 mm	.4331	11.5 mm	38 mm	2.75 mm	5 mm	12 mm	83 mm	BBM-121138	70.30				
11 mm	.4331	11.5 mm	50 mm	2.75 mm	5 mm	12 mm	83 mm	BBM-121150	70.30	BBM-121150G	79.10		
12 mm	.4724	12.5 mm	20 mm	3 mm	6 mm	12 mm	83 mm	BBM-121220	70.30	BBM-121220G	79.10	BBM-121220X	82.25
12 mm	.4724	12.5 mm	32 mm	3 mm	6 mm	12 mm	83 mm	BBM-121232	70.30	BBM-121232G	79.10	BBM-121232X	82.25
12 mm	.4724	12.5 mm	46 mm	3 mm	6 mm	12 mm	83 mm	BBM-121246	70.30	BBM-121246G	79.10	BBM-121246X	82.25
12 mm	.4724	12.5 mm	60 mm	3 mm	6 mm	12 mm	83 mm	BBM-121260	70.30	BBM-121260G	79.10	BBM-121260X	82.25

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

Continued on next page

BBS / BBM



Standard – Boring Tools

Right Hand – Sharp (cont.)

Continued from previous page

Head Width		Min. Bore Dia*	Max. Bore Depth	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TIN Coated		AITIN Coated	
H	decimal equiv.	L ₂	$+0.050''$ $-0.000''$ $+1.24\text{mm}$ -0.00mm	P	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price	Tool #	Price
.490	.4900	.5100	.750	.122	.2400	.5000	3.0	BB-490750S	75.00	BB-490750SG	82.55	BB-490750SX	85.10
.490	.4900	.5100	1.000	.122	.2400	.5000	3.0	BB-4901000S	75.00			BB-4901000SX	85.10
.490	.4900	.5100	1.250	.122	.2400	.5000	3.0	BB-4901250S	75.00	BB-4901250SG	82.55	BB-4901250SX	85.10
.490	.4900	.5100	1.500	.122	.2400	.5000	3.0	BB-4901500S	75.00			BB-4901500SX	85.10
.490	.4900	.5100	2.000	.122	.2400	.5000	4.0	BB-4902000S	82.25	BB-4902000SG	91.25	BB-4902000SX	94.20
.490	.4900	.5100	2.500	.122	.2400	.5000	4.0	BB-4902500S	82.25	BB-4902500SG	91.25	BB-4902500SX	94.20
.490	.4900	.5100	2.750	.122	.2400	.5000	4.0	BB-4902750S	82.25	BB-4902750SG	91.25	BB-4902750SX	94.20
.490	.4900	.5100	3.000	.122	.2400	.5000	6.0	BB-4903000S	103.80			BB-4903000SX	117.70
.490	.4900	.5100	3.500	.122	.2400	.5000	6.0	BB-4903500S	103.80	BB-4903500SG	115.55	BB-4903500SX	117.70
.490	.4900	.5100	4.000	.122	.2400	.5000	6.0	BB-4904000S	103.80			BB-4904000SX	117.70
.490	.4900	.5100	4.500	.122	.2400	.5000	6.0	BB-4904500S	103.80			BB-4904500SX	117.70

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

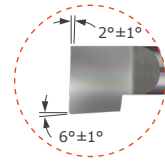
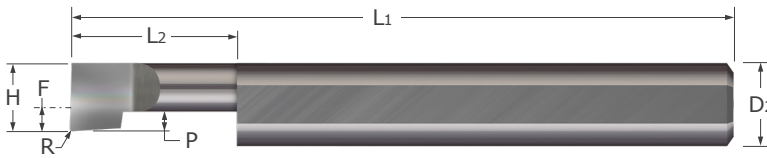
See pg 140 for standard tool holders

Standard – Boring Tools

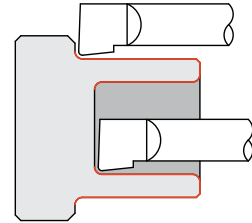
Right Hand



BB



- 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 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



Standard – Boring Tools

Head Width	Minimum Bore Dia.*	Max. Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
								Tool #	Price	Tool #	Price	Tool #	Price
H	L2	$+.050''$ $-.000''$	$R+.003''$ $-.000''$	P	F	D2 (h6)	L1						
.050	.055	.150	.003	.012	-.0125	.1250	1.5	BB-050150	26.10	BB-050150G	28.60	BB-050150X	29.25
.050	.055	.200	.003	.012	-.0125	.1250	1.5	BB-050200	26.10	BB-050200G	28.60	BB-050200X	29.25
.050	.055	.300	.003	.012	-.0125	.1250	1.5	BB-050300	26.10	BB-050300G	28.60	BB-050300X	29.25
.050	.055	.400	.003	.012	-.0125	.1250	1.5	BB-050400	26.10	BB-050400G	28.60	BB-050400X	29.25
.060	.070	.150	.003	.015	-.0025	.1250	1.5	BB-060150	26.10	BB-060150G	28.60	BB-060150X	29.25
.060	.070	.200	.003	.015	-.0025	.1250	1.5	BB-060200	26.10	BB-060200G	28.60	BB-060200X	29.25
.060	.070	.300	.003	.015	-.0025	.1250	1.5	BB-060300	26.10	BB-060300G	28.60	BB-060300X	29.25
.060	.070	.400	.003	.015	-.0025	.1250	1.5	BB-060400	26.10	BB-060400G	28.60	BB-060400X	29.25
.060	.070	.500	.003	.015	-.0025	.1250	1.5	BB-060500	26.10	BB-060500G	28.60	BB-060500X	29.25
.070	.080	.150	.003	.015	.0075	.1250	1.5	BB-070150	26.10			BB-070150X	29.25
.070	.080	.200	.003	.015	.0075	.1250	1.5	BB-070200	26.10			BB-070200X	29.25
.070	.080	.300	.003	.015	.0075	.1250	1.5	BB-070300	26.10			BB-070300X	29.25
.080	.090	.150	.003	.020	.0175	.1250	1.5	BB-080150	26.10	BB-080150G	28.60	BB-080150X	29.25
.080	.090	.200	.003	.020	.0175	.1250	1.5	BB-080200	26.10	BB-080200G	28.60	BB-080200X	29.25
.080	.090	.300	.003	.020	.0175	.1250	1.5	BB-080300	26.10	BB-080300G	28.60	BB-080300X	29.25
.080	.090	.400	.003	.020	.0175	.1250	1.5	BB-080400	26.10	BB-080400G	28.60	BB-080400X	29.25
.080	.090	.500	.003	.020	.0175	.1250	1.5	BB-080500	26.10	BB-080500G	28.60	BB-080500X	29.25
.080	.090	.600	.003	.020	.0175	.1250	1.5	BB-080600	26.10	BB-080600G	28.60	BB-080600X	29.25
.090	.100	.150	.003	.020	.0275	.1250	1.5	BB3-090150	26.10	BB3-090150G	30.10	BB3-090150X	30.10 NEW
.090	.100	.200	.003	.020	.0275	.1250	1.5	BB3-090200	26.10	BB3-090200G	30.10	BB3-090200X	30.10 NEW
.090	.100	.300	.003	.020	.0275	.1250	1.5	BB-090300	26.10			BB-090300X	29.25
.090	.100	.400	.003	.020	.0275	.1250	1.5	BB3-090400	26.10	BB3-090400G	30.10	BB3-090400X	30.10 NEW
.090	.100	.500	.003	.020	.0275	.1250	1.5	BB3-090500	26.10	BB3-090500G	30.10	BB3-090500X	30.10 NEW

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

Continued on next page

See pg 140 for standard tool holders

BB



Standard – Boring Tools

Right Hand (cont.)

Continued from previous page

Head Width	Minimum Bore Dia.*	Max. Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TIN Coated		ATIN Coated	
								H	L2	Tool #	Price	Tool #	Price
			$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	P	F	D2 (h6)	L1						
.100	.110	.150	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.025	.0375	.1250	1.5	BB-100150	26.10	BB-100150G	28.60	BB-100150X	29.25
.100	.110	.200	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.025	.0375	.1250	1.5	BB-100200	26.10	BB-100200G	28.60	BB-100200X	29.25
.100	.110	.300	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.025	.0375	.1250	1.5	BB-100300	26.10	BB-100300G	28.60	BB-100300X	29.25
.100	.110	.400	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.025	.0375	.1250	1.5	BB-100400	26.10	BB-100400G	28.60	BB-100400X	29.25
.100	.110	.500	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.025	.0375	.1250	1.5	BB-100500	26.10	BB-100500G	28.60	BB-100500X	29.25
.100	.110	.600	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.025	.0375	.1250	1.5	BB-100600	26.10	BB-100600G	28.60	BB-100600X	29.25
.100	.110	.700	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.025	.0375	.1250	1.5	BB-100700	26.10	BB-100700G	28.60	BB-100700X	29.25
.110	.122	.150	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.027	.0475	.1250	1.5	BB-110150	26.10	BB-110150G	28.60	BB-110150X	29.25
.110	.122	.200	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.027	.0475	.1250	1.5	BB-110200	26.10	BB-110200G	28.60	BB-110200X	29.25
.110	.122	.300	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.027	.0475	.1250	1.5	BB-110300	26.10	BB-110300G	28.60	BB-110300X	29.25
.110	.122	.400	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.027	.0475	.1250	1.5	BB-110400	26.10	BB-110400G	28.60	BB-110400X	29.25
.110	.122	.500	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.027	.0475	.1250	1.5	BB-110500	26.10	BB-110500G	28.60	BB-110500X	29.25
.110	.122	.600	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.027	.0475	.1250	1.5	BB-110600	26.10	BB-110600G	28.60	BB-110600X	29.25
.110	.122	.700	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	.027	.0475	.1250	1.5	BB-110700	26.10	BB-110700G	28.60	BB-110700X	29.25

	H	L2	R	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price	
NEW	.120	.132	.250	.003	.030	.0263	.1875	2.0	BB3-120250	27.70	BB3-120250G	32.20	BB3-120250X	32.20
	.120	.132	.250	.006	.030	.0263	.1875	2.0	BB-120250	27.70	BB-120250G	30.50	BB-120250X	31.30
NEW	.120	.132	.350	.003	.030	.0263	.1875	2.0	BB3-120350	27.70	BB3-120350G	32.20	BB3-120350X	32.20
	.120	.132	.350	.006	.030	.0263	.1875	2.0	BB-120350	27.70	BB-120350G	30.50	BB-120350X	31.30
NEW	.120	.132	.500	.003	.030	.0263	.1875	2.0	BB3-120500	27.70	BB3-120500G	32.20	BB3-120500X	32.20
	.120	.132	.500	.006	.030	.0263	.1875	2.0	BB-120500	27.70	BB-120500G	30.50	BB-120500X	31.30
NEW	.120	.132	.600	.003	.030	.0263	.1875	2.0	BB3-120600	27.70	BB3-120600G	32.20	BB3-120600X	32.20
	.120	.132	.600	.006	.030	.0263	.1875	2.0	BB-120600	27.70	BB-120600G	30.50	BB-120600X	31.30
NEW	.120	.132	.700	.003	.030	.0263	.1875	2.0	BB3-120700	27.70	BB3-120700G	32.20	BB3-120700X	32.20
	.120	.132	.700	.006	.030	.0263	.1875	2.0	BB-120700	27.70	BB-120700G	30.50	BB-120700X	31.30
NEW	.120	.132	.800	.003	.030	.0263	.1875	2.0	BB3-120800	27.70	BB3-120800G	32.20	BB3-120800X	32.20
	.120	.132	.800	.006	.030	.0263	.1875	2.0	BB-120800	27.70	BB-120800G	30.50	BB-120800X	31.30
NEW	.140	.152	.250	.003	.035	.0463	.1875	2.0	BB3-140250	27.70	BB3-140250G	32.20	BB3-140250X	32.20
	.140	.152	.250	.006	.035	.0463	.1875	2.0	BB-140250	27.70	BB-140250G	30.50	BB-140250X	31.30
NEW	.140	.152	.400	.003	.035	.0463	.1875	2.0	BB3-140400	27.70	BB3-140400G	32.20	BB3-140400X	32.20
	.140	.152	.400	.006	.035	.0463	.1875	2.0	BB-140400	27.70	BB-140400G	30.50	BB-140400X	31.30
NEW	.140	.152	.500	.003	.035	.0463	.1875	2.0	BB3-140500	27.70	BB3-140500G	32.20	BB3-140500X	32.20
	.140	.152	.500	.006	.035	.0463	.1875	2.0	BB-140500	27.70	BB-140500G	30.50	BB-140500X	31.30
NEW	.140	.152	.600	.003	.035	.0463	.1875	2.0	BB3-140600	27.70	BB3-140600G	32.20	BB3-140600X	32.20
	.140	.152	.600	.006	.035	.0463	.1875	2.0	BB-140600	27.70	BB-140600G	30.50	BB-140600X	31.30
NEW	.140	.152	.700	.003	.035	.0463	.1875	2.0	BB3-140700	27.70	BB3-140700G	32.20	BB3-140700X	32.20
	.140	.152	.700	.006	.035	.0463	.1875	2.0	BB-140700	27.70	BB-140700G	30.50	BB-140700X	31.30
NEW	.140	.152	.750	.003	.035	.0463	.1875	2.0	BB3-140750	27.70	BB3-140750G	32.20	BB3-140750X	32.20
	.140	.152	.750	.006	.035	.0463	.1875	2.0	BB-140750	27.70	BB-140750G	30.50	BB-140750X	31.30
NEW	.140	.152	.800	.003	.035	.0463	.1875	2.0	BB3-140800	27.70	BB3-140800G	32.20	BB3-140800X	32.20
	.140	.152	.800	.006	.035	.0463	.1875	2.0	BB-140800	27.70	BB-140800G	30.50	BB-140800X	31.30
NEW	.140	.152	.900	.003	.035	.0463	.1875	2.0	BB3-140900	27.70	BB3-140900G	32.20	BB3-140900X	32.20
NEW	.140	.152	.900	.006	.035	.0463	.1875	2.0	BB6-140900	27.70	BB6-140900G	32.20	BB6-140900X	32.20

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

Continued on next page

Standard – Boring Tools

Standard – Boring Tools

Right Hand (cont.)



BB

Continued from previous page

Head Width	Minimum Bore Dia.*	Max. Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TIN Coated		AITIN Coated		
H	L ₂	$L_2^{+.050"}_{-.000"} R^{+.002"}_{-.000"} P$	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price	Tool #	Price			
.160	.176	.250	.003	.040	.0663	.1875	2.0	BB3-160250	27.70	BB3-160250G	32.20	BB3-160250X	32.20	NEW
.160	.176	.250	.006	.040	.0663	.1875	2.0	BB-160250	27.70	BB-160250G	30.50	BB-160250X	31.30	
.160	.176	.400	.003	.040	.0663	.1875	2.0	BB3-160400	27.70	BB3-160400G	32.20	BB3-160400X	32.20	NEW
.160	.176	.400	.006	.040	.0663	.1875	2.0	BB-160400	27.70	BB-160400G	30.50	BB-160400X	31.30	
.160	.176	.500	.003	.040	.0663	.1875	2.0	BB3-160500	27.70	BB3-160500G	32.20	BB3-160500X	32.20	NEW
.160	.176	.500	.006	.040	.0663	.1875	2.0	BB-160500	27.70	BB-160500G	30.50	BB-160500X	31.30	
.160	.176	.600	.003	.040	.0663	.1875	2.0	BB3-160600	27.70	BB3-160600G	32.20	BB3-160600X	32.20	NEW
.160	.176	.600	.006	.040	.0663	.1875	2.0	BB-160600	27.70	BB-160600G	30.50	BB-160600X	31.30	
.160	.176	.700	.003	.040	.0663	.1875	2.0	BB3-160700	27.70	BB3-160700G	32.20	BB3-160700X	32.20	NEW
.160	.176	.700	.006	.040	.0663	.1875	2.0	BB6-160700	27.70	BB6-160700G	32.20	BB6-160700X	32.20	NEW
.160	.176	.750	.003	.040	.0663	.1875	2.0	BB3-160750	27.70	BB3-160750G	32.20	BB3-160750X	32.20	NEW
.160	.176	.750	.006	.040	.0663	.1875	2.0	BB-160750	27.70	BB-160750G	30.50	BB-160750X	31.30	
.160	.176	.800	.003	.040	.0663	.1875	2.0	BB3-160800	27.70	BB3-160800G	32.20	BB3-160800X	32.20	NEW
.160	.176	.800	.006	.040	.0663	.1875	2.0	BB6-160800	27.70	BB6-160800G	32.20	BB6-160800X	32.20	NEW
.160	.176	.900	.003	.040	.0663	.1875	2.0	BB3-160900	27.70	BB3-160900G	32.20	BB3-160900X	32.20	NEW
.160	.176	.900	.006	.040	.0663	.1875	2.0	BB-160900	27.70	BB-160900G	30.50	BB-160900X	31.30	
.160	.176	1.000	.003	.040	.0663	.1875	2.0	BB3-1601000	27.70	BB3-1601000G	32.20	BB3-1601000X	32.20	NEW
.160	.176	1.000	.006	.040	.0663	.1875	2.0	BB-1601000	27.70	BB-1601000G	30.50	BB-1601000X	31.30	
.180	.196	.350	.006	.045	.0550	.2500	2.5	BB-180350	29.95	BB-180350G	34.05	BB-180350X	35.70	
.180	.196	.500	.006	.045	.0550	.2500	2.5	BB-180500	29.95	BB-180500G	34.05	BB-180500X	35.70	
.180	.196	.600	.006	.045	.0550	.2500	2.5	BB-180600	29.95	BB-180600G	34.05	BB-180600X	35.70	
.180	.196	.750	.006	.045	.0550	.2500	2.5	BB-180750	29.95	BB-180750G	34.05	BB-180750X	35.70	
.180	.196	.900	.006	.045	.0550	.2500	2.5	BB-180900	29.95	BB-180900G	34.05	BB-180900X	35.70	
.180	.196	1.000	.006	.045	.0550	.2500	2.5	BB-1801000	29.95	BB-1801000G	34.05	BB-1801000X	35.70	
.180	.196	1.100	.006	.045	.0550	.2500	2.5	BB-1801100	29.95	BB-1801100G	34.05	BB-1801100X	35.70	
.180	.196	1.250	.006	.045	.0550	.2500	2.5	BB-1801250	29.95	BB-1801250G	34.05	BB-1801250X	35.70	
.180	.196	1.500	.006	.045	.0550	.2500	2.5	BB-1801500	29.95	BB-1801500G	34.05	BB-1801500X	35.70	
.200	.216	.400	.006	.050	.0750	.2500	2.5	BB-200400	29.95	BB-200400G	34.05	BB-200400X	35.70	
.200	.216	.500	.006	.050	.0750	.2500	2.5	BB-200500	29.95	BB-200500G	34.05	BB-200500X	35.70	
.200	.216	.600	.006	.050	.0750	.2500	2.5	BB-200600	29.95	BB-200600G	34.05	BB-200600X	35.70	
.200	.216	.700	.006	.050	.0750	.2500	2.5	BB-200700	29.95	BB-200700G	34.05	BB-200700X	35.70	
.200	.216	.750	.006	.050	.0750	.2500	2.5	BB6-200750	29.95	BB6-200750G	35.70	BB6-200750X	35.70	NEW
.200	.216	.800	.006	.050	.0750	.2500	2.5	BB-200800	29.95	BB-200800G	34.05	BB-200800X	35.70	
.200	.216	.900	.006	.050	.0750	.2500	2.5	BB-200900	29.95	BB-200900G	34.05	BB-200900X	35.70	
.200	.216	1.000	.006	.050	.0750	.2500	2.5	BB-2001000	29.95	BB-2001000G	34.05	BB-2001000X	35.70	
.200	.216	1.100	.006	.050	.0750	.2500	2.5	BB-2001100	29.95			BB-2001100X	35.70	
.200	.216	1.200	.006	.050	.0750	.2500	2.5	BB-2001200	29.95	BB-2001200G	34.05	BB-2001200X	35.70	
.200	.216	1.300	.006	.050	.0750	.2500	2.5	BB-2001300	29.95	BB-2001300G	34.05	BB-2001300X	35.70	
.200	.216	1.500	.006	.050	.0750	.2500	2.5	BB6-2001500	29.95	BB6-2001500G	35.70	BB6-2001500X	35.70	NEW

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

Continued on next page

See pg 140 for standard tool holders

Standard – Boring Tools

BB



Standard – Boring Tools Right Hand (cont.)

Continued from previous page

	Head Width	Minimum Bore Dia.*	Max. Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TIN Coated		AlTiN Coated	
									Tool #	Price	Tool #	Price	Tool #	Price
	H	L ₂	+ .050" / - .000"	R +.002" / R -.000"	P	F	D ₂ (h6)	L ₁						
	.230	.250	.400	.006	.057	.0738	.3125	2.5	BB-230400	40.20	BB-230400G	46.15	BB-230400X	47.10
	.230	.250	.500	.006	.057	.0738	.3125	2.5	BB-230500	40.20	BB-230500G	46.15	BB-230500X	47.10
	.230	.250	.600	.006	.057	.0738	.3125	2.5	BB-230600	40.20	BB-230600G	46.15	BB-230600X	47.10
	.230	.250	.700	.006	.057	.0738	.3125	2.5	BB-230700	40.20	BB-230700G	46.15	BB-230700X	47.10
NEW	.230	.250	.750	.006	.057	.0738	.3125	2.5	BB6-230750	40.20	BB6-230750G	47.10	BB6-230750X	47.10
	.230	.250	.800	.006	.057	.0738	.3125	2.5	BB-230800	40.20	BB-230800G	46.15	BB-230800X	47.10
	.230	.250	.900	.006	.057	.0738	.3125	2.5	BB-230900	40.20	BB-230900G	46.15	BB-230900X	47.10
	.230	.250	1.000	.006	.057	.0738	.3125	2.5	BB-231000	40.20	BB-231000G	46.15	BB-231000X	47.10
	.230	.250	1.100	.006	.057	.0738	.3125	2.5	BB-231100	40.20	BB-231100G	46.15	BB-231100X	47.10
	.230	.250	1.150	.006	.057	.0738	.3125	2.5	BB-231150	40.20	BB-231150G	46.15	BB-231150X	47.10
	.230	.250	1.200	.006	.057	.0738	.3125	2.5	BB-231200	40.20	BB-231200G	46.15	BB-231200X	47.10
	.230	.250	1.250	.006	.057	.0738	.3125	2.5	BB-231250	40.20	BB-231250G	46.15	BB-231250X	47.10
	.230	.250	1.400	.006	.057	.0738	.3125	2.5	BB-231400	40.20	BB-231400G	46.15	BB-231400X	47.10
	.230	.250	1.500	.006	.057	.0738	.3125	2.5	BB-231500	40.20	BB-231500G	46.15	BB-231500X	47.10
	.230	.250	1.600	.006	.057	.0738	.3125	2.5	BB-231600	40.20	BB-231600G	46.15	BB-231600X	47.10
NEW	.260	.280	.400	.006	.065	.1038	.3125	2.5	BB6-260400	40.20	BB6-260400G	47.10	BB6-260400X	47.10
NEW	.260	.280	.500	.006	.065	.1038	.3125	2.5	BB6-260500	40.20	BB6-260500G	47.10	BB6-260500X	47.10
NEW	.260	.280	.600	.006	.065	.1038	.3125	2.5	BB6-260600	40.20	BB6-260600G	47.10	BB6-260600X	47.10
NEW	.260	.280	.700	.006	.065	.1038	.3125	2.5	BB6-260700	40.20	BB6-260700G	47.10	BB6-260700X	47.10
NEW	.260	.280	.750	.006	.065	.1038	.3125	2.5	BB6-260750	40.20	BB6-260750G	47.10	BB6-260750X	47.10
NEW	.260	.280	.800	.006	.065	.1038	.3125	2.5	BB6-260800	40.20	BB6-260800G	47.10	BB6-260800X	47.10
NEW	.260	.280	.900	.006	.065	.1038	.3125	2.5	BB6-260900	40.20	BB6-260900G	47.10	BB6-260900X	47.10
NEW	.260	.280	1.000	.006	.065	.1038	.3125	2.5	BB6-2601000	40.20	BB6-2601000G	47.10	BB6-2601000X	47.10
NEW	.260	.280	1.250	.006	.065	.1038	.3125	2.5	BB6-2601250	40.20	BB6-2601250G	47.10	BB6-2601250X	47.10
	.290	.310	.500	.006	.072	.1338	.3125	2.5	BB-290500	40.20	BB-290500G	46.15	BB-290500X	47.10
	.290	.310	.600	.006	.072	.1338	.3125	2.5	BB-290600	40.20	BB-290600G	46.15	BB-290600X	47.10
	.290	.310	.750	.006	.072	.1338	.3125	2.5	BB-290750	40.20	BB-290750G	46.15	BB-290750X	47.10
	.290	.310	.900	.006	.072	.1338	.3125	2.5	BB-290900	40.20	BB-290900G	46.15	BB-290900X	47.10
	.290	.310	1.000	.006	.072	.1338	.3125	2.5	BB-2901000	40.20	BB-2901000G	46.15	BB-2901000X	47.10
	.290	.310	1.100	.006	.072	.1338	.3125	2.5	BB-2901100	40.20	BB-2901100G	46.15	BB-2901100X	47.10
	.290	.310	1.250	.006	.072	.1338	.3125	2.5	BB-2901250	40.20	BB-2901250G	46.15	BB-2901250X	47.10
	.290	.310	1.350	.006	.072	.1338	.3125	2.5	BB-2901350	40.20	BB-2901350G	46.15	BB-2901350X	47.10
	.290	.310	1.500	.006	.072	.1338	.3125	2.5	BB-2901500	40.20	BB-2901500G	46.15	BB-2901500X	47.10
	.290	.310	1.600	.006	.072	.1338	.3125	2.5	BB-2901600	40.20	BB-2901600G	46.15	BB-2901600X	47.10
	.290	.310	1.750	.006	.072	.1338	.3125	2.5	BB-2901750	40.20	BB-2901750G	46.15	BB-2901750X	47.10
	.320	.340	.500	.006	.080	.1325	.3750	2.5	BB-320500	54.85	BB-320500G	61.10	BB-320500X	63.05
	.320	.340	.600	.006	.080	.1325	.3750	2.5	BB-320600	54.85	BB-320600G	61.10	BB-320600X	63.05
	.320	.340	.750	.006	.080	.1325	.3750	2.5	BB-320750	54.85	BB-320750G	61.10	BB-320750X	63.05
	.320	.340	.900	.006	.080	.1325	.3750	2.5	BB-320900	54.85	BB-320900G	61.10	BB-320900X	63.05
	.320	.340	1.000	.006	.080	.1325	.3750	2.5	BB-3201000	54.85	BB-3201000G	61.10	BB-3201000X	63.05
	.320	.340	1.100	.006	.080	.1325	.3750	2.5	BB-3201100	54.85	BB-3201100G	61.10	BB-3201100X	63.05
	.320	.340	1.250	.006	.080	.1325	.3750	2.5	BB-3201250	54.85	BB-3201250G	61.10	BB-3201250X	63.05
	.320	.340	1.500	.006	.080	.1325	.3750	2.5	BB-3201500	54.85	BB-3201500G	61.10	BB-3201500X	63.05

Standard – Boring Tools

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

Continued on next page

See pg 140 for standard tool holders

Standard – Boring Tools

Right Hand (cont.)



BB

Continued from previous page

Head Width	Minimum Bore Dia.*	Max. Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TIN Coated		AITIN Coated	
								Tool #	Price	Tool #	Price	Tool #	Price
H	L ₂ ^{+0.050"} _{-.000"}	R ^{+0.002"} _{-.000"}	P	⌀ ₂ (h6)	L ₁	Tool #	Price	Tool #	Price	Tool #	Price		
.320	.340	1.600	.006	.080	.1325	.3750	2.5	BB-3201600	54.85	BB-3201600G	61.10	BB-3201600X	63.05
.320	.340	1.800	.006	.080	.1325	.3750	2.5	BB-3201800	54.85	BB-3201800G	61.10	BB-3201800X	63.05
.320	.340	2.000	.006	.080	.1325	.3750	4.0	BB-3202000	70.15	BB-3202000G	77.75	BB-3202000X	78.95
.320	.340	2.500	.006	.080	.1325	.3750	4.0	BB-3202500	70.15	BB-3202500G	77.75	BB-3202500X	78.95
.320	.340	3.000	.006	.080	.1325	.3750	4.0	BB-3203000	70.15			BB-3203000X	78.95
.360	.380	.500	.006	.090	.1725	.3750	2.5	BB-360500	54.85	BB-360500G	61.10	BB-360500X	63.05
.360	.380	.600	.006	.090	.1725	.3750	2.5	BB-360600	54.85	BB-360600G	61.10	BB-360600X	63.05
.360	.380	.750	.006	.090	.1725	.3750	2.5	BB-360750	54.85	BB-360750G	61.10	BB-360750X	63.05
.360	.380	.900	.006	.090	.1725	.3750	2.5	BB-360900	54.85	BB-360900G	61.10	BB-360900X	63.05
.360	.380	1.000	.006	.090	.1725	.3750	2.5	BB-3601000	54.85	BB-3601000G	61.10	BB-3601000X	63.05
.360	.380	1.150	.006	.090	.1725	.3750	2.5	BB-3601150	54.85	BB-3601150G	61.10	BB-3601150X	63.05
.360	.380	1.250	.006	.090	.1725	.3750	2.5	BB-3601250	54.85	BB-3601250G	61.10	BB-3601250X	63.05
.360	.380	1.500	.006	.090	.1725	.3750	2.5	BB-3601500	54.85	BB-3601500G	61.10	BB-3601500X	63.05
.360	.380	1.600	.006	.090	.1725	.3750	2.5	BB-3601600	54.85	BB-3601600G	61.10	BB-3601600X	63.05
.360	.380	1.800	.006	.090	.1725	.3750	2.5	BB-3601800	54.85	BB-3601800G	61.10	BB-3601800X	63.05
.360	.380	2.000	.006	.090	.1725	.3750	4.0	BB-3602000	70.15	BB-3602000G	77.75	BB-3602000X	78.95
.360	.380	2.500	.006	.090	.1725	.3750	4.0	BB-3602500	70.15	BB-3602500G	77.75	BB-3602500X	78.95
.360	.380	3.000	.006	.090	.1725	.3750	4.0	BB-3603000	70.15	BB-3603000G	77.75	BB-3603000X	78.95
.410	.430	.750	.006	.104	.1600	.5000	3.0	BB6-410750	76.45	BB6-410750G	87.60	BB6-410750X	87.60
.410	.430	1.000	.006	.104	.1600	.5000	3.0	BB6-4101000	76.45	BB6-4101000G	87.60	BB6-4101000X	87.60
.410	.430	1.250	.006	.104	.1600	.5000	3.0	BB6-4101250	76.45	BB6-4101250G	87.60	BB6-4101250X	87.60
.410	.430	1.500	.006	.104	.1600	.5000	3.0	BB6-4101500	76.45	BB6-4101500G	87.60	BB6-4101500X	87.60
.460	.480	1.000	.006	.115	.2100	.5000	3.0	BB6-4601000	76.45	BB6-4601000G	87.60	BB6-4601000X	87.60
.460	.480	1.500	.006	.115	.2100	.5000	3.0	BB6-4601500	76.45	BB6-4601500G	87.60	BB6-4601500X	87.60
.460	.480	2.000	.006	.115	.2100	.5000	3.0	BB6-4602000	76.45	BB6-4602000G	87.60	BB6-4602000X	87.60
.490	.510	.750	.006	.122	.2400	.5000	3.0	BB-490750	76.45	BB-490750G	84.05	BB-490750X	86.60
.490	.510	1.000	.006	.122	.2400	.5000	3.0	BB-4901000	76.45	BB-4901000G	84.05	BB-4901000X	86.60
.490	.510	1.250	.006	.122	.2400	.5000	3.0	BB-4901250	76.45	BB-4901250G	84.05	BB-4901250X	86.60
.490	.510	1.500	.006	.122	.2400	.5000	3.0	BB-4901500	76.45	BB-4901500G	84.05	BB-4901500X	86.60
.490	.510	2.000	.006	.122	.2400	.5000	4.0	BB-4902000	83.80	BB-4902000G	92.85	BB-4902000X	95.75
.490	.510	2.500	.006	.122	.2400	.5000	4.0	BB-4902500	83.80	BB-4902500G	92.85	BB-4902500X	95.75
.490	.510	2.750	.006	.122	.2400	.5000	4.0	BB-4902750	83.80	BB-4902750G	92.85	BB-4902750X	95.75
.490	.510	3.000	.006	.122	.2400	.5000	6.0	BB-4903000	105.20	BB-4903000G	116.95	BB-4903000X	119.10
.490	.510	3.500	.006	.122	.2400	.5000	6.0	BB-4903500	105.20	BB-4903500G	116.95	BB-4903500X	119.10
.490	.510	4.000	.006	.122	.2400	.5000	6.0	BB-4904000	105.20			BB-4904000X	119.10
.490	.510	4.500	.006	.122	.2400	.5000	6.0	BB-4904500	105.20	BB-4904500G	116.95	BB-4904500X	119.10

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

See pg 140 for standard tool holders

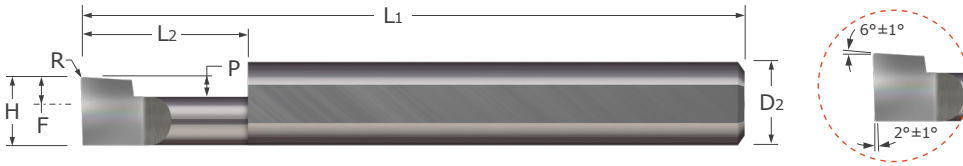
Standard – Boring Tools

BBL

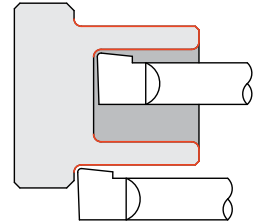


Standard – Boring Tools

Left Hand



- Designed for left hand facing and boring applications
- 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



Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TIN Coated		AlTiN Coated	
								H	L2	R	P	F	D2 (h6)
.050	.055	.150	.003	.012	-.0125	.1250	1.5	BBL-050150	26.10	BBL-050150G	28.60	BBL-050150X	29.25
.050	.055	.200	.003	.012	-.0125	.1250	1.5	BBL-050200	26.10				
.050	.055	.400	.003	.012	-.0125	.1250	1.5	BBL-050400	26.10			BBL-050400X	29.25
.060	.070	.150	.003	.015	-.0025	.1250	1.5	BBL-060150	26.10			BBL-060150X	29.25
.060	.070	.200	.003	.015	-.0025	.1250	1.5	BBL-060200	26.10			BBL-060200X	29.25
.060	.070	.300	.003	.015	-.0025	.1250	1.5	BBL-060300	26.10			BBL-060300X	29.25
.080	.090	.150	.003	.020	.0175	.1250	1.5			BBL-080150G	28.60		
.080	.090	.200	.003	.020	.0175	.1250	1.5	BBL-080200	26.10			BBL-080200X	29.25
.080	.090	.300	.003	.020	.0175	.1250	1.5	BBL-080300	26.10			BBL-080300X	29.25
.080	.090	.400	.003	.020	.0175	.1250	1.5	BBL-080400	26.10	BBL-080400G	28.60	BBL-080400X	29.25
.080	.090	.500	.003	.020	.0175	.1250	1.5	BBL-080500	26.10	BBL-080500G	28.60	BBL-080500X	29.25
.100	.110	.150	.003	.025	.0375	.1250	1.5	BBL-100150	26.10			BBL-100150X	29.25
.100	.110	.300	.003	.025	.0375	.1250	1.5	BBL-100300	26.10	BBL-100300G	28.60	BBL-100300X	29.25
.100	.110	.500	.003	.025	.0375	.1250	1.5	BBL-100500	26.10	BBL-100500G	28.60	BBL-100500X	29.25
.100	.110	.600	.003	.025	.0375	.1250	1.5	BBL-100600	26.10				
.100	.110	.700	.003	.025	.0375	.1250	1.5	BBL-100700	26.10			BBL-100700X	29.25
.110	.122	.150	.003	.027	.0475	.1250	1.5	BBL-110150	26.10			BBL-110150X	29.25
.110	.122	.200	.003	.027	.0475	.1250	1.5			BBL-110200G	28.60		
.110	.122	.300	.003	.027	.0475	.1250	1.5	BBL-110300	26.10			BBL-110300X	29.25
.110	.122	.400	.003	.027	.0475	.1250	1.5	BBL-110400	26.10			BBL-110400X	29.25
.110	.122	.600	.003	.027	.0475	.1250	1.5	BBL-110600	26.10			BBL-110600X	29.25
.110	.122	.700	.003	.027	.0475	.1250	1.5	BBL-110700	26.10			BBL-110700X	29.25

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

Continued on next page

See pg 140 for standard tool holders

Standard – Boring Tools

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	Tool #	Price	Tool #	Price
		$L_2 \begin{matrix} +.050'' \\ -.000'' \end{matrix}$	$R \begin{matrix} +.002'' \\ -.000'' \end{matrix}$	P	F	D ₂ (h6)	L ₁						
.120	.132	.250	.006	.030	.0263	.1875	2.0	BBL-120250	27.70			BBL-120250X	31.30
.120	.132	.500	.006	.030	.0263	.1875	2.0	BBL-120500	27.70			BBL-120500X	31.30
.120	.132	.600	.006	.030	.0263	.1875	2.0	BBL-120600	27.70			BBL-120600X	31.30
.120	.132	.700	.006	.030	.0263	.1875	2.0	BBL-120700	27.70			BBL-120700X	31.30
.140	.152	.250	.006	.035	.0463	.1875	2.0	BBL-140250	27.70	BBL-140250G	30.50	BBL-140250X	31.30
.140	.152	.400	.006	.035	.0463	.1875	2.0	BBL-140400	27.70	BBL-140400G	30.50	BBL-140400X	31.30
.140	.152	.500	.006	.035	.0463	.1875	2.0	BBL-140500	27.70			BBL-140500X	31.30
.140	.152	.600	.006	.035	.0463	.1875	2.0	BBL-140600	27.70	BBL-140600G	30.50	BBL-140600X	31.30
.140	.152	.700	.006	.035	.0463	.1875	2.0	BBL-140700	27.70			BBL-140700X	31.30
.140	.152	.800	.006	.035	.0463	.1875	2.0	BBL-140800	27.70			BBL-140800X	31.30
.160	.176	.400	.006	.040	.0663	.1875	2.0	BBL-160400	27.70				
.160	.176	.500	.006	.040	.0663	.1875	2.0	BBL-160500	27.70			BBL-160500X	31.30
.160	.176	.600	.006	.040	.0663	.1875	2.0	BBL-160600	27.70			BBL-160600X	31.30
.160	.176	.750	.006	.040	.0663	.1875	2.0	BBL-160750	27.70				
.160	.176	.900	.006	.040	.0663	.1875	2.0	BBL-160900	27.70	BBL-160900G	30.50	BBL-160900X	31.30
.160	.176	1.000	.006	.040	.0663	.1875	2.0	BBL-1601000	27.70			BBL-1601000X	31.30
.180	.196	.350	.006	.045	.0550	.2500	2.5	BBL-180350	29.95			BBL-180350X	35.70
.180	.196	.500	.006	.045	.0550	.2500	2.5	BBL-180500	29.95			BBL-180500X	35.70
.180	.196	.600	.006	.045	.0550	.2500	2.5	BBL-180600	29.95	BBL-180600G	34.05	BBL-180600X	35.70
.180	.196	.750	.006	.045	.0550	.2500	2.5	BBL-180750	29.95	BBL-180750G	34.05	BBL-180750X	35.70
.180	.196	.900	.006	.045	.0550	.2500	2.5	BBL-180900	29.95			BBL-180900X	35.70
.180	.196	1.000	.006	.045	.0550	.2500	2.5	BBL-1801000	29.95			BBL-1801000X	35.70
.180	.196	1.100	.006	.045	.0550	.2500	2.5	BBL-1801100	29.95			BBL-1801100X	35.70
.180	.196	1.500	.006	.045	.0550	.2500	2.5	BBL-1801500	29.95			BBL-1801500X	35.70
.200	.216	.400	.006	.050	.0750	.2500	2.5	BBL-200400	29.95	BBL-200400G	34.05	BBL-200400X	35.70
.200	.216	.500	.006	.050	.0750	.2500	2.5	BBL-200500	29.95			BBL-200500X	35.70
.200	.216	.600	.006	.050	.0750	.2500	2.5	BBL-200600	29.95	BBL-200600G	34.05	BBL-200600X	35.70
.200	.216	.700	.006	.050	.0750	.2500	2.5	BBL-200700	29.95			BBL-200700X	35.70
.200	.216	.800	.006	.050	.0750	.2500	2.5	BBL-200800	29.95	BBL-200800G	34.05	BBL-200800X	35.70
.200	.216	1.000	.006	.050	.0750	.2500	2.5	BBL-2001000	29.95			BBL-2001000X	35.70
.200	.216	1.100	.006	.050	.0750	.2500	2.5	BBL-2001100	29.95				
.200	.216	1.200	.006	.050	.0750	.2500	2.5	BBL-2001200	29.95			BBL-2001200X	35.70
.200	.216	1.300	.006	.050	.0750	.2500	2.5	BBL-2001300	29.95			BBL-2001300X	35.70
.230	.250	.600	.006	.057	.0738	.3125	2.5	BBL-230600	40.20	BBL-230600G	46.15	BBL-230600X	47.10
.230	.250	.700	.006	.057	.0738	.3125	2.5	BBL-230700	40.20			BBL-230700X	47.10
.230	.250	.800	.006	.057	.0738	.3125	2.5	BBL-230800	40.20			BBL-230800X	47.10
.230	.250	.900	.006	.057	.0738	.3125	2.5	BBL-230900	40.20			BBL-230900X	47.10
.230	.250	1.000	.006	.057	.0738	.3125	2.5	BBL-2301000	40.20			BBL-2301000X	47.10
.230	.250	1.200	.006	.057	.0738	.3125	2.5	BBL-2301200	40.20			BBL-2301200X	47.10
.230	.250	1.250	.006	.057	.0738	.3125	2.5	BBL-2301250	40.20				
.230	.250	1.500	.006	.057	.0738	.3125	2.5	BBL-2301500	40.20			BBL-2301500X	47.10
.230	.250	1.600	.006	.057	.0738	.3125	2.5	BBL-2301600	40.20			BBL-2301600X	47.10

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

Continued on next page

See pg 140 for standard tool holders



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	L2	L2	R	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price	
.290	.310	.500	$^{+.050''}_{-.000''}$	.006	.072	.1338	.3125	2.5	BBL-290500	40.20			BBL-290500X	47.10
.290	.310	.600	$^{+.050''}_{-.000''}$	.006	.072	.1338	.3125	2.5	BBL-290600	40.20			BBL-290600X	47.10
.290	.310	.750	$^{+.050''}_{-.000''}$	.006	.072	.1338	.3125	2.5	BBL-290750	40.20			BBL-290750X	47.10
.290	.310	.900	$^{+.050''}_{-.000''}$	.006	.072	.1338	.3125	2.5	BBL-290900	40.20				
.290	.310	1.000	$^{+.050''}_{-.000''}$	.006	.072	.1338	.3125	2.5	BBL-2901000	40.20			BBL-2901000X	47.10
.290	.310	1.100	$^{+.050''}_{-.000''}$	.006	.072	.1338	.3125	2.5	BBL-2901100	40.20			BBL-2901100X	47.10
.290	.310	1.250	$^{+.050''}_{-.000''}$	.006	.072	.1338	.3125	2.5	BBL-2901250	40.20			BBL-2901250X	47.10
.290	.310	1.350	$^{+.050''}_{-.000''}$	.006	.072	.1338	.3125	2.5	BBL-2901350	40.20				
.290	.310	1.500	$^{+.050''}_{-.000''}$	.006	.072	.1338	.3125	2.5	BBL-2901500	40.20			BBL-2901500X	47.10
.320	.340	.600	$^{+.050''}_{-.000''}$	.006	.080	.1325	.3750	2.5	BBL-320600	54.85	BBL-320600G	61.10	BBL-320600X	63.05
.320	.340	.750	$^{+.050''}_{-.000''}$	.006	.080	.1325	.3750	2.5	BBL-320750	54.85			BBL-320750X	63.05
.320	.340	1.000	$^{+.050''}_{-.000''}$	.006	.080	.1325	.3750	2.5	BBL-3201000	54.85			BBL-3201000X	63.05
.320	.340	1.500	$^{+.050''}_{-.000''}$	.006	.080	.1325	.3750	2.5	BBL-3201500	54.85			BBL-3201500X	63.05
.320	.340	1.800	$^{+.050''}_{-.000''}$	.006	.080	.1325	.3750	2.5	BBL-3201800	54.85				
.320	.340	2.000	$^{+.050''}_{-.000''}$	.006	.080	.1325	.3750	4.0	BBL-3202000	70.15			BBL-3202000X	78.95
.320	.340	2.500	$^{+.050''}_{-.000''}$	.006	.080	.1325	.3750	4.0	BBL-3202500	70.15				
.320	.340	3.000	$^{+.050''}_{-.000''}$	.006	.080	.1325	.3750	4.0	BBL-3203000	70.15			BBL-3203000X	78.95
.360	.380	.750	$^{+.050''}_{-.000''}$	.006	.090	.1725	.3750	2.5	BBL-360750	54.85			BBL-360750X	63.05
.360	.380	.900	$^{+.050''}_{-.000''}$	.006	.090	.1725	.3750	2.5	BBL-360900	54.85				
.360	.380	1.000	$^{+.050''}_{-.000''}$	.006	.090	.1725	.3750	2.5	BBL-3601000	54.85			BBL-3601000X	63.05
.360	.380	1.250	$^{+.050''}_{-.000''}$	.006	.090	.1725	.3750	2.5	BBL-3601250	54.85			BBL-3601250X	63.05
.360	.380	1.500	$^{+.050''}_{-.000''}$	.006	.090	.1725	.3750	2.5	BBL-3601500	54.85			BBL-3601500X	63.05
.360	.380	1.600	$^{+.050''}_{-.000''}$	.006	.090	.1725	.3750	2.5	BBL-3601600	54.85				
.360	.380	1.800	$^{+.050''}_{-.000''}$	.006	.090	.1725	.3750	2.5	BBL-3601800	54.85				
.360	.380	2.500	$^{+.050''}_{-.000''}$	.006	.090	.1725	.3750	4.0	BBL-3602500	70.15				
.360	.380	3.000	$^{+.050''}_{-.000''}$	.006	.090	.1725	.3750	4.0	BBL-3603000	70.15			BBL-3603000X	78.95
.490	.510	1.500	$^{+.050''}_{-.000''}$	.006	.122	.2400	.5000	3.0	BBL-4901500	76.45			BBL-4901500X	86.60
.490	.510	2.600	$^{+.050''}_{-.000''}$	.006	.122	.2400	.5000	4.0	BBL-4902600	83.80				
.490	.510	3.500	$^{+.050''}_{-.000''}$	.006	.122	.2400	.5000	6.0	BBL-4903500	105.20				
.490	.510	4.000	$^{+.050''}_{-.000''}$	.006	.122	.2400	.5000	6.0	BBL-4904000	105.20				
.490	.510	4.500	$^{+.050''}_{-.000''}$	.006	.122	.2400	.5000	6.0	BBL-4904500	105.20				

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

See pg 140 for standard tool holders

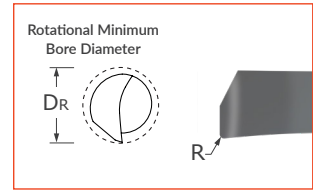
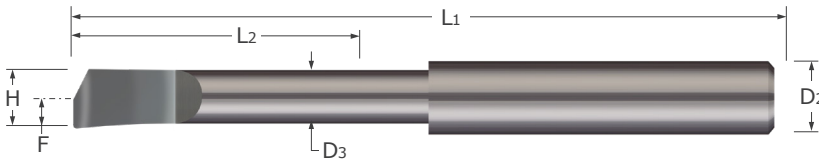
Standard – Boring Tools

Standard – Boring Tools

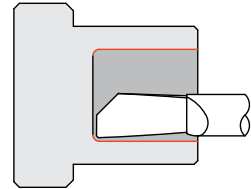
Helical Back Rake – Corner Radius



HBBC



- 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



Standard – Boring Tools

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 #	Price
.0275	.030	.187	.004	.025	.0150	.1250	1.5	HBBC-030187-004	34.75
.0275	.030	.250	.004	.025	.0150	.1250	1.5	HBBC-030250-004	34.75
.0325	.035	.125	.004	.030	.0175	.1250	1.5	HBBC-035125-004	27.15
.0325	.035	.187	.004	.030	.0175	.1250	1.5	HBBC-035187-004	27.15
.0325	.035	.250	.004	.030	.0175	.1250	1.5	HBBC-035250-004	27.15
.0375	.040	.187	.004	.035	.0200	.1250	1.5	HBBC-040187-004	27.15
.0375	.040	.250	.004	.035	.0200	.1250	1.5	HBBC-040250-004	27.15
.0375	.040	.312	.004	.035	.0200	.1250	1.5	HBBC-040312-004	27.15
.0450	.050	.187	.004	.040	.0250	.1250	1.5	HBBC-050187-004	27.15
.0450	.050	.312	.004	.040	.0250	.1250	1.5	HBBC-050312-004	27.15
.0450	.050	.375	.004	.040	.0250	.1250	1.5	HBBC-050375-004	27.15
.0550	.060	.250	.004	.050	.0300	.1250	1.5	HBBC-060250-004	27.15
.0550	.060	.375	.004	.050	.0300	.1250	1.5	HBBC-060375-004	27.15
.0550	.060	.500	.004	.050	.0300	.1250	1.5	HBBC-060500-004	27.15
.0650	.070	.312	.004	.060	.0350	.1250	1.5	HBBC-070312-004	27.15
.0650	.070	.437	.004	.060	.0350	.1250	1.5	HBBC-070437-004	27.15
.0650	.070	.562	.004	.060	.0350	.1250	1.5	HBBC-070562-004	27.15
.0750	.080	.375	.004	.070	.0400	.1250	1.5	HBBC-080375-004	27.15
.0750	.080	.500	.004	.070	.0400	.1250	1.5	HBBC-080500-004	27.15
.0750	.080	.625	.004	.070	.0400	.1250	1.5	HBBC-080625-004	27.15
.0850	.090	.375	.004	.080	.0450	.1250	1.5	HBBC-090375-004	27.15
.0850	.090	.500	.004	.080	.0450	.1250	1.5	HBBC-090500-004	27.15
.0850	.090	.687	.004	.080	.0450	.1250	1.5	HBBC-090687-004	27.15
.0950	.100	.437	.004	.090	.0500	.1250	1.5	HBBC-100437-004	27.15
.0950	.100	.562	.004	.090	.0500	.1250	1.5	HBBC-100562-004	27.15
.0950	.100	.750	.004	.090	.0500	.1250	1.5	HBBC-100750-004	27.15

Continued on next page

See pg 140 for standard tool holders

HBBC



Standard – Boring Tools

Helical Back Rake – Corner Radius (cont.)

Continued from previous page

Head Width	Rotational Minimum Bore Diameter	Maximum Bore Depth	Radius	Neck Diameter	Centerline Offset	Shank Diameter	Overall Length	Uncoated	
H	DR	L ₂ ^{+0.032"} _{-.000"}	R ^{+0.001"} _{-.001"}	D ₃ ^{+0.000"} _{-.002"}	F	D ₂ (h6)	L ₁	Tool #	Price
.1100	.120	.500	.004	.100	.0600	.1250	1.5	HBBC-120500-004	27.15
.1100	.120	.625	.004	.100	.0600	.1250	1.5	HBBC-120625-004	27.15
.1100	.120	1.000	.004	.100	.0600	.1250	1.5	HBBC-1201000-004	27.15
.1225	.135	.562	.004	.110	.0675	.1875	2.0	HBBC-135562-004	29.20
.1225	.135	.750	.004	.110	.0675	.1875	2.0	HBBC-135750-004	29.20
.1225	.135	1.000	.004	.110	.0675	.1875	2.0	HBBC-1351000-004	29.20
.1400	.150	.625	.004	.130	.0750	.1875	2.0	HBBC-150625-004	29.20
.1400	.150	1.000	.004	.130	.0750	.1875	2.0	HBBC-1501000-004	29.20
.1400	.150	1.250	.004	.130	.0750	.1875	2.0	HBBC-1501250-004	29.20
.1700	.180	1.000	.004	.160	.0900	.1875	2.0	HBBC-1801000-004	29.20
.1700	.180	1.250	.004	.160	.0900	.1875	2.0	HBBC-1801250-004	29.20
.1700	.180	1.500	.004	.160	.0900	.1875	2.0	HBBC-1801500-004	29.20
.1975	.210	1.000	.004	.185	.1050	.2500	2.5	HBBC-2101000-004	31.50
.1975	.210	1.250	.004	.185	.1050	.2500	2.5	HBBC-2101250-004	31.50
.1975	.210	1.500	.004	.185	.1050	.2500	2.5	HBBC-2101500-004	31.50
.2275	.240	1.000	.004	.215	.1200	.2500	2.5	HBBC-2401000-004	31.50
.2275	.240	1.500	.004	.215	.1200	.2500	2.5	HBBC-2401500-004	31.50
.2275	.240	1.750	.004	.215	.1200	.2500	2.5	HBBC-2401750-004	31.50
.2750	.300	1.000	.004	.250	.1500	.3125	2.5	HBBC-3001000-004	42.45
.2750	.300	1.500	.004	.250	.1500	.3125	2.5	HBBC-3001500-004	42.45
.2750	.300	1.750	.004	.250	.1500	.3125	2.5	HBBC-3001750-004	42.45
.3400	.360	1.000	.004	.320	.1800	.3750	2.5	HBBC-3601000-004	58.35
.3400	.360	1.500	.004	.320	.1800	.3750	2.5	HBBC-3601500-004	58.35
.3400	.360	2.000	.004	.320	.1800	.3750	4.0	HBBC-3602000-004	74.55
.3400	.360	2.500	.004	.320	.1800	.3750	4.0	HBBC-3602500-004	74.55

See pg 140 for standard tool holders

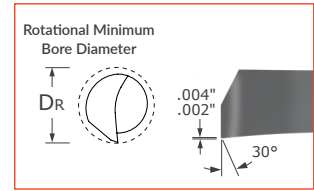
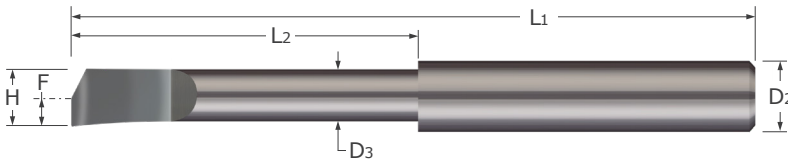
Standard – Boring Tools

Helical Back Rake

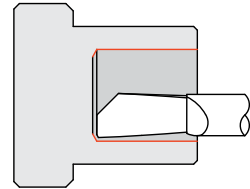


Tech Resources
Available Online

HBB / HBM



- 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



Standard – Boring Tools

Head Width		Rotational Min. Bore Diameter	Max. Bore Depth	Neck Diameter	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
H	decimal equiv.	DR	L2 +.032" -.000" +.81 mm -.00 mm	D3 +.000" -.002" +.00 mm -.05 mm	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.0175	.0175	.020	.063	.015	.0100	.1250	1.5	HBB-020062	33.20	HBB-020062X	36.45
0.45 mm	.0177	0.5 mm	2 mm	0.4 mm	0.25 mm	3 mm	38 mm	HBM-005002	30.15		
.0225	.0225	.025	.063	.020	.0125	.1250	1.5	HBB-025062	33.20		
.0225	.0225	.025	.125	.020	.0125	.1250	1.5	HBB-025125	33.20	HBB-025125X	36.45
0.65 mm	.0256	0.7 mm	3 mm	0.6 mm	0.35 mm	3 mm	38 mm	HBM-007003	30.15		
.0275	.0275	.030	.125	.025	.0150	.1250	1.5	HBB-030125	33.20		
.0275	.0275	.030	.188	.025	.0150	.1250	1.5	HBB-030187	33.20	HBB-030187X	36.45
0.75 mm	.0295	0.8 mm	4 mm	0.7 mm	0.40 mm	3 mm	38 mm	HBM-008004	30.15		
.0325	.0325	.035	.125	.030	.0175	.1250	1.5	HBB-035125	25.60	HBB-035125X	28.75
.0325	.0325	.035	.188	.030	.0175	.1250	1.5	HBB-035187	25.60	HBB-035187X	28.75
0.85 mm	.0335	0.9 mm	5 mm	0.8 mm	0.45 mm	3 mm	38 mm	HBM-009005	23.30		
0.90 mm	.0354	1.0 mm	6 mm	0.8 mm	0.50 mm	3 mm	38 mm	HBM-010006	23.30		
.0375	.0375	.040	.188	.035	.0200	.1250	1.5	HBB-040187	25.60	HBB-040187X	28.75
.0375	.0375	.040	.250	.035	.0200	.1250	1.5	HBB-040250	25.60	HBB-040250X	28.75
.0450	.0450	.050	.313	.040	.0250	.1250	1.5	HBB-050312	25.60	HBB-050312X	28.75
1.35 mm	.0531	1.5 mm	9 mm	1.2 mm	0.75 mm	3 mm	38 mm	HBM-015009	23.30		
.0550	.0550	.060	.375	.050	.0300	.1250	1.5	HBB-060375	25.60	HBB-060375X	28.75
1.63 mm	.0642	1.75 mm	10 mm	1.5 mm	0.875 mm	3 mm	38 mm	HBM-017510	23.30		
.0650	.0650	.070	.438	.060	.0350	.1250	1.5	HBB-070437	25.60	HBB-070437X	28.75
.0750	.0750	.080	.500	.070	.0400	.1250	1.5	HBB-080500	25.60	HBB-080500X	28.75
2.05 mm	.0807	2.26 mm	12 mm	1.9 mm	1.13 mm	3 mm	38 mm	HBM-022512	23.30		
.0850	.0850	.090	.500	.080	.0450	.1250	1.5	HBB-090500	25.60	HBB-090500X	28.75
.0950	.0950	.100	.563	.090	.0500	.1250	1.5	HBB-100562	25.60	HBB-100562X	28.75
2.58 mm	.1016	2.75 mm	14 mm	2.4 mm	1.375 mm	3 mm	38 mm	HBM-027514	23.30		
2.75 mm	.1083	3.0 mm	16 mm	2.5 mm	1.50 mm	4 mm	50 mm	HBM-030016	24.10		

Continued on next page

See pg 140 for standard tool holders

HBB / HBM



Standard – Boring Tools

Helical Back Rake (cont.)

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.	DR	L ₂ +.032" -.000" +.81 mm -.00 mm	D ₃ +.000" -.002" +.00 mm -.05 mm	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price
.1100	.1100	.120	.625	.100	.0600	.1250	1.5	HBB-120625	25.60	HBB-120625X	28.75
.1100	.1100	.120	1.000	.100	.0600	.1250	1.5	HBB-1201000	25.60	HBB-1201000X	28.75
.1225	.1225	.135	.750	.110	.0675	.1875	2.0	HBB-135750	27.40	HBB-135750X	31.00
.1225	.1225	.135	1.000	.110	.0675	.1875	2.0	HBB-1351000	27.40	HBB-1351000X	31.00
.1400	.1400	.150	1.000	.130	.0750	.1875	2.0	HBB-1501000	27.40	HBB-1501000X	31.00
.1400	.1400	.150	1.250	.130	.0750	.1875	2.0	HBB-1501250	27.40	HBB-1501250X	31.00
3.65 mm	.1437	4.0 mm	25 mm	3.3 mm	2.00 mm	6 mm	57 mm			HBM-040025X	37.10
4.15 mm	.1634	4.5 mm	30 mm	3.8 mm	2.25 mm	6 mm	57 mm	HBM-045030	26.95		
.1700	.1700	.180	1.000	.160	.0900	.1875	2.0	HBB-1801000	27.40	HBB-1801000X	31.00
.1700	.1700	.180	1.250	.160	.0900	.1875	2.0	HBB-1801250	27.40	HBB-1801250X	31.00
.1700	.1700	.180	1.500	.160	.0900	.1875	2.0	HBB-1801500	27.40	HBB-1801500X	31.00
.1975	.1975	.210	1.000	.185	.1050	.2500	2.5	HBB-2101000	29.70	HBB-2101000X	35.45
.1975	.1975	.210	1.250	.185	.1050	.2500	2.5	HBB-2101250	29.70	HBB-2101250X	35.45
.1975	.1975	.210	1.500	.185	.1050	.2500	2.5	HBB-2101500	29.70	HBB-2101500X	35.45
5.15 mm	.2028	5.5 mm	35 mm	4.7 mm	2.75 mm	6 mm	57 mm	HBM-055035	26.95		
.2275	.2275	.240	1.000	.215	.1200	.2500	2.5	HBB-2401000	29.70	HBB-2401000X	35.45
.2275	.2275	.240	1.500	.215	.1200	.2500	2.5	HBB-2401500	29.70	HBB-2401500X	35.45
.2275	.2275	.240	1.750	.215	.1200	.2500	2.5	HBB-2401750	29.70	HBB-2401750X	35.45
.2750	.2750	.300	1.000	.250	.1500	.3125	2.5	HBB-3001000	40.60	HBB-3001000X	47.50
.2750	.2750	.300	1.500	.250	.1500	.3125	2.5	HBB-3001500	40.60	HBB-3001500X	47.50
.2750	.2750	.300	1.750	.250	.1500	.3125	2.5	HBB-3001750	40.60	HBB-3001750X	47.50
.3400	.3400	.360	1.000	.320	.1800	.3750	2.5	HBB-3601000	56.35		
.3400	.3400	.360	1.500	.320	.1800	.3750	2.5	HBB-3601500	56.35	HBB-3601500X	64.55
.3400	.3400	.360	2.000	.320	.1800	.3750	4.0	HBB-3602000	72.60	HBB-3602000X	80.15
.3400	.3400	.360	2.250	.320	.1800	.3750	4.0	HBB-3602250	72.60		
.3400	.3400	.360	2.500	.320	.1800	.3750	4.0	HBB-3602500	72.60	HBB-3602500X	80.15
.4600	.4600	.480	2.500	.440	.2400	.5000	4.0	HBB-4802500	87.05		
.4600	.4600	.480	3.000	.440	.2400	.5000	4.0	HBB-4803000	87.05		

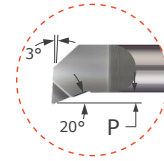
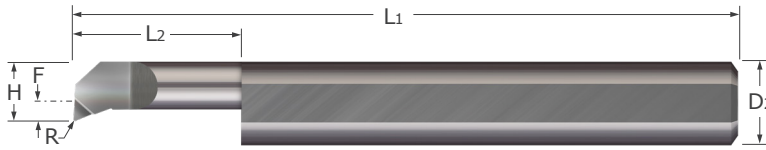
See pg 140 for standard tool holders

Standard – Boring Tools

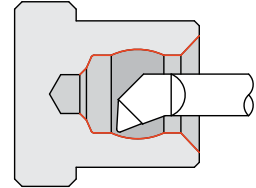
Top Rake Chipbreaker



PBT



- 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



Standard – Boring Tools

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
								Tool #	Price	Tool #	Price
H	L ₂	$L_2 \begin{smallmatrix} +.030'' \\ -.000'' \end{smallmatrix}$	$R \begin{smallmatrix} +.003'' \\ -.000'' \end{smallmatrix}$	P	F	D ₂ (h6)	L ₁				
.0500	.0550	.150	.002	.005	-.0125	.1250	1.5	PBT2-050150	27.35	PBT2-050150X	30.55
.0500	.0550	.200	.002	.005	-.0125	.1250	1.5	PBT2-050200	27.35	PBT2-050200X	30.55
.0500	.0550	.400	.002	.005	-.0125	.1250	1.5	PBT2-050400	27.35	PBT2-050400X	30.55
.0500	.0550	.500	.002	.005	-.0125	.1250	1.5	PBT2-050500	27.35	PBT2-050500X	30.55
.0600	.0700	.150	.002	.010	-.0025	.1250	1.5	PBT2-060150	27.35	PBT2-060150X	30.55
.0600	.0700	.200	.002	.010	-.0025	.1250	1.5	PBT2-060200	27.35	PBT2-060200X	30.55
.0600	.0700	.400	.002	.010	-.0025	.1250	1.5	PBT2-060400	27.35	PBT2-060400X	30.55
.0600	.0700	.500	.002	.010	-.0025	.1250	1.5	PBT2-060500	27.35	PBT2-060500X	30.55
.0700	.0800	.150	.002	.015	.0075	.1250	1.5	PBT2-070150	26.75	PBT2-070150X	29.90
.0700	.0800	.200	.002	.015	.0075	.1250	1.5	PBT2-070200	26.75	PBT2-070200X	29.90
.0700	.0800	.400	.002	.015	.0075	.1250	1.5	PBT2-070400	26.75	PBT2-070400X	29.90
.0700	.0800	.600	.002	.015	.0075	.1250	1.5	PBT2-070600	26.75	PBT2-070600X	29.90
.0800	.0900	.200	.002	.015	.0175	.1250	1.5	PBT2-080200	26.75	PBT2-080200X	29.90
.0800	.0900	.400	.002	.015	.0175	.1250	1.5	PBT2-080400	26.75	PBT2-080400X	29.90
.0900	.1000	.200	.002	.015	.0275	.1250	1.5	PBT2-090200	26.75	PBT2-090200X	29.90
.0900	.1000	.400	.002	.015	.0275	.1250	1.5	PBT2-090400	26.75	PBT2-090400X	29.90
.1000	.1100	.200	.002	.015	.0375	.1250	1.5	PBT2-100200	26.75	PBT2-100200X	29.90
.1000	.1100	.400	.002	.015	.0375	.1250	1.5	PBT2-100400	26.75	PBT2-100400X	29.90
.1100	.1220	.250	.004	.020	.0475	.1250	1.5	PBT4-110250	26.75	PBT4-110250X	29.90
.1100	.1220	.500	.004	.020	.0475	.1250	1.5	PBT4-110500	26.75	PBT4-110500X	29.90
.1100	.1220	.750	.004	.020	.0475	.1250	1.5	PBT4-110750	26.75	PBT4-110750X	29.90
.1200	.1320	.250	.004	.020	.0263	.1875	2.0	PBT-120250	27.85	PBT-120250X	31.50
.1200	.1320	.375	.004	.020	.0263	.1875	2.0	PBT4-120375	27.85	PBT4-120375X	31.50
.1200	.1320	.500	.004	.020	.0263	.1875	2.0	PBT-120500	27.85	PBT-120500X	31.50
.1200	.1320	.750	.004	.020	.0263	.1875	2.0	PBT-120750	27.85	PBT-120750X	31.50
.1200	.1320	1.000	.004	.020	.0263	.1875	2.0	PBT-1201000	27.85	PBT-1201000X	31.50
.1400	.1520	.250	.002	.025	.0463	.1875	2.0	PBT2-140250	27.85	PBT2-140250X	31.50
.1400	.1520	.250	.004	.025	.0463	.1875	2.0	PBT4-140250	27.85	PBT4-140250X	31.50
.1400	.1520	.375	.002	.025	.0463	.1875	2.0	PBT2-140375	27.85	PBT2-140375X	31.50
.1400	.1520	.375	.004	.025	.0463	.1875	2.0	PBT4-140375	27.85	PBT4-140375X	31.50
.1400	.1520	.500	.002	.025	.0463	.1875	2.0	PBT2-140500	27.85	PBT2-140500X	31.50
.1400	.1520	.500	.004	.025	.0463	.1875	2.0	PBT4-140500	27.85	PBT4-140500X	31.50

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

Continued on next page

See pg 140 for standard tool holders

PBT



Standard – Boring Tools

Top Rake Chipbreaker (cont.)

Continued from previous page

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AITIN Coated	
								Tool #	Price	Tool #	Price
H		L ₂ ^{+ .030"} _{– .000"}	R ^{+ .003"} _{– .000"}	P	F	D ₂ (h6)	L ₁				
.1600	.1760	.375	.006	.025	.0663	.1875	2.0	PBT6-160375	27.85	PBT6-160375X	31.50
.1600	.1760	.500	.006	.025	.0663	.1875	2.0	PBT-160500	27.85	PBT-160500X	31.50
.1600	.1760	.750	.006	.025	.0663	.1875	2.0	PBT-160750	27.85	PBT-160750X	31.50
.1600	.1760	1.000	.006	.025	.0663	.1875	2.0	PBT6-1601000	27.85	PBT6-1601000X	31.50
.1600	.1760	1.250	.006	.025	.0663	.1875	2.0	PBT6-1601250	27.85	PBT6-1601250X	31.50
.1800	.1960	.375	.006	.030	.0550	.2500	2.5	PBT6-180375	35.65	PBT6-180375X	41.40
.1800	.1960	.500	.006	.030	.0550	.2500	2.5	PBT-180500	35.65	PBT-180500X	41.40
.1800	.1960	.750	.006	.030	.0550	.2500	2.5	PBT6-180750	35.65	PBT6-180750X	41.40
.1800	.1960	1.000	.006	.030	.0550	.2500	2.5	PBT-1801000	35.65	PBT-1801000X	41.40
.1800	.1960	1.250	.006	.030	.0550	.2500	2.5	PBT6-1801250	35.65	PBT6-1801250X	41.40
.1800	.1960	1.500	.006	.030	.0550	.2500	2.5	PBT6-1801500	35.65	PBT6-1801500X	41.40
.2000	.2160	.375	.006	.030	.0750	.2500	2.5	PBT6-200375	35.65	PBT6-200375X	41.40
.2000	.2160	.600	.006	.030	.0750	.2500	2.5	PBT-200600	35.65	PBT-200600X	41.40
.2000	.2160	.750	.006	.030	.0750	.2500	2.5	PBT6-200750	35.65	PBT6-200750X	41.40
.2000	.2160	1.000	.006	.030	.0750	.2500	2.5	PBT-2001000	35.65	PBT-2001000X	41.40
.2000	.2160	1.250	.006	.030	.0750	.2500	2.5	PBT6-2001250	35.65	PBT6-2001250X	41.40
.2000	.2160	1.500	.006	.030	.0750	.2500	2.5	PBT6-2001500	35.65	PBT6-2001500X	41.40
.2300	.2500	.500	.004	.040	.0738	.3125	2.5	PBT4-230500	44.10	PBT4-230500X	51.00
.2300	.2500	.500	.006	.040	.0738	.3125	2.5	PBT6-230500	44.10	PBT6-230500X	51.00
.2300	.2500	.750	.004	.040	.0738	.3125	2.5	PBT4-230750	44.10	PBT4-230750X	51.00
.2300	.2500	.750	.006	.040	.0738	.3125	2.5	PBT-230750	44.10	PBT-230750X	51.00
.2300	.2500	1.100	.006	.040	.0738	.3125	2.5	PBT6-2301100	44.10	PBT6-2301100X	51.00
.2300	.2500	1.300	.006	.040	.0738	.3125	2.5	PBT6-2301300	44.10	PBT6-2301300X	51.00
.2300	.2500	1.600	.006	.040	.0738	.3125	3.0	PBT-2301600	52.40	PBT-2301600X	59.30
.2600	.2800	.500	.004	.045	.1038	.3125	2.5	PBT4-260500	44.10	PBT4-260500X	51.00
.2600	.2800	.500	.006	.045	.1038	.3125	2.5	PBT6-260500	44.10	PBT6-260500X	51.00
.2600	.2800	.750	.004	.045	.1038	.3125	2.5	PBT4-260750	44.10	PBT4-260750X	51.00
.2600	.2800	.750	.006	.045	.1038	.3125	2.5	PBT6-260750	44.10	PBT6-260750X	51.00
.3000	.3200	.750	.006	.050	.1125	.3750	2.5	PBT6-300750	53.25	PBT6-300750X	61.45
.3000	.3200	1.000	.006	.050	.1125	.3750	2.5	PBT-3001000	53.25	PBT-3001000X	61.45
.3000	.3200	1.250	.006	.050	.1125	.3750	2.5	PBT6-3001250	53.25	PBT6-3001250X	61.45
.3000	.3200	1.600	.006	.050	.1125	.3750	3.0	PBT6-3001600	53.25	PBT6-3001600X	61.45
.3000	.3200	2.100	.006	.050	.1125	.3750	3.5	PBT6-3002100	53.25	PBT6-3002100X	61.50

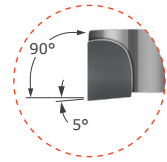
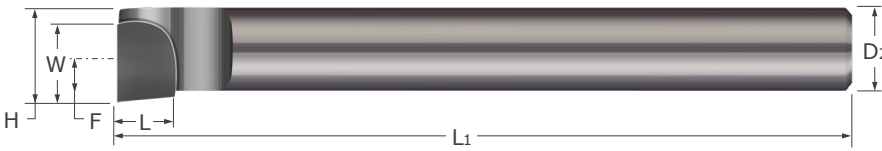
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pg 140 for standard tool holders

Standard – Boring Tools

Right Hand – Brazed – Sharp

TBB



- 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 ^{+0.000"} _{-.003"}	L ₁	Tool #	Price
.320	.250	.188	.195	.2500	4.0	TBB-250	23.30
.413	.313	.250	.257	.3125	5.0	TBB-312	24.35
.463	.313	.250	.276	.3750	6.0	TBB-375	26.10
.625	.500	.250	.375	.5000	7.0	TBB-500	32.45
.795	.500	.250	.483	.6250	8.0	TBB-625	35.15
.935	.625	.250	.560	.7500	9.0	TBB-750	36.30
1.233	.750	.375	.733	1.0000	10.0	TBB-001	44.20

See pg 140 for standard tool holders

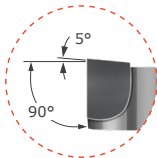
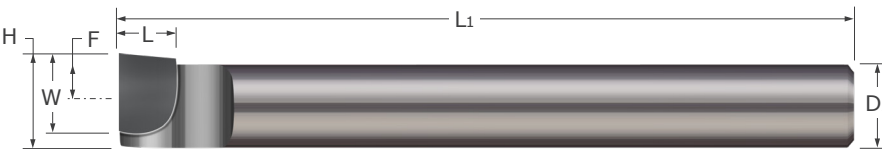
See pg 294 for tool set options

Standard – Boring Tools

Standard – Boring Tools

Left Hand – Brazed – Sharp

TBBL



- 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 ^{+0.000"} _{-.003"}	L ₁	Tool #	Price
.320	.250	.188	.195	.2500	4.0	TBBL-250	22.65
.413	.313	.250	.257	.3125	5.0	TBBL-312	23.30
.463	.313	.250	.276	.3750	6.0	TBBL-375	24.95
.625	.500	.250	.375	.5000	7.0	TBBL-500	32.35
.795	.500	.250	.483	.6250	8.0	TBBL-625	34.55
.935	.625	.250	.560	.7500	9.0	TBBL-750	35.45
1.233	.750	.375	.733	1.0000	10.0	TBBL-001	44.20

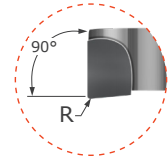
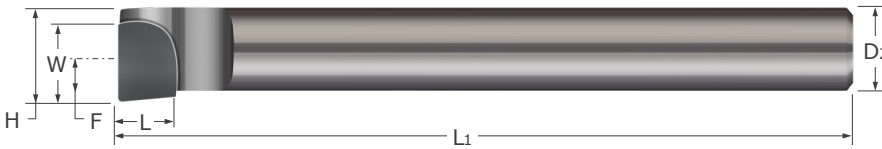
See pg 140 for standard tool holders

See pg 294 for tool set options

TBBC

Standard – Boring Tools

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

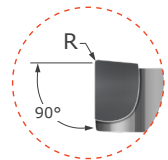
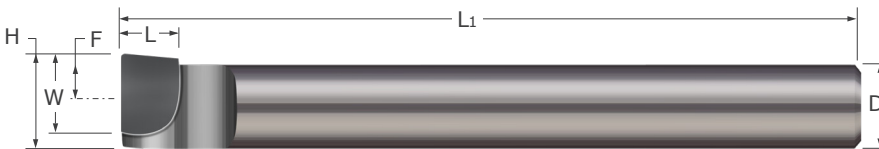
Head Width	Radius	Width	Length	Centerline Offset	Shank Diameter	Overall Length	Brazed Style	
H	$R \begin{smallmatrix} +.001" \\ -.001" \end{smallmatrix}$	W	L	F	$D_2 \begin{smallmatrix} +.0000" \\ -.0030" \end{smallmatrix}$	L1	Tool #	Price
.320	.008	.250	.188	.195	.2500	4.0	TBBC-250-008	25.05
.413	.008	.313	.250	.257	.3125	5.0	TBBC-312-008	26.10
.463	.008	.313	.250	.276	.3750	6.0	TBBC-375-008	27.85
.625	.008	.500	.250	.375	.5000	7.0	TBBC-500-008	34.20
.795	.008	.500	.250	.483	.6250	8.0	TBBC-625-008	36.90
.935	.008	.625	.250	.560	.7500	9.0	TBBC-750-008	38.05
1.233	.008	.750	.375	.733	1.0000	10.0	TBBC-001-008	44.20

See pg 140 for standard tool holders

TBBCL

Standard – Boring Tools

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	$R \begin{smallmatrix} +.001" \\ -.001" \end{smallmatrix}$	W	L	F	$D_2 \begin{smallmatrix} +.0000" \\ -.0030" \end{smallmatrix}$	L1	Tool #	Price
.320	.008	.250	.188	.195	.2500	4.0	TBBCL-250-008	25.05
.413	.008	.313	.250	.257	.3125	5.0	TBBCL-312-008	26.10
.463	.008	.313	.250	.276	.3750	6.0	TBBCL-375-008	27.85
.625	.008	.500	.250	.375	.5000	7.0	TBBCL-500-008	34.20
.795	.008	.500	.250	.483	.6250	8.0	TBBCL-625-008	36.90
.935	.008	.625	.250	.560	.7500	9.0	TBBCL-750-008	38.05
1.233	.008	.750	.375	.733	1.0000	10.0	TBBCL-001-008	44.20

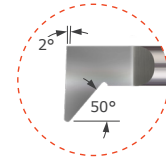
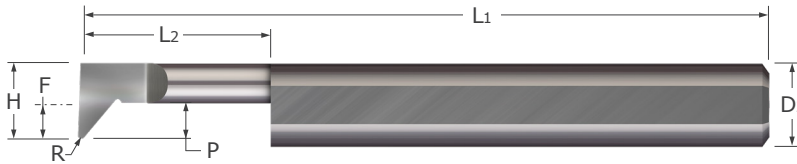
See pg 140 for standard tool holders

Standard – Profiling Tools

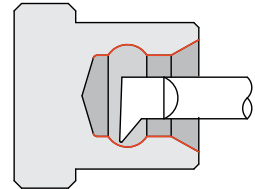
Radial Profiling



PR



- Designed for radial profiling
- Excellent choice for fine finishing
- Can be used in thread relief applications
- 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



Standard – Profiling Tools

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
								Tool #	Price	Tool #	Price
H	L2 ^{+0.050"} / _{-.000"}	R ^{+0.002"} / _{-.000"}	P	F	D2 (h6)	L1					
.0500	.0550	.150	.002	.015	-.0125	.1250	1.5	PR2-050150	27.45	PR2-050150X	30.65
.0500	.0550	.200	.002	.015	-.0125	.1250	1.5	PR2-050200	27.45	PR2-050200X	30.65
.0600	.0700	.150	.002	.020	-.0025	.1250	1.5	PR2-060150	27.45	PR2-060150X	30.65
.0600	.0700	.200	.002	.020	-.0025	.1250	1.5	PR2-060200	27.45	PR2-060200X	30.65
.0700	.0800	.150	.002	.025	.0075	.1250	1.5	PR2-070150	26.85	PR2-070150X	30.00
.0700	.0800	.200	.002	.025	.0075	.1250	1.5	PR2-070200	26.85	PR2-070200X	30.00
.0700	.0800	.200	.005	.025	.0075	.1250	1.5	PR-070200	26.85	PR-070200X	30.00
.0700	.0800	.300	.002	.025	.0075	.1250	1.5	PR2-070300	26.85	PR2-070300X	30.00
.0700	.0800	.500	.002	.025	.0075	.1250	1.5	PR2-070500	26.85	PR2-070500X	30.00
.0700	.0800	.500	.005	.025	.0075	.1250	1.5	PR-070500	26.85	PR-070500X	30.00
.0800	.0900	.200	.002	.030	.0175	.1250	1.5	PR2-080200	26.85	PR2-080200X	30.00
.0800	.0900	.300	.002	.030	.0175	.1250	1.5	PR2-080300	26.85	PR2-080300X	30.00
.0900	.1000	.200	.002	.030	.0275	.1250	1.5	PR2-090200	26.85	PR2-090200X	30.00
.0900	.1000	.300	.002	.030	.0275	.1250	1.5	PR2-090300	26.85	PR2-090300X	30.00
.1000	.1100	.200	.002	.035	.0375	.1250	1.5	PR2-100200	26.85	PR2-100200X	30.00
.1000	.1100	.200	.005	.035	.0375	.1250	1.5	PR5-100200	26.85	PR5-100200X	30.00
.1000	.1100	.300	.002	.035	.0375	.1250	1.5	PR2-100300	26.85	PR2-100300X	30.00
.1000	.1100	.300	.005	.035	.0375	.1250	1.5	PR5-100300	26.85	PR5-100300X	30.00
.1100	.1240	.250	.005	.040	.0475	.1250	1.5	PR-110250	26.85	PR-110250X	30.00
.1100	.1240	.375	.005	.040	.0475	.1250	1.5	PR5-110375	26.85	PR5-110375X	30.00
.1100	.1240	.500	.005	.040	.0475	.1250	1.5	PR5-110500	26.85	PR5-110500X	30.00
.1200	.1340	.250	.008	.050	.0263	.1875	2.0	PR-120250	27.90	PR-120250X	31.55
.1200	.1340	.375	.005	.050	.0263	.1875	2.0	PR5-120375	27.90	PR5-120375X	31.55
.1200	.1340	.375	.008	.050	.0263	.1875	2.0	PR8-120375	27.90	PR8-120375X	31.55
.1200	.1340	.500	.008	.050	.0263	.1875	2.0	PR-120500	27.90	PR-120500X	31.55
.1200	.1340	.750	.005	.050	.0263	.1875	2.0	PR5-120750	27.90	PR5-120750X	31.55
.1200	.1340	.750	.008	.050	.0263	.1875	2.0	PR8-120750	27.90	PR8-120750X	31.55

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

Continued on next page

See pg 140 for standard tool holders

PR



Standard – Profiling Tools

Radial Profiling (cont.)

Continued from previous page

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AITIN Coated	
								Tool #	Price	Tool #	Price
H	L ₂	$L_2^{+.050''}$ $-.000''$	R	P	F	D ₂ (h6)	L ₁				
.1400	.1540	.375	.005	.050	.0463	.1875	2.0	PR5-140375	27.90	PR5-140375X	31.55
.1400	.1540	.375	.008	.050	.0463	.1875	2.0	PR8-140375	27.90	PR8-140375X	31.55
.1400	.1540	.500	.005	.050	.0463	.1875	2.0	PR5-140500	27.90	PR5-140500X	31.55
.1400	.1540	.500	.008	.050	.0463	.1875	2.0	PR8-140500	27.90	PR8-140500X	31.55
.1600	.1780	.375	.008	.050	.0663	.1875	2.0	PR8-160375	27.90	PR8-160375X	31.55
.1600	.1780	.500	.008	.050	.0663	.1875	2.0	PR-160500	27.90	PR-160500X	31.55
.1600	.1780	.750	.008	.050	.0663	.1875	2.0	PR8-160750	27.90	PR8-160750X	31.55
.1600	.1780	1.000	.008	.050	.0663	.1875	2.0	PR8-1601000	27.90	PR8-1601000X	31.55
.1800	.1980	.375	.008	.080	.0550	.2500	2.5	PR8-180375	35.70	PR8-180375X	41.45
.1800	.1980	.500	.008	.080	.0550	.2500	2.5	PR-180500	35.70	PR-180500X	41.45
.1800	.1980	.750	.008	.080	.0550	.2500	2.5	PR-180750	35.70	PR-180750X	41.45
.1800	.1980	1.000	.008	.080	.0550	.2500	2.5	PR8-1801000	35.70	PR8-1801000X	41.45
.2000	.2180	.500	.005	.080	.0750	.2500	2.5	PR5-200500	35.70	PR5-200500X	41.45
.2000	.2180	.500	.008	.080	.0750	.2500	2.5	PR8-200500	35.70	PR8-200500X	41.45
.2000	.2180	.750	.005	.080	.0750	.2500	2.5	PR5-200750	35.70	PR5-200750X	41.45
.2000	.2180	.750	.008	.080	.0750	.2500	2.5	PR8-200750	35.70	PR8-200750X	41.45
.2300	.2520	.500	.008	.080	.0738	.3125	2.5	PR8-230500	44.10	PR8-230500X	51.00
.2300	.2520	.750	.008	.080	.0738	.3125	2.5	PR-230750	44.10	PR-230750X	51.00
.2300	.2520	1.000	.008	.080	.0738	.3125	2.5	PR-2301000	44.10	PR-2301000X	51.00
.2300	.2520	1.250	.008	.080	.0738	.3125	2.5	PR8-2301250	44.10	PR8-2301250X	51.00
.2600	.2820	.750	.008	.090	.1038	.3125	2.5	PR8-260750	44.10	PR8-260750X	51.00
.2600	.2820	1.000	.008	.090	.1038	.3125	2.5	PR8-2601000	44.10	PR8-2601000X	51.00
.3000	.3220	.750	.008	.110	.1438	.3125	2.5	PR8-300750	44.10	PR8-300750X	51.00
.3000	.3220	1.000	.008	.110	.1438	.3125	2.5	PR-3001000	44.10	PR-3001000X	51.00
.3000	.3220	1.250	.008	.110	.1438	.3125	2.5	PR-3001250	44.10	PR-3001250X	51.00
.3600	.3820	.750	.008	.130	.1725	.3750	2.5	PR8-360750	57.15	PR8-360750X	65.35
.3600	.3820	1.000	.008	.130	.1725	.3750	2.5	PR-3601000	57.15	PR-3601000X	65.35
.3600	.3820	1.250	.008	.130	.1725	.3750	2.5	PR-3601250	57.15	PR-3601250X	65.35
.4600	.4820	.750	.008	.150	.2100	.5000	3.0	PR8-460750	78.75	PR8-460750X	88.95
.4600	.4820	1.000	.008	.150	.2100	.5000	3.0	PR8-4601000	78.75	PR8-4601000X	88.95

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

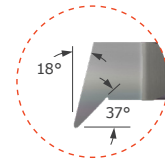
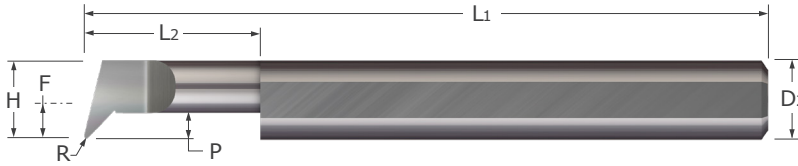
See pg 140 for standard tool holders

Standard – Profiling Tools

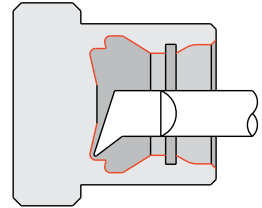
Angled Profiling

Tech Resources
Available Online

PA



- 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



Standard – Profiling Tools

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
								Tool #	Price	Tool #	Price
H		L2 ^{+ .030"} _{-.000"}	R ^{+ .0005"} _{-.0005"}	P	F	D2 (h6)	L1				
.0500	.0550	.150	.0020	.015	-.0125	.1250	1.5	PA2-050150	27.45	PA2-050150X	30.65
.0500	.0550	.200	.0020	.015	-.0125	.1250	1.5	PA2-050200	27.45	PA2-050200X	30.65
.0600	.0700	.150	.0020	.020	-.0025	.1250	1.5	PA2-060150	27.45	PA2-060150X	30.65
.0600	.0700	.200	.0020	.020	-.0025	.1250	1.5	PA2-060200	27.45	PA2-060200X	30.65
.0700	.0800	.150	.0020	.020	.0075	.1250	1.5	PA2-070150	26.85	PA2-070150X	30.00
.0700	.0800	.200	.0020	.020	.0075	.1250	1.5	PA2-070200	26.85	PA2-070200X	30.00
.0800	.0900	.200	.0020	.025	.0175	.1250	1.5	PA2-080200	26.85	PA2-080200X	30.00
.0800	.0900	.300	.0020	.025	.0175	.1250	1.5	PA2-080300	26.85	PA2-080300X	30.00
.0900	.1000	.200	.0020	.030	.0275	.1250	1.5	PA2-090200	26.85	PA2-090200X	30.00
.0900	.1000	.300	.0020	.030	.0275	.1250	1.5	PA2-090300	26.85	PA2-090300X	30.00
.1000	.1100	.200	.0020	.030	.0375	.1250	1.5	PA2-100200	26.85	PA2-100200X	30.00
.1000	.1100	.200	.0050	.030	.0375	.1250	1.5	PA5-100200	26.85	PA5-100200X	30.00
.1000	.1100	.300	.0020	.030	.0375	.1250	1.5	PA2-100300	26.85	PA2-100300X	30.00
.1000	.1100	.300	.0050	.030	.0375	.1250	1.5	PA5-100300	26.85	PA5-100300X	30.00
.1100	.1240	.250	.0050	.035	.0475	.1250	1.5	PA5-110250	26.85	PA5-110250X	30.00
.1100	.1240	.375	.0050	.035	.0475	.1250	1.5	PA5-110375	26.85	PA5-110375X	30.00
.1200	.1340	.250	.0050	.035	.0263	.1875	2.0	PA5-120250	27.90	PA5-120250X	31.55
.1200	.1340	.375	.0050	.035	.0263	.1875	2.0	PA5-120375	27.90	PA5-120375X	31.55
.1400	.1540	.375	.0050	.040	.0463	.1875	2.0	PA5-140375	27.90	PA5-140375X	31.55
.1400	.1540	.500	.0050	.040	.0463	.1875	2.0	PA5-140500	27.90	PA5-140500X	31.55
.1600	.1780	.375	.0050	.050	.0663	.1875	2.0	PA5-160375	27.90	PA5-160375X	31.55
.1600	.1780	.500	.0050	.050	.0663	.1875	2.0	PA5-160500	27.90	PA5-160500X	31.55
.1800	.1980	.375	.0050	.055	.0550	.2500	2.5	PA5-180375	35.70	PA5-180375X	41.45
.1800	.1980	.500	.0050	.055	.0550	.2500	2.5	PA5-180500	35.70	PA5-180500X	41.45

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

Continued on next page

See pg 140 for standard tool holders

PA



Standard – Profiling Tools

Angled Profiling (cont.)

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	R	P	F	D_{2} (h6)	L_{1}	Tool #	Price	Tool #	Price
.2000	.2180	.500	.0050	.060	.0750	.2500	2.5	PA5-200500	35.70	PA5-200500X	41.45
.2000	.2180	.500	.0080	.060	.0750	.2500	2.5	PA8-200500	35.70	PA8-200500X	41.45
.2000	.2180	.750	.0050	.060	.0750	.2500	2.5	PA5-200750	35.70	PA5-200750X	41.45
.2000	.2180	.750	.0080	.060	.0750	.2500	2.5	PA8-200750	35.70	PA8-200750X	41.45
.2300	.2520	.500	.0080	.070	.0738	.3125	2.5	PA8-230500	44.10	PA8-230500X	51.00
.2300	.2520	.750	.0080	.070	.0738	.3125	2.5	PA8-230750	44.10	PA8-230750X	51.00
.2600	.2820	.750	.0080	.080	.1038	.3125	2.5	PA8-260750	44.10	PA8-260750X	51.00
.2600	.2820	1.000	.0080	.080	.1038	.3125	2.5	PA8-2601000	44.10	PA8-2601000X	51.00
.3000	.3220	.750	.0080	.090	.1438	.3125	2.5	PA8-300750	44.10	PA8-300750X	51.00
.3000	.3220	1.000	.0080	.090	.1438	.3125	2.5	PA8-3001000	44.10	PA8-3001000X	51.00
.3600	.3820	.750	.0080	.110	.1725	.3750	2.5	PA8-360750	57.15	PA8-360750X	65.35
.3600	.3820	1.000	.0080	.110	.1725	.3750	2.5	PA8-3601000	57.15	PA8-3601000X	65.35
.4100	.4320	.750	.0080	.120	.1600	.5000	3.0	PA8-410750	80.00	PA8-410750X	90.20
.4100	.4320	1.250	.0080	.120	.1600	.5000	3.0	PA8-4101250	80.00	PA8-4101250X	90.20
.4600	.4820	.750	.0080	.140	.2100	.5000	3.0	PA8-460750	80.00	PA8-460750X	90.20
.4600	.4820	1.000	.0080	.140	.2100	.5000	3.0	PA8-4601000	80.00	PA8-4601000X	90.20

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

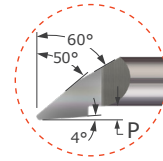
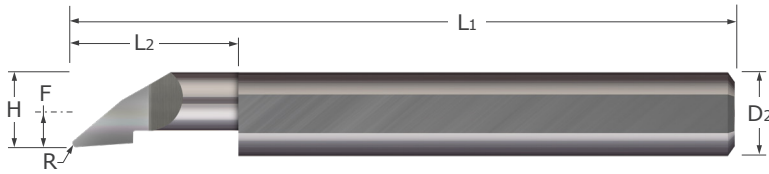
See pg 140 for standard tool holders

Standard – Profiling Tools

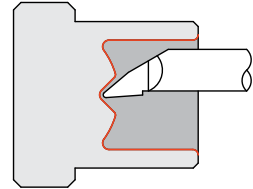
Axial Profiling



PF



- 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 geometry makes the tool as rigid as possible
- 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



Standard – Profiling Tools

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
								Tool #	Price	Tool #	Price
H		L ₂ ^{+0.050"} / _{-.000"}	R ^{+0.002"} / _{-.000"}	P	F	D ₂ (h6)	L ₁				
.0500	.0550	.150	.005	.005	-.0125	.1250	1.5	PF5-050150	27.45	PF5-050150X	30.65
.0500	.0550	.200	.005	.005	-.0125	.1250	1.5	PF5-050200	27.45	PF5-050200X	30.65
.0600	.0700	.200	.005	.005	-.0025	.1250	1.5	PF5-060200	27.45	PF5-060200X	30.65
.0600	.0700	.250	.005	.005	-.0025	.1250	1.5	PF5-060250	26.85	PF5-060250X	30.00
.0700	.0800	.200	.005	.010	.0075	.1250	1.5	PF-070200	26.85	PF-070200X	30.00
.0700	.0800	.400	.005	.010	.0075	.1250	1.5	PF-070400	26.85	PF-070400X	30.00
.0700	.0800	.500	.005	.010	.0075	.1250	1.5	PF-070500	26.85	PF-070500X	30.00
.0800	.0900	.150	.005	.010	.0175	.1250	1.5	PF5-080150	26.85	PF5-080150X	30.00
.0800	.0900	.200	.005	.010	.0175	.1250	1.5	PF5-080200	26.85	PF5-080200X	30.00
.0800	.0900	.250	.005	.010	.0175	.1250	1.5	PF5-080250	26.85	PF5-080250X	30.00
.0900	.1000	.200	.005	.010	.0275	.1250	1.5	PF5-090200	26.85	PF5-090200X	30.00
.0900	.1000	.300	.005	.010	.0275	.1250	1.5	PF5-090300	26.85	PF5-090300X	30.00
.1000	.1100	.300	.005	.015	.0375	.1250	1.5	PF5-100300	26.85	PF5-100300X	30.00
.1000	.1100	.400	.005	.015	.0375	.1250	1.5	PF5-100400	26.85	PF5-100400X	30.00
.1100	.1220	.250	.005	.015	.0475	.1250	1.5	PF-110250	26.85	PF-110250X	30.00
.1100	.1220	.375	.005	.015	.0475	.1250	1.5	PF5-110375	26.85	PF5-110375X	30.00
.1100	.1220	.500	.005	.015	.0475	.1250	1.5	PF-110500	26.85	PF-110500X	30.00
.1100	.1220	.750	.005	.015	.0475	.1250	1.5	PF-110750	26.85	PF-110750X	30.00
.1200	.1320	.250	.005	.020	.0263	.1875	2.0	PF5-120250	27.90	PF5-120250X	31.55
.1200	.1320	.250	.008	.020	.0263	.1875	2.0	PF-120250	27.90	PF-120250X	31.55
.1200	.1320	.375	.005	.020	.0263	.1875	2.0	PF5-120375	27.90	PF5-120375X	31.55
.1200	.1320	.375	.008	.020	.0263	.1875	2.0	PF8-120375	27.90	PF8-120375X	31.55
.1200	.1320	.500	.008	.020	.0263	.1875	2.0	PF-120500	27.90	PF-120500X	31.55
.1200	.1320	.750	.008	.020	.0263	.1875	2.0	PF-120750	27.90	PF-120750X	31.55
.1400	.1520	.375	.008	.020	.0463	.1875	2.0	PF8-140375	27.90	PF8-140375X	31.55
.1400	.1520	.500	.008	.020	.0463	.1875	2.0	PF8-140500	27.90	PF8-140500X	31.55

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

Continued on next page

See pg 140 for standard tool holders

PF



Standard – Profiling Tools

Axial Profiling (cont.)

Continued from previous page

Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AITIN Coated	
								H	L ₂	R	P	F	D_{2} (h6)	L_{1}	Tool #	Price	Tool #	Price
.1600	.1760	.375	.008	.030	.0663	.1875	2.0	PF8-160375	27.90	PF8-160375X	31.55
.1600	.1760	.500	.008	.030	.0663	.1875	2.0	PF-160500	27.90	PF-160500X	31.55
.1600	.1760	.750	.008	.030	.0663	.1875	2.0	PF-160750	27.90	PF-160750X	31.55
.1800	.1960	.375	.008	.030	.0550	.2500	2.5	PF8-180375	35.70	PF8-180375X	41.45
.1800	.1960	.500	.008	.030	.0550	.2500	2.5	PF-180500	35.70	PF-180500X	41.45
.1800	.1960	.750	.008	.030	.0550	.2500	2.5	PF-180750	35.70	PF-180750X	41.45
.1800	.1960	1.000	.008	.030	.0550	.2500	2.5	PF-1801000	35.70	PF-1801000X	41.45
.2000	.2160	.400	.008	.030	.0750	.2500	2.5	PF8-200400	35.70	PF8-200400X	41.45
.2000	.2160	.600	.008	.030	.0750	.2500	2.5	PF-200600	35.70	PF-200600X	41.45
.2000	.2160	.800	.008	.030	.0750	.2500	2.5	PF8-200800	35.70	PF8-200800X	41.45
.2000	.2160	1.000	.008	.030	.0750	.2500	2.5	PF-2001000	35.70	PF-2001000X	41.45
.2300	.2500	.500	.008	.030	.0738	.3125	2.5	PF8-230500	44.10	PF8-230500X	51.00
.2300	.2500	.750	.008	.030	.0738	.3125	2.5	PF-230750	44.10	PF-230750X	51.00
.2300	.2500	1.000	.008	.030	.0738	.3125	2.5	PF-2301000	44.10	PF-2301000X	51.00
.2300	.2500	1.250	.008	.030	.0738	.3125	2.5	PF-2301250	44.10	PF-2301250X	51.00
.2600	.2800	.750	.008	.030	.1038	.3125	2.5	PF8-260750	44.10	PF8-260750X	51.00
.3000	.3200	1.000	.008	.030	.1438	.3125	2.5	PF-3001000	44.10	PF-3001000X	51.00
.3600	.3800	.750	.008	.030	.1725	.3750	2.5	PF8-360750	57.15	PF8-360750X	65.35
.3600	.3800	1.000	.008	.030	.1725	.3750	2.5	PF-3601000	57.15	PF-3601000X	65.35
.4100	.4300	.750	.008	.040	.1600	.5000	3.0	PF8-410750	78.75	PF8-410750X	88.95
.4100	.4300	1.000	.008	.040	.1600	.5000	3.0	PF8-4101000	78.75	PF8-4101000X	88.95
.4600	.4800	.750	.008	.050	.2100	.5000	3.0	PF8-460750	78.75	PF8-460750X	88.95
.4600	.4800	1.000	.008	.050	.2100	.5000	3.0	PF8-4601000	78.75	PF8-4601000X	88.95

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

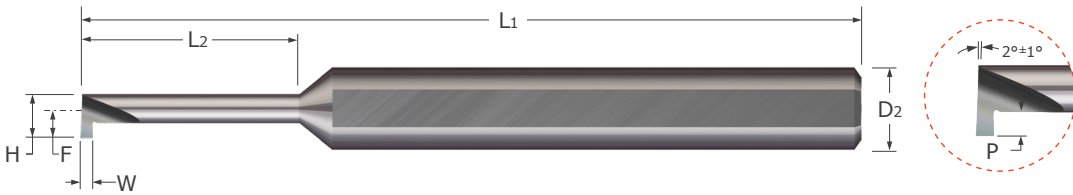
See pg 140 for standard tool holders

Standard – Grooving Tools

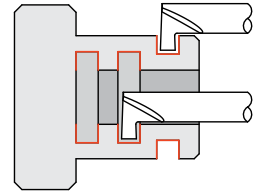
Retaining Ring – Square – Right Hand – Miniature



MRR



- 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



Standard – Profiling Tools

Width W	Head Width H	Min. Bore Diameter*	Maximum Bore Depth L2	Projection P	Centerline Offset F	Shank Diameter D2 (h6)	Overall Length L1	Uncoated		AlTiN Coated	
								Tool #	Price	Tool #	Price
.015	.0600	.0700	.150	.020	.0400	.1250	1.5	MRR-015-150-060	31.00	MRR-015-150-060X	34.25
.015	.0600	.0700	.250	.020	.0400	.1250	1.5	MRR-015-250-060	31.00	MRR-015-250-060X	34.25
.020	.0600	.0700	.150	.020	.0400	.1250	1.5	MRR-020-150-060	31.00	MRR-020-150-060X	34.25
.020	.0600	.0700	.250	.020	.0400	.1250	1.5	MRR-020-250-060	31.00	MRR-020-250-060X	34.25
.020	.0700	.0800	.100	.020	.0450	.1250	1.5	MRR-020-100-070	31.00	MRR-020-100-070X	34.25
.020	.0700	.0800	.150	.020	.0450	.1250	1.5	MRR-020-150-070	31.00	MRR-020-150-070X	34.25
.020	.0800	.0900	.150	.025	.0525	.1250	1.5	MRR-020-150-080	31.00	MRR-020-150-080X	34.25
.020	.0800	.0900	.250	.025	.0525	.1250	1.5	MRR-020-250-080	31.00	MRR-020-250-080X	34.25
.020	.0900	.1000	.150	.025	.0575	.1250	1.5	MRR-020-150-090	31.00	MRR-020-150-090X	34.25
.020	.0900	.1000	.250	.025	.0575	.1250	1.5	MRR-020-250-090	31.00	MRR-020-250-090X	34.25
.020	.1000	.1100	.150	.030	.0650	.1875	2.0	MRR-020-150-100	32.75	MRR-020-150-100X	36.45
.020	.1000	.1100	.250	.030	.0650	.1875	2.0	MRR-020-250-100	32.75	MRR-020-250-100X	36.45
.020	.1200	.1340	.150	.040	.0800	.1875	2.0	MRR-020-150-120	32.75	MRR-020-150-120X	36.45
.020	.1200	.1340	.250	.040	.0800	.1875	2.0	MRR-020-250-120	32.75	MRR-020-250-120X	36.45
.030	.0700	.0800	.100	.020	.0450	.1250	1.5	MRR-030-100-070	31.00	MRR-030-100-070X	34.25
.030	.0700	.0800	.150	.020	.0450	.1250	1.5	MRR-030-150-070	31.00	MRR-030-150-070X	34.25
.030	.0800	.0900	.150	.025	.0525	.1250	1.5	MRR-030-150-080	31.00	MRR-030-150-080X	34.25
.030	.0800	.0900	.250	.025	.0525	.1250	1.5	MRR-030-250-080	31.00	MRR-030-250-080X	34.25
.030	.0900	.1000	.150	.025	.0575	.1250	1.5	MRR-030-150-090	31.00	MRR-030-150-090X	34.25
.030	.0900	.1000	.250	.025	.0575	.1250	1.5	MRR-030-250-090	31.00	MRR-030-250-090X	34.25
.030	.1000	.1100	.150	.030	.0650	.1875	2.0	MRR-030-150-100	32.75	MRR-030-150-100X	36.45
.030	.1000	.1100	.250	.030	.0650	.1875	2.0	MRR-030-250-100	32.75	MRR-030-250-100X	36.45
.030	.1200	.1340	.150	.040	.0800	.1875	2.0	MRR-030-150-120	32.75	MRR-030-150-120X	36.45
.030	.1200	.1340	.250	.040	.0800	.1875	2.0	MRR-030-250-120	32.75	MRR-030-250-120X	36.45

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

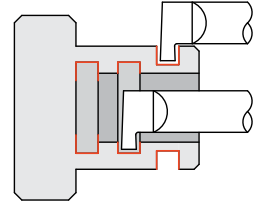
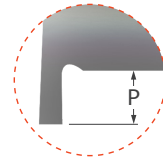
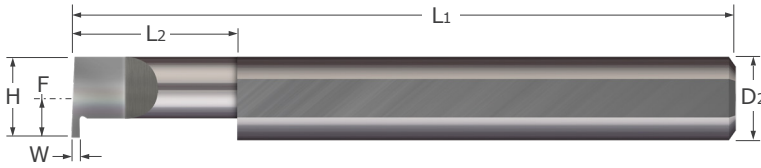
See pg 140 for standard tool holders

RR / RRM



Standard – Grooving Tools

Retaining Ring – Square – 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 Dia*	Max. Bore Depth	Proj.	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
								Tool #	Price	Tool #	Price	Tool #	Price
W _{+0.001" dec. equiv. +0.025mm -0.000mm}	H		L _{+0.050" -0.000" +1.25mm -0.00mm}	P	F	D _{2 (h6)}	L ₁						
0.3 mm .0118	3 mm	3.35 mm	10 mm	0.60 mm	1.5 mm	4 mm	50 mm	RRR-030-10	29.50			RRR-030-10X	33.15
0.3 mm .0118	3 mm	3.35 mm	15 mm	0.60 mm	1.5 mm	4 mm	50 mm	RRR-030-15	29.50			RRR-030-15X	33.15
0.4 mm .0157	4 mm	4.45 mm	10 mm	0.80 mm	2 mm	4 mm	50 mm	RRR-040-10	29.50			RRR-040-10X	33.15
0.4 mm .0157	4 mm	4.45 mm	15 mm	0.80 mm	2 mm	4 mm	50 mm	RRR-040-15	29.50	RRR-040-15G	32.30	RRR-040-15X	33.15
0.4 mm .0157	4 mm	4.45 mm	20 mm	0.80 mm	2 mm	4 mm	50 mm	RRR-040-20	29.50	RRR-040-20G	32.30	RRR-040-20X	33.15
.017 .0170	.187	.205	.250	.030	.0937	.1875	2.0	RR-017-250-187	32.05			RR-017-250-187X	35.70
.017 .0170	.187	.205	.375	.030	.0937	.1875	2.0	RR-017-375-187	32.05			RR-017-375-187X	35.70
.017 .0170	.187	.205	.500	.030	.0937	.1875	2.0	RR-017-500-187	32.05			RR-017-500-187X	35.70
.017 .0170	.187	.205	.625	.030	.0937	.1875	2.0	RR-017-625-187	32.05			RR-017-625-187X	35.70
.017 .0170	.250	.272	.250	.050	.1250	.2500	2.5	RR-017-4	34.95			RR-017-4X	40.70
.017 .0170	.250	.272	.375	.050	.1250	.2500	2.5	RR-017-6	34.95			RR-017-6X	40.70
.017 .0170	.250	.272	.500	.050	.1250	.2500	2.5	RR-017-8	34.95			RR-017-8X	40.70
.017 .0170	.250	.272	.625	.050	.1250	.2500	2.5	RR-017-10	34.95			RR-017-10X	40.70
0.5 mm .0200	6 mm	6.55 mm	10 mm	1.24 mm	3 mm	6 mm	57 mm	RRR-050-10	34.35	RRR-050-10G	38.55	RRR-050-10X	40.10
0.5 mm .0200	6 mm	6.55 mm	20 mm	1.24 mm	3 mm	6 mm	57 mm	RRR-050-20	34.35			RRR-050-20X	40.10
0.5 mm .0200	6 mm	6.55 mm	25 mm	1.24 mm	3 mm	6 mm	57 mm	RRR-050-25	34.35	RRR-050-25G	38.55	RRR-050-25X	40.10
.020 .0200	.120	.134	.150	.030	.0262	.1875	2.0	RR-020-150-120	32.05			RR-020-150-120X	35.70
.020 .0200	.120	.134	.250	.030	.0262	.1875	2.0	RR-020-250-120	32.05			RR-020-250-120X	35.70
.020 .0200	.140	.154	.250	.030	.0462	.1875	2.0	RR-020-250-140	32.05			RR-020-250-140X	35.70
.020 .0200	.140	.154	.375	.030	.0462	.1875	2.0	RR-020-375-140	32.05			RR-020-375-140X	35.70
.020 .0200	.160	.178	.250	.030	.0662	.1875	2.0	RR-020-250-160	32.05			RR-020-250-160X	35.70
.020 .0200	.160	.178	.375	.030	.0662	.1875	2.0	RR-020-375-160	32.05			RR-020-375-160X	35.70
.020 .0200	.187	.205	.250	.030	.0937	.1875	2.0	RR-020-250-187	32.05			RR-020-250-187X	35.70
.020 .0200	.187	.205	.375	.030	.0937	.1875	2.0	RR-020-375-187	32.05			RR-020-375-187X	35.70
.020 .0200	.187	.205	.500	.030	.0937	.1875	2.0	RR-020-500-187	32.05			RR-020-500-187X	35.70
.020 .0200	.187	.205	.625	.030	.0937	.1875	2.0	RR-020-625-187	32.05			RR-020-625-187X	35.70
.020 .0200	.250	.272	.250	.050	.1250	.2500	2.5	RR-020-250-250	34.95			RR-020-250-250X	40.70
.020 .0200	.250	.272	.375	.050	.1250	.2500	2.5	RR-020-375-250	34.95			RR-020-375-250X	40.70
.020 .0200	.250	.272	.500	.050	.1250	.2500	2.5	RR-020-500-250	34.95			RR-020-500-250X	40.70
.020 .0200	.250	.272	.625	.050	.1250	.2500	2.5	RR-020-625-250	34.95			RR-020-625-250X	40.70

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

Continued on next page

See pg 140 for standard tool holders

Standard – Grooving Tools

Standard – Grooving Tools

Retaining Ring – Square – Right Hand (cont.)



RR / RRM

Continued from previous page

Width W ₁ +.001" -.000" +.025mm -.000mm dec. equiv.	Head Width H	Min. Bore Dia* L2	Max. Bore Depth L2 +.050" -.000" +1.25mm -.00mm	Proj. P	Centerline Offset F	Shank Dia. D2 (h6)	OAL L1	Uncoated		TIN Coated		A1TIN Coated		
								Tool #	Price	Tool #	Price	Tool #	Price	
.025	.0250	.250	.272	.250	.050	.1250	.2500	2.5	RR-025-4	34.95			RR-025-4X	40.70
.025	.0250	.250	.272	.375	.050	.1250	.2500	2.5	RR-025-6	34.95			RR-025-6X	40.70
.025	.0250	.250	.272	.500	.050	.1250	.2500	2.5	RR-025-8	34.95			RR-025-8X	40.70
.025	.0250	.250	.272	.625	.050	.1250	.2500	2.5	RR-025-10	34.95			RR-025-10X	40.70
.025	.0250	.250	.272	.750	.050	.1250	.2500	2.5	RR-025-750-250	34.95			RR-025-750-250X	40.70
.025	.0250	.250	.272	1.000	.050	.1250	.2500	2.5	RR-025-1000-250	34.95			RR-025-1000-250X	40.70
0.7 mm	.0280	6 mm	6.55 mm	10 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-070-10	34.35			RRM-070-10X	40.10
0.7 mm	.0280	6 mm	6.55 mm	15 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-070-15	34.35				
0.7 mm	.0280	6 mm	6.55 mm	20 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-070-20	34.35				
0.7 mm	.0280	6 mm	6.55 mm	25 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-070-25	34.35	RRM-070-25G	38.55	RRM-070-25X	40.10
.029	.0290	.250	.272	.250	.050	.1250	.2500	2.5	RR-029-250-250	34.95			RR-029-250-250X	40.70
.029	.0290	.250	.272	.500	.050	.1250	.2500	2.5	RR-029-500-250	34.95			RR-029-500-250X	40.70
.030	.0300	.120	.134	.150	.030	.0262	.1875	2.0	RR-030-150-120	32.05			RR-030-150-120X	35.70
.030	.0300	.120	.134	.250	.030	.0262	.1875	2.0	RR-030-250-120	32.05			RR-030-250-120X	35.70
.030	.0300	.140	.154	.250	.030	.0462	.1875	2.0	RR-030-250-140	32.05			RR-030-250-140X	35.70
.030	.0300	.140	.154	.375	.030	.0462	.1875	2.0	RR-030-375-140	32.05			RR-030-375-140X	35.70
.030	.0300	.160	.178	.250	.030	.0662	.1875	2.0	RR-030-250-160	32.05			RR-030-250-160X	35.70
.030	.0300	.160	.178	.375	.030	.0662	.1875	2.0	RR-030-375-160	32.05			RR-030-375-160X	35.70
.030	.0300	.187	.205	.250	.030	.0937	.1875	2.0	RR-030-250-187	32.05			RR-030-250-187X	35.70
.030	.0300	.187	.205	.500	.030	.0937	.1875	2.0	RR-030-500-187	32.05			RR-030-500-187X	35.70
.030	.0300	.250	.272	.250	.050	.1250	.2500	2.5	RR-030-4	34.95			RR-030-4X	40.70
.030	.0300	.250	.272	.375	.050	.1250	.2500	2.5	RR-030-6	34.95			RR-030-6X	40.70
.030	.0300	.250	.272	.500	.050	.1250	.2500	2.5	RR-030-8	34.95			RR-030-8X	40.70
.030	.0300	.250	.272	.625	.050	.1250	.2500	2.5	RR-030-10	34.95			RR-030-10X	40.70
.030	.0300	.250	.272	.750	.050	.1250	.2500	2.5	RR-030-750-250	34.95			RR-030-750-250X	40.70
.030	.0300	.250	.272	1.000	.050	.1250	.2500	2.5	RR-030-1000-250	34.95			RR-030-1000-250X	40.70
.030	.0300	.312	.334	.500	.100	.1562	.3125	2.5	RR-030-500-312	43.60			RR-030-500-312X	50.50
.030	.0300	.312	.334	.750	.100	.1562	.3125	2.5	RR-030-750-312	43.60			RR-030-750-312X	50.50
.031	.0310	.250	.272	.250	.050	.1250	.2500	2.5	RR-031-250-250	34.95			RR-031-250-250X	40.70
.031	.0310	.250	.272	.500	.050	.1250	.2500	2.5	RR-031-500-250	34.95			RR-031-500-250X	40.70
0.8 mm	.0310	6 mm	6.55 mm	15 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-080-15	34.35	RRM-080-15G	38.55	RRM-080-15X	40.10
0.8 mm	.0310	6 mm	6.55 mm	25 mm	1.24 mm	3 mm	6 mm	57 mm	RRM-080-25	34.35	RRM-080-25G	38.55	RRM-080-25X	40.10
.033	.0330	.312	.334	.250	.100	.1562	.3125	2.5	RR-033-4	43.60			RR-033-4X	50.50
.033	.0330	.312	.334	.375	.100	.1562	.3125	2.5	RR-033-6	43.60			RR-033-6X	50.50
.033	.0330	.312	.334	.500	.100	.1562	.3125	2.5	RR-033-8	43.60			RR-033-8X	50.50
.033	.0330	.312	.334	.750	.100	.1562	.3125	2.5	RR-033-12	43.60			RR-033-12X	50.50
.033	.0330	.312	.334	1.000	.100	.1562	.3125	2.5	RR-033-1000-312	43.60			RR-033-1000-312X	50.50
.033	.0330	.312	.334	1.250	.100	.1562	.3125	2.5	RR-033-1250-312	43.60			RR-033-1250-312X	50.50
0.9 mm	.0350	8 mm	8.55 mm	20 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-090-20	41.40			RRM-090-20X	49.40
0.9 mm	.0350	8 mm	8.55 mm	30 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-090-30	41.40			RRM-090-30X	49.40

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

Continued on next page

See pg 140 for standard tool holders

RR / RRM



Standard – Grooving Tools

Retaining Ring – Square – Right Hand (cont.)

Continued from previous page

Width W +.002" dec. -.000" equiv. +.050mm -.000mm	Head Width H	Min. Bore Dia* L2	Max. Bore Depth L2 +.050" -.000" +1.25mm -.00mm	Proj. P	Centerline Offset F	Shank Dia. D2 (h6)	OAL L1	Uncoated		TiN Coated		AlTiN Coated		
								Tool #	Price	Tool #	Price	Tool #	Price	
.038	.0380	.250	.272	.250	.050	.1250	.2500	2.5	RR-038-250-250	34.95			RR-038-250-250X	40.70
.038	.0380	.250	.272	.500	.050	.1250	.2500	2.5	RR-038-500-250	34.95			RR-038-500-250X	40.70
.038	.0380	.312	.334	.250	.100	.1562	.3125	2.5	RR-038-4	43.60			RR-038-4X	50.50
.038	.0380	.312	.334	.375	.100	.1562	.3125	2.5	RR-038-6	43.60			RR-038-6X	50.50
.038	.0380	.312	.334	.500	.100	.1562	.3125	2.5	RR-038-8	43.60			RR-038-8X	50.50
.038	.0380	.312	.334	.750	.100	.1562	.3125	2.5	RR-038-12	43.60			RR-038-12X	50.50
.038	.0380	.312	.334	1.000	.100	.1562	.3125	2.5	RR-038-1000-312	43.60			RR-038-1000-312X	50.50
.038	.0380	.312	.334	1.250	.100	.1562	.3125	2.5	RR-038-1250-312	43.60			RR-038-1250-312X	50.50
.039	.0390	.187	.205	.250	.030	.0937	.1875	2.0	RR-039-250-187	32.05			RR-039-250-187X	35.70
.039	.0390	.187	.205	.500	.030	.0937	.1875	2.0	RR-039-500-187	32.05			RR-039-500-187X	35.70
.039	.0390	.250	.272	.250	.050	.1250	.2500	2.5	RR-039-250-250	34.95			RR-039-250-250X	40.70
.039	.0390	.250	.272	.500	.050	.1250	.2500	2.5	RR-039-500-250	34.95			RR-039-500-250X	40.70
.039	.0390	.375	.397	.250	.100	.1875	.3750	2.5	RR-039-4	56.80			RR-039-4X	65.00
.039	.0390	.375	.397	.375	.100	.1875	.3750	2.5	RR-039-6	56.80			RR-039-6X	65.00
.039	.0390	.375	.397	.500	.100	.1875	.3750	2.5	RR-039-8	56.80			RR-039-8X	65.00
.039	.0390	.375	.397	.750	.100	.1875	.3750	2.5	RR-039-12	56.80			RR-039-12X	65.00
.039	.0390	.375	.397	1.000	.100	.1875	.3750	2.5	RR-039-16	56.80			RR-039-16X	65.00
.039	.0390	.375	.397	1.250	.100	.1875	.3750	2.5	RR-039-20	56.80			RR-039-20X	65.00
.039	.0390	.375	.397	1.500	.100	.1875	.3750	2.5	RR-039-1500-375	56.80			RR-039-1500-375X	65.00
1 mm	.0390	8 mm	8.55 mm	10 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-100-10	41.40	RRM-100-10G	47.40	RRM-100-10X	49.40
1 mm	.0390	8 mm	8.55 mm	20 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-100-20	41.40			RRM-100-20X	49.40
1 mm	.0390	8 mm	8.55 mm	40 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-100-40	41.40			RRM-100-40X	49.40
.040	.0400	.250	.272	.250	.050	.1250	.2500	2.5	RR-040-250-250	34.95			RR-040-250-250X	40.70
.040	.0400	.250	.272	.500	.050	.1250	.2500	2.5	RR-040-500-250	34.95			RR-040-500-250X	40.70
1.1 mm	.0430	8 mm	8.55 mm	10 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-110-10	41.40	RRM-110-10G	47.40	RRM-110-10X	49.40
1.1 mm	.0430	8 mm	8.55 mm	20 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-110-20	41.40			RRM-110-20X	49.40
1.1 mm	.0430	8 mm	8.55 mm	40 mm	2.50 mm	4 mm	8 mm	63 mm	RRM-110-40	41.40			RRM-110-40X	49.40
.046	.0460	.312	.334	.500	.100	.1562	.3125	2.5	RR-046-500-312	43.60			RR-046-500-312X	50.50
.046	.0460	.312	.334	.750	.100	.1562	.3125	2.5	RR-046-750-312	43.60			RR-046-750-312X	50.50
.046	.0460	.375	.397	.250	.100	.1875	.3750	2.5	RR-046-4	56.80			RR-046-4X	65.00
.046	.0460	.375	.397	.375	.100	.1875	.3750	2.5	RR-046-6	56.80			RR-046-6X	65.00
.046	.0460	.375	.397	.500	.100	.1875	.3750	2.5	RR-046-8	56.80			RR-046-8X	65.00
.046	.0460	.375	.397	.750	.100	.1875	.3750	2.5	RR-046-12	56.80			RR-046-12X	65.00
.046	.0460	.375	.397	1.000	.100	.1875	.3750	2.5	RR-046-16	56.80			RR-046-16X	65.00
.046	.0460	.375	.397	1.250	.100	.1875	.3750	2.5	RR-046-20	56.80			RR-046-20X	65.00
1.2 mm	.0470	10 mm	10.55 mm	20 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-120-20	58.20			RRM-120-20X	66.50
1.2 mm	.0470	10 mm	10.55 mm	30 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-120-30	58.20				
1.2 mm	.0470	10 mm	10.55 mm	40 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-120-40	58.20	RRM-120-40G	64.60	RRM-120-40X	66.50
1.3 mm	.0510	10 mm	10.55 mm	30 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-130-30	58.20				
1.3 mm	.0510	10 mm	10.55 mm	40 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-130-40	58.20				

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

Continued on next page

See pg 140 for standard tool holders

Standard – Grooving Tools

Standard – Grooving Tools

Retaining Ring – Square – Right Hand (cont.)



RR / RRM

Continued from previous page

Width W +.002" dec. -.000" equiv. +.050mm -.000mm	Head Width H	Min. Bore Dia* L2	Max. Bore Depth L1	Proj. P	Centerline Offset F	Shank Dia. D2 (h6)	OAL L1	Uncoated		TIN Coated		AlTiN Coated		
								Tool #	Price	Tool #	Price	Tool #	Price	
.055	.0550	.250	.272	.250	.050	.1250	.2500	2.5	RR-055-250-250	34.95			RR-055-250-250X	40.70
.055	.0550	.250	.272	.500	.050	.1250	.2500	2.5	RR-055-500-250	34.95			RR-055-500-250X	40.70
.055	.0550	.375	.397	.250	.100	.1875	.3750	2.5	RR-055-4	56.80			RR-055-4X	65.00
.055	.0550	.375	.397	.375	.100	.1875	.3750	2.5	RR-055-6	56.80			RR-055-6X	65.00
.055	.0550	.375	.397	.500	.100	.1875	.3750	2.5	RR-055-8	56.80			RR-055-8X	65.00
.055	.0550	.375	.397	.750	.100	.1875	.3750	2.5	RR-055-12	56.80			RR-055-12X	65.00
.055	.0550	.375	.397	1.000	.100	.1875	.3750	2.5	RR-055-16	56.80			RR-055-16X	65.00
.055	.0550	.375	.397	1.250	.100	.1875	.3750	2.5	RR-055-20	56.80			RR-055-20X	65.00
.055	.0550	.375	.397	1.500	.100	.1875	.3750	2.5	RR-055-1500-375	56.80			RR-055-1500-375X	65.00
.056	.0560	.250	.272	.250	.050	.1250	.2500	2.5	RR-056-250-250	34.95			RR-056-250-250X	40.70
.056	.0560	.250	.272	.500	.050	.1250	.2500	2.5	RR-056-500-250	34.95			RR-056-500-250X	40.70
.059	.0590	.375	.397	.500	.100	.1875	.3750	2.5	RR-059-500-375	56.80			RR-059-500-375X	65.00
.059	.0590	.375	.397	1.000	.100	.1875	.3750	2.5	RR-059-1000-375	56.80			RR-059-1000-375X	65.00
.062	.0620	.187	.205	.250	.030	.0937	.1875	2.0	RR-062-250-187	32.05			RR-062-250-187X	35.70
.062	.0620	.187	.205	.500	.030	.0937	.1875	2.0	RR-062-500-187	32.05			RR-062-500-187X	35.70
.062	.0620	.250	.272	.250	.050	.1250	.2500	2.5	RR-062-250-250	34.95			RR-062-250-250X	40.70
.062	.0620	.250	.272	.500	.050	.1250	.2500	2.5	RR-062-500-250	34.95			RR-062-500-250X	40.70
.062	.0620	.250	.272	.750	.050	.1250	.2500	2.5	RR-062-750-250	34.95			RR-062-750-250X	40.70
.062	.0620	.312	.334	.500	.100	.1562	.3125	2.5	RR-062-500-312	43.60			RR-062-500-312X	50.50
.062	.0620	.312	.334	.750	.100	.1562	.3125	2.5	RR-062-750-312	43.60			RR-062-750-312X	50.50
.062	.0620	.312	.334	1.000	.100	.1562	.3125	2.5	RR-062-1000-312	43.60			RR-062-1000-312X	50.50
.062	.0620	.375	.397	.250	.100	.1875	.3750	2.5	RR-062-4	56.80			RR-062-4X	65.00
.062	.0620	.375	.397	.375	.100	.1875	.3750	2.5	RR-062-6	56.80			RR-062-6X	65.00
.062	.0620	.375	.397	.500	.100	.1875	.3750	2.5	RR-062-8	56.80			RR-062-8X	65.00
.062	.0620	.375	.397	.750	.100	.1875	.3750	2.5	RR-062-12	56.80			RR-062-12X	65.00
.062	.0620	.375	.397	1.000	.100	.1875	.3750	2.5	RR-062-16	56.80			RR-062-16X	65.00
.062	.0620	.375	.397	1.250	.100	.1875	.3750	2.5	RR-062-20	56.80			RR-062-20X	65.00
.062	.0620	.375	.397	1.500	.100	.1875	.3750	2.5	RR-062-1500-375	56.80			RR-062-1500-375X	65.00
1.6 mm	.0630	10 mm	10.55 mm	30 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-160-30	58.20				
1.6 mm	.0630	10 mm	10.55 mm	40 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-160-40	58.20				
.069	.0690	.375	.397	.375	.100	.1875	.3750	2.5	RR-069-6	56.80			RR-069-6X	65.00
.069	.0690	.375	.397	.500	.100	.1875	.3750	2.5	RR-069-8	56.80			RR-069-8X	65.00
.069	.0690	.375	.397	.750	.100	.1875	.3750	2.5	RR-069-12	56.80			RR-069-12X	65.00
.069	.0690	.375	.397	1.000	.100	.1875	.3750	2.5	RR-069-16	56.80			RR-069-16X	65.00
.069	.0690	.375	.397	1.250	.100	.1875	.3750	2.5	RR-069-20	56.80			RR-069-20X	65.00
1.8 mm	.0710	10 mm	10.55 mm	10 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-180-10	58.20	RRM-180-10G	64.60		
.079	.0790	.375	.397	.500	.100	.1875	.3750	2.5	RR-079-500-375	56.80			RR-079-500-375X	65.00
.079	.0790	.375	.397	1.000	.100	.1875	.3750	2.5	RR-079-1000-375	56.80			RR-079-1000-375X	65.00
2 mm	.0790	10 mm	10.55 mm	20 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-200-20	58.20	RRM-200-20G	64.60	RRM-200-20X	66.50
2 mm	.0790	10 mm	10.55 mm	30 mm	2.74 mm	5 mm	10 mm	72 mm	RRM-200-30	58.20	RRM-200-30G	64.60	RRM-200-30X	66.50

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

Continued on next page

See pg 140 for standard tool holders

RR / RRM



Standard – Grooving Tools
Retaining Ring – Square – Right Hand (cont.)

Continued from previous page

Width W ₁	Head Width	Min. Bore Dia* L ₂	Max. Bore Depth L ₁	Proj.	Centerline Offset			Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated		
					P	F	D ₂ (h6)			L ₁	Tool #	Price	Tool #	Price	Tool #	Price
.087 +.002" dec. -.000" equiv. +.050mm -.000mm	.0870	.250	.272	.250	.050	.1250	.2500	2.5		RR-087-250-250	34.95			RR-087-250-250X	40.70	
	.0870	.250	.272	.500	.050	.1250	.2500	2.5		RR-087-500-250	34.95			RR-087-500-250X	40.70	
	.0870	.250	.272	.750	.050	.1250	.2500	2.5		RR-087-750-250	34.95			RR-087-750-250X	40.70	
	.0870	.312	.334	.500	.100	.1562	.3125	2.5		RR-087-500-312	43.60			RR-087-500-312X	50.50	
	.0870	.312	.334	.750	.100	.1562	.3125	2.5		RR-087-750-312	43.60			RR-087-750-312X	50.50	
	.0870	.375	.397	.250	.100	.1875	.3750	2.5		RR-087-4	56.80			RR-087-4X	65.00	
	.0870	.375	.397	.375	.100	.1875	.3750	2.5		RR-087-6	56.80			RR-087-6X	65.00	
	.0870	.375	.397	.500	.100	.1875	.3750	2.5		RR-087-8	56.80			RR-087-8X	65.00	
	.0870	.375	.397	.750	.100	.1875	.3750	2.5		RR-087-12	56.80			RR-087-12X	65.00	
	.0870	.375	.397	1.000	.100	.1875	.3750	2.5		RR-087-16	56.80			RR-087-16X	65.00	
	.0870	.375	.397	1.250	.100	.1875	.3750	2.5		RR-087-20	56.80			RR-087-20X	65.00	
	.0870	.375	.397	1.500	.100	.1875	.3750	2.5		RR-087-1500-375	56.80			RR-087-1500-375X	65.00	
	.093	.0930	.375	.397	.750	.100	.1875	.3750	2.5		RR-093-750-375	56.80			RR-093-750-375X	65.00
	.093	.0930	.375	.397	1.000	.100	.1875	.3750	2.5		RR-093-1000-375	56.80			RR-093-1000-375X	65.00
	.093	.0930	.375	.397	1.250	.100	.1875	.3750	2.5		RR-093-1250-375	56.80			RR-093-1250-375X	65.00
	.093	.0930	.500	.522	.500	.150	.2500	.5000	3.0		RR-093-8	79.60			RR-093-8X	89.85
	.093	.0930	.500	.522	.750	.150	.2500	.5000	3.0		RR-093-12	79.60			RR-093-12X	89.85
	.093	.0930	.500	.522	1.000	.150	.2500	.5000	3.0		RR-093-16	79.60			RR-093-16X	89.85
	.093	.0930	.500	.522	1.250	.150	.2500	.5000	3.0		RR-093-20	79.60			RR-093-20X	89.85
	.093	.0930	.500	.522	1.500	.150	.2500	.5000	3.0		RR-093-24	79.60			RR-093-24X	89.85
.093	.0930	.500	.522	1.750	.150	.2500	.5000	3.0		RR-093-1750-500	79.60			RR-093-1750-500X	89.85	
3 mm	.1180	12 mm	12.55 mm	20 mm	3.76 mm	6 mm	12 mm	83 mm		RRM-300-20	74.60			RRM-300-20X	86.55	
3 mm	.1180	12 mm	12.55 mm	30 mm	3.76 mm	6 mm	12 mm	83 mm		RRM-300-30	74.60			RRM-300-30X	86.55	
3 mm	.1180	12 mm	12.55 mm	40 mm	3.76 mm	6 mm	12 mm	83 mm		RRM-300-40	74.60	RRM-300-40G	83.50	RRM-300-40X	86.55	
.125	.1250	.375	.397	.750	.100	.1875	.3750	2.5		RR-125-750-375	56.80			RR-125-750-375X	65.00	
	.1250	.375	.397	1.000	.100	.1875	.3750	2.5		RR-125-1000-375	56.80			RR-125-1000-375X	65.00	
	.1250	.375	.397	1.250	.100	.1875	.3750	2.5		RR-125-1250-375	56.80			RR-125-1250-375X	65.00	
	.1250	.500	.522	.500	.150	.2500	.5000	3.0		RR-125-8	79.60			RR-125-8X	89.85	
	.1250	.500	.522	.750	.150	.2500	.5000	3.0		RR-125-12	79.60			RR-125-12X	89.85	
	.1250	.500	.522	1.000	.150	.2500	.5000	3.0		RR-125-16	79.60			RR-125-16X	89.85	
	.1250	.500	.522	1.250	.150	.2500	.5000	3.0		RR-125-20	79.60			RR-125-20X	89.85	
	.1250	.500	.522	1.500	.150	.2500	.5000	3.0		RR-125-24	79.60			RR-125-24X	89.85	
	.1250	.500	.522	1.750	.150	.2500	.5000	3.0		RR-125-1750-500	79.60			RR-125-1750-500X	89.85	
	.156	.1560	.500	.522	.750	.150	.2500	.5000	3.0		RR-156-12	79.60			RR-156-12X	89.85
	.156	.1560	.500	.522	1.000	.150	.2500	.5000	3.0		RR-156-16	79.60			RR-156-16X	89.85
	.156	.1560	.500	.522	1.250	.150	.2500	.5000	3.0		RR-156-20	79.60			RR-156-20X	89.85
.156	.1560	.500	.522	1.500	.150	.2500	.5000	3.0		RR-156-24	79.60			RR-156-24X	89.85	
4 mm	.1570	12 mm	12.55 mm	20 mm	3.76 mm	6 mm	12 mm	83 mm		RRM-400-20	74.60					
	.1570	12 mm	12.55 mm	30 mm	3.76 mm	6 mm	12 mm	83 mm		RRM-400-30	74.60					
	.1570	12 mm	12.55 mm	50 mm	3.76 mm	6 mm	12 mm	83 mm		RRM-400-50	74.60	RRM-400-50G	83.50	RRM-400-50X	86.55	

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

Continued on next page

See pg 140 for standard tool holders

Standard – Grooving Tools

Standard – Grooving Tools

Retaining Ring – Square – Right Hand (cont.)



RR / RRM

Continued from previous page

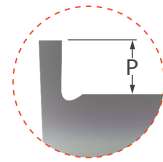
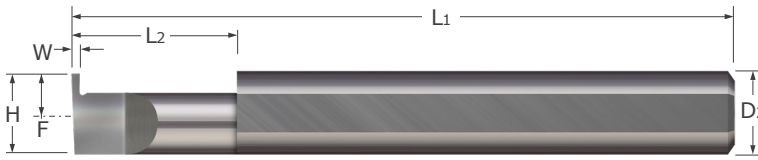
Width W +.002" -.000" dec. equiv. +.050mm -.000mm	Head Width H	Min. Bore Dia* L2	Max. Bore Depth L2 +.050" -.000" +1.25mm -.00mm	Proj. P	Centerline Offset F	Shank Dia. D2 (h6)	OAL L1	Uncoated		TiN Coated		AlTiN Coated		
								Tool #	Price	Tool #	Price	Tool #	Price	
.187	.1870	.500	.522	.750	.150	.2500	.5000	3.0	RR-187-12	79.60			RR-187-12X	89.85
.187	.1870	.500	.522	1.000	.150	.2500	.5000	3.0	RR-187-16	79.60			RR-187-16X	89.85
.187	.1870	.500	.522	1.250	.150	.2500	.5000	3.0	RR-187-20	79.60			RR-187-20X	89.85
.187	.1870	.500	.522	1.500	.150	.2500	.5000	3.0	RR-187-24	79.60			RR-187-24X	89.85
5 mm	.1970	12 mm	12.55 mm	20 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-500-20	74.60				
5 mm	.1970	12 mm	12.55 mm	30 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-500-30	74.60				
5 mm	.1970	12 mm	12.55 mm	50 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-500-50	74.60			RRM-500-50X	86.55
6 mm	.2360	12 mm	12.55 mm	20 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-600-20	74.60				
6 mm	.2360	12 mm	12.55 mm	50 mm	3.76 mm	6 mm	12 mm	83 mm	RRM-600-50	74.60			RRM-600-50X	86.55
.250	.2500	.500	.522	.750	.150	.2500	.5000	3.0	RR-250-12	79.60			RR-250-12X	89.85
.250	.2500	.500	.522	1.000	.150	.2500	.5000	3.0	RR-250-16	79.60			RR-250-16X	89.85
.250	.2500	.500	.522	1.250	.150	.2500	.5000	3.0	RR-250-20	79.60			RR-250-20X	89.85
.250	.2500	.500	.522	1.500	.150	.2500	.5000	3.0	RR-250-24	79.60			RR-250-24X	89.85

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

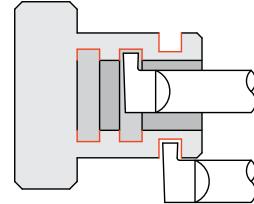
See pg 140 for standard tool holders

Standard – Grooving Tools

Retaining Ring – Square – Left Hand



- 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	
								Tool #	Price	Tool #	Price
W $\begin{smallmatrix} +.001" \\ -.000" \end{smallmatrix}$	H		L2 $\begin{smallmatrix} +.050" \\ -.000" \end{smallmatrix}$	P	F	D2 (h6)	L1				
.017	.250	.272	.250	.050	.1250	.2500	2.5	RRL-017-4	34.95	RRL-017-4X	40.70
.017	.250	.272	.500	.050	.1250	.2500	2.5	RRL-017-8	34.95	RRL-017-8X	40.70
.025	.250	.272	.250	.050	.1250	.2500	2.5	RRL-025-4	34.95	RRL-025-4X	40.70
.025	.250	.272	.500	.050	.1250	.2500	2.5	RRL-025-8	34.95	RRL-025-8X	40.70
.030	.250	.272	.250	.050	.1250	.2500	2.5	RRL-030-4	34.95	RRL-030-4X	40.70
.030	.250	.272	.375	.050	.1250	.2500	2.5	RRL-030-6	34.95	RRL-030-6X	40.70
.030	.250	.272	.500	.050	.1250	.2500	2.5	RRL-030-8	34.95	RRL-030-8X	40.70
.030	.250	.272	.625	.050	.1250	.2500	2.5	RRL-030-10	34.95	RRL-030-10X	40.70
.033	.312	.334	.250	.100	.1562	.3125	2.5	RRL-033-4	43.60	RRL-033-4X	50.50
.033	.312	.334	.375	.100	.1562	.3125	2.5	RRL-033-6	43.60		
.033	.312	.334	.750	.100	.1562	.3125	2.5	RRL-033-12	43.60	RRL-033-12X	50.50
.038	.312	.334	.250	.100	.1562	.3125	2.5	RRL-038-4	43.60		
.038	.312	.334	.375	.100	.1562	.3125	2.5	RRL-038-6	43.60	RRL-038-6X	50.50
.038	.312	.334	.500	.100	.1562	.3125	2.5	RRL-038-8	43.60	RRL-038-8X	50.50
.038	.312	.334	.750	.100	.1562	.3125	2.5	RRL-038-12	43.60	RRL-038-12X	50.50

Width	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Projection	Centerline Offset	Shank Diameter	Overall Length	Tool #	Price	Tool #	Price
W $\begin{smallmatrix} +.002" \\ -.000" \end{smallmatrix}$	H		L2 $\begin{smallmatrix} +.050" \\ -.000" \end{smallmatrix}$	P	F	D2 (h6)	L1				
.039	.375	.397	.250	.100	.1875	.3750	2.5	RRL-039-4	56.80	RRL-039-4X	65.00
.039	.375	.397	.500	.100	.1875	.3750	2.5	RRL-039-8	56.80	RRL-039-8X	65.00
.039	.375	.397	.750	.100	.1875	.3750	2.5	RRL-039-12	56.80		
.046	.375	.397	.250	.100	.1875	.3750	2.5	RRL-046-4	56.80	RRL-046-4X	65.00
.046	.375	.397	.375	.100	.1875	.3750	2.5	RRL-046-6	56.80	RRL-046-6X	65.00
.046	.375	.397	.750	.100	.1875	.3750	2.5	RRL-046-12	56.80	RRL-046-12X	65.00
.046	.375	.397	1.000	.100	.1875	.3750	2.5	RRL-046-16	56.80	RRL-046-16X	65.00
.046	.375	.397	1.250	.100	.1875	.3750	2.5	RRL-046-20	56.80	RRL-046-20X	65.00
.055	.375	.397	.250	.100	.1875	.3750	2.5	RRL-055-4	56.80		
.055	.375	.397	.500	.100	.1875	.3750	2.5	RRL-055-8	56.80		
.055	.375	.397	.750	.100	.1875	.3750	2.5	RRL-055-12	56.80	RRL-055-12X	65.00
.055	.375	.397	1.000	.100	.1875	.3750	2.5	RRL-055-16	56.80	RRL-055-16X	65.00

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

Continued on next page

See pg 140 for standard tool holders

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		AITIN Coated	
W $\begin{smallmatrix} +.002" \\ -.000" \end{smallmatrix}$	H		L2 $\begin{smallmatrix} +.050" \\ -.000" \end{smallmatrix}$	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.062	.375	.397	.250	.100	.1875	.3750	2.5	RRL-062-4	56.80		
.062	.375	.397	.500	.100	.1875	.3750	2.5	RRL-062-8	56.80	RRL-062-8X	65.00
.062	.375	.397	.750	.100	.1875	.3750	2.5	RRL-062-12	56.80	RRL-062-12X	65.00
.062	.375	.397	1.250	.100	.1875	.3750	2.5	RRL-062-20	56.80	RRL-062-20X	65.00
.069	.375	.397	.250	.100	.1875	.3750	2.5	RRL-069-4	56.80	RRL-069-4X	65.00
.069	.375	.397	.500	.100	.1875	.3750	2.5	RRL-069-8	56.80	RRL-069-8X	65.00
.069	.375	.397	1.000	.100	.1875	.3750	2.5	RRL-069-16	56.80	RRL-069-16X	65.00
.069	.375	.397	1.250	.100	.1875	.3750	2.5	RRL-069-20	56.80		
.087	.375	.397	.375	.100	.1875	.3750	2.5	RRL-087-6	56.80		
.087	.375	.397	.500	.100	.1875	.3750	2.5	RRL-087-8	56.80	RRL-087-8X	65.00
.087	.375	.397	.750	.100	.1875	.3750	2.5	RRL-087-12	56.80	RRL-087-12X	65.00
.087	.375	.397	1.000	.100	.1875	.3750	2.5	RRL-087-16	56.80	RRL-087-16X	65.00
.087	.375	.397	1.250	.100	.1875	.3750	2.5	RRL-087-20	56.80	RRL-087-20X	65.00
.093	.500	.522	.750	.150	.2500	.5000	3.0	RRL-093-12	79.60	RRL-093-12X	89.85
.093	.500	.522	1.000	.150	.2500	.5000	3.0	RRL-093-16	79.60	RRL-093-16X	89.85
.093	.500	.522	1.500	.150	.2500	.5000	3.0	RRL-093-24	79.60	RRL-093-24X	89.85
.125	.500	.522	.500	.150	.2500	.5000	3.0	RRL-125-8	79.60	RRL-125-8X	89.85
.125	.500	.522	.750	.150	.2500	.5000	3.0	RRL-125-12	79.60	RRL-125-12X	89.85
.125	.500	.522	1.000	.150	.2500	.5000	3.0	RRL-125-16	79.60	RRL-125-16X	89.85
.125	.500	.522	1.500	.150	.2500	.5000	3.0	RRL-125-24	79.60	RRL-125-24X	89.85
.156	.500	.522	.500	.150	.2500	.5000	3.0	RRL-156-8	79.60		
.187	.500	.522	.500	.150	.2500	.5000	3.0	RRL-187-8	79.60		
.187	.500	.522	.750	.150	.2500	.5000	3.0	RRL-187-12	79.60		
.187	.500	.522	1.000	.150	.2500	.5000	3.0	RRL-187-16	79.60		
.187	.500	.522	1.250	.150	.2500	.5000	3.0	RRL-187-20	79.60		
.250	.500	.522	.500	.150	.2500	.5000	3.0	RRL-250-8	79.60		
.250	.500	.522	.750	.150	.2500	.5000	3.0	RRL-250-12	79.60		
.250	.500	.522	1.000	.150	.2500	.5000	3.0	RRL-250-16	79.60		
.250	.500	.522	1.250	.150	.2500	.5000	3.0	RRL-250-20	79.60		

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

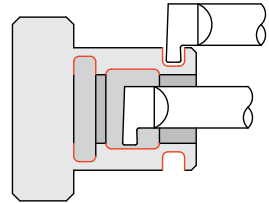
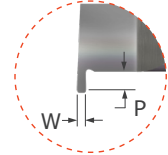
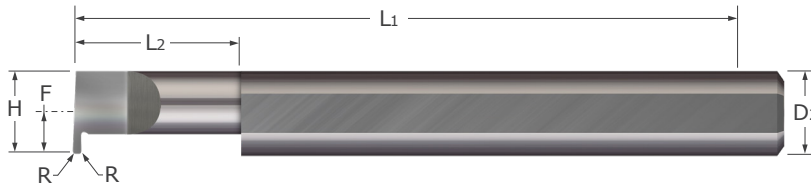
See pg 140 for standard tool holders

Standard – Grooving Tools



Standard – Grooving Tools

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	
									Tool #	Price	Tool #	Price
W ^{+0.01"} / _{-.000"}	H		L2 ^{+0.050"} / _{-.000"}	R ^{+0.001"} / _{-.001"}	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.017	.187	.205	.250	.003	.030	.0937	.1875	2.0	RRC3-017-250-187	37.25	RRC3-017-250-187X	41.00
.017	.187	.205	.375	.003	.030	.0937	.1875	2.0	RRC3-017-375-187	37.25	RRC3-017-375-187X	41.00
.017	.250	.272	.250	.003	.050	.1250	.2500	2.5	RRC3-017-250-250	40.15	RRC3-017-250-250X	45.90
.017	.250	.272	.375	.003	.050	.1250	.2500	2.5	RRC3-017-375-250	40.15	RRC3-017-375-250X	45.90
.020	.187	.205	.250	.003	.030	.0937	.1875	2.0	RRC3-020-250-187	37.25	RRC3-020-250-187X	41.00
.020	.187	.205	.375	.003	.030	.0937	.1875	2.0	RRC3-020-375-187	37.25	RRC3-020-375-187X	41.00
.020	.250	.272	.250	.003	.050	.1250	.2500	2.5	RRC3-020-250-250	40.15	RRC3-020-250-250X	45.90
.020	.250	.272	.375	.003	.050	.1250	.2500	2.5	RRC3-020-375-250	40.15	RRC3-020-375-250X	45.90
.025	.250	.272	.250	.003	.050	.1250	.2500	2.5	RRC3-025-250-250	40.15	RRC3-025-250-250X	45.90
.025	.250	.272	.375	.003	.050	.1250	.2500	2.5	RRC3-025-375-250	40.15	RRC3-025-375-250X	45.90
.030	.187	.205	.250	.003	.030	.0937	.1875	2.0	RRC3-030-250-187	37.25	RRC3-030-250-187X	41.00
.030	.187	.205	.500	.003	.030	.0937	.1875	2.0	RRC3-030-500-187	37.25	RRC3-030-500-187X	41.00
.030	.250	.272	.250	.003	.050	.1250	.2500	2.5	RRC3-030-250-250	40.15	RRC3-030-250-250X	45.90
.030	.250	.272	.375	.003	.050	.1250	.2500	2.5	RRC3-030-375-250	40.15	RRC3-030-375-250X	45.90
.030	.312	.334	.500	.003	.100	.1562	.3125	2.5	RRC3-030-500-312	50.10	RRC3-030-500-312X	57.00
.030	.312	.334	.750	.003	.100	.1562	.3125	2.5	RRC3-030-750-312	50.10	RRC3-030-750-312X	57.00
.033	.312	.334	.500	.003	.100	.1562	.3125	2.5	RRC3-033-500-312	50.10	RRC3-033-500-312X	57.00
.033	.312	.334	.750	.003	.100	.1562	.3125	2.5	RRC3-033-750-312	50.10	RRC3-033-750-312X	57.00
.038	.312	.334	.500	.003	.100	.1562	.3125	2.5	RRC3-038-500-312	50.10	RRC3-038-500-312X	57.00
.038	.312	.334	.750	.003	.100	.1562	.3125	2.5	RRC3-038-750-312	50.10	RRC3-038-750-312X	57.00
W ^{+0.002"} / _{-.000"}	H		L2 ^{+0.050"} / _{-.000"}	R ^{+0.001"} / _{-.001"}	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
.039	.375	.397	.500	.003	.100	.1875	.3750	2.5	RRC3-039-500-375	63.45	RRC3-039-500-375X	71.65
.039	.375	.397	.750	.003	.100	.1875	.3750	2.5	RRC3-039-750-375	63.45	RRC3-039-750-375X	71.65
.039	.375	.397	1.000	.003	.100	.1875	.3750	2.5	RRC3-039-1000-375	63.45	RRC3-039-1000-375X	71.65
.062	.375	.397	.500	.003	.100	.1875	.3750	2.5	RRC3-062-500-375	63.45	RRC3-062-500-375X	71.65
.062	.375	.397	.500	.006	.100	.1875	.3750	2.5	RRC6-062-500-375	63.45	RRC6-062-500-375X	71.65
.062	.375	.397	.750	.003	.100	.1875	.3750	2.5	RRC3-062-750-375	63.45	RRC3-062-750-375X	71.65

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

Continued on next page

See pg 140 for standard tool holders

Standard – Grooving Tools

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



Continued from previous page

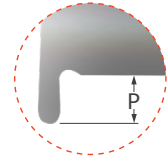
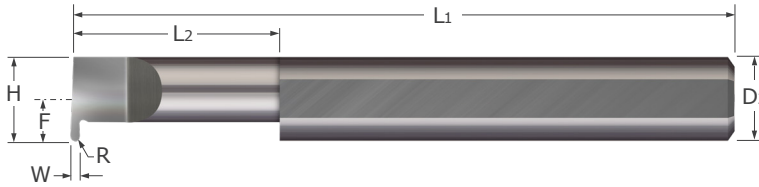
Width W $\begin{smallmatrix} +.002'' \\ -.000'' \end{smallmatrix}$	Head Width H	Minimum Bore Diameter*	Maximum Bore Depth L2 $\begin{smallmatrix} +.050'' \\ -.000'' \end{smallmatrix}$	Radius R $\begin{smallmatrix} +.001'' \\ -.001'' \end{smallmatrix}$	Projection P	Centerline Offset F	Shank Diameter D2 (h6)	Overall Length L1	Uncoated		AlTiN Coated	
									Tool #	Price	Tool #	Price
.062	.375	.397	.750	.006	.100	.1875	.3750	2.5	RRC6-062-750-375	63.45	RRC6-062-750-375X	71.65
.062	.375	.397	1.000	.003	.100	.1875	.3750	2.5	RRC3-062-1000-375	63.45	RRC3-062-1000-375X	71.65
.062	.375	.397	1.000	.006	.100	.1875	.3750	2.5	RRC6-062-1000-375	63.45	RRC6-062-1000-375X	71.65
.087	.375	.397	.500	.003	.100	.1875	.3750	2.5	RRC3-087-500-375	63.45	RRC3-087-500-375X	71.65
.087	.375	.397	.500	.006	.100	.1875	.3750	2.5	RRC6-087-500-375	63.45	RRC6-087-500-375X	71.65
.087	.375	.397	.750	.003	.100	.1875	.3750	2.5	RRC3-087-750-375	63.45	RRC3-087-750-375X	71.65
.087	.375	.397	.750	.006	.100	.1875	.3750	2.5	RRC6-087-750-375	63.45	RRC6-087-750-375X	71.65
.087	.375	.397	1.000	.003	.100	.1875	.3750	2.5	RRC3-087-1000-375	63.45	RRC3-087-1000-375X	71.65
.087	.375	.397	1.000	.006	.100	.1875	.3750	2.5	RRC6-087-1000-375	63.45	RRC6-087-1000-375X	71.65
.093	.500	.522	.750	.003	.150	.2500	.5000	3.0	RRC3-093-750-500	87.20	RRC3-093-750-500X	97.55
.093	.500	.522	.750	.006	.150	.2500	.5000	3.0	RRC6-093-750-500	87.20	RRC6-093-750-500X	97.55
.093	.500	.522	1.000	.003	.150	.2500	.5000	3.0	RRC3-093-1000-500	87.20	RRC3-093-1000-500X	97.55
.093	.500	.522	1.000	.006	.150	.2500	.5000	3.0	RRC6-093-1000-500	87.20	RRC6-093-1000-500X	97.55
.125	.500	.522	.750	.003	.150	.2500	.5000	3.0	RRC3-125-750-500	87.20	RRC3-125-750-500X	97.55
.125	.500	.522	.750	.006	.150	.2500	.5000	3.0	RRC6-125-750-500	87.20	RRC6-125-750-500X	97.55
.125	.500	.522	1.000	.003	.150	.2500	.5000	3.0	RRC3-125-1000-500	87.20	RRC3-125-1000-500X	97.55
.125	.500	.522	1.000	.006	.150	.2500	.5000	3.0	RRC6-125-1000-500	87.20	RRC6-125-1000-500X	97.55

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

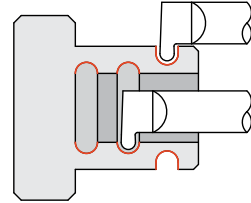
See pg 140 for standard tool holders

Standard – Grooving Tools

Full Radius



- 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	
									Tool #	Price	Tool #	Price
W $^{+.002"}_{-.000"}$	R	H	L2 $^{+.050"}_{-.000"}$	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	
.017	.0085	.187	.205	.250	.030	.0937	.1875	2.0	FR-017-4-187	37.25	FR-017-4-187X	41.00
.017	.0085	.187	.205	.375	.030	.0937	.1875	2.0	FR-017-6-187	37.25	FR-017-6-187X	41.00
.017	.0085	.187	.205	.500	.030	.0937	.1875	2.0	FR-017-8-187	37.25	FR-017-8-187X	41.00
.017	.0085	.187	.205	.625	.030	.0937	.1875	2.0	FR-017-10-187	37.25	FR-017-10-187X	41.00
.017	.0085	.250	.272	.250	.050	.1250	.2500	2.5	FR-017-4	40.15	FR-017-4X	45.90
.017	.0085	.250	.272	.375	.050	.1250	.2500	2.5	FR-017-6	40.15	FR-017-6X	45.90
.017	.0085	.250	.272	.500	.050	.1250	.2500	2.5	FR-017-8	40.15	FR-017-8X	45.90
.017	.0085	.250	.272	.625	.050	.1250	.2500	2.5	FR-017-10	40.15	FR-017-10X	45.90
.020	.0100	.187	.205	.250	.030	.0937	.1875	2.0	FR-020-4-187	37.25	FR-020-4-187X	41.00
.020	.0100	.187	.205	.375	.030	.0937	.1875	2.0	FR-020-6-187	37.25	FR-020-6-187X	41.00
.020	.0100	.187	.205	.500	.030	.0937	.1875	2.0	FR-020-8-187	37.25	FR-020-8-187X	41.00
.020	.0100	.187	.205	.625	.030	.0937	.1875	2.0	FR-020-10-187	37.25	FR-020-10-187X	41.00
.025	.0125	.250	.272	.250	.050	.1250	.2500	2.5	FR-025-4	40.15	FR-025-4X	45.90
.025	.0125	.250	.272	.375	.050	.1250	.2500	2.5	FR-025-6	40.15	FR-025-6X	45.90
.025	.0125	.250	.272	.500	.050	.1250	.2500	2.5	FR-025-8	40.15	FR-025-8X	45.90
.025	.0125	.250	.272	.625	.050	.1250	.2500	2.5	FR-025-10	40.15	FR-025-10X	45.90
.030	.0150	.250	.272	.250	.050	.1250	.2500	2.5	FR-030-4	40.15	FR-030-4X	45.90
.030	.0150	.250	.272	.375	.050	.1250	.2500	2.5	FR-030-6	40.15	FR-030-6X	45.90
.030	.0150	.250	.272	.500	.050	.1250	.2500	2.5	FR-030-8	40.15	FR-030-8X	45.90
.030	.0150	.250	.272	.625	.050	.1250	.2500	2.5	FR-030-10	40.15	FR-030-10X	45.90
.033	.0165	.312	.334	.250	.100	.1562	.3125	2.5	FR-033-4	50.10	FR-033-4X	57.00
.033	.0165	.312	.334	.375	.100	.1562	.3125	2.5	FR-033-6	50.10	FR-033-6X	57.00
.033	.0165	.312	.334	.500	.100	.1562	.3125	2.5	FR-033-8	50.10	FR-033-8X	57.00
.033	.0165	.312	.334	.625	.100	.1562	.3125	2.5	FR-033-10	50.10	FR-033-10X	57.00
.038	.0190	.312	.334	.250	.100	.1562	.3125	2.5	FR-038-4	50.10	FR-038-4X	57.00
.038	.0190	.312	.334	.375	.100	.1562	.3125	2.5	FR-038-6	50.10	FR-038-6X	57.00
.038	.0190	.312	.334	.500	.100	.1562	.3125	2.5	FR-038-8	50.10	FR-038-8X	57.00
.038	.0190	.312	.334	.625	.100	.1562	.3125	2.5	FR-038-10	50.10	FR-038-10X	57.00
.039	.0195	.375	.397	.250	.100	.1875	.3750	2.5	FR-039-4	63.45	FR-039-4X	71.65
.039	.0195	.375	.397	.375	.100	.1875	.3750	2.5	FR-039-6	63.45	FR-039-6X	71.65
.039	.0195	.375	.397	.500	.100	.1875	.3750	2.5	FR-039-8	63.45	FR-039-8X	71.65
.039	.0195	.375	.397	.750	.100	.1875	.3750	2.5	FR-039-12	63.45	FR-039-12X	71.65
.039	.0195	.375	.397	1.000	.100	.1875	.3750	2.5	FR-039-16	63.45	FR-039-16X	71.65

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

Continued on next page

See pg 140 for standard tool holders

Standard – Grooving Tools

Full Radius (cont.)



Continued from previous page

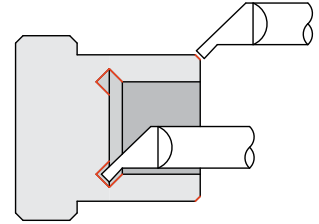
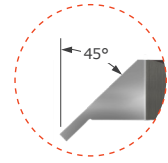
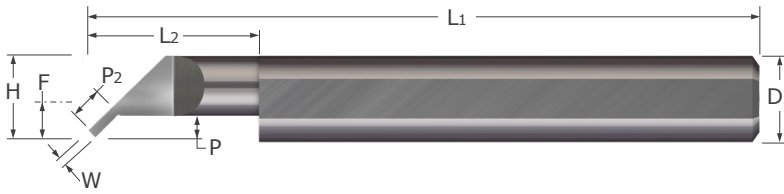
Width	Radius	Head Width	Min. Bore Dia*	Max. Bore Depth	Proj.	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AITIN Coated	
									Tool #	Price	Tool #	Price
W $+0.002$ -0.000 "	R	H		L ₂ $+0.050$ -0.000 "	P	F	D ₂ (h6)	L ₁				
.039	.0195	.375	.397	1.250	.100	.1875	.3750	2.5	FR-039-20	63.45	FR-039-20X	71.65
.046	.0230	.375	.397	.250	.100	.1875	.3750	2.5	FR-046-4	63.45	FR-046-4X	71.65
.046	.0230	.375	.397	.375	.100	.1875	.3750	2.5	FR-046-6	63.45	FR-046-6X	71.65
.046	.0230	.375	.397	.500	.100	.1875	.3750	2.5	FR-046-8	63.45	FR-046-8X	71.65
.046	.0230	.375	.397	.750	.100	.1875	.3750	2.5	FR-046-12	63.45	FR-046-12X	71.65
.046	.0230	.375	.397	1.000	.100	.1875	.3750	2.5	FR-046-16	63.45	FR-046-16X	71.65
.046	.0230	.375	.397	1.250	.100	.1875	.3750	2.5	FR-046-20	63.45	FR-046-20X	71.65
.055	.0275	.375	.397	.250	.100	.1875	.3750	2.5	FR-055-4	63.45	FR-055-4X	71.65
.055	.0275	.375	.397	.375	.100	.1875	.3750	2.5	FR-055-6	63.45	FR-055-6X	71.65
.055	.0275	.375	.397	.500	.100	.1875	.3750	2.5	FR-055-8	63.45	FR-055-8X	71.65
.055	.0275	.375	.397	.750	.100	.1875	.3750	2.5	FR-055-12	63.45	FR-055-12X	71.65
.055	.0275	.375	.397	1.000	.100	.1875	.3750	2.5	FR-055-16	63.45	FR-055-16X	71.65
.055	.0275	.375	.397	1.250	.100	.1875	.3750	2.5	FR-055-20	63.45	FR-055-20X	71.65
.062	.0310	.375	.397	.250	.100	.1875	.3750	2.5	FR-062-4	63.45	FR-062-4X	71.65
.062	.0310	.375	.397	.375	.100	.1875	.3750	2.5	FR-062-6	63.45	FR-062-6X	71.65
.062	.0310	.375	.397	.500	.100	.1875	.3750	2.5	FR-062-8	63.45	FR-062-8X	71.65
.062	.0310	.375	.397	.750	.100	.1875	.3750	2.5	FR-062-12	63.45	FR-062-12X	71.65
.062	.0310	.375	.397	1.000	.100	.1875	.3750	2.5	FR-062-16	63.45	FR-062-16X	71.65
.062	.0310	.375	.397	1.250	.100	.1875	.3750	2.5	FR-062-20	63.45	FR-062-20X	71.65
.069	.0345	.375	.397	.250	.100	.1875	.3750	2.5	FR-069-4	63.45	FR-069-4X	71.65
.069	.0345	.375	.397	.375	.100	.1875	.3750	2.5	FR-069-6	63.45	FR-069-6X	71.65
.069	.0345	.375	.397	.500	.100	.1875	.3750	2.5	FR-069-8	63.45	FR-069-8X	71.65
.069	.0345	.375	.397	.750	.100	.1875	.3750	2.5	FR-069-12	63.45	FR-069-12X	71.65
.069	.0345	.375	.397	1.000	.100	.1875	.3750	2.5	FR-069-16	63.45	FR-069-16X	71.65
.069	.0345	.375	.397	1.250	.100	.1875	.3750	2.5	FR-069-20	63.45	FR-069-20X	71.65
.087	.0435	.375	.397	.250	.100	.1875	.3750	2.5	FR-087-4	63.45	FR-087-4X	71.65
.087	.0435	.375	.397	.375	.100	.1875	.3750	2.5	FR-087-6	63.45	FR-087-6X	71.65
.087	.0435	.375	.397	.500	.100	.1875	.3750	2.5	FR-087-8	63.45	FR-087-8X	71.65
.087	.0435	.375	.397	.750	.100	.1875	.3750	2.5	FR-087-12	63.45	FR-087-12X	71.65
.087	.0435	.375	.397	1.000	.100	.1875	.3750	2.5	FR-087-16	63.45	FR-087-16X	71.65
.087	.0435	.375	.397	1.250	.100	.1875	.3750	2.5	FR-087-20	63.45	FR-087-20X	71.65
.093	.0465	.500	.522	.500	.150	.2500	.5000	3.0	FR-093-8	87.20	FR-093-8X	97.55
.093	.0465	.500	.522	.750	.150	.2500	.5000	3.0	FR-093-12	87.20	FR-093-12X	97.55
.093	.0465	.500	.522	1.000	.150	.2500	.5000	3.0	FR-093-16	87.20	FR-093-16X	97.55
.093	.0465	.500	.522	1.250	.150	.2500	.5000	3.0	FR-093-20	87.20	FR-093-20X	97.55
.093	.0465	.500	.522	1.500	.150	.2500	.5000	3.0	FR-093-24	87.20	FR-093-24X	97.55
.125	.0625	.500	.522	.500	.150	.2500	.5000	3.0	FR-125-8	87.20	FR-125-8X	97.55
.125	.0625	.500	.522	.750	.150	.2500	.5000	3.0	FR-125-12	87.20	FR-125-12X	97.55
.125	.0625	.500	.522	1.000	.150	.2500	.5000	3.0	FR-125-16	87.20	FR-125-16X	97.55
.125	.0625	.500	.522	1.250	.150	.2500	.5000	3.0	FR-125-20	87.20	FR-125-20X	97.55
.125	.0625	.500	.522	1.500	.150	.2500	.5000	3.0	FR-125-24	87.20	FR-125-24X	97.55
.187	.0935	.500	.522	.500	.150	.2500	.5000	3.0	FR-187-8	87.20	FR-187-8X	97.55
.187	.0935	.500	.522	.750	.150	.2500	.5000	3.0	FR-187-12	87.20	FR-187-12X	97.55
.187	.0935	.500	.522	1.000	.150	.2500	.5000	3.0	FR-187-16	87.20	FR-187-16X	97.55
.187	.0935	.500	.522	1.250	.150	.2500	.5000	3.0	FR-187-20	87.20	FR-187-20X	97.55
.187	.0935	.500	.522	1.500	.150	.2500	.5000	3.0	FR-187-24	87.20	FR-187-24X	97.55

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

See pg 140 for standard tool holders

Standard – Grooving Tools

Undercutting – Square



- 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

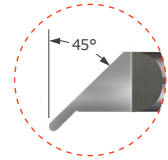
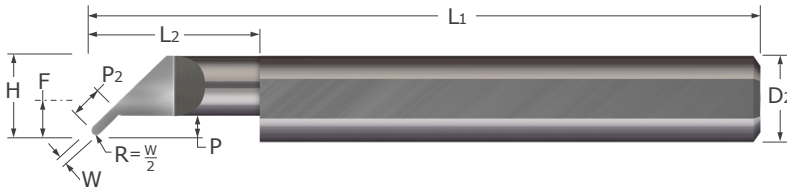
Width	Projection	Angled Projection	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
$W^{+.002" / -.000"}$	P	P ₂	H		$L_2^{+.050" / -.000"}$	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price
.030	.060	.080	.240	.262	.500	.1150	.2500	2.5	UC-25030-8	36.25	UC-25030-8X	42.00
.050	.083	.120	.303	.325	.500	.1468	.3125	2.5	UC-31050-8	45.15	UC-31050-8X	52.05
.062	.083	.120	.303	.325	1.000	.1468	.3125	2.5	UC-31062-16	45.15	UC-31062-16X	52.05
.062	.083	.120	.303	.325	1.250	.1468	.3125	2.5	UC-31062-20	45.15	UC-31062-20X	52.05
.062	.095	.130	.365	.387	1.000	.1775	.3750	2.5	UC-37062-16	59.55	UC-37062-16X	67.75
.062	.125	.180	.490	.512	1.000	.2400	.5000	3.0	UC-50062-16	83.40	UC-50062-16X	93.70
.062	.125	.180	.490	.512	1.500	.2400	.5000	3.0	UC-50062-24	83.40	UC-50062-24X	93.70
.093	.095	.130	.365	.387	1.000	.1775	.3750	2.5	UC-37093-16	59.55	UC-37093-16X	67.75
.093	.125	.180	.490	.512	1.500	.2400	.5000	3.0	UC-50093-24	83.40	UC-50093-24X	93.70
.125	.095	.130	.365	.387	1.000	.1775	.3750	2.5	UC-37125-16	59.55	UC-37125-16X	67.75
.125	.095	.130	.365	.387	1.250	.1775	.3750	2.5	UC-37125-20	59.55		
.125	.125	.180	.490	.512	1.000	.2400	.5000	3.0	UC-50125-16	83.40	UC-50125-16X	93.70
.125	.125	.180	.490	.512	1.500	.2400	.5000	3.0	UC-50125-24	83.40	UC-50125-24X	93.70

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

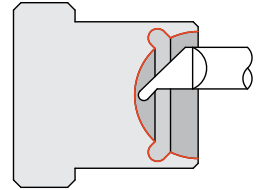
See pg 140 for standard tool holders

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



Standard – Grooving Tools

Width	Projection	Angled Projection	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
									Tool #	Price	Tool #	Price
W ^{+ .002"} _{-.000"}	P	P ₂	H		L ₂ ^{+ .050"} _{-.000"}	F	D ₂ (h6)	L ₁				
.020	.050	.077	.180	.198	.375	.0862	.1875	2.0	UP-18020-6	38.70	UP-18020-6X	42.50
.020	.050	.077	.180	.198	.500	.0862	.1875	2.0	UP-18020-8	38.70	UP-18020-8X	42.50
.025	.050	.078	.180	.198	.375	.0862	.1875	2.0	UP-18025-6	38.70	UP-18025-6X	42.50
.025	.050	.078	.180	.198	.500	.0862	.1875	2.0	UP-18025-8	38.70	UP-18025-8X	42.50
.025	.060	.092	.240	.262	.375	.1150	.2500	2.5	UP-25025-6	41.65	UP-25025-6X	47.40
.025	.060	.092	.240	.262	.500	.1150	.2500	2.5	UP-25025-8	41.65	UP-25025-8X	47.40
.030	.050	.079	.180	.198	.375	.0862	.1875	2.0	UP-18030-6	38.70	UP-18030-6X	42.50
.030	.050	.079	.180	.198	.500	.0862	.1875	2.0	UP-18030-8	38.70	UP-18030-8X	42.50
.030	.060	.094	.240	.262	.500	.1150	.2500	2.5	UP-25030-8	41.65	UP-25030-8X	47.40
.030	.060	.094	.240	.262	1.000	.1150	.2500	2.5	UP-25030-16	41.65	UP-25030-16X	47.40
.050	.083	.132	.303	.325	.500	.1468	.3125	2.5	UP-31050-8	51.85	UP-31050-8X	58.75
.050	.083	.132	.303	.325	1.000	.1468	.3125	2.5	UP-31050-16	51.85	UP-31050-16X	58.75
.062	.083	.136	.303	.325	1.000	.1468	.3125	2.5	UP-31062-16	51.85	UP-31062-16X	58.75
.062	.083	.136	.303	.325	1.250	.1468	.3125	2.5	UP-31062-20	51.85	UP-31062-20X	58.75
.062	.095	.153	.365	.387	1.000	.1775	.3750	2.5	UP-37062-16	66.30	UP-37062-16X	74.50
.062	.095	.153	.365	.387	1.250	.1775	.3750	2.5	UP-37062-20	66.30	UP-37062-20X	74.50
.062	.125	.195	.490	.512	1.000	.2400	.5000	3.0	UP-50062-16	91.45	UP-50062-16X	101.90
.062	.125	.195	.490	.512	1.500	.2400	.5000	3.0	UP-50062-24	91.45	UP-50062-24X	101.90
.093	.095	.162	.365	.387	1.000	.1775	.3750	2.5	UP-37093-16	66.30	UP-37093-16X	74.50
.093	.125	.204	.490	.512	1.000	.2400	.5000	3.0	UP-50093-16	91.45	UP-50093-16X	101.90
.093	.125	.204	.490	.512	1.500	.2400	.5000	3.0	UP-50093-24	91.45	UP-50093-24X	101.90
.125	.095	.171	.365	.387	1.000	.1775	.3750	2.5	UP-37125-16	66.30	UP-37125-16X	74.50
.125	.095	.171	.365	.387	1.250	.1775	.3750	2.5	UP-37125-20	66.30	UP-37125-20X	74.50
.125	.125	.213	.490	.512	1.000	.2400	.5000	3.0	UP-50125-16	91.45	UP-50125-16X	101.90
.125	.125	.213	.490	.512	1.500	.2400	.5000	3.0	UP-50125-24	91.45	UP-50125-24X	101.90

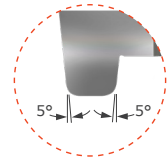
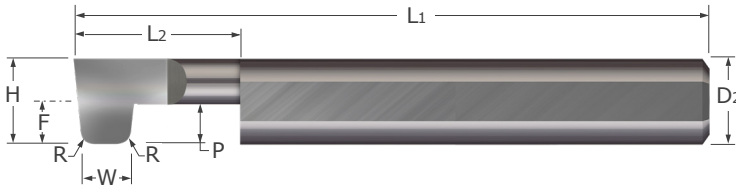
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pg 140 for standard tool holders

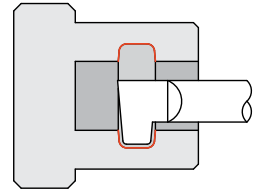


Standard – Grooving Tools

O-Ring Grooving



- 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
- AITIN 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		AITIN Coated	
									Tool #	Price	Tool #	Price
W $\begin{matrix} +.002'' \\ -.000'' \end{matrix}$	H		L2 $\begin{matrix} +.050'' \\ -.000'' \end{matrix}$	R $\begin{matrix} +.010'' \\ -.000'' \end{matrix}$	P	F	D2 (h6)	L1				
.096	.250	.272	.500	.010	.100	.1250	.2500	2.5	QR-096-8	34.95	QR-096-8X	40.70
.141	.250	.272	.562	.35	.100	.1250	.2500	2.5	QR-141-9	34.95	QR-141-9X	40.70
.144	.250	.272	.625	.035	.100	.1250	.2500	2.5	QR-144-10	34.95	QR-144-10X	40.70
.174	.375	.397	.750	.010	.115	.1875	.3750	2.5	QR-174-12	57.35	QR-174-12X	65.55
.208	.375	.397	.812	.035	.115	.1875	.3750	2.5	QR-208-13	57.35	QR-208-13X	65.55
.241	.375	.397	.938	.035	.115	.1875	.3750	2.5	QR-241-15	57.35	QR-241-15X	65.55

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

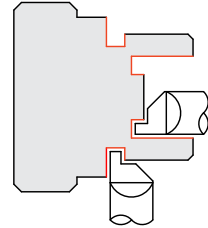
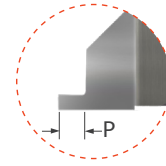
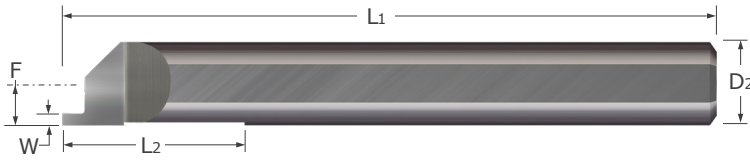
See pg 140 for standard tool holders

Standard – Grooving Tools

Face Grooving – Square



FG



- 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 geometry makes the tool as rigid as possible
- Relief ground along Maximum Bore Depth (L2) 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	
							Tool #	Price	Tool #	Price
W $+0.002$ -0.000 "	P $+0.015$ -0.000 "		L2	F	D2 (h6)	L1				
.015	.025	.197	.750	.0937	.1875	2.0	FG-187-015-025	25.15	FG-187-015-025X	28.75
.015	.025	.260	1.000	.1250	.2500	2.5	FG-250-015-025	28.05	FG-250-015-025X	33.75
.017	.025	.197	.750	.0937	.1875	2.0	FG-187-017-025	25.15	FG-187-017-025X	28.75
.017	.025	.260	1.000	.1250	.2500	2.5	FG-250-017-025	28.05	FG-250-017-025X	33.75
.020	.025	.135	.375	.0625	.1250	1.5	FG-125-020-025	24.35	FG-125-020-025X	27.45
.020	.025	.197	.750	.0937	.1875	2.0	FG-187-020-025	25.15	FG-187-020-025X	28.75
.020	.025	.260	1.000	.1250	.2500	2.5	FG-250-020-025	28.05	FG-250-020-025X	33.75
.020	.050	.190	.155	.0862	.1875	2.0	FG-180-020	25.15	FG-180-020X	28.75
.020	.050	.197	.750	.0937	.1875	2.0	FG-187-020-050	25.15	FG-187-020-050X	28.75
.020	.050	.240	.215	.1200	.2500	2.5	FG-230-020	28.05	FG-230-020X	31.65
.020	.050	.260	.215	.1250	.2500	2.5	FG-250-020	28.05	FG-250-020X	33.75
.025	.025	.135	.375	.0625	.1250	1.5	FG-125-025-025	24.35	FG-125-025-025X	27.45
.025	.025	.197	.750	.0937	.1875	2.0	FG-187-025-025	25.15	FG-187-025-025X	28.75
.025	.025	.260	1.000	.1250	.2500	2.5	FG-250-025-025	28.05	FG-250-025-025X	33.75
.025	.050	.197	.750	.0937	.1875	2.0	FG-187-025-050	25.15	FG-187-025-050X	28.75
.025	.050	.260	1.000	.1250	.2500	2.5	FG-250-025-050	28.05	FG-250-025-050X	33.75
.030	.050	.135	.375	.0625	.1250	1.5	FG-125-030-050	24.35	FG-125-030-050X	27.45
.030	.050	.190	.155	.0862	.1875	2.0	FG-180-030	25.15	FG-180-030X	29.65
.030	.050	.197	.750	.0937	.1875	2.0	FG-187-030-050	25.15	FG-187-030-050X	28.75
.030	.050	.260	.215	.1250	.2500	2.5	FG-250-030	28.05	FG-250-030X	33.75
.030	.050	.322	.240	.1563	.3125	2.5	FG-312-030	38.30	FG-312-030X	45.20
.030	.050	.385	.275	.1875	.3750	2.5	FG-375-030	53.35	FG-375-030X	61.55
.030	.075	.197	.750	.0937	.1875	2.0	FG-187-030-075	25.15	FG-187-030-075X	28.75
.030	.075	.260	1.000	.1250	.2500	2.5	FG-250-030-075	28.05	FG-250-030-075X	33.75
.039	.050	.197	.750	.0937	.1875	2.0	FG-187-039-050	25.15	FG-187-039-050X	28.75
.039	.050	.260	1.000	.1250	.2500	2.5	FG-250-039-050	28.05	FG-250-039-050X	33.75
.039	.050	.385	1.250	.1875	.3750	2.5	FG-375-039-050	53.35	FG-375-039-050X	61.55
.039	.075	.197	.750	.0937	.1875	2.0	FG-187-039-075	25.15	FG-187-039-075X	28.75
.039	.075	.260	1.000	.1250	.2500	2.5	FG-250-039-075	28.05	FG-250-039-075X	33.75
.040	.050	.197	.750	.0937	.1875	2.0	FG-187-040-050	25.15	FG-187-040-050X	28.75
.040	.050	.260	.215	.1250	.2500	2.5	FG-250-040	28.05	FG-250-040X	33.75
.040	.050	.322	.240	.1563	.3125	2.5	FG-312-040	38.30	FG-312-040X	45.20
.040	.050	.385	1.250	.1875	.3750	2.5	FG-375-040-050	53.35	FG-375-040-050X	61.55
.040	.075	.197	.750	.0937	.1875	2.0	FG-187-040-075	25.15	FG-187-040-075X	28.75
.040	.075	.260	1.000	.1250	.2500	2.5	FG-250-040-075	28.05	FG-250-040-075X	33.75

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

Continued on next page



Standard – Grooving Tools

Face Grooving – Square (cont.)

Continued from previous page

Width	Projection	Minimum Groove Diameter*	Maximum Bore Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
							Tool #	Price	Tool #	Price
W $^{+.002}$ _{-.000} "	P $^{+.015}$ _{-.000} "	L2	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	
.050	.050	.197	.750	.0937	.1875	2.0	FG-187-050-050	25.15	FG-187-050-050X	28.75
.050	.050	.260	.215	.1250	.2500	2.5	FG-250-050	28.05	FG-250-050X	33.75
.050	.050	.322	.240	.1563	.3125	2.5	FG-312-050	38.30	FG-312-050X	45.20
.050	.050	.385	1.250	.1875	.3750	2.5	FG-375-050-050	53.35	FG-375-050-050X	61.55
.050	.075	.197	.750	.0937	.1875	2.0	FG-187-050-075	25.15	FG-187-050-075X	28.75
.050	.075	.260	1.000	.1250	.2500	2.5	FG-250-050-075	28.05	FG-250-050-075X	33.75
.050	.075	.322	1.125	.1563	.3125	2.5	FG-312-050-075	38.30	FG-312-050-075X	45.20
.059	.075	.197	.750	.0937	.1875	2.0	FG-187-059-075	25.15	FG-187-059-075X	28.75
.059	.075	.260	1.000	.1250	.2500	2.5	FG-250-059-075	28.05	FG-250-059-075X	33.75
.059	.075	.385	1.250	.1875	.3750	2.5	FG-375-059-075	53.35	FG-375-059-075X	61.55
.059	.100	.197	.750	.0937	.1875	2.0	FG-187-059-100	25.15	FG-187-059-100X	28.75
.059	.100	.260	1.000	.1250	.2500	2.5	FG-250-059-100	28.05	FG-250-059-100X	33.75
.062	.075	.197	.750	.0937	.1875	2.0	FG-187-062-075	25.15	FG-187-062-075X	28.75
.062	.075	.260	1.000	.1250	.2500	2.5	FG-250-062-075	28.05	FG-250-062-075X	33.75
.062	.075	.322	.250	.1563	.3125	2.5	FG-312-062	38.30	FG-312-062X	45.20
.062	.075	.385	.285	.1875	.3750	2.5	FG-375-062	53.35	FG-375-062X	61.55
.062	.075	.510	.350	.2500	.5000	3.0	FG-500-062	60.35	FG-500-062X	70.25
.062	.075	.635	.410	.3125	.6250	3.5	FG-625-062	98.35	FG-625-062X	112.20
.062	.100	.197	.750	.0937	.1875	2.0	FG-187-062-100	25.15	FG-187-062-100X	28.75
.062	.100	.260	1.000	.1250	.2500	2.5	FG-250-062-100	28.05	FG-250-062-100X	33.75
.062	.100	.322	1.125	.1563	.3125	2.5	FG-312-062-100	38.30	FG-312-062-100X	45.20
.062	.100	.385	1.250	.1875	.3750	2.5	FG-375-062-100	53.35	FG-375-062-100X	61.55
.062	.150	.197	.750	.0937	.1875	2.0	FG-187-062-150	25.15	FG-187-062-150X	28.75
.062	.150	.260	1.000	.1250	.2500	2.5	FG-250-062-150	28.05	FG-250-062-150X	33.75
.062	.150	.322	1.125	.1563	.3125	2.5	FG-312-062-150	38.30	FG-312-062-150X	45.20
.062	.150	.385	1.250	.1875	.3750	2.5	FG-375-062-150	53.35	FG-375-062-150X	61.55
.078	.100	.260	1.000	.1250	.2500	2.5	FG-250-078-100	28.05	FG-250-078-100X	33.75
.078	.100	.322	1.125	.1563	.3125	2.5	FG-312-078-100	38.30	FG-312-078-100X	45.20
.078	.100	.385	.300	.1875	.3750	2.5	FG-375-078	53.35	FG-375-078X	61.55
.093	.100	.385	.320	.1875	.3750	2.5	FG-375-093	53.35	FG-375-093X	61.55
.093	.100	.510	.375	.2500	.5000	3.0	FG-500-093	60.35	FG-500-093X	70.25
.093	.100	.635	.430	.3125	.6250	3.5	FG-625-093	98.35	FG-625-093X	112.20
.093	.100	.760	.475	.3750	.7500	4.0	FG-750-093	156.50	FG-750-093X	173.00
.093	.150	.322	1.125	.1563	.3125	2.5	FG-312-093-150	38.30	FG-312-093-150X	45.20
.093	.150	.385	1.250	.1875	.3750	2.5	FG-375-093-150	53.35	FG-375-093-150X	61.55
.118	.150	.385	1.250	.1875	.3750	2.5	FG-375-118-150	53.35	FG-375-118-150X	61.55
.125	.100	.385	.320	.1875	.3750	2.5	FG-375-125	53.35	FG-375-125X	61.55
.125	.100	.510	.350	.2500	.5000	3.0	FG-500-125	60.35	FG-500-125X	70.25
.125	.100	.760	.475	.3750	.7500	4.0	FG-750-125	156.50	FG-750-125X	173.00
.125	.200	.385	1.250	.1875	.3750	2.5	FG-375-125-200	53.35	FG-375-125-200X	61.55
.156	.100	.510	.375	.2500	.5000	3.0	FG-500-156	60.35	FG-500-156X	70.25
.156	.100	.635	.430	.3125	.6250	3.5	FG-625-156	98.35	FG-625-156X	112.20
.156	.100	.760	.475	.3750	.7500	4.0	FG-750-156	156.50		
.187	.150	.635	.480	.3125	.6250	3.5	FG-625-187	98.35	FG-625-187X	112.20
.187	.150	.760	.525	.3750	.7500	4.0	FG-750-187	156.50	FG-750-187X	173.00
.250	.250	.760	.625	.3750	.7500	4.0	FG-750-250	156.50	FG-750-250X	173.00

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

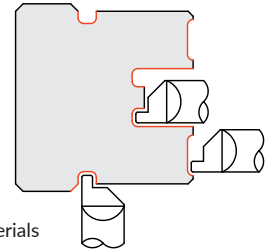
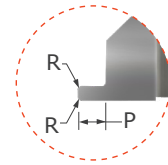
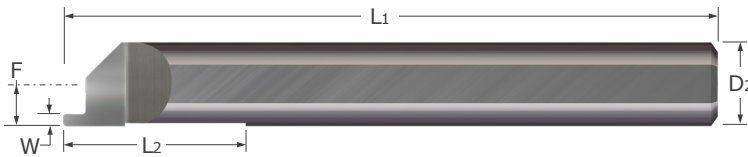
See pg 140 for standard tool holders

Standard – Grooving Tools

Face Grooving – Corner Radius



FGC



- 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 geometry makes the tool as rigid as possible
- Relief ground along Maximum Bore Depth (L2) 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

Standard – Grooving Tools

W	Projection	Minimum Groove Diameter*	Radius	Maximum Bore Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
								Tool #	Price	Tool #	Price
$W \begin{matrix} +.002" \\ -.000" \end{matrix}$	$P \begin{matrix} +.015" \\ -.000" \end{matrix}$		$R \begin{matrix} +.001" \\ -.001" \end{matrix}$	L2	F	D2 (h6)	L1				
.015	.025	.197	.003	.750	.0938	.1875	2.0	FGC3-187-015-025	26.95	FGC3-187-015-025X	30.55
.015	.025	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-015-025	29.85	FGC3-250-015-025X	35.60
.017	.025	.197	.003	.750	.0938	.1875	2.0	FGC3-187-017-025	26.95	FGC3-187-017-025X	30.55
.017	.025	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-017-025	29.85	FGC3-250-017-025X	35.60
.020	.025	.135	.003	.375	.0625	.1250	1.5	FGC3-125-020-025	26.10	FGC3-125-020-025X	29.25
.020	.025	.197	.003	.750	.0938	.1875	2.0	FGC3-187-020-025	26.95	FGC3-187-020-025X	30.55
.020	.025	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-020-025	29.85	FGC3-250-020-025X	35.60
.025	.025	.135	.003	.375	.0625	.1250	1.5	FGC3-125-025-025	26.10	FGC3-125-025-025X	29.25
.025	.025	.197	.003	.750	.0938	.1875	2.0	FGC3-187-025-025	26.95	FGC3-187-025-025X	30.55
.025	.025	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-025-025	29.85	FGC3-250-025-025X	35.60
.030	.050	.135	.003	.375	.0625	.1250	1.5	FGC3-125-030-050	26.10	FGC3-125-030-050X	29.25
.030	.050	.197	.003	.750	.0938	.1875	2.0	FGC3-187-030-050	26.95	FGC3-187-030-050X	30.55
.030	.050	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-030-050	29.85	FGC3-250-030-050X	35.60
.030	.050	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-030-050	40.15	FGC3-312-030-050X	47.05
.030	.050	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-030-050	55.10	FGC3-375-030-050X	63.30
.039	.050	.197	.003	.750	.0938	.1875	2.0	FGC3-187-039-050	26.95	FGC3-187-039-050X	30.55
.039	.050	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-039-050	29.85	FGC3-250-039-050X	35.60
.039	.050	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-039-050	55.10	FGC3-375-039-050X	63.30
.040	.050	.197	.003	.750	.0938	.1875	2.0	FGC3-187-040-050	26.95	FGC3-187-040-050X	30.55
.040	.050	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-040-050	29.85	FGC3-250-040-050X	35.60
.040	.050	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-040-050	40.15	FGC3-312-040-050X	47.05
.040	.050	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-040-050	55.10	FGC3-375-040-050X	63.30
.050	.050	.197	.003	.750	.0938	.1875	2.0	FGC3-187-050-050	26.95	FGC3-187-050-050X	30.55
.050	.050	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-050-050	29.85	FGC3-250-050-050X	35.60
.050	.050	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-050-050	40.15	FGC3-312-050-050X	47.05
.050	.050	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-050-050	55.10	FGC3-375-050-050X	63.30
.059	.075	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-059-075	55.10	FGC3-375-059-075X	63.30

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

Continued on next page

See pg 140 for standard tool holders

Standard – Grooving Tools

Face Grooving – Corner Radius (cont.)

Continued from previous page

Width	Projection	Minimum Groove Diameter*	Radius	Maximum Bore Depth	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
								Tool #	Price	Tool #	Price
W $^{+.002"}_{-.000"}$	P $^{+.015"}_{-.000"}$		R $^{+.001"}_{-.001"}$	L ₂	F	D ₂ (h6)	L ₁				
.062	.075	.197	.003	.750	.0938	.1875	2.0	FGC3-187-062-075	26.95	FGC3-187-062-075X	30.55
.062	.075	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-062-075	29.85	FGC3-250-062-075X	35.60
.062	.075	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-062-075	40.15	FGC3-312-062-075X	47.05
.062	.075	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-062-075	55.10	FGC3-375-062-075X	63.30
.062	.100	.197	.003	.750	.0938	.1875	2.0	FGC3-187-062-100	26.95	FGC3-187-062-100X	30.55
.062	.100	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-062-100	29.85	FGC3-250-062-100X	35.60
.078	.100	.260	.003	1.000	.1250	.2500	2.5	FGC3-250-078-100	29.85	FGC3-250-078-100X	35.60
.078	.100	.322	.003	1.125	.1563	.3125	2.5	FGC3-312-078-100	40.15	FGC3-312-078-100X	47.05
.078	.100	.385	.003	1.250	.1875	.3750	2.5	FGC3-375-078-100	55.10	FGC3-375-078-100X	63.30
.093	.100	.385	.006	1.250	.1875	.3750	2.5	FGC6-375-093-100	55.10	FGC6-375-093-100X	63.30
.093	.150	.322	.006	1.125	.1563	.3125	2.5	FGC6-312-093-150	40.15	FGC6-312-093-150X	47.05
.118	.150	.385	.006	1.250	.1875	.3750	2.5	FGC6-375-118-150	55.10	FGC6-375-118-150X	63.30
.125	.100	.385	.006	1.250	.1875	.3750	2.5	FGC6-375-125-100	55.10	FGC6-375-125-100X	63.30

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

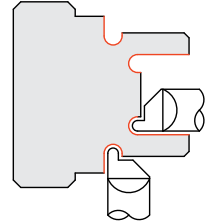
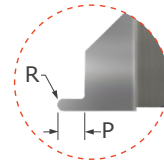
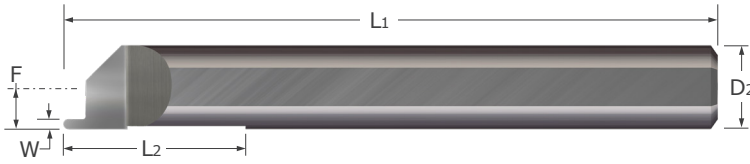
See pg 140 for standard tool holders

Standard – Grooving Tools

Face Grooving – Full Radius



FGF



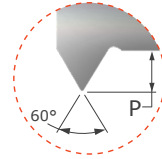
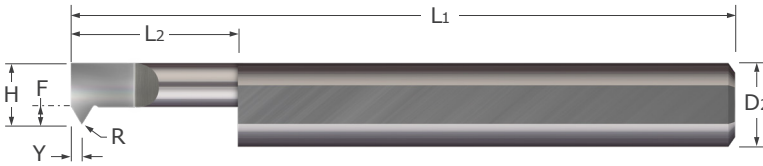
- Designed for generating full radius grooves in the face of the part
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split geometry makes the tool as rigid as possible
- Relief ground along Maximum Bore Depth (L2) to avoid interference during deep hole 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	
								Tool #	Price	Tool #	Price
W $+0.002"$ $-0.000"$	R	P $+0.030"$ $-0.000"$		L2	F	D2 (h6)	L1				
.015	.0075	.025	.197	.750	.0937	.1875	2.0	FGF-187-015-025	25.70	FGF-187-015-025X	29.25
.015	.0075	.025	.260	1.000	.1250	.2500	2.5	FGF-250-015-025	28.90	FGF-250-015-025X	34.65
.017	.0085	.025	.197	.750	.0937	.1875	2.0	FGF-187-017-025	25.70	FGF-187-017-025X	29.25
.017	.0085	.025	.260	1.000	.1250	.2500	2.5	FGF-250-017-025	28.90	FGF-250-017-025X	34.65
.020	.0100	.050	.135	.375	.0625	.1250	1.5	FGF-125-020-050	24.85	FGF-125-020-050X	28.00
.020	.0100	.050	.190	.180	.0860	.1875	2.0	FGF-180-020	25.70	FGF-180-020X	29.25
.020	.0100	.050	.197	.750	.0937	.1875	2.0	FGF-187-020-050	25.70	FGF-187-020-050X	29.25
.020	.0100	.050	.240	.230	.1050	.2500	2.5	FGF-230-020	28.90	FGF-230-020X	34.65
.020	.0100	.050	.260	.230	.1250	.2500	2.5	FGF-250-020	28.90	FGF-250-020X	34.65
.025	.0125	.050	.135	.375	.0625	.1250	1.5	FGF-125-025-050	24.85	FGF-125-025-050X	28.00
.025	.0125	.050	.197	.750	.0937	.1875	2.0	FGF-187-025-050	25.70	FGF-187-025-050X	29.25
.025	.0125	.050	.260	1.000	.1250	.2500	2.5	FGF-250-025-050	28.90	FGF-250-025-050X	34.65
.030	.0150	.050	.135	.375	.0625	.1250	1.5	FGF-125-030-050	24.85	FGF-125-030-050X	28.00
.030	.0150	.050	.190	.180	.0860	.1875	2.0	FGF-180-030	25.70	FGF-180-030X	29.25
.030	.0150	.050	.197	.750	.0937	.1875	2.0	FGF-187-030-050	25.70	FGF-187-030-050X	29.25
.030	.0150	.050	.260	.230	.1250	.2500	2.5	FGF-250-030	28.90	FGF-250-030X	34.65
.039	.0195	.075	.197	.750	.0937	.1875	2.0	FGF-187-039-075	25.70	FGF-187-039-075X	29.25
.039	.0195	.075	.260	1.000	.1250	.2500	2.5	FGF-250-039-075	28.90	FGF-250-039-075X	34.65
.040	.0200	.050	.260	.230	.1250	.2500	2.5	FGF-250-040	28.90	FGF-250-040X	34.65
.040	.0200	.075	.197	.750	.0937	.1875	2.0	FGF-187-040-075	25.70	FGF-187-040-075X	29.25
.040	.0200	.075	.260	1.000	.1250	.2500	2.5	FGF-250-040-075	28.90	FGF-250-040-075X	34.65
.050	.0250	.050	.322	.255	.1563	.3125	2.5	FGF-312-050	39.50	FGF-312-050X	46.40
.050	.0250	.075	.197	.750	.0937	.1875	2.0	FGF-187-050-075	25.70	FGF-187-050-075X	29.25
.050	.0250	.075	.260	1.000	.1250	.2500	2.5	FGF-250-050-075	28.90	FGF-250-050-075X	34.65
.050	.0250	.075	.322	1.125	.1563	.3125	2.5	FGF-312-050-075	39.50	FGF-312-050-075X	46.40
.062	.0310	.075	.322	.280	.1563	.3125	2.5	FGF-312-062	39.50	FGF-312-062X	46.40
.062	.0310	.075	.385	.315	.1875	.3750	2.5	FGF-375-062	54.90	FGF-375-062X	63.10
.062	.0310	.100	.197	.750	.0937	.1875	2.0	FGF-187-062-100	25.70	FGF-187-062-100X	29.25
.062	.0310	.100	.260	1.000	.1250	.2500	2.5	FGF-250-062-100	28.90	FGF-250-062-100X	34.65
.062	.0310	.100	.322	1.125	.1563	.3125	2.5	FGF-312-062-100	39.50	FGF-312-062-100X	46.40
.062	.0310	.100	.385	1.250	.1875	.3750	2.5	FGF-375-062-100	54.90	FGF-375-062-100X	63.10
.078	.0390	.100	.385	.335	.1875	.3750	2.5	FGF-375-078	54.90	FGF-375-078X	63.10
.093	.0465	.100	.385	.335	.1875	.3750	2.5	FGF-375-093	54.90	FGF-375-093X	63.10
.125	.0625	.100	.385	.335	.1875	.3750	2.5	FGF-375-125	54.90	FGF-375-125X	63.10

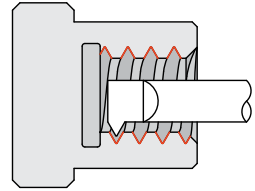
*Minimum Groove Diameter provides proper clearance on outside of tooth during initial plunge.

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 Dia.	Overall Length	Uncoated		AlTiN Coated	
										Tool #	Price	Tool #	Price
TPI	H	L2	$^{+.050"}_{-.000"}$	$^{+.010"}_{-.000"}$	P	$^{+.001"}_{-.000"}$	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
56-76	.040	.045	.075	.009	.015	.001	-.0225	.1250	1.5	IT-040075	40.75	IT-040075X	44.20
56-76	.040	.045	.100	.009	.015	.001	-.0225	.1250	1.5	IT-040100	40.75	IT-040100X	44.20
56-76	.040	.045	.150	.009	.015	.001	-.0225	.1250	1.5	IT-040150	40.75	IT-040150X	44.20
48-76	.050	.055	.100	.012	.020	.001	-.0125	.1250	1.5	IT-050100	40.75	IT-050100X	44.20
48-76	.050	.055	.150	.012	.020	.001	-.0125	.1250	1.5	IT-050150	40.75	IT-050150X	44.20
48-76	.050	.055	.200	.012	.020	.001	-.0125	.1250	1.5	IT-050200	40.75	IT-050200X	44.20
48-76	.060	.070	.200	.012	.020	.001	-.0025	.1250	1.5	IT-060200	35.55	IT-060200X	38.90
48-76	.060	.070	.250	.012	.020	.001	-.0025	.1250	1.5	IT-060250	35.55	IT-060250X	38.90
48-76	.060	.070	.300	.012	.020	.001	-.0025	.1250	1.5	IT-060300	35.55	IT-060300X	38.90

TPI	H	L2	$^{+.050"}_{-.000"}$	$^{+.010"}_{-.000"}$	P	$^{+.001"}_{-.001"}$	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
40-76	.080	.090	.250	.012	.020	.002	.0175	.1250	1.5	IT-080250	32.40	IT-080250X	35.65
40-76	.080	.090	.350	.012	.020	.002	.0175	.1250	1.5	IT-080350	32.40	IT-080350X	35.65
40-76	.080	.090	.500	.012	.020	.002	.0175	.1250	1.5	IT-080500	32.40	IT-080500X	35.65
32-76	.100	.110	.250	.014	.025	.002	.0375	.1250	1.5	IT-100250	32.40	IT-100250X	35.65
32-76	.100	.110	.350	.014	.025	.002	.0375	.1250	1.5	IT-100350	32.40	IT-100350X	35.65
32-76	.100	.110	.500	.014	.025	.002	.0375	.1250	1.5	IT-100500	32.40	IT-100500X	35.65
32-76	.100	.110	.600	.014	.025	.002	.0375	.1250	1.5	IT-100600	32.40	IT-100600X	35.65
32-56	.120	.136	.250	.017	.030	.002	.0263	.1875	2.0	IT-120250	34.50	IT-120250X	38.20
32-56	.120	.136	.400	.017	.030	.002	.0263	.1875	2.0	IT-120400	34.50	IT-120400X	38.20
32-56	.120	.136	.500	.017	.030	.002	.0263	.1875	2.0	IT-120500	34.50	IT-120500X	38.20
32-56	.120	.136	.600	.017	.030	.002	.0263	.1875	2.0	IT-120600	34.50	IT-120600X	38.20
32-56	.120	.136	.750	.017	.030	.002	.0263	.1875	2.0	IT-120750	34.50	IT-120750X	38.20
28-56	.140	.156	.250	.020	.035	.002	.0463	.1875	2.0	IT-140250	34.50	IT-140250X	38.20
28-56	.140	.156	.400	.020	.035	.002	.0463	.1875	2.0	IT-140400	34.50	IT-140400X	38.20
28-56	.140	.156	.500	.020	.035	.002	.0463	.1875	2.0	IT-140500	34.50	IT-140500X	38.20
28-56	.140	.156	.750	.020	.035	.002	.0463	.1875	2.0	IT-140750	34.50	IT-140750X	38.20

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

Continued on next page

See pg 140 for standard tool holders

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		AITIN Coated	
										Tool #	Price	Tool #	Price
TPI	H	L ₂	$^{+.050}_{-.000}$ "	$^{+.010}_{-.000}$ "	P	$R^{+.001}_{-.001}$ "	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price
24-56	.160	.182	.250	.023	.040	.002	.0663	.1875	2.0	IT-160250	34.50	IT-160250X	38.20
24-56	.160	.182	.400	.023	.040	.002	.0663	.1875	2.0	IT-160400	34.50	IT-160400X	38.20
24-56	.160	.182	.500	.023	.040	.002	.0663	.1875	2.0	IT-160500	34.50	IT-160500X	38.20
24-56	.160	.182	.750	.023	.040	.002	.0663	.1875	2.0	IT-160750	34.50	IT-160750X	38.20
24-56	.160	.182	1.000	.023	.040	.002	.0663	.1875	2.0	IT-1601000	34.50	IT-1601000X	38.20
24-56	.180	.202	.350	.023	.040	.002	.0550	.2500	2.5	IT-180350	36.85	IT-180350X	42.60
24-56	.180	.202	.500	.023	.040	.002	.0550	.2500	2.5	IT-180500	36.85	IT-180500X	42.60
24-56	.180	.202	.750	.023	.040	.002	.0550	.2500	2.5	IT-180750	36.85	IT-180750X	42.60
24-56	.180	.202	1.000	.023	.040	.002	.0550	.2500	2.5	IT-1801000	36.85	IT-1801000X	42.60
24-40	.200	.222	.400	.026	.045	.002	.0750	.2500	2.5	IT-200400	36.85	IT-200400X	42.60
24-40	.200	.222	.600	.026	.045	.002	.0750	.2500	2.5	IT-200600	36.85	IT-200600X	42.60
24-40	.200	.222	.750	.026	.045	.002	.0750	.2500	2.5	IT-200750	36.85	IT-200750X	42.60
24-40	.200	.222	1.000	.026	.045	.002	.0750	.2500	2.5	IT-2001000	36.85	IT-2001000X	42.60
20-40	.230	.252	.400	.032	.055	.002	.0738	.3125	2.5	IT-230400	46.10	IT-230400X	53.00
20-40	.230	.252	.600	.032	.055	.002	.0738	.3125	2.5	IT-230600	46.10	IT-230600X	53.00
20-40	.230	.252	.750	.032	.055	.002	.0738	.3125	2.5	IT-230750	46.10	IT-230750X	53.00
20-40	.230	.252	1.000	.032	.055	.002	.0738	.3125	2.5	IT-2301000	46.10	IT-2301000X	53.00
20-40	.230	.252	1.500	.032	.055	.002	.0738	.3125	2.5	IT-2301500	46.10	IT-2301500X	53.00
14-40	.290	.312	.500	.040	.070	.002	.1338	.3125	2.5	IT-290500	46.10	IT-290500X	53.00
14-40	.290	.312	.750	.040	.070	.002	.1338	.3125	2.5	IT-290750	46.10	IT-290750X	53.00
14-40	.290	.312	1.000	.040	.070	.002	.1338	.3125	2.5	IT-2901000	46.10	IT-2901000X	53.00
14-40	.290	.312	1.250	.040	.070	.002	.1338	.3125	2.5	IT-2901250	46.10	IT-2901250X	53.00
14-40	.290	.312	1.750	.040	.070	.002	.1338	.3125	2.5	IT-2901750	46.10	IT-2901750X	53.00
10-32	.320	.342	.500	.043	.075	.002	.1325	.3750	2.5	IT-320500	60.05	IT-320500X	68.25
10-32	.320	.342	.750	.043	.075	.002	.1325	.3750	2.5	IT-320750	60.05	IT-320750X	68.25
10-32	.320	.342	1.000	.043	.075	.002	.1325	.3750	2.5	IT-3201000	60.05	IT-3201000X	68.25
10-32	.320	.342	1.250	.043	.075	.002	.1325	.3750	2.5	IT-3201250	60.05	IT-3201250X	68.25
10-32	.320	.342	1.800	.043	.075	.002	.1325	.3750	2.5	IT-3201800	60.05	IT-3201800X	68.25
10-32	.360	.382	.500	.049	.085	.002	.1725	.3750	2.5	IT-360500	60.05	IT-360500X	68.25
10-32	.360	.382	.750	.049	.085	.002	.1725	.3750	2.5	IT-360750	60.05	IT-360750X	68.25
10-32	.360	.382	1.000	.049	.085	.002	.1725	.3750	2.5	IT-3601000	60.05	IT-3601000X	68.25
10-32	.360	.382	1.250	.049	.085	.002	.1725	.3750	2.5	IT-3601250	60.05	IT-3601250X	68.25
10-32	.360	.382	1.800	.049	.085	.002	.1725	.3750	2.5	IT-3601800	60.05	IT-3601800X	68.25
6-24	.490	.512	.750	.069	.120	.002	.2400	.5000	3.0	IT-490750	84.25	IT-490750X	94.55
6-24	.490	.512	1.500	.069	.120	.002	.2400	.5000	3.0	IT-4901500	84.25	IT-4901500X	94.55
6-24	.490	.512	2.000	.069	.120	.002	.2400	.5000	3.0	IT-4902000	84.25	IT-4902000X	94.55

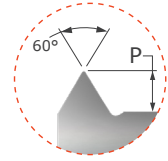
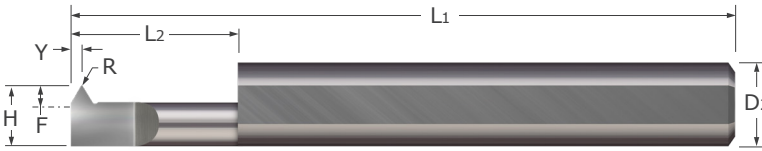
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pg 140 for standard tool holders

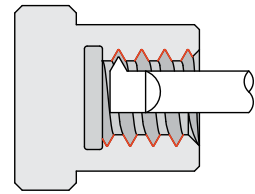
See pg 293 for tool set options

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 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 Dia.	Overall Length	Uncoated		AlTiN Coated	
										Tool #	Price	Tool #	Price
TPI	H	L2	$Y^{+.050}_{-.000}$	$Y^{+.010}_{-.000}$	P	$R^{+.001}_{-.000}$	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
56 - 76	.040	.045	.075	.009	.015	.001	-.0225	.1250	1.5	ITL-040075	40.75		
56 - 76	.040	.045	.150	.009	.015	.001	-.0225	.1250	1.5	ITL-040150	40.75		
48 - 76	.050	.055	.200	.012	.020	.001	-.0125	.1250	1.5	ITL-050200	40.75	ITL-050200X	44.20
48 - 76	.060	.070	.200	.012	.020	.001	-.0025	.1250	1.5	ITL-060200	35.55	ITL-060200X	38.90
48 - 76	.060	.070	.250	.012	.020	.001	-.0025	.1250	1.5	ITL-060250	35.55	ITL-060250X	38.90
48 - 76	.060	.070	.300	.012	.020	.001	-.0025	.1250	1.5	ITL-060300	35.55	ITL-060300X	38.90

TPI	H	L2	$Y^{+.050}_{-.000}$	$Y^{+.010}_{-.000}$	P	$R^{+.001}_{-.001}$	F	D2 (h6)	L1	Uncoated		AlTiN Coated	
										Tool #	Price	Tool #	Price
40 - 76	.080	.090	.250	.012	.020	.002	.0175	.1250	1.5	ITL-080250	32.40	ITL-080250X	35.65
40 - 76	.080	.090	.350	.012	.020	.002	.0175	.1250	1.5	ITL-080350	32.40	ITL-080350X	35.65
40 - 76	.080	.090	.500	.012	.020	.002	.0175	.1250	1.5	ITL-080500	32.40	ITL-080500X	35.65
32 - 76	.100	.110	.250	.014	.025	.002	.0375	.1250	1.5	ITL-100250	32.40	ITL-100250X	35.65
32 - 76	.100	.110	.350	.014	.025	.002	.0375	.1250	1.5	ITL-100350	32.40	ITL-100350X	35.65
32 - 76	.100	.110	.500	.014	.025	.002	.0375	.1250	1.5	ITL-100500	32.40	ITL-100500X	35.65
32 - 76	.100	.110	.600	.014	.025	.002	.0375	.1250	1.5	ITL-100600	32.40	ITL-100600X	35.65
32 - 56	.120	.136	.250	.017	.030	.002	.0263	.1875	2.0	ITL-120250	34.50	ITL-120250X	38.20
32 - 56	.120	.136	.400	.017	.030	.002	.0263	.1875	2.0	ITL-120400	34.50	ITL-120400X	38.20
32 - 56	.120	.136	.500	.017	.030	.002	.0263	.1875	2.0	ITL-120500	34.50	ITL-120500X	38.20
32 - 56	.120	.136	.600	.017	.030	.002	.0263	.1875	2.0	ITL-120600	34.50	ITL-120600X	38.20
32 - 56	.120	.136	.750	.017	.030	.002	.0263	.1875	2.0	ITL-120750	34.50	ITL-120750X	38.20
28 - 56	.140	.156	.250	.020	.035	.002	.0463	.1875	2.0	ITL-140250	34.50	ITL-140250X	38.20
28 - 56	.140	.156	.400	.020	.035	.002	.0463	.1875	2.0	ITL-140400	34.50	ITL-140400X	38.20
28 - 56	.140	.156	.500	.020	.035	.002	.0463	.1875	2.0	ITL-140500	34.50	ITL-140500X	38.20
28 - 56	.140	.156	.750	.020	.035	.002	.0463	.1875	2.0	ITL-140750	34.50	ITL-140750X	38.20

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

Continued on next page

See pg 140 for standard tool holders

Standard – Threading Tools

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



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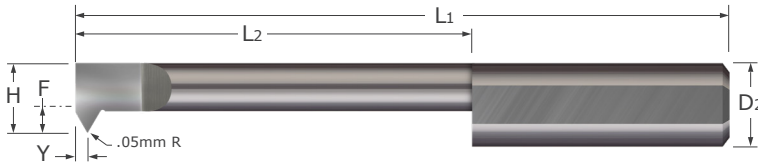
Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Radius	Centerline Offset	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
										Tool #	Price	Tool #	Price
TPI	H	L ₂	$^{+.050}_{-.000}$ "	$^{+.010}_{-.000}$ "	P	$^{+.001}_{-.001}$ "	F	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price
24 - 56	.160	.182	.250	.023	.040	.002	.0663	.1875	2.0	ITL-160250	34.50	ITL-160250X	38.20
24 - 56	.160	.182	.400	.023	.040	.002	.0663	.1875	2.0	ITL-160400	34.50	ITL-160400X	38.20
24 - 56	.160	.182	.500	.023	.040	.002	.0663	.1875	2.0	ITL-160500	34.50	ITL-160500X	38.20
24 - 56	.160	.182	.750	.023	.040	.002	.0663	.1875	2.0	ITL-160750	34.50	ITL-160750X	38.20
24 - 56	.180	.202	.350	.023	.040	.002	.0550	.2500	2.5	ITL-180350	36.85	ITL-180350X	42.60
24 - 56	.180	.202	.500	.023	.040	.002	.0550	.2500	2.5	ITL-180500	36.85	ITL-180500X	42.60
24 - 56	.180	.202	.750	.023	.040	.002	.0550	.2500	2.5	ITL-180750	36.85	ITL-180750X	42.60
24 - 56	.180	.202	1.000	.023	.040	.002	.0550	.2500	2.5	ITL-1801000	36.85	ITL-1801000X	42.60
24 - 40	.200	.222	.400	.026	.045	.002	.0750	.2500	2.5	ITL-200400	36.85	ITL-200400X	42.60
24 - 40	.200	.222	.600	.026	.045	.002	.0750	.2500	2.5	ITL-200600	36.85	ITL-200600X	42.60
24 - 40	.200	.222	.750	.026	.045	.002	.0750	.2500	2.5	ITL-200750	36.85	ITL-200750X	42.60
24 - 40	.200	.222	1.000	.026	.040	.002	.0750	.2500	2.5	ITL-2001000	36.85	ITL-2001000X	42.60
20 - 40	.230	.252	.400	.032	.055	.002	.0738	.3125	2.5	ITL-230400	46.10	ITL-230400X	53.00
20 - 40	.230	.252	.600	.032	.055	.002	.0738	.3125	2.5	ITL-230600	46.10	ITL-230600X	53.00
20 - 40	.230	.252	.750	.032	.055	.002	.0738	.3125	2.5	ITL-230750	46.10	ITL-230750X	53.00
20 - 40	.230	.252	1.000	.032	.055	.002	.0738	.3125	2.5	ITL-2301000	46.10	ITL-2301000X	53.00
14 - 40	.290	.312	.500	.040	.070	.002	.1338	.3125	2.5	ITL-290500	46.10	ITL-290500X	53.00
14 - 40	.290	.312	.750	.040	.070	.002	.1338	.3125	2.5	ITL-290750	46.10	ITL-290750X	53.00
14 - 40	.290	.312	1.000	.040	.070	.002	.1338	.3125	2.5	ITL-2901000	46.10	ITL-2901000X	53.00
14 - 40	.290	.312	1.250	.040	.070	.002	.1338	.3125	2.5	ITL-2901250	46.10	ITL-2901250X	53.00
10 - 32	.320	.342	.500	.043	.075	.002	.1325	.3750	2.5	ITL-320500	60.05	ITL-320500X	68.25
10 - 32	.320	.342	.750	.043	.075	.002	.1325	.3750	2.5	ITL-320750	60.05	ITL-320750X	68.25
10 - 32	.320	.342	1.000	.043	.075	.002	.1325	.3750	2.5	ITL-3201000	60.05	ITL-3201000X	68.25
10 - 32	.320	.342	1.250	.043	.075	.002	.1325	.3750	2.5	ITL-3201250	60.05	ITL-3201250X	68.25
10 - 32	.360	.382	.500	.049	.085	.002	.1725	.3750	2.5	ITL-360500	60.05	ITL-360500X	68.25
10 - 32	.360	.382	.750	.049	.085	.002	.1725	.3750	2.5	ITL-360750	60.05	ITL-360750X	68.25
10 - 32	.360	.382	1.000	.049	.085	.002	.1725	.3750	2.5	ITL-3601000	60.05	ITL-3601000X	68.25
10 - 32	.360	.382	1.250	.049	.085	.002	.1725	.3750	2.5	ITL-3601250	60.05	ITL-3601250X	68.25
10 - 32	.360	.382	1.800	.049	.085	.002	.1725	.3750	2.5	ITL-3601800	60.05	ITL-3601800X	68.25
6 - 24	.490	.512	.750	.069	.120	.002	.2400	.5000	3.0	ITL-490750	84.25	ITL-490750X	94.55
6 - 24	.490	.512	1.500	.069	.120	.002	.2400	.5000	3.0	ITL-4901500	84.25	ITL-4901500X	94.55
6 - 24	.490	.512	2.000	.069	.120	.002	.2400	.5000	3.0	ITL-4902000	84.25	ITL-4902000X	94.55

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

See pg 140 for standard tool holders

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 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

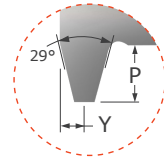
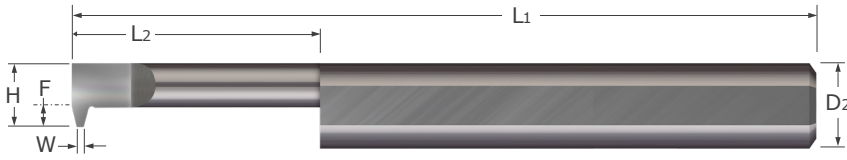
Pitch	Head Width	Minimum Bore Diameter*	Max. Bore Depth	Point Offset	Projection	Centerline Offset	Shank Dia.	OAL	Uncoated		TiN Coated		AlTiN Coated	
									Tool #	Price	Tool #	Price	Tool #	Price
	H	L_2	$+1.24\text{mm}$ -0.00mm	$+0.25\text{mm}$ -0.00mm	P	F	D ₂ (h6)	L ₁						
.70-1.5mm	4.60mm	5.15 mm	13 mm	0.71 mm	1.22 mm	1.6 mm	6 mm	57 mm	ITM-064613	36.35	ITM-064613G	40.55	ITM-064613X	42.10
.70-1.5 mm	4.60mm	5.15 mm	25 mm	0.71 mm	1.22 mm	1.6 mm	6 mm	57 mm	ITM-064625	36.35	ITM-064625G	40.55	ITM-064625X	42.10
1.2-1.7mm	5.10 mm	5.65 mm	15 mm	0.76 mm	1.32 mm	2.1 mm	6 mm	57 mm	ITM-065115	36.35			ITM-065115X	42.10
1.2-1.7mm	5.10 mm	5.65 mm	28 mm	0.76 mm	1.32 mm	2.1 mm	6 mm	57 mm	ITM-065128	36.35			ITM-065128X	42.10
1.2-2.0mm	5.80 mm	6.35 mm	15 mm	0.86 mm	1.50 mm	1.8 mm	8 mm	63 mm	ITM-085815	43.85			ITM-085815X	51.90
1.2-2.0 mm	5.80 mm	6.35 mm	25 mm	0.86 mm	1.50 mm	1.8 mm	8 mm	63 mm	ITM-085825	43.85			ITM-085825X	51.90
1.2-2.0 mm	5.80 mm	6.35 mm	38 mm	0.86 mm	1.50 mm	1.8 mm	8 mm	63 mm	ITM-085838	43.85	ITM-085838G	49.85	ITM-085838X	51.90
1.7-2.2 mm	7.40 mm	7.95 mm	20 mm	1.09 mm	1.91 mm	3.4 mm	8 mm	63 mm	ITM-087420	43.85	ITM-087420G	49.85	ITM-087420X	51.90
1.7-2.2 mm	7.40 mm	7.95 mm	32 mm	1.09 mm	1.91 mm	3.4 mm	8 mm	63 mm	ITM-087432	43.85	ITM-087432G	49.85	ITM-087432X	51.90
1.7-2.2 mm	7.40 mm	7.95 mm	46 mm	1.09 mm	1.91 mm	3.4 mm	8 mm	63 mm	ITM-087446	43.85	ITM-087446G	49.85	ITM-087446X	51.90
1.75-3.0 mm	9.60 mm	10.15 mm	20 mm	1.40 mm	2.41 mm	4.6 mm	10 mm	72 mm	ITM-109620	61.50				
2.0-4.0 mm	11.40 mm	11.95 mm	50 mm	1.85 mm	3.23 mm	5.4 mm	12 mm	83 mm	ITM-121150	78.85				

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

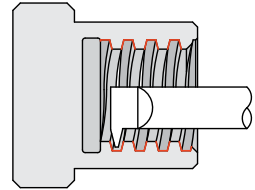
See pg 140 for standard tool holders

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 geometry makes the tool as rigid as possible
- 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



Standard – Threading Tools

Threads Per Inch	Head Width	Minimum Bore Diameter*	Maximum Bore Depth	Point Offset	Projection	Flat	Centerline Offset	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
										Tool #	Price	Tool #	Price
TPI	H	L2	L2 ^{+ .050"} / _{-.000"}	Y	P	W ^{+ .000"} / _{-.005"}	F	D2 (h6)	L1				
16	.200	.222	.400	.035	.045	.021	.0750	.2500	2.5	IAT-400-16	36.85	IAT-400-16X	42.60
16	.200	.222	.600	.024	.045	.021	.0750	.2500	2.5	IAT-600-16	36.85	IAT-600-16X	42.60
16	.200	.222	.750	.035	.045	.021	.0750	.2500	2.5	IAT-750-16	36.85	IAT-750-16X	42.60
16	.200	.222	1.000	.035	.045	.021	.0750	.2500	2.5	IAT-1000-16	36.85	IAT-1000-16X	42.60
14	.255	.277	.500	.043	.070	.024	.0988	.3125	2.5	IAT-500-14	45.60	IAT-500-14X	52.50
14	.255	.277	.750	.030	.070	.024	.0988	.3125	2.5	IAT-750-14	45.60	IAT-750-14X	52.50
14	.255	.277	1.000	.043	.070	.024	.0988	.3125	2.5	IAT-1000-14	45.60	IAT-1000-14X	52.50
14	.255	.277	1.250	.043	.070	.024	.0988	.3125	2.5	IAT-1250-14	45.60	IAT-1250-14X	52.50
12	.360	.382	.750	.049	.085	.028	.1725	.3750	2.5	IAT-750-12	60.05	IAT-750-12X	68.25
12	.360	.382	1.000	.036	.085	.028	.1725	.3750	2.5	IAT-1000-12	60.05	IAT-1000-12X	68.25
12	.360	.382	1.250	.049	.085	.028	.1725	.3750	2.5	IAT-1250-12	60.05	IAT-1250-12X	68.25
12	.360	.382	1.800	.049	.085	.028	.1725	.3750	2.5	IAT-1800-12	60.05	IAT-1800-12X	68.25
10	.490	.512	.750	.060	.120	.032	.2400	.5000	3.0	IAT-750-10	84.25	IAT-750-10X	94.55
10	.490	.512	1.500	.060	.120	.032	.2400	.5000	3.0	IAT-1500-10	84.25	IAT-1500-10X	94.55
10	.490	.512	2.000	.060	.120	.032	.2400	.5000	3.0	IAT-2000-10	84.25	IAT-2000-10X	94.55
8	.490	.512	.750	.064	.120	.041	.2400	.5000	3.0	IAT-750-8	84.25	IAT-750-8X	94.55
8	.490	.512	1.500	.064	.120	.041	.2400	.5000	3.0	IAT-1500-8	84.25	IAT-1500-8X	94.55
8	.490	.512	2.000	.064	.120	.041	.2400	.5000	3.0	IAT-2000-8	84.25	IAT-2000-8X	94.55
6	.490	.512	.750	.072	.120	.057	.2400	.5000	3.0	IAT-750-6	84.25	IAT-750-6X	94.55
6	.490	.512	1.500	.072	.120	.057	.2400	.5000	3.0	IAT-1500-6	84.25	IAT-1500-6X	94.55
6	.490	.512	2.000	.072	.120	.057	.2400	.5000	3.0	IAT-2000-6	84.25	IAT-2000-6X	94.55
5	.490	.512	1.500	.078	.120	.069	.2400	.5000	3.0	IAT-1500-5	84.25	IAT-1500-5X	94.55
5	.490	.512	2.000	.078	.120	.069	.2400	.5000	3.0	IAT-2000-5	84.25	IAT-2000-5X	94.55

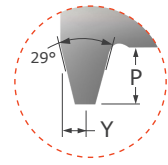
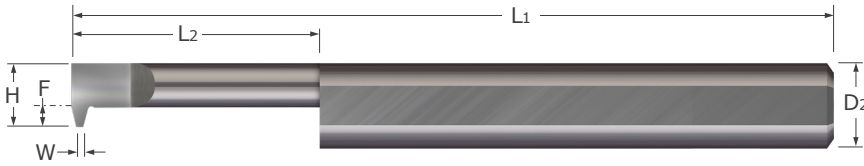
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pg 140 for standard tool holders

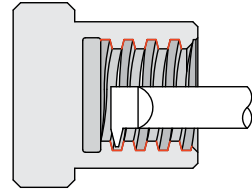


Standard – Threading Tools

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 geometry makes the tool as rigid as possible
- 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	
										Tool #	Price	Tool #	Price
TPI	H		L ₂	Y	P	W	F	D ₂ (h6)	L ₁				
			^{+0.050"} _{-.000"}			^{+0.000"} _{-.005"}							
16	.200	.222	.400	.024	.045	.024	.0750	.2500	2.5	SAT-400-16	36.85	SAT-400-16X	42.60
16	.200	.222	.600	.024	.045	.024	.0750	.2500	2.5	SAT-600-16	36.85	SAT-600-16X	42.60
16	.200	.222	.750	.024	.045	.024	.0750	.2500	2.5	SAT-750-16	36.85	SAT-750-16X	42.60
16	.200	.222	1.000	.024	.045	.024	.0750	.2500	2.5	SAT-1000-16	36.85	SAT-1000-16X	42.60
14	.235	.257	.500	.045	.070	.028	.0788	.3125	2.5	SAT-500-14	45.60	SAT-500-14X	52.50
14	.235	.257	.750	.045	.070	.028	.0788	.3125	2.5	SAT-750-14	45.60	SAT-750-14X	52.50
14	.235	.257	1.000	.045	.070	.028	.0788	.3125	2.5	SAT-1000-14	45.60	SAT-1000-14X	52.50
14	.235	.257	1.750	.045	.070	.028	.0788	.3125	2.5	SAT-1750-14	45.60	SAT-1750-14X	52.50
12	.360	.382	.500	.051	.085	.033	.1725	.3750	2.5	SAT-500-12	60.05	SAT-500-12X	68.25
12	.360	.382	.750	.051	.085	.033	.1725	.3750	2.5	SAT-750-12	60.05	SAT-750-12X	68.25
12	.360	.382	1.000	.051	.085	.033	.1725	.3750	2.5	SAT-1000-12	60.05	SAT-1000-12X	68.25
12	.360	.382	1.250	.051	.085	.033	.1725	.3750	2.5	SAT-1250-12	60.05	SAT-1250-12X	68.25
12	.360	.382	1.800	.051	.085	.033	.1725	.3750	2.5	SAT-1800-12	60.05	SAT-1800-12X	68.25
10	.490	.512	.750	.062	.120	.037	.2400	.5000	3.0	SAT-750-10	84.25	SAT-750-10X	94.55
10	.490	.512	1.500	.062	.120	.037	.2400	.5000	3.0	SAT-1500-10	84.25	SAT-1500-10X	94.55
10	.490	.512	2.000	.062	.120	.037	.2400	.5000	3.0	SAT-2000-10	84.25	SAT-2000-10X	94.55
9	.490	.512	2.000	.052	.120	.042	.2400	.5000	3.0	SAT-2000-9	84.25	SAT-2000-9X	94.55
8	.490	.512	.750	.068	.120	.048	.2400	.5000	3.0	SAT-750-8	84.25	SAT-750-8X	94.55
8	.490	.512	1.500	.068	.120	.048	.2400	.5000	3.0	SAT-1500-8	84.25	SAT-1500-8X	94.55
8	.490	.512	2.000	.068	.120	.048	.2400	.5000	3.0	SAT-2000-8	84.25	SAT-2000-8X	94.55
7	.490	.512	.750	.059	.120	.055	.2400	.5000	3.0	SAT-750-7	84.25		
7	.490	.512	2.000	.059	.120	.055	.2400	.5000	3.0	SAT-2000-7	84.25	SAT-2000-7X	94.55
6	.490	.512	2.000	.076	.120	.065	.2400	.5000	3.0	SAT-2000-6	84.25	SAT-2000-6X	94.55
5	.490	.512	.750	.083	.120	.079	.2400	.5000	3.0	SAT-750-5	84.25	SAT-750-5X	94.55
5	.490	.512	1.500	.083	.120	.079	.2400	.5000	3.0	SAT-1500-5	84.25	SAT-1500-5X	94.55
5	.490	.512	2.000	.083	.120	.079	.2400	.5000	3.0	SAT-2000-5	84.25	SAT-2000-5X	94.55

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

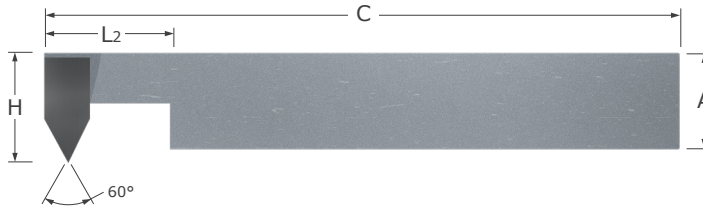
See pg 140 for standard tool holders

Standard – Threading Tools

UN Threads – Right Hand – Brazed



IDRT



- 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	
				Tool #	Price
H	$L_2 \begin{smallmatrix} +.050'' \\ -.000'' \end{smallmatrix}$	$A \begin{smallmatrix} +.0000'' \\ -.0030'' \end{smallmatrix}$	C		
.450	.615	.3750	2.50	IDRT-60	52.75
.450	1.115	.3750	2.50	IDRT-61	52.75
.575	.875	.5000	3.52	IDRT-80	53.25
.575	1.395	.5000	3.52	IDRT-81	49.00

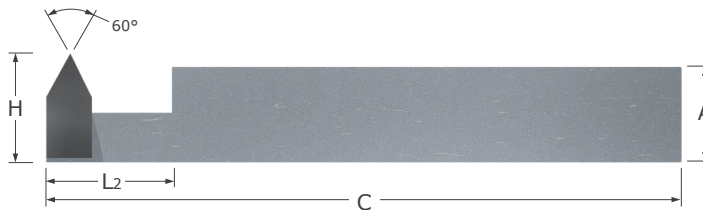
Standard – Threading Tools

Standard – Threading Tools

UN Threads – Left Hand – Brazed



IDLT

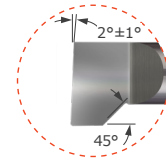
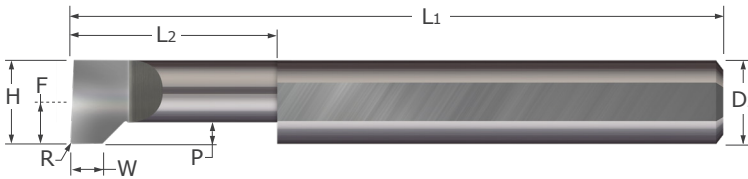


- Designed for threading multiple thread pitches (ANSI, UN, and Metric 60°) in a left hand threading application
- Designed for single point threading where a square shank tool is required in .450" bores and larger
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- Solid carbide 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	
				Tool #	Price
H	$L_2 \begin{smallmatrix} +.050'' \\ -.000'' \end{smallmatrix}$	$A \begin{smallmatrix} +.0000'' \\ -.0030'' \end{smallmatrix}$	C		
.450	.615	.3750	2.50	IDLT-60	52.75
.450	1.115	.3750	2.50	IDLT-61	52.75
.575	.875	.5000	3.52	IDLT-80	53.25
.575	1.395	.5000	3.52	IDLT-81	53.25

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 geometry makes the tool as rigid as possible
- 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	
									Tool #	Price	Tool #	Price
H		L2	W	R	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price
		$^{+.050}_{-.000}$ "	$^{+.002}_{-.002}$ "	$^{+.002}_{-.000}$ "								
.094	.104	.250	.049	.002	.040	.0315	.1250	1.5	LTR-094-4	26.85	LTR-094-4X	30.00
.094	.104	.375	.049	.002	.040	.0315	.1250	1.5	LTR-094-6	26.85	LTR-094-6X	30.00
.125	.139	.375	.063	.002	.040	.0625	.1250	1.5	LTR-125-6	26.85	LTR-125-6X	30.00
.125	.139	.500	.063	.002	.040	.0625	.1250	1.5	LTR-125-8	26.85	LTR-125-8X	30.00

H	L2	W	R	P	F	D2 (h6)	L1	Tool #	Price	Tool #	Price	
.156	.174	.375	.063	.005	.040	.0625	.1875	2.0	LTR-156-6	30.80	LTR-156-6X	34.45
.156	.174	.500	.063	.005	.040	.0625	.1875	2.0	LTR-156-8	30.80	LTR-156-8X	34.45
.187	.205	.375	.078	.005	.040	.0938	.1875	2.0	LTR-187-6	30.80	LTR-187-6X	34.45
.187	.205	.500	.078	.005	.040	.0938	.1875	2.0	LTR-187-8	30.80	LTR-187-8X	34.45
.187	.205	.750	.078	.005	.040	.0938	.1875	2.0	LTR-187-12	30.80	LTR-187-12X	34.45
.187	.205	1.000	.078	.005	.040	.0938	.1875	2.0	LTR-187-16	30.80	LTR-187-16X	34.45
.250	.272	.500	.094	.005	.050	.1250	.2500	2.5	LTR-250-8	36.85	LTR-250-8X	42.60
.250	.272	.750	.094	.005	.050	.1250	.2500	2.5	LTR-250-12	36.85	LTR-250-12X	42.60
.250	.272	1.000	.094	.005	.050	.1250	.2500	2.5	LTR-250-16	36.85	LTR-250-16X	42.60
.250	.272	1.250	.094	.005	.050	.1250	.2500	2.5	LTR-250-20	36.85	LTR-250-20X	42.60
.312	.334	.750	.094	.005	.075	.1563	.3125	2.5	LTR-312-12	46.10	LTR-312-12X	53.00
.312	.334	1.250	.094	.005	.075	.1563	.3125	2.5	LTR-312-20	46.10	LTR-312-20X	53.00
.375	.397	.750	.125	.005	.100	.1875	.3750	2.5	LTR-375-12	60.70	LTR-375-12X	68.90
.375	.397	1.250	.125	.005	.100	.1875	.3750	2.5	LTR-375-20	60.70	LTR-375-20X	68.90
.500	.522	1.000	.156	.010	.125	.2500	.5000	3.0	LTR-500-16	85.95	LTR-500-16X	96.30
.500	.522	1.500	.156	.010	.125	.2500	.5000	3.0	LTR-500-24	85.95	LTR-500-24X	96.30

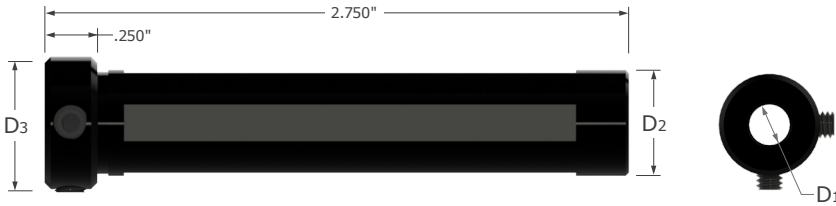
*Suggested Minimum Bore Diameter to accommodate chip evacuation and retract clearance in static (not live) applications.

See pg 140 for standard tool holders

Standard – Tool Holders


Tech Resources
Available Online

TH / THM / THMA



- Tool holder optimized for use with Micro 100 standard shank tools in lathe applications
- Head allows for consistent length when seated against the tooling block.
- Ability for tool to be mounted in 4 different orientations, 90 degrees apart, due to 4 alignment flats on shank
- 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

Standard – Tool Holders

Internal Diameter		Head Diameter	Shank Diameter	Locating Locking Screw	Tool Holder	
D1 +.0005" -.0000"	decimal equiv.	D3 +.005" -.005" +.127mm -.127mm	D2 -.0003" -.0008" -.008mm -.020mm		Tool #	Price
3 mm	.1181	15 mm	12 mm	40239	THM-312	71.40
3 mm	.1181	19 mm	16 mm	40239	THM-316	71.40
3 mm	.1181	25 mm	20 mm	40287	THM-320	78.75
.1250	.1250	.625	.5000	40211	TH-84	71.40
.1250	.1250	.750	.6250	40263	TH-104	71.40
.1250	.1250	.875	.7500	40284	TH-204	78.75
.1250	.1250	25 mm	20 mm	40287	THMA-420	78.75
.1250	.1250	27 mm	22 mm	40287	THMA-422	78.75
.1250	.1250	32 mm	25 mm	40286	THMA-425	93.45
.1250	.1250	1.250	1.0000	40285	TH-404	93.45
4 mm	.1575	15 mm	12 mm	40283	THM-412	71.40
4 mm	.1575	19 mm	16 mm	40239	THM-416	71.40
4 mm	.1575	25 mm	20 mm	40287	THM-420	78.75
.1875	.1875	.625	.5000	40211	TH-85	71.40
.1875	.1875	.750	.6250	40263	TH-105	71.40
.1875	.1875	.875	.7500	40284	TH-205	78.75
.1875	.1875	25 mm	20 mm	40287	THMA-520	78.75
.1875	.1875	27 mm	22 mm	40287	THMA-522	78.75
.1875	.1875	32 mm	25 mm	40286	THMA-525	93.45
.1875	.1875	1.250	1.0000	40285	TH-405	93.45
6 mm	.2362	15 mm	12 mm	40283	THM-612	71.40
6 mm	.2362	19 mm	16 mm	40239	THM-616	71.40
6 mm	.2362	25 mm	20 mm	40287	THM-620	78.75
.2500	.2500	.625	.5000	40211	TH-86	71.40
.2500	.2500	.750	.6250	40211	TH-106	71.40
.2500	.2500	.875	.7500	40263	TH-206	78.75
.2500	.2500	25 mm	20 mm	40287	THMA-620	78.75
.2500	.2500	27 mm	22 mm	40287	THMA-622	78.75
.2500	.2500	32 mm	25 mm	40286	THMA-625	93.45
.2500	.2500	1.250	1.0000	40285	TH-406	93.45

See pg 142 for replacement parts and accessories

Continued on next page

TH / THM / THMA



Standard – Tool Holders

(cont.)


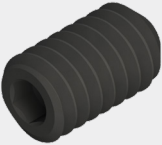
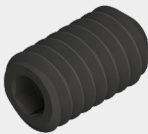
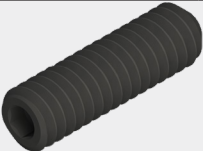
Continued from previous page

Internal Diameter		Head Diameter	Shank Diameter	Locating Locking Screw	Tool Holder	
D_1 $\begin{matrix} +.0005'' \\ -.0000'' \end{matrix}$	decimal equiv.	D_3 $\begin{matrix} +.005'' \\ -.005'' \\ +.127mm \\ -.127mm \end{matrix}$	D_2 $\begin{matrix} -.0003'' \\ -.0008'' \\ -.008mm \\ -.020mm \end{matrix}$		Tool #	Price
.3125	.3125	.625	.5000	40211	TH-87	71.40
.3125	.3125	.750	.6250	40211	TH-107	71.40
.3125	.3125	.875	.7500	40263	TH-207	78.75
.3125	.3125	25 mm	20 mm	40287	THMA-720	78.75
.3125	.3125	27 mm	22 mm	40287	THMA-722	78.75
.3125	.3125	32 mm	25 mm	40287	THMA-725	93.45
.3125	.3125	1.250	1.0000	40284	TH-407	93.45
8 mm	.3150	15 mm	12 mm	40283	THM-812	71.40
8 mm	.3150	19 mm	16 mm	40283	THM-816	71.40
8 mm	.3150	25 mm	20 mm	40287	THM-820	78.75
.3750	.3750	.625	.5000	40211	TH-88	71.40
.3750	.3750	.750	.6250	40211	TH-108	71.40
.3750	.3750	.875	.7500	40211	TH-208	78.75
.3750	.3750	25 mm	20 mm	40239	THMA-820	78.75
.3750	.3750	27 mm	22 mm	40287	THMA-822	78.75
.3750	.3750	32 mm	25 mm	40287	THMA-825	93.45
.3750	.3750	1.250	1.0000	40284	TH-408	93.45
10 mm	.3937	19 mm	16 mm	40283	THM-1016	71.40
10 mm	.3937	25 mm	20 mm	40239	THM-1020	78.75
12 mm	.4724	19 mm	16 mm	40283	THM-1216	71.40
12 mm	.4724	25 mm	20 mm	40283	THM-1220	78.75
.5000	.5000	.875	.7500	40211	TH-210	78.75
.5000	.5000	1.125	1.0000	40284	TH-410	93.45

Standard - Tool Holders

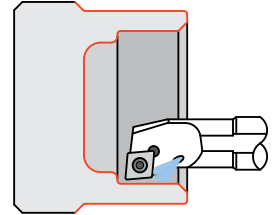
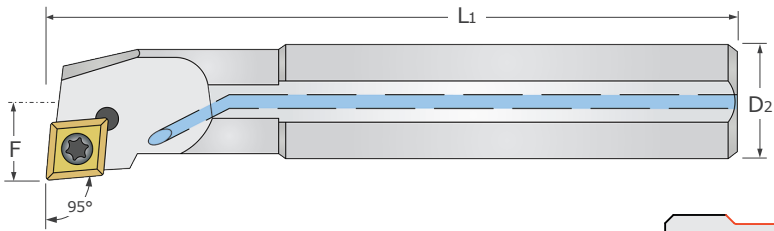
Tool Holder System – Accessories

Standard – Tool Holders

Image	Accessory Type	Compatibility	Single		Package of 10		
			Tool #	Price	Tool #	Price	
	Locating / Locking Screw	See TH/THM/THMA table for compatibility page 140	40211	1.10	41211	9.00	NEW
	Locating / Locking Screw		40263	1.10	41263	9.00	NEW
	Locating / Locking Screw		40284	1.10	41284	9.00	NEW
	Locating / Locking Screw		40285	1.10	41285	9.00	NEW
	Locating / Locking Screw		40283	1.10	41283	9.00	NEW
	Locating / Locking Screw		40239	1.10	41239	9.00	NEW
	Locating / Locking Screw		40287	1.10	41287	9.00	NEW
	Locating / Locking Screw		40286	1.10	41286	9.00	NEW

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	
						Tool #	Price
	F	D ₂	L ₁				
.330	.177	.2500	3.1	50-1100	A04F SCLCR 2	20-0821	72.45
.380	.197	.3125	3.9	50-1100	A05H SCLCR 2	20-0823	74.35
.490	.275	.3750	4.5	50-1100	A06J SCLCR 2	20-0825	77.60
.630	.354	.5000	4.9	50-1100	A08K SCLCR 2	20-0827	80.85
.630	.354	.5000	4.9	50-1105	A08K SCLCR 3	20-0850	84.10
.775	.433	.6250	5.9	50-1100	A10M SCLCR 2	20-0829	86.40
.775	.433	.6250	5.9	50-1105	A10M SCLCR 3	20-0852	89.60
.925	.511	.7500	7.1	50-1105	A12Q SCLCR 3	20-0854	97.00

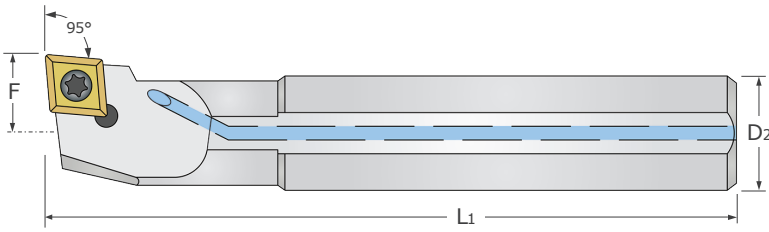
*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

See pg 303 for indexable insert accessories

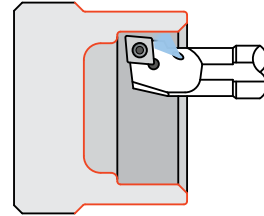
See pgs [297-302](#) for tool set options

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	
						Tool #	Price
	F	D ₂	L ₁				
.330	.177	.2500	3.1	50-1100	A04F SCLCL 2	20-0822	72.45
.380	.197	.3125	3.9	50-1100	A05H SCLCL 2	20-0824	74.35
.490	.275	.3750	4.5	50-1100	A06J SCLCL 2	20-0826	77.60
.630	.354	.5000	4.9	50-1100	A08K SCLCL 2	20-0828	80.85
.630	.354	.5000	4.9	50-1105	A08K SCLCL 3	20-0851	84.10
.775	.433	.6250	5.9	50-1100	A10M SCLCL 2	20-0830	86.40
.775	.433	.6250	5.9	50-1105	A10M SCLCL 3	20-0853	89.60
.925	.511	.7500	7.1	50-1105	A12Q SCLCL 3	20-0855	97.00

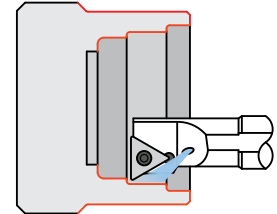
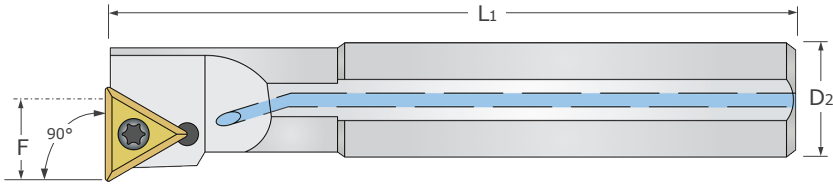
*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

See pg 303 for indexable insert accessories

See pgs [297-302](#) for tool set options

Indexable – Boring Bars

Facing – Coolant Through – Right Hand



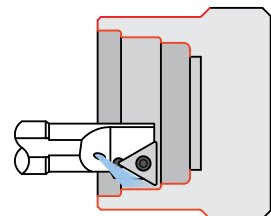
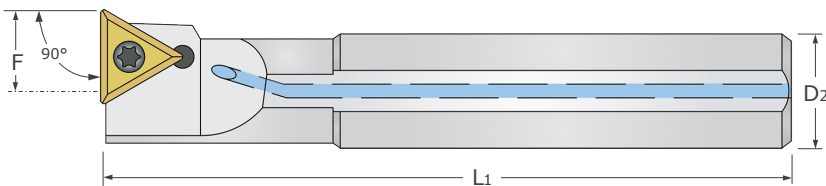
- Coolant through boring bar for left hand boring and facing with 0° approach (lead) angle, which allows for deeper roughing passes
- Made from precision ground heat treated steel
- Coolant through design for improved chip removal
- Insert not included

Minimum Bore Diameter*	Centerline Offset	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
						Tool #	Price
	F	D ₂	L ₁				
.490	.275	.3750	4.3	50-1300	A06J STFCL 2	20-1031	75.70
.633	.354	.5000	4.9	50-1300	A08K STFCL 2	20-1033	80.15
.775	.433	.6250	5.9	50-1300	A10M STFCL 2	20-1035	81.15

*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	
						Tool #	Price
	F	D ₂	L ₁				
.490	.275	.3750	4.3	50-1300	A06J STFLCL 2	20-1032	75.70
.633	.354	.5000	4.9	50-1300	A08K STFLCL 2	20-1034	80.15
.775	.433	.6250	5.9	50-1300	A10M STFLCL 2	20-1036	81.15

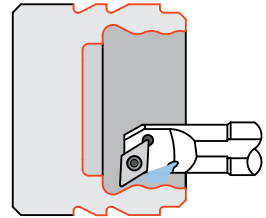
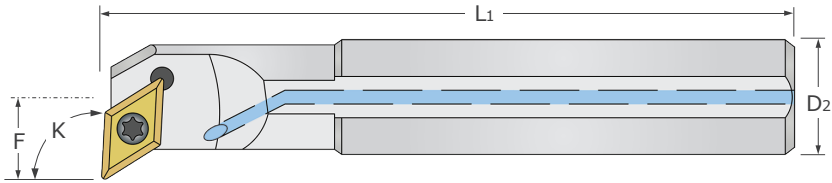
*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

See pg 303 for indexable insert accessories

See pgs [297-302](#) for tool set options

Indexable – Boring Bars

Profiling – Coolant Through – Right Hand



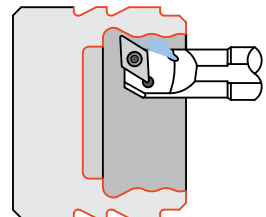
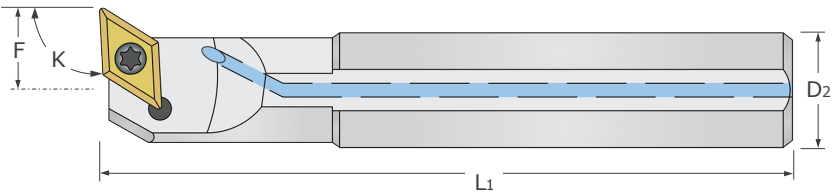
- Coolant through boring bar for right hand boring, facing, and profiling
- Made from precision ground heat treated steel
- Coolant through design for improved chip removal
- Insert not included

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 #	Price
.563	.197	107.5°	.3125	3.9	50-1200	A05H SDQCR 2	20-0901	72.80
.622	.275	93°	.3750	4.5	50-1200	A06J SDUCR 2	20-0931	75.70
.732	.354	93°	.5000	4.9	50-1200	A08K SDUCR 2	20-0933	80.15
.868	.433	93°	.6250	5.9	50-1200	A10M SDUCR 2	20-0935	81.15

*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 #	Price
.563	.197	107.5°	.3125	3.9	50-1200	A05H SDQCL 2	20-0902	72.80
.622	.275	93°	.3750	4.5	50-1200	A06J SDUCL 2	20-0932	75.70
.732	.354	93°	.5000	4.9	50-1200	A08K SDUCL 2	20-0934	80.15
.868	.433	93°	.6250	5.9	50-1200	A10M SDUCL 2	20-0936	81.15

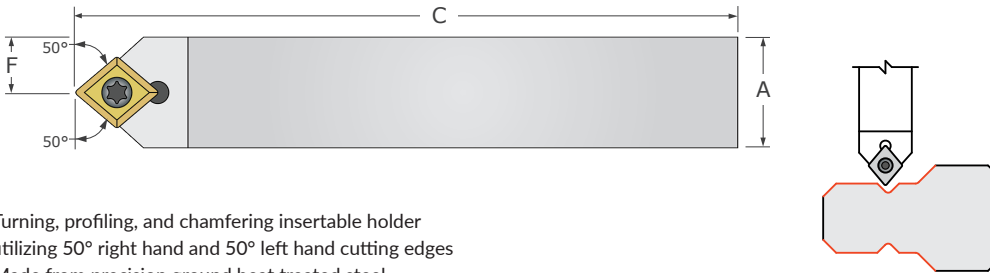
*Suggested Minimum Bore Diameter to accommodate .015" insert radius, chip evacuation and retract clearance in static (not live) applications.

See pg 303 for indexable insert accessories

See pgs 297-302 for tool set options

Indexable – Tool Holders

Chamfering & Turning – Style SCMCN

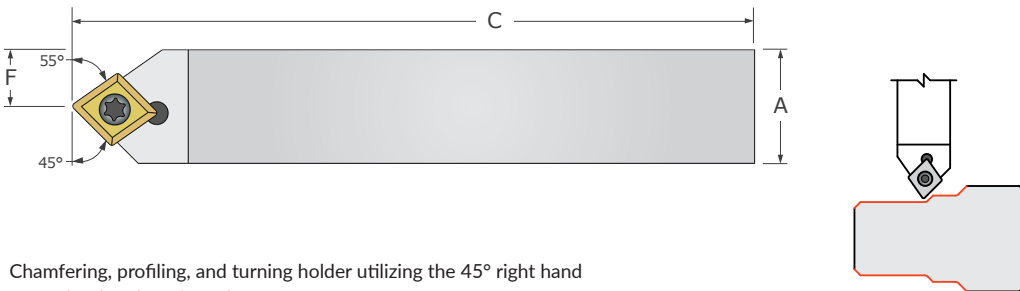


- Turning, profiling, and chamfering insertable holder utilizing 50° right hand and 50° left hand cutting edges
- Made from precision ground heat treated steel
- Insert not included

Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
					Tool #	Price
F	A	C				
.157	.2500	2.4	50-1100	SCMCN 0404 D2	10-3311	39.15
.157	.3125	2.4	50-1100	SCMCN 0505 D2	10-3312	42.45
.189	.3750	2.8	50-1100	SCMCN 0606 E2	10-3313	47.70
.250	.5000	3.2	50-1100	SCMCN 0808 F2	10-3314	52.20
.315	.6250	3.9	50-1100	SCMCN 1010 H2	10-3315	57.85

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

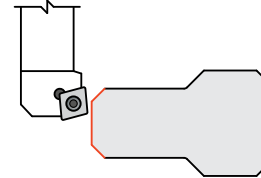
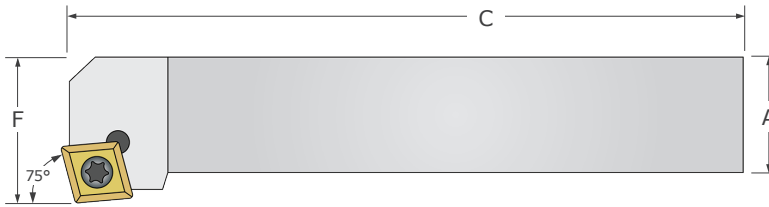
Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
					Tool #	Price
F	A	C				
.157	.2500	2.4	50-1100	SCSCR 0404 D2	10-3351	39.15
.157	.3125	2.4	50-1100	SCSCR 0505 D2	10-3353	42.45
.189	.3750	2.8	50-1100	SCSCR 0606 E2	10-3355	47.70
.250	.5000	3.2	50-1100	SCSCR 0808 F2	10-3357	52.20
.315	.6250	3.9	50-1100	SCSCR 1010 H2	10-3359	57.85
.390	.7500	4.9	50-1100	SCSCR 1212 J3	10-3365	67.95

See pg 303 for indexable insert accessories

See pgs [297-302](#) 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

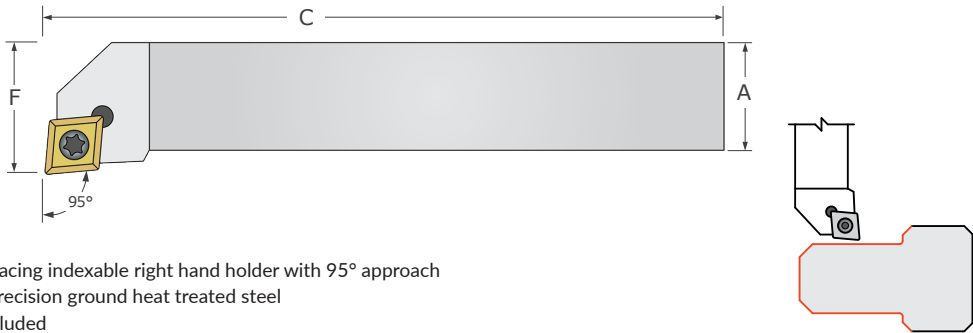
Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
					Tool #	Price
F	A	C				
.394	.2500	2.4	50-1100	SCKCR 0404 D2	10-3211	39.15
.394	.3125	2.4	50-1100	SCKCR 0505 D2	10-3212	42.45
.472	.3750	2.8	50-1100	SCKCR 0606 E2	10-3213	47.70
.630	.5000	3.2	50-1100	SCKCR 0808 F2	10-3215	52.20
.787	.6250	3.9	50-1100	SCKCR 1010 H2	10-3217	57.85

See pg 303 for indexable insert accessories

See pgs [297-302](#) for tool set options

Indexable – Tool Holders

Facing & Turning – Radial – Right Hand – Style SCLCR

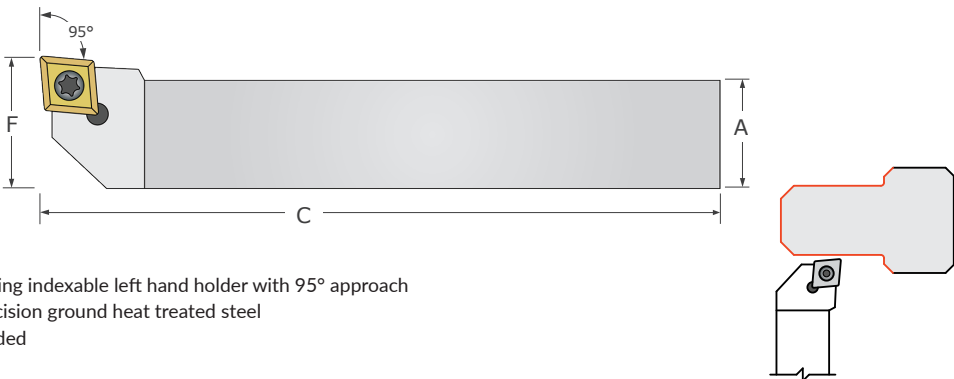


- Turning and facing indexable right hand holder with 95° approach
- Made from precision ground heat treated steel
- Insert not included

Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	Price
.394	.2500	2.4	50-1100	SCLCR 0404 D2	10-3231	39.15
.394	.3125	2.4	50-1100	SCLCR 0404 D2	10-3233	42.45
.472	.3750	2.8	50-1100	SCLCR 0606 E2	10-3235	47.70
.628	.5000	3.2	50-1100	SCLCR 0808 F2	10-3237	52.20
.787	.6250	3.9	50-1100	SCLCR 1010 H2	10-3241	57.85
1.000	.7500	4.9	50-1105	SCLCR 1212 J3	10-3251	67.95

Indexable – Tool Holders

Facing & Turning – Radial – Left Hand – Style SCLCL



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

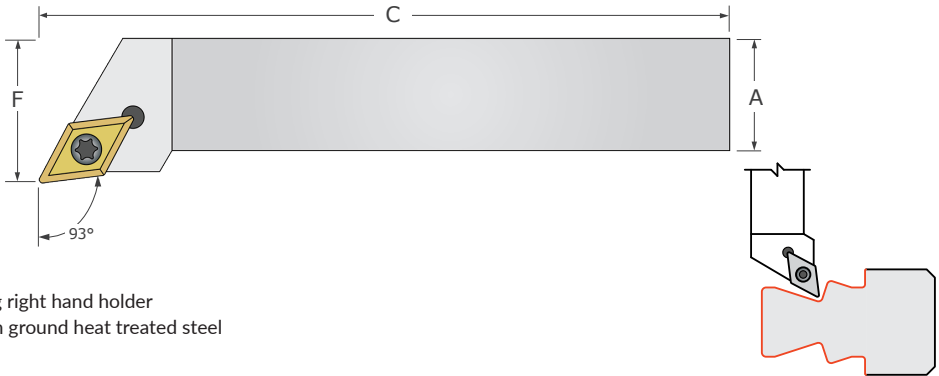
Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
F	A	C			Tool #	Price
.394	.2500	2.4	50-1100	SCLCL 0404 D2	10-3232	39.15
.394	.3125	2.4	50-1100	SCLCL 0505 D2	10-3234	42.45
.472	.3750	2.8	50-1100	SCLCL 0606 E2	10-3236	47.70
.600	.5000	3.2	50-1100	SCLCL 0808 F2	10-3238	52.20
.787	.6250	3.9	50-1100	SCLCL 1010 H2	10-3242	57.85
1.000	.7500	4.9	50-1105	SCLCL 1212 J3	10-3252	67.95

See pg 303 for indexable insert accessories

See pgs [297-302](#) for tool set options

Indexable – Tool Holders

Facing & Turning – Radial – Right Hand – Style SDJCR

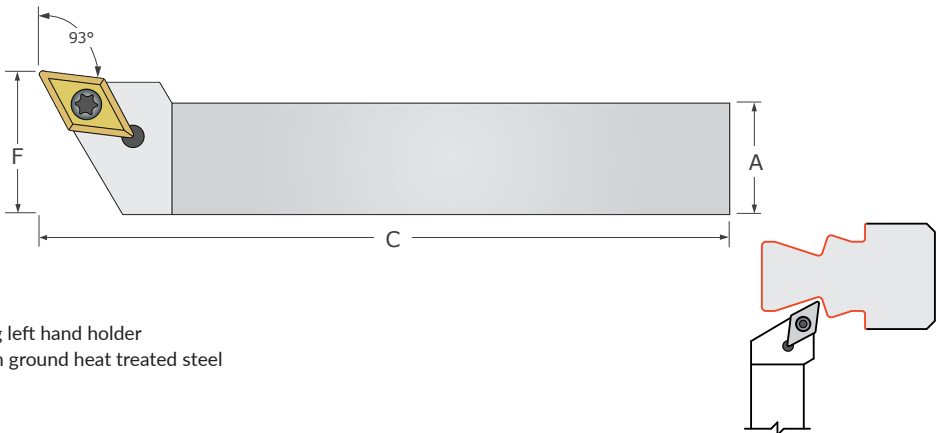


- Turning and profiling right hand holder
- Made from precision ground heat treated steel
- Insert not included

Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
					Tool #	Price
F	A	C				
.394	.3125	3.9	50-1200	SDJCR 0505 H2	10-3641	47.70
.472	.3750	3.9	50-1200	SDJCR 0606 H2	10-3651	55.85
.629	.5000	3.9	50-1200	SDJCR 0808H2	10-3653	58.80
.787	.6250	3.9	50-1200	SDJCR 1010 H2	10-3615	65.25

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

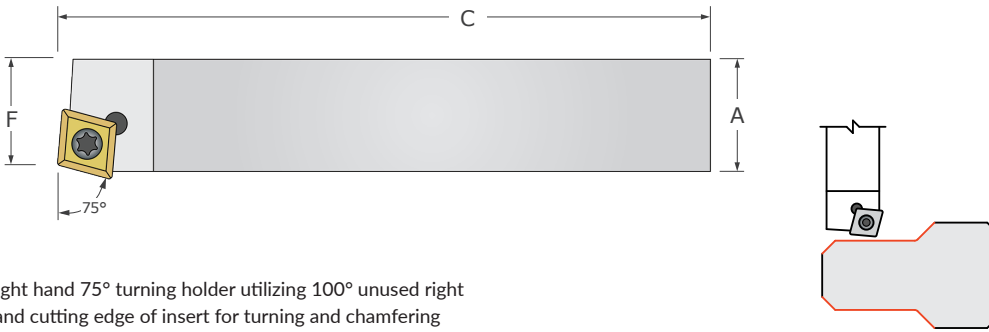
Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
					Tool #	Price
F	A	C				
.394	.3125	3.9	50-1200	SDJCL 0505 H2	10-3642	47.70
.472	.3750	3.9	50-1200	SDJCL 0606 H2	10-3652	55.85
.629	.7500	3.9	50-1200	SDJCL 0808H2	10-3654	58.80
.787	.6250	3.9	50-1200	SDJCL 1010 H2	10-3616	65.25

See pg 303 for indexable insert accessories

See pgs [297-302](#) for tool set options

Indexable – Tool Holders

Facing & Turning – Radial – Right Hand – Style SCBCR

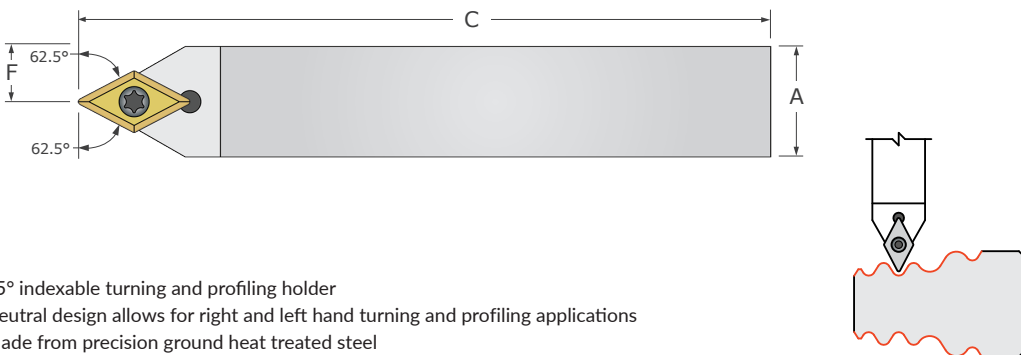


- Right hand 75° turning holder utilizing 100° unused right hand cutting edge of insert for turning and chamfering
- Made from precision ground heat treated steel
- Insert not included

Locating Offset	Square Shank	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
					Tool #	Price
F	A	C				
.267	.2500	2.4	50-1100	SCBCR 0404 D2	10-3151	39.15
.267	.3125	2.4	50-1100	SCBCR 0505 D2	10-3153	42.45
.330	.3750	2.8	50-1100	SCBCR 0606 E2	10-3155	47.70
.460	.5000	3.2	50-1100	SCBCR 0808 F2	10-3157	52.20
.574	.6250	3.9	50-1100	SCBCR 1010 H2	10-3159	57.85

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	
					Tool #	Price
F	A	C				
.157	.3125	3.9	50-1200	SDNCN 0505 H2	10-3761	47.70
.189	.3750	3.9	50-1200	SDNCN 0606 H2	10-3762	55.85
.250	.5000	3.9	50-1200	SDNCN 0808 H2	10-3763	58.80
.313	.6250	3.9	50-1200	SDNCN 1010 H2	10-3764	65.25

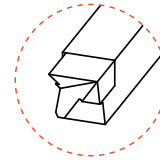
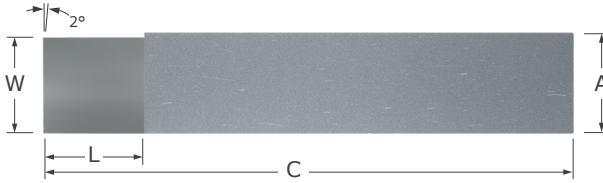
See pg 303 for indexable insert accessories

See pgs [297-302](#) for tool set options

Brazed – Box Turning Tools

BT

BT Style



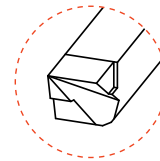
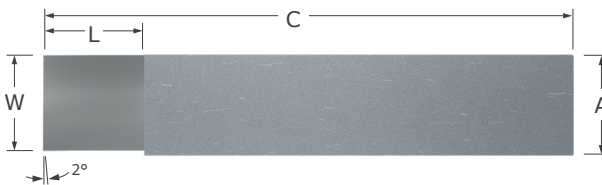
- Designed to be used for outside diameter (OD) turning with roller box turning attachments in automatic screw machines and turret lathes
- Ground to provide high metal removal rates improved finish and concentricity, when used in conjunction with a properly adjusted roller box turning attachment
- Solid 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	
$W \begin{smallmatrix} +.040'' \\ -.000'' \end{smallmatrix}$	L	$A \begin{smallmatrix} +.0000'' \\ -.0100'' \end{smallmatrix}$	C	Tool #	Price
.200	.185	.2500	1.50	BT-4	29.05
.263	.185	.3125	1.75	BT-5	30.80
.325	.310	.3750	2.00	BT-6	32.30
.388	.310	.4375	2.25	BT-7	38.25
.450	.375	.5000	2.50	BT-8	36.20
.513	.375	.5625	2.75	BT-9	64.50
.575	.500	.6250	3.00	BT-10	43.00

Brazed – Box Turning Tools

BTL

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

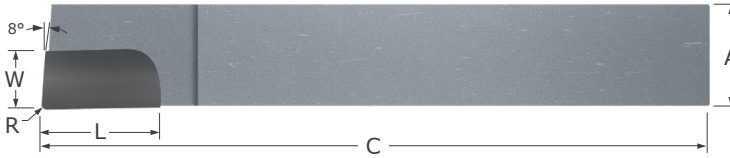
Width	Length	Square Shank	Overall Length	BTL Style	
$W \begin{smallmatrix} +.040'' \\ -.000'' \end{smallmatrix}$	L	$A \begin{smallmatrix} +.0000'' \\ -.0100'' \end{smallmatrix}$	C	Tool #	Price
.200	.185	.2500	1.50	BTL-4	51.50
.263	.185	.3125	1.75	BTL-5	51.60
.325	.310	.3750	2.00	BTL-6	53.70
.388	.310	.4375	2.25	BTL-7	54.20
.450	.375	.5000	2.50	BTL-8	40.30
.513	.375	.5625	2.75	BTL-9	64.50
.575	.500	.6250	3.00	BTL-10	68.80

Brazed

AR

Brazed – Forming Tools

AR Style



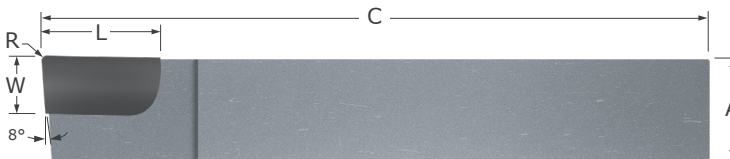
- Designed for right hand turning and facing in lathe applications
- Ground with side rake to provide a positive cutting action and better chip evacuation
- Corner radius profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard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

Radius	Width	Length	Square Shank	Overall Length	AR Style	
R	W	L	A $^{+.0000}$ $_{-.0050}$ "	C	Tool #	Price
.015	.170	.250	.2500	2.00	AR-4	10.50
.015	.233	.313	.3125	2.25	AR-5	10.60
.015	.235	.500	.3750	2.50	AR-6	11.35
.015	.233	.500	.4375	3.00	AR-7	11.90
.015	.235	.625	.5000	3.50	AR-8	12.30
.015	.360	.750	.6250	4.00	AR-10	21.90
.015	.420	.813	.7500	4.50	AR-12	30.55

AL

Brazed – Forming Tools

AL Style



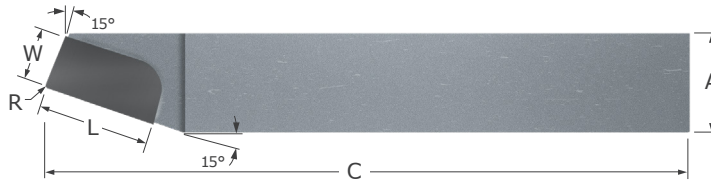
- Designed for left hand turning and facing on the outside diameter (OD) in lathe applications
- Ground with side rake to provide a positive cutting action and better chip evacuation
- Corner radius profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- 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 #	Price
.015	.170	.250	.2500	2.00	AL-4	10.50
.015	.233	.313	.3125	2.25	AL-5	10.60
.015	.235	.500	.3750	2.50	AL-6	11.35
.015	.233	.500	.4375	3.00	AL-7	11.90
.015	.235	.625	.5000	3.50	AL-8	12.30
.015	.360	.750	.6250	4.00	AL-10	21.90
.015	.420	.813	.7500	4.50	AL-12	30.55

Brazed – Forming Tools

BR

BR Style



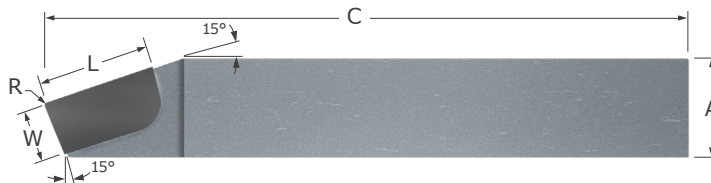
- Designed with a 15° side cutting edge angle for right hand turning in lathe applications
- Ground with side rake to provide a positive cutting action and better chip evacuation
- Side cutting edge angle allow for higher feed rates
- Corner radius profile
- Solid carbide tipped with zinc coated steel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

Radius	Width	Length	Square Shank	Overall Length	BR Style	
R	W	L	A $^{+.0000''}$ $_{-.0050''}$	C	Tool #	Price
.015	.250	.500	.3750	2.5	BR-6	11.55
.015	.250	.500	.4375	3.0	BR-7	12.10
.015	.250	.625	.5000	3.5	BR-8	12.95
.015	.375	.750	.6250	4.0	BR-10	23.10
.015	.438	.813	.7500	4.5	BR-12	31.95

Brazed – Forming Tools

BL

BL Style



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

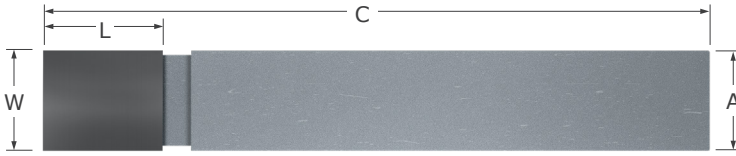
Radius	Width	Length	Square Shank	Overall Length	BL Style	
R	W	L	A $^{+.0000''}$ $_{-.0050''}$	C	Tool #	Price
.015	.250	.500	.3750	2.5	BL-6	11.55
.015	.250	.500	.4375	3.0	BL-7	12.10
.015	.250	.625	.5000	3.5	BL-8	12.95
.015	.375	.750	.6250	4.0	BL-10	23.10
.015	.438	.813	.7500	4.5	BL-12	31.95

Brazed

Brazed – Forming Tools

C Style

C



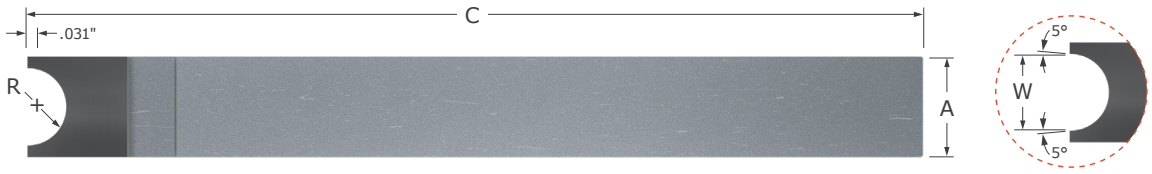
- Neutral design allows for right and left hand modifications
- First choice when modifying or making specials
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Length	Square Shank	Overall Length	C Style	
				Tool #	Price
W	L	A $\begin{matrix} +.0000" \\ -.0050" \end{matrix}$	C		
.235	.250	.2500	6.00	C-250	29.05
.235	.250	.2500	2.00	C-4	10.90
.281	.375	.2812	6.00	C-281	44.05
.312	.375	.3125	6.00	C-312	24.40
.313	.375	.3125	2.25	C-5	11.75
.375	.500	.3750	2.50	C-6	12.10
.375	.500	.3750	6.00	C-375	20.30
.437	.500	.4375	6.00	C-437	36.60
.438	.500	.4375	3.00	C-7	12.30
.500	.500	.5000	3.50	C-8	12.55
.500	.500	.5000	6.00	C-500	24.85
.625	.625	.6250	4.00	C-10	27.10
.750	.750	.7500	4.00	C-750	53.15
.750	.750	.7500	4.50	C-12	31.85

Brazed – Forming Tools

CRT Style – Full Radius (Concave)

CRT



- 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

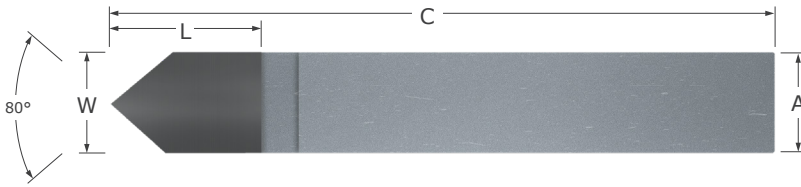
Radius	Width	Square Shank	Overall Length	CRT Style	
				Tool #	Price
R $\begin{matrix} +.0005" \\ -.0005" \end{matrix}$	W $\begin{matrix} +.004" \\ -.004" \end{matrix}$	A $\begin{matrix} +.0000" \\ -.0050" \end{matrix}$	C		
.0312	.067	.3750	2.5	CRT-1	47.75
.0625	.129	.3750	2.5	CRT-2	47.75
.0938	.192	.3750	2.5	CRT-3	47.75
.1250	.254	.5000	3.5	CRT-4	54.85
.1875	.379	.5000	3.5	CRT-6	59.10
.2500	.504	.7500	4.5	CRT-8	86.20

Brazed

D

Brazed – Forming Tools

D Style



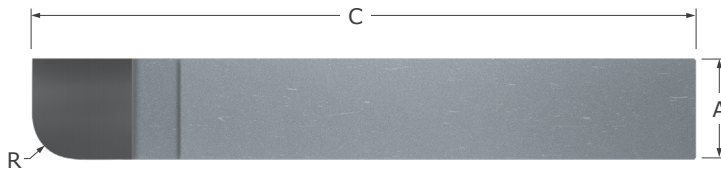
- Designed as a multi-functional tool for a manual lathe
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Length	Square Shank	Overall Length	D Style	
W	L	A $\begin{smallmatrix} +.0000" \\ -.0030" \end{smallmatrix}$	C	Tool #	Price
.2500	.313	.2500	2.00	D-4	10.35
.3125	.375	.3125	2.25	D-5	12.00
.3750	.500	.3750	2.50	D-6	11.45
.4375	.500	.4375	3.00	D-7	12.55
.5000	.500	.5000	3.50	D-8	12.00
.6250	.625	.6250	4.00	D-10	22.25
.7500	.725	.7500	4.50	D-12	29.60

Brazed – Forming Tools

RXD

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

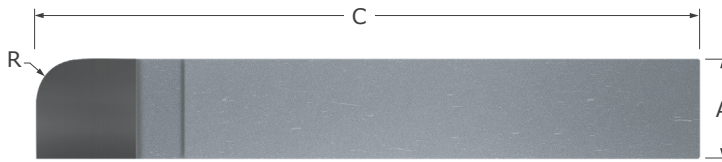
Radius	Square Shank	Overall Length	Brazed	
			Tool #	Price
$R \begin{matrix} +.0005'' \\ -.0005'' \end{matrix}$	$A \begin{matrix} +.0000'' \\ -.0050'' \end{matrix}$	C		
.0312	.3750	2.5	RXD-1	47.10
.0625	.3750	2.5	RXD-2	47.10
.0938	.3750	2.5	RXD-3	47.10
.1250	.3750	2.5	RXD-4	47.10
.1562	.3750	2.5	RXD-5	47.10
.1875	.3750	2.5	RXD-6	47.10
.2188	.3750	2.5	RXD-7	47.10
.2500	.3750	2.5	RXD-8	47.10
.2812	.5000	3.5	RXD-9	51.30
.3125	.5000	3.5	RXD-10	51.30
.3438	.5000	3.5	RXD-11	51.30
.3750	.5000	3.5	RXD-12	51.30
.4062	.7500	4.5	RXD-13	57.80
.4375	.7500	4.5	RXD-14	57.80
.4688	.7500	4.5	RXD-15	57.80
.5000	.7500	4.5	RXD-16	57.80

Brazed

RXL

Brazed – Forming Tools

90° Radius Convex – Left 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	
			Tool #	Price
$R \begin{matrix} +.0005'' \\ -.0005'' \end{matrix}$	$A \begin{matrix} +.0000'' \\ -.0050'' \end{matrix}$	C		
.0312	.3750	2.5	RXL-1	47.10
.0625	.3750	2.5	RXL-2	47.10
.0938	.3750	2.5	RXL-3	47.10
.1250	.3750	2.5	RXL-4	47.10
.1562	.3750	2.5	RXL-5	47.10
.1875	.3750	2.5	RXL-6	47.10
.2188	.3750	2.5	RXL-7	47.10
.2500	.3750	2.5	RXL-8	47.10
.2812	.5000	3.5	RXL-9	51.30
.3125	.5000	3.5	RXL-10	58.85
.3438	.5000	3.5	RXL-11	58.85
.3750	.5000	3.5	RXL-12	58.85
.4062	.7500	4.5	RXL-13	57.80
.4375	.7500	4.5	RXL-14	57.80
.4688	.7500	4.5	RXL-15	57.80
.5000	.7500	4.5	RXL-16	57.80

Brazed – Forming Tools

RAD

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	
			Tool #	Price
$R \begin{matrix} +.0005'' \\ -.0005'' \end{matrix}$	$A \begin{matrix} +.0000'' \\ -.0050'' \end{matrix}$	C		
.0312	.3750	2.5	RAD-1	47.10
.0625	.3750	2.5	RAD-2	47.10
.0938	.3750	2.5	RAD-3	47.10
.1250	.3750	2.5	RAD-4	47.10
.1562	.3750	2.5	RAD-5	47.10
.1875	.3750	2.5	RAD-6	47.10
.2188	.3750	2.5	RAD-7	47.10
.2500	.3750	2.5	RAD-8	47.10
.2812	.5000	3.5	RAD-9	51.30
.3125	.5000	3.5	RAD-10	51.30
.3438	.5000	3.5	RAD-11	51.30
.3750	.5000	3.5	RAD-12	51.30
.4062	.7500	4.5	RAD-13	57.80
.4375	.7500	4.5	RAD-14	57.80
.4688	.7500	4.5	RAD-15	57.80
.5000	.7500	4.5	RAD-16	57.80

See pg 295 for tool set options

RAL

Brazed – Forming Tools

90° Radius Concave – Left Hand



- 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

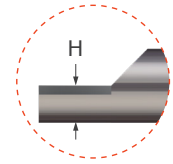
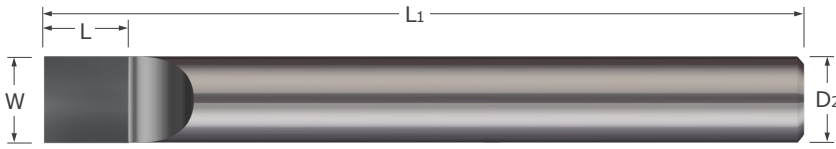
Radius	Square Shank	Overall Length	Brazed	
			Tool #	Price
$R \begin{matrix} +.0005'' \\ -.0005'' \end{matrix}$	$A \begin{matrix} +.0000'' \\ -.0050'' \end{matrix}$	C		
.0312	.3750	2.5	RAL-1	47.10
.0625	.3750	2.5	RAL-2	47.10
.0938	.3750	2.5	RAL-3	47.10
.1250	.3750	2.5	RAL-4	47.10
.1562	.3750	2.5	RAL-5	47.10
.1875	.3750	2.5	RAL-6	47.10
.2188	.3750	2.5	RAL-7	47.10
.2500	.3750	2.5	RAL-8	47.10
.2812	.5000	3.5	RAL-9	51.30
.3125	.5000	3.5	RAL-10	51.30
.3438	.5000	3.5	RAL-11	51.30
.3750	.5000	3.5	RAL-12	51.30
.4062	.7500	4.5	RAL-13	57.80
.4375	.7500	4.5	RAL-14	57.80
.4688	.7500	4.5	RAL-15	57.80
.5000	.7500	4.5	RAL-16	57.80

See pg 296 for tool set options

Brazed – Forming Tools

TRG

Round Shank



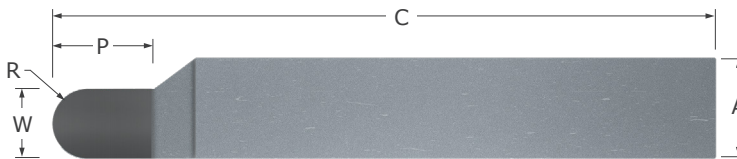
- Carbide tipped design allows for modification into a round shank special
- Carbide is mounted .031" above centerline to allow for grinding
- Neutral design allows for right and left hand modifications
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available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

Width	Length	Split Height	Shank Diameter	Overall Length	Brazed	
W $\begin{matrix} +.0000" \\ -.0050" \end{matrix}$	L $\begin{matrix} +.031" \\ -.031" \end{matrix}$	H $\begin{matrix} +.000" \\ -.010" \end{matrix}$	D2 $\begin{matrix} +.0000" \\ -.0030" \end{matrix}$	L1	Tool #	Price
.2500	.253	.156	.2500	2.5	TRG-4	26.45
.3125	.375	.187	.3125	3.0	TRG-5	28.20
.3750	.500	.219	.3750	3.5	TRG-6	30.55
.4375	.500	.250	.4375	4.0	TRG-7	33.15
.5000	.500	.281	.5000	5.0	TRG-8	33.15
.6250	.625	.344	.6250	6.0	TRG-10	41.60

Brazed – Grooving Tools

FRT

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

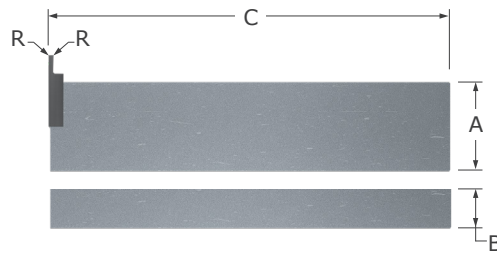
Radius	Width	Projection	Square Shank	Overall Length	Brazed	
R $\begin{matrix} +.0005" \\ -.0005" \end{matrix}$	W $\begin{matrix} +.001" \\ -.001" \end{matrix}$	P $\begin{matrix} +.015" \\ -.015" \end{matrix}$	A $\begin{matrix} +.0000" \\ -.0050" \end{matrix}$	C	Tool #	Price
.0312	.063	1.000	.3750	2.5	FRT-1	47.75
R $\begin{matrix} +.0005" \\ -.0005" \end{matrix}$	W $\begin{matrix} +.001" \\ -.001" \end{matrix}$	P $\begin{matrix} +.031" \\ -.031" \end{matrix}$	A $\begin{matrix} +.0000" \\ -.0050" \end{matrix}$	C	Tool #	Price
.0625	.125	.375	.3750	2.5	FRT-2	47.75
.0938	.188	.375	.3750	2.5	FRT-3	47.75
.1250	.250	.375	.3750	2.5	FRT-4	47.75
.1563	.313	.375	.3750	2.5	FRT-5	47.75
.1875	.375	.500	.5000	3.5	FRT-6	59.10
.2500	.500	.500	.5000	3.5	FRT-8	59.10
.3125	.625	.625	.6250	4.0	FRT-10	78.60
.3750	.750	.750	.7500	4.5	FRT-12	86.20

Brazed

GR

Brazed – Grooving Tools

GR Style – Square



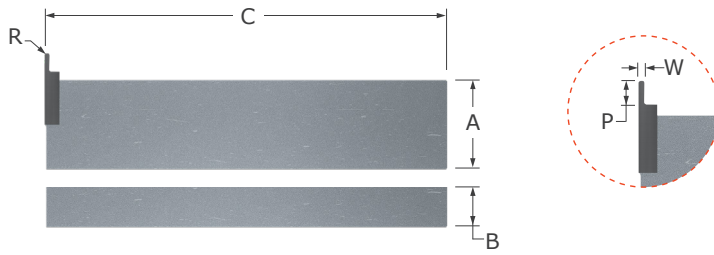
- Designed for plunging outside diameter (OD) grooves when the tool is held parallel to the axis
- Square profile with .003" corner radius for added strength
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes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

Width	Projection	Radius	Shank Width	Shank Height	Overall Length	GR Style	
$W \begin{matrix} +.002'' \\ -.000'' \end{matrix}$	$P \begin{matrix} +.000'' \\ -.030'' \end{matrix}$	R (max)	$A \begin{matrix} +.0000'' \\ -.0050'' \end{matrix}$	$B \begin{matrix} +.0000'' \\ -.0050'' \end{matrix}$	C	Tool #	Price
.012	.030	.003	.7500	.3750	4.0	GR-012002	43.75
.018	.060	.003	.7500	.3750	4.0	GR-018002	43.75
.022	.090	.003	.7500	.3750	4.0	GR-022002	43.75
.028	.090	.003	.7500	.3750	4.0	GR-028002	43.75
.038	.120	.003	.7500	.3750	4.0	GR-038002	43.75
.040	.150	.003	.7500	.3750	4.0	GR-040002	43.75
.046	.150	.003	.7500	.3750	4.0	GR-046002	43.75
.054	.180	.003	.7500	.3750	4.0	GR-054002	43.75
.060	.210	.003	.7500	.3750	4.0	GR-060002	43.75
.068	.210	.003	.7500	.3750	4.0	GR-068002	43.75
.072	.240	.003	.7500	.3750	4.0	GR-072002	43.75
.080	.270	.003	.7500	.3750	4.0	GR-080002	43.75
.086	.270	.003	.7500	.3750	4.0	GR-086002	43.75
.090	.300	.003	.7500	.3750	4.0	GR-090002	43.75
.096	.300	.003	.7500	.3750	4.0	GR-096002	43.75
.102	.400	.003	.7500	.3750	4.0	GR-102002	43.75
.114	.400	.003	.7500	.3750	4.0	GR-114002	43.75
.120	.400	.003	.7500	.3750	4.0	GR-120002	43.75
.122	.400	.003	.7500	.3750	4.0	GR-122002	43.75

Brazed – Grooving Tools

GR-F

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

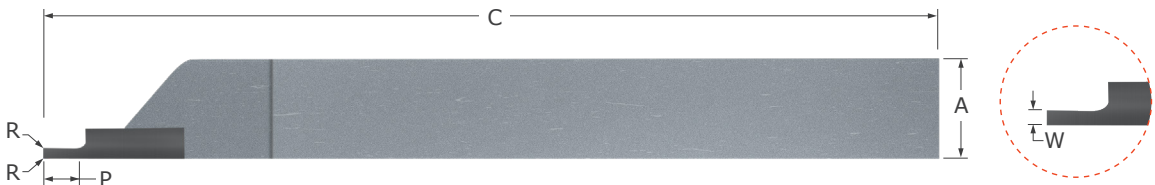
Radius	Width	Projection	Shank Width	Shank Height	Overall Length	GR-F Style	
R $\begin{matrix} +.001" \\ -.000" \end{matrix}$	W $\begin{matrix} +.002" \\ -.000" \end{matrix}$	P $\begin{matrix} +.000" \\ -.030" \end{matrix}$	A $\begin{matrix} +.0000" \\ -.0050" \end{matrix}$	B $\begin{matrix} +.0000" \\ -.0050" \end{matrix}$	C	Tool #	Price
.006	.012	.030	.7500	.3750	4.0	GR-012F	45.60
.009	.018	.060	.7500	.3750	4.0	GR-018F	45.60
.011	.022	.090	.7500	.3750	4.0	GR-022F	45.60
.014	.028	.090	.7500	.3750	4.0	GR-028F	45.60
.019	.038	.120	.7500	.3750	4.0	GR-038F	45.60
.020	.040	.150	.7500	.3750	4.0	GR-040F	45.60
.023	.046	.150	.7500	.3750	4.0	GR-046F	45.60
.027	.054	.180	.7500	.3750	4.0	GR-054F	45.60
.030	.060	.210	.7500	.3750	4.0	GR-060F	45.60
.034	.068	.210	.7500	.3750	4.0	GR-068F	45.60
.036	.072	.240	.7500	.3750	4.0	GR-072F	45.60
.040	.080	.270	.7500	.3750	4.0	GR-080F	45.60
.043	.086	.270	.7500	.3750	4.0	GR-086F	45.60
.045	.090	.300	.7500	.3750	4.0	GR-090F	45.60
.048	.096	.300	.7500	.3750	4.0	GR-096F	45.60
.051	.102	.400	.7500	.3750	4.0	GR-102F	45.60
.057	.114	.400	.7500	.3750	4.0	GR-114F	45.60
.060	.120	.400	.7500	.3750	4.0	GR-120F	45.60
.061	.122	.400	.7500	.3750	4.0	GR-122F	45.60

Brazed

GS

Brazed – Grooving Tools

GS Style – Square



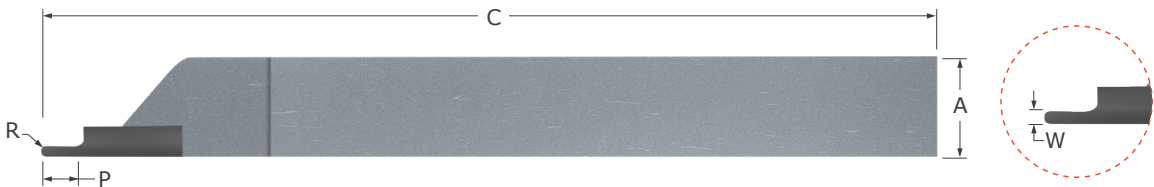
- Designed for plunging grooves when on the outside diameter of a part
- Square profile with .003" corner radius for added strength
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Projection	Radius	Square Shank	Overall Length	GS Style	
					Tool #	Price
W $\begin{matrix} +.002" \\ -.000" \end{matrix}$	P $\begin{matrix} +.000" \\ -.030" \end{matrix}$	R (max)	A $\begin{matrix} +.0000" \\ -.0050" \end{matrix}$	C		
.012	.030	.003	.3750	3.0	GS-012002	35.55
.018	.060	.003	.3750	3.0	GS-018002	35.55
.022	.090	.003	.3750	3.0	GS-022002	35.55
.028	.090	.003	.3750	3.0	GS-028002	35.55
.038	.120	.003	.3750	3.0	GS-038002	35.55
.040	.150	.003	.3750	3.0	GS-040002	35.55
.046	.150	.003	.3750	3.0	GS-046002	35.55
.054	.180	.003	.3750	3.0	GS-054002	35.55
.060	.210	.003	.3750	3.0	GS-060002	35.55
.068	.210	.003	.3750	3.0	GS-068002	35.55
.072	.240	.003	.3750	3.0	GS-072002	35.55
.080	.270	.003	.3750	3.0	GS-080002	35.55
.086	.270	.003	.3750	3.0	GS-086002	35.55
.090	.300	.003	.3750	3.0	GS-090002	35.55
.096	.300	.003	.3750	3.0	GS-096002	35.55
.102	.400	.003	.3750	3.0	GS-102002	35.55
.114	.400	.003	.3750	3.0	GS-114002	35.55
.120	.400	.003	.3750	3.0	GS-120002	35.55
.122	.400	.003	.3750	3.0	GS-122002	35.55

Brazed - Grooving Tools

GS-F

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

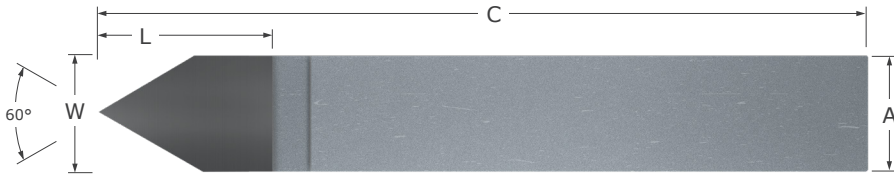
Radius	Width	Projection	Square Shank	Overall Length	GS-F Style	
R $\begin{matrix} +.001'' \\ -.000'' \end{matrix}$	W $\begin{matrix} +.002'' \\ -.000'' \end{matrix}$	P $\begin{matrix} +.000'' \\ -.030'' \end{matrix}$	A $\begin{matrix} +.0000'' \\ -.0050'' \end{matrix}$	C	Tool #	Price
.006	.012	.030	.3750	3.0	GS-012F	39.30
.009	.018	.060	.3750	3.0	GS-018F	39.30
.011	.022	.090	.3750	3.0	GS-022F	39.30
.014	.028	.090	.3750	3.0	GS-028F	39.30
.019	.038	.120	.3750	3.0	GS-038F	39.30
.020	.040	.150	.3750	3.0	GS-040F	39.30
.023	.046	.150	.3750	3.0	GS-046F	39.30
.027	.054	.180	.3750	3.0	GS-054F	39.30
.030	.060	.210	.3750	3.0	GS-060F	39.30
.034	.068	.210	.3750	3.0	GS-068F	39.30
.036	.072	.240	.3750	3.0	GS-072F	39.30
.040	.080	.270	.3750	3.0	GS-080F	39.30
.043	.086	.270	.3750	3.0	GS-086F	39.30
.045	.090	.300	.3750	3.0	GS-090F	39.30
.048	.096	.300	.3750	3.0	GS-096F	39.30
.051	.102	.400	.3750	3.0	GS-102F	39.30
.057	.114	.400	.3750	3.0	GS-114F	39.30
.060	.120	.400	.3750	3.0	GS-120F	39.30
.061	.122	.400	.3750	3.0	GS-122E	39.30

Brazed

E

Brazed – Threading Tools

E Style



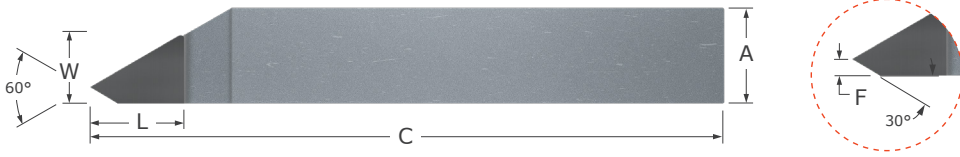
- Designed for outside diameter (OD) general purpose threading
- Neutral design allows for right and left hand threading applications
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Length	Square Shank	Overall Length	E Style	
W	L	A ^{+0.000"} _{-.0050"}	C	Tool #	Price
.3125	.363	.3125	2.25	E-5	11.35
.3750	.568	.3750	2.50	E-6	11.35
.5000	.568	.5000	3.50	E-8	11.90
.6250	.653	.6250	4.00	E-10	22.55
.7500	.778	.7500	4.50	E-12	26.15

Brazed – Threading Tools

ER

ER Style



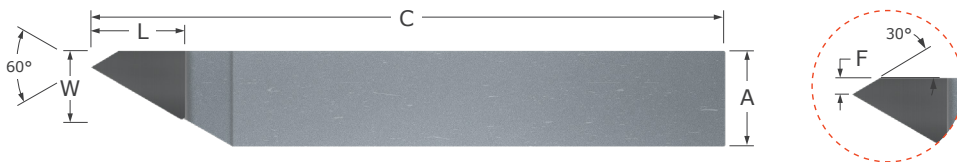
- Designed for right hand threading on the outside diameter (OD), close to a shoulder
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Point Offset	Width	Length	Square Shank	Overall Length	ER Style	
					Tool #	Price
F $^{+.010''}$ $_{-.010''}$	W	L	A $^{+.0000''}$ $_{-.0050''}$	C		
.063	.266	.360	.3750	2.50	ER-6	12.95
.063	.270	.360	.3125	2.25	ER-5	12.10
.094	.444	.610	.6250	4.00	ER-10	21.70
.094	.446	.610	.5000	3.50	ER-8	14.35
.125	.558	.750	.7500	4.50	ER-12	27.65

Brazed – Threading Tools

EL

EL Style



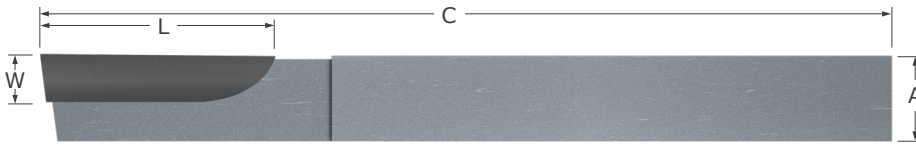
- Designed for left hand threading on the outside diameter (OD), close to a shoulder
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Point Offset	Width	Length	Square Shank	Overall Length	EL Style	
					Tool #	Price
F $^{+.010''}$ $_{-.010''}$	W	L	A $^{+.0000''}$ $_{-.0050''}$	C		
.063	.266	.360	.3750	2.50	EL-6	12.95
.063	.270	.360	.3125	2.25	EL-5	12.10
.094	.444	.610	.6250	4.00	EL-10	21.70
.094	.446	.610	.5000	3.50	EL-8	14.35
.125	.558	.750	.7500	4.50	EL-12	27.65

RT / LT

Brazed – Screw Machining Tools

Turning



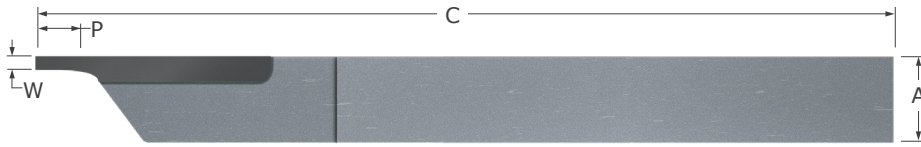
- Designed for general purpose turning; RT for right hand and LT for left hand
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Length	Square Shank	Overall Length	Right Hand		Left Hand	
W	L	A $\begin{matrix} +.0000" \\ -.0050" \end{matrix}$	C	Tool #	Price	Tool #	Price
.128	1.075	.2500	6.0	RT-250	17.30	LT-250	34.55
.174	1.200	.2812	6.0	RT-281	18.05	LT-281	31.30
.188	1.200	.3750	6.0	RT-375	17.30	LT-375	34.55
.190	1.200	.3125	6.0	RT-312	17.05	LT-312	15.55
.253	1.345	.5000	6.0	RT-500	22.35	LT-500	27.75
.260	1.345	.4375	6.0	RT-437	21.90	LT-437	35.65
.263	1.345	.6250	4.0	RT-625	29.50	LT-625	29.50
.263	1.345	.7500	4.0	RT-750	34.55	LT-750	42.10

Brazed – Screw Machine Tools

RC / LC

Cut Off



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

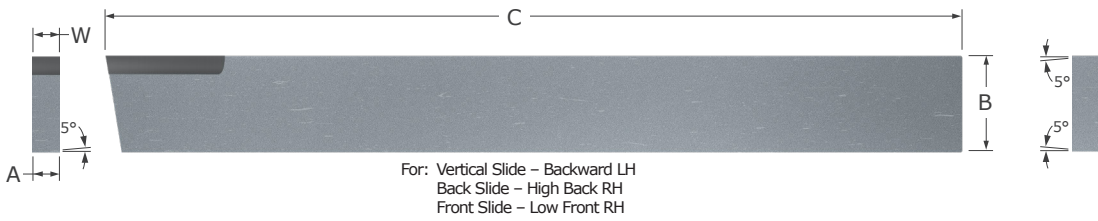
Width	Projection	Square Shank	Overall Length	Right Hand		Left Hand	
W ^{+ .000"} _{-.005"}	P (min)	A ^{+ .0000"} _{-.0050"}	C	Tool #	Price	Tool #	Price
.040	.120	.2500	6.0	RC-250040	16.30	LC-250040	39.95
.040	.120	.2812	6.0	RC-281040	18.05	LC-281040	47.95
.040	.120	.3125	6.0	RC-312040	17.05	LC-312040	33.35
.040	.120	.3750	6.0	RC-375040	16.85	LC-375040	33.60
.060	.180	.2500	6.0	RC-250060	16.30	LC-250060	26.90
.060	.180	.2812	6.0	RC-281060	18.05	LC-281060	47.95
.060	.180	.3125	6.0	RC-312060	17.05	LC-312060	21.15
.060	.180	.3750	6.0	RC-375060	16.85	LC-375060	22.55
.060	.180	.4375	6.0	RC-437060	21.40	LC-437060	34.65
.060	.180	.5000	6.0	RC-500060	22.15	LC-500060	22.35
.060	.180	.6250	4.0	RC-625060	29.05	LC-625060	29.50
.060	.180	.7500	4.0	RC-750060	34.55	LC-750060	34.55
.080	.240	.2812	6.0	RC-281080	18.05	LC-281080	33.60
.080	.240	.3125	6.0	RC-312080	17.05	LC-312080	18.70
.080	.240	.3750	6.0	RC-375080	16.85	LC-375080	26.70
.080	.240	.4375	6.0	RC-437080	21.40	LC-437080	34.65
.080	.240	.5000	6.0	RC-500080	22.25	LC-500080	22.35
.080	.240	.6250	4.0	RC-625080	28.30	LC-625080	29.50
.080	.240	.7500	4.0	RC-750080	34.55	LC-750080	34.55
.100	.300	.2812	6.0	RC-281100	18.05	LC-281100	24.40
.100	.300	.3125	6.0	RC-312100	17.05	LC-312100	18.70
.100	.300	.3750	6.0	RC-375100	16.85	LC-375100	24.60
.100	.300	.4375	6.0	RC-437100	21.80	LC-437100	36.85
.100	.300	.5000	6.0	RC-500100	22.25	LC-500100	22.35
.100	.300	.6250	4.0	RC-625100	29.50	LC-625100	29.50
.100	.300	.7500	4.0	RC-750100	34.55	LC-750100	34.55
.120	.360	.3750	6.0	RC-375120	16.85	LC-375120	30.80
.120	.360	.4375	6.0	RC-437120	21.80	LC-437120	35.65
.120	.360	.5000	6.0	RC-500120	21.90	LC-500120	22.35
.125	.375	.6250	4.0	RC-625125	29.50	LC-625125	29.50
.125	.375	.7500	4.0	RC-750125	34.55	LC-750125	34.55
.187	.561	.6250	4.0	RC-625187	34.55	LC-625187	29.50
.187	.561	.7500	4.0	RC-750187	36.70	LC-750187	34.55

Brazed

CR

Brazed – Cut Off Tools

CR Style



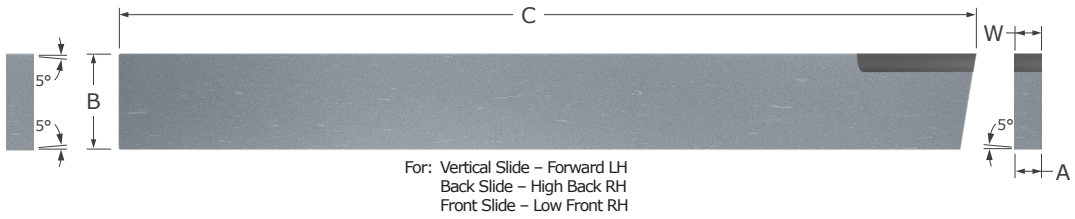
- Right hand cut-off blades for Brown & Sharpe automatic screw machines
- Designed for use in Pratt & Whitney holders and dovetail slot holders
- Carbide tipped with hardened and precision ground steel blade
- Ground in the USA

Width	Shank Width	Shank Height	Overall Length	CR Style	
W $+0.0000''$ $-0.0050''$	A $+0.0000''$ $-0.0050''$	B $+0.0000''$ $-0.0050''$	C	Tool #	Price
.0781	.0580	.5000	4.5	CR-101	72.15
.0938	.0730	.5000	4.5	CR-102	56.60
.0938	.0730	.6875	5.0	CR-104	75.90
.0938	.0730	.8125	6.0	CR-108	77.35
.0938	.0730	1.0000	6.0	CR-113	109.85
.1250	.1050	.5000	4.5	CR-103	54.85
.1250	.1050	.6875	5.0	CR-105	75.90
.1250	.1050	.8125	6.0	CR-109	60.05
.1562	.1360	.6875	5.0	CR-106	80.25
.1562	.1360	.8125	6.0	CR-110	129.80
.1875	.1670	.6875	5.0	CR-107	83.60
.1875	.1670	.8125	6.0	CR-111	112.75

Brazed - Cut Off Tools

CL

CL Style



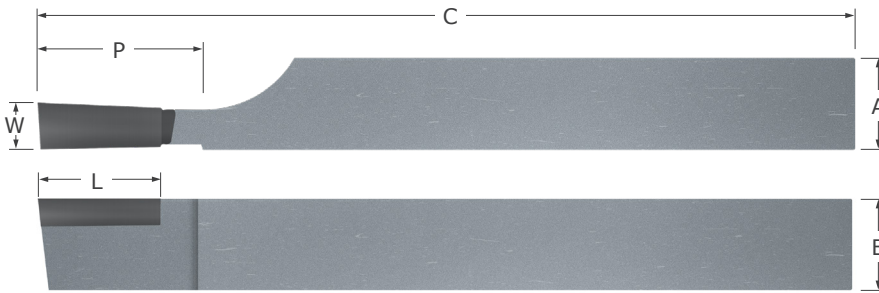
- Left hand cut-off blades for Brown & Sharpe automatic screw machines
- Designed for use in Pratt & Whitney holders and dovetail slot holders
- Carbide tipped with hardened and precision ground steel blade
- Ground in the USA

Width	Shank Width	Shank Height	Overall Length	CL Style	
W $\begin{matrix} +.0000" \\ -.0050" \end{matrix}$	A $\begin{matrix} +.0000" \\ -.0050" \end{matrix}$	B $\begin{matrix} +.0000" \\ -.0050" \end{matrix}$	C	Tool #	Price
.0781	.0580	.5000	4.5	CL-101	72.45
.0938	.0730	.5000	4.5	CL-102	73.20
.0938	.0730	.6875	5.0	CL-104	85.30
.0938	.0730	.8125	6.0	CL-108	98.15
.0938	.0730	1.0000	6.0	CL-113	56.40
.1250	.1050	.5000	4.5	CL-103	74.95
.1250	.1050	.6875	5.0	CL-105	79.70
.1250	.1050	.8125	6.0	CL-109	82.50
.1250	.1050	1.0000	6.0	CL-114	56.40
.1562	.1360	.6875	5.0	CL-106	88.45
.1562	.1360	.8125	6.0	CL-110	105.95
.1875	.1670	.6875	5.0	CL-107	91.80
.1875	.1670	.8125	6.0	CL-111	47.40

CT

Brazed – Cut Off Tools

CT Style



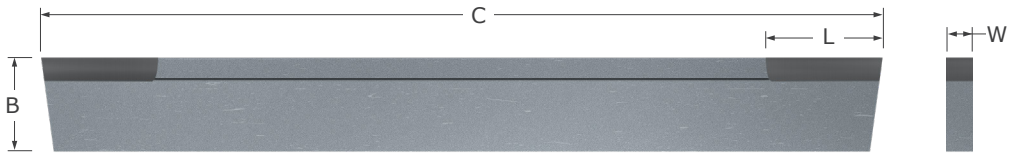
- Designed for cut-off with a 5° front clearance to reduce cut-off burr
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- Available in industry standard fractional shank sizes
- Ground in the USA

Width	Projection	Length	Shank Width	Shank Height	Overall Length	CT Style	
W $^{+.000"}_{-.005"}"$	P $^{+.062"}_{-.000"}"$	L	A $^{+.0000"}_{-.0100"}"$	B $^{+.0000"}_{-.0100"}"$	C	Tool #	Price
.187	.813	.750	.5000	1.0000	5.0	CT-122	26.90
.250	1.000	.750	.5000	1.0000	5.0	CT-121	28.95
.312	1.000	.500	.5000	1.0000	5.0	CT-120	29.50
.375	1.250	.500	.6250	1.2500	5.0	CT-130	36.85
.375	1.250	.625	.7500	1.5000	6.0	CT-140	46.65

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

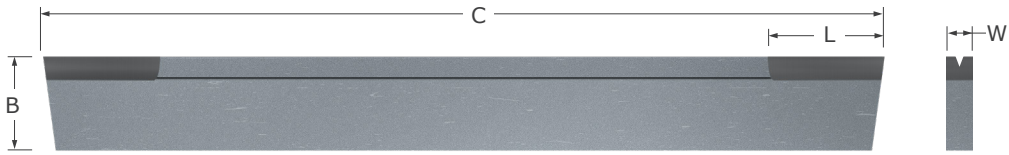
Width	Length	Shank Height	Overall Length	T Style	
W ^{+0.001"} _{-.001"}	L	B	C	Tool #	Price
.062	.750	.5000	4.5	T-100	50.10
.078	.750	.5000	4.5	T-101	50.85
.093	.750	.5000	4.5	T-102	48.70
.093	.750	.6875	5.0	T-104	53.90
.125	.750	.5000	4.5	T-103	48.05
.125	.750	.6875	5.0	T-105	53.25
.125	.750	.7500	5.0	T-108	55.10
.125	.750	.8750	6.0	T-111	60.60
.156	.750	.6875	5.0	T-106	65.35
.156	.750	.7500	5.0	T-109	58.10
.156	.750	.8750	6.0	T-112	60.50
.187	.750	.6875	5.0	T-107	67.50
.187	.750	.7500	5.0	T-110	54.20
.187	.750	.8750	6.0	T-113	70.65
.187	.750	1.1250	6.0	T-116	73.20

Brazed

Brazed – Cut Off Tools

T Style – V-Groove

T-V



- 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	
				Tool #	Price
W $\begin{matrix} +.001" \\ -.001" \end{matrix}$	L	B	C		
.062	.760	.5000	4.5	T-100-V	57.25
.078	.760	.5000	4.5	T-101-V	63.95
.093	.760	.5000	4.5	T-102-V	56.80
.093	.760	.6875	5.0	T-104-V	60.90
.125	.750	.5000	4.5	T-103-V	55.60
.125	.760	.6875	5.0	T-105-V	59.70
.125	.750	.7500	5.0	T-108-V	63.60
.125	.750	.8750	6.0	T-111-V	68.35
.156	.750	.6875	5.0	T-106-V	71.80
.156	.750	.7500	5.0	T-109-V	64.60
.156	.750	.8750	6.0	T-112-V	73.85
.187	.750	.6875	5.0	T-107-V	74.00
.187	.750	.7500	5.0	T-110-V	64.50
.187	.750	.8750	6.0	T-113-V	77.10
.187	.750	1.1250	6.0	T-116-V	81.30

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MILLING

End Mills, Holemaking & Threading



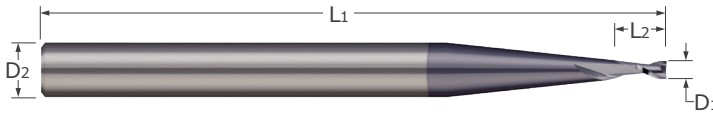
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End Mills – Square

2 Flute – Stub & Standard – Miniature



RME / RMEM
SME / AMRM



End Mills

- 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	Tool #	Price	Tool #	Price
+ .0005"	+ .00 mm	decimal equiv.	+ .010"							
– .0005"	– .02 mm		– .000"							
			+ .25 mm							
			– .00 mm							
.0050		.0050	.007	2	.1250	1.5	SME-005-2	46.45	SME-005-2X	48.65
.0060		.0060	.009	2	.1250	1.5	SME-006-2	46.45	SME-006-2X	48.65
.0070		.0070	.010	2	.1250	1.5	SME-007-2	39.40	SME-007-2X	41.65
	0.2 mm	.0079	0.4 mm	2	3 mm	38 mm	RMEM-002-2	32.75	RMEM-002-2X	35.10
	0.2 mm	.0079	0.4 mm	2	4 mm	50 mm	AMRM-002-2	35.50	AMRM-002-2X	38.25
.0080		.0080	.012	2	.1250	1.5	SME-008-2	39.40	SME-008-2X	41.65
.0090		.0090	.013	2	.1250	1.5	SME-009-2	35.80	SME-009-2X	38.10
.0100		.0100	.015	2	.1250	1.5	SME-010-2	35.80	SME-010-2X	38.10
.0100		.0100	.030	2	.1250	1.5	RME-010-2	37.40	RME-010-2X	39.70
.0110		.0110	.016	2	.1250	1.5	SME-011-2	32.35		
.0110		.0110	.033	2	.1250	1.5			RME-011-2X	36.20
	0.3 mm	.0118	0.9 mm	2	3 mm	38 mm	RMEM-003-2	28.20	RMEM-003-2X	30.60
	0.3 mm	.0118	0.9 mm	2	4 mm	50 mm	AMRM-003-2	31.05	AMRM-003-2X	33.80
.0120		.0120	.018	2	.1250	1.5	SME-012-2	32.35	SME-012-2X	34.70
.0120		.0120	.036	2	.1250	1.5	RME-012-2	33.85	RME-012-2X	36.20
.0130		.0130	.019	2	.1250	1.5	SME-013-2	27.50	SME-013-2X	29.90
.0130		.0130	.039	2	.1250	1.5	RME-013-2	28.80	RME-013-2X	31.15
.0140		.0140	.021	2	.1250	1.5	SME-014-2	27.50	SME-014-2X	29.90
.0140		.0140	.042	2	.1250	1.5	RME-014-2	28.80	RME-014-2X	31.15
.0150		.0150	.022	2	.1250	1.5	SME-015-2	21.90	SME-015-2X	24.35
.0150		.0150	.045	2	.1250	1.5	RME-015-2	22.85	RME-015-2X	25.30
	0.4 mm	.0157	1.2 mm	2	3 mm	38 mm	RMEM-004-2	20.70		
	0.4 mm	.0157	1.2 mm	2	4 mm	50 mm	AMRM-004-2	23.60	AMRM-004-2X	26.45
.0160		.0160	.024	2	.1250	1.5	SME-016-2	21.90	SME-016-2X	24.35
.0160		.0160	.048	2	.1250	1.5	RME-016-2	22.85	RME-016-2X	25.30
.0170		.0170	.025	2	.1250	1.5	SME-017-2	21.90	SME-017-2X	24.35
.0170		.0170	.051	2	.1250	1.5	RME-017-2	22.85	RME-017-2X	25.30
.0180		.0180	.027	2	.1250	1.5	SME-018-2	21.90	SME-018-2X	24.35
.0180		.0180	.054	2	.1250	1.5	RME-018-2	22.85	RME-018-2X	25.30
.0190		.0190	.028	2	.1250	1.5	SME-019-2	21.90	SME-019-2X	24.35
.0190		.0190	.057	2	.1250	1.5			RME-019-2X	25.30
	0.5 mm	.0197	1.5 mm	2	3 mm	38 mm	RMEM-005-2	19.10	RMEM-005-2X	21.55
	0.5 mm	.0197	1.5 mm	2	4 mm	50 mm	AMRM-005-2	20.65	AMRM-005-2X	23.55

*.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 L2	Flutes	Shank Diameter D2 (h6)	Overall Length L1	Uncoated		AlTiN Coated	
+ .0005" - .0005"	+ .00 mm - .02 mm	decimal equiv.					Tool #	Price	Tool #	Price
.0200	.0200	.0200	.030	2	.1250	1.5	SME-020-2	20.15	SME-020-2X	22.65
.0200	.0200	.0200	.060	2	.1250	1.5	RME-020-2	21.10	RME-020-2X	23.55
.0210	.0210	.0210	.063	2	.1250	1.5	RME-021-2	21.10	RME-021-2X	23.55
.0220	.0220	.0220	.033	2	.1250	1.5	SME-022-2	20.15	SME-022-2X	22.65
.0220	.0220	.0220	.066	2	.1250	1.5	RME-022-2	21.10	RME-022-2X	23.55
.0230	.0230	.0230	.034	2	.1250	1.5	SME-023-2	20.15	SME-023-2X	22.65
.0230	.0230	.0230	.069	2	.1250	1.5	RME-023-2	21.10	RME-023-2X	23.55
0.6 mm	.0236	.0236	1.8 mm	2	3 mm	38 mm	RMEM-006-2	19.10	RMEM-006-2X	21.55
.0240	.0240	.0240	.036	2	.1250	1.5	SME-024-2	20.15		
.0240	.0240	.0240	.072	2	.1250	1.5	RME-024-2	21.10	RME-024-2X	23.55
.0250	.0250	.0250	.037	2	.1250	1.5	SME-025-2	20.15	SME-025-2X	22.65
.0250	.0250	.0250	.075	2	.1250	1.5	RME-025-2	21.10	RME-025-2X	23.55
.0260	.0260	.0260	.039	2	.1250	1.5	SME-026-2	17.70	SME-026-2X	20.20
.0270	.0270	.0270	.040	2	.1250	1.5	SME-027-2	17.70	SME-027-2X	20.20
.0270	.0270	.0270	.081	2	.1250	1.5	RME-027-2	17.80	RME-027-2X	20.30
0.7 mm	.0276	.0276	2.1 mm	2	3 mm	38 mm	RMEM-007-2	17.10	RMEM-007-2X	19.60
0.7 mm	.0276	.0276	2.1 mm	2	4 mm	50 mm	AMRM-007-2	18.55	AMRM-007-2X	21.45
.0280	.0280	.0280	.042	2	.1250	1.5	SME-028-2	17.70	SME-028-2X	20.20
.0280	.0280	.0280	.084	2	.1250	1.5	RME-028-2	17.80	RME-028-2X	20.30
.0290	.0290	.0290	.043	2	.1250	1.5	SME-029-2	17.70	SME-029-2X	20.20
.0290	.0290	.0290	.087	2	.1250	1.5	RME-029-2	17.80	RME-029-2X	20.30
.0300	.0300	.0300	.045	2	.1250	1.5	SME-030-2	17.70	SME-030-2X	20.20
.0300	.0300	.0300	.090	2	.1250	1.5	RME-030-2	17.80	RME-030-2X	20.30
.0310	.0310	.0310	.047	2	.1250	1.5	SME-031-2	17.70	SME-031-2X	20.20
0.8 mm	.0315	.0315	2.4 mm	2	3 mm	38 mm	RMEM-008-2	17.10	RMEM-008-2X	19.60
0.8 mm	.0315	.0315	2.4 mm	2	4 mm	50 mm	AMRM-008-2	18.55		
.0320	.0320	.0320	.096	2	.1250	1.5	RME-032-2	17.80	RME-032-2X	20.30
.0340	.0340	.0340	.102	2	.1250	1.5			RME-034-2X	20.30
.0350	.0350	.0350	.105	2	.1250	1.5	RME-035-2	17.80	RME-035-2X	20.30
0.9 mm	.0354	.0354	2.7 mm	2	3 mm	38 mm	RMEM-009-2	17.10	RMEM-009-2X	19.60
0.9 mm	.0354	.0354	2.7 mm	2	4 mm	50 mm			AMRM-009-2X	21.45
1 mm	.0394	.0394	3 mm	2	3 mm	38 mm	RMEM-010-2	17.10	RMEM-010-2X	19.60
1 mm	.0394	.0394	3 mm	2	4 mm	50 mm	AMRM-010-2	18.55	AMRM-010-2X	21.45
.0400	.0400	.0400	.060	2	.1250	1.5	SME-040-2	17.70	SME-040-2X	20.20
.0400	.0400	.0400	.120	2	.1250	1.5	RME-040-2	17.80	RME-040-2X	20.30
1.1 mm	.0433	.0433	3.3 mm	2	3 mm	38 mm	RMEM-011-2	17.10	RMEM-011-2X	19.60
1.1 mm	.0433	.0433	3.3 mm	2	4 mm	50 mm	AMRM-011-2	18.55		
.0450	.0450	.0450	.068	2	.1250	1.5	SME-045-2	17.70	SME-045-2X	20.20
.0450	.0450	.0450	.135	2	.1250	1.5			RME-045-2X	20.30
1.2 mm	.0472	.0472	3.8 mm	2	3 mm	38 mm	RMEM-012-2	17.10	RMEM-012-2X	19.60
1.2 mm	.0472	.0472	3.8 mm	2	4 mm	50 mm	AMRM-012-2	18.55	AMRM-012-2X	21.45

*.0005" / .013 mm max TIR

Continued on next page

End Mills – Square

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



RME / RMEM
SME / AMRM

Continued from previous page

End Mills

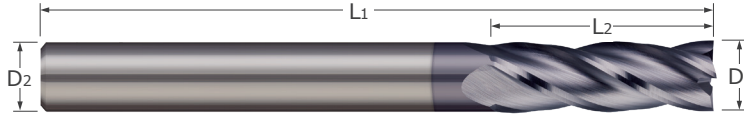
Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AITIN Coated	
D1 +.0005" -.0005"	+.00 mm -.02 mm	decimal equiv.	L2 +.010" -.000" +.25 mm -.00 mm	D2 (h6)	L1	Tool #	Price	Tool #	Price	
.0500		.0500	.075	2	.1250	1.5	SME-050-2	17.70	SME-050-2X	20.20
.0500		.0500	.150	2	.1250	1.5	RME-050-2	17.80	RME-050-2X	20.30
1.3 mm		.0512	3.9 mm	2	3 mm	38 mm	RMEM-013-2	17.10	RMEM-013-2X	19.60
1.3 mm		.0512	3.9 mm	2	4 mm	50 mm	AMRM-013-2	18.55	AMRM-013-2X	21.45
1.4 mm		.0551	4.2 mm	2	3 mm	38 mm	RMEM-014-2	17.10	RMEM-014-2X	19.60
1.4 mm		.0551	4.2 mm	2	4 mm	50 mm			AMRM-014-2X	21.45
1.5 mm		.0591	4.2 mm	2	3 mm	38 mm	RMEM-015-2	17.10	RMEM-015-2X	19.60
1.5 mm		.0591	4.2 mm	2	4 mm	50 mm	AMRM-015-2	18.55	AMRM-015-2X	21.45
1.6 mm		.0630	4.8 mm	2	3 mm	38 mm	RMEM-016-2	15.85	RMEM-016-2X	18.35
1.6 mm		.0630	4.8 mm	2	4 mm	50 mm	AMRM-016-2	18.55	AMRM-016-2X	21.45
1.7 mm		.0669	5.1 mm	2	3 mm	38 mm	RMEM-017-2	15.85	RMEM-017-2X	18.35
1.7 mm		.0669	5.1 mm	2	4 mm	50 mm			AMRM-017-2X	21.45
1.8 mm		.0709	5.3 mm	2	3 mm	38 mm	RMEM-018-2	15.85	RMEM-018-2X	18.35
1.8 mm		.0709	5.3 mm	2	4 mm	50 mm	AMRM-018-2	18.55	AMRM-018-2X	21.45
1.9 mm		.0748	5.7 mm	2	3 mm	38 mm	RMEM-019-2	15.85	RMEM-019-2X	18.35
1.9 mm		.0748	5.7 mm	2	4 mm	50 mm	AMRM-019-2	18.55	AMRM-019-2X	21.45
2 mm		.0787	6 mm	2	3 mm	38 mm	RMEM-020-2	15.85	RMEM-020-2X	18.35
2 mm		.0787	6 mm	2	4 mm	50 mm	AMRM-020-2	18.55	AMRM-020-2X	21.45
2.5 mm		.0984	8 mm	2	3 mm	38 mm	RMEM-025-2	15.85	RMEM-025-2X	18.35
2.5 mm		.0984	8 mm	2	4 mm	50 mm	AMRM-025-2	18.55	AMRM-025-2X	21.45
3 mm		.1181	9 mm	2	4 mm	50 mm	AMRM-030-2	18.55	AMRM-030-2X	21.45
3.5 mm		.1378	10.5 mm	2	4 mm	50 mm			AMRM-035-2X	21.45

*.0005" / .013 mm max TIR

**GEM / GEMM
SEM / AEMM**



**End Mills – Square
2, 3, 4 Flute**



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

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 + .0000" - .0020" (h9)	decimal equiv.	L2 + .030" - .000" + .78 mm - .00 mm	D2 (h6)	L1	Tool #	Price	Tool #	Price		
.0312	.0312	.063	.1250	1.5	SEM-031-02	15.25	SEM-031-02X	17.75		
.0312	.0312	.063	.1250	1.5	SEM-031-03	15.25	SEM-031-03X	17.75		
.0312	.0312	.063	.1250	1.5	SEM-031-04	15.25	SEM-031-04X	17.75		
.0312	.0312	.078	.1250	1.5	GEM-031-2	15.95	GEM-031-2X	18.45		
.0312	.0312	.078	.1250	1.5	GEM-031-3	15.95	GEM-031-3X	18.45		
.0312	.0312	.078	.1250	1.5	GEM-031-4	15.95	GEM-031-4X	18.45		
1 mm	.0394	3 mm	3 mm	38 mm	GEMM-010-2	15.30	GEMM-010-2X	17.80		
1 mm	.0394	3 mm	3 mm	38 mm	GEMM-010-3	15.30	GEMM-010-3X	17.80		
1 mm	.0394	3 mm	3 mm	38 mm	GEMM-010-4	15.30				
1 mm	.0394	4 mm	4 mm	50 mm			AEMM-010-2X	21.45		
1 mm	.0394	4 mm	4 mm	50 mm	AEMM-010-3	18.55	AEMM-010-3X	21.45		
1 mm	.0394	4 mm	4 mm	50 mm	AEMM-010-4	18.55	AEMM-010-4X	21.45		
.0469	.0469	.094	.1250	1.5	SEM-046-02	15.25	SEM-046-02X	17.75		
.0469	.0469	.094	.1250	1.5	SEM-046-03	15.25	SEM-046-03X	17.75		
.0469	.0469	.094	.1250	1.5	SEM-046-04	15.25	SEM-046-04X	17.75		
.0469	.0469	.109	.1250	1.5	GEM-046-2	15.95	GEM-046-2X	18.45		
.0469	.0469	.109	.1250	1.5	GEM-046-3	15.95	GEM-046-3X	18.45		
.0469	.0469	.109	.1250	1.5	GEM-046-4	15.95	GEM-046-4X	18.45		
1.5 mm	.0591	4 mm	4 mm	50 mm	AEMM-015-2	18.55	AEMM-015-2X	21.45		
1.5 mm	.0591	4 mm	4 mm	50 mm	AEMM-015-3	18.55	AEMM-015-3X	21.45		
1.5 mm	.0591	4 mm	4 mm	50 mm	AEMM-015-4	18.55	AEMM-015-4X	21.45		
.0625	.0625	.125	.1250	1.5	SEM-062-02	13.80	SEM-062-02X	16.30		
.0625	.0625	.125	.1250	1.5	SEM-062-03	13.80	SEM-062-03X	16.30		
.0625	.0625	.125	.1250	1.5	SEM-062-04	13.80	SEM-062-04X	16.30		
.0625	.0625	.188	.1250	1.5	GEM-062-2	14.60	GEM-062-2X	17.10		
.0625	.0625	.188	.1250	1.5	GEM-062-3	14.60	GEM-062-3X	17.10		
.0625	.0625	.188	.1250	1.5	GEM-062-4	14.60	GEM-062-4X	17.10		
.0781	.0781	.156	.1250	1.5	SEM-078-02	13.80	SEM-078-02X	16.30		
.0781	.0781	.156	.1250	1.5	SEM-078-03	13.80	SEM-078-03X	16.30		
.0781	.0781	.156	.1250	1.5	SEM-078-04	13.80	SEM-078-04X	16.30		
.0781	.0781	.188	.1250	1.5	GEM-078-2	14.60	GEM-078-2X	17.10		
.0781	.0781	.188	.1250	1.5	GEM-078-3	14.60	GEM-078-3X	17.10		
.0781	.0781	.188	.1250	1.5	GEM-078-4	14.60	GEM-078-4X	17.10		
2 mm	.0787	5 mm	4 mm	50 mm	AEMM-020-2	18.55	AEMM-020-2X	21.45		
2 mm	.0787	5 mm	4 mm	50 mm	AEMM-020-3	18.55	AEMM-020-3X	21.45		
2 mm	.0787	5 mm	4 mm	50 mm	AEMM-020-4	18.55	AEMM-020-4X	21.45		
2 mm	.0787	6 mm	3 mm	38 mm	GEMM-020-2	13.85	GEMM-020-2X	16.40		
2 mm	.0787	6 mm	3 mm	38 mm			GEMM-020-3X	16.40		
2 mm	.0787	7 mm	3 mm	38 mm	GEMM-020-4	13.85	GEMM-020-4X	16.40		

*.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

End Mills

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AITIN Coated	
D ₁							Tool #	Price	Tool #	Price
+ .0000" - .0020"	(h9)	decimal equiv.	L ₂ +.030" -.000" +.78 mm -.00 mm		D ₂ (h6)	L ₁				
.0938	.0938	.0938	.188	2	.1250	1.5	SEM-093-02	13.80	SEM-093-02X	16.30
.0938	.0938	.0938	.188	3	.1250	1.5	SEM-093-03	13.80	SEM-093-03X	16.30
.0938	.0938	.0938	.188	4	.1250	1.5	SEM-093-04	13.80	SEM-093-04X	16.30
.0938	.0938	.0938	.375	2	.1250	1.5	GEM-093-2	14.60	GEM-093-2X	17.10
.0938	.0938	.0938	.375	3	.1250	1.5	GEM-093-3	14.60	GEM-093-3X	17.10
.0938	.0938	.0938	.375	4	.1250	1.5	GEM-093-4	14.60	GEM-093-4X	17.10
2.5 mm	.0984	.0984	6 mm	2	4 mm	50 mm	AEMM-025-2	18.55	AEMM-025-2X	21.45
2.5 mm	.0984	.0984	6 mm	3	4 mm	50 mm	AEMM-025-3	18.55	AEMM-025-3X	21.45
2.5 mm	.0984	.0984	6 mm	4	4 mm	50 mm	AEMM-025-4	18.55	AEMM-025-4X	21.45
.1094	.1094	.1094	.188	2	.1250	1.5	SEM-109-02	13.80	SEM-109-02X	16.30
.1094	.1094	.1094	.188	3	.1250	1.5	SEM-109-03	13.80	SEM-109-03X	16.30
.1094	.1094	.1094	.188	4	.1250	1.5	SEM-109-04	13.80	SEM-109-04X	16.30
.1094	.1094	.1094	.375	2	.1250	1.5	GEM-109-2	14.60	GEM-109-2X	17.10
.1094	.1094	.1094	.375	3	.1250	1.5	GEM-109-3	14.60	GEM-109-3X	17.10
.1094	.1094	.1094	.375	4	.1250	1.5	GEM-109-4	14.60	GEM-109-4X	17.10
3 mm	.1181	.1181	7 mm	2	3 mm	38 mm	GEMM-030-2	12.40	GEMM-030-2X	14.95
3 mm	.1181	.1181	7 mm	3	3 mm	38 mm	GEMM-030-3	12.40	GEMM-030-3X	14.95
3 mm	.1181	.1181	8 mm	4	3 mm	38 mm	GEMM-030-4	12.40	GEMM-030-4X	14.95
3 mm	.1181	.1181	8 mm	2	6 mm	57 mm	AEMM-030-2	23.25	AEMM-030-2X	28.25
3 mm	.1181	.1181	8 mm	3	6 mm	57 mm	AEMM-030-3	23.25		
3 mm	.1181	.1181	8 mm	4	6 mm	57 mm	AEMM-030-4	23.25	AEMM-030-4X	28.25
.1250	.1250	.1250	.250	2	.1250	1.5	SEM-125-02	12.30	SEM-125-02X	14.85
.1250	.1250	.1250	.250	3	.1250	1.5	SEM-125-03	12.30	SEM-125-03X	14.85
.1250	.1250	.1250	.250	4	.1250	1.5	SEM-125-04	12.30	SEM-125-04X	14.85
.1250	.1250	.1250	.500	2	.1250	1.5	GEM-125-2	13.00	GEM-125-2X	15.55
.1250	.1250	.1250	.500	3	.1250	1.5	GEM-125-3	13.00	GEM-125-3X	15.55
.1250	.1250	.1250	.500	4	.1250	1.5	GEM-125-4	13.00	GEM-125-4X	15.55
3.5 mm	.1378	.1378	10 mm	2	6 mm	57 mm			AEMM-035-2X	28.25
3.5 mm	.1378	.1378	10 mm	3	6 mm	57 mm	AEMM-035-3	23.25	AEMM-035-3X	28.25
3.5 mm	.1378	.1378	10 mm	4	6 mm	57 mm	AEMM-035-4	23.25	AEMM-035-4X	28.25
.1406	.1406	.1406	.250	2	.1875	1.5	SEM-140-02	19.65	SEM-140-02X	22.55
.1406	.1406	.1406	.250	3	.1875	1.5	SEM-140-03	19.65	SEM-140-03X	22.55
.1406	.1406	.1406	.250	4	.1875	1.5	SEM-140-04	19.65	SEM-140-04X	22.55
.1406	.1406	.1406	.500	2	.1875	2.0	GEM-140-2	20.60	GEM-140-2X	23.50
.1406	.1406	.1406	.500	3	.1875	2.0	GEM-140-3	20.60	GEM-140-3X	23.50
.1406	.1406	.1406	.500	4	.1875	2.0	GEM-140-4	20.60	GEM-140-4X	23.50
.1562	.1562	.1562	.313	2	.1875	1.5	SEM-156-02	19.65	SEM-156-02X	22.55
.1562	.1562	.1562	.313	3	.1875	1.5	SEM-156-03	19.65	SEM-156-03X	22.55
.1562	.1562	.1562	.313	4	.1875	1.5	SEM-156-04	19.65	SEM-156-04X	22.55
.1562	.1562	.1562	.563	2	.1875	2.0	GEM-156-2	20.60	GEM-156-2X	23.50
.1562	.1562	.1562	.563	3	.1875	2.0	GEM-156-3	20.60	GEM-156-3X	23.50
.1562	.1562	.1562	.563	4	.1875	2.0	GEM-156-4	20.60	GEM-156-4X	23.50
4 mm	.1575	.1575	8 mm	2	4 mm	50 mm	GEMM-040-2	18.55		
4 mm	.1575	.1575	8 mm	3	4 mm	50 mm	GEMM-040-3	18.55		
4 mm	.1575	.1575	11 mm	4	4 mm	50 mm	GEMM-040-4	18.55	GEMM-040-4X	21.45
4 mm	.1575	.1575	11 mm	2	6 mm	57 mm	AEMM-040-2	23.25	AEMM-040-2X	28.25
4 mm	.1575	.1575	11 mm	3	6 mm	57 mm	AEMM-040-3	23.25	AEMM-040-3X	28.25
4 mm	.1575	.1575	11 mm	4	6 mm	57 mm	AEMM-040-4	23.25	AEMM-040-4X	28.25

*.0005" / .013 mm max TIR

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Cutter Diameter*		Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AITIN Coated	
D ₁	decimal equiv.					L ₂	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price
$+0.0000''$ $-0.0020''$	(h9)	$+0.030''$ $-0.000''$ $+0.78$ mm -0.00 mm							
.1719	.1719	.313	3	.1875	1.5	SEM-171-03	19.65	SEM-171-03X	22.55
.1719	.1719	.313	4	.1875	1.5	SEM-171-04	19.65	SEM-171-04X	22.55
.1719	.1719	.625	2	.1875	2.0	GEM-171-2	20.60	GEM-171-2X	23.50
.1719	.1719	.625	4	.1875	2.0	GEM-171-4	20.60	GEM-171-4X	23.50
4.5 mm	.1772	11 mm	3	6 mm	57 mm			AEMM-045-3X	28.25
4.5 mm	.1772	11 mm	4	6 mm	57 mm	AEMM-045-4	23.25	AEMM-045-4X	28.25
.1875	.1875	.375	2	.1875	1.5	SEM-187-02	19.65	SEM-187-02X	22.55
.1875	.1875	.375	3	.1875	1.5	SEM-187-03	19.65	SEM-187-03X	22.55
.1875	.1875	.375	4	.1875	1.5	SEM-187-04	19.65	SEM-187-04X	22.55
.1875	.1875	.625	2	.1875	2.0	GEM-187-2	20.60	GEM-187-2X	23.50
.1875	.1875	.625	3	.1875	2.0	GEM-187-3	20.60	GEM-187-3X	23.50
.1875	.1875	.625	4	.1875	2.0	GEM-187-4	20.60	GEM-187-4X	23.50
5 mm	.1969	10 mm	2	6 mm	57 mm	GEMM-050-2	19.80	GEMM-050-2X	22.75
5 mm	.1969	13 mm	4	6 mm	57 mm	GEMM-050-4	19.80	GEMM-050-4X	22.75
5 mm	.1969	16 mm	2	6 mm	57 mm	AEMM-050-2	23.25	AEMM-050-2X	28.25
5 mm	.1969	16 mm	3	6 mm	57 mm			AEMM-050-3X	28.25
5 mm	.1969	16 mm	4	6 mm	57 mm	AEMM-050-4	23.25	AEMM-050-4X	28.25
.2031	.2031	.375	3	.2500	2.0	SEM-203-03	24.40	SEM-203-03X	27.30
.2031	.2031	.375	4	.2500	2.0	SEM-203-04	24.40	SEM-203-04X	27.30
.2031	.2031	.625	2	.2500	2.5	GEM-203-2	25.75		
.2031	.2031	.625	4	.2500	2.5	GEM-203-4	25.75	GEM-203-4X	30.70
5.5 mm	.2165	16 mm	2	6 mm	57 mm	AEMM-055-2	23.25		
5.5 mm	.2165	16 mm	3	6 mm	57 mm	AEMM-055-3	23.25		
5.5 mm	.2165	16 mm	4	6 mm	57 mm	AEMM-055-4	23.25	AEMM-055-4X	28.25
.2187	.2187	.438	4	.2500	2.0	SEM-218-04	24.40	SEM-218-04X	27.30
.2187	.2187	.625	2	.2500	2.5	GEM-218-2	25.75	GEM-218-2X	30.70
.2187	.2187	.625	4	.2500	2.5	GEM-218-4	25.75		
.2344	.2344	.438	4	.2500	2.0	SEM-234-04	24.40	SEM-234-04X	27.30
6 mm	.2362	10 mm	2	6 mm	57 mm	GEMM-060-2	23.25	GEMM-060-2X	28.25
6 mm	.2362	10 mm	3	6 mm	57 mm	GEMM-060-3	23.25		
6 mm	.2362	13 mm	4	6 mm	57 mm	GEMM-060-4	23.25	GEMM-060-4X	28.25
6 mm	.2362	16 mm	2	6 mm	57 mm	AEMM-060-2	23.25	AEMM-060-2X	28.25
6 mm	.2362	16 mm	3	6 mm	57 mm	AEMM-060-3	23.25	AEMM-060-3X	28.25
6 mm	.2362	16 mm	4	6 mm	57 mm	AEMM-060-4	23.25	AEMM-060-4X	28.25
.2500	.2500	.500	2	.2500	2.0	SEM-250-02	24.40	SEM-250-02X	27.30
.2500	.2500	.500	3	.2500	2.0	SEM-250-03	24.40	SEM-250-03X	27.30
.2500	.2500	.500	4	.2500	2.0	SEM-250-04	24.40	SEM-250-04X	27.30
.2500	.2500	.750	2	.2500	2.5	GEM-250-2	25.75	GEM-250-2X	30.70
.2500	.2500	.750	3	.2500	2.5	GEM-250-3	25.75	GEM-250-3X	30.70
.2500	.2500	.750	4	.2500	2.5	GEM-250-4	25.75	GEM-250-4X	30.70

D ₁	decimal equiv.	L ₂	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price	
$+0.0000''$ $-0.0030''$	(h9)	$+0.030''$ $-0.000''$ $+0.78$ mm -0.00 mm							
.2656	.2656	.500	4	.3125	2.0	SEM-265-04	27.00	SEM-265-04X	33.50
7 mm	.2756	22 mm	3	8 mm	63 mm			AEMM-070-3X	35.70
7 mm	.2756	22 mm	4	8 mm	63 mm	AEMM-070-4	28.80	AEMM-070-4X	35.70

*.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

End Mills

Cutter Diameter*		Length of Cut L ₂	Flutes	Shank Diameter D ₂ (h6)	Overall Length L ₁	Uncoated		AITIN Coated	
D ₁ + .0000" - .0030" (h9)	decimal equiv.					Tool #	Price	Tool #	Price
.2812	.2812	.500	4	.3125	2.0	SEM-281-04	27.00	SEM-281-04X	33.50
.2812	.2812	.750	2	.3125	2.5	GEM-281-2	29.95	GEM-281-2X	36.85
.2812	.2812	.750	3	.3125	2.5	GEM-281-3	29.95	GEM-281-3X	36.85
.2812	.2812	.750	4	.3125	2.5	GEM-281-4	29.95	GEM-281-4X	36.85
.3125	.3125	.500	2	.3125	2.0	SEM-312-02	27.00	SEM-312-02X	33.50
.3125	.3125	.500	4	.3125	2.0	SEM-312-04	27.00	SEM-312-04X	33.50
.3125	.3125	.813	2	.3125	2.5	GEM-312-2	29.95	GEM-312-2X	36.85
.3125	.3125	.813	4	.3125	2.5	GEM-312-4	29.95	GEM-312-4X	36.85
8 mm	.3150	16 mm	2	8 mm	63 mm	GEMM-080-2	28.80	GEMM-080-2X	35.70
8 mm	.3150	19 mm	4	8 mm	63 mm	GEMM-080-4	28.80		
8 mm	.3150	22 mm	2	8 mm	63 mm	AEMM-080-2	28.80	AEMM-080-2X	35.70
8 mm	.3150	22 mm	3	8 mm	63 mm	AEMM-080-3	28.80	AEMM-080-3X	35.70
8 mm	.3150	22 mm	4	8 mm	63 mm	AEMM-080-4	28.80	AEMM-080-4X	35.70
.3281	.3281	.500	2	.3750	2.0	SEM-328-02	32.25	SEM-328-02X	38.10
.3281	.3281	.500	3	.3750	2.0	SEM-328-03	32.25	SEM-328-03X	38.10
.3281	.3281	.500	4	.3750	2.0	SEM-328-04	32.25		
.3750	.3750	.625	2	.3750	2.0	SEM-375-02	32.25	SEM-375-02X	37.45
.3750	.3750	.625	3	.3750	2.0	SEM-375-03	32.25	SEM-375-03X	37.45
.3750	.3750	.625	4	.3750	2.0	SEM-375-04	32.25	SEM-375-04X	37.45
.3750	.3750	.875	2	.3750	2.5	GEM-375-2	33.95	GEM-375-2X	40.85
.3750	.3750	.875	3	.3750	2.5	GEM-375-3	33.95	GEM-375-3X	40.85
.3750	.3750	.875	4	.3750	2.5	GEM-375-4	33.95	GEM-375-4X	40.85
.3906	.3906	.625	4	.4375	2.5	SEM-390-04	48.25	SEM-390-04X	56.50
10 mm	.3937	19 mm	2	10 mm	72 mm	GEMM-100-2	33.90	GEMM-100-2X	40.80
10 mm	.3937	19 mm	3	10 mm	72 mm	GEMM-100-3	33.90	GEMM-100-3X	40.80
10 mm	.3937	22 mm	4	10 mm	72 mm	GEMM-100-4	33.90	GEMM-100-4X	40.80
10 mm	.3937	22 mm	2	10 mm	72 mm	AEMM-100-2	33.90	AEMM-100-2X	40.80
10 mm	.3937	22 mm	3	10 mm	72 mm	AEMM-100-3	33.90	AEMM-100-3X	40.80
10 mm	.3937	22 mm	4	10 mm	72 mm	AEMM-100-4	33.90	AEMM-100-4X	40.80
11 mm	.4331	30 mm	3	12 mm	83 mm	AEMM-110-3	54.05		
.4375	.4375	1.000	4	.4375	2.5	GEM-437-4	53.60	GEM-437-4X	61.80
12 mm	.4724	22 mm	2	12 mm	83 mm	GEMM-120-2	54.05	GEMM-120-2X	64.45
12 mm	.4724	22 mm	3	12 mm	83 mm	GEMM-120-3	54.05	GEMM-120-3X	64.45
12 mm	.4724	30 mm	2	12 mm	83 mm	AEMM-120-2	54.05	AEMM-120-2X	64.45
12 mm	.4724	30 mm	3	12 mm	83 mm	AEMM-120-3	54.05		
12 mm	.4724	30 mm	4	12 mm	83 mm	AEMM-120-4	54.05	AEMM-120-4X	64.45
.5000	.5000	.625	2	.5000	2.5	SEM-500-02	53.15	SEM-500-02X	61.20
.5000	.5000	.625	3	.5000	2.5	SEM-500-03	53.15	SEM-500-03X	61.20
.5000	.5000	.625	4	.5000	2.5	SEM-500-04	53.15	SEM-500-04X	61.20
.5000	.5000	1.000	2	.5000	3.0	GEM-500-2	59.00	GEM-500-2X	67.15
.5000	.5000	1.000	3	.5000	3.0	GEM-500-3	59.00	GEM-500-3X	67.15
.5000	.5000	1.000	4	.5000	3.0	GEM-500-4	59.00	GEM-500-4X	67.15
.5000	.5000	1.250	4	.5000	3.5	GEM-5125-4	62.00	GEM-5125-4X	69.00
14 mm	.5512	26 mm	4	14 mm	83 mm	GEMM-140-4	62.75	GEMM-140-4X	74.25
14 mm	.5512	35 mm	2	14 mm	83 mm	AEMM-140-2	62.75	AEMM-140-2X	74.25
14 mm	.5512	35 mm	3	14 mm	83 mm	AEMM-140-3	62.75		

*.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		AITIN Coated	
D ₁		decimal equiv.					L ₂	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price
+ .0000" - .0030"	(h9)		+ .030" - .000" + .78 mm - .00 mm							
14 mm		.5512	35 mm	4	14 mm	83 mm	AEMM-140-4	62.75	AEMM-140-4X	74.25
.5625		.5625	1.250	2	.5625	3.5	GEM-562-2	90.60		
.5625		.5625	1.250	4	.5625	3.5	GEM-562-4	90.60	GEM-562-4X	102.85
.6250		.6250	1.250	4	.6250	3.5	GEM-625-4	104.15	GEM-625-4X	116.35
16 mm		.6299	26 mm	2	16 mm	92 mm	GEMM-160-2	100.10	GEMM-160-2X	112.30
16 mm		.6299	32 mm	4	16 mm	92 mm	GEMM-160-4	100.10		
16 mm		.6299	35 mm	3	16 mm	92 mm			AEMM-160-3X	112.30
16 mm		.6299	35 mm	4	16 mm	92 mm	AEMM-160-4	100.10	AEMM-160-4X	112.30
18 mm		.7087	26 mm	2	18 mm	92 mm	GEMM-180-2	134.55		
18 mm		.7087	26 mm	3	18 mm	92 mm			GEMM-180-3X	148.45
18 mm		.7087	32 mm	4	18 mm	92 mm	GEMM-180-4	134.55		
18 mm		.7087	45 mm	3	18 mm	92 mm	AEMM-180-3	134.55	AEMM-180-3X	148.45
.7500		.7500	1.500	2	.7500	4.0	GEM-750-2	158.75	GEM-750-2X	172.40
.7500		.7500	1.500	4	.7500	4.0	GEM-750-4	158.75	GEM-750-4X	172.40
20 mm		.7874	32 mm	3	20 mm	104 mm			GEMM-200-3X	190.55
20 mm		.7874	38 mm	4	20 mm	104 mm	GEMM-200-4	170.95		
20 mm		.7874	45 mm	2	20 mm	104 mm			AEMM-200-2X	190.55
20 mm		.7874	45 mm	3	20 mm	104 mm			AEMM-200-3X	190.55
20 mm		.7874	45 mm	4	20 mm	104 mm			AEMM-200-4X	190.55
.8750		.8750	1.500	4	.8750	4.0	GEM-875-4	220.00		
25 mm		.9843	50 mm	2	25 mm	127 mm			AEMM-250-2X	225.60
25 mm		.9843	50 mm	3	25 mm	127 mm	AEMM-250-3	203.35	AEMM-250-3X	225.60
25 mm		.9843	50 mm	4	25 mm	127 mm	AEMM-250-4	203.35	AEMM-250-4X	225.60
1.0000		1.0000	1.500	4	1.0000	4.0	GEM-001-4	240.50		

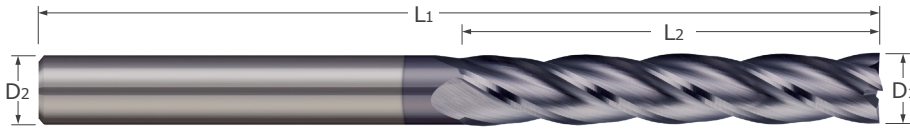
*.0005" / .013 mm max TIR

End Mills – Square

2, 3, 4 Flute – Long Flute



GEL / GELM / AELM



End Mills

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

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" -.0020"	(h9)	decimal equiv.	L2 +.031" -.000" +.79 mm -.00 mm	D2 (h6)	L1	Tool #	Price	Tool #	Price	
										3 mm	.1181	15 mm	2	6 mm	75 mm	AELM-030-2	29.10
3 mm	.1181	15 mm	4	6 mm	75 mm	AELM-030-4	29.10	AELM-030-4X	34.05	
3 mm	.1181	25 mm	3	3 mm	75 mm			GELM-030-3X	22.85	
3 mm	.1181	25 mm	4	3 mm	75 mm	GELM-030-4	19.95			
4 mm	.1575	20 mm	2	6 mm	75 mm			AELM-040-2X	34.05	
4 mm	.1575	25 mm	2	4 mm	75 mm			GELM-040-2X	25.50	
4 mm	.1575	25 mm	3	4 mm	75 mm	GELM-040-3	21.55			
4 mm	.1575	25 mm	4	4 mm	75 mm	GELM-040-4	21.55			
5 mm	.1969	25 mm	3	5 mm	75 mm	GELM-050-3	25.30			
5 mm	.1969	25 mm	4	5 mm	75 mm	GELM-050-4	25.30			
5 mm	.1969	25 mm	4	6 mm	100 mm	AELM-050-4	37.40			
6 mm	.2362	25 mm	3	6 mm	75 mm	GELM-060-3	32.40	GELM-060-3X	37.30	
6 mm	.2362	25 mm	4	6 mm	75 mm	GELM-060-4	32.40	GELM-060-4X	37.30	
.2500	.2500	1.500	2	.2500	4.0	GEL-250-2	36.20			
.2500	.2500	1.500	4	.2500	4.0	GEL-250-4	36.20			

D1 +.0000" -.0030"	(h9)	decimal equiv.	L2 +.031" -.000" +.79 mm -.00 mm	D2 (h6)	L1	Tool #	Price	Tool #	Price
8 mm	.3150	40 mm	2	8 mm	100 mm	AELM-080-2	51.10	AELM-080-2X	56.75
8 mm	.3150	40 mm	4	8 mm	100 mm	AELM-080-4	51.10		
.3750	.3750	1.750	2	.3750	4.0	GEL-375-2	48.05		
.3750	.3750	1.750	4	.3750	4.0	GEL-375-4	48.05		
10 mm	.3937	38 mm	3	10 mm	100 mm			GELM-100-3X	57.75
10 mm	.3937	50 mm	4	10 mm	120 mm	AELM-100-4	60.25	AELM-100-4X	70.05
11 mm	.4331	50 mm	2	10 mm	120 mm	AELM-110-2	118.20		
12 mm	.4724	50 mm	3	12 mm	100 mm			GELM-120-3X	82.25
12 mm	.4724	55 mm	4	12 mm	130 mm	AELM-120-4	84.35		
14 mm	.5512	60 mm	2	14 mm	140 mm			AELM-140-2X	143.25
16 mm	.6299	65 mm	4	16 mm	150 mm			AELM-160-4X	153.15
18 mm	.7087	75 mm	2	18 mm	150 mm	GELM-180-2	181.05	GELM-180-2X	200.25
18 mm	.7087	75 mm	3	18 mm	150 mm	GELM-180-3	181.05		
20 mm	.7874	75 mm	2	20 mm	150 mm			AELM-200-2X	270.65
25 mm	.9843	75 mm	2	25 mm	150 mm			GELM-250-2X	324.55

*.0005" / .013 mm max TIR

Continued on next page

GEL / GELM / AELM



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

Continued from previous page

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" -.0030"	(h9)	decimal equiv.	L2 +.79 mm -.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
25 mm		.9843	75 mm	3	25 mm	150 mm	GELM-250-3	300.80		
25 mm		.9843	75 mm	4	25 mm	150 mm			GELM-250-4X	324.55

*.0005" / .013 mm max TIR

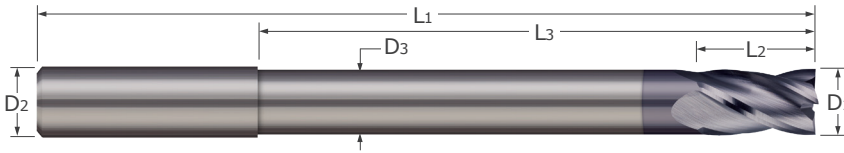
End Mills

End Mills – Square

2 & 4 Flute – Reduced Neck



GLR / GLRM



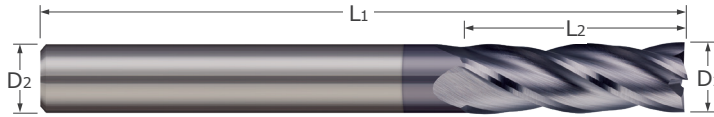
End Mills

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

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" -.0020" (h9) decimal equiv.	L2 +.015" -.000" +.38 mm -.00 mm	L3 +.015" -.015" +.38 mm -.38 mm	D3	D2 (h6)	L1	Tool #	Price	Tool #	Price			
										3 mm	.1181	8 mm
3 mm	.1181	8 mm	30 mm	2.5 mm	4	6 mm	75 mm			GLRM-030-4X	40.35	
4 mm	.1575	8 mm	30 mm	3.5 mm	2	6 mm	75 mm			GLRM-040-2X	40.35	
4 mm	.1575	8 mm	30 mm	3.5 mm	4	6 mm	75 mm			GLRM-040-4X	40.35	
.1875	.1875	.375	2.00	.1675	2	.1875	3.0	GLR-187-2	34.50			
.1875	.1875	.375	2.00	.1675	4	.1875	3.0	GLR-187-4	34.50			
5 mm	.1969	10 mm	50 mm	4.5 mm	4	6 mm	100 mm	GLRM-050-4	37.20			
6 mm	.2362	12 mm	50 mm	5.5 mm	2	6 mm	100 mm	GLRM-060-2	37.20			
6 mm	.2362	12 mm	50 mm	5.5 mm	4	6 mm	100 mm			GLRM-060-4X	42.05	
.2500	.2500	.500	2.50	.2300	4	.2500	4.0	GLR-250-4	41.70			

D1 +.0000" -.0030" (h9) decimal equiv.	L2 +.015" -.000" +.38 mm -.00 mm	L3 +.015" -.015" +.38 mm -.38 mm	D3	D2 (h6)	L1	Tool #	Price	Tool #	Price		
										8 mm	.3150	14 mm	50 mm	7.5 mm	2	8 mm	100 mm		GLRM-080-2X	59.45
.3750	.3750	.750	2.75	.3550	2	.3750	4.0	GLR-375-2	55.20		
10 mm	.3937	18 mm	65 mm	9.5 mm	2	10 mm	120 mm	GLRM-100-2	56.90	GLRM-100-2X	66.80
10 mm	.3937	18 mm	65 mm	9.5 mm	4	10 mm	120 mm	GLRM-100-4	56.90		
12 mm	.4724	22 mm	80 mm	11.5 mm	4	12 mm	130 mm	GLRM-120-4	79.80		
.6250	.6250	1.250	4.50	.6050	2	.6250	6.0	GLR-625-2	168.80		
16 mm	.6299	30 mm	100 mm	15 mm	2	16 mm	150 mm			GLRM-160-2X	176.30

*.0005" / .013 mm max TIR



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

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 +.0010" -.0000"	+.03 mm -.00 mm	decimal equiv.	L2 +.030" -.000" +.78 mm -.00 mm	D2 (h6)	L1	Tool #	Price	Tool #	Price	
										.0312
.0312	.0312	.0312	.078	3	.1250	1.5	FMS-031-3	19.20	FMS-031-3X	21.70
.0312	.0312	.0312	.078	4	.1250	1.5	FMS-031-4	19.20	FMS-031-4X	21.70
.0625	.0625	.0625	.188	2	.1250	1.5	FMS-062-2	17.45	FMS-062-2X	19.95
.0625	.0625	.0625	.188	3	.1250	1.5	FMS-062-3	17.45	FMS-062-3X	19.95
.0625	.0625	.0625	.188	4	.1250	1.5	FMS-062-4	17.45	FMS-062-4X	19.95
2 mm	.0787		10 mm	2	2 mm	38 mm			FMSM-020-2X	16.15
.0938	.0938	.0938	.375	2	.1250	1.5			FMS-093-2X	19.95
.0938	.0938	.0938	.375	3	.1250	1.5	FMS-093-3	17.45	FMS-093-3X	19.95
.0938	.0938	.0938	.375	4	.1250	1.5	FMS-093-4	17.45	FMS-093-4X	19.95
3 mm	.1181		15 mm	2	3 mm	38 mm	FMSM-030-2	13.65		
3 mm	.1181		15 mm	4	3 mm	38 mm	FMSM-030-4	13.65		
.1250	.1250	.1250	.500	2	.1250	1.5	FMS-125-2	15.55	FMS-125-2X	18.05
.1250	.1250	.1250	.500	3	.1250	1.5	FMS-125-3	15.55	FMS-125-3X	18.05
.1250	.1250	.1250	.500	4	.1250	1.5	FMS-125-4	15.55	FMS-125-4X	18.05
.1562	.1562	.1562	.563	2	.1875	2.0	FMS-156-2	24.60		
.1562	.1562	.1562	.563	3	.1875	2.0	FMS-156-3	24.60		
.1562	.1562	.1562	.563	4	.1875	2.0	FMS-156-4	24.60	FMS-156-4X	27.45
4 mm	.1575		18 mm	2	4 mm	50 mm	FMSM-040-2	20.40	FMSM-040-2X	23.25
.1875	.1875	.1875	.625	2	.1875	2.0	FMS-187-2	24.60		
.1875	.1875	.1875	.625	4	.1875	2.0	FMS-187-4	24.60	FMS-187-4X	27.45
.2187	.2187	.2187	.625	3	.2500	2.5	FMS-218-3	30.90	FMS-218-3X	35.85
6 mm	.2362		18 mm	4	6 mm	57 mm	FMSM-060-4	25.70	FMSM-060-4X	30.65
.2500	.2500	.2500	.750	2	.2500	2.5	FMS-250-2	30.90		
.2500	.2500	.2500	.750	3	.2500	2.5	FMS-250-3	30.90	FMS-250-3X	35.85
.2500	.2500	.2500	.750	4	.2500	2.5	FMS-250-4	30.90	FMS-250-4X	35.85
.3125	.3125	.3125	.813	4	.3125	2.5	FMS-312-4	35.95	FMS-312-4X	42.85
8 mm	.3150		22 mm	3	8 mm	63 mm	FMSM-080-3	31.60		
.3750	.3750	.3750	.875	2	.3750	2.5	FMS-375-2	40.75	FMS-375-2X	47.60

*.0005" / .013 mm max TIR

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End Mills – Square

2, 3, 4, 6 Flute – NC Tolerance (cont.)



EMS / EMSM

End Mills

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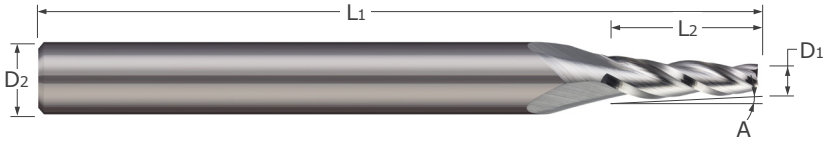
Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AITIN Coated	
D1			L2		D2 (h6)	L1	Tool #	Price	Tool #	Price
+ .0010" - .0000"	+ .03 mm - .00 mm	decimal equiv.	+ .030" - .000" + .78 mm - .00 mm							
.3750	.3750	.3750	.875	3	.3750	2.5	FMS-375-3	40.75	FMS-375-3X	47.60
.3750	.3750	.3750	.875	4	.3750	2.5	FMS-375-4	40.75	FMS-375-4X	47.60
10 mm	.3937	.3937	25 mm	3	10 mm	72 mm	FMSM-100-3	37.30		
.4375	.4375	.4375	1.000	2	.4375	2.5	FMS-437-2	64.30		
12 mm	.4724	.4724	30 mm	3	12 mm	83 mm	FMSM-120-3	59.45		
.5000	.5000	.5000	1.000	2	.5000	3.0	FMS-500-2	70.60	FMS-500-2X	78.65
.5000	.5000	.5000	1.000	3	.5000	3.0	FMS-500-3	70.60	FMS-500-3X	78.65
.5000	.5000	.5000	1.000	4	.5000	3.0	FMS-500-4	70.60	FMS-500-4X	78.65
.6250	.6250	.6250	1.250	4	.6250	3.5	FMS-625-4	124.90		
16 mm	.6299	.6299	35 mm	3	16 mm	92 mm	FMSM-160-3	110.15		
.6875	.6875	.6875	1.375	3	.6875	4.0	FMS-687-3	153.85		
.7500	.7500	.7500	1.500	2	.7500	4.0	FMS-750-2	190.45		
.7500	.7500	.7500	1.500	4	.7500	4.0	FMS-750-4	190.45		
20 mm	.7874	.7874	45 mm	4	20 mm	104 mm	FMSM-200-4	188.05		
1.0000	1.0000	1.0000	2.500	3	1.0000	5.0	FMS-001-3	288.45		
1.0000	1.0000	1.0000	2.500	6	1.0000	5.0	FMS-001-6	288.45		

*.0005" / .013 mm max TIR

TSM



End Mills – Square 3 Flute – Tapered End Mill



- Designed to machine tapered profiles in cavities
- Well suited for die and mold making applications
- Available in standard and long length styles
- 30° helix ■ Center cutting
- Solid carbide
- CNC ground in the USA

Angle Per Side	Cutter Diameter*	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated	
						Tool #	Price
A $+0^{\circ}30'$ $-0^{\circ}30'$	D1 $+0.0030''$ $-0.0000''$	L2	3	D2 (h6)	L1	TSM-250-1	46.05
1° 30'	.1250	.500	3	.2500	2.5	TSM-375-3	70.15
3°	.1562	.750	3	.3750	2.5	TSM-375-3	70.15

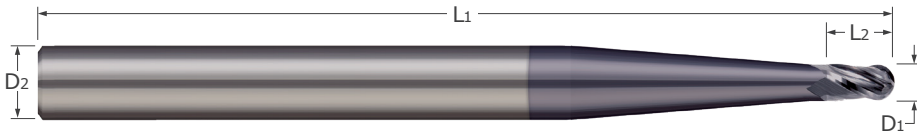
*.0005" max TIR

End Mills – Ball

2, 3, 4 Flute – Stub & Standard



BMR / BMRM / BMS
BMSM / BEM / BEMM



End Mills

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

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 +.0005" -.0005"	+.00 mm -.02 mm	decimal equiv.	L2	D2 (h6)	L1	Tool #	Price	Tool #	Price	
										.0100
.0100	.0100	.0100	.030	2	.1250	1.5	BMR-010-2	42.95	BMR-010-2X	45.20
.0110	.0110	.0110	.033	2	.1250	1.5	BMR-011-2	39.00	BMR-011-2X	41.30
0.3 mm		.0118	0.5 mm	2	3 mm	38 mm	BMSM-003-2	31.00	BMSM-003-2X	33.35
.0120	.0120	.0120	.018	2	.1250	1.5	BMS-012-2	37.20	BMS-012-2X	39.50
.0120	.0120	.0120	.036	2	.1250	1.5	BMR-012-2	39.00	BMR-012-2X	41.30
.0130	.0130	.0130	.019	2	.1250	1.5	BMS-013-2	31.60	BMS-013-2X	33.95
.0130	.0130	.0130	.039	2	.1250	1.5	BMR-013-2	35.50	BMR-013-2X	35.50
.0140	.0140	.0140	.021	2	.1250	1.5	BMS-014-2	31.60	BMS-014-2X	33.95
.0140	.0140	.0140	.042	2	.1250	1.5	BMR-014-2	33.15	BMR-014-2X	35.50
.0150	.0150	.0150	.022	2	.1250	1.5	BMS-015-2	25.25	BMS-015-2X	27.65
.0150	.0150	.0150	.045	2	.1250	1.5	BMR-015-2	26.20	BMR-015-2X	28.60
0.4 mm		.0157	0.6 mm	2	3 mm	38 mm	BMSM-004-2	22.90	BMSM-004-2X	25.35
.0160	.0160	.0160	.024	2	.1250	1.5	BMS-016-2	25.25	BMS-016-2X	27.65
.0160	.0160	.0160	.048	2	.1250	1.5	BMR-016-2	26.20	BMR-016-2X	28.60
.0170	.0170	.0170	.051	2	.1250	1.5	BMR-017-2	28.60	BMR-017-2X	28.60
.0180	.0180	.0180	.027	2	.1250	1.5	BMS-018-2	25.25	BMS-018-2X	27.65
.0180	.0180	.0180	.054	2	.1250	1.5	BMR-018-2	26.20	BMR-018-2X	28.60
.0190	.0190	.0190	.028	2	.1250	1.5	BMS-019-2	25.25	BMS-019-2X	27.65
.0190	.0190	.0190	.057	2	.1250	1.5	BMR-019-2	26.20	BMR-019-2X	28.60
0.5 mm		.0197	0.8 mm	2	3 mm	38 mm	BMSM-005-2	21.15	BMSM-005-2X	23.60
0.5 mm		.0197	1.5 mm	2	4 mm	50 mm	BMRM-005-2	23.10	BMRM-005-2X	25.95
.0200	.0200	.0200	.030	2	.1250	1.5	BMS-020-2	23.20	BMS-020-2X	25.65
.0200	.0200	.0200	.060	2	.1250	1.5	BMR-020-2	24.35	BMR-020-2X	26.75
.0210	.0210	.0210	.063	2	.1250	1.5	BMR-021-2	24.35	BMR-021-2X	26.75
.0220	.0220	.0220	.033	2	.1250	1.5	BMS-022-2	24.35	BMS-022-2X	25.65
.0220	.0220	.0220	.066	2	.1250	1.5	BMR-022-2	24.35	BMR-022-2X	26.75
.0230	.0230	.0230	.034	2	.1250	1.5	BMS-023-2	23.20	BMS-023-2X	25.65
.0230	.0230	.0230	.069	2	.1250	1.5	BMR-023-2	24.35	BMR-023-2X	26.75
0.6 mm		.0236	0.9 mm	2	3 mm	38 mm	BMSM-006-2	21.15	BMSM-006-2X	23.60
0.6 mm		.0236	1.8 mm	2	4 mm	50 mm	BMRM-006-2	25.95	BMRM-006-2X	25.95

*.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		AITIN Coated	
D1 +.0005" -.0005"	+.00 mm -.02 mm	decimal equiv.	L2	D2 (h6)	L1	Tool #	Price	Tool #	Price	
										.0240
.0250	.0250	.0250	.037	2	.1250	1.5	BMS-025-2	23.20	BMS-025-2X	25.65
.0250	.0250	.0250	.075	2	.1250	1.5	BMR-025-2	24.35	BMR-025-2X	26.75
.0260	.0260	.0260	.039	2	.1250	1.5			BMS-026-2X	23.60
.0260	.0260	.0260	.078	2	.1250	1.5	BMR-026-2	22.15	BMR-026-2X	24.60
.0270	.0270	.0270	.081	2	.1250	1.5	BMR-027-2	22.15	BMR-027-2X	24.60
	0.7 mm	.0276	1.1 mm	2	3 mm	38 mm	BMSM-007-2	20.10	BMSM-007-2X	22.60
	0.7 mm	.0276	2.1 mm	2	4 mm	50 mm	BMRM-007-2	23.10	BMRM-007-2X	25.95
.0280	.0280	.0280	.042	2	.1250	1.5	BMS-028-2	21.15	BMS-028-2X	23.60
.0280	.0280	.0280	.084	2	.1250	1.5	BMR-028-2	22.15	BMR-028-2X	24.60
.0300	.0300	.0300	.045	2	.1250	1.5	BMS-030-2	21.15	BMS-030-2X	23.60
.0300	.0300	.0300	.090	2	.1250	1.5	BMR-030-2	22.15	BMR-030-2X	24.60
.0310	.0310	.0310	.047	2	.1250	1.5	BMS-031-2	21.15	BMS-031-2X	23.60
.0310	.0310	.0310	.093	2	.1250	1.5	BMR-031-2	22.15	BMR-031-2X	24.60

D1			L2	D2 (h6)	L1	Tool #	Price	Tool #	Price	
+.0000" -.0020"	+.00 mm -.02 mm	decimal equiv.	L2	D2 (h6)	L1	Tool #	Price	Tool #	Price	
										.0313
.0313	.0313	.0313	.078	3	.1250	1.5	BEM-031-03	18.40	BEM-031-03X	20.90
.0313	.0313	.0313	.078	4	.1250	1.5	BEM-031-04	18.40	BEM-031-04X	20.90
	0.8 mm	.0315	1.2 mm	2	3 mm	38 mm	BMSM-008-2	20.10	BMSM-008-2X	22.60
.0320	.0320	.0320	.048	2	.1250	1.5	BMS-032-2	21.15	BMS-032-2X	23.60
.0320	.0320	.0320	.096	2	.1250	1.5	BMR-032-2	22.15	BMR-032-2X	24.60
.0330	.0330	.0330	.050	2	.1250	1.5			BMS-033-2X	23.60
.0330	.0330	.0330	.099	2	.1250	1.5	BMR-033-2	22.15	BMR-033-2X	24.60
.0340	.0340	.0340	.051	2	.1250	1.5	BMS-034-2	21.15		
.0350	.0350	.0350	.053	2	.1250	1.5	BMS-035-2	21.15	BMS-035-2X	23.60
.0350	.0350	.0350	.105	2	.1250	1.5	BMR-035-2	22.15	BMR-035-2X	24.60
	0.9 mm	.0354	1.4 mm	2	3 mm	38 mm	BMSM-009-2	20.10	BMSM-009-2X	22.60
	0.9 mm	.0354	2.7 mm	2	4 mm	50 mm	BMRM-009-2	23.10	BMRM-009-2X	25.95
	1 mm	.0394	1.5 mm	2	3 mm	38 mm	BMSM-010-2	19.65	BMSM-010-2X	22.10
	1 mm	.0394	1.5 mm	4	3 mm	38 mm	BMSM-010-4	19.65	BMSM-010-4X	22.10
	1 mm	.0394	3 mm	2	4 mm	50 mm	BMRM-010-2	21.25	BMRM-010-2X	24.10
	1 mm	.0394	3 mm	4	4 mm	50 mm			BMRM-010-4X	24.10
.0400	.0400	.0400	.060	2	.1250	1.5	BMS-040-2	21.15	BMS-040-2X	23.60
.0400	.0400	.0400	.120	2	.1250	1.5	BMR-040-2	22.15	BMR-040-2X	24.60
	1.1 mm	.0433	3.3 mm	2	4 mm	50 mm			BMRM-011-2X	24.10
	1.1 mm	.0433	3.3 mm	4	4 mm	50 mm	BMRM-011-4	21.25	BMRM-011-4X	24.10
.0450	.0450	.0450	.135	2	.1250	1.5	BMR-045-2	22.15	BMR-045-2X	24.60
.0468	.0468	.0468	.109	2	.1250	1.5	BEM-046-02	18.40	BEM-046-02X	20.90
.0468	.0468	.0468	.109	3	.1250	1.5	BEM-046-03	18.40	BEM-046-03X	20.90
.0468	.0468	.0468	.109	4	.1250	1.5	BEM-046-04	18.40	BEM-046-04X	20.90
.0500	.0500	.0500	.075	2	.1250	1.5	BMS-050-2	21.15	BMS-050-2X	23.60

*.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

End Mills

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AITIN Coated	
+ .0000" - .0020"	+ .00 mm - .02 mm	decimal equiv.	L2	D2 (h6)	L1	Tool #	Price	Tool #	Price	
										D1
.0500		.0500	.150	2	.1250	1.5	BMR-050-2	22.15	BMR-050-2X	24.60
	1.4 mm	.0551	2.1 mm	2	3 mm	38 mm	BMSM-014-2	19.65	BMSM-014-2X	22.10
	1.5 mm	.0591	2.3 mm	2	3 mm	38 mm	BMSM-015-2	19.65	BMSM-015-2X	22.10
	1.5 mm	.0591	4.2 mm	2	4 mm	50 mm	BMRM-015-2	21.25	BMRM-015-2X	24.10
	1.5 mm	.0591	4.2 mm	4	4 mm	50 mm	BMRM-015-4	21.25	BMRM-015-4X	24.10
.0625		.0625	.188	2	.1250	1.5	BEM-062-02	16.60	BEM-062-02X	19.10
.0625		.0625	.188	3	.1250	1.5	BEM-062-03	16.60	BEM-062-03X	19.10
.0625		.0625	.188	4	.1250	1.5	BEM-062-04	16.60	BEM-062-04X	19.10
	1.6 mm	.0630	2.4 mm	2	3 mm	38 mm	BMSM-016-2	18.10	BMSM-016-2X	20.55
	1.6 mm	.0630	4.8 mm	2	4 mm	50 mm	BMRM-016-2	21.25	BMRM-016-2X	24.10
	1.7 mm	.0669	2.5 mm	4	3 mm	38 mm			BMSM-017-4X	20.55
	1.8 mm	.0709	2.7 mm	2	3 mm	38 mm	BMSM-018-2	18.10	BMSM-018-2X	20.55
	1.8 mm	.0709	5.3 mm	2	4 mm	50 mm			BMRM-018-2X	24.10
	1.8 mm	.0709	5.3 mm	4	4 mm	50 mm			BMRM-018-4X	24.10
	1.9 mm	.0748	2.8 mm	2	3 mm	38 mm	BMSM-019-2	18.10	BMSM-019-2X	20.55
	1.9 mm	.0748	2.8 mm	4	3 mm	38 mm	BMSM-019-4	18.10	BMSM-019-4X	20.55
.0781		.0781	.188	2	.1250	1.5	BEM-078-02	16.60	BEM-078-02X	19.10
.0781		.0781	.188	3	.1250	1.5	BEM-078-03	16.60	BEM-078-03X	19.10
.0781		.0781	.188	4	.1250	1.5	BEM-078-04	16.60	BEM-078-04X	19.10
	2 mm	.0787	3 mm	2	3 mm	38 mm	BMSM-020-2	18.10	BMSM-020-2X	20.55
	2 mm	.0787	3 mm	4	3 mm	38 mm			BMSM-020-4X	20.55
	2 mm	.0787	6 mm	2	4 mm	50 mm	BMRM-020-2	21.25	BMRM-020-2X	24.10
	2 mm	.0787	6 mm	4	4 mm	50 mm			BMRM-020-4X	24.10
.0937		.0937	.375	2	.1250	1.5	BEM-093-02	16.60	BEM-093-02X	19.10
.0937		.0937	.375	3	.1250	1.5	BEM-093-03	16.60	BEM-093-03X	19.10
.0937		.0937	.375	4	.1250	1.5	BEM-093-04	16.60	BEM-093-04X	19.10
	2.5 mm	.0984	3.8 mm	2	3 mm	38 mm	BMSM-025-2	18.10	BMSM-025-2X	20.55
.1093		.1093	.375	2	.1250	1.5	BEM-109-02	16.60		
	3 mm	.1181	15 mm	2	3 mm	38 mm	BEMM-030-2	13.65	BEMM-030-2X	16.15
	3 mm	.1181	15 mm	3	3 mm	38 mm	BEMM-030-3	13.65	BEMM-030-3X	16.15
	3 mm	.1181	15 mm	4	3 mm	38 mm	BEMM-030-4	13.65	BEMM-030-4X	16.15
	3 mm	.1181	9 mm	2	4 mm	50 mm	BMRM-030-2	21.25	BMRM-030-2X	24.10
	3 mm	.1181	9 mm	4	4 mm	50 mm			BMRM-030-4X	24.10
.1250		.1250	.500	2	.1250	1.5	BEM-125-02	14.85	BEM-125-02X	17.40
.1250		.1250	.500	3	.1250	1.5	BEM-125-03	14.85	BEM-125-03X	17.40
.1250		.1250	.500	4	.1250	1.5	BEM-125-04	14.85	BEM-125-04X	17.40
	3.5 mm	.1378	10.5 mm	2	4 mm	50 mm			BMRM-035-2X	24.10
.1562		.1562	.563	2	.1875	2.0	BEM-156-02	23.60	BEM-156-02X	26.45
.1562		.1562	.563	3	.1875	2.0	BEM-156-03	23.60	BEM-156-03X	26.45
.1562		.1562	.563	4	.1875	2.0	BEM-156-04	23.60	BEM-156-04X	26.45

*.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.)

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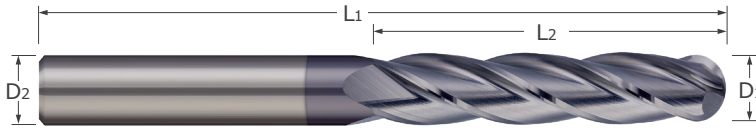
Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AITIN Coated	
D1			L2		D2 (h6)	L1	Tool #	Price	Tool #	Price
+ .0000" - .0020"	+ .00 mm - .02 mm	decimal equiv.								
	4 mm	.1575	18 mm	2	4 mm	50 mm	BEMM-040-2	20.40	BEMM-040-2X	23.25
	4 mm	.1575	18 mm	3	4 mm	50 mm	BEMM-040-3	20.40	BEMM-040-3X	23.25
	4 mm	.1575	18 mm	4	4 mm	50 mm	BEMM-040-4	20.40	BEMM-040-4X	23.25
.1719		.1719	.625	2	.1875	2.0			BEM-171-02X	26.45
.1875		.1875	.625	2	.1875	2.0	BEM-187-02	23.60	BEM-187-02X	26.45
.1875		.1875	.625	3	.1875	2.0	BEM-187-03	23.60	BEM-187-03X	26.45
.1875		.1875	.625	4	.1875	2.0	BEM-187-04	23.60	BEM-187-04X	26.45
.2031		.2031	.625	3	.2500	2.5			BEM-203-03X	34.50
.2187		.2187	.625	2	.2500	2.5	BEM-218-02	29.60	BEM-218-02X	34.50
.2187		.2187	.625	4	.2500	2.5	BEM-218-04	29.60	BEM-218-04X	34.50
.2343		.2343	.750	3	.2500	2.5	BEM-234-03	29.60		
	6 mm	.2362	18 mm	2	6 mm	57 mm	BEMM-060-2	25.70	BEMM-060-2X	30.65
	6 mm	.2362	18 mm	4	6 mm	57 mm	BEMM-060-4	25.70	BEMM-060-4X	30.65
.2500		.2500	.750	2	.2500	2.5	BEM-250-02	29.60	BEM-250-02X	34.50
.2500		.2500	.750	3	.2500	2.5	BEM-250-03	29.60	BEM-250-03X	34.50
.2500		.2500	.750	4	.2500	2.5	BEM-250-04	29.60	BEM-250-04X	34.50
.2812		.2812	.750	4	.3125	2.5	BEM-281-04	34.45	BEM-281-04X	41.35
.3125		.3125	.813	2	.3125	2.5	BEM-312-02	34.45	BEM-312-02X	41.35
.3125		.3125	.813	4	.3125	2.5	BEM-312-04	34.45	BEM-312-04X	41.35
	8 mm	.3150	22 mm	2	8 mm	63 mm	BEMM-080-2	31.60	BEMM-080-2X	38.55
	8 mm	.3150	22 mm	4	8 mm	63 mm	BEMM-080-4	31.60	BEMM-080-4X	38.55
.3750		.3750	.875	2	.3750	2.5	BEM-375-02	39.10	BEM-375-02X	45.95
.3750		.3750	.875	3	.3750	2.5	BEM-375-03	39.10	BEM-375-03X	45.95
.3750		.3750	.875	4	.3750	2.5	BEM-375-04	39.10	BEM-375-04X	45.95
	10 mm	.3937	25 mm	2	10 mm	72 mm	BEMM-100-2	37.30	BEMM-100-2X	44.15
	10 mm	.3937	25 mm	3	10 mm	72 mm	BEMM-100-3	37.30	BEMM-100-3X	44.15
	10 mm	.3937	25 mm	4	10 mm	72 mm	BEMM-100-4	37.30	BEMM-100-4X	44.15
.4370		.4370	1.000	2	.4375	2.5			BEM-437-02X	70.50
	12 mm	.4724	30 mm	3	12 mm	83 mm			BEMM-120-3X	69.80
	12 mm	.4724	30 mm	4	12 mm	83 mm	BEMM-120-4	59.45	BEMM-120-4X	69.80
.5000		.5000	1.000	2	.5000	3.0	BEM-500-02	67.70	BEM-500-02X	75.75
.5000		.5000	1.000	3	.5000	3.0	BEM-500-03	67.70	BEM-500-03X	75.75
.5000		.5000	1.000	4	.5000	3.0	BEM-500-04	67.70	BEM-500-04X	75.75
.6250		.6250	1.250	4	.6250	3.5	BEM-625-04	119.70	BEM-625-04X	131.70
	16 mm	.6299	35 mm	3	16 mm	92 mm			BEMM-160-3X	122.25
.6875		.6875	1.375	2	.7500	4.0	BEM-687-02	147.35		
.6875		.6875	1.375	3	.7500	4.0	BEM-687-03	147.35		
.6875		.6875	1.375	4	.7500	4.0	BEM-687-04	147.35		
	18 mm	.7087	45 mm	2	18 mm	92 mm			BEMM-180-2X	161.75
.7500		.7500	1.500	4	.7500	4.0			BEM-750-04X	196.05
	20 mm	.7874	45 mm	4	20 mm	104 mm	BEMM-200-4	188.05		
.8750		.8750	1.500	2	.8750	4.0	BEM-875-02	252.95		

*.0005" / .013 mm max TIR

End Mills – Ball

2, 3, 4 Flute – Long Flute

BEL / BELM



End Mills

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

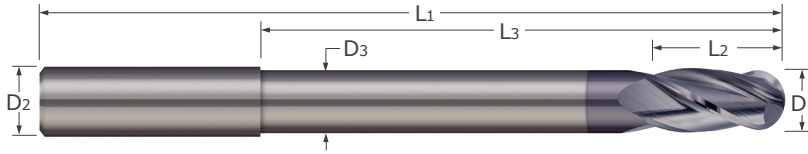
Cutter Diameter*		Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D ₁	decimal equiv.					L ₂	D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price
$+0.0000''$ $-0.0020''$	(h9)	$+0.031''$ $-0.000''$							
		$+0.79$ mm -0.00 mm							
10 mm	.3937	38 mm	2	10 mm	100 mm			BELM-100-2X	63.30
10 mm	.3937	38 mm	4	10 mm	100 mm	BELM-100-4	54.30		
$+0.0000''$ $-0.0030''$	(h9)	$+0.031''$ $-0.000''$							
		$+0.79$ mm -0.00 mm							
12 mm	.4724	50 mm	3	12 mm	100 mm			BELM-120-3X	89.45
12 mm	.4724	50 mm	4	12 mm	100 mm	BELM-120-4	79.30		
14 mm	.5512	75 mm	4	14 mm	150 mm	BELM-140-4	118.20		
18 mm	.7087	75 mm	4	18 mm	150 mm	BELM-180-4	199.00		
20 mm	.7874	75 mm	2	20 mm	150 mm	BELM-200-2	269.10		
25 mm	.9843	75 mm	2	25 mm	150 mm			BELM-250-2X	339.50
25 mm	.9843	75 mm	4	25 mm	150 mm	BELM-250-4	315.85	BELM-250-4X	339.50

*.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	
D1		L2	L3	D3		D2 (h6)	L1	Tool #	Price	Tool #	Price
+ .0000" - .0020"	(h6) decimal equiv.	+ .015" - .000" + .38 mm - .00 mm	+ .015" - .015" + .38 mm - .38 mm								
0.2 mm	.0078	0.3 mm	0.3 mm	-	2	6 mm	57 mm	SFBM-002-0	65.90	SFBM-002-0X	70.50
0.3 mm	.0118	0.3 mm	3.0 mm	0.28 mm	2	4 mm	50 mm	MMBM-003-3	50.15	MMBM-003-3X	52.75
0.3 mm	.0118	0.4 mm	0.4 mm	0.4 mm	2	6 mm	57 mm			SFBM-003-0X	63.40
0.3 mm	.0118	0.4 mm	1.0 mm	0.25 mm	2	6 mm	57 mm	SFBM-003-1	58.15		
0.4 mm	.0157	0.4 mm	3.0 mm	0.38 mm	2	4 mm	50 mm	MMBM-004-3	43.10	MMBM-004-3X	45.80
0.4 mm	.0157	0.4 mm	8.0 mm	0.38 mm	2	4 mm	50 mm	MMBM-004-8	43.10	MMBM-004-8X	45.80
0.4 mm	.0157	0.5 mm	1.2 mm	0.35 mm	2	6 mm	57 mm			SFBM-004-1X	61.90
0.5 mm	.0197	0.5 mm	5.0 mm	0.48 mm	2	4 mm	50 mm	MMBM-005-5	38.00	MMBM-005-5X	40.70
0.5 mm	.0197	0.5 mm	10.0 mm	0.48 mm	2	4 mm	50 mm	MMBM-005-10	38.00	MMBM-005-10X	40.70
0.5 mm	.0197	0.6 mm	1.6 mm	0.45 mm	2	6 mm	57 mm			SFBM-005-1X	59.20
0.6 mm	.0236	0.6 mm	12.0 mm	0.58 mm	2	4 mm	50 mm			MMBM-006-12X	40.70
0.6 mm	.0236	0.6 mm	5.0 mm	0.58 mm	2	4 mm	50 mm	MMBM-006-5	38.00	MMBM-006-5X	40.70
0.7 mm	.0276	0.7 mm	5.0 mm	0.68 mm	2	4 mm	50 mm	MMBM-007-5	38.00		
0.8 mm	.0315	0.8 mm	2.5 mm	0.75 mm	2	6 mm	57 mm			SFBM-008-2X	56.30
0.8 mm	.0315	0.8 mm	5.0 mm	0.78 mm	2	4 mm	50 mm	MMBM-008-5	32.65	MMBM-008-5X	35.40
0.8 mm	.0315	0.8 mm	5.2 mm	0.75 mm	2	6 mm	57 mm			SFBM-008-5X	56.30
0.8 mm	.0315	0.8 mm	8.0 mm	0.75 mm	2	6 mm	57 mm	SFBM-008-8	56.30	SFBM-008-8X	60.95
0.8 mm	.0315	0.8 mm	10.0 mm	0.78 mm	2	4 mm	50 mm	MMBM-008-10	32.65		
1.0 mm	.0394	1.3 mm	3.3 mm	0.95 mm	2	6 mm	57 mm			SFBM-010-3X	53.60
1.0 mm	.0394	1.0 mm	6.0 mm	0.95 mm	2	6 mm	57 mm	MMBM-010-6	35.80	MMBM-010-6X	40.65
1.0 mm	.0394	1.0 mm	8.0 mm	0.95 mm	2	6 mm	57 mm			MMBM-010-8X	40.65
1.0 mm	.0394	1.0 mm	11.0 mm	0.95 mm	2	6 mm	57 mm	MMBM-010-11	35.80	MMBM-010-11X	40.65
1.0 mm	.0394	1.0 mm	12.0 mm	0.95 mm	2	6 mm	57 mm			MMBM-010-12X	40.65
1.0 mm	.0394	1.0 mm	15.0 mm	0.95 mm	2	6 mm	57 mm			MMBM-010-15X	40.65
1.0 mm	.0394	1.0 mm	20.0 mm	0.95 mm	2	6 mm	57 mm	MMBM-010-20	35.80	MMBM-010-20X	40.65
1.2 mm	.0472	1.2 mm	7.0 mm	1.15 mm	2	6 mm	57 mm			MMBM-012-7X	40.65
1.2 mm	.0472	1.2 mm	15.0 mm	1.15 mm	2	6 mm	57 mm	MMBM-012-15	35.80	MMBM-012-15X	40.65
1.2 mm	.0472	1.2 mm	20.0 mm	1.15 mm	2	6 mm	57 mm	MMBM-012-20	35.80		
1.5 mm	.0591	1.5 mm	7.0 mm	1.45 mm	2	6 mm	57 mm	MMBM-015-7	35.80	MMBM-015-7X	40.65
1.5 mm	.0591	1.5 mm	9.5 mm	1.45 mm	2	6 mm	57 mm	SFBM-015-9	46.45	SFBM-015-9X	51.20

*.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

End Mills

Cutter Diameter*		Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" -.0020" (h6) decimal equiv.	L2	L3	D3	D2 (h6)	L1	Tool #	Price	Tool #	Price		
1.5 mm	.0591	1.5 mm	15.0 mm	1.45 mm	2	6 mm	57 mm	MMBM-015-15	35.80	MMBM-015-15X	40.65
1.5 mm	.0591	1.5 mm	20.0 mm	1.45 mm	2	6 mm	57 mm			MMBM-015-20X	40.65
2.0 mm	.0787	2.0 mm	7.0 mm	1.9 mm	2	6 mm	57 mm	MMBM-020-7	35.80	MMBM-020-7X	40.65
2.0 mm	.0787	2.0 mm	15.0 mm	1.9 mm	2	6 mm	57 mm	MMBM-020-15	35.80	MMBM-020-15X	40.65
2.0 mm	.0787	2.0 mm	20.0 mm	1.9 mm	2	6 mm	57 mm	MMBM-020-20	35.80	MMBM-020-20X	40.65
2.0 mm	.0787	2.5 mm	9.5 mm	1.95 mm	2	6 mm	57 mm	SFBM-020-9	44.65	SFBM-020-9X	49.45
2.0 mm	.0787	5.0 mm	15.0 mm	1.5 mm	4	6 mm	57 mm			BLRM-020-4X	35.30
3.0 mm	.1181	3.0 mm	12.0 mm	2.9 mm	2	6 mm	57 mm			MMBM-030-12X	40.65
3.0 mm	.1181	3.0 mm	15.0 mm	2.9 mm	2	6 mm	57 mm	MMBM-030-15	35.80	MMBM-030-15X	40.65
3.0 mm	.1181	4.0 mm	8.0 mm	2.9 mm	2	6 mm	57 mm	SFBM-030-8	39.95	SFBM-030-8X	44.80
3.0 mm	.1181	4.0 mm	15.0 mm	2.9 mm	2	6 mm	57 mm	SFBM-030-15	42.85	SFBM-030-15X	47.65
3.0 mm	.1181	8.0 mm	30.0 mm	2.5 mm	2	6 mm	75 mm	BLRM-030-2	32.15	BLRM-030-2X	37.05
3.0 mm	.1181	8.0 mm	30.0 mm	2.5 mm	4	6 mm	75 mm	BLRM-030-4	32.15	BLRM-030-4X	37.05
4.0 mm	.1575	4.0 mm	15.0 mm	3.8 mm	2	6 mm	57 mm	MMBM-040-15	35.80	MMBM-040-15X	40.65
4.0 mm	.1575	5.0 mm	10.0 mm	3.9 mm	2	6 mm	57 mm			SFBM-040-10X	44.80
4.0 mm	.1575	5.0 mm	20.0 mm	3.9 mm	2	6 mm	57 mm	SFBM-040-20	44.65	SFBM-040-20X	49.45
4.0 mm	.1575	8.0 mm	30.0 mm	3.5 mm	2	6 mm	75 mm	BLRM-040-2	32.15	BLRM-040-2X	37.05
4.0 mm	.1575	8.0 mm	30.0 mm	3.5 mm	3	6 mm	75 mm	BLRM-040-3	32.15		
4.0 mm	.1575	8.0 mm	30.0 mm	3.5 mm	4	6 mm	75 mm	BLRM-040-4	32.15	BLRM-040-4X	37.05

D1 +.0000" -.0030" (h6) decimal equiv.	L2	L3	D3	D2 (h6)	L1	Tool #	Price	Tool #	Price		
.1875	.1875	.375	2.00	.1675	2	.1875	3.0	BLR-187-2	37.95	BLR-187-2X	41.80
.1875	.1875	.375	2.00	.1675	4	.1875	3.0			BLR-187-4X	41.80
5 mm	.1969	6.0 mm	11.0 mm	4.9 mm	2	6 mm	57 mm			SFBM-050-11X	42.75
6 mm	.2362	7.5 mm	12.5 mm	5.9 mm	2	6 mm	57 mm	SFBM-060-12	37.35	SFBM-060-12X	42.20
6 mm	.2362	7.5 mm	25.0 mm	5.9 mm	2	6 mm	57 mm	SFBM-060-25	40.25	SFBM-060-25X	45.05
6 mm	.2362	12.0 mm	50.0 mm	5.5 mm	2	6 mm	100 mm	BLRM-060-2	41.25		
6 mm	.2362	12.0 mm	50.0 mm	5.5 mm	4	6 mm	100 mm	BLRM-060-4	41.25	BLRM-060-4X	46.05
6 mm	.2362	12.0 mm	50.0 mm	12.0 mm	3	6 mm	100 mm			BLRM-060-3X	46.05
.2500	.2500	.500	2.50	.2300	2	.2500	4.0	BLR-250-2	45.75	BLR-250-2X	50.50
.2500	.2500	.500	2.50	.2300	4	.2500	4.0	BLR-250-4	45.75	BLR-250-4X	50.50
.3125	.3125	.625	2.63	.2925	2	.3125	4.0	BLR-312-2	52.70	BLR-312-2X	60.10
8 mm	.3150	14.0 mm	50.0 mm	7.5 mm	2	8 mm	100 mm	BLRM-080-2	56.30	BLRM-080-2X	61.90
8 mm	.3150	14.0 mm	50.0 mm	7.5 mm	4	8 mm	100 mm	BLRM-080-4	56.30	BLRM-080-4X	61.90
.3750	.3750	.750	2.75	.3550	4	.3750	4.0	BLR-375-4	60.70	BLR-375-4X	69.50
10 mm	.3937	18.0 mm	65.0 mm	9.5 mm	2	10 mm	120 mm	BLRM-100-2	63.25		
10 mm	.3937	18.0 mm	65.0 mm	9.5 mm	4	10 mm	120 mm	BLRM-100-4	63.25	BLRM-100-4X	73.05
.4375	.4375	1.000	4.50	.4175	2	.4375	6.0	BLR-437-2	91.60		
.4375	.4375	1.000	4.50	.4175	4	.4375	6.0	BLR-437-4	91.60		
12 mm	.4724	22.0 mm	80.0 mm	11.5 mm	2	12 mm	130 mm	BLRM-120-2	88.60	BLRM-120-2X	100.50
12 mm	.4724	22.0 mm	80.0 mm	11.5 mm	3	12 mm	130 mm	BLRM-120-3	88.60	BLRM-120-3X	100.50

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

Continued on next page

BLR / BLRM
SFBM / MMBM



End Mills – Ball

2, 3, 4 Flute – Reduced Neck (cont.)

Continued from previous page

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		AITIN Coated	
D1 +.0000" -.0030"	(h6)	decimal equiv.	L2	L3	D3	D2 (h6)	L1	Tool #	Price	Tool #	Price	
			+ .015" -.000" +.38 mm -.00 mm	+ .030" -.030" +.38 mm -.38 mm								
12 mm		.4724	22.0 mm	80.0 mm	11.5 mm	4	12 mm	130 mm		BLRM-120-4X	100.50	
.5000		.5000	1.000	4.50	.4800	2	.5000	6.0	BLR-500-2	104.75	BLR-500-2X	118.65
.5000		.5000	1.000	4.50	.4800	4	.5000	6.0	BLR-500-4	104.75	BLR-500-4X	118.65
.6250		.6250	1.250	4.50	.6050	2	.6250	6.0	BLR-625-2	185.60		
16 mm		.6299	30.0 mm	100.0 mm	15.5 mm	4	16 mm	150 mm	BLRM-160-4	156.45		
.7500		.7500	1.500	4.50	.7300	2	.7500	6.0	BLR-750-2	281.90		
20 mm		.7874	38.0 mm	100.0 mm	19.5 mm	3	20 mm	150 mm	BLRM-200-3	255.95	BLRM-200-3X	279.15
20 mm		.7874	38.0 mm	100.0 mm	19.5 mm	4	20 mm	150 mm	BLRM-200-4	255.95		
20 mm		.7874	38.0 mm	100.0 mm	38.0 mm	2	20 mm	150 mm			BLRM-200-2X	279.15

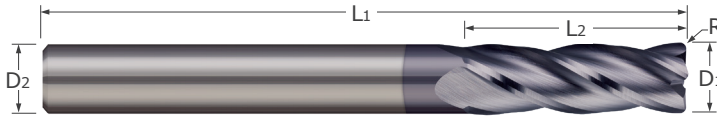
*.0005" / .013 mm max TIR. SFBM and MMBM tools held to h8 tolerance

End Mills – Corner Radius

2, 3, 4 Flute



AECM / GEC



End Mills

- 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	(h9)	decimal equiv.	L2	R		D2 (h6)	L1	Tool #	Price	Tool #	Price
+ .0000" - .0020"			+ .031" - .000"	+ .0000" - .0005"							
			+ .79 mm - .00 mm	+ .000 mm - .013 mm							
.0312	.0312	.0312	.078	.005	2	.1250	1.5	GEC-031-2-005	18.40	GEC-031-2-005X	20.90
.0312	.0312	.0312	.078	.005	3	.1250	1.5	GEC-031-3-005	18.40	GEC-031-3-005X	20.90
.0312	.0312	.0312	.078	.005	4	.1250	1.5			GEC-031-4-005X	20.90
1 mm	.0394	.0394	4 mm	0.1 mm	4	4 mm	50 mm			AECM-0101-4X	23.15
1 mm	.0394	.0394	4 mm	0.2 mm	4	4 mm	50 mm			AECM-0102-4X	23.15
.0625	.0625	.0625	.188	.005	2	.1250	1.5	GEC-062-2-005	16.60		
.0625	.0625	.0625	.188	.005	3	.1250	1.5	GEC-062-3-005	16.60	GEC-062-3-005X	19.10
.0625	.0625	.0625	.188	.005	4	.1250	1.5	GEC-062-4-005	16.60	GEC-062-4-005X	19.10
.0625	.0625	.0625	.188	.010	3	.1250	1.5	GEC-062-3-010	16.60	GEC-062-3-010X	19.10
.0625	.0625	.0625	.188	.010	4	.1250	1.5	GEC-062-4-010	16.60	GEC-062-4-010X	19.10
2 mm	.0787	.0787	5 mm	0.2 mm	4	4 mm	50 mm			AECM-0202-4X	23.15
2 mm	.0787	.0787	5 mm	0.5 mm	4	4 mm	50 mm			AECM-0205-4X	23.15
.0938	.0938	.0938	.375	.005	4	.1250	1.5			GEC-093-4-005X	19.10
.0938	.0938	.0938	.375	.010	2	.1250	1.5	GEC-093-2-010	16.60	GEC-093-2-010X	19.10
.0938	.0938	.0938	.375	.010	3	.1250	1.5	GEC-093-3-010	16.60	GEC-093-3-010X	19.10
.0938	.0938	.0938	.375	.010	4	.1250	1.5			GEC-093-4-010X	19.10
3 mm	.1181	.1181	8 mm	0.5 mm	4	6 mm	57 mm			AECM-0305-4X	30.60
.1250	.1250	.1250	.500	.010	3	.1250	1.5	GEC-125-3-010	16.60	GEC-125-3-010X	19.10
.1250	.1250	.1250	.500	.010	4	.1250	1.5	GEC-125-4-010	16.60	GEC-125-4-010X	19.10
.1250	.1250	.1250	.500	.020	2	.1250	1.5			GEC-125-2-020X	19.10
.1250	.1250	.1250	.500	.020	3	.1250	1.5	GEC-125-3-020	16.60	GEC-125-3-020X	19.10
.1250	.1250	.1250	.500	.020	4	.1250	1.5	GEC-125-4-020	16.60	GEC-125-4-020X	19.10
4 mm	.1575	.1575	11 mm	0.2 mm	4	6 mm	57 mm			AECM-0402-4X	30.60
4 mm	.1575	.1575	11 mm	0.5 mm	4	6 mm	57 mm			AECM-0405-4X	30.60
.1875	.1875	.1875	.625	.010	4	.1875	2.0			GEC-187-4-010X	26.45
.1875	.1875	.1875	.625	.020	3	.1875	2.0	GEC-187-3-020	23.60	GEC-187-3-020X	26.45
.1875	.1875	.1875	.625	.030	2	.1875	2.0	GEC-187-2-030	23.60		
.1875	.1875	.1875	.625	.030	3	.1875	2.0	GEC-187-3-030	23.60	GEC-187-3-030X	26.45
.1875	.1875	.1875	.625	.030	4	.1875	2.0			GEC-187-4-030X	26.45
5 mm	.1969	.1969	16 mm	1.0 mm	3	6 mm	57 mm	AECM-0510-3	25.65		
6 mm	.2362	.2362	16 mm	0.3 mm	4	6 mm	57 mm	AECM-0603-4	25.65	AECM-0603-4X	30.60
6 mm	.2362	.2362	16 mm	0.5 mm	4	6 mm	57 mm	AECM-0605-4	25.65	AECM-0605-4X	30.60
6 mm	.2362	.2362	16 mm	1.0 mm	4	6 mm	57 mm			AECM-0610-4X	30.60

*.0005" / .013 mm max TIR

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Cutter Diameter*		Length of Cut	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		AITIN Coated	
D1 +.0000" -.0020" (h9)	decimal equiv.	L2 +.031" -.000" +.79 mm -.00 mm	R +.0000" -.0005" +.000 mm -.013 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
.2500	.2500	.750	.010	2	.2500	2.5	GEC-250-2-010	29.60	GEC-250-2-010X	34.50
.2500	.2500	.750	.010	4	.2500	2.5	GEC-250-4-010	29.60	GEC-250-4-010X	34.50
.2500	.2500	.750	.020	2	.2500	2.5	GEC-250-2-020	29.60		
.2500	.2500	.750	.020	3	.2500	2.5			GEC-250-3-020X	34.50
.2500	.2500	.750	.020	4	.2500	2.5			GEC-250-4-020X	34.50
.2500	.2500	.750	.030	3	.2500	2.5	GEC-250-3-030	29.60	GEC-250-3-030X	34.50
.2500	.2500	.750	.030	4	.2500	2.5	GEC-250-4-030	29.60	GEC-250-4-030X	34.50
.3125	.3125	.813	.010	2	.3125	2.5	GEC-312-2-010	34.45	GEC-312-2-010X	41.35
.3125	.3125	.813	.010	4	.3125	2.5	GEC-312-4-010	34.45	GEC-312-4-010X	41.35
.3125	.3125	.813	.020	2	.3125	2.5	GEC-312-2-020	34.45		
8 mm	.3150	22 mm	1.0 mm	2	8 mm	63 mm	AECM-0810-2	31.60		
.3750	.3750	.875	.010	2	.3750	2.5	GEC-375-2-010	39.10	GEC-375-2-010X	45.95
.3750	.3750	.875	.010	4	.3750	2.5	GEC-375-4-010	39.10	GEC-375-4-010X	45.95
.3750	.3750	.875	.030	3	.3750	2.5	GEC-375-3-030	39.10	GEC-375-3-030X	45.95
.3750	.3750	.875	.030	4	.3750	2.5			GEC-375-4-030X	45.95
10 mm	.3937	25 mm	0.5 mm	2	10 mm	72 mm	AECM-1005-2	37.30		
10 mm	.3937	25 mm	0.5 mm	4	10 mm	72 mm	AECM-1005-4	37.30	AECM-1005-4X	44.15
10 mm	.3937	25 mm	1.5 mm	4	10 mm	72 mm	AECM-1015-4	37.30		
12 mm	.4724	30 mm	0.5 mm	4	12 mm	83 mm	AECM-1205-4	59.55		
12 mm	.4724	30 mm	1.0 mm	4	12 mm	83 mm			AECM-1210-4X	69.90
12 mm	.4724	30 mm	1.5 mm	2	12 mm	83 mm			AECM-1215-2X	69.90
12 mm	.4724	30 mm	1.5 mm	3	12 mm	83 mm			AECM-1215-3X	69.90
12 mm	.4724	30 mm	1.5 mm	4	12 mm	83 mm	AECM-1215-4	59.55	AECM-1215-4X	69.90
.5000	.5000	1.000	.010	4	.5000	3.0	GEC-500-4-010	67.70	GEC-500-4-010X	75.75
.5000	.5000	1.000	.030	3	.5000	3.0	GEC-500-3-030	67.70	GEC-500-3-030X	75.75
.6250	.6250	1.250	.020	2	.6250	3.5	GEC-625-2-020	119.70		
.6250	.6250	1.250	.030	3	.6250	3.5	GEC-625-3-030	119.70		
.6250	.6250	1.250	.060	2	.6250	3.5	GEC-625-2-060	119.70		
.6250	.6250	1.250	.090	2	.6250	3.5	GEC-625-2-090	119.70		
.6250	.6250	1.250	.090	3	.6250	3.5	GEC-625-3-090	119.70		
.7500	.7500	1.500	.020	2	.7500	4.0	GEC-750-2-020	182.60		
1.0000	1.0000	1.500	.020	2	1.0000	4.0	GEC-001-2-020	276.55		
1.0000	1.0000	1.500	.030	2	1.0000	4.0	GEC-001-2-030	276.55		
1.0000	1.0000	1.500	.060	2	1.0000	4.0	GEC-001-2-060	276.55		
1.0000	1.0000	1.500	.090	2	1.0000	4.0	GEC-001-2-090	276.55		
1.0000	1.0000	1.500	.125	2	1.0000	4.0	GEC-001-2-125	276.55		

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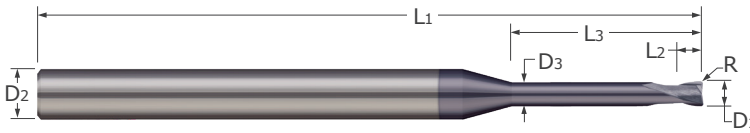
End Mills – Corner Radius

2 Flute – Reduced Neck



Tech Resources
Available Online

MMRM



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

Cutter Diameter*	Length of Cut	Corner Radius	Overall Reach	Neck Diameter	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
							Tool #	Price	Tool #	Price
D1 (h8)	L2 $^{+.38mm}_{-.00mm}$	R $^{+.000mm}_{-.013mm}$	L3 $^{+.25mm}_{-.00mm}$	D3 $^{+.00mm}_{-.13mm}$	D2 (h6)	L1				
0.8 mm	0.8 mm	0.1 mm	5 mm	0.78 mm	4 mm	50 mm	MMRM-008-5	29.45		
0.8 mm	0.8 mm	0.1 mm	10 mm	0.78 mm	4 mm	50 mm	MMRM-008-10	29.45	MMRM-008-10X	32.20
0.8 mm	0.8 mm	0.1 mm	16 mm	0.78 mm	4 mm	50 mm	MMRM-008-16	29.45		
1 mm	1 mm	0.1 mm	8 mm	0.95 mm	6 mm	57 mm	MMRM-010-8	32.55		
1.5 mm	1.5 mm	0.15 mm	7 mm	1.45 mm	6 mm	57 mm	MMRM-015-7	32.55	MMRM-015-7X	37.40
1.5 mm	1.5 mm	0.15 mm	15 mm	1.45 mm	6 mm	57 mm	MMRM-015-15	32.55		
1.5 mm	1.5 mm	0.15 mm	25 mm	1.45 mm	6 mm	72 mm	MMRM-015-25	32.55	MMRM-015-25X	37.40
2 mm	2 mm	0.2 mm	30 mm	1.9 mm	6 mm	72 mm	MMRM-020-30	32.55		
3 mm	3 mm	0.25 mm	8 mm	2.9 mm	6 mm	57 mm	MMRM-030-8	32.55		
3 mm	3 mm	0.25 mm	30 mm	2.9 mm	6 mm	72 mm			MMRM-030-30X	37.40
4 mm	4 mm	0.25 mm	9 mm	3.8 mm	6 mm	57 mm	MMRM-040-9	32.55		
4 mm	4 mm	0.25 mm	15 mm	3.8 mm	6 mm	57 mm			MMRM-040-15X	37.40
5 mm	5 mm	0.50 mm	30 mm	4.8 mm	6 mm	72 mm	MMRM-050-30	32.55		
6 mm	6 mm	1 mm	11 mm	5.8 mm	6 mm	57 mm	MMRM-060-11	32.55	MMRM-060-11X	37.40
10 mm	10 mm	1 mm	25 mm	9.8 mm	10 mm	72 mm	MMRM-100-25	49.50		
12 mm	12 mm	1.5 mm	25 mm	11.8 mm	12 mm	83 mm	MMRM-120-25	79.15		

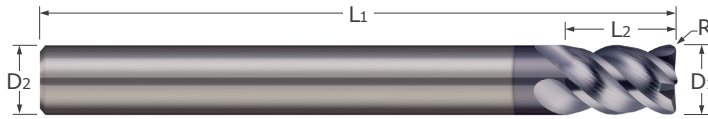
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HMCM



End Mills For Hardened Steels

Corner Radius – 4 Flute



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

Cutter Diameter*	Length of Cut	Corner Radius	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
					Tool #	Price	Tool #	Price
D1 (h8)	L2 $\begin{matrix} +.38 \text{ mm} \\ -.00 \text{ mm} \end{matrix}$	R $\begin{matrix} +.000 \text{ mm} \\ -.013 \text{ mm} \end{matrix}$	D2 (h6)	L1				
3 mm	8 mm	0.5 mm	6 mm	57 mm			HMCM-0305-4X	73.30
4 mm	11 mm	0.5 mm	6 mm	57 mm	HMCM-0405-4	68.75		
5 mm	13 mm	1.0 mm	6 mm	57 mm			HMCM-0510-4X	78.75
6 mm	13 mm	1.0 mm	6 mm	57 mm			HMCM-0610-4X	78.75
8 mm	19 mm	0.5 mm	8 mm	75 mm			HMCM-0805-4X	87.15
8 mm	19 mm	1.0 mm	8 mm	75 mm	HMCM-0810-4	79.90		
8 mm	19 mm	1.5 mm	8 mm	75 mm			HMCM-0815-4X	87.15
8 mm	19 mm	2.0 mm	8 mm	75 mm	HMCM-0820-4	79.90		
10 mm	22 mm	0.5 mm	10 mm	80 mm	HMCM-1005-4	88.05	HMCM-1005-4X	94.45
10 mm	22 mm	2.0 mm	10 mm	80 mm	HMCM-1020-4	88.05		
12 mm	26 mm	0.5 mm	12 mm	100 mm			HMCM-1205-4X	121.35
12 mm	26 mm	1.0 mm	12 mm	100 mm			HMCM-1210-4X	121.35
12 mm	26 mm	1.5 mm	12 mm	100 mm			HMCM-1215-4X	121.35
12 mm	26 mm	2.0 mm	12 mm	100 mm			HMCM-1220-4X	121.35
16 mm	32 mm	1.0 mm	16 mm	110 mm			HMCM-1610-4X	252.90
16 mm	32 mm	2.0 mm	16 mm	110 mm			HMCM-1620-4X	252.90
20 mm	38 mm	1.0 mm	20 mm	125 mm			HMCM-2010-4X	347.55
20 mm	38 mm	1.5 mm	20 mm	125 mm			HMCM-2015-4X	347.55
20 mm	38 mm	1.5 mm	20 mm	125 mm	HMCM-2015-4	326.10		
20 mm	38 mm	2.0 mm	20 mm	125 mm	HMCM-2020-4	326.10	HMCM-2020-4X	347.55
20 mm	38 mm	3.0 mm	20 mm	125 mm	HMCM-2030-4	326.10	HMCM-2030-4X	347.55

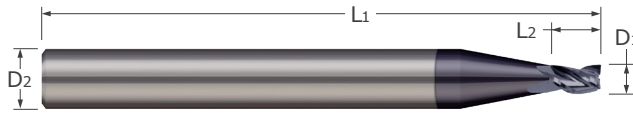
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End Mills For Steels & High Temperature Alloys

Square – 2 & 3 Flute – Stub Flute



MEF / MEFM



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

Steels & High Temp. Alloys

Cutter Diameter*			Length of Cut L2	Flutes	Shank Diameter D2 (h6)	Overall Length L1	Uncoated		nACRo® Coated	
D1 +.0000" -.0005"	+.000 mm -.013 mm	decimal equiv.					Tool #	Price	Tool #	Price
0.1 mm	.0039	0.15 mm	2	3 mm	38 mm			MEFM-001-015K	71.80	
0.15 mm	.0059	0.25 mm	2	3 mm	38 mm			MEFM-0015-025K	58.55	
0.2 mm	.0079	0.3 mm	2	3 mm	38 mm	MEFM-002-030	45.50	MEFM-002-030K	49.50	
.0100	.0100	.015	2	.1250	1.5	MEF-010-015	40.40	MEF-010-015K	44.40	
.0100	.0100	.015	3	.1250	1.5	MEF-010-015-3	40.40	MEF-010-015-3K	44.40	
0.3 mm	.0118	0.45 mm	2	3 mm	38 mm	MEFM-003-045	40.40	MEFM-003-045K	44.40	
.0150	.0150	.023	2	.1250	1.5	MEF-015-023	35.85	MEF-015-023K	39.85	
.0150	.0150	.023	3	.1250	1.5	MEF-015-023-3	35.85	MEF-015-023-3K	39.85	
0.4 mm	.0157	0.6 mm	2	3 mm	38 mm	MEFM-004-060	35.85	MEFM-004-060K	39.85	
.0200	.0200	.030	2	.1250	1.5			MEF-020-030K	29.15	
.0200	.0200	.030	3	.1250	1.5	MEF-020-030-3	25.15	MEF-020-030-3K	29.15	
0.6 mm	.0236	0.9 mm	2	3 mm	38 mm	MEFM-006-090	25.15	MEFM-006-090K	29.15	
.0250	.0250	.038	2	.1250	1.5	MEF-025-038	25.15	MEF-025-038K	29.15	
.0250	.0250	.038	3	.1250	1.5	MEF-025-038-3	25.15	MEF-025-038-3K	29.15	
.0300	.0300	.045	2	.1250	1.5	MEF-030-045	23.00	MEF-030-045K	27.00	
.0300	.0300	.045	3	.1250	1.5	MEF-030-045-3	23.00	MEF-030-045-3K	27.00	
.0313	.0313	.047	2	.1250	1.5	MEF-031-047	23.00	MEF-031-047K	27.00	
.0313	.0313	.047	3	.1250	1.5			MEF-031-047-3K	27.00	
0.8 mm	.0315	1.2 mm	2	3 mm	38 mm	MEFM-008-120	23.00	MEFM-008-120K	27.00	
.0350	.0350	.053	2	.1250	1.5	MEF-035-053	23.00	MEF-035-053K	27.00	
.0350	.0350	.053	3	.1250	1.5			MEF-035-053-3K	27.00	
1 mm	.0394	1.5 mm	2	3 mm	38 mm	MEFM-010-150	23.00	MEFM-010-150K	27.00	
.0400	.0400	.060	2	.1250	1.5	MEF-040-060	23.00	MEF-040-060K	27.00	
.0400	.0400	.060	3	.1250	1.5	MEF-040-060-3	23.00	MEF-040-060-3K	27.00	
.0450	.0450	.068	2	.1250	1.5	MEF-045-068	23.00	MEF-045-068K	27.00	
.0450	.0450	.068	3	.1250	1.5	MEF-045-068-3	23.00	MEF-045-068-3K	27.00	
.0469	.0469	.071	2	.1250	1.5	MEF-047-071	23.00	MEF-047-071K	27.00	
.0469	.0469	.071	3	.1250	1.5	MEF-047-071-3	23.00	MEF-047-071-3K	27.00	
1.2 mm	.0472	1.8 mm	2	3 mm	38 mm	MEFM-012-180	23.00	MEFM-012-180K	27.00	
.0500	.0500	.075	2	.1250	1.5	MEF-050-075	23.00			
.0500	.0500	.075	3	.1250	1.5			MEF-050-075-3K	27.00	

*.0005" / .013 mm max TIR

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MEF / MEFM



End Mills For Steels & High Temperature Alloys
Square – 2 & 3 Flute – Stub Flute (cont.)

Continued from previous page

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
D1 +.0000" -.0005"	+.000 mm -.013 mm	decimal equiv.	L2 +.015" -.000" +.38 mm -.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
.0600		.0600	.090	2	.1250	1.5	MEF-060-090	23.00	MEF-060-090K	27.00
.0600		.0600	.090	3	.1250	1.5	MEF-060-090-3	23.00	MEF-060-090-3K	27.00
.0625		.0625	.093	2	.1250	1.5	MEF-062-093	23.00		
.0625		.0625	.093	3	.1250	1.5	MEF-062-093-3	23.00		
.0750		.0750	.113	2	.1250	1.5	MEF-075-113	23.00	MEF-075-113K	27.00
.0750		.0750	.113	3	.1250	1.5	MEF-075-113-3	23.00	MEF-075-113-3K	27.00
.0781		.0781	.117	2	.1250	1.5			MEF-078-117K	27.15
	2 mm	.0787	2.5 mm	2	3 mm	38 mm	MEFM-020-250	23.00	MEFM-020-250K	27.00
.0900		.0900	.125	2	.1250	1.5	MEF-090-125	23.00	MEF-090-125K	27.00
	2.5 mm	.0984	3 mm	2	3 mm	38 mm	MEFM-025-300	23.00	MEFM-025-300K	27.00
	3 mm	.1181	3 mm	2	6 mm	57 mm	MEFM-030-300	30.50		
.1250		.1250	.125	2	.1875	2.0	MEF-125-125	25.15		
	4 mm	.1575	5 mm	2	6 mm	57 mm	MEFM-040-500	30.50	MEFM-040-500K	36.25
.1875		.1875	.200	2	.2500	2.5			MEF-187-250K	38.20
D1 +.0000" -.0010"		decimal equiv.	L2 +.015" -.000"		D2 (h6)	L1	Tool #	Price	Tool #	Price
.2500		.2500	.250	2	.2500	2.5	MEF-250-250	30.50	MEF-250-250K	36.25

*.0005" / .013 mm max TIR

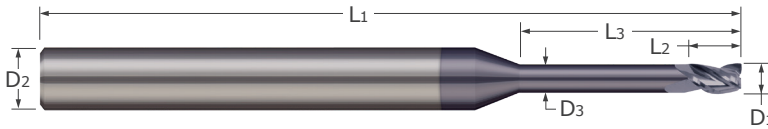
Steels & High Temp. Alloys

End Mills For Steels & High Temperature 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

Steels & High Temp. Alloys

Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D1 +.0000" +.000 mm -.0005" -.013 mm	decimal equiv.	L2	L3	D3	D2 (h6)	L1	Tool #	Price	Tool #	Price		
											+.015" +.010" -.000" -.010"	+.38 mm +.25 mm -.00 mm -.00 mm
.0100	.0100	.015	.050	.009	2	.1250	1.5	MEF-010-050	45.75	MEF-010-050K	49.75	
.0100	.0100	.015	.050	.009	3	.1250	1.5	MEF-010-050-3	45.75	MEF-010-050-3K	49.75	
.0100	.0100	.015	.075	.009	2	.1250	1.5	MEF-010-075	45.75	MEF-010-075K	49.75	
.0100	.0100	.015	.075	.009	3	.1250	1.5	MEF-010-075-3	45.75	MEF-010-075-3K	49.75	
.0150	.0150	.023	.100	.014	2	.1250	1.5	MEF-015-100	41.20	MEF-015-100K	45.20	
.0150	.0150	.023	.100	.014	3	.1250	1.5	MEF-015-100-3	41.20	MEF-015-100-3K	45.20	
.0150	.0150	.023	.200	.014	2	.1250	1.5	MEF-015-200	42.25	MEF-015-200K	46.25	
.0150	.0150	.023	.200	.014	3	.1250	1.5	MEF-015-200-3	42.25	MEF-015-200-3K	46.25	
.0200	.0200	.030	.150	.019	2	.1250	1.5			MEF-020-150K	34.50	
.0200	.0200	.030	.150	.019	3	.1250	1.5	MEF-020-150-3	30.50	MEF-020-150-3K	34.50	
.0200	.0200	.030	.250	.019	2	.1250	1.5	MEF-020-250	31.55	MEF-020-250K	35.55	
.0200	.0200	.030	.250	.019	3	.1250	1.5	MEF-020-250-3	31.55	MEF-020-250-3K	35.55	
0.6 mm	.0236	0.9 mm	3 mm	0.55 mm	2	3 mm	38 mm	MEFM-006-300	30.50			
0.6 mm	.0236	0.9 mm	5 mm	0.55 mm	2	3 mm	38 mm	MEFM-006-500	31.55	MEFM-006-500K	35.55	
0.6 mm	.0236	0.9 mm	6 mm	0.55 mm	2	3 mm	38 mm	MEFM-006-600	33.15	MEFM-006-600K	37.15	
.0250	.0250	.038	.250	.024	3	.1250	1.5	MEF-025-250-3	31.55	MEF-025-250-3K	35.55	
.0250	.0250	.038	.150	.024	3	.1250	1.5	MEF-025-150-3	30.50			
.0250	.0250	.038	.250	.024	2	.1250	1.5	MEF-025-250	31.55	MEF-025-250K	35.55	
.0250	.0250	.038	.150	.024	2	.1250	1.5			MEF-025-150K	34.50	
.0300	.0300	.045	.100	.028	2	.1250	1.5	MEF-030-100	28.35	MEF-030-100K	32.35	
.0300	.0300	.045	.100	.028	3	.1250	1.5	MEF-030-100-3	28.35	MEF-030-100-3K	32.35	
.0300	.0300	.045	.200	.028	2	.1250	1.5	MEF-030-200	29.45			
.0300	.0300	.045	.200	.028	3	.1250	1.5	MEF-030-200-3	29.45	MEF-030-200-3K	33.40	
.0300	.0300	.045	.375	.028	2	.1250	1.5	MEF-030-375	32.65			
.0300	.0300	.045	.375	.028	3	.1250	1.5	MEF-030-375-3	32.65	MEF-030-375-3K	36.65	
.0313	.0313	.047	.100	.029	2	.1250	1.5	MEF-031-100	28.35	MEF-031-100K	32.35	
.0313	.0313	.047	.100	.029	3	.1250	1.5	MEF-031-100-3	28.35	MEF-031-100-3K	32.35	
.0313	.0313	.047	.200	.029	2	.1250	1.5	MEF-031-200	29.45	MEF-031-200K	33.40	
.0313	.0313	.047	.200	.029	3	.1250	1.5	MEF-031-200-3	29.45	MEF-031-200-3K	33.40	
.0313	.0313	.047	.375	.029	2	.1250	1.5	MEF-031-375	32.65	MEF-031-375K	36.65	
.0313	.0313	.047	.375	.029	3	.1250	1.5	MEF-031-375-3	32.65	MEF-031-375-3K	36.65	

*.0005" / .013 mm max TIR

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End Mills For Steels & High Temperature Alloys
Square – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

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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"	L3 +.38 mm -.00 mm	D3 +.010" -.010"	D2 (h6)	L1	Tool #	Price	Tool #	Price	
0.8 mm	.0315		1.2 mm	4 mm	0.75 mm	2	3 mm	38 mm	MEFM-008-400	30.50	MEFM-008-400K	34.50
0.8 mm	.0315		1.2 mm	7 mm	0.75 mm	2	3 mm	38 mm	MEFM-008-700	33.15	MEFM-008-700K	37.15
0.8 mm	.0315		1.2 mm	9 mm	0.75 mm	2	3 mm	38 mm	MEFM-008-900	37.45	MEFM-008-900K	41.45
.0350	.0350		.053	.150	.033	2	.1250	1.5	MEF-035-150	28.35	MEF-035-150K	32.35
.0350	.0350		.053	.150	.033	3	.1250	1.5	MEF-035-150-3	28.35	MEF-035-150-3K	32.35
.0350	.0350		.053	.250	.033	2	.1250	1.5	MEF-035-250	29.45	MEF-035-250K	33.40
.0350	.0350		.053	.250	.033	3	.1250	1.5	MEF-035-250-3	29.45	MEF-035-250-3K	33.40
.0350	.0350		.053	.400	.033	3	.1250	1.5	MEF-035-400-3	32.65	MEF-035-400-3K	36.65
1 mm	.0394		1.5 mm	4 mm	0.95 mm	2	3 mm	38 mm	MEFM-010-400	30.50	MEFM-010-400K	34.50
1 mm	.0394		1.5 mm	7 mm	0.95 mm	2	3 mm	38 mm	MEFM-010-700	33.15	MEFM-010-700K	37.15
1 mm	.0394		1.5 mm	9 mm	0.95 mm	2	3 mm	38 mm	MEFM-010-900	37.45		
.0400	.0400		.060	.150	.038	3	.1250	1.5			MEF-040-150-3K	32.75
.0400	.0400		.060	.250	.038	2	.1250	1.5	MEF-040-250	29.45	MEF-040-250K	33.40
.0400	.0400		.060	.250	.038	3	.1250	1.5	MEF-040-250-3	29.45	MEF-040-250-3K	33.40
.0400	.0400		.060	.500	.038	2	.1250	1.5	MEF-040-500	34.75	MEF-040-500K	38.75
.0400	.0400		.060	.500	.038	3	.1250	1.5			MEF-040-500-3K	38.75
.0450	.0450		.068	.150	.043	2	.1250	1.5	MEF-045-150	28.35	MEF-045-150K	32.35
.0450	.0450		.068	.150	.043	3	.1250	1.5	MEF-045-150-3	28.35	MEF-045-150-3K	32.35
.0450	.0450		.068	.250	.043	2	.1250	1.5	MEF-045-250	29.45	MEF-045-250K	33.40
.0450	.0450		.068	.250	.043	3	.1250	1.5	MEF-045-250-3	29.45	MEF-045-250-3K	33.40
.0450	.0450		.068	.500	.043	2	.1250	1.5			MEF-045-500K	38.75
.0450	.0450		.068	.500	.043	3	.1250	1.5	MEF-045-500-3	34.75	MEF-045-500-3K	38.75
.0469	.0469		.071	.150	.045	2	.1250	1.5	MEF-047-150	28.35	MEF-047-150K	32.35
.0469	.0469		.071	.150	.045	3	.1250	1.5	MEF-047-150-3	28.35	MEF-047-150-3K	32.35
.0469	.0469		.071	.250	.045	2	.1250	1.5			MEF-047-250K	33.40
.0469	.0469		.071	.250	.045	3	.1250	1.5	MEF-047-250-3	29.45	MEF-047-250-3K	33.40
.0469	.0469		.071	.500	.045	2	.1250	1.5	MEF-047-500	34.75	MEF-047-500K	38.75
.0469	.0469		.071	.500	.045	3	.1250	1.5	MEF-047-500-3	34.75	MEF-047-500-3K	38.75
1.2 mm	.0472		1.8 mm	6 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-600	33.15	MEFM-012-600K	37.15
1.2 mm	.0472		1.8 mm	10 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-1000	37.45	MEFM-012-1000K	41.45
1.2 mm	.0472		1.8 mm	12 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-1200	40.40	MEFM-012-1200K	44.40
.0500	.0500		.075	.200	.048	2	.1250	1.5			MEF-050-200K	32.35
.0500	.0500		.075	.200	.048	3	.1250	1.5	MEF-050-200-3	28.35	MEF-050-200-3K	32.35
.0500	.0500		.075	.300	.048	2	.1250	1.5	MEF-050-300	30.50	MEF-050-300K	34.50
.0500	.0500		.075	.300	.048	3	.1250	1.5	MEF-050-300-3	30.50	MEF-050-300-3K	34.50
.0500	.0500		.075	.550	.048	2	.1250	1.5			MEF-050-550K	38.75
.0500	.0500		.075	.550	.048	3	.1250	1.5	MEF-050-550-3	34.75	MEF-050-550-3K	38.75
1.5 mm	.0591		2.2 mm	6 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-600	33.15		
1.5 mm	.0591		2.2 mm	10 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1000	37.45	MEFM-015-1000K	41.45
1.5 mm	.0591		2.2 mm	12 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1200	40.40	MEFM-015-1200K	44.40
.0600	.0600		.090	.200	.056	2	.1250	1.5	MEF-060-200	28.35	MEF-060-200K	32.35
.0600	.0600		.090	.200	.056	3	.1250	1.5	MEF-060-200-3	28.35	MEF-060-200-3K	32.35

*.0005" / .013 mm max TIR

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Steels & High Temp. Alloys

End Mills For Steels & High Temperature Alloys

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



MEF / MEFM

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Steels & High Temp. Alloys

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 #	Price	Tool #	Price
+ .0000"	+ .000 mm	decimal	+ .015"	+ .010"								
-.0005"	-.013 mm	equiv.	+.38 mm	+.25 mm								
			-.00 mm	-.00 mm								
.0600	.0600	.0600	.090	.350	.056	2	.1250	1.5	MEF-060-350	30.50	MEF-060-350K	34.50
.0600	.0600	.0600	.090	.350	.056	3	.1250	1.5	MEF-060-350-3	30.50		
.0600	.0600	.0600	.090	.500	.056	2	.1250	1.5	MEF-060-500	34.75	MEF-060-500K	38.75
.0600	.0600	.0600	.090	.500	.056	3	.1250	1.5	MEF-060-500-3	34.75	MEF-060-500-3K	38.75
.0600	.0600	.0600	.090	.750	.056	2	.1250	2.0	MEF-060-750	40.15	MEF-060-750K	44.15
.0600	.0600	.0600	.090	.750	.056	3	.1250	2.0	MEF-060-750-3	40.15	MEF-060-750-3K	44.15
.0625	.0625	.0625	.093	.200	.058	2	.1250	1.5	MEF-062-200	28.35	MEF-062-200K	32.35
.0625	.0625	.0625	.093	.200	.058	3	.1250	1.5	MEF-062-200-3	28.35	MEF-062-200-3K	32.35
.0625	.0625	.0625	.093	.350	.058	2	.1250	1.5	MEF-062-350	30.50	MEF-062-350K	34.50
.0625	.0625	.0625	.093	.350	.058	3	.1250	1.5	MEF-062-350-3	30.50	MEF-062-350-3K	34.50
.0625	.0625	.0625	.093	.550	.058	2	.1250	1.5	MEF-062-550	34.75	MEF-062-550K	38.75
.0625	.0625	.0625	.093	.550	.058	3	.1250	1.5	MEF-062-550-3	34.75		
.0625	.0625	.0625	.093	.750	.058	2	.1250	2.0	MEF-062-750	40.15		
.0625	.0625	.0625	.093	.750	.058	3	.1250	2.0	MEF-062-750-3	40.15	MEF-062-750-3K	44.15
.0750	.0750	.0750	.113	.250	.071	2	.1250	1.5	MEF-075-250	28.35	MEF-075-250K	32.35
.0750	.0750	.0750	.113	.250	.071	3	.1250	1.5	MEF-075-250-3	28.35	MEF-075-250-3K	32.35
.0750	.0750	.0750	.113	.400	.071	2	.1250	1.5	MEF-075-400	30.50	MEF-075-400K	34.50
.0750	.0750	.0750	.113	.400	.071	3	.1250	1.5	MEF-075-400-3	30.50	MEF-075-400-3K	34.50
.0750	.0750	.0750	.113	.600	.071	2	.1250	2.0	MEF-075-600	34.75		
.0750	.0750	.0750	.113	.600	.071	3	.1250	2.0	MEF-075-600-3	34.75		
.0750	.0750	.0750	.113	.900	.071	2	.1250	2.0	MEF-075-900	41.75	MEF-075-900K	45.75
.0750	.0750	.0750	.113	.900	.071	3	.1250	2.0	MEF-075-900-3	41.75	MEF-075-900-3K	45.75
.0781	.0781	.0781	.117	.250	.074	2	.1250	1.5	MEF-078-250	28.35	MEF-078-250K	32.35
.0781	.0781	.0781	.117	.250	.074	3	.1250	1.5	MEF-078-250-3	28.35	MEF-078-250-3K	32.35
.0781	.0781	.0781	.117	.400	.074	2	.1250	1.5	MEF-078-400	30.50	MEF-078-400K	34.50
.0781	.0781	.0781	.117	.400	.074	3	.1250	1.5	MEF-078-400-3	30.50		
.0781	.0781	.0781	.117	.650	.074	2	.1250	2.0	MEF-078-650	34.75	MEF-078-650K	38.75
.0781	.0781	.0781	.117	.650	.074	3	.1250	2.0	MEF-078-650-3	34.75	MEF-078-650-3K	38.75
.0781	.0781	.0781	.117	.900	.074	2	.1250	2.0	MEF-078-900	41.75	MEF-078-900K	45.75
.0781	.0781	.0781	.117	.900	.074	3	.1250	2.0	MEF-078-900-3	41.75	MEF-078-900-3K	45.75
2 mm	.0787	2.5 mm	7 mm	19 mm	1.9 mm	2	3 mm	38 mm	MEFM-020-700	33.15	MEFM-020-700K	37.15
2 mm	.0787	2.5 mm	12 mm	19 mm	1.9 mm	2	3 mm	38 mm			MEFM-020-1200K	44.40
2 mm	.0787	2.5 mm	16 mm	19 mm	1.9 mm	2	3 mm	38 mm	MEFM-020-1600	42.80	MEFM-020-1600K	46.80
2 mm	.0787	2.5 mm	20 mm	19 mm	1.9 mm	2	3 mm	50 mm	MEFM-020-2000	53.50	MEFM-020-2000K	57.50
2 mm	.0787	2.5 mm	25 mm	19 mm	1.9 mm	2	3 mm	50 mm	MEFM-020-2500	61.00	MEFM-020-2500K	65.00
.0900	.0900	.0900	.125	.250	.086	2	.1250	1.5	MEF-090-250	28.35	MEF-090-250K	32.35
.0900	.0900	.0900	.125	.400	.086	2	.1250	1.5	MEF-090-400	30.50	MEF-090-400K	34.50
.0900	.0900	.0900	.125	.900	.086	2	.1250	2.0	MEF-090-900	38.00	MEF-090-900K	42.00
.0938	.0938	.0938	.125	.250	.089	2	.1250	1.5	MEF-093-250	28.35		
.0938	.0938	.0938	.125	.500	.089	2	.1250	1.5	MEF-093-500	30.50	MEF-093-500K	34.50
.0938	.0938	.0938	.125	.750	.089	2	.1250	2.0	MEF-093-750	34.75	MEF-093-750K	38.75
.0938	.0938	.0938	.125	1.000	.089	2	.1250	2.0	MEF-093-1000	40.15	MEF-093-1000K	44.15
2.5 mm	.0984	3 mm	10 mm	2.4 mm	2	3 mm	38 mm		MEFM-025-1000	36.90	MEFM-025-1000K	40.90
2.5 mm	.0984	3 mm	20 mm	2.4 mm	2	3 mm	50 mm		MEFM-025-2000	53.50	MEFM-025-2000K	57.50

*.0005" / .013 mm max TIR

Continued on next page

MEF / MEFM



End Mills For Steels & High Temperature 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	
D1 +.0000" -.0005"	+ .000 mm -.013 mm	decimal equiv.	L2 +.015" -.000" +.38 mm -.00 mm	L3 +.010" -.010" +.25 mm -.00 mm	D3	D2 (h6)	L1	Tool #	Price	Tool #	Price	
2.5 mm	.0984		3 mm	25 mm	2.4 mm	2	3 mm	50 mm	MEFM-025-2500	61.00	MEFM-025-2500K	65.00
3 mm	.1181		3 mm	15 mm	2.9 mm	2	6 mm	57 mm	MEFM-030-1500	43.80	MEFM-030-1500K	49.55
3 mm	.1181		3 mm	30 mm	2.9 mm	2	6 mm	57 mm			MEFM-030-3000K	65.90
.1250	.1250		.125	.750	.121	2	.1875	2.0			MEF-125-750K	41.40
.1250	.1250		.125	1.000	.121	2	.1875	2.0	MEF-125-1000	40.15	MEF-125-1000K	44.65
.1250	.1250		.125	1.500	.121	2	.1875	3.0	MEF-125-1500	45.95		
4 mm	.1575		5 mm	30 mm	3.9 mm	2	6 mm	57 mm	MEFM-040-3000	58.80	MEFM-040-3000K	64.55
.1875	.1875		.200	1.000	.183	2	.2500	2.5			MEF-187-1000K	57.05
.1875	.1875		.200	1.500	.183	2	.2500	2.5	MEF-187-1500	58.80	MEF-187-1500K	64.55
.1875	.1875		.200	.500	.183	2	.2500	2.5	MEF-187-500	37.20		
.1875	.1875		.200	.750	.183	2	.2500	2.5	MEF-187-750	43.80	MEF-187-750K	49.55
5 mm	.1969		6 mm	25 mm	4.9 mm	2	6 mm	57 mm	MEFM-050-2500	51.30	MEFM-050-2500K	57.05
5 mm	.1969		6 mm	30 mm	4.9 mm	2	6 mm	57 mm	MEFM-050-3000	58.80	MEFM-050-3000K	64.55
D1 +.0000" -.0010"	decimal equiv.		L2 +.015" -.000"	L3 +.010" -.010"	D3	D2 (h6)	L1	Tool #	Price	Tool #	Price	
.2500	.2500		.250	1.000	.246	2	.2500	2.5	MEF-250-1000	51.30	MEF-250-1000K	57.05
.2500	.2500		.250	1.500	.246	2	.2500	3.0	MEF-250-1500	58.80		
.2500	.2500		.250	.750	.246	2	.2500	2.5	MEF-250-750	43.80	MEF-250-750K	49.55

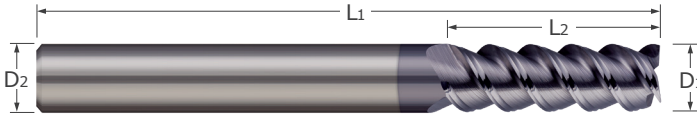
*.0005" / .013 mm max TIR

End Mills For Steels & High Temperature Alloys

Square – 3 & 4 Flute



SDH / SDHM



Steels & High Temp. Alloys

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

Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" -.0030"	(h9)	decimal equiv.					L2 +.78 mm -.00 mm	D2 (h6)	L1	Tool #	Price	Tool #	Price
6 mm		.2362	18 mm	3	6 mm	57 mm	SDHM-060-3	23.25		
.2500		.2500	.750	3	.2500	2.5	SDH-250-03	28.30	SDH-250-03X	33.25
.2813		.2813	.750	3	.3125	2.5	SDH-281-03	32.85		
12 mm		.4724	30 mm	4	12 mm	83 mm	SDHM-120-4	54.05	SDHM-120-4X	64.45
.5000		.5000	1.000	3	.5000	3.0	SDH-500-03	64.90		
.5000		.5000	1.000	4	.5000	3.0	SDH-500-04	64.90	SDH-500-04X	73.00
14 mm		.5512	35 mm	3	14 mm	83 mm	SDHM-140-3	65.90		
16 mm		.6299	35 mm	3	16 mm	92 mm			SDHM-160-3X	117.30
18 mm		.7087	45 mm	3	18 mm	92 mm	SDHM-180-3	141.30	SDHM-180-3X	155.15
18 mm		.7087	45 mm	4	18 mm	92 mm	SDHM-180-4	141.30		
20 mm		.7874	45 mm	3	20 mm	104 mm			SDHM-200-3X	199.70
20 mm		.7874	45 mm	4	20 mm	104 mm	SDHM-200-4	180.20		

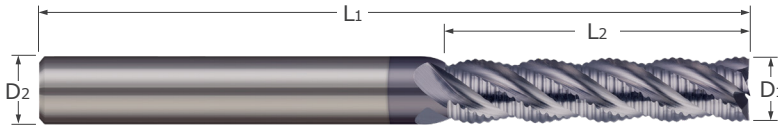
*.0005" / .013 mm max TIR

**SHR / SHRM
SHL / SHLM**



End Mills For Steels & High Temperature Alloys

Square – 4 Flute – Chipbreaker Rougher



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

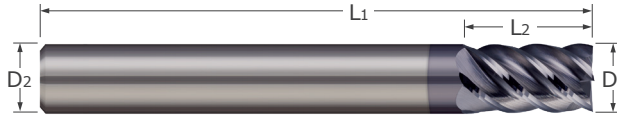
Cutter Diameter*		Length of Cut	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" -.0030" (h9)	decimal equiv.					L2 +.030" -.000" +.78 mm -.00 mm	D2 (h6)	L1	Tool #	Price	Tool #	Price
6 mm	.2362	16 mm	4	6 mm	57 mm	SHRM-060-4	38.65	SHRM-060-4X	43.45
6 mm	.2362	25 mm	4	6 mm	75 mm	SHLM-060-4	49.35	SHLM-060-4X	54.05
.2500	.2500	.750	4	.2500	2.5			SHR-250-4X	44.05
.2500	.2500	1.125	4	.2500	3.0	SHL-250-4	50.20	SHL-250-4X	54.90
.3125	.3125	.813	4	.3125	2.5			SHR-312-4X	50.55
.3125	.3125	1.125	4	.3125	3.0			SHL-312-4X	63.05
8 mm	.3150	22 mm	4	8 mm	63 mm			SHRM-080-4X	51.65
8 mm	.3150	30 mm	4	8 mm	75 mm	SHLM-080-4	56.60	SHLM-080-4X	63.30
.3750	.3750	.875	4	.3750	2.5	SHR-375-4	55.10	SHR-375-4X	61.80
.3750	.3750	1.250	4	.3750	3.0			SHL-375-4X	77.95
10 mm	.3937	25 mm	4	10 mm	72 mm			SHRM-100-4X	67.10
10 mm	.3937	38 mm	4	10 mm	100 mm	SHLM-100-4	74.20	SHLM-100-4X	82.40
12 mm	.4724	30 mm	4	12 mm	83 mm			SHRM-120-4X	87.50
12 mm	.4724	50 mm	4	12 mm	100 mm	SHLM-120-4	99.70	SHLM-120-4X	111.65
.5000	.5000	1.000	4	.5000	3.0	SHR-500-4	80.55	SHR-500-4X	88.50
.5000	.5000	2.000	4	.5000	4.5			SHL-500-4X	113.60
14 mm	.5512	35 mm	4	14 mm	83 mm	SHRM-140-4	129.05	SHRM-140-4X	139.90
.6250	.6250	1.250	4	.6250	3.5	SHR-625-4	143.05	SHR-625-4X	154.85
.6250	.6250	2.500	4	.6250	5.0			SHL-625-4X	196.05
16 mm	.6299	35 mm	4	16 mm	92 mm			SHRM-160-4X	155.75
16 mm	.6299	75 mm	4	16 mm	150 mm			SHLM-160-4X	199.65
18 mm	.7087	75 mm	4	18 mm	150 mm			SHLM-180-4X	279.15
.7500	.7500	1.500	4	.7500	4.0			SHR-750-4X	214.65
.7500	.7500	2.500	4	.7500	5.0	SHL-750-4	254.95	SHL-750-4X	272.70
20 mm	.7874	45 mm	4	20 mm	104 mm			SHRM-200-4X	257.60

*.0005" / .013 mm max TIR

End Mills For Steels & High Temperature Alloys

ASM / ASMM

Square – 5 Flute – Stub Flute



Steels & High Temp. Alloys

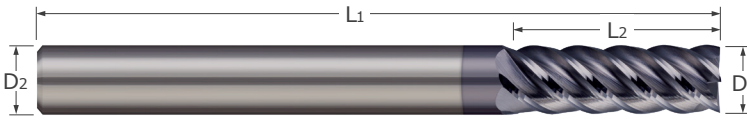
- Designed for applications in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- 45° high helix for reduced cutting forces and increased material removal rates
- Stub flutes for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

Cutter Diameter*			Length of Cut	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" -.0020" (h9) decimal equiv.			L2 +.031" -.000" +.79 mm -.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
3 mm	.1181		6 mm	5	6 mm	57 mm	ASMM-030-5	27.65	ASMM-030-5X	32.60
5 mm	.1969		10 mm	5	6 mm	57 mm	ASMM-050-5	27.65	ASMM-050-5X	32.60
.2500	.2500		.500	5	.2500	2.0	ASM-250-5	26.20		
D1 +.0000" -.0030" (h9) decimal equiv.			L2 +.031" -.000" +.79 mm -.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
.3125	.3125		.500	5	.3125	2.0	ASM-312-5	30.75		
8 mm	.3150		16 mm	5	8 mm	63 mm	ASMM-080-5	32.75		
.3750	.3750		.625	5	.3750	2.0	ASM-375-5	38.25		
10 mm	.3937		19 mm	5	10 mm	72 mm	ASMM-100-5	38.75	ASMM-100-5X	45.60
12 mm	.4724		22 mm	5	12 mm	83 mm	ASMM-120-5	61.65		
.5000	.5000		.625	5	.5000	2.0	ASM-500-5	60.15	ASM-500-5X	68.15

*.0005" / .013 mm max TIR

ARM / ARMM

End Mills For Steels & High Temperature Alloys
Square – 5 Flute



- 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
- Square profile ■ Center cutting
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide ■ CNC ground in the USA

Cutter Diameter*			Length of Cut	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" -.0020" (h8)	decimal equiv.	L2	D2 (h6)	L1	Tool #	Price	Tool #	Price		
3 mm	.1181	10 mm	5	6 mm	57 mm	ARMM-030-5	29.10			
4 mm	.1575	15 mm	5	6 mm	57 mm	ARMM-040-5	29.10			
.1875	.1875	.625	5	.1875	2.0	ARM-187-5	24.65			
6 mm	.2362	20 mm	5	6 mm	57 mm	ARMM-060-5	29.10	ARMM-060-5X	34.05	
.2500	.2500	.750	5	.2500	2.5	ARM-250-5	30.90	ARM-250-5X	35.85	

D1 +.0000" -.0030" (h8)	decimal equiv.	L2	D2 (h6)	L1	Tool #	Price	Tool #	Price
.3750	.3750	.875	5	.3750	2.5	ARM-375-5	40.75	
10 mm	.3937	25 mm	5	10 mm	72 mm	ARMM-100-5	40.65	ARMM-100-5X 47.50
.5000	.5000	1.000	5	.5000	3.0	ARM-500-5	67.90	ARM-500-5X 75.95
14 mm	.5512	30 mm	5	14 mm	83 mm			ARMM-140-5X 105.35
16 mm	.6299	35 mm	5	16 mm	92 mm			ARMM-160-5X 132.20
18 mm	.7087	45 mm	5	18 mm	92 mm			ARMM-180-5X 175.00

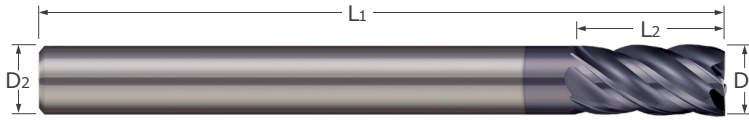
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End Mills For Steels & High Temperature Alloys

Square – 5 Flute – Variable Helix



VHS / VHM



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

Steels & High Temp. Alloys

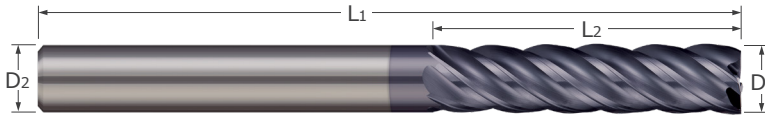
Cutter Diameter	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
					Tool #	Price	Tool #	Price
D1 $\begin{matrix} +.0000'' \\ -.0020'' \end{matrix}$	L2 $\begin{matrix} +.015'' \\ -.000'' \end{matrix}$		D2 (h6)	L1				
.2500	.750	5	.2500	2.5	VHM-250-5	31.55	VHM-250-5K	37.30
D1 $\begin{matrix} +.0000'' \\ -.0030'' \end{matrix}$	L2 $\begin{matrix} +.015'' \\ -.000'' \end{matrix}$		D2 (h6)	L1	Tool #	Price	Tool #	Price
.3125	.813	5	.3125	2.5	VHM-312-5	39.60		
.5000	.625	5	.5000	3.0			VHS-500-5K	74.80
.5000	1.000	5	.5000	3.0	VHM-500-5	70.60	VHM-500-5K	81.75
.5000	1.250	5	.5000	3.5	VHM-5125-5	74.15	VHM-5125-5K	86.10
.6250	1.250	5	.6250	3.5			VHM-625-5K	146.80
.7500	1.500	5	.7500	4.0	VHM-750-5	195.80		

VLM



End Mills For Steels & High Temperature Alloys

Square – 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
- Weldon flat offered on sizes 3/8" and larger
- Square profile
- Center cutting
- nACRo® coating option for added heat resistance in difficult to machine materials
- Solid carbide
- CNC ground in the USA

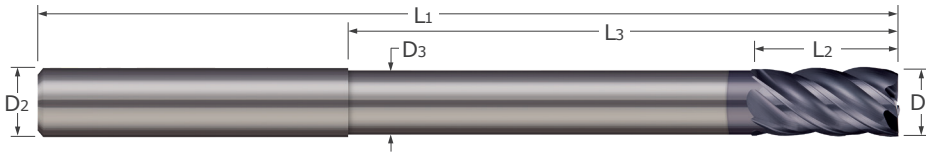
Cutter Diameter	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
					Tool #	Price	Tool #	Price
D1 $+0.0000''$ $-0.0030''$	L2 $+0.015''$ $-0.000''$		D2 (h6)	L1				
.3125	1.125	5	.3125	3.0	VLM-312-5	44.40		
.3750	1.250	5	.3750	3.0	VLM-375-5	54.05	VLM-375-5K	62.25
.5000	1.750	5	.5000	4.5			VLM-500-5K	104.35
.6250	2.250	5	.6250	5.0	VLM-625-5	167.45		

VLR



End Mills For Steels & High Temperature Alloys

Square – 5 Flute – Variable Helix – Long Reach



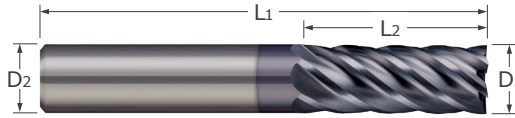
- Designed for high performance in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Variable helix design reduces chatter and harmonics and increases material removal rates
- Specialized geometry for maximum performance in high velocity tool paths
- Long reach for deep pocket milling
- Square 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	Overall Reach	Neck Diameter	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
							Tool #	Price	Tool #	Price
D1 $+0.0000''$ $-0.0030''$	L2 $+0.010''$ $-0.000''$	L3 $+0.015''$ $-0.000''$	D3		D2 (h6)	L1				
.3125	.625	2.625	.292	5	.3125	4.0	VLR-312-5	54.55	VLR-312-5K	64.35
.3750	.750	2.750	.355	5	.3750	4.0	VLR-375-5	75.45		

End Mills For Steels & High Temperature Alloys

EMH / EMHM

Square – 4 & 6 Flute



Steels & High Temp. Alloys

- 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	
D1 +.0000" -.0002" (h9)	decimal equiv.	L2 +.030" -.000" +.78 mm -.00 mm	D2 (h6)	L1	Tool #	Price	Tool #	Price		
3 mm	.1181	8 mm	4	4 mm	50 mm	EMHM-030-4	18.55			
4 mm	.1574	12 mm	4	4 mm	50 mm	EMHM-040-4	18.55			
6 mm	.2362	18 mm	4	6 mm	57 mm			EMHM-060-4X	28.25	
6 mm	.2362	18 mm	6	6 mm	57 mm	EMHM-060-6	23.25	EMHM-060-6X	28.25	

D1 +.0000" -.0003" (h9)	decimal equiv.	L2 +.030" -.000" +.78 mm -.00 mm	D2 (h6)	L1	Tool #	Price	Tool #	Price	
.2813	.2813	.750	6	.3125	2.5	EMH-281-06	35.95	EMH-281-06X	42.85
8 mm	.3150	20 mm	4	8 mm	63 mm	EMHM-080-4	28.80	EMHM-080-4X	35.70
10 mm	.3937	22 mm	6	10 mm	72 mm			EMHM-100-6X	40.55
12 mm	.4724	25 mm	6	12 mm	83 mm	EMHM-120-6	54.05		
14 mm	.5512	30 mm	6	14 mm	83 mm	EMHM-140-6	65.90		
.6250	.6250	1.250	6	.6250	3.5	EMH-625-06	124.90		
16 mm	.6299	35 mm	6	16 mm	92 mm			EMHM-160-6X	117.25
20 mm	.7874	45 mm	6	20 mm	104 mm			EMHM-200-6X	199.70
1.0000	1.0000	1.500	6	1.0000	4.0	EMH-000-06	288.45		

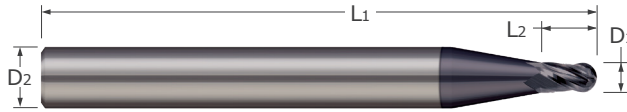
*.0005" / .013 mm max TIR

BEF / BEFM



End Mills For Steels & High Temperature 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	
D1			L2		D2 (h6)	L1	Tool #	Price	Tool #	Price
+ .0000"	+ .000 mm	decimal equiv.	+ .015"							
- .0005"	- .013 mm		- .000"							
			+ .38 mm							
			- .00 mm							
	0.2 mm	.0079	0.3 mm	2	3 mm	38 mm	BEFM-002-030	53.15	BEFM-002-030K	57.15
	0.3 mm	.0118	0.45 mm	2	3 mm	38 mm	BEFM-003-045	47.35		
.0150		.0150	.023	2	.1250	1.5			BFF-015-023K	46.40
	0.5 mm	.0197	0.7 mm	2	3 mm	38 mm			BEFM-005-070K	33.70
.0200		.0200	.030	2	.1250	1.5			BFF-020-030K	33.70
.0200		.0200	.030	3	.1250	1.5	BFF-020-030-3	29.70	BFF-020-030-3K	33.70
	0.6 mm	.0236	0.9 mm	2	3 mm	38 mm			BEFM-006-090K	33.70
.0313		.0313	.047	3	.1250	1.5	BFF-031-047-3	27.30		
	0.8 mm	.0315	1.2 mm	2	3 mm	38 mm			BEFM-008-120K	31.40
.0350		.0350	.053	3	.1250	1.5	BFF-035-053-3	27.30	BFF-035-053-3K	31.30
	1 mm	.0394	1.5 mm	2	3 mm	38 mm	BEFM-010-150	27.30	BEFM-010-150K	31.30
.0400		.0400	.060	2	.1250	1.5	BFF-040-060	27.30	BFF-040-060K	31.30
.0400		.0400	.060	3	.1250	1.5	BFF-040-060-3	27.30	BFF-040-060-3K	31.30
.0450		.0450	.068	2	.1250	1.5	BFF-045-068	27.30	BFF-045-068K	31.30
.0450		.0450	.068	3	.1250	1.5	BFF-045-068-3	27.30	BFF-045-068-3K	31.30
.0469		.0469	.071	3	.1250	1.5			BFF-047-071-3K	31.30
	1.2 mm	.0472	1.8 mm	2	3 mm	38 mm			BEFM-012-180K	31.40
.0500		.0500	.075	2	.1250	1.5	BFF-050-075	27.30	BFF-050-075K	31.30
.0500		.0500	.075	3	.1250	1.5	BFF-050-075-3	27.30	BFF-050-075-3K	31.30
	1.5 mm	.0591	2.2 mm	2	3 mm	38 mm			BEFM-015-220K	31.40
.0600		.0600	.090	2	.1250	1.5	BFF-060-090	27.30	BFF-060-090K	31.30
.0600		.0600	.090	3	.1250	1.5	BFF-060-090-3	27.30	BFF-060-090-3K	31.30
.0625		.0625	.093	2	.1250	1.5	BFF-062-093	27.30		
.0625		.0625	.093	3	.1250	1.5	BFF-062-093-3	27.30		
.0750		.0750	.113	2	.1250	1.5			BFF-075-113K	31.30
.0750		.0750	.113	3	.1250	1.5	BFF-075-113-3	27.30	BFF-075-113-3K	31.30
.0781		.0781	.117	2	.1250	1.5			BFF-078-117K	31.30
.0781		.0781	.117	3	.1250	1.5	BFF-078-117-3	27.30	BFF-078-117-3K	31.30

*.0005" / .013 mm max TIR

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End Mills For Steels & High Temperature Alloys

Ball – 2 & 3 Flute – Stub Flute (cont.)



Tech Resources
Available Online

BEF / BEFM

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Cutter Diameter*			Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
D1 +.0000" -.0005" +.000 mm -.013 mm decimal equiv.			L2 +.015" -.000" +.38 mm -.00 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
2 mm		.0787	2.5 mm	2	3 mm	38 mm			BEFM-020-250K	31.65
.0900		.0900	.125	2	.1250	1.5	BEF-090-125	27.30	BEF-090-125K	31.30
.0938		.0938	.125	2	.1250	1.5	BEF-093-125	27.30		
2.5 mm		.0984	3 mm	2	3 mm	38 mm	BEFM-025-300	27.30		
3 mm		.1181	3 mm	2	6 mm	57 mm	BEFM-030-300	39.50		
.1250		.1250	.125	2	.1875	2.0	BEF-125-125	29.45	BEF-125-125K	33.90
4 mm		.1575	5 mm	2	6 mm	57 mm			BEFM-040-500K	44.45
.1875		.1875	.200	2	.2500	2.5	BEF-187-250	39.50	BEF-187-250K	45.25
5 mm		.1969	6 mm	2	6 mm	57 mm	BEFM-050-600	39.50	BEFM-050-600K	44.45
D1 +.0000" -.0010" decimal equiv.			L2 +.015" -.000"		D2 (h6)	L1	Tool #	Price	Tool #	Price
.2500		.2500	.250	2	.2500	2.5	BEF-250-250	39.50		

*.0005" / .013 mm max TIR

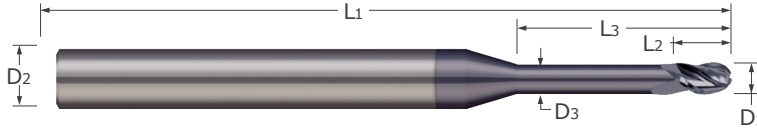
Steels & High Temp. Alloys

BEF / BEFM



End Mills For Steels & High Temperature Alloys

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



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

Cutter Diameter*	Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated		
							Tool #	Price	Tool #	Price	
D1 +.0000" +.000 mm -.0005" -.013 mm decimal equiv.	L2 +.015" -.000"	L3 +.010" -.000" +.25 mm -.00 mm	D3		D2 (h6)	L1					
.0150	.0150	.023	.100	.014	2	.1250	1.5	BEF-015-100	47.35	BEF-015-100K	51.35
.0150	.0150	.023	.200	.014	2	.1250	1.5	BEF-015-200	48.40	BEF-015-200K	52.40
.0150	.0150	.023	.200	.014	3	.1250	1.5	BEF-015-200-3	48.40		
.0150	.0150	.023	.200	.014	3	.1250	1.5			BEF-015-200-3K	52.40
0.5 mm	.0197	0.7 mm	3 mm	0.45 mm	2	3 mm	38 mm	BEFM-005-300	35.05		
0.5 mm	.0197	0.7 mm	6 mm	0.45 mm	2	3 mm	38 mm			BEFM-005-600K	41.45
.0200	.0200	.030	.150	.019	2	.1250	1.5	BEF-020-150	35.05	BEF-020-150K	39.05
.0200	.0200	.030	.150	.019	3	.1250	1.5	BEF-020-150-3	35.05	BEF-020-150-3K	39.05
.0200	.0200	.030	.250	.019	2	.1250	1.5	BEF-020-250	36.10		
.0200	.0200	.030	.250	.019	3	.1250	1.5	BEF-020-250-3	36.10	BEF-020-250-3K	40.10
0.6 mm	.0236	0.9 mm	3 mm	0.55 mm	2	3 mm	38 mm	BEFM-006-300	35.05	BEFM-006-300K	39.05
0.6 mm	.0236	0.9 mm	5 mm	0.55 mm	2	3 mm	38 mm	BEFM-006-500	36.10	BEFM-006-500K	40.10
0.6 mm	.0236	0.9 mm	6 mm	0.55 mm	2	3 mm	38 mm	BEFM-006-600	37.45	BEFM-006-600K	41.45
.0250	.0250	.038	.150	.024	2	.1250	1.5	BEF-025-150	35.05	BEF-025-150K	39.05
.0250	.0250	.038	.150	.024	3	.1250	1.5	BEF-025-150-3	35.05	BEF-025-150-3K	39.05
.0250	.0250	.038	.250	.024	2	.1250	1.5	BEF-025-250	36.10	BEF-025-250K	40.10
.0250	.0250	.038	.250	.024	3	.1250	1.5	BEF-025-250-3	36.10	BEF-025-250-3K	40.10
.0300	.0300	.045	.125	.028	2	.1250	1.5	BEF-030-100	32.65	BEF-030-100K	36.65
.0300	.0300	.045	.125	.028	3	.1250	1.5	BEF-030-100-3	32.65	BEF-030-100-3K	36.65
.0300	.0300	.045	.200	.028	2	.1250	1.5	BEF-030-200	33.70	BEF-030-200K	37.70
.0300	.0300	.045	.200	.028	3	.1250	1.5	BEF-030-200-3	33.70	BEF-030-200-3K	37.70
.0300	.0300	.045	.375	.028	2	.1250	1.5			BEF-030-375K	37.70
.0300	.0300	.045	.375	.028	3	.1250	1.5	BEF-030-375-3	33.70	BEF-030-375-3K	37.70
.0313	.0313	.047	.125	.029	2	.1250	1.5	BEF-031-100	32.65	BEF-031-100K	36.65
.0313	.0313	.047	.125	.029	3	.1250	1.5	BEF-031-100-3	32.65	BEF-031-100-3K	36.65
.0313	.0313	.047	.200	.029	2	.1250	1.5	BEF-031-200	33.70	BEF-031-200K	37.70
.0313	.0313	.047	.200	.029	3	.1250	1.5	BEF-031-200-3	33.70	BEF-031-200-3K	37.70
.0313	.0313	.047	.375	.029	2	.1250	1.5	BEF-031-375	36.90	BEF-031-375K	40.90
.0313	.0313	.047	.375	.029	3	.1250	1.5	BEF-031-375-3	36.90	BEF-031-375-3K	40.90

*.0005" / .013 mm max TIR

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End Mills For Steels & High Temperature Alloys

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



BEF / BEFM

Steels & High Temp. Alloys

Continued from previous page

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" +.38 mm -.00 mm	L3 +.010" +.25 mm -.00 mm	D3	D2 (h6)	L1	Tool #	Price	Tool #	Price	
			0.8 mm	.0315	1.2 mm	4 mm	0.75 mm					2	3 mm	38 mm	BEFM-008-400	32.65	BEFM-008-400K	36.65
0.8 mm	.0315	1.2 mm	7 mm	0.75 mm	2	3 mm	38 mm	BEFM-008-700	33.70	BEFM-008-700K	37.70	
0.8 mm	.0315	1.2 mm	9 mm	0.75 mm	2	3 mm	38 mm	BEFM-008-900	36.90			
.0350	.0350	.053	.150	.033	2	.1250	1.5	BEF-035-150	32.65	BEF-035-150K	36.65	
.0350	.0350	.053	.150	.033	3	.1250	1.5	BEF-035-150-3	32.65	BEF-035-150-3K	36.65	
.0350	.0350	.053	.250	.033	2	.1250	1.5	BEF-035-250	33.70	BEF-035-250K	37.70	
.0350	.0350	.053	.250	.033	3	.1250	1.5	BEF-035-250-3	33.70	BEF-035-250-3K	37.70	
.0350	.0350	.053	.400	.033	2	.1250	1.5	BEF-035-400	36.90	BEF-035-400K	40.90	
.0350	.0350	.053	.400	.033	3	.1250	1.5	BEF-035-400-3	36.90	BEF-035-400-3K	40.90	
1 mm	.0394	1.5 mm	7 mm	0.95 mm	2	3 mm	38 mm	BEFM-010-700	33.70	BEFM-010-700K	37.70	
1 mm	.0394	1.5 mm	9 mm	0.95 mm	2	3 mm	38 mm	BEFM-010-900	36.90			
.0400	.0400	.060	.150	.038	2	.1250	1.5			BEF-040-150K	36.65	
.0400	.0400	.060	.150	.038	3	.1250	1.5	BEF-040-150-3	32.65	BEF-040-150-3K	36.65	
.0400	.0400	.060	.250	.038	2	.1250	1.5	BEF-040-250	33.70	BEF-040-250K	37.70	
.0400	.0400	.060	.250	.038	3	.1250	1.5	BEF-040-250-3	33.70	BEF-040-250-3K	37.70	
.0400	.0400	.060	.500	.038	2	.1250	1.5	BEF-040-500	39.05	BEF-040-500K	43.05	
.0400	.0400	.060	.500	.038	3	.1250	1.5	BEF-040-500-3	39.05	BEF-040-500-3K	43.05	
.0450	.0450	.068	.150	.043	2	.1250	1.5	BEF-045-150	32.65	BEF-045-150K	36.65	
.0450	.0450	.068	.150	.043	3	.1250	1.5	BEF-045-150-3	32.65	BEF-045-150-3K	36.65	
.0450	.0450	.068	.250	.043	2	.1250	1.5	BEF-045-250	33.70	BEF-045-250K	37.70	
.0450	.0450	.068	.250	.043	3	.1250	1.5	BEF-045-250-3	33.70	BEF-045-250-3K	37.70	
.0450	.0450	.068	.500	.043	2	.1250	1.5	BEF-045-500	39.05	BEF-045-500K	43.05	
.0450	.0450	.068	.500	.043	3	.1250	1.5	BEF-045-500-3	39.05	BEF-045-500-3K	43.05	
.0469	.0469	.071	.150	.045	2	.1250	1.5	BEF-047-150	32.65	BEF-047-150K	36.65	
.0469	.0469	.071	.150	.045	3	.1250	1.5	BEF-047-150-3	32.65	BEF-047-150-3K	36.65	
.0469	.0469	.071	.250	.045	2	.1250	1.5	BEF-047-250	33.70	BEF-047-250K	37.70	
.0469	.0469	.071	.250	.045	3	.1250	1.5	BEF-047-250-3	33.70	BEF-047-250-3K	37.70	
.0469	.0469	.071	.500	.045	2	.1250	1.5			BEF-047-500K	43.05	
.0469	.0469	.071	.500	.045	3	.1250	1.5	BEF-047-500-3	39.05	BEF-047-500-3K	43.05	
1.2 mm	.0472	1.8 mm	10 mm	1.1 mm	2	3 mm	38 mm			BEFM-012-1000K	40.90	
1.2 mm	.0472	1.8 mm	12 mm	1.1 mm	2	3 mm	38 mm	BEFM-012-1200	40.45	BEFM-012-1200K	44.45	
.0500	.0500	.075	.200	.048	2	.1250	1.5	BEF-050-200	32.65	BEF-050-200K	36.65	
.0500	.0500	.075	.200	.048	3	.1250	1.5	BEF-050-200-3	32.65	BEF-050-200-3K	36.65	
.0500	.0500	.075	.300	.048	2	.1250	1.5	BEF-050-300	33.70	BEF-050-300K	37.70	
.0500	.0500	.075	.300	.048	3	.1250	1.5	BEF-050-300-3	33.70	BEF-050-300-3K	37.70	
.0500	.0500	.075	.550	.048	2	.1250	1.5			BEF-050-550K	43.05	
.0500	.0500	.075	.550	.048	3	.1250	1.5	BEF-050-550-3	39.05	BEF-050-550-3K	43.05	
1.5 mm	.0591	2.2 mm	6 mm	1.4 mm	2	3 mm	38 mm	BEFM-015-600	33.70	BEFM-015-600K	37.70	
1.5 mm	.0591	2.2 mm	10 mm	1.4 mm	2	3 mm	38 mm	BEFM-015-1000	36.90	BEFM-015-1000K	40.90	
1.5 mm	.0591	2.2 mm	12 mm	1.4 mm	2	3 mm	38 mm	BEFM-015-1200	40.45	BEFM-015-1200K	44.45	
1.5 mm	.0591	2.2 mm	15 mm	1.4 mm	2	3 mm	38 mm	BEFM-015-1500	42.85	BEFM-015-1500K	46.85	
1.5 mm	.0591	2.2 mm	20 mm	1.4 mm	2	3 mm	50 mm	BEFM-015-2000	53.50	BEFM-015-2000K	57.50	

*.0005" / .013 mm max TIR

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BEF / BEFM



End Mills For Steels & High Temperature Alloys

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

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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"	L3 +.010" -.000"	D3 +.25 mm -.00 mm	D2 (h6)	L1	Tool #	Price	Tool #	Price	
			+.38 mm -.00 mm	+.25 mm -.00 mm								
.0600	.0600	.0600	.090	.200	.056	2	.1250	1.5	BEF-060-200	32.65	BEF-060-200K	36.65
.0600	.0600	.0600	.090	.200	.056	3	.1250	1.5	BEF-060-200-3	32.65	BEF-060-200-3K	36.65
.0600	.0600	.0600	.090	.350	.056	2	.1250	1.5	BEF-060-350	33.70	BEF-060-350K	37.70
.0600	.0600	.0600	.090	.350	.056	3	.1250	1.5	BEF-060-350-3	33.70	BEF-060-350-3K	37.70
.0600	.0600	.0600	.090	.500	.056	2	.1250	1.5	BEF-060-500	39.05	BEF-060-500K	43.05
.0600	.0600	.0600	.090	.500	.056	3	.1250	1.5	BEF-060-500-3	39.05	BEF-060-500-3K	43.05
.0600	.0600	.0600	.090	.750	.056	2	.1250	2.0	BEF-060-750	44.40		
.0600	.0600	.0600	.090	.750	.056	3	.1250	2.0	BEF-060-750-3	44.40	BEF-060-750-3K	48.40
.0625	.0625	.0625	.093	.200	.058	2	.1250	1.5			BEF-062-200K	36.65
.0625	.0625	.0625	.093	.200	.058	3	.1250	1.5	BEF-062-200-3	32.65	BEF-062-200-3K	36.65
.0625	.0625	.0625	.093	.550	.058	2	.1250	1.5	BEF-062-550	39.05	BEF-062-550K	43.05
.0625	.0625	.0625	.093	.550	.058	3	.1250	1.5	BEF-062-550-3	39.05	BEF-062-550-3K	43.05
.0625	.0625	.0625	.093	.750	.058	2	.1250	2.0	BEF-062-750	44.40	BEF-062-750K	48.40
.0625	.0625	.0625	.093	.750	.058	3	.1250	2.0	BEF-062-750-3	44.40	BEF-062-750-3K	48.40
.0750	.0750	.0750	.113	.250	.071	2	.1250	1.5	BEF-075-250	32.65	BEF-075-250K	36.65
.0750	.0750	.0750	.113	.250	.071	3	.1250	1.5	BEF-075-250-3	32.65	BEF-075-250-3K	36.65
.0750	.0750	.0750	.113	.400	.071	2	.1250	1.5	BEF-075-400	39.05	BEF-075-400K	43.05
.0750	.0750	.0750	.113	.400	.071	3	.1250	1.5	BEF-075-400-3	39.05	BEF-075-400-3K	43.05
.0750	.0750	.0750	.113	.600	.071	2	.1250	2.0	BEF-075-600	43.35	BEF-075-600K	47.35
.0750	.0750	.0750	.113	.600	.071	3	.1250	2.0	BEF-075-600-3	43.35	BEF-075-600-3K	47.35
.0750	.0750	.0750	.113	.900	.071	2	.1250	2.0	BEF-075-900	46.80	BEF-075-900K	50.80
.0750	.0750	.0750	.113	.900	.071	3	.1250	2.0	BEF-075-900-3	46.80	BEF-075-900-3K	50.80
.0781	.0781	.0781	.117	.250	.074	2	.1250	1.5	BEF-078-250	32.65		
.0781	.0781	.0781	.117	.250	.074	3	.1250	1.5	BEF-078-250-3	32.65	BEF-078-250-3K	36.65
.0781	.0781	.0781	.117	.400	.074	2	.1250	1.5	BEF-078-400	39.05	BEF-078-400K	43.05
.0781	.0781	.0781	.117	.400	.074	3	.1250	1.5	BEF-078-400-3	39.05	BEF-078-400-3K	43.05
.0781	.0781	.0781	.117	.650	.074	2	.1250	2.0	BEF-078-650	43.35	BEF-078-650K	47.35
.0781	.0781	.0781	.117	.650	.074	3	.1250	2.0	BEF-078-650-3	43.35	BEF-078-650-3K	47.35
.0781	.0781	.0781	.117	.900	.074	2	.1250	2.0	BEF-078-900	46.80	BEF-078-900K	50.80
.0781	.0781	.0781	.117	.900	.074	3	.1250	2.0	BEF-078-900-3	46.80	BEF-078-900-3K	50.80
2 mm	.0787		2.5 mm	7 mm	1.9 mm	2	3 mm	38 mm	BEFM-020-700	33.70	BEFM-020-700K	37.70
2 mm	.0787		2.5 mm	16 mm	1.9 mm	2	3 mm	38 mm	BEFM-020-1600	42.85		
2 mm	.0787		2.5 mm	20 mm	1.9 mm	2	3 mm	50 mm	BEFM-020-2000	53.50	BEFM-020-2000K	57.50
2 mm	.0787		2.5 mm	25 mm	1.9 mm	2	3 mm	50 mm	BEFM-020-2500	59.40	BEFM-020-2500K	63.40
.0900	.0900	.0900	.125	.250	.086	2	.1250	1.5	BEF-090-250	32.65	BEF-090-250K	36.65
.0900	.0900	.0900	.125	.400	.086	2	.1250	1.5	BEF-090-400	39.05	BEF-090-400K	43.05
.0900	.0900	.0900	.125	.400	.086	3	.1250	1.5	BEF-090-400-3	39.05		
.0900	.0900	.0900	.125	.400	.086	3	.1250	1.5			BEF-090-400-3K	43.05
.0900	.0900	.0900	.125	.650	.086	2	.1250	2.0	BEF-090-650	43.35		
.0900	.0900	.0900	.125	.650	.086	3	.1250	2.0	BEF-090-650-3	43.35		
.0900	.0900	.0900	.125	.650	.086	3	.1250	2.0			BEF-090-650-3K	47.35
.0900	.0900	.0900	.125	.900	.086	2	.1250	2.0	BEF-090-900	44.40	BEF-090-900K	48.40

*.0005" / .013 mm max TIR

Steels & High Temp. Alloys

Continued on next page

End Mills For Steels & High Temperature Alloys

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



Tech Resources
Available Online

BEF / BEFM

Continued from previous page

Steels & High Temp. Alloys

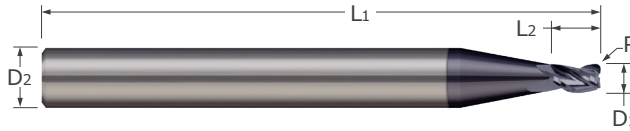
Cutter Diameter*			Length of Cut	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated		
D1 +.0000" -.0005"	+.000 mm -.013 mm	decimal equiv.	L2	L3	D3	D2 (h6)	L1	Tool #	Price	Tool #	Price		
			+ .015" -.000"	+ .010" -.000"								+ .38 mm -.00 mm	+ .25 mm -.00 mm
.0938	.0938	.0938	.125	.250	.089	2	.1250	1.5	BEF-093-250	32.65	BEF-093-250K	36.65	
.0938	.0938	.0938	.125	.500	.089	2	.1250	1.5	BEF-093-500	39.05	BEF-093-500K	43.05	
.0938	.0938	.0938	.125	.750	.089	2	.1250	2.0	BEF-093-750	44.40	BEF-093-750K	48.40	
.0938	.0938	.0938	.125	1.000	.089	2	.1250	2.0	BEF-093-1000	46.80	BEF-093-1000K	50.80	
2.5 mm	.0984	.0984	3 mm	10 mm	2.4 mm	2	3 mm	38 mm	BEFM-025-1000	36.90	BEFM-025-1000K	40.90	
2.5 mm	.0984	.0984	3 mm	15 mm	2.4 mm	2	3 mm	38 mm	BEFM-025-1500	42.85	BEFM-025-1500K	46.85	
2.5 mm	.0984	.0984	3 mm	20 mm	2.4 mm	2	3 mm	50 mm	BEFM-025-2000	53.50	BEFM-025-2000K	57.50	
2.5 mm	.0984	.0984	3 mm	25 mm	2.4 mm	2	3 mm	50 mm	BEFM-025-2500	59.40	BEFM-025-2500K	63.40	
2.5 mm	.0984	.0984	3 mm	30 mm	2.4 mm	2	3 mm	60 mm	BEFM-025-3000	65.25	BEFM-025-3000K	69.50	
3 mm	.1181	.1181	3 mm	10 mm	2.9 mm	2	6 mm	57 mm	BEFM-030-1000	46.15			
3 mm	.1181	.1181	3 mm	15 mm	2.9 mm	2	6 mm	57 mm	BEFM-030-1500	52.85			
3 mm	.1181	.1181	3 mm	25 mm	2.9 mm	2	6 mm	57 mm	BEFM-030-2500	60.45			
3 mm	.1181	.1181	3 mm	30 mm	2.9 mm	2	6 mm	57 mm	BEFM-030-3000	66.35	BEFM-030-3000K	71.05	
.1250	.1250	.1250	.125	.375	.121	2	.1875	2.0	BEF-125-375	39.05	BEF-125-375K	43.55	
.1250	.1250	.1250	.125	.750	.121	2	.1875	2.0	BEF-125-750	44.40	BEF-125-750K	48.90	
.1250	.1250	.1250	.125	1.000	.121	2	.1875	2.0	BEF-125-1000	46.80	BEF-125-1000K	51.30	
.1250	.1250	.1250	.125	1.500	.121	2	.1875	3.0	BEF-125-1500	50.25	BEF-125-1500K	55.05	
4 mm	.1575	.1575	5 mm	15 mm	3.9 mm	2	6 mm	57 mm	BEFM-040-1500	52.85	BEFM-040-1500K	57.70	
4 mm	.1575	.1575	5 mm	25 mm	3.9 mm	2	6 mm	57 mm	BEFM-040-2500	60.45	BEFM-040-2500K	65.25	
4 mm	.1575	.1575	5 mm	30 mm	3.9 mm	2	6 mm	57 mm	BEFM-040-3000	66.35	BEFM-040-3000K	71.05	
.1875	.1875	.1875	.200	.750	.183	2	.2500	2.5	BEF-187-750	43.80			
.1875	.1875	.1875	.200	1.000	.183	2	.2500	2.5	BEF-187-1000	51.30	BEF-187-1000K	57.05	
.1875	.1875	.1875	.200	1.500	.183	2	.2500	3.0			BEF-187-1500K	64.55	
5 mm	.1969	.1969	6 mm	15 mm	4.9 mm	2	6 mm	57 mm	BEFM-050-1500	52.85	BEFM-050-1500K	57.70	
5 mm	.1969	.1969	6 mm	25 mm	4.9 mm	2	6 mm	57 mm	BEFM-050-2500	60.45	BEFM-050-2500K	65.25	
5 mm	.1969	.1969	6 mm	30 mm	4.9 mm	2	6 mm	57 mm	BEFM-050-3000	66.35	BEFM-050-3000K	71.05	
D1	+ .0000" -.0010"	decimal equiv.	L2	+ .015" -.000"	L3	+ .010" -.000"	D3	D2(h6)	L1	Tool #	Price	Tool #	Price
.2500	.2500	.2500	.250	.500	.246	2	.2500	2.5	BEF-250-500	37.20	BEF-250-500K	42.95	
.2500	.2500	.2500	.250	.750	.246	2	.2500	2.5	BEF-250-750	43.80	BEF-250-750K	49.55	
.2500	.2500	.2500	.250	1.000	.246	2	.2500	2.5	BEF-250-1000	51.30	BEF-250-1000K	57.05	
.2500	.2500	.2500	.250	1.500	.246	2	.2500	3.0	BEF-250-1500	58.80	BEF-250-1500K	64.55	

*.0005" / .013 mm max TIR

MEF / MEFM



End Mills For Steels & High Temperature Alloys
Corner Radius – 2 & 3 Flute – Stub Flute



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

Cutter Diameter*			Length of Cut	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
D1			L2	R		D2 (h6)	L1	Tool #	Price	Tool #	Price
+ .0000" - .0005"	+ .000 mm - .013 mm	decimal equiv.	+ .015" - .000" + .38 mm - .00 mm	+ .0000" - .0005" + .000 mm - .013 mm							
.0150		.0150	.023	.002	2	.1250	1.5			MEF-015-023-002K	46.00
.0150		.0150	.023	.002	3	.1250	1.5	MEF-015-023-3-002	42.00	MEF-015-023-3-002K	46.00
	0.5 mm	.0197	0.7 mm	0.05 mm	2	3 mm	38 mm	MEFM-005-070-05	29.70	MEFM-005-070-05K	33.70
.0200		.0200	.030	.002	2	.1250	1.5	MEF-020-030-002	29.70	MEF-020-030-002K	33.70
.0200		.0200	.030	.002	3	.1250	1.5	MEF-020-030-3-002	29.70	MEF-020-030-3-002K	33.70
.0250		.0250	.038	.003	2	.1250	1.5	MEF-025-038-003	29.70	MEF-025-038-003K	33.70
.0250		.0250	.038	.003	3	.1250	1.5	MEF-025-038-3-003	29.70	MEF-025-038-3-003K	33.70
.0300		.0300	.045	.005	2	.1250	1.5	MEF-030-045-005	27.30	MEF-030-045-005K	31.30
.0300		.0300	.045	.005	3	.1250	1.5	MEF-030-045-3-005	27.30	MEF-030-045-3-005K	31.30
.0300		.0300	.045	.010	2	.1250	1.5	MEF-030-045-010	27.30	MEF-030-045-010K	31.30
.0300		.0300	.045	.010	3	.1250	1.5			MEF-030-045-3-010K	31.30
.0313		.0313	.047	.005	2	.1250	1.5	MEF-031-047-005	27.30	MEF-031-047-005K	31.30
.0313		.0313	.047	.005	3	.1250	1.5	MEF-031-047-3-005	27.30	MEF-031-047-3-005K	31.30
.0313		.0313	.047	.010	2	.1250	1.5			MEF-031-047-010K	31.30
.0313		.0313	.047	.010	3	.1250	1.5	MEF-031-047-3-010	27.30	MEF-031-047-3-010K	31.30
	0.8 mm	.0315	1.2 mm	0.05 mm	2	3 mm	38 mm	MEFM-008-120-05	27.30	MEFM-008-120-05K	31.30
.0350		.0350	.053	.005	2	.1250	1.5	MEF-035-053-005	27.30	MEF-035-053-005K	31.30
.0350		.0350	.053	.005	3	.1250	1.5	MEF-035-053-3-005	27.30	MEF-035-053-3-005K	31.30
.0350		.0350	.053	.010	2	.1250	1.5	MEF-035-053-010	27.30	MEF-035-053-010K	31.30
.0350		.0350	.053	.010	3	.1250	1.5	MEF-035-053-3-010	27.30	MEF-035-053-3-010K	31.30
	1 mm	.0394	1.5 mm	0.1 mm	2	3 mm	38 mm	MEFM-010-150-10	27.30	MEFM-010-150-10K	31.30
	1 mm	.0394	1.5 mm	0.2 mm	2	3 mm	38 mm	MEFM-010-150-20	27.30	MEFM-010-150-20K	31.30
.0400		.0400	.060	.005	2	.1250	1.5	MEF-040-060-005	27.30	MEF-040-060-005K	31.30
.0400		.0400	.060	.005	3	.1250	1.5	MEF-040-060-3-005	27.30	MEF-040-060-3-005K	31.30
.0400		.0400	.060	.010	2	.1250	1.5	MEF-040-060-010	27.30	MEF-040-060-010K	31.30
.0400		.0400	.060	.010	3	.1250	1.5	MEF-040-060-3-010	27.30	MEF-040-060-3-010K	31.30
.0450		.0450	.068	.005	2	.1250	1.5	MEF-045-068-005	27.30	MEF-045-068-005K	31.30
.0450		.0450	.068	.005	3	.1250	1.5	MEF-045-068-3-005	27.30	MEF-045-068-3-005K	31.30
.0450		.0450	.068	.010	2	.1250	1.5	MEF-045-068-010	27.30	MEF-045-068-010K	31.30
.0450		.0450	.068	.010	3	.1250	1.5	MEF-045-068-3-010	27.30	MEF-045-068-3-010K	31.30

*.0005" / .013 mm max TIR

Continued on next page

End Mills For Steels & High Temperature Alloys

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



MEF / MEFM

Continued from previous page

Cutter Diameter*			Length of Cut	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
D1			L2	R		D2 (h6)	L1	Tool #	Price	Tool #	Price
+ .0000" - .0005"	+ .000 mm - .013 mm	decimal equiv.	+ .015" - .000" + .38 mm - .00 mm	+ .0000" - .0005" + .000 mm - .013 mm							
.0469		.0469	.071	.005	2	.1250	1.5	MEF-047-071-005	27.30	MEF-047-071-005K	31.30
.0469		.0469	.071	.005	3	.1250	1.5	MEF-047-071-3-005	27.30	MEF-047-071-3-005K	31.30
.0469		.0469	.071	.010	2	.1250	1.5	MEF-047-071-010	27.30	MEF-047-071-010K	31.30
.0469		.0469	.071	.010	3	.1250	1.5	MEF-047-071-3-010	27.30		
	1.2 mm	.0472	1.8 mm	0.1 mm	2	3 mm	38 mm	MEFM-012-180-10	27.30	MEFM-012-180-10K	31.30
	1.2 mm	.0472	1.8 mm	0.2 mm	2	3 mm	38 mm	MEFM-012-180-20	27.30	MEFM-012-180-20K	31.30
.0500		.0500	.075	.005	2	.1250	1.5	MEF-050-075-005	27.30	MEF-050-075-005K	31.30
.0500		.0500	.075	.005	3	.1250	1.5	MEF-050-075-3-005	27.30	MEF-050-075-3-005K	31.30
.0500		.0500	.075	.010	2	.1250	1.5	MEF-050-075-010	27.30	MEF-050-075-010K	31.30
.0500		.0500	.075	.010	3	.1250	1.5	MEF-050-075-3-010	27.30	MEF-050-075-3-010K	31.30
	1.5 mm	.0591	2.2 mm	0.15 mm	2	3 mm	38 mm	MEFM-015-220-15	27.30		
	1.5 mm	.0591	2.2 mm	0.25 mm	2	3 mm	38 mm	MEFM-015-220-25	27.30	MEFM-015-220-25K	31.30
.0600		.0600	.090	.005	2	.1250	1.5	MEF-060-090-005	27.30	MEF-060-090-005K	31.30
.0600		.0600	.090	.005	3	.1250	1.5	MEF-060-090-3-005	27.30	MEF-060-090-3-005K	31.30
.0600		.0600	.090	.010	2	.1250	1.5	MEF-060-090-010	27.30		
.0600		.0600	.090	.010	3	.1250	1.5	MEF-060-090-3-010	27.30	MEF-060-090-3-010K	31.30
.0600		.0600	.090	.015	2	.1250	1.5	MEF-060-090-015	27.30	MEF-060-090-015K	31.30
.0600		.0600	.090	.015	3	.1250	1.5	MEF-060-090-3-015	27.30	MEF-060-090-3-015K	31.30
.0625		.0625	.093	.005	2	.1250	1.5	MEF-062-093-005	27.30	MEF-062-093-005K	31.30
.0625		.0625	.093	.005	3	.1250	1.5	MEF-062-093-3-005	27.30		
.0625		.0625	.093	.010	2	.1250	1.5	MEF-062-093-010	27.30	MEF-062-093-010K	31.30
.0625		.0625	.093	.010	3	.1250	1.5	MEF-062-093-3-010	27.30		
.0625		.0625	.093	.015	2	.1250	1.5	MEF-062-093-015	27.30	MEF-062-093-015K	31.30
.0750		.0750	.113	.005	2	.1250	1.5	MEF-075-113-005	27.30	MEF-075-113-005K	31.30
.0750		.0750	.113	.005	3	.1250	1.5	MEF-075-113-3-005	27.30	MEF-075-113-3-005K	31.30
.0750		.0750	.113	.010	2	.1250	1.5	MEF-075-113-010	27.30	MEF-075-113-010K	31.30
.0750		.0750	.113	.010	3	.1250	1.5	MEF-075-113-3-010	27.30	MEF-075-113-3-010K	31.30
.0750		.0750	.113	.015	2	.1250	1.5	MEF-075-113-015	27.30	MEF-075-113-015K	31.30
.0750		.0750	.113	.015	3	.1250	1.5	MEF-075-113-3-015	27.30	MEF-075-113-3-015K	31.30
.0781		.0781	.117	.005	2	.1250	1.5	MEF-078-117-005	27.30	MEF-078-117-005K	31.30
.0781		.0781	.117	.005	3	.1250	1.5	MEF-078-117-3-005	27.30	MEF-078-117-3-005K	31.30
.0781		.0781	.117	.010	2	.1250	1.5	MEF-078-117-010	27.30	MEF-078-117-010K	31.30
.0781		.0781	.117	.015	2	.1250	1.5	MEF-078-117-015	27.30	MEF-078-117-015K	31.30
.0781		.0781	.117	.015	3	.1250	1.5	MEF-078-117-3-015	27.30	MEF-078-117-3-015K	31.30
	2 mm	.0787	2.5 mm	0.15 mm	2	3 mm	38 mm	MEFM-020-250-15	27.30		
	2 mm	.0787	2.5 mm	0.25 mm	2	3 mm	38 mm	MEFM-020-250-25	27.30	MEFM-020-250-25K	31.30
.0900		.0900	.125	.005	2	.1250	1.5	MEF-090-125-005	27.30	MEF-090-125-005K	31.30
.0900		.0900	.125	.010	2	.1250	1.5	MEF-090-125-010	27.30	MEF-090-125-010K	31.30
.0900		.0900	.125	.015	2	.1250	1.5			MEF-090-125-015K	31.30
.0938		.0938	.125	.005	2	.1250	1.5	MEF-093-125-005	27.30	MEF-093-125-005K	31.30
.0938		.0938	.125	.010	2	.1250	1.5	MEF-093-125-010	27.30	MEF-093-125-010K	31.30
.0938		.0938	.125	.015	2	.1250	1.5	MEF-093-125-015	27.30		
	3 mm	.1181	3 mm	0.15 mm	2	6 mm	57 mm			MEFM-030-300-15K	45.25

*.0005" / .013 mm max TIR

Continued on next page

Steels & High Temp. Alloys

MEF / MEFM



End Mills For Steels & High Temperature Alloys
 Corner Radius – 2 & 3 Flute – Stub Flute (cont.)

Continued from previous page

Cutter Diameter*			Length of Cut	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
D1 +.0000" -.0005"	+ .000 mm -.013 mm	decimal equiv.	L2 +.015" -.000" +.38 mm -.00 mm	R +.0000" -.0005" +.000 mm -.013 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
3 mm		.1181	3 mm	0.25 mm	2	6 mm	57 mm	MEFM-030-300-25	39.50	MEFM-030-300-25K	45.25
.1250		.1250	.125	.005	2	.1875	2.0	MEF-125-125-005	29.45	MEF-125-125-005K	33.90
.1250		.1250	.125	.010	2	.1875	2.0	MEF-125-125-010	29.45	MEF-125-125-010K	33.90
4 mm		.1575	5 mm	0.25 mm	2	6 mm	57 mm	MEFM-040-500-25	39.50		
5 mm		.1969	6 mm	0.25 mm	2	6 mm	57 mm	MEFM-050-600-25	39.50	MEFM-050-600-25K	45.25
D1 +.0000" -.0010"		decimal equiv.	L2 +.015" -.000"	R +.0000" -.0005"		D2 (h6)	L1	Tool #	Price	Tool #	Price
.2500		.2500	.250	.005	2	.2500	2.5	MEF-250-250-005	39.50	MEF-250-250-005K	45.25
.2500		.2500	.250	.010	2	.2500	2.5	MEF-250-250-010	39.50	MEF-250-250-010K	45.25
.2500		.2500	.250	.015	2	.2500	2.5	MEF-250-250-015	39.50	MEF-250-250-015K	45.25

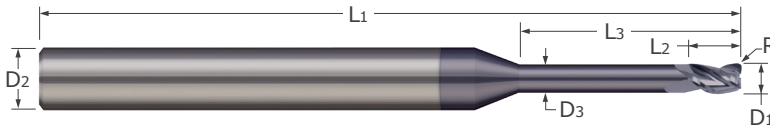
*.0005" / .013 mm max TIR

End Mills For Steels & High Temperature Alloys

Corner Radius – 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
- 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

Steels & High Temp. Alloys

Cutter Diameter*	Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
								Tool #	Price	Tool #	Price
D1 +.0000" +.000mm -.0005" -.013mm	L2 +.015" +.38mm -.000" -.00mm	R +.0000" +.000mm -.0005" -.013mm	L3 +.010" +.25mm -.010" -.00mm	D3		D2 (h6)	L1				
.0150 .0150	.023 .002	.100 .014	2 .1250	1.5	MEF-015-100-002	47.35	MEF-015-100-002K	51.35			
.0150 .0150	.023 .002	.100 .014	3 .1250	1.5	MEF-015-200-002	48.40	MEF-015-200-002K	52.40			
.0150 .0150	.023 .002	.200 .014	2 .1250	1.5	MEF-015-200-3-002	48.40	MEF-015-200-3-002K	52.40			
.0150 .0150	.023 .002	.200 .014	3 .1250	1.5	MEFM-005-600-05	36.90	MEFM-005-600-05K	40.90			
0.5 mm .0197	0.7 mm 0.05 mm	6 mm 0.45 mm	2 3 mm	38 mm	MEF-020-150-002	39.05	MEF-020-150-002K	39.05			
.0200 .0200	.030 .002	.150 .019	2 .1250	1.5	MEF-020-250-002	36.10	MEF-020-250-002K	40.10			
.0200 .0200	.030 .002	.250 .019	2 .1250	1.5	MEF-020-250-3-002	40.10	MEF-020-250-3-002K	40.10			
.0200 .0200	.030 .002	.250 .019	3 .1250	1.5	MEF-020-150-3-002	39.05	MEF-020-150-3-002K	39.05			
.0200 .0200	.030 .002	.150 .019	3 .1250	1.5							
0.6 mm .0236	0.9 mm 0.05 mm	3 mm 0.55 mm	2 3 mm	38 mm	MEFM-006-300-05	35.05	MEFM-006-500-05K	40.10			
0.6 mm .0236	0.9 mm 0.05 mm	5 mm 0.55 mm	2 3 mm	38 mm	MEFM-006-500-05	36.10	MEFM-006-500-05K	40.10			
0.6 mm .0236	0.9 mm 0.05 mm	6 mm 0.55 mm	2 3 mm	38 mm	MEFM-006-600-05	39.30	MEFM-006-600-05K	43.30			
.0250 .0250	.038 .003	.150 .024	2 .1250	1.5	MEF-025-150-003	35.05	MEF-025-150-003K	39.05			
.0250 .0250	.038 .003	.150 .024	3 .1250	1.5	MEF-025-150-3-003	35.05	MEF-025-150-3-003K	39.05			
.0250 .0250	.038 .003	.250 .024	2 .1250	1.5	MEF-025-250-003	36.10	MEF-025-250-003K	40.10			
.0250 .0250	.038 .003	.250 .024	3 .1250	1.5	MEF-025-250-3-003	40.10	MEF-025-250-3-003K	40.10			
.0300 .0300	.045 .005	.100 .028	2 .1250	1.5	MEF-030-100-005	32.65	MEF-030-100-005K	36.65			
.0300 .0300	.045 .005	.100 .028	3 .1250	1.5	MEF-030-100-3-005	36.65	MEF-030-100-3-005K	36.65			
.0300 .0300	.045 .005	.200 .028	2 .1250	1.5	MEF-030-200-005	33.70	MEF-030-200-005K	37.70			
.0300 .0300	.045 .005	.200 .028	3 .1250	1.5	MEF-030-200-3-005	33.70	MEF-030-200-3-005K	37.70			
.0300 .0300	.045 .005	.375 .028	2 .1250	1.5	MEF-030-375-005	36.90	MEF-030-375-005K	40.90			
.0300 .0300	.045 .005	.375 .028	3 .1250	1.5	MEF-030-375-3-005	36.90	MEF-030-375-3-005K	40.90			
.0300 .0300	.045 .010	.100 .028	2 .1250	1.5	MEF-030-100-010	32.65	MEF-030-100-010K	36.65			
.0300 .0300	.045 .010	.100 .028	3 .1250	1.5	MEF-030-100-3-010	32.65	MEF-030-100-3-010K	36.65			
.0300 .0300	.045 .010	.200 .028	2 .1250	1.5	MEF-030-200-010	33.70	MEF-030-200-010K	37.70			
.0300 .0300	.045 .010	.200 .028	3 .1250	1.5	MEF-030-200-3-010	33.70	MEF-030-200-3-010K	37.70			
.0300 .0300	.045 .010	.375 .028	2 .1250	1.5	MEF-030-375-010	36.90	MEF-030-375-010K	40.90			
.0300 .0300	.045 .010	.375 .028	3 .1250	1.5	MEF-030-375-3-010	36.90	MEF-030-375-3-010K	40.90			

*.0005" / .013 mm max TIR

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End Mills For Steels & High Temperature Alloys
 Corner Radius – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

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Cutter Diameter*		Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
D1 +.0000"-.0005mm -.0005"-.013mm		L2 +.015" -.000"	R +.0000" -.0005"	L3 +.010" -.010"	D3		D2 (h6)	L1	Tool #	Price	Tool #	Price
.0313	.0313	.047	.005	.100	.029	2	.1250	1.5	MEF-031-100-005	32.65	MEF-031-100-005K	36.65
.0313	.0313	.047	.005	.100	.029	3	.1250	1.5	MEF-031-100-3-005	32.65	MEF-031-100-3-005K	36.65
.0313	.0313	.047	.005	.200	.029	2	.1250	1.5	MEF-031-200-005	33.70	MEF-031-200-005K	37.70
.0313	.0313	.047	.005	.200	.029	3	.1250	1.5	MEF-031-200-3-005	33.70	MEF-031-200-3-005K	37.70
.0313	.0313	.047	.005	.375	.029	2	.1250	1.5	MEF-031-375-005	36.90	MEF-031-375-005K	40.90
.0313	.0313	.047	.005	.375	.029	3	.1250	1.5	MEF-031-375-3-005	36.90	MEF-031-375-3-005K	40.90
.0313	.0313	.047	.010	.100	.029	2	.1250	1.5	MEF-031-100-010	32.65		
.0313	.0313	.047	.010	.100	.029	3	.1250	1.5	MEF-031-100-3-010	32.65	MEF-031-100-3-010K	36.65
.0313	.0313	.047	.010	.200	.029	2	.1250	1.5	MEF-031-200-010	33.70	MEF-031-200-010K	37.70
.0313	.0313	.047	.010	.200	.029	3	.1250	1.5	MEF-031-200-3-010	33.70	MEF-031-200-3-010K	37.70
.0313	.0313	.047	.010	.375	.029	2	.1250	1.5	MEF-031-375-010	36.90	MEF-031-375-010K	40.90
.0313	.0313	.047	.010	.375	.029	3	.1250	1.5	MEF-031-375-3-010	36.90	MEF-031-375-3-010K	40.90
0.8 mm	.0315	1.2 mm	0.05 mm	4 mm	0.75 mm	2	3 mm	38 mm	MEFM-008-400-05K			36.65
0.8 mm	.0315	1.2 mm	0.05 mm	7 mm	0.75 mm	2	3 mm	38 mm	MEFM-008-700-05	36.40	MEFM-008-700-05K	40.40
0.8 mm	.0315	1.2 mm	0.05 mm	9 mm	0.75 mm	2	3 mm	38 mm	MEFM-008-900-05	40.60	MEFM-008-900-05K	44.60
.0350	.0350	.053	.005	.150	.033	2	.1250	1.5	MEF-035-150-005	32.65	MEF-035-150-005K	36.65
.0350	.0350	.053	.005	.150	.033	3	.1250	1.5	MEF-035-150-3-005	32.65	MEF-035-150-3-005K	36.65
.0350	.0350	.053	.005	.250	.033	2	.1250	1.5	MEF-035-250-005	33.70	MEF-035-250-005K	37.70
.0350	.0350	.053	.005	.250	.033	3	.1250	1.5	MEF-035-250-3-005	33.70	MEF-035-250-3-005K	37.70
.0350	.0350	.053	.005	.400	.033	2	.1250	1.5	MEF-035-400-005	36.90	MEF-035-400-005K	40.90
.0350	.0350	.053	.005	.400	.033	3	.1250	1.5	MEF-035-400-3-005	36.90	MEF-035-400-3-005K	40.90
.0350	.0350	.053	.010	.150	.033	2	.1250	1.5	MEF-035-150-010	32.65	MEF-035-150-010K	36.65
.0350	.0350	.053	.010	.150	.033	3	.1250	1.5	MEF-035-150-3-010	32.65	MEF-035-150-3-010K	36.65
.0350	.0350	.053	.010	.250	.033	2	.1250	1.5	MEF-035-250-010	33.70	MEF-035-250-010K	37.70
.0350	.0350	.053	.010	.250	.033	3	.1250	1.5	MEF-035-250-3-010	33.70	MEF-035-250-3-010K	37.70
.0350	.0350	.053	.010	.400	.033	2	.1250	1.5	MEF-035-400-010	36.90	MEF-035-400-010K	40.90
.0350	.0350	.053	.010	.400	.033	3	.1250	1.5	MEF-035-400-3-010	36.90	MEF-035-400-3-010K	40.90
1 mm	.0394	1.5 mm	0.1 mm	4 mm	0.95 mm	2	3 mm	38 mm	MEFM-010-400-10	32.65		
1 mm	.0394	1.5 mm	0.2 mm	4 mm	0.95 mm	2	3 mm	38 mm	MEFM-010-400-20	32.65		
1 mm	.0394	1.5 mm	0.2 mm	7 mm	0.95 mm	2	3 mm	38 mm	MEFM-010-700-20	36.40	MEFM-010-700-20K	40.40
1 mm	.0394	1.5 mm	0.2 mm	9 mm	0.95 mm	2	3 mm	38 mm	MEFM-010-900-20	40.55	MEFM-010-900-20K	43.50
.0400	.0400	.060	.005	.150	.038	2	.1250	1.5	MEF-040-150-005	32.65	MEF-040-150-005K	36.65
.0400	.0400	.060	.005	.150	.038	3	.1250	1.5	MEF-040-150-3-005	32.65		
.0400	.0400	.060	.005	.250	.038	2	.1250	1.5	MEF-040-250-005	33.70	MEF-040-250-005K	37.70
.0400	.0400	.060	.005	.250	.038	3	.1250	1.5	MEF-040-250-3-005	33.70	MEF-040-250-3-005K	37.70
.0400	.0400	.060	.005	.500	.038	2	.1250	1.5	MEF-040-500-005	39.05	MEF-040-500-005K	43.05
.0400	.0400	.060	.005	.500	.038	3	.1250	1.5	MEF-040-500-3-005	39.05	MEF-040-500-3-005K	43.05
.0400	.0400	.060	.010	.150	.038	2	.1250	1.5	MEF-040-150-010	32.65	MEF-040-150-010K	36.65
.0400	.0400	.060	.010	.150	.038	3	.1250	1.5	MEF-040-150-3-010	32.65	MEF-040-150-3-010K	36.65
.0400	.0400	.060	.010	.250	.038	2	.1250	1.5	MEF-040-250-010	33.70	MEF-040-250-010K	37.70
.0400	.0400	.060	.010	.250	.038	3	.1250	1.5	MEF-040-250-3-010	33.70	MEF-040-250-3-010K	37.70
.0400	.0400	.060	.010	.500	.038	2	.1250	1.5	MEF-040-500-010	39.05	MEF-040-500-010K	43.05
.0400	.0400	.060	.010	.500	.038	3	.1250	1.5	MEF-040-500-3-010	39.05	MEF-040-500-3-010K	43.05

*.0005" / .013 mm max TIR

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Steels & High Temp. Alloys

End Mills For Steels & High Temperature Alloys

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



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Steels & High Temp. Alloys

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Cutter Diameter*	Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated		
								Tool #	Price	Tool #	Price	
D1 +.0000"-.000mm -.0005"-.013mm	L2 +.015" -.000" +.38mm -.00mm	R +.0000" -.0005" +.000mm -.013mm	L3 +.010" -.010" +.25mm -.00mm	D3		D2 (h6)	L1					
.0450	.0450	.068	.005	.150	.043	2	.1250	1.5	MEF-045-150-005	32.65	MEF-045-150-005K	36.65
.0450	.0450	.068	.005	.150	.043	3	.1250	1.5	MEF-045-150-3-005	32.65	MEF-045-150-3-005K	36.65
.0450	.0450	.068	.005	.250	.043	2	.1250	1.5	MEF-045-250-005	33.70	MEF-045-250-005K	37.70
.0450	.0450	.068	.005	.250	.043	3	.1250	1.5	MEF-045-250-3-005	33.70	MEF-045-250-3-005K	37.70
.0450	.0450	.068	.005	.500	.043	2	.1250	1.5	MEF-045-500-005	39.05	MEF-045-500-005K	43.05
.0450	.0450	.068	.005	.500	.043	3	.1250	1.5	MEF-045-500-3-005	39.05	MEF-045-500-3-005K	43.05
.0450	.0450	.068	.010	.150	.043	2	.1250	1.5	MEF-045-150-010	32.65	MEF-045-150-010K	36.65
.0450	.0450	.068	.010	.150	.043	3	.1250	1.5	MEF-045-150-3-010	32.65	MEF-045-150-3-010K	36.65
.0450	.0450	.068	.010	.250	.043	2	.1250	1.5	MEF-045-250-010	33.70	MEF-045-250-010K	37.70
.0450	.0450	.068	.010	.250	.043	3	.1250	1.5	MEF-045-250-3-010	33.70	MEF-045-250-3-010K	37.70
.0450	.0450	.068	.010	.500	.043	2	.1250	1.5	MEF-045-500-010	39.05	MEF-045-500-010K	43.05
.0450	.0450	.068	.010	.500	.043	3	.1250	1.5	MEF-045-500-3-010	39.05	MEF-045-500-3-010K	43.05
.0469	.0469	.071	.005	.150	.045	2	.1250	1.5	MEF-047-150-005	32.65	MEF-047-150-005K	36.65
.0469	.0469	.071	.005	.150	.045	3	.1250	1.5	MEF-047-150-3-005	32.65	MEF-047-150-3-005K	36.65
.0469	.0469	.071	.005	.250	.045	2	.1250	1.5	MEF-047-250-005	33.70	MEF-047-250-005K	37.70
.0469	.0469	.071	.005	.250	.045	3	.1250	1.5	MEF-047-250-3-005	33.70	MEF-047-250-3-005K	37.70
.0469	.0469	.071	.005	.500	.045	2	.1250	1.5	MEF-047-500-005	39.05		
.0469	.0469	.071	.005	.500	.045	3	.1250	1.5	MEF-047-500-3-005	39.05	MEF-047-500-3-005K	43.05
.0469	.0469	.071	.010	.150	.045	2	.1250	1.5	MEF-047-150-010	32.65	MEF-047-150-010K	36.65
.0469	.0469	.071	.010	.150	.045	3	.1250	1.5	MEF-047-150-3-010	32.65	MEF-047-150-3-010K	36.65
.0469	.0469	.071	.010	.250	.045	2	.1250	1.5	MEF-047-250-010	33.70	MEF-047-250-010K	37.70
.0469	.0469	.071	.010	.250	.045	3	.1250	1.5	MEF-047-250-3-010	33.70	MEF-047-250-3-010K	37.70
.0469	.0469	.071	.010	.500	.045	2	.1250	1.5	MEF-047-500-010	39.05	MEF-047-500-010K	43.05
.0469	.0469	.071	.010	.500	.045	3	.1250	1.5	MEF-047-500-3-010	39.05	MEF-047-500-3-010K	43.05
1.2 mm	.0472	1.8 mm	0.1 mm	6 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-600-10	36.40		
1.2 mm	.0472	1.8 mm	0.1 mm	10 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-1000-10	40.60	MEFM-012-1000-10K	44.60
1.2 mm	.0472	1.8 mm	0.1 mm	12 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-1200-10	44.15	MEFM-012-1200-10K	48.15
1.2 mm	.0472	1.8 mm	0.2 mm	6 mm	1.1 mm	2	3 mm	38 mm			MEFM-012-600-20K	40.40
1.2 mm	.0472	1.8 mm	0.2 mm	10 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-1000-20	40.60	MEFM-012-1000-20K	44.60
1.2 mm	.0472	1.8 mm	0.2 mm	12 mm	1.1 mm	2	3 mm	38 mm	MEFM-012-1200-20	44.15	MEFM-012-1200-20K	48.15
.0500	.0500	.075	.005	.200	.048	2	.1250	1.5	MEF-050-200-005	32.65	MEF-050-200-005K	36.65
.0500	.0500	.075	.005	.200	.048	3	.1250	1.5	MEF-050-200-3-005	32.65	MEF-050-200-3-005K	36.65
.0500	.0500	.075	.005	.300	.048	2	.1250	1.5	MEF-050-300-005	34.75	MEF-050-300-005K	38.75
.0500	.0500	.075	.005	.300	.048	3	.1250	1.5	MEF-050-300-3-005	34.75	MEF-050-300-3-005K	38.75
.0500	.0500	.075	.005	.550	.048	2	.1250	1.5	MEF-050-550-005	39.05	MEF-050-550-005K	43.05
.0500	.0500	.075	.005	.550	.048	3	.1250	1.5	MEF-050-550-3-005	39.05		
.0500	.0500	.075	.010	.200	.048	2	.1250	1.5	MEF-050-200-010	32.65	MEF-050-200-010K	36.65
.0500	.0500	.075	.010	.200	.048	3	.1250	1.5	MEF-050-200-3-010	32.65	MEF-050-200-3-010K	36.65
.0500	.0500	.075	.010	.300	.048	2	.1250	1.5	MEF-050-300-010	34.75	MEF-050-300-010K	38.75
.0500	.0500	.075	.010	.300	.048	3	.1250	1.5	MEF-050-300-3-010	34.75	MEF-050-300-3-010K	38.75
.0500	.0500	.075	.010	.550	.048	2	.1250	1.5			MEF-050-550-010K	43.05
.0500	.0500	.075	.010	.550	.048	3	.1250	1.5	MEF-050-550-3-010	39.05	MEF-050-550-3-010K	43.05

*.0005" / .013 mm max TIR

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End Mills For Steels & High Temperature Alloys

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

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Cutter Diameter*	Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
								Tool #	Price	Tool #	Price
D1 +.0000" +.000mm -.0005" -.013mm	L2 +.015" +.38mm -.000" -.00mm	R +.0000" +.000mm -.0005" -.013mm	L3 +.010" +.25mm -.010" -.00mm	D3		D2 (h6)	L1				
1.5 mm .0591	2.2 mm	0.15 mm	6 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-600-15	36.40		
1.5 mm .0591	2.2 mm	0.15 mm	10 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1000-15	40.60	MEFM-015-1000-15K	44.60
1.5 mm .0591	2.2 mm	0.15 mm	12 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1200-15	44.15	MEFM-015-1200-15K	48.15
1.5 mm .0591	2.2 mm	0.15 mm	15 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1500-15	46.55	MEFM-015-1500-15K	50.55
1.5 mm .0591	2.2 mm	0.15 mm	20 mm	1.4 mm	2	3 mm	50 mm	MEFM-015-2000-15	57.25	MEFM-015-2000-15K	61.25
1.5 mm .0591	2.2 mm	0.25 mm	6 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-600-25	36.40	MEFM-015-600-25K	40.40
1.5 mm .0591	2.2 mm	0.25 mm	10 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1000-25	40.60	MEFM-015-1000-25K	44.60
1.5 mm .0591	2.2 mm	0.25 mm	12 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1200-25	44.15	MEFM-015-1200-25K	48.15
1.5 mm .0591	2.2 mm	0.25 mm	15 mm	1.4 mm	2	3 mm	38 mm	MEFM-015-1500-25	46.55	MEFM-015-1500-25K	50.55
1.5 mm .0591	2.2 mm	0.25 mm	20 mm	1.4 mm	2	3 mm	50 mm	MEFM-015-2000-25	57.25	MEFM-015-2000-25K	61.25
.0600 .0600	.090	.005	.200	.056	2	.1250	1.5	MEF-060-200-005	32.65	MEF-060-200-005K	36.65
.0600 .0600	.090	.005	.200	.056	3	.1250	1.5	MEF-060-200-3-005	32.65	MEF-060-200-3-005K	36.65
.0600 .0600	.090	.005	.350	.056	2	.1250	1.5	MEF-060-350-005	34.75	MEF-060-350-005K	38.75
.0600 .0600	.090	.005	.350	.056	3	.1250	1.5	MEF-060-350-3-005	34.75	MEF-060-350-3-005K	38.75
.0600 .0600	.090	.005	.500	.056	2	.1250	1.5	MEF-060-500-005	39.05	MEF-060-500-005K	43.05
.0600 .0600	.090	.005	.500	.056	3	.1250	1.5	MEF-060-500-3-005	39.05	MEF-060-500-3-005K	43.05
.0600 .0600	.090	.005	.750	.056	2	.1250	2.0	MEF-060-750-005	44.40	MEF-060-750-005K	48.40
.0600 .0600	.090	.005	.750	.056	3	.1250	2.0	MEF-060-750-3-005	44.40	MEF-060-750-3-005K	48.40
.0600 .0600	.090	.010	.200	.056	3	.1250	1.5	MEF-060-200-3-010	32.65	MEF-060-200-3-010K	36.65
.0600 .0600	.090	.010	.350	.056	2	.1250	1.5	MEF-060-350-010	34.75	MEF-060-350-010K	38.75
.0600 .0600	.090	.010	.350	.056	3	.1250	1.5	MEF-060-350-3-010	34.75	MEF-060-350-3-010K	38.75
.0600 .0600	.090	.010	.500	.056	2	.1250	1.5	MEF-060-500-010	39.05	MEF-060-500-010K	43.05
.0600 .0600	.090	.010	.500	.056	3	.1250	1.5	MEF-060-500-3-010	39.05	MEF-060-500-3-010K	43.05
.0600 .0600	.090	.010	.750	.056	2	.1250	2.0	MEF-060-750-010	44.40	MEF-060-750-010K	48.40
.0600 .0600	.090	.010	.750	.056	3	.1250	2.0	MEF-060-750-3-010	44.40	MEF-060-750-3-010K	48.40
.0600 .0600	.090	.015	.200	.056	2	.1250	1.5	MEF-060-200-015	32.65	MEF-060-200-015K	36.65
.0600 .0600	.090	.015	.200	.056	3	.1250	1.5	MEF-060-200-3-015	32.65	MEF-060-200-3-015K	36.65
.0600 .0600	.090	.015	.350	.056	2	.1250	1.5	MEF-060-350-015	34.75	MEF-060-350-015K	38.75
.0600 .0600	.090	.015	.350	.056	3	.1250	1.5	MEF-060-350-3-015	34.75	MEF-060-350-3-015K	38.75
.0600 .0600	.090	.015	.500	.056	2	.1250	1.5	MEF-060-500-015	39.05	MEF-060-500-015K	43.05
.0600 .0600	.090	.015	.500	.056	3	.1250	1.5	MEF-060-500-3-015	39.05	MEF-060-500-3-015K	43.05
.0600 .0600	.090	.015	.750	.056	2	.1250	2.0	MEF-060-750-015	44.40	MEF-060-750-015K	48.40
.0600 .0600	.090	.015	.750	.056	3	.1250	2.0	MEF-060-750-3-015	44.40	MEF-060-750-3-015K	48.40
.0625 .0625	.093	.005	.200	.058	2	.1250	1.5	MEF-062-200-005	32.65	MEF-062-200-005K	36.65
.0625 .0625	.093	.005	.200	.058	3	.1250	1.5	MEF-062-200-3-005	32.65	MEF-062-200-3-005K	36.65
.0625 .0625	.093	.005	.350	.058	2	.1250	1.5	MEF-062-350-005	34.75		
.0625 .0625	.093	.005	.350	.058	3	.1250	1.5	MEF-062-350-3-005	34.75	MEF-062-350-3-005K	38.75
.0625 .0625	.093	.005	.550	.058	2	.1250	1.5	MEF-062-550-005	39.05	MEF-062-550-005K	43.05
.0625 .0625	.093	.005	.550	.058	3	.1250	1.5	MEF-062-550-3-005	39.05	MEF-062-550-3-005K	43.05
.0625 .0625	.093	.005	.750	.058	2	.1250	2.0	MEF-062-750-005	44.40	MEF-062-750-005K	48.40
.0625 .0625	.093	.005	.750	.058	3	.1250	2.0	MEF-062-750-3-005	44.40	MEF-062-750-3-005K	48.40
.0625 .0625	.093	.010	.200	.058	2	.1250	1.5	MEF-062-200-010	32.65	MEF-062-200-010K	36.65

*.0005" / .013 mm max TIR

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Steels & High Temp. Alloys

End Mills For Steels & High Temperature Alloys

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



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Steels & High Temp. Alloys

Cutter Diameter*	Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
								Tool #	Price	Tool #	Price
D1 +.0000"/+.000mm -.0005"/-.013mm	L2 +.015"/+.000mm -.0005"/-.00mm	R +.0000"/+.000mm -.0005"/-.013mm	L3 +.010"/+.010mm -.010"/-.00mm	D3		D2 (h6)	L1				
.0625 .0625	.093	.010	.200	.058	3	.1250	1.5	MEF-062-200-3-010	32.65	MEF-062-200-3-010K	36.65
.0625 .0625	.093	.010	.350	.058	2	.1250	1.5	MEF-062-350-010	34.75	MEF-062-350-010K	38.75
.0625 .0625	.093	.010	.350	.058	3	.1250	1.5	MEF-062-350-3-010	34.75	MEF-062-350-3-010K	38.75
.0625 .0625	.093	.010	.550	.058	2	.1250	1.5	MEF-062-550-010	39.05	MEF-062-550-010K	43.05
.0625 .0625	.093	.010	.550	.058	3	.1250	1.5	MEF-062-550-3-010	39.05	MEF-062-550-3-010K	43.05
.0625 .0625	.093	.010	.750	.058	2	.1250	2.0	MEF-062-750-010	44.40	MEF-062-750-010K	48.40
.0625 .0625	.093	.010	.750	.058	3	.1250	2.0	MEF-062-750-3-010	44.40	MEF-062-750-3-010K	48.40
.0625 .0625	.093	.015	.200	.058	2	.1250	1.5	MEF-062-200-015	32.65	MEF-062-200-015K	36.65
.0625 .0625	.093	.015	.200	.058	3	.1250	1.5	MEF-062-200-3-015	32.65	MEF-062-200-3-015K	36.65
.0625 .0625	.093	.015	.350	.058	2	.1250	1.5	MEF-062-350-015	34.25	MEF-062-350-015K	38.25
.0625 .0625	.093	.015	.350	.058	3	.1250	1.5	MEF-062-350-3-015	34.25	MEF-062-350-3-015K	38.25
.0625 .0625	.093	.015	.550	.058	2	.1250	1.5	MEF-062-550-015	39.05	MEF-062-550-015K	43.05
.0625 .0625	.093	.015	.550	.058	3	.1250	1.5	MEF-062-550-3-015	39.05	MEF-062-550-3-015K	43.05
.0625 .0625	.093	.015	.750	.058	2	.1250	2.0	MEF-062-750-015	44.40	MEF-062-750-015K	48.40
.0625 .0625	.093	.015	.750	.058	3	.1250	2.0	MEF-062-750-3-015	44.40	MEF-062-750-3-015K	48.40
.0750 .0750	.113	.005	.250	.071	2	.1250	1.5	MEF-075-250-005	32.65	MEF-075-250-005K	36.65
.0750 .0750	.113	.005	.250	.071	3	.1250	1.5	MEF-075-250-3-005	32.65	MEF-075-250-3-005K	36.65
.0750 .0750	.113	.005	.400	.071	2	.1250	1.5	MEF-075-400-005	34.75	MEF-075-400-005K	38.75
.0750 .0750	.113	.005	.400	.071	3	.1250	1.5	MEF-075-400-3-005	34.75	MEF-075-400-3-005K	38.75
.0750 .0750	.113	.005	.600	.071	2	.1250	2.0	MEF-075-600-005	39.05	MEF-075-600-005K	43.05
.0750 .0750	.113	.005	.600	.071	3	.1250	2.0	MEF-075-600-3-005	39.05	MEF-075-600-3-005K	43.05
.0750 .0750	.113	.005	.900	.071	2	.1250	2.0	MEF-075-900-005	46.80	MEF-075-900-005K	50.80
.0750 .0750	.113	.005	.900	.071	3	.1250	2.0	MEF-075-900-3-005	46.80	MEF-075-900-3-005K	50.80
.0750 .0750	.113	.010	.250	.071	2	.1250	1.5	MEF-075-250-010	32.65	MEF-075-250-010K	36.65
.0750 .0750	.113	.010	.250	.071	3	.1250	1.5	MEF-075-250-3-010	32.65	MEF-075-250-3-010K	36.65
.0750 .0750	.113	.010	.400	.071	2	.1250	1.5	MEF-075-400-010	34.75	MEF-075-400-010K	38.75
.0750 .0750	.113	.010	.400	.071	3	.1250	1.5	MEF-075-400-3-010	34.75	MEF-075-400-3-010K	38.75
.0750 .0750	.113	.010	.600	.071	2	.1250	2.0	MEF-075-600-010	39.05	MEF-075-600-010K	43.05
.0750 .0750	.113	.010	.600	.071	3	.1250	2.0	MEF-075-600-3-010	39.05	MEF-075-600-3-010K	43.05
.0750 .0750	.113	.010	.900	.071	2	.1250	2.0	MEF-075-900-010	46.80	MEF-075-900-010K	50.80
.0750 .0750	.113	.010	.900	.071	3	.1250	2.0	MEF-075-900-3-010	46.80	MEF-075-900-3-010K	50.80
.0750 .0750	.113	.015	.250	.071	2	.1250	1.5	MEF-075-250-015	32.65	MEF-075-250-015K	36.65
.0750 .0750	.113	.015	.250	.071	3	.1250	1.5	MEF-075-250-3-015	32.65	MEF-075-250-3-015K	36.65
.0750 .0750	.113	.015	.400	.071	2	.1250	1.5	MEF-075-400-015	34.75	MEF-075-400-015K	38.75
.0750 .0750	.113	.015	.400	.071	3	.1250	1.5	MEF-075-400-3-015	34.75	MEF-075-400-3-015K	38.75
.0750 .0750	.113	.015	.600	.071	2	.1250	2.0	MEF-075-600-015	39.05	MEF-075-600-015K	43.05
.0750 .0750	.113	.015	.600	.071	3	.1250	2.0	MEF-075-600-3-015	39.05	MEF-075-600-3-015K	43.05
.0750 .0750	.113	.015	.900	.071	2	.1250	2.0	MEF-075-900-015	46.80	MEF-075-900-015K	50.80
.0750 .0750	.113	.015	.900	.071	3	.1250	2.0	MEF-075-900-3-015	46.80	MEF-075-900-3-015K	50.80
.0781 .0781	.117	.005	.250	.074	2	.1250	1.5	MEF-078-250-005	32.65	MEF-078-250-005K	36.65
.0781 .0781	.117	.005	.250	.074	3	.1250	1.5	MEF-078-250-3-005	32.65	MEF-078-250-3-005K	36.65
.0781 .0781	.117	.005	.400	.074	2	.1250	1.5	MEF-078-400-005	34.75	MEF-078-400-005K	38.75
.0781 .0781	.117	.005	.400	.074	3	.1250	1.5	MEF-078-400-3-005	34.75	MEF-078-400-3-005K	38.75
.0781 .0781	.117	.005	.650	.074	2	.1250	2.0	MEF-078-650-005	39.05	MEF-078-650-005K	43.05
.0781 .0781	.117	.005	.650	.074	3	.1250	2.0	MEF-078-650-3-005	39.05	MEF-078-650-3-005K	43.05

*.0005" / .013 mm max TIR

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End Mills For Steels & High Temperature Alloys
 Corner Radius – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

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Cutter Diameter*	Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated		
								Tool #	Price	Tool #	Price	
D1 +.0000"-.0005mm +.0000"-.013mm	L2 +.015"-.000"	R +.0000"-.0005" +.0000mm-.013mm	L3 +.010"-.010" +.25mm-.00mm	D3		D2 (h6)	L1					
.0781	.0781	.117	.005	.900	.074	2	.1250	2.0	MEF-078-900-005	46.80	MEF-078-900-005K	50.80
.0781	.0781	.117	.005	.900	.074	3	.1250	2.0	MEF-078-900-3-005	46.80	MEF-078-900-3-005K	50.80
.0781	.0781	.117	.010	.250	.074	2	.1250	1.5	MEF-078-250-010	32.65	MEF-078-250-010K	36.65
.0781	.0781	.117	.010	.250	.074	3	.1250	1.5	MEF-078-250-3-010	32.65	MEF-078-250-3-010K	36.65
.0781	.0781	.117	.010	.400	.074	2	.1250	1.5	MEF-078-400-010	34.75	MEF-078-400-010K	38.75
.0781	.0781	.117	.010	.400	.074	3	.1250	1.5	MEF-078-400-3-010	34.75	MEF-078-400-3-010K	38.75
.0781	.0781	.117	.010	.650	.074	2	.1250	2.0	MEF-078-650-010	39.05	MEF-078-650-010K	43.05
.0781	.0781	.117	.010	.650	.074	3	.1250	2.0	MEF-078-650-3-010	39.05	MEF-078-650-3-010K	43.05
.0781	.0781	.117	.010	.900	.074	2	.1250	2.0	MEF-078-900-010	46.80	MEF-078-900-010K	50.80
.0781	.0781	.117	.010	.900	.074	3	.1250	2.0	MEF-078-900-3-010	46.80	MEF-078-900-3-010K	50.80
.0781	.0781	.117	.015	.250	.074	2	.1250	1.5	MEF-078-250-015	32.65	MEF-078-250-015K	36.65
.0781	.0781	.117	.015	.250	.074	3	.1250	1.5	MEF-078-250-3-015	32.65	MEF-078-250-3-015K	36.65
.0781	.0781	.117	.015	.400	.074	2	.1250	1.5	MEF-078-400-015	34.75	MEF-078-400-015K	38.75
.0781	.0781	.117	.015	.400	.074	3	.1250	1.5	MEF-078-400-3-015	34.75	MEF-078-400-3-015K	38.75
.0781	.0781	.117	.015	.650	.074	2	.1250	2.0	MEF-078-650-015	39.05	MEF-078-650-015K	43.05
.0781	.0781	.117	.015	.650	.074	3	.1250	2.0			MEF-078-650-3-015K	43.05
.0781	.0781	.117	.015	.900	.074	2	.1250	2.0			MEF-078-900-015K	50.80
.0781	.0781	.117	.015	.900	.074	3	.1250	2.0	MEF-078-900-3-015	46.80	MEF-078-900-3-015K	50.80
2 mm	.0787	2.5 mm	0.15 mm	7 mm	1.9 mm	2	3 mm	38 mm	MEFM-020-700-15	37.45	MEFM-020-700-15K	41.45
2 mm	.0787	2.5 mm	0.15 mm	12 mm	1.9 mm	2	3 mm	38 mm	MEFM-020-1200-15	44.15	MEFM-020-1200-15K	48.15
2 mm	.0787	2.5 mm	0.15 mm	16 mm	1.9 mm	2	3 mm	38 mm			MEFM-020-1600-15K	50.55
2 mm	.0787	2.5 mm	0.15 mm	25 mm	1.9 mm	2	3 mm	50 mm			MEFM-020-2500-15K	67.15
2 mm	.0787	2.5 mm	0.25 mm	7 mm	1.9 mm	2	3 mm	38 mm	MEFM-020-700-25	37.45	MEFM-020-700-25K	41.45
2 mm	.0787	2.5 mm	0.25 mm	12 mm	1.9 mm	2	3 mm	38 mm	MEFM-020-1200-25	44.15	MEFM-020-1200-25K	48.15
2 mm	.0787	2.5 mm	0.25 mm	16 mm	1.9 mm	2	3 mm	38 mm	MEFM-020-1600-25	46.55	MEFM-020-1600-25K	50.55
2 mm	.0787	2.5 mm	0.25 mm	20 mm	1.9 mm	2	3 mm	50 mm	MEFM-020-2000-25	57.25	MEFM-020-2000-25K	61.25
2 mm	.0787	2.5 mm	0.25 mm	25 mm	1.9 mm	2	3 mm	50 mm	MEFM-020-2500-25	63.15	MEFM-020-2500-25K	67.15
.0900	.0900	.125	.005	.250	.086	2	.1250	1.5	MEF-090-250-005	32.65	MEF-090-250-005K	36.65
.0900	.0900	.125	.005	.400	.086	2	.1250	1.5	MEF-090-400-005	34.75	MEF-090-400-005K	38.75
.0900	.0900	.125	.005	.650	.086	2	.1250	2.0	MEF-090-650-005	39.05	MEF-090-650-005K	43.05
.0900	.0900	.125	.005	.900	.086	2	.1250	2.0	MEF-090-900-005	46.80	MEF-090-900-005K	50.80
.0900	.0900	.125	.010	.250	.086	2	.1250	1.5	MEF-090-250-010	32.65	MEF-090-250-010K	36.65
.0900	.0900	.125	.010	.400	.086	2	.1250	1.5	MEF-090-400-010	34.75	MEF-090-400-010K	38.75
.0900	.0900	.125	.010	.650	.086	2	.1250	2.0	MEF-090-650-010	39.05	MEF-090-650-010K	43.05
.0900	.0900	.125	.010	.900	.086	2	.1250	2.0	MEF-090-900-010	46.80	MEF-090-900-010K	50.80
.0900	.0900	.125	.015	.250	.086	2	.1250	1.5	MEF-090-250-015	32.65	MEF-090-250-015K	36.65
.0900	.0900	.125	.015	.400	.086	2	.1250	1.5	MEF-090-400-015	34.75	MEF-090-400-015K	38.75
.0900	.0900	.125	.015	.650	.086	2	.1250	2.0	MEF-090-650-015	39.05	MEF-090-650-015K	43.05
.0900	.0900	.125	.015	.900	.086	2	.1250	2.0	MEF-090-900-015	46.80	MEF-090-900-015K	50.80
.0938	.0938	.125	.005	.250	.089	2	.1250	1.5	MEF-093-250-005	32.65	MEF-093-250-005K	36.65
.0938	.0938	.125	.005	.500	.089	2	.1250	1.5	MEF-093-500-005	39.05	MEF-093-500-005K	43.05
.0938	.0938	.125	.005	.750	.089	2	.1250	2.0	MEF-093-750-005	44.40	MEF-093-750-005K	48.40
.0938	.0938	.125	.005	1.000	.089	2	.1250	2.0	MEF-093-1000-005	46.80	MEF-093-1000-005K	50.80
.0938	.0938	.125	.010	.250	.089	2	.1250	1.5	MEF-093-250-010	32.65	MEF-093-250-010K	36.65
.0938	.0938	.125	.010	.500	.089	2	.1250	1.5	MEF-093-500-010	39.05	MEF-093-500-010K	43.05

*.0005" / .013 mm max TIR

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Steels & High Temp. Alloys

End Mills For Steels & High Temperature Alloys

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



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Steels & High Temp. Alloys

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Cutter Diameter*	Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nAcRo® Coated	
								Tool #	Price	Tool #	Price
D1 +.0000"/+.000mm -.0005"/-.013mm	L2	R +.0000" -.0005" +.0000mm -.013mm	L3 +.010" -.010" +.25mm -.00mm	D3		D2 (h6)	L1				
.0938 .0938	.125	.010	.750	.089	2	.1250	2.0	MEF-093-750-010	44.40	MEF-093-750-010K	48.40
.0938 .0938	.125	.010	1.000	.089	2	.1250	2.0	MEF-093-1000-010	46.80	MEF-093-1000-010K	50.80
.0938 .0938	.125	.015	.250	.089	2	.1250	1.5	MEF-093-250-015	32.65	MEF-093-250-015K	36.65
.0938 .0938	.125	.015	.500	.089	2	.1250	1.5	MEF-093-500-015	39.05	MEF-093-500-015K	43.05
.0938 .0938	.125	.015	.750	.089	2	.1250	2.0	MEF-093-750-015	44.40		
.0938 .0938	.125	.015	1.000	.089	2	.1250	2.0	MEF-093-1000-015	46.80		
2.5 mm .0984	3 mm	0.15 mm	15 mm	2.4 mm	2	3 mm	38 mm	MEFM-025-1500-15	46.55	MEFM-025-1500-15K	50.55
2.5 mm .0984	3 mm	0.15 mm	20 mm	2.4 mm	2	3 mm	50 mm	MEFM-025-2000-15	57.25	MEFM-025-2000-15K	61.25
2.5 mm .0984	3 mm	0.15 mm	25 mm	2.4 mm	2	3 mm	50 mm	MEFM-025-2500-15	63.15	MEFM-025-2500-15K	67.15
2.5 mm .0984	3 mm	0.15 mm	30 mm	2.4 mm	2	3 mm	60 mm			MEFM-025-3000-15K	73.40
2.5 mm .0984	3 mm	0.25 mm	20 mm	2.4 mm	2	3 mm	50 mm	MEFM-025-2000-25	57.25	MEFM-025-2000-25K	61.25
2.5 mm .0984	3 mm	0.25 mm	25 mm	2.4 mm	2	3 mm	50 mm	MEFM-025-2500-25	63.15	MEFM-025-2500-25K	67.15
3 mm .1181	3 mm	0.15 mm	10 mm	2.9 mm	2	6 mm	57 mm			MEFM-030-1000-15K	51.90
3 mm .1181	3 mm	0.15 mm	15 mm	2.9 mm	2	6 mm	57 mm	MEFM-030-1500-15	52.85	MEFM-030-1500-15K	58.60
3 mm .1181	3 mm	0.15 mm	25 mm	2.9 mm	2	6 mm	57 mm			MEFM-030-2500-15K	68.15
3 mm .1181	3 mm	0.15 mm	30 mm	2.9 mm	2	6 mm	57 mm	MEFM-030-3000-15	66.35	MEFM-030-3000-15K	72.10
3 mm .1181	3 mm	0.25 mm	10 mm	2.9 mm	2	6 mm	57 mm	MEFM-030-1000-25	46.15	MEFM-030-1000-25K	51.90
3 mm .1181	3 mm	0.25 mm	15 mm	2.9 mm	2	6 mm	57 mm	MEFM-030-1500-25	52.85	MEFM-030-1500-25K	58.60
3 mm .1181	3 mm	0.25 mm	30 mm	2.9 mm	2	6 mm	57 mm	MEFM-030-3000-25	66.35		
.1250 .1250	.125	.005	.375	.121	2	.1875	2.0	MEF-125-375-005	34.75	MEF-125-375-005K	39.25
.1250 .1250	.125	.005	.750	.121	2	.1875	2.0	MEF-125-750-005	41.20	MEF-125-750-005K	45.70
.1250 .1250	.125	.005	1.000	.121	2	.1875	2.0	MEF-125-1000-005	46.55	MEF-125-1000-005K	51.05
.1250 .1250	.125	.005	1.500	.121	2	.1875	3.0	MEF-125-1500-005	50.25	MEF-125-1500-005K	55.05
.1250 .1250	.125	.010	.375	.121	2	.1875	2.0	MEF-125-375-010	34.75		
.1250 .1250	.125	.010	.750	.121	2	.1875	2.0	MEF-125-750-010	41.20	MEF-125-750-010K	45.70
.1250 .1250	.125	.010	1.000	.121	2	.1875	2.0	MEF-125-1000-010	46.55	MEF-125-1000-010K	51.05
.1250 .1250	.125	.010	1.500	.121	2	.1875	3.0	MEF-125-1500-010	50.25	MEF-125-1500-010K	55.05
.1250 .1250	.125	.015	.375	.121	2	.1875	2.0	MEF-125-375-015	34.75	MEF-125-375-015K	39.25
.1250 .1250	.125	.015	.750	.121	2	.1875	2.0	MEF-125-750-015	41.20	MEF-125-750-015K	45.70
.1250 .1250	.125	.015	1.000	.121	2	.1875	2.0	MEF-125-1000-015	46.55	MEF-125-1000-015K	51.05
4 mm .1575	5 mm	0.25 mm	30 mm	3.9 mm	2	6 mm	57 mm	MEFM-040-3000-25	66.20	MEFM-040-3000-25K	71.95
4 mm .1575	5 mm	0.5 mm	30 mm	3.9 mm	2	6 mm	57 mm	MEFM-040-3000-50	66.20	MEFM-040-3000-50K	71.95
4 mm .1575	5 mm	1 mm	30 mm	3.9 mm	2	6 mm	57 mm	MEFM-040-3000-100	66.20	MEFM-040-3000-100K	71.95
.1875 .1875	.200	.005	1.000	.183	2	.2500	2.5	MEF-187-1000-005	58.85	MEF-187-1000-005K	64.60
.1875 .1875	.200	.010	1.000	.183	2	.2500	2.5	MEF-187-1000-010	58.85	MEF-187-1000-010K	64.60
.1875 .1875	.200	.010	1.500	.183	2	.2500	3.0	MEF-187-1500-010	66.35	MEF-187-1500-010K	72.10
.1875 .1875	.200	.015	1.000	.183	2	.2500	2.5	MEF-187-1000-015	58.85	MEF-187-1000-015K	64.60
.1875 .1875	.200	.015	1.500	.183	2	.2500	3.0	MEF-187-1500-015	66.35	MEF-187-1500-015K	72.10
.1875 .1875	.200	.005	.750	.183	2	.2500	2.5	MEF-187-750-005	52.40	MEF-187-750-005K	58.15
.1875 .1875	.200	.015	.750	.183	2	.2500	2.5	MEF-187-750-015	52.40	MEF-187-750-015K	58.15
.1875 .1875	.200	.010	.750	.183	2	.2500	2.5	MEF-187-750-010	52.40	MEF-187-750-010K	58.15

*.0005" / .013 mm max TIR

Continued on next page

MEF / MEFM



End Mills For Steels & High Temperature Alloys
 Corner Radius – 2 & 3 Flute – Long Reach, Stub Flute (cont.)

Continued from previous page

Cutter Diameter*	Length of Cut	Corner Radius	Overall Reach	Neck Dia.	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
								Tool #	Price	Tool #	Price
D1 +.0000"/+.000mm -.0005"/-.013mm	L2 +.015"/-.000" +.38mm -.00mm	R +.0000"/-.0005" +.000mm -.013mm	L3 +.010"/-.010" +.25mm -.00mm	D3		D2 (h6)	L1	Tool #	Price	Tool #	Price
5 mm .1969	6 mm	0.25 mm	15 mm	4.9 mm	2	6 mm	57 mm	MEFM-050-1500-25	52.80	MEFM-050-1500-25K	58.55
5 mm .1969	6 mm	0.25 mm	25 mm	4.9 mm	2	6 mm	57 mm	MEFM-050-2500-25	60.30	MEFM-050-2500-25K	66.05
5 mm .1969	6 mm	0.25 mm	30 mm	4.9 mm	2	6 mm	57 mm			MEFM-050-3000-25K	71.95
5 mm .1969	6 mm	0.5 mm	30 mm	4.9 mm	2	6 mm	57 mm	MEFM-050-3000-50	66.20	MEFM-050-3000-50K	71.95
5 mm .1969	6 mm	1 mm	30 mm	4.9 mm	2	6 mm	57 mm	MEFM-050-3000-100	66.20	MEFM-050-3000-100K	71.95

D1 +.0000" -.0010"	L2 +.015" -.000"	R +.0000" -.0005"	L3 +.010" -.010"	D3	D2 (h6)	L1	Tool #	Price	Tool #	Price
.2500 .2500	.250 .005	.750 .246	2 .2500 2.5	MFF-250-750-005	52.40	MFF-250-750-005K	58.15			
.2500 .2500	.250 .010	.750 .246	2 .2500 2.5	MFF-250-750-010	52.40	MFF-250-750-010K	58.15			
.2500 .2500	.250 .015	.750 .246	2 .2500 2.5	MFF-250-750-015	52.40	MFF-250-750-015K	58.15			
.2500 .2500	.250 .010	1.000 .246	2 .2500 2.5	MFF-250-1000-010	58.85	MFF-250-1000-010K	64.60			
.2500 .2500	.250 .005	1.000 .246	2 .2500 2.5	MFF-250-1000-005	58.85	MFF-250-1000-005K	64.60			
.2500 .2500	.250 .015	1.000 .246	2 .2500 2.5	MFF-250-1000-015	58.85	MFF-250-1000-015K	64.60			

*.0005" / .013 mm max TIR

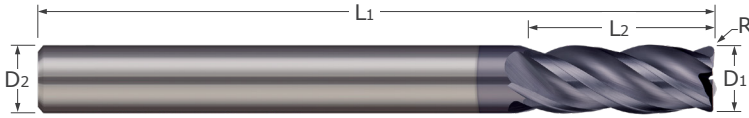
Steels & High Temp. Alloys

End Mills For Steels & High Temperature Alloys

Corner Radius – 4 Flute – Variable Helix



VHS / VHSM
VHM / VHMM



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

Steels & High Temp. Alloys

Cutter Diameter*			Length of Cut	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
D1 +.0000" -.0020" (h9) decimal equiv.			L2	R		D2 (h6)	L1	Tool #	Price	Tool #	Price
3 mm		.1181	6 mm	0.5 mm	4	4 mm	50 mm			VHSM-030-4X	18.20
3 mm		.1181	8 mm	0.5 mm	4	4 mm	50 mm			VHMM-030-4X	19.75
.1250		.1250	.500	.010	4	.1250	1.5			VHM-125-4X	16.80
4 mm		.1575	8 mm	0.5 mm	4	4 mm	50 mm	VHSM-040-4	21.65	VHSM-040-4X	24.55
4 mm		.1575	11 mm	0.5 mm	4	4 mm	50 mm	VHMM-040-4	24.05	VHMM-040-4X	26.90
5 mm		.1969	16 mm	0.5 mm	4	6 mm	57 mm	VHMM-050-4	28.55		

D1 +.0000" -.0030" (h9) decimal equiv.			L2	R		D2 (h6)	L1	Tool #	Price	Tool #	Price
6 mm		.2362	16 mm	0.5 mm	4	6 mm	57 mm			VHMM-060-4X	33.80
.2500		.2500	.500	.020	4	.2500	2.5	VHS-250-4	25.45	VHS-250-4X	30.40
.3125		.3125	.500	.020	4	.3125	2.5			VHS-312-4X	36.75
8 mm		.3150	16 mm	0.5 mm	4	8 mm	63 mm	VHSM-080-4	29.95		
8 mm		.3150	19 mm	0.5 mm	4	8 mm	63 mm	VHMM-080-4	33.35	VHMM-080-4X	40.25
.3750		.3750	.875	.020	4	.3750	2.5	VHM-375-4	37.50		
10 mm		.3937	19 mm	0.5 mm	4	10 mm	72 mm	VHSM-100-4	38.35		
10 mm		.3937	22 mm	0.6 mm	4	10 mm	72 mm	VHMM-100-4	42.60	VHMM-100-4X	49.40
.4375		.4375	1.000	.020	4	.4375	2.5	VHM-437-4	58.55	VHM-437-4X	66.65
12 mm		.4724	22 mm	0.5 mm	4	12 mm	83 mm			VHSM-120-4X	65.10
12 mm		.4724	26 mm	0.6 mm	4	12 mm	83 mm	VHMM-120-4	60.70	VHMM-120-4X	71.05
.5000		.5000	1.250	.030	4	.5000	3.5	VHM-5125-4	68.10	VHM-5125-4X	75.05
25 mm		.9843	38 mm	0.8 mm	4	25 mm	127 mm			VHMM-250-4X	305.75

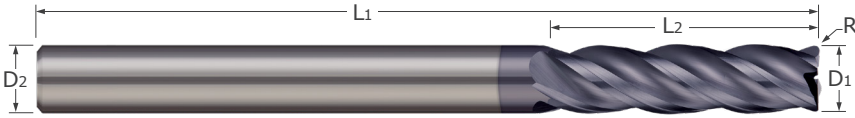
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VLM



End Mills For Steels & High Temperature Alloys

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



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

Steels & High Temp. Alloys

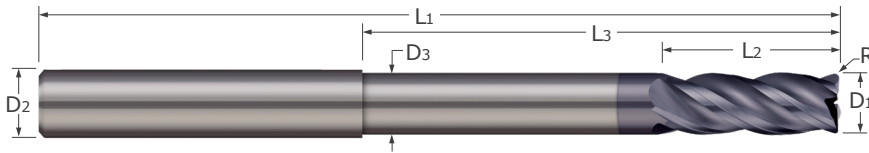
Cutter Diameter	Length of Cut	Corner Radius	Flutes	Shank Dia.	Overall Length	Uncoated		AlTiN Coated		nACRo® Coated	
						Tool #	Price	Tool #	Price	Tool #	Price
D1 $\begin{matrix} +.0000" \\ -.0020" \end{matrix}$	L2 $\begin{matrix} +.030" \\ -.000" \end{matrix}$	R $\begin{matrix} +.0000" \\ -.0005" \end{matrix}$		D2 (h6)	L1						
.1875	.750	.0100	4	.1875	2.5			VLM-187-4X	32.75		
.2500	1.125	.0200	4	.2500	3.0	VLM-250-4	36.05				
.2500	1.125	.0200	5	.2500	3.0	VLM-250-5-020	40.40			VLM-250-5-020K	46.15
D1 $\begin{matrix} +.0000" \\ -.0020" \end{matrix}$	L2 $\begin{matrix} +.030" \\ -.000" \end{matrix}$	R $\begin{matrix} +.0000" \\ -.0005" \end{matrix}$		D2 (h6)	L1	Tool #	Price	Tool #	Price	Tool #	Price
.3125	1.125	.0200	4	.3125	3.0	VLM-312-4	40.25	VLM-312-4X	47.15		
.3125	1.125	.0200	5	.3125	3.0					VLM-312-5-020K	51.80
.3750	1.250	.0200	5	.3750	3.0	VLM-375-5-020	54.05			VLM-375-5-020K	62.25
.5000	1.750	.0600	5	.5000	4.5	VLM-500-5-060	91.50				
.5000	1.750	.0900	5	.5000	4.5	VLM-500-5-090	91.50			VLM-500-5-090K	104.35
.5000	1.750	.1250	5	.5000	4.5	VLM-500-5-125	91.50				

End Mills For Steels & High Temperature Alloys

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

VLR / VLRM

Tech Resources Available Online



Steels & High Temp. Alloys

- 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	
								Tool #	Price	Tool #	Price
D1 +.0000" (h9) -.0020" decimal equiv.	L2 +.010" -.000" +.25 mm -.00 mm	R +.0000" -.0005" +.000mm -.013mm	L3 +.015" -.000" +.38 mm -.00 mm	D3	4	D2 (h6)	L1	Tool #	Price	Tool #	Price
6 mm .2362 .2500 .2500	8 mm .500	0.5 mm .020	30 mm 2.500	5.49 mm .230	4	6 mm .2500	75 mm 4.0	VLRM-060-4	48.65	VLRM-060-4X	53.35
										VLR-250-4X	53.20
D1 +.0000" (h9) -.0030" decimal equiv.	L2 +.010" -.000" +.25 mm -.00 mm	R +.0000" -.0005" +.000mm -.013mm	L3 +.015" -.000" +.38 mm -.00 mm	D3	4	D2 (h6)	L1	Tool #	Price	Tool #	Price
.3125 .3125	.625	.020	2.625	.293	4	.3125	4.0	VLR-312-4	51.55	VLR-312-4X	58.95
8 mm .3150	10 mm	0.5 mm	50 mm	7.49 mm	4	8 mm	100 mm			VLRM-080-4X	60.60
.3750 .3750	.750	.020	2.750	.355	4	.3750	4.0			VLR-375-4X	79.35
10 mm .3937	12 mm	0.6 mm	50 mm	9.5 mm	4	10 mm	100 mm	VLRM-100-4	77.35		
.5000 .5000	1.000	.030	4.500	.480	4	.5000	6.0			VLR-500-4X	141.45
.6250 .6250	1.250	.030	4.500	.605	4	.6250	6.0	VLR-625-4	199.30	VLR-625-4X	215.40
16 mm .6299	22 mm	0.7 mm	80 mm	15.49 mm	4	16 mm	130 mm	VLRM-160-4	231.70		
.7500 .7500	1.500	.030	4.500	.730	4	.7500	6.0	VLR-750-4	261.70		

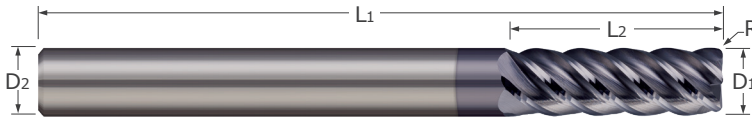
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ARC



End Mills For Steels & High Temperature Alloys

Corner Radius – 5 Flute



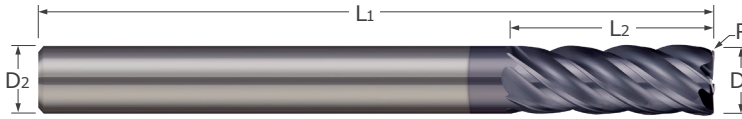
- Designed for roughing in titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- 45° high helix for reduced cutting forces and increased material removal rates
- Corner radius profile
- 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	
						Tool #	Price	Tool #	Price
D1 $\begin{matrix} +.0000'' \\ -.0020'' \end{matrix}$	L2 $\begin{matrix} +.030'' \\ -.000'' \end{matrix}$	R $\begin{matrix} +.0000'' \\ -.0005'' \end{matrix}$		D2 (h6)	L1				
.1875	.625	.0100	5	.1875	2.0	ARC-187-5-010	28.45	ARC-187-5-010X	31.25
.1875	.625	.0200	5	.1875	2.0			ARC-187-5-020X	31.25
.1875	.625	.0300	5	.1875	2.0	ARC-187-5-030	28.45	ARC-187-5-030X	31.25
.2500	.750	.0100	5	.2500	2.5			ARC-250-5-010X	40.70
.2500	.750	.0300	5	.2500	2.5			ARC-250-5-030X	40.70
D1 $\begin{matrix} +.0000'' \\ -.0030'' \end{matrix}$	L2 $\begin{matrix} +.030'' \\ -.000'' \end{matrix}$	R $\begin{matrix} +.0000'' \\ -.0005'' \end{matrix}$		D2 (h6)	L1	Tool #	Price	Tool #	Price
.3125	.813	.0200	5	.3125	2.5			ARC-312-5-020X	46.50
.3750	.875	.0300	5	.3750	2.5			ARC-375-5-030X	51.75
.3750	.875	.0600	5	.3750	2.5	ARC-375-5-060	44.95	ARC-375-5-060X	51.75
.5000	1.000	.0100	5	.5000	3.0	ARC-500-5-010	77.80		
.5000	1.000	.0600	5	.5000	3.0			ARC-500-5-060X	85.75
.6250	1.250	.0900	5	.6250	3.5	ARC-625-5-090	131.20	ARC-625-5-090X	143.10
.7500	1.500	.0200	5	.7500	4.0	ARC-750-5-020	200.05	ARC-750-5-020X	213.35
.7500	1.500	.0900	5	.7500	4.0	ARC-750-5-090	200.05		

End Mills For Steels & High Temperature 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

Steels & High Temp. Alloys

Cutter Diameter*		Length of Cut	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		nACRo® Coated	
D1 +.0000" -.0020"	(h9) decimal equiv.	L2	R +.0000" -.0005" +.000 mm -.013 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
3 mm	.1181	6 mm	0.3 mm	5	4 mm	50 mm	VHSM-030-5	16.85	VHSM-030-5K	21.35
3 mm	.1181	8 mm	0.3 mm	5	4 mm	50 mm	VHMM-030-5	18.75	VHMM-030-5K	23.25
4 mm	.1575	8 mm	0.3 mm	5	4 mm	50 mm	VHSM-040-5	23.85	VHSM-040-5K	28.35
4 mm	.1575	11 mm	0.3 mm	5	4 mm	50 mm	VHMM-040-5	26.50	VHMM-040-5K	31.00
6 mm	.2362	10 mm	0.5 mm	5	6 mm	57 mm	VHSM-060-5	28.20	VHSM-060-5K	34.05
6 mm	.2362	16 mm	0.5 mm	5	6 mm	57 mm	VHMM-060-5	31.35	VHMM-060-5K	37.10
.2500	.2500	.500	.020	5	.2500	2.5	VHS-250-5-020	28.40		

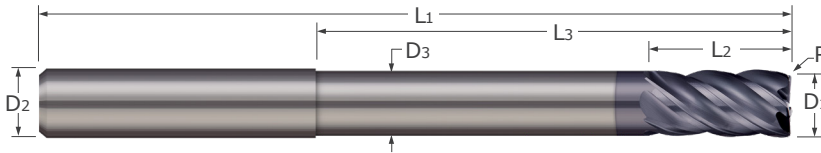
D1 +.0000" -.0030"	(h9) decimal equiv.	L2	R +.0000" -.0005" +.000 mm -.013 mm		D2 (h6)	L1	Tool #	Price	Tool #	Price
.3125	.3125	.500	.020	5	.3125	2.5	VHS-312-5-020	35.65	VHS-312-5-020K	43.95
8 mm	.3150	16 mm	0.5 mm	5	8 mm	63 mm	VHSM-080-5	33.20	VHSM-080-5K	41.40
8 mm	.3150	19 mm	0.5 mm	5	8 mm	63 mm	VHMM-080-5	36.90	VHMM-080-5K	45.10
.3750	.3750	.625	.020	5	.3750	2.5	VHS-375-5-020	39.00	VHS-375-5-020K	47.20
.3750	.3750	.875	.020	5	.3750	2.5			VHM-375-5-020K	51.55
10 mm	.3937	19 mm	0.5 mm	5	10 mm	72 mm			VHSM-100-5K	51.90
10 mm	.3937	22 mm	0.5 mm	5	10 mm	72 mm			VHMM-100-5K	57.55
12 mm	.4724	22 mm	0.5 mm	5	12 mm	83 mm	VHSM-120-5	58.75	VHSM-120-5K	70.70
12 mm	.4724	26 mm	0.5 mm	5	12 mm	83 mm	VHMM-120-5	65.25	VHMM-120-5K	77.20
.5000	.5000	.625	.030	5	.5000	3.0	VHS-500-5-030	63.55	VHS-500-5-030K	74.70
.5000	.5000	1.000	.060	5	.5000	3.0	VHM-500-5-060	70.60	VHM-500-5-060K	81.75
.5000	.5000	.625	.090	5	.5000	3.0	VHS-500-5-090	63.55	VHS-500-5-090K	74.70
.5000	.5000	1.000	.090	5	.5000	3.0	VHM-500-5-090	70.60	VHM-500-5-090K	81.75
.5000	.5000	1.000	.125	5	.5000	3.0	VHM-500-5-125	70.60		
.6250	.6250	1.250	.060	5	.6250	3.5	VHM-625-5-060	132.95	VHM-625-5-060K	146.80
.7500	.7500	1.500	.125	5	.7500	4.0	VHM-750-5-125	195.80	VHM-750-5-125K	212.30

*.0005" / .013 mm max TIR

VLR

End Mills For Steels & High Temperature Alloys

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



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

Cutter Diameter	Length of Cut	Corner Radius	Overall Reach	Neck Diameter	Flutes	Shank Dia.	Overall Length	Uncoated		nACRo® Coated	
								Tool #	Price	Tool #	Price
D1 ^{+0.0000"} / _{-.0030"}	L2 ^{+0.010"} / _{-.000"}	R ^{+0.0000"} / _{-.0005"}	L3 ^{+0.015"} / _{-.000"}	D3		D2 (h6)	L1				
.3125	.625	.0200	2.625	.292	5	.3125	4.0	VLR-312-5-020	54.55	VLR-312-5-020K	64.35
.3750	.750	.0200	2.750	.355	5	.3750	4.0	VLR-375-5-020	75.45	VLR-375-5-020K	84.25
.5000	1.000	.0300	4.500	.480	5	.5000	6.0	VLR-500-5-030	133.75	VLR-500-5-030K	147.65
.5000	1.000	.0600	4.500	.480	5	.5000	6.0	VLR-500-5-060	133.75	VLR-500-5-060K	147.65
.5000	1.000	.0900	4.500	.480	5	.5000	6.0	VLR-500-5-090	133.75	VLR-500-5-090K	147.65
.5000	1.000	.1250	4.500	.480	5	.5000	6.0			VLR-500-5-125K	147.65

End Mills For Aluminum Alloys

Square – 2 Flute – Stub Flute



ASM / ASMM



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

Aluminum Alloys

Cutter Diameter*			Length of Cut L2	Flutes	Shank Diameter D2 (h6)	Overall Length L1	Uncoated		ZrN Coated	
D1 +.0000" -.0020"	+ .00 mm -.05 mm	decimal equiv.					Tool #	Price	Tool #	Price
2 mm		.0787	4 mm	2	4 mm	50 mm	ASMM-020-2	21.25		
6 mm		.2362	10 mm	2	6 mm	57 mm			ASMM-060-2S	31.30

D1			L2	Flutes	Shank Diameter D2 (h6)	Overall Length L1	Uncoated		ZrN Coated	
+ .0000" -.0030"	+ .00 mm -.08 mm	decimal equiv.					Tool #	Price	Tool #	Price
.3125		.3125	.500	2	.3125	2.0	ASM-312-2	29.75		
.3750		.3750	.625	2	.3750	2.0	ASM-375-2	35.60		
10 mm		.3937	19 mm	2	10 mm	72 mm	ASMM-100-2	37.10		
.5000		.5000	.625	2	.5000	2.5	ASM-500-2	58.70	ASM-500-2S	68.55

*.0005" / .013 mm max TIR

ARM / ARMM



End Mills For Aluminum Alloys
Square – 2 & 3 Flute



- 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 L2	Flutes	Shank Diameter D2 (h6)	Overall Length L1	Uncoated		ZrN Coated	
D1 +.0000" -.0020" (h8) decimal equiv.							Tool #	Price	Tool #	Price
1 mm	.0394		3 mm	2	4 mm	50 mm	ARMM-010-2	21.25		
2 mm	.0787		6 mm	2	4 mm	50 mm	ARMM-020-2	21.25		
3 mm	.1181		10 mm	2	6 mm	57 mm	ARMM-030-2	26.85		
5 mm	.1969		20 mm	2	6 mm	57 mm	ARMM-050-2	26.85	ARMM-050-2S	32.60
6 mm	.2362		20 mm	3	6 mm	57 mm	ARMM-060-3	26.85	ARMM-060-3S	32.60

D1 +.0000" -.0030" (h8) decimal equiv.			L2 +.030" -.000" +.78 mm -.00 mm	D2 (h6)	L1	Tool #	Price	Tool #	Price	
.2813	.2813									.750
.2813	.2813		.750	3	.3125	2.5			ARM-281-3S	40.05
.3125	.3125		.813	3	.3125	2.5	ARM-312-3	33.15		
8 mm	.3150		25 mm	2	8 mm	63 mm			ARMM-080-2S	41.35
8 mm	.3150		25 mm	3	8 mm	63 mm	ARMM-080-3	33.15	ARMM-080-3S	41.35
10 mm	.3937		25 mm	2	10 mm	72 mm			ARMM-100-2S	47.20
10 mm	.3937		25 mm	3	10 mm	72 mm	ARMM-100-3	39.00		
12 mm	.4724		30 mm	3	12 mm	83 mm	ARMM-120-3	62.15	ARMM-120-3S	74.10
.5000	.5000		1.250	2	.5000	3.5	ARM-5125-2	68.35		
.5000	.5000		1.250	3	.5000	3.5	ARM-5125-3	68.35		
14 mm	.5510		30 mm	3	14 mm	83 mm	ARMM-140-3	72.20		
.6250	.6250		1.250	3	.6250	3.5	ARM-625-3	115.15		
16 mm	.6299		35 mm	2	16 mm	92 mm	ARMM-160-2	115.95	ARMM-160-2S	130.00
16 mm	.6299		35 mm	3	16 mm	92 mm			ARMM-160-3S	130.00
18 mm	.7087		45 mm	3	18 mm	92 mm	ARMM-180-3	154.65		
20 mm	.7874		45 mm	2	20 mm	104 mm	ARMM-200-2	196.60		
20 mm	.7874		45 mm	3	20 mm	104 mm			ARMM-200-3S	218.05

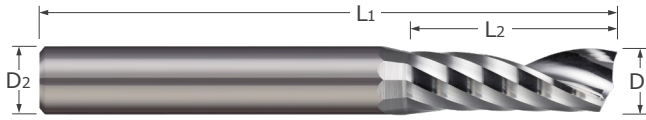
*.0005" / .013 mm max TIR

End Mills For Aluminum Alloys

Square – Single Flute – Upcut Router



SFA / SFAM



Aluminum Alloys

- 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	
D1 +.0000" -.0020"	+.00 mm -.05 mm	decimal equiv.	L2 +.015" -.000" +.38 mm -.00 mm	D2 (h6)	L1	Tool #	Price
						.0625	.0625	.250	.1250	1.5	SFA-062-22	28.30
.0625	.0625	.250	.2500	2.0	SFA-062-42	33.30	
2 mm	.0787	6 mm	6 mm	57 mm	SFAM-020020	31.25	
3 mm	.1181	12 mm	6 mm	57 mm	SFAM-030020	31.25	
.1250	.1250	.250	.1250	1.5	SFA-125-22	25.00	
.1250	.1250	.250	.2500	2.0	SFA-125-42	29.10	
.1250	.1250	.500	.1250	1.5	SFA-125-24	25.00	
.1250	.1250	.500	.2500	2.0	SFA-125-44	29.10	
.1562	.1562	.625	.2500	2.0	SFA-156-45	29.10	
4 mm	.1575	16 mm	6 mm	57 mm	SFAM-040020	31.25	
.1875	.1875	.500	.1875	2.0	SFA-187-33	27.60	
.1875	.1875	.500	.2500	2.0	SFA-187-44	29.10	
.1875	.1875	.625	.1875	2.0	SFA-187-35	27.60	
.1875	.1875	.625	.2500	2.0	SFA-187-45	29.10	
5 mm	.1969	20 mm	6 mm	57 mm	SFAM-050025	31.25	
.2188	.2188	.750	.2500	2.5	SFA-218-46	29.10	
6 mm	.2362	20 mm	6 mm	100 mm	SFAM-060100	46.80	
6 mm	.2362	25 mm	6 mm	57 mm	SFAM-060030	31.25	
.2500	.2500	.375	.2500	2.5	SFA-250-43	29.10	
.2500	.2500	.750	.2500	2.5	SFA-250-46	29.10	
.2500	.2500	1.250	.2500	3.0	SFA-250-410	32.80	
8 mm	.3150	20 mm	8 mm	100 mm	SFAM-080100	59.80	
8 mm	.3150	30 mm	8 mm	75 mm	SFAM-080040	47.95	
.3750	.3750	1.125	.3750	3.0	SFA-375-69	43.60	
10 mm	.3937	25 mm	10 mm	120 mm	SFAM-100100	72.85	
10 mm	.3937	35 mm	10 mm	90 mm	SFAM-100050	63.70	

*.0005" / .013 mm max TIR

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SFA / SFAM



End Mills For Aluminum Alloys

Square – Single Flute – Upcut Router (Cont.)

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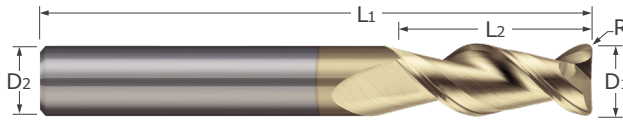
Cutter Diameter*		Length of Cut	Shank Diameter	Overall Length	Uncoated	
	decimal equiv.				L ₁	Tool #
12 mm	.4724	40 mm	12 mm	90 mm	SFAM-120050	79.00
.5000	.5000	1.000	.5000	3.0	SFA-500-88	72.20
.5000	.5000	1.500	.5000	4.0	SFA-500-812	75.95
20 mm	.7874	40 mm	20 mm	150 mm	SFAM-200100	310.75
20 mm	.7874	50 mm	20 mm	100 mm	SFAM-200050	238.30

*.0005" / .013 mm max TIR

End Mills For Aluminum Alloys

ARC

Corner Radius – 2 & 3 Flute



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

Aluminum Alloys

Cutter Diameter	Length of Cut	Corner Radius	Flutes	Shank Dia.	Overall Length	Uncoated		ZrN Coated	
						Tool #	Price	Tool #	Price
D1 $\begin{matrix} +.0000'' \\ -.0020'' \end{matrix}$	L2 $\begin{matrix} +.030'' \\ -.000'' \end{matrix}$	R $\begin{matrix} +.0000'' \\ -.0005'' \end{matrix}$		D2 (h6)	L1				
.0938	.375	.0100	2	.1250	1.5	ARC-093-2-010	18.45		
.1250	.500	.0100	2	.1250	1.5	ARC-125-2-010	18.45	ARC-125-2-010S	22.20
.2500	.750	.0100	2	.2500	2.5	ARC-250-2-010	32.65		

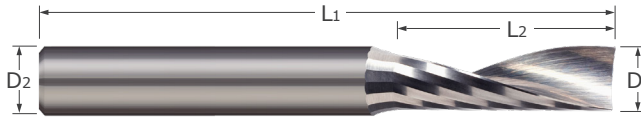
Cutter Diameter	Length of Cut	Corner Radius	Flutes	Shank Dia.	Overall Length	Uncoated		ZrN Coated	
						Tool #	Price	Tool #	Price
D1 $\begin{matrix} +.0000'' \\ -.0030'' \end{matrix}$	L2 $\begin{matrix} +.030'' \\ -.000'' \end{matrix}$	R $\begin{matrix} +.0000'' \\ -.0005'' \end{matrix}$		D2 (h6)	L1				
.3125	.813	.0300	2	.3125	2.5			ARC-312-2-030S	43.45
.3125	.813	.0300	3	.3125	2.5	ARC-312-3-030	36.55		
.5000	1.000	.0300	3	.5000	3.0	ARC-500-3-030	71.70	ARC-500-3-030S	81.40
.5000	1.250	.0300	3	.5000	3.5	ARC-5125-3-030	75.25		
.6250	1.250	.0300	2	.6250	3.5	ARC-625-2-030	126.60		
.6250	1.250	.0600	2	.6250	3.5	ARC-625-2-060	126.60		
.6250	1.250	.0600	3	.6250	3.5	ARC-625-3-060	126.60		
.6250	1.250	.0900	2	.6250	3.5	ARC-625-2-090	126.60		
.6250	1.250	.0900	3	.6250	3.5	ARC-625-3-090	126.60		
.7500	1.500	.0600	2	.7500	4.0	ARC-750-2-060	184.30		
1.0000	1.500	.0200	2	1.0000	4.0	ARC-001-2-020	279.15		
1.0000	1.500	.0300	2	1.0000	4.0	ARC-001-2-030	279.15		
1.0000	1.500	.0600	2	1.0000	4.0	ARC-001-2-060	279.15		
1.0000	1.500	.0900	2	1.0000	4.0	ARC-001-2-090	279.15	ARC-001-2-090S	303.00
1.0000	1.500	.1250	2	1.0000	4.0	ARC-001-2-125	279.15	ARC-001-2-125S	303.00

* .0005" max TIR

SFP / SFPM



End Mills For Plastics & Composites
Square – Single Flute – Upcut Router



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

Cutter Diameter*			Length of Cut	Shank Diameter	Overall Length	Uncoated	
D1 +.0000" -.0020"	+.00 mm -.05 mm	decimal equiv.	L2 +.015" -.000" +.38 mm -.00 mm	D2 (h6)	L1	Tool #	Price
						1 mm	.0394	5 mm	3 mm	57 mm	SFPM-010-10	27.05
.0625	.0625	.0625	.250	.1250	1.50	SFP-062-22	28.30
.0625	.0625	.0625	.250	.2500	2.00	SFP-062-42	33.30
2 mm	.0787	.0787	6 mm	3 mm	57 mm	SFPM-020-10	27.05
2 mm	.0787	.0787	10 mm	3 mm	38 mm	SFPM-020-20	24.50
2 mm	.0787	.0787	12 mm	3 mm	57 mm	SFPM-020-30	27.05
2 mm	.0787	.0787	14 mm	3 mm	75 mm	SFPM-020-40	31.25
3 mm	.1181	.1181	8 mm	3 mm	57 mm	SFPM-030-10	27.05
3 mm	.1181	.1181	8 mm	6 mm	57 mm	SFPM-030-50	29.65
3 mm	.1181	.1181	12 mm	3 mm	38 mm	SFPM-030-20	24.50
3 mm	.1181	.1181	18 mm	6 mm	57 mm	SFPM-030-60	31.95
3 mm	.1181	.1181	18 mm	6 mm	75 mm	SFPM-030-70	39.15
.1250	.1250	.1250	.250	.1250	1.50	SFP-125-22	25.00
.1250	.1250	.1250	.250	.2500	2.00	SFP-125-42	29.10
.1250	.1250	.1250	.500	.1250	1.50	SFP-125-24	25.00
.1250	.1250	.1250	.500	.2500	2.00	SFP-125-44	29.10
.1562	.1562	.1562	.625	.2500	2.00	SFP-156-45	29.10
4 mm	.1575	.1575	12 mm	4 mm	50 mm	SFPM-040-10	28.75
4 mm	.1575	.1575	12 mm	6 mm	57 mm	SFPM-040-50	29.65
4 mm	.1575	.1575	15 mm	4 mm	50 mm	SFPM-040-20	26.45
4 mm	.1575	.1575	20 mm	6 mm	57 mm	SFPM-040-60	31.95
4 mm	.1575	.1575	20 mm	6 mm	75 mm	SFPM-040-70	39.15
4 mm	.1575	.1575	20 mm	8 mm	100 mm	SFPM-040-80	44.65
.1875	.1875	.1875	.500	.1875	2.00	SFP-187-33	27.60
.1875	.1875	.1875	.500	.2500	2.00	SFP-187-44	29.10
.1875	.1875	.1875	.625	.1875	2.00	SFP-187-35	27.60
.1875	.1875	.1875	.625	.2500	2.00	SFP-187-45	29.10
5 mm	.1969	.1969	16 mm	5 mm	50 mm	SFPM-050-10	36.65
5 mm	.1969	.1969	16 mm	6 mm	57 mm	SFPM-050-40	38.35
5 mm	.1969	.1969	20 mm	8 mm	95 mm	SFPM-050-70	44.65
5 mm	.1969	.1969	28 mm	6 mm	57 mm	SFPM-050-50	38.35
5 mm	.1969	.1969	28 mm	6 mm	75 mm	SFPM-050-60	41.15

*.0005" / .013 mm max TIR

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Plastics & Composites

End Mills For Plastics & Composites

Square – Single Flute – Upcut Router (cont.)



SFP / SFPM

Continued from previous page

Cutter Diameter*			Length of Cut	Shank Diameter	Overall Length	Uncoated	
D ₁ +.0000" -.0020"	+.00 mm -.05 mm	decimal equiv.	L ₂ +.015" -.000" +.38 mm -.00 mm	D ₂ (h6)	L ₁	Tool #	Price
						6 mm	.2362	16 mm	6 mm	57 mm	SFPM-060-10	38.35
6 mm	.2362	20 mm	6 mm	57 mm	SFPM-060-20	39.15	
6 mm	.2362	20 mm	8 mm	95 mm	SFPM-060-60	44.65	
6 mm	.2362	35 mm	6 mm	75 mm	SFPM-060-30	41.15	
6 mm	.2362	35 mm	8 mm	75 mm	SFPM-060-50	47.15	
.2500	.2500	.375	.2500	2.50	SFP-250-43	29.10	
.2500	.2500	.750	.2500	2.50	SFP-250-46	29.10	
.2500	.2500	1.250	.2500	3.00	SFP-250-41Q	32.80	
8 mm	.3150	18 mm	8 mm	50 mm	SFPM-080-10	34.45	
8 mm	.3150	22 mm	8 mm	63 mm	SFPM-080-20	37.20	
8 mm	.3150	30 mm	8 mm	75 mm	SFPM-080-30	44.65	
8 mm	.3150	40 mm	8 mm	100 mm	SFPM-080-40	57.00	
.3750	.3750	1.125	.3750	3.00	SFP-375-69	43.60	
10 mm	.3937	25 mm	10 mm	72 mm	SFPM-100-10	47.85	
10 mm	.3937	30 mm	10 mm	150 mm	SFPM-100-30	84.20	
10 mm	.3937	55 mm	10 mm	100 mm	SFPM-100-20	67.80	
12 mm	.4724	30 mm	12 mm	83 mm	SFPM-120-10	73.05	
12 mm	.4724	40 mm	12 mm	150 mm	SFPM-120-20	108.80	
.5000	.5000	1.000	.5000	3.00	SFP-500-88	72.20	
.5000	.5000	1.500	.5000	4.00	SFP-500-812	75.95	

*.0005" / .013 mm max TIR

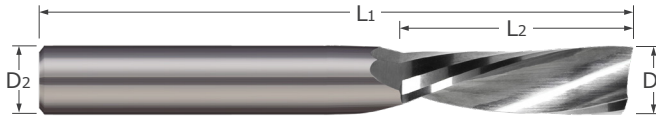
Plastics & Composites

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 #	Price
						.0625	1 mm	.0394	5 mm	3 mm	57 mm	SFLM-010-10	27.05
	2 mm	.0787	6 mm	3 mm	57 mm	SFLM-020-10	27.05
	2 mm	.0787	12 mm	3 mm	57 mm	SFLM-020-30	27.05
	2 mm	.0787	14 mm	3 mm	75 mm	SFLM-020-40	31.25
	3 mm	.1181	8 mm	3 mm	57 mm	SFLM-030-10	27.05
	3 mm	.1181	12 mm	3 mm	38 mm	SFLM-030-20	24.50
	3 mm	.1181	18 mm	6 mm	57 mm	SFLM-030-60	31.95
.1250		.1250	.250	.1250	1.5	SFL-125-22	25.00
.1250		.1250	.250	.2500	2.0	SFL-125-42	29.10
.1250		.1250	.500	.1250	1.5	SFL-125-24	25.00
.1250		.1250	.500	.2500	2.0	SFL-125-44	29.10
.1562		.1562	.625	.2500	2.0	SFL-156-45	29.10
	4 mm	.1575	12 mm	4 mm	57 mm	SFLM-040-10	28.75
	4 mm	.1575	15 mm	4 mm	40 mm	SFLM-040-20	26.45
	4 mm	.1575	20 mm	6 mm	57 mm	SFLM-040-60	31.95
	4 mm	.1575	20 mm	6 mm	75 mm	SFLM-040-70	39.15
	4 mm	.1575	20 mm	8 mm	95 mm	SFLM-040-80	44.65
.1875		.1875	.500	.1875	2.0	SFL-187-33	27.60
.1875		.1875	.500	.2500	2.0	SFL-187-44	29.10
.1875		.1875	.625	.1875	2.0	SFL-187-35	27.60
.1875		.1875	.625	.2500	2.0	SFL-187-45	29.10
	5 mm	.1969	16 mm	6 mm	57 mm	SFLM-050-40	38.35
	5 mm	.1969	20 mm	8 mm	95 mm	SFLM-050-70	44.65
	5 mm	.1969	28 mm	6 mm	57 mm	SFLM-050-50	38.35
	5 mm	.1969	28 mm	6 mm	75 mm	SFLM-050-60	41.15
.2188		.2188	.750	.2500	2.5	SFL-218-46	29.10
	6 mm	.2362	16 mm	6 mm	57 mm	SFLM-060-10	38.35
	6 mm	.2362	20 mm	8 mm	95 mm	SFLM-060-60	44.65
	6 mm	.2362	20 mm	6 mm	57 mm	SFLM-060-20	39.15
.2500		.2500	.375	.2500	2.5	SFL-250-43	29.10
.2500		.2500	.750	.2500	2.5	SFL-250-46	29.10

*.0005" / .013 mm max TIR

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End Mills For Plastics & Composites

Square – Single Flute – Downcut Router (cont.)



SFL / SFLM

Continued from previous page

Cutter Diameter*			Length of Cut	Shank Diameter	Overall Length	Uncoated	
D1			L2	D2 (h6)	L1	Tool #	Price
+ .0000" - .0020"	+ .00 mm - .05 mm	decimal equiv.	+ .015" - .000" + .38 mm - .00 mm				
.2500		.2500	1.250	.2500	3.0	SFL-250-410	32.80
.3750		.3750	1.125	.3750	3.0	SFL-375-69	43.60
	12 mm	.4724	30 mm	12 mm	83 mm	SFLM-120-10	73.05
.5000		.5000	1.000	.5000	3.0	SFL-500-88	72.20
.5000		.5000	1.500	.5000	4.0	SFL-500-812	75.95

*.0005" / .013 mm max TIR

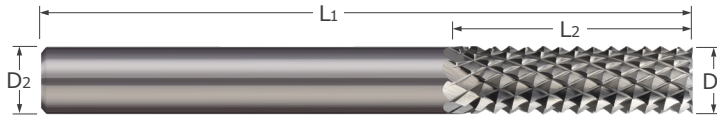
Plastics & Composites

RDA



End Mills For Plastics & Composites

Diamond Cut – No End Cut



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

Cutter Diameter*	Length of Cut	Shank Dia.	Overall Length	Uncoated	
				Tool #	Price
$D_1 \begin{matrix} +.0000'' \\ -.0030'' \end{matrix}$	$L_2 \begin{matrix} +.030'' \\ -.000'' \end{matrix}$	$D_2 (h_6)$	L_1		
.0625	.188	.1250	1.5	RDA-10	12.10
.0938	.375	.1250	1.5	RDA-20	12.10
.1250	.500	.1250	1.5	RDA-30	12.10
.1875	.625	.1875	2.0	RDA-40	17.10
.1875	.625	.2500	2.0	RDA-50	19.40
.2500	.750	.2500	2.0	RDA-60	20.75
.2500	.750	.2500	2.5	RDA-70	22.15
.2500	1.000	.2500	3.0	RDA-80	28.95
.5000	1.000	.5000	3.0	RDA-110	70.35

*.0005" max TIR

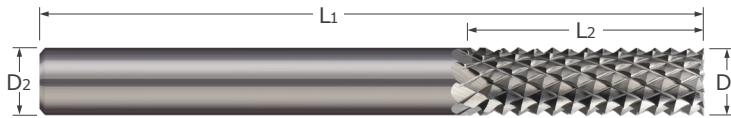
Plastics & Composites

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

Plastics & Composites

Cutter Diameter*	Length of Cut	Shank Dia.	Overall Length	Uncoated	
				Tool #	Price
$D_1 \begin{matrix} +.0000'' \\ -.0030'' \end{matrix}$	$L_2 \begin{matrix} +.030'' \\ -.000'' \end{matrix}$	$D_2 (h6)$	L_1		
.0625	.188	.1250	1.5	RDB-10	14.40
.0938	.375	.1250	1.5	RDB-20	14.40
.1250	.500	.1250	1.5	RDB-30	14.40
.1875	.625	.1875	2.0	RDB-40	20.55
.1875	.625	.2500	2.0	RDB-50	23.20
.2500	.750	.2500	2.0	RDB-60	24.70
.2500	.750	.2500	2.5	RDB-70	26.40
.2500	1.000	.2500	3.0	RDB-80	34.60
.3750	1.000	.3750	2.5	RDB-100	61.25
.5000	1.000	.5000	3.0	RDB-110	80.95

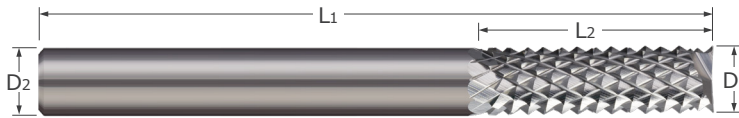
*.0005" max TIR

RDC



End Mills For Plastics & Composites

Diamond Cut – End Mill Cut



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

Cutter Diameter*	Length of Cut	Shank Dia.	Overall Length	Uncoated	
				Tool #	Price
D1 $^{+.0000}$ / $_{-.0030}$ "	L2 $^{+.030}$ / $_{-.000}$ "	D2 (h6)	L1		
.0938	.375	.1250	1.5	RDC-20	14.40
.1250	.500	.1250	1.5	RDC-30	14.40
.1875	.625	.1875	2.0	RDC-40	20.55
.1875	.625	.2500	2.0	RDC-50	23.20
.2500	.750	.2500	2.0	RDC-60	24.70
.2500	.750	.2500	2.5	RDC-70	26.40
.2500	1.000	.2500	3.0	RDC-80	34.60

*.0005" max TIR

Plastics & Composites

RDD



End Mills For Plastics & Composites

Diamond Cut – 135° Drill Point



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

Cutter Diameter*	Length of Cut	Shank Dia.	Overall Length	Uncoated	
				Tool #	Price
D1 $^{+.0000}$ / $_{-.0030}$ "	L2 $^{+.030}$ / $_{-.000}$ "	D2 (h6)	L1		
.0625	.188	.1250	1.5	RDD-10	14.40
.0938	.375	.1250	1.5	RDD-20	14.40
.1250	.500	.1250	1.5	RDD-30	14.40
.1875	.625	.1875	2.0	RDD-40	20.55
.1875	.625	.2500	2.0	RDD-50	23.20
.2500	.750	.2500	2.0	RDD-60	24.70
.2500	.750	.2500	2.5	RDD-70	26.40
.2500	1.000	.2500	3.0	RDD-80	34.60
.3125	1.000	.3125	2.5	RDD-90	46.10
.5000	1.000	.5000	3.0	RDD-110	80.95

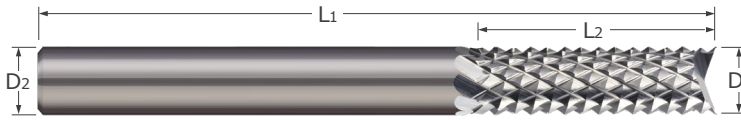
*.0005" max TIR

End Mills For Plastics & Composites

Diamond Cut – Fish Tail End Cut



RDE



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

Plastics & Composites

Cutter Diameter*	Length of Cut	Shank Dia.	Overall Length	Uncoated	
				Tool #	Price
$D_1 \begin{matrix} +.0000'' \\ -.0030'' \end{matrix}$	$L_2 \begin{matrix} +.030'' \\ -.000'' \end{matrix}$	$D_2 \text{ (h6)}$	L_1		
.0938	.375	.1250	1.5	RDE-20	14.40
.1250	.500	.1250	1.5	RDE-30	14.40
.1875	.625	.1875	2.0	RDE-40	20.55
.1875	.625	.2500	2.0	RDE-50	23.20
.2500	1.000	.2500	3.0	RDE-80	34.60
.3750	1.000	.3750	2.5	RDE-100	61.25
.5000	1.000	.5000	3.0	RDE-110	80.95

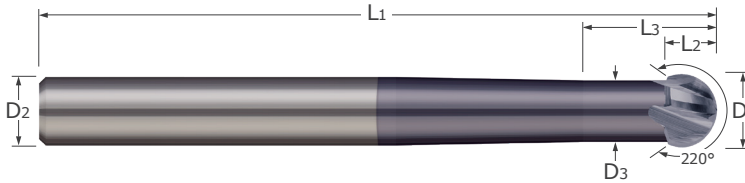
*.0005" max TIR

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		
							Tool #	Price	Tool #	Price	
D1 +.0000" +.00mm -.0020" -.05mm	L2	L3	+ .030" -.000" + .78 mm -.00 mm	D3	+ .003" -.005" + .08mm -.13mm	D2 (h6)	L1				
2 mm .0787	1.3 mm	6 mm	1.3 mm	2	6 mm	75 mm			SBMM-020-206X	82.70	
2 mm .0787	1.3 mm	6 mm	1.3 mm	4	6 mm	75 mm	SBMM-020-406	78.20	SBMM-020-406X	82.70	
2 mm .0787	1.3 mm	10 mm	1.3 mm	2	6 mm	75 mm	SBMM-020-210	78.20	SBMM-020-210X	82.70	
2 mm .0787	1.3 mm	10 mm	1.3 mm	4	6 mm	75 mm	SBMM-020-410	78.20	SBMM-020-410X	82.70	
2 mm .0787	1.3 mm	16 mm	1.3 mm	2	6 mm	75 mm	SBMM-020-216	78.20	SBMM-020-216X	82.70	
2 mm .0787	1.3 mm	16 mm	1.3 mm	3	6 mm	75 mm	SBMM-020-316	78.20	SBMM-020-316X	82.70	
2 mm .0787	1.3 mm	16 mm	1.3 mm	4	6 mm	75 mm			SBMM-020-416X	82.70	
3 mm .1181	2.0 mm	9 mm	2.0 mm	4	6 mm	75 mm			SBMM-030-409X	82.70	
3 mm .1181	2.0 mm	15 mm	2.0 mm	2	6 mm	75 mm	SBMM-030-215	78.20	SBMM-030-215X	82.70	
3 mm .1181	2.0 mm	15 mm	2.0 mm	4	6 mm	75 mm	SBMM-030-415	78.20	SBMM-030-415X	82.70	
3 mm .1181	2.0 mm	21 mm	2.0 mm	2	6 mm	75 mm	SBMM-030-221	78.20	SBMM-030-221X	82.70	
3 mm .1181	2.0 mm	21 mm	2.0 mm	3	6 mm	75 mm	SBMM-030-321	78.20			
3 mm .1181	2.0 mm	21 mm	2.0 mm	4	6 mm	75 mm			SBMM-030-421X	82.70	
.1250	.1250	.100	.250	.100	4	.2500	3.0	SBM-125-4	78.20	SBM-125-4X	82.70
4 mm .1575	2.7 mm	12 mm	2.7 mm	2	6 mm	75 mm	SBMM-040-212	78.20	SBMM-040-212X	82.70	
4 mm .1575	2.7 mm	12 mm	2.7 mm	4	6 mm	75 mm			SBMM-040-412X	82.70	
4 mm .1575	2.7 mm	20 mm	2.7 mm	2	6 mm	75 mm			SBMM-040-220X	82.70	
4 mm .1575	2.7 mm	20 mm	2.7 mm	4	6 mm	75 mm	SBMM-040-420	78.20	SBMM-040-420X	82.70	
4 mm .1575	2.7 mm	32 mm	2.7 mm	2	6 mm	100 mm	SBMM-040-232	78.20	SBMM-040-232X	82.70	
4 mm .1575	2.7 mm	32 mm	2.7 mm	4	6 mm	100 mm	SBMM-040-432	78.20	SBMM-040-432X	82.35	
.1875	.1875	.150	.350	.150	4	.2500	3.0	SBM-187-4	78.20	SBM-187-4X	82.70
6 mm .2362	4.0 mm	18 mm	4.0 mm	2	6 mm	75 mm	SBMM-060-218	78.20	SBMM-060-218X	82.70	
6 mm .2362	4.0 mm	18 mm	4.0 mm	3	6 mm	75 mm	SBMM-060-318	78.20			
6 mm .2362	4.0 mm	18 mm	4.0 mm	4	6 mm	75 mm	SBMM-060-418	78.20	SBMM-060-418X	82.70	
6 mm .2362	4.0 mm	30 mm	4.0 mm	2	6 mm	75 mm			SBMM-060-230X	82.70	
6 mm .2362	4.0 mm	30 mm	4.0 mm	4	6 mm	75 mm	SBMM-060-430	78.20	SBMM-060-430X	82.70	
6 mm .2362	4.0 mm	32 mm	4.0 mm	2	6 mm	100 mm	SBMM-060-248	78.20	SBMM-060-248X	82.70	
6 mm .2362	4.0 mm	32 mm	4.0 mm	3	6 mm	100 mm	SBMM-060-348	78.20	SBMM-060-348X	82.70	
6 mm .2362	4.0 mm	32 mm	4.0 mm	4	6 mm	100 mm	SBMM-060-448	78.20	SBMM-060-448X	82.35	
.2500	.2500	.200	.500	.200	2	.2500	3.0	SBM-250-2	78.20	SBM-250-2X	82.70
.2500	.2500	.200	.500	.200	3	.2500	3.0	SBM-250-3	78.20	SBM-250-3X	82.70
.2500	.2500	.200	.500	.200	4	.2500	3.0	SBM-250-4	78.20	SBM-250-4X	82.70

*.0005" / .013 mm max TIR

Continued on next page

Undercutting End Mills

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		AITIN Coated	
D1 +.0000" +.00mm -.0030" -.08mm	.3125 .3125	L2	L3	+.030" -.000" +.78 mm -.00 mm	D3 +.003" -.005" +.08mm -.13mm	4	D2 (h6)	L1	Tool #	Price	Tool #	Price
		.250	.600	.250		4	.3125	4.0	SBM-312-4	98.35		
8 mm	.3150	5.4 mm	24 mm	5.4 mm	4	8 mm	100 mm		SBMM-080-424	98.35	SBMM-080-424X	107.15
8 mm	.3150	5.4 mm	40 mm	5.4 mm	2	8 mm	100 mm		SBMM-080-240	98.35	SBMM-080-240X	107.15
8 mm	.3150	5.4 mm	40 mm	5.4 mm	3	8 mm	100 mm		SBMM-080-340	98.35	SBMM-080-340X	107.15
8 mm	.3150	5.4 mm	40 mm	5.4 mm	4	8 mm	100 mm				SBMM-080-440X	107.15
8 mm	.3150	5.4 mm	55 mm	5.4 mm	2	8 mm	100 mm				SBMM-080-264X	107.15
8 mm	.3150	5.4 mm	55 mm	5.4 mm	4	8 mm	100 mm				SBMM-080-464X	107.15
.3750	.3750	.300	.800	.300	2	.3750	4.0				SBM-375-2X	135.10
.3750	.3750	.300	.800	.300	4	.3750	4.0		SBM-375-4	126.30	SBM-375-4X	135.10
10 mm	.3937	6.7 mm	30 mm	6.7 mm	2	10 mm	100 mm		SBMM-100-230	132.65		
10 mm	.3937	6.7 mm	30 mm	6.7 mm	4	10 mm	100 mm		SBMM-100-430	132.65	SBMM-100-430X	140.30
10 mm	.3937	6.7 mm	50 mm	6.7 mm	2	10 mm	100 mm		SBMM-100-250	132.65	SBMM-100-250X	140.30
10 mm	.3937	6.7 mm	50 mm	6.7 mm	4	10 mm	100 mm		SBMM-100-450	132.65	SBMM-100-450X	140.30
10 mm	.3937	6.7 mm	55 mm	6.7 mm	2	10 mm	100 mm		SBMM-100-272	132.65	SBMM-100-272X	140.30
10 mm	.3937	6.7 mm	55 mm	6.7 mm	4	10 mm	100 mm		SBMM-100-472	132.65	SBMM-100-472X	140.30
12 mm	.4724	8.0 mm	36 mm	8.0 mm	2	12 mm	100 mm		SBMM-120-236	155.10	SBMM-120-236X	164.55
12 mm	.4724	8.0 mm	36 mm	8.0 mm	4	12 mm	100 mm		SBMM-120-436	155.10	SBMM-120-436X	164.55
12 mm	.4724	8.0 mm	55 mm	8.0 mm	4	12 mm	100 mm				SBMM-120-472X	164.55
.5000	.5000	.400	.900	.400	2	.5000	4.0		SBM-500-2	157.15	SBM-500-2X	166.60
.5000	.5000	.400	.900	.400	4	.5000	4.0		SBM-500-4	157.15	SBM-500-4X	166.60
.6250	.6250	.500	1.000	.500	2	.6250	4.0		SBM-625-2	195.40	SBM-625-2X	206.70
.6250	.6250	.500	1.000	.500	3	.6250	4.0		SBM-625-3	195.40	SBM-625-3X	206.70
.6250	.6250	.500	1.000	.500	4	.6250	4.0				SBM-625-4X	206.70

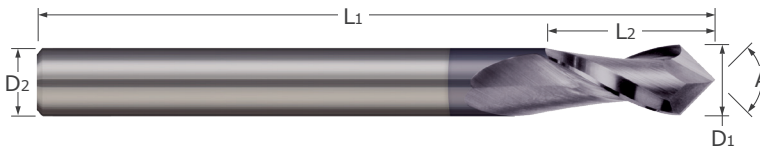
*.0005" / .013 mm max TIR

Undercutting End Mills

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	
						Tool #	Price	Tool #	Price
$A_{-1^{\circ}}^{+1^{\circ}}$	D1	$L_2 \begin{matrix} +.030'' \\ -.000'' \\ +.76 \text{ mm} \\ -.00 \text{ mm} \end{matrix}$		D2 (h6)	L1				
90°	3 mm	8 mm	2	3 mm	38 mm	DMM-030-290	17.35	DMM-030-290X	19.80
	3 mm	8 mm	4	3 mm	38 mm	DMM-030-490	18.20	DMM-030-490X	20.65
	.1250	.500	2	.1250	1.5	DM-125-290	17.35	DM-125-290X	19.80
	.1250	.500	4	.1250	1.5	DM-125-490	18.20	DM-125-490X	20.65
	4 mm	11 mm	2	4 mm	50 mm	DMM-040-290	24.30	DMM-040-290X	27.15
	4 mm	11 mm	4	4 mm	50 mm	DMM-040-490	25.30	DMM-040-490X	28.15
	.1875	.625	2	.1875	2.0	DM-187-290	24.30	DM-187-290X	27.15
	.1875	.625	4	.1875	2.0	DM-187-490	25.40	DM-187-490X	28.25
	5 mm	13 mm	2	6 mm	57 mm	DMM-050-290	30.40	DMM-050-290X	35.30
	6 mm	16 mm	2	6 mm	57 mm			DMM-060-290X	35.30
	6 mm	16 mm	4	6 mm	57 mm	DMM-060-490	31.80	DMM-060-490X	36.70
	.2500	.750	2	.2500	2.5	DM-250-290	30.40	DM-250-290X	35.30
	.2500	.750	4	.2500	2.5	DM-250-490	31.80	DM-250-490X	36.70
	.3125	.813	2	.3125	2.5	DM-312-290	37.80	DM-312-290X	44.70
	.3125	.813	4	.3125	2.5	DM-312-490	39.75	DM-312-490X	46.65
	8 mm	22 mm	2	8 mm	63 mm	DMM-080-290	37.80	DMM-080-290X	44.70
	8 mm	22 mm	4	8 mm	63 mm	DMM-080-490	39.50	DMM-080-490X	46.30
	.3750	1.000	2	.3750	2.5	DM-375-290	47.40	DM-375-290X	54.15
	.3750	1.000	4	.3750	2.5	DM-375-490	49.90	DM-375-490X	56.65
	10 mm	25 mm	2	10 mm	72 mm	DMM-100-290	47.40	DMM-100-290X	54.15
	10 mm	25 mm	4	10 mm	72 mm	DMM-100-490	49.40	DMM-100-490X	56.15
	12 mm	30 mm	2	12 mm	83 mm	DMM-120-290	71.65	DMM-120-290X	81.90
	12 mm	30 mm	4	12 mm	83 mm	DMM-120-490	78.40		
	.5000	1.000	2	.5000	3.0	DM-500-290	71.65	DM-500-290X	79.65
	.5000	1.000	4	.5000	3.0	DM-500-490	78.40	DM-500-490X	86.35
	.6250	1.250	2	.6250	3.5	DM-625-290	143.75	DM-625-290X	155.55
	.6250	1.250	4	.6250	3.5	DM-625-490	150.50	DM-625-490X	162.25
	.7500	1.500	2	.7500	4.0	DM-750-290	211.45	DM-750-290X	224.60
.7500	1.500	4	.7500	4.0	DM-750-490	221.40	DM-750-490X	234.45	
20 mm	45 mm	4	20 mm	104 mm			DMM-200-490X	248.95	

* .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

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		AITIN Coated	
						Tool #	Price	Tool #	Price
A $\begin{matrix} +1^\circ \\ -1^\circ \end{matrix}$	D1	L2 $\begin{matrix} +.030'' \\ -.000'' \\ +.76 \text{ mm} \\ -.00 \text{ mm} \end{matrix}$		D2 (h6)	L1				
	3 mm	8 mm	2	3 mm	38 mm	DMM-030-2120	17.35		
	3 mm	8 mm	4	3 mm	38 mm	DMM-030-4120	18.20	DMM-030-4120X	20.65
	.1250	.500	2	.1250	1.5			DM-125-2120X	19.80
	.1250	.500	4	.1250	1.5	DM-125-4120	18.20	DM-125-4120X	20.65
	4 mm	11 mm	2	4 mm	50 mm	DMM-040-2120	24.30	DMM-040-2120X	27.15
	4 mm	11 mm	4	4 mm	50 mm	DMM-040-4120	25.30		
	.1875	.625	2	.1875	2.0	DM-187-2120	24.30	DM-187-2120X	27.15
	.1875	.625	4	.1875	2.0	DM-187-4120	25.40	DM-187-4120X	28.25
	5 mm	13 mm	2	6 mm	57 mm			DMM-050-2120X	35.30
	5 mm	13 mm	4	6 mm	57 mm	DMM-050-4120	31.80		
	6 mm	16 mm	2	6 mm	57 mm	DMM-060-2120	30.40	DMM-060-2120X	35.30
	.2500	.750	2	.2500	2.5	DM-250-2120	30.40	DM-250-2120X	35.30
	.2500	.750	4	.2500	2.5	DM-250-4120	31.80	DM-250-4120X	36.70
	.3125	.813	2	.3125	2.5	DM-312-2120	37.80	DM-312-2120X	44.70
	.3125	.813	4	.3125	2.5	DM-312-4120	39.75	DM-312-4120X	46.65
	8 mm	22 mm	2	8 mm	63 mm	DMM-080-2120	37.80		
	8 mm	22 mm	4	8 mm	63 mm	DMM-080-4120	39.50	DMM-080-4120X	46.30
	.3750	1.000	2	.3750	2.5	DM-375-2120	47.40	DM-375-2120X	54.15
	.3750	1.000	4	.3750	2.5	DM-375-4120	49.90	DM-375-4120X	56.65
	10 mm	25 mm	2	10 mm	72 mm	DMM-100-2120	47.40		
	10 mm	25 mm	4	10 mm	72 mm	DMM-100-4120	49.40		
	12 mm	30 mm	2	12 mm	83 mm	DMM-120-2120	71.65	DMM-120-2120X	81.90
	.5000	1.000	2	.5000	3.0	DM-500-2120	71.65	DM-500-2120X	79.65
	.5000	1.000	4	.5000	3.0	DM-500-4120	78.40	DM-500-4120X	86.35
	.6250	1.250	2	.6250	3.5			DM-625-2120X	155.55
	.6250	1.250	4	.6250	3.5	DM-625-4120	150.50	DM-625-4120X	162.25
	16 mm	35 mm	4	16 mm	92 mm	DMM-160-4120	150.10	DMM-160-4120X	161.85
	.7500	1.500	2	.7500	4.0	DM-750-2120	211.45	DM-750-2120X	224.60
	.7500	1.500	4	.7500	4.0	DM-750-4120	221.40		

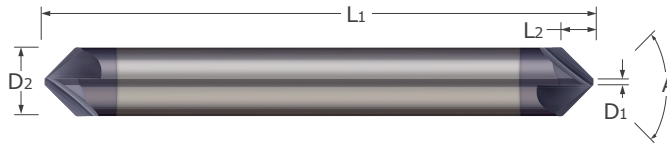
* .0005" / .013 mm max TIR. Tolerances for cutter diameters .125"-.250": .000" / -.002"; diameters .313"-.750": .000" / -.003".

Drill/End Mills

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	
						Tool #	Price	Tool #	Price
A $+1^\circ$ -1°	D1 $+0.001$ -0.003	L2		D2 (h6)	L1				
60°	.030	.082	3	.1250	1.5	CS-125-060	25.65	CS-125-060X	29.30
	.040	.128	4	.1875	2.0			CS-187-060X	34.85
	.050	.173	6	.2500	2.5	CS-250-060	33.45	CS-250-060X	41.40
	.060	.219	6	.3125	2.5	CS-312-060	46.80	CS-312-060X	58.55
	.070	.264	6	.3750	2.5	CS-375-060	53.45	CS-375-060X	64.70
	.080	.364	6	.5000	3.0	CS-500-060	77.60	CS-500-060X	91.25
82°	.030	.055	3	.1250	1.5	CS-125-082	25.65	CS-125-082X	29.30
	.040	.085	4	.1875	2.0			CS-187-082X	34.85
	.050	.115	6	.2500	2.5	CS-250-082	33.45	CS-250-082X	41.40
	.060	.145	6	.3125	2.5	CS-312-082	46.80	CS-312-082X	58.55
	.070	.175	6	.3750	2.5	CS-375-082	53.45	CS-375-082X	64.70
	.080	.242	6	.5000	3.0	CS-500-082	77.60	CS-500-082X	91.25
90°	.030	.047	3	.1250	1.5	CS-125-090	25.65	CS-125-090X	29.30
	.040	.074	4	.1875	2.0	CS-187-090	30.50	CS-187-090X	34.85
	.050	.100	6	.2500	2.5	CS-250-090	33.45	CS-250-090X	41.40
	.060	.126	6	.3125	2.5	CS-312-090	46.80	CS-312-090X	58.55
	.070	.152	6	.3750	2.5	CS-375-090	53.45	CS-375-090X	64.70
	.080	.210	6	.5000	3.0	CS-500-090	77.60	CS-500-090X	91.25
100°	.030	.040	3	.1250	1.5	CS-125-100	25.65	CS-125-100X	29.30
	.040	.062	4	.1875	2.0	CS-187-100	30.50	CS-187-100X	34.85
	.050	.084	6	.2500	2.5	CS-250-100	33.45	CS-250-100X	41.40
	.060	.106	6	.3125	2.5	CS-312-100	46.80	CS-312-100X	58.55
	.070	.128	6	.3750	2.5	CS-375-100	53.45	CS-375-100X	64.70
	.080	.176	6	.5000	3.0	CS-500-100	77.60	CS-500-100X	91.25
120°	.030	.027	3	.1250	1.5	CS-125-120	25.65	CS-125-120X	29.30
	.050	.058	6	.2500	2.5	CS-250-120	33.45	CS-250-120X	41.40
	.060	.073	6	.3125	2.5			CS-312-120X	58.55
	.070	.088	6	.3750	2.5			CS-375-120X	64.70
	.080	.121	6	.5000	3.0			CS-500-120X	91.25

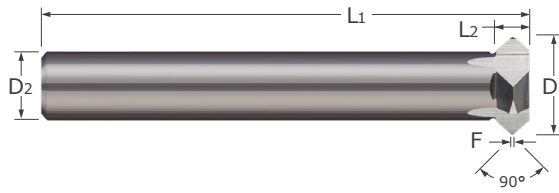
Chamfer Cutters

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

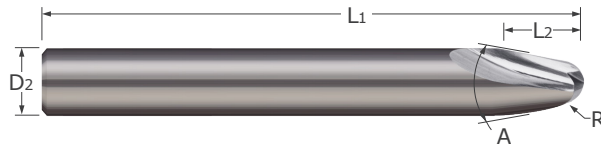
Cutter Diameter	Cutter Width	Flat	Flutes	Shank Diameter	Overall Length	Uncoated	
						Tool #	Price
$D_1 \begin{smallmatrix} +.000'' \\ -.005'' \end{smallmatrix}$	$L_2 \begin{smallmatrix} +.000'' \\ -.015'' \end{smallmatrix}$	$F \begin{smallmatrix} +.000'' \\ -.005'' \end{smallmatrix}$		$D_2 \text{ (h6)}$	L_1		
.375	.125	.031	4	.2500	2.63	MBC-375	78.30
.500	.125	.031	5	.3125	2.63	MBC-500	95.45
.750	.156	.031	6	.3750	2.66	MBC-750	118.45
1.000	.188	.031	7	.5000	3.19	MBC-001	154.55

Chamfer Cutters

MRF / MRT



Runner Cutters



- 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	
						Tool #	Price
A $^{+1^{\circ}}_{-1^{\circ}}$	R $^{+.0030''}_{-.0000''}$	L2		D2 (h6)	L1		
20°	.0312	.383	2	.1875	2.0	MRT-187-031	40.75
	.0469	.308	2	.1875	2.0	MRT-187-046	40.75
	.0625	.414	2	.2500	2.5	MRT-250-062	45.20
	.0938	.437	2	.3125	2.5	MRT-312-093	54.95
	.1094	.366	2	.3125	2.5	MRT-312-109	54.95
	.1250	.468	2	.3750	2.5	MRT-375-125	57.80
30°	.1562	.675	2	.5000	3.0	MRT-500-156	72.55
	.0312	.262	2	.1875	2.0	MRF-187-031	40.75
	.0625	.287	2	.2500	2.5	MRF-250-062	45.20
	.0781	.243	2	.2500	2.5	MRF-250-078	45.20
	.1094	.270	2	.3125	2.5	MRF-312-109	54.95

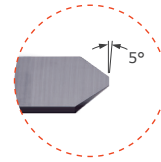
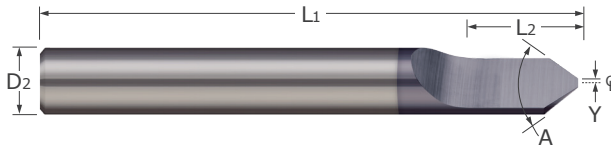
Runner Cutters

Engraving Cutters

Tipped Off – Single Ended



RTC / RTCM / RSC
RSCM / RNC / RNCM



- 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

Engraving Cutters

Included Angle	Shank Diameter	Point Offset	Split Length	Overall Length	Uncoated		AlTiN Coated	
					Tool #	Price	Tool #	Price
A $+0^{\circ}30'$ $-0^{\circ}30'$	D2 (h6)	Y $+0.001''$ $-0.001''$ $+0.02$ mm -0.02 mm	L2 $+0.015''$ $-0.000''$ $+0.38$ mm -0.00 mm	L1	Tool #	Price	Tool #	Price
30°	3 mm	0.10 mm	7 mm	38 mm	RTCM-030-1	13.95	RTCM-030-1X	16.50
	.1250	.004	.375	1.5	RTC-125-1	19.15	RTC-125-1X	20.45
	.1250	.004	.375	3.0	RTC-125-13	19.70	RTC-125-13X	21.85
	4 mm	0.10 mm	10 mm	50 mm	RTCM-040-1	17.85	RTCM-040-1X	20.80
	.1875	.004	.437	2.0	RTC-187-1	23.75		
	5 mm	0.10 mm	12 mm	50 mm	RTCM-050-1	20.30		
	6 mm	0.10 mm	12 mm	57 mm	RTCM-060-1	21.55	RTCM-060-1X	26.55
	.2500	.004	.500	2.5	RTC-250-1	25.70	RTC-250-1X	35.40
	.2500	.004	.500	4.0	RTC-250-14	37.45		
	.2500	.010	.500	2.5	RTC-250-120	24.80	RTC-250-120X	35.40
	.2500	.015	.500	2.5	RTC-250-130	30.80		
	.2500	.022	.500	2.5	RTC-250-145	32.55		
	.2500	.030	.500	2.5	RTC-250-160	32.55		
	.3125	.004	.500	2.5	RTC-312-1	48.05		
	.3125	.004	.500	4.0	RTC-312-14	60.35		
	8 mm	0.10 mm	12 mm	63 mm	RTCM-080-1	34.60	RTCM-080-1X	41.50
.3750	.004	.500	2.5	RTC-375-1	60.15			
12 mm	0.10 mm	14 mm	83 mm			RTCM-120-1X	82.60	
.5000	.004	.625	3.0	RTC-500-1	94.05			
60°	3 mm	0.10 mm	5 mm	38 mm	RSCM-030-1	13.95	RSCM-030-1X	16.50
	.1250	.004	.375	1.5	RSC-125-1	18.85	RSC-125-1X	19.80
	.1250	.004	.375	3.0	RSC-125-13	20.10		
	4 mm	0.10 mm	6 mm	50 mm	RSCM-040-1	17.85	RSCM-040-1X	20.80
	.1875	.004	.375	2.0	RSC-187-1	23.00	RSC-187-1X	28.95
	.1875	.004	.375	3.0	RSC-187-13	24.50		
	5 mm	0.10 mm	7 mm	50 mm			RSCM-050-1X	24.45
	6 mm	0.10 mm	8 mm	57 mm	RSCM-060-1	21.55	RSCM-060-1X	26.55
	.2500	.004	.375	2.5	RSC-250-1	27.40		
	.2500	.004	.375	4.0	RSC-250-14	40.75		
	.2500	.010	.375	2.5	RSC-250-120	27.20	RSC-250-120X	35.40
	.2500	.015	.375	2.5	RSC-250-130	30.30		
	.2500	.022	.375	2.5	RSC-250-145	32.55		

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RTC / RTCM / RSC
RSCM / RNC / RNCM



Engraving Cutters
Tipped Off – Single Ended (cont.)

Continued from previous page

Included Angle	Shank Diameter	Point Offset	Split Length	Overall Length	Uncoated		AlTiN Coated	
					Tool #	Price	Tool #	Price
60°	D2 (h6)	Y +.001" -.001" +.02 mm -.02 mm	L2 +.015" -.000" +.38 mm -.00 mm	L1	RSC-250-160	32.55		
					RSC-312-1	47.85		
					RSC-312-14	60.35		
					RSCM-080-1	34.60	RSCM-080-1X	41.50
					RSC-375-1	58.95	RSC-375-1X	67.15
					RSC-375-14	85.30		
					RSCM-100-1	51.00	RSCM-100-1X	57.70
					RSCM-120-1	71.60		
					RSC-500-1	94.05	RSC-500-1X	98.60
90°					RNCM-030-1	13.95	RNCM-030-1X	16.50
					RNC-125-1	17.75	RNC-125-1X	24.50
					RNC-125-13	23.20		
					RNCM-040-1	17.85	RNCM-040-1X	20.80
					RNC-187-1	24.95	RNC-187-1X	22.90
					RNC-187-13	26.00	RNC-187-13X	31.00
					RNCM-050-1	20.30	RNCM-050-1X	24.20
					RNCM-060-1	21.55	RNCM-060-1X	26.55
					RNC-250-1	28.45	RNC-250-1X	29.45
					RNC-250-14	34.55	RNC-250-14X	43.65
					RNC-250-130	32.55		
					RNC-250-145	32.55		
					RNC-250-160	32.55		
					RNC-312-1	38.75		
					RNCM-080-1	34.60	RNCM-080-1X	41.50
					RNC-375-1	56.60	RNC-375-1X	64.80
					RNCM-100-1	51.00		
					RNCM-120-1	71.60	RNCM-120-1X	81.85
					RNC-500-1	91.60		

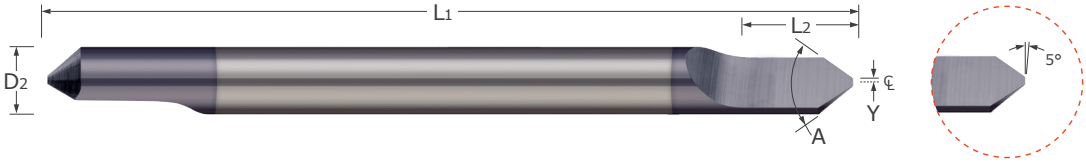
Engraving Cutters

Engraving Cutters

Tipped Off – Doubled Ended



RTC / RTCM / RSC
RSCM / RNC / RNCM



- 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

Engraving Cutters

Included Angle	Shank Diameter	Point Offset	Split Length	Overall Length	Uncoated		AlTiN Coated	
					Tool #	Price	Tool #	Price
A ^{+0°30'} -0°30'	D2 (h6)	Y ^{+ .001"} ^{-.001"} ^{+.02 mm} ^{-.02 mm}	L2 ^{+.015"} ^{-.015"} ^{+.38 mm} ^{-.38 mm}	L1				
30°	3 mm	0.10 mm	7 mm	38 mm	RTCM-030-2	18.65	RTCM-030-2X	22.30
	.1250	.004	.375	2.0	RTC-125-2	22.45	RTC-125-2X	30.10
	.1250	.004	.375	3.0	RTC-125-23	28.05	RTC-125-23X	35.25
	4 mm	0.10 mm	10 mm	50 mm	RTCM-040-2	23.80	RTCM-040-2X	28.15
	.1875	.004	.437	2.0	RTC-187-2	29.55	RTC-187-2X	37.20
	.1875	.004	.437	3.0	RTC-187-23	34.15	RTC-187-23X	42.50
	5 mm	0.10 mm	12 mm	50 mm	RTCM-050-2	26.85	RTCM-050-2X	31.15
	6 mm	0.10 mm	12 mm	57 mm	RTCM-060-2	29.35	RTCM-060-2X	37.35
	.2500	.004	.500	2.5	RTC-250-2	34.45	RTC-250-2X	43.45
	.2500	.004	.500	4.0	RTC-250-24	47.85		
	.2500	.010	.500	2.5	RTC-250-220	36.40	RTC-250-220X	44.20
	.2500	.015	.500	2.5	RTC-250-230	31.80		
	.2500	.022	.500	2.5	RTC-250-245	40.65	RTC-250-245X	48.25
	.2500	.030	.500	2.5	RTC-250-260	40.65		
	.3125	.004	.500	2.5	RTC-312-2	60.35		
	.3125	.004	.500	4.0	RTC-312-24	73.50		
8 mm	0.10 mm	12 mm	63 mm	RTCM-080-2	46.50	RTCM-080-2X	57.95	
.3750	.004	.500	2.5	RTC-375-2	74.90			
.3750	.004	.500	4.0	RTC-375-24	94.80			
10 mm	0.10 mm	12 mm	72 mm	RTCM-100-2	66.45			
.5000	.004	.625	3.0	RTC-500-2	102.85			
60°	3 mm	0.10 mm	5 mm	38 mm	RSCM-030-2	18.65	RSCM-030-2X	22.30
	.1250	.004	.375	2.0	RSC-125-2	23.45	RSC-125-2X	27.65
	.1250	.004	.375	3.0	RSC-125-23	27.80		
	4 mm	0.10 mm	6 mm	50 mm	RSCM-040-2	23.80	RSCM-040-2X	28.15
	.1875	.004	.375	2.0	RSC-187-2	28.45	RSC-187-2X	33.20
	.1875	.004	.375	3.0	RSC-187-23	35.40		
	5 mm	0.10 mm	7 mm	50 mm			RSCM-050-2X	30.45
	6 mm	0.10 mm	8 mm	57 mm	RSCM-060-2	29.35	RSCM-060-2X	37.35
	.2500	.004	.375	2.5	RSC-250-2	35.75	RSC-250-2X	45.50

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**RTC / RTCM / RSC
RSCM / RNC / RNCM**



Engraving Cutters
Tipped Off – Doubled Ended (cont.)

Continued from previous page

Included Angle	Shank Diameter	Point Offset	Split Length	Overall Length	Uncoated		AITIN Coated	
					Tool #	Price	Tool #	Price
60°	D2 (h6)	Y +.001" -.001" +.02 mm -.02 mm	L2 +.015" -.015" +.38 mm -.38 mm	L1	RSC-250-24	52.10		
					RSC-250-220	36.05	RSC-250-220X	45.85
					RSC-250-230	36.90		
					RSC-250-260	40.65		
					RSC-312-2	61.75	RSC-312-2X	64.25
					RSC-312-24	73.50		
					RSC-375-2	71.80	RSC-375-2X	85.75
					RSC-375-24	94.15		
					RSCM-100-2	66.45	RSCM-100-2X	77.70
					RSCM-120-2	90.30		
RSC-500-2	110.30							
90°					RNCM-030-2	18.65	RNCM-030-2X	22.30
					RNC-125-2	23.75	RNC-125-2X	31.95
					RNC-125-23	29.00	RNC-125-23X	36.20
					RNCM-040-2	23.80	RNCM-040-2X	28.15
					RNC-187-2	29.45	RNC-187-2X	34.55
					RNC-187-23	34.65		
					RNCM-050-2	26.85		
					RNCM-060-2	29.35	RNCM-060-2X	37.35
					RNC-250-2	36.50	RNC-250-2X	44.30
					RNC-250-24	47.85	RNC-250-24X	58.30
					RNC-250-220	36.15	RNC-250-220X	46.00
					RNC-250-230	37.75	RNC-250-230X	47.55
					RNC-250-260	40.65		
					RNC-312-2	58.85		
					RNC-312-24	73.50	RNC-312-24X	86.10
					RNCM-080-2	46.50	RNCM-080-2X	57.95
					RNC-375-2	74.35	RNC-375-2X	88.30
					RNC-375-24	92.65		
					RNC-500-2	107.95	RNC-500-2X	123.60
					RNC-500-24	155.05		

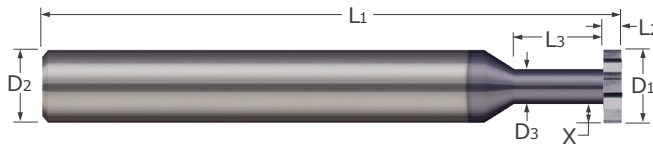
Engraving Cutters

Keyseat Cutters

Square



KC



- 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

Keyseat Cutters

Cutter Diameter	Cutter Width	Neck Diameter	Radial Depth of Cut	Neck Length	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
								Tool #	Price	Tool #	Price
$D_1 \begin{smallmatrix} +.0000 \\ -.0020 \end{smallmatrix}$	$L_2 \begin{smallmatrix} +.001 \\ -.000 \end{smallmatrix}$	$D_3 \begin{smallmatrix} +.000 \\ -.002 \end{smallmatrix}$	X	$L_3 \begin{smallmatrix} +.010 \\ -.000 \end{smallmatrix}$		D2 (h6)	L1				
.0938	.010	.047	.019	.140	4	.1250	1.5	KC-093-140-010	41.05	KC-093-140-010X	43.30
.0938	.015	.047	.019	.140	4	.1250	1.5	KC-093-140-015	38.80	KC-093-140-015X	41.10
.0938	.020	.047	.019	.140	4	.1250	1.5	KC-093-140-020	38.80	KC-093-140-020X	41.10
.0938	.040	.047	.019	.140	4	.1250	1.5	KC-093-140-040	38.80	KC-093-140-040X	41.10
.1250	.015	.062	.028	.190	6	.1250	1.5	KC-125-190-015	38.80	KC-125-190-015X	41.10
.1250	.025	.062	.028	.190	6	.1250	1.5	KC-125-190-025	38.80	KC-125-190-025X	41.10
.1250	.030	.062	.028	.190	6	.1250	1.5	KC-125-190-030	38.80	KC-125-190-030X	41.10
.1250	.030	.062	.028	.375	6	.1250	1.5	KC-125-375-030	38.80	KC-125-375-030X	41.10
.1250	.035	.062	.028	.190	6	.1250	1.5			KC-125-190-035X	41.10
.1250	.040	.062	.028	.190	6	.1250	1.5	KC-125-190-040	38.80	KC-125-190-040X	41.10
.1250	.045	.062	.028	.190	6	.1250	1.5	KC-125-190-045	38.80	KC-125-190-045X	41.10
.1250	.050	.062	.028	.190	6	.1250	1.5	KC-125-190-050	38.80	KC-125-190-050X	41.10
.1250	.055	.062	.028	.190	6	.1250	1.5	KC-125-190-055	38.80	KC-125-190-055X	41.10
.1250	.060	.062	.028	.190	6	.1250	1.5	KC-125-190-060	38.80	KC-125-190-060X	41.10
.1250	.062	.062	.028	.190	6	.1250	1.5	KC-125-190-062	38.80	KC-125-190-062X	41.10
.1250	.062	.062	.028	.375	6	.1250	1.5	KC-125-375-062	38.80	KC-125-375-062X	41.10
.1250	.093	.062	.028	.190	6	.1250	1.5	KC-125-190-093	38.80	KC-125-190-093X	41.10
.1250	.093	.062	.028	.375	6	.1250	1.5	KC-125-375-093	38.80		
.1875	.015	.090	.045	.300	6	.1875	2.0	KC-187-300-015	41.05		
.1875	.018	.090	.045	.300	6	.1875	2.0			KC-187-300-018X	43.75
.1875	.020	.090	.045	.300	6	.1875	2.0	KC-187-300-020	41.05		
.1875	.025	.090	.045	.300	6	.1875	2.0	KC-187-300-025	41.05		
.1875	.029	.090	.045	.300	6	.1875	2.0	KC-187-300-029	41.05	KC-187-300-029X	43.75
.1875	.030	.090	.045	.300	6	.1875	2.0	KC-187-300-030	41.05	KC-187-300-030X	43.75
.1875	.035	.090	.045	.550	6	.1875	2.0	KC-187-550-035	41.05		
.1875	.040	.090	.045	.300	6	.1875	2.0	KC-187-300-040	41.05	KC-187-300-040X	43.75
.1875	.045	.090	.045	.300	6	.1875	2.0			KC-187-300-045X	43.75
.1875	.050	.090	.045	.300	6	.1875	2.0	KC-187-300-050	41.05		
.1875	.055	.090	.045	.300	6	.1875	2.0			KC-187-300-055X	43.75
.1875	.093	.090	.045	.300	6	.1875	2.0	KC-187-300-093	41.05		
.1875	.093	.090	.045	.550	6	.1875	2.0	KC-187-550-093	41.05	KC-187-550-093X	43.75

Continued on next page

KC



Keyseat Cutters
Square (cont.)

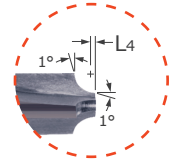
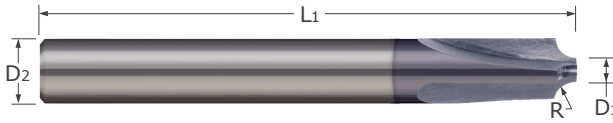
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Cutter Diameter	Cutter Width	Neck Diameter	Radial Depth of Cut	Neck Length	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
								Tool #	Price	Tool #	Price
$D_1 \begin{smallmatrix} +.000'' \\ -.002'' \end{smallmatrix}$	$L_2 \begin{smallmatrix} +.001'' \\ -.000'' \end{smallmatrix}$	$D_3 \begin{smallmatrix} +.000'' \\ -.002'' \end{smallmatrix}$	X	$L_3 \begin{smallmatrix} +.010'' \\ -.000'' \end{smallmatrix}$		D2 (h6)	L1				
.1875	.125	.090	.045	.300	6	.1875	2.0	KC-187-300-125	41.05		
.1875	.125	.090	.045	.550	6	.1875	2.0	KC-187-550-125	41.05	KC-187-550-125X	43.75
.2500	.035	.125	.059	.375	6	.2500	2.5			KC-250-375-035X	46.25
.2500	.040	.125	.059	.375	6	.2500	2.5	KC-250-375-040	43.55		
.3750	.030	.190	.089	.600	8	.3750	2.5	KC-375-600-030	63.50		
.3750	.035	.190	.089	.600	8	.3750	2.5	KC-375-600-035	63.50		
.3750	.040	.190	.089	.600	8	.3750	2.5	KC-375-600-040	63.50	KC-375-600-040X	70.10
.3750	.062	.190	.089	1.125	8	.3750	2.5	KC-375-1125-062	70.25		
.3750	.086	.190	.089	.600	8	.3750	2.5			KC-375-600-086X	70.10
.3750	.093	.190	.089	1.125	8	.3750	2.5	KC-375-1125-093	63.50	KC-375-1125-093X	70.10
.3750	.125	.190	.089	.600	8	.3750	2.5	KC-375-600-125	63.50		
.3750	.125	.190	.089	1.125	8	.3750	2.5			KC-375-1125-125X	70.10
.3750	.156	.190	.089	.600	8	.3750	2.5	KC-375-600-156	63.50		
.3750	.156	.190	.089	1.125	8	.3750	2.5	KC-375-1125-156	63.50	KC-375-1125-156X	70.10
.3750	.187	.190	.089	.600	8	.3750	2.5	KC-375-600-187	63.50		
.3750	.187	.190	.089	1.125	8	.3750	2.5	KC-375-1125-187	63.50	KC-375-1125-187X	70.10
.5000	.030	.250	.121	.750	8	.5000	3.0	KC-500-750-030	81.95		
.5000	.035	.250	.121	.750	8	.5000	3.0	KC-500-750-035	81.95		
.5000	.040	.250	.121	.750	8	.5000	3.0			KC-500-750-040X	89.90
.5000	.062	.250	.121	.750	8	.5000	3.0	KC-500-750-062	81.95		
.5000	.062	.250	.121	1.500	8	.5000	3.0	KC-500-1500-062	92.70	KC-500-1500-062X	100.55
.5000	.093	.250	.121	.750	8	.5000	3.0	KC-500-750-093	81.95		
.5000	.093	.250	.121	1.500	8	.5000	3.0	KC-500-1500-093	92.70	KC-500-1500-093X	100.55
.5000	.103	.250	.121	.750	8	.5000	3.0	KC-500-750-103	81.95		
.5000	.118	.250	.121	.750	8	.5000	3.0			KC-500-750-118X	89.90
.5000	.118	.250	.121	1.500	8	.5000	3.0	KC-500-1500-118	92.70		
.5000	.120	.250	.121	.750	8	.5000	3.0	KC-500-750-120	81.95	KC-500-750-120X	89.90
.5000	.125	.250	.121	.750	8	.5000	3.0	KC-500-750-125	81.95		
.5000	.125	.250	.121	1.500	8	.5000	3.0	KC-500-1500-125	92.70		
.5000	.156	.250	.121	.750	8	.5000	3.0	KC-500-750-156	81.95		
.5000	.156	.250	.121	1.500	8	.5000	3.0	KC-500-1500-156	92.70	KC-500-1500-156X	100.55
.5000	.187	.250	.121	.750	8	.5000	3.0	KC-500-750-187	81.95		
.5000	.187	.250	.121	1.500	8	.5000	3.0	KC-500-1500-187	92.70	KC-500-1500-187X	100.55
.5000	.250	.250	.121	.750	8	.5000	3.0	KC-500-750-250	81.95		

Keyseat Cutters

Corner Rounding End Mills

3 Flute – Single 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
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide ■ CNC ground in the USA

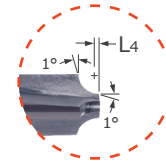
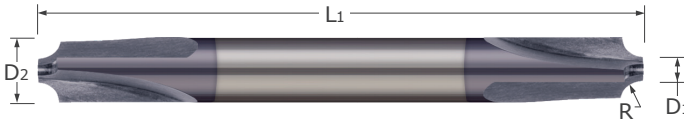
Minor Diameter	Radius	Max Lead in Length	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
					Tool #	Price	Tool #	Price
D1 $\begin{matrix} +.000 \text{ mm} \\ -.076 \text{ mm} \end{matrix}$	R $\begin{matrix} +.000 \text{ mm} \\ -.013 \text{ mm} \end{matrix}$	L4	D2 (h6)	L1				
1.5 mm	0.3 mm	.13 mm	6 mm	57 mm	CREM-060-030	39.60	CREM-060-030X	44.40
1.5 mm	0.5 mm	.13 mm	6 mm	57 mm			CREM-060-050X	44.40
1.5 mm	0.8 mm	.13 mm	6 mm	57 mm	CREM-060-080	39.60	CREM-060-080X	44.40
1.5 mm	1.0 mm	.13 mm	6 mm	57 mm	CREM-060-100	39.60	CREM-060-100X	44.40
1.5 mm	1.5 mm	.13 mm	6 mm	57 mm	CREM-060-150	39.60	CREM-060-150X	44.40
1.5 mm	2.0 mm	.13 mm	6 mm	57 mm	CREM-060-200	39.60	CREM-060-200X	44.40
1.5 mm	2.5 mm	.13 mm	8 mm	63 mm			CREM-080-250X	54.40
1.5 mm	3.0 mm	.13 mm	8 mm	63 mm	CREM-080-300	47.60	CREM-080-300X	54.40
1.5 mm	4.0 mm	.13 mm	10 mm	73 mm	CREM-100-400	64.70	CREM-100-400X	71.30

CRE



Corner Rounding End Mills

3 Flute – Double Ended



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

Minor Diameter	Radius	Max Lead in Length	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
					Tool #	Price	Tool #	Price
$D1^{+.000"}_{-.002"}$	$R^{+.0000"}_{-.0005"}$	L4	D2 (h6)	L1				
.060	.0100	.005	.1250	2.0	CRE-125-010	35.30	CRE-125-010X	38.80
.060	.0156	.005	.1250	2.0	CRE-125-015	35.30	CRE-125-015X	38.80
.060	.0200	.005	.1250	2.0	CRE-125-020	35.30	CRE-125-020X	38.80
.060	.0250	.005	.1250	2.0	CRE-125-025	35.30	CRE-125-025X	38.80
.060	.0300	.005	.1250	2.0	CRE-125-030	35.30	CRE-125-030X	38.80
.060	.0312	.005	.1250	2.0	CRE-125-031	35.30	CRE-125-031X	38.80
.060	.0350	.005	.1875	2.0	CRE-187-035	38.05	CRE-187-035X	42.35
.060	.0400	.005	.1875	2.0	CRE-187-040	38.05	CRE-187-040X	42.35
.060	.0450	.005	.1875	2.0	CRE-187-045	38.05	CRE-187-045X	42.35
.060	.0469	.005	.1875	2.0	CRE-187-047	38.05	CRE-187-047X	42.35
.060	.0500	.005	.1875	2.0	CRE-187-050	38.05	CRE-187-050X	42.35
.060	.0550	.005	.1875	2.0	CRE-187-055	38.05	CRE-187-055X	42.35
.060	.0600	.005	.1875	2.0	CRE-187-060	38.05	CRE-187-060X	42.35
.060	.0625	.005	.1875	2.0	CRE-187-062	38.05	CRE-187-062X	42.35

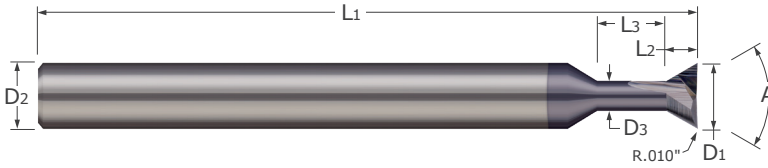
Minor Diameter	Radius	L4	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
					Tool #	Price	Tool #	Price
$D1^{+.000"}_{-.003"}$	$R^{+.0000"}_{-.0005"}$	L4	D2 (h6)	L1				
.060	.0700	.005	.2500	2.5	CRE-250-070	49.25	CRE-250-070X	56.00
.060	.0750	.005	.2500	2.5	CRE-250-075	49.25	CRE-250-075X	56.00
.060	.0781	.005	.2500	2.5	CRE-250-078	49.25	CRE-250-078X	56.00
.060	.0800	.005	.2500	2.5	CRE-250-080	49.25	CRE-250-080X	56.00
.060	.0900	.005	.2500	2.5	CRE-250-090	49.25	CRE-250-090X	56.00
.060	.0938	.005	.2500	2.5	CRE-250-093	49.25	CRE-250-093X	56.00
.060	.1000	.005	.3125	2.5	CRE-312-100	59.50	CRE-312-100X	71.20
.060	.1094	.005	.3125	2.5	CRE-312-109	59.50	CRE-312-109X	71.20
.060	.1250	.005	.3125	2.5	CRE-312-125	59.50	CRE-312-125X	71.20
.060	.1406	.005	.3750	2.5	CRE-375-140	80.85	CRE-375-140X	91.85
.060	.1562	.005	.3750	2.5	CRE-375-156	80.85	CRE-375-156X	91.85
.120	.1718	.010	.5000	3.0	CRE-500-171	125.25	CRE-500-171X	137.30
.120	.1875	.010	.5000	3.0	CRE-500-187	125.25	CRE-500-187X	137.30
.120	.2031	.010	.6250	3.5	CRE-625-203	134.25	CRE-625-203X	154.30
.120	.2188	.010	.6250	3.5	CRE-625-218	134.25	CRE-625-218X	154.30
.120	.2344	.010	.6250	3.5	CRE-625-234	134.25	CRE-625-234X	154.30
.120	.2500	.010	.6250	3.5	CRE-625-250	134.25	CRE-625-250X	154.30
.120	.2812	.010	.7500	4.0	CRE-750-281	188.30		
.120	.3125	.010	.7500	4.0	CRE-750-312	188.30	CRE-750-312X	211.35
.120	.3750	.010	1.0000	4.0	CRE-001-375	351.35	CRE-001-375X	382.60
.120	.4370	.010	1.0000	4.0	CRE-001-437	351.35	CRE-001-437X	382.60

Corner Rounding End Mills

Dovetail Cutters



DT

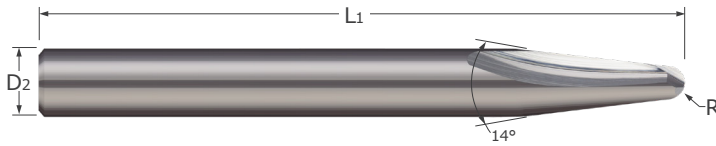


- Designed to mill dovetail grooves into a part
- Offered with 30°, 60°, and 90° included angles
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide
- CNC ground in the USA

Included Angle	Cutter Diameter*	Length of Cut	Neck Diameter	Neck Length	Corner Radius	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
									Tool #	Price	Tool #	Price
A $+1^\circ$ -1°	D ₁ $+0.0000"$ $-0.0020"$	L ₂	D ₃	L ₃ $+0.030"$ $-0.000"$	R		D ₂ (h6)	L ₁				
30°	.1250	.095	.080	.125	.010	2	.1250	1.5	DT-125-030-010	55.65	DT-125-030-010X	57.75
	.1875	.127	.125	.125	.010	2	.1875	2.0	DT-187-030-010	59.50	DT-187-030-010X	62.00
	.2500	.161	.170	.125	.010	2	.2500	2.5	DT-250-030-010	75.00	DT-250-030-010X	79.50
	.3125	.221	.200	.312	.010	2	.3125	2.5	DT-312-030-010	81.20	DT-312-030-010X	88.10
	.3750	.263	.240	.375	.010	3	.3750	2.5	DT-375-030-010	85.70	DT-375-030-010X	92.10
	.5000	.347	.320	.500	.010	3	.5000	3.0	DT-500-030-010	111.15	DT-500-030-010X	118.85
60°	.1250	.065	.065	.125	.010	2	.1250	1.5	DT-125-060-010	55.65	DT-125-060-010X	57.75
	.1875	.093	.095	.125	.010	2	.1875	2.0	DT-187-060-010	59.50	DT-187-060-010X	62.00
	.2500	.125	.120	.125	.010	2	.2500	2.5	DT-250-060-010	75.00	DT-250-060-010X	79.50
	.3125	.162	.140	.312	.010	2	.3125	2.5	DT-312-060-010	81.20	DT-312-060-010X	88.10
	.3750	.190	.170	.375	.010	3	.3750	2.5	DT-375-060-010	85.70	DT-375-060-010X	92.10
	.5000	.255	.220	.500	.010	3	.5000	3.0	DT-500-060-010	111.15	DT-500-060-010X	118.85
90°	.1250	.042	.070	.125	.010	2	.1250	1.5	DT-125-090-010	55.65	DT-125-090-010X	57.75
	.1875	.048	.120	.125	.010	2	.1875	2.0	DT-187-090-010	59.50	DT-187-090-010X	62.00
	.2500	.064	.150	.125	.010	2	.2500	2.5	DT-250-090-010	75.00	DT-250-090-010X	79.50
	.3125	.095	.150	.312	.010	2	.3125	2.5	DT-312-090-010	81.20	DT-312-090-010X	88.10
	.3750	.127	.150	.375	.010	3	.3750	2.5	DT-375-090-010	85.70	DT-375-090-010X	92.10
	.5000	.164	.200	.500	.010	3	.5000	3.0	DT-500-090-010	111.15	DT-500-090-010X	118.85

* .0005" max TIR

Dovetail Cutters

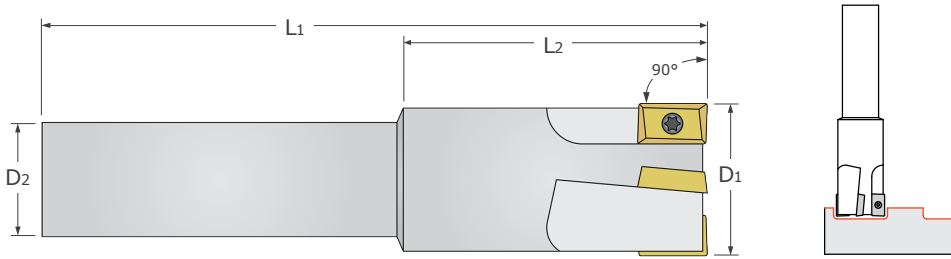


- Utilized for die sinking and finish milling operations
- 2 straight flutes
- 14° included angle with a radius end
- Solid carbide ■ CNC ground in the USA

Radius	Flutes	Shank Diameter	Overall Length	Uncoated	
				Tool #	Price
R $\begin{matrix} +.0030'' \\ -.0000'' \end{matrix}$		D ₂ (h6)	L ₁		
.0400	2	.1562	2.0	DSC-156	32.65
.0700	2	.3125	2.5	DSC-312	53.95
.1250	2	.5000	3.0	DSC-500	99.85

Indexable

Milling – Tool Holders



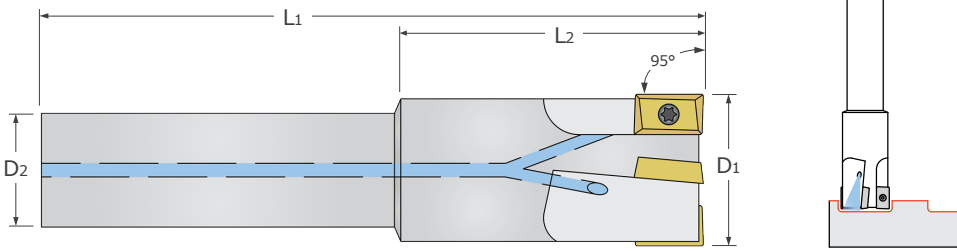
- 90° orientation angle allows for square shoulder cutting
- Utilizes ANSI standard APKT style inserts (not included)
- Each tool holder includes a M2.5 x T-8 torx screw and torx key (part # [16-1020](#))
- Non coolant-through
- Insert not included

Cutter Diameter	Body Length	Flutes	Shank Diameter	Overall Length	Insert Part Number	Holder Nomenclature	Tool Holder	
							Tool #	Price
D1	L2		D2	L1				
.375	1.500	1	.5000	3.0	50-2100	BAAP 1216 2	31-1216	110.00
.500	1.500	1	.5000	3.0	50-2100	BAAP 1616 2	31-1616	122.90
.625	1.500	2	.5000	3.0	50-2100	BAAP 1816 2	31-1816	135.80
.750	2.000	3	.7500	4.4	50-2100	BAAP 2424 2	31-2424	187.50
1.000	2.000	4	.7500	4.4	50-2100	BAAP 3224 2	31-3224	200.40
1.250	2.000	5	.7500	4.4	50-2100	BAAP 4024 2	31-4024	298.65

See pg 303 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	
							Tool #	Price
D ₁	L ₂		D ₂	L ₁				
.375	1.500	1	.5000	3.0	50-2100	AAAP 1216 2	30-1216	135.80
.500	1.500	1	.5000	3.0	50-2100	AAAP 1616 2	30-1616	148.65
.625	1.500	2	.5000	3.0	50-2100	AAAP 1816 2	30-1816	162.30
.750	2.000	3	.7500	4.4	50-2100	AAAP 2424 2	30-2424	191.15
1.000	2.000	4	.7500	4.4	50-2100	AAAP 3224 2	30-3224	306.40
1.250	2.000	5	.7500	4.4	50-2100	AAAP 4024 2	30-4024	328.40

See pg 303 for indexable insert accessories

See pg 302 for tool set options

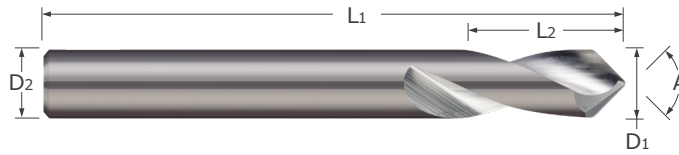
Drills

Spotting & Centering Drill



Tech Resources
Available Online

SPD



- Optimized for spotting and chamfering applications
- Available in 82°, 90°, 100°, and 120° 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

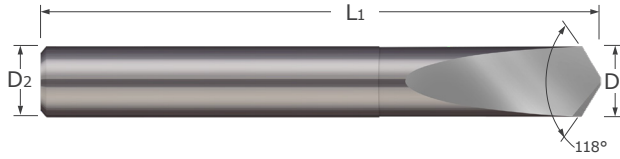
Included Angle	Drill Diameter	Flute Length	Shank Diameter	Overall Length	Uncoated	
					Tool #	Price
$A \begin{matrix} +1^\circ \\ -1^\circ \end{matrix}$	$D1 \begin{matrix} +.0000'' \\ -.0005'' \end{matrix}$	$L2 \begin{matrix} +.031'' \\ -.031'' \end{matrix}$	D2 (h6)	L1		
82°	.2500	.750	.2500	2.5	SPD-250-082	24.50
	.3125	.750	.3125	2.5	SPD-312-082	28.55
	.3750	1.000	.3750	2.5	SPD-375-082	35.95
	.5000	1.000	.5000	2.5	SPD-500-082	53.55
	.6250	1.125	.6250	2.5	SPD-625-082	94.70
	.7500	1.125	.7500	2.5	SPD-750-082	143.65
90°	.2500	.750	.2500	2.5	SPD-250-090	24.50
	.3125	.750	.3125	2.5	SPD-312-090	28.55
	.3750	1.000	.3750	2.5	SPD-375-090	35.95
	.5000	1.000	.5000	2.5	SPD-500-090	53.55
	.6250	1.125	.6250	2.5	SPD-625-090	94.70
	.7500	1.125	.7500	2.5	SPD-750-090	143.65
	1.0000	1.250	1.0000	2.5	SPD-001-090	217.75
100°	.2500	.750	.2500	2.5	SPD-250-100	24.50
	.3125	.750	.3125	2.5	SPD-312-100	28.55
	.3750	1.000	.3750	2.5	SPD-375-100	35.95
	.5000	1.000	.5000	2.5	SPD-500-100	53.55
	.6250	1.125	.6250	2.5	SPD-625-100	94.70
	.7500	1.125	.7500	2.5	SPD-750-100	143.65
	1.0000	1.250	1.0000	2.5	SPD-001-100	217.75
120°	.2500	.750	.2500	2.5	SPD-250-120	24.50
	.3125	.750	.3125	2.5	SPD-312-120	28.55
	.3750	1.000	.3750	2.5	SPD-375-120	35.95
	.5000	1.000	.5000	2.5	SPD-500-120	53.55
	.6250	1.125	.6250	2.5	SPD-625-120	94.70
	.7500	1.125	.7500	2.5	SPD-750-120	143.65

Drills



Drills

Spade Drill



- 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

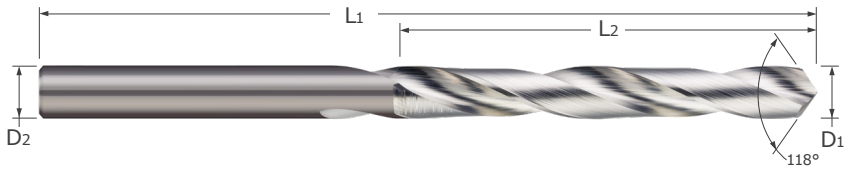
Drill Diameter	Web Thickness	Shank Diameter	Overall Length	Uncoated	
				Tool #	Price
$D_1^{+.0000''}$ $_{-.0005''}$	$+.002''$ $_{-.002''}$	D_2 (h6)	L_1		
.0312	.010	.0312	1.25	SD-031	13.75
.0625	.012	.0625	1.50	SD-062	14.30
.0937	.016	.0938	1.50	SD-093	14.65
.1250	.020	.1250	1.50	SD-125	16.10
.1562	.025	.1562	2.00	SD-156	17.65
.1875	.028	.1875	2.00	SD-187	20.50
.2188	.030	.2188	2.00	SD-218	24.15
.2500	.035	.2500	2.00	SD-250	27.65
.3125	.040	.3125	2.50	SD-312	38.25
.3750	.046	.3750	2.50	SD-375	46.10
.4375	.050	.4375	2.50	SD-437	52.85
.5000	.060	.5000	2.50	SD-500	64.50

Drills

Jobber Length Drills

 Tech Resources Available Online

DR



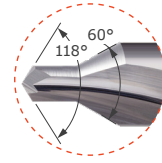
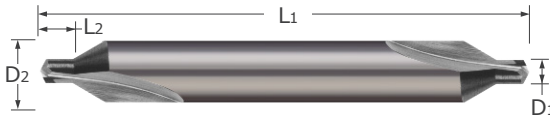
- 118° included point jobber drills can be used for general purpose drilling
- Solid carbide
- CNC ground in the USA

Drill Diameter	Flute Length	Shank Diameter	Overall Length	Uncoated	
				Tool #	Price
$D_1 \begin{smallmatrix} +.0000'' \\ -.0005'' \end{smallmatrix}$	$L_2 \begin{smallmatrix} +.062'' \\ -.062'' \end{smallmatrix}$	$D_2 \text{ (h6)}$	L_1		
.0312	.500	.0312	1.25	DR-031-2	12.35
.0469	.750	.0469	1.50	DR-046-2	16.25
.0625	.750	.0625	1.50	DR-062-2	16.60
.1094	1.250	.1094	2.25	DR-109-2	21.15
.1250	1.250	.1250	2.25	DR-125-2	22.30
.1875	1.625	.1875	2.75	DR-187-2	32.80
.2500	2.000	.2500	3.25	DR-250-2	48.70
.3125	2.375	.3125	3.75	DR-312-2	64.70

DC / DCM



Combined Drill & Countersinks



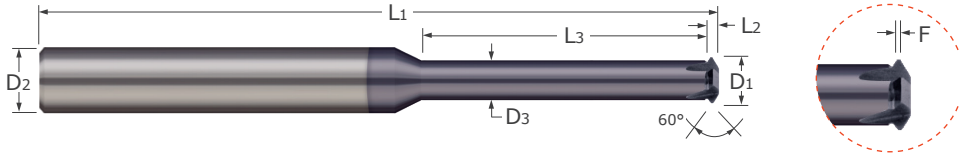
- Designed for predrilling 60° live center holes
- Can be utilized for countersinking and spot drilling
- Double-ended for quicker tool changes
- Solid carbide ■ CNC ground in the USA

Drill Diameter			Drill Length	Shank Diameter	Overall Length	Uncoated	
D1			L2	D2 (h6)	L1	Tool #	Price
+ .0030" - .0000"	+ .08 mm - .00 mm	decimal equiv.					
.0250		.0250	.031	.1250	1.500	DC-00	24.00
.0312		.0312	.038	.1250	1.500	DC-01	24.00
	0.8 mm	.0320	1.1 mm	3.15 mm	35 mm	DCM-008	23.10
	1.0 mm	.0390	1.3 mm	3.15 mm	35 mm	DCM-010	23.10
.0469		.0469	.047	.1250	1.500	DC-1	24.00
	1.25 mm	.0490	1.6 mm	3.15 mm	35 mm	DCM-013	23.10
	1.6 mm	.0630	2.0 mm	4 mm	35.5 mm	DCM-016	33.85
.0781		.0781	.078	.1875	1.875	DC-2	37.80
	2.5 mm	.0980	3.1 mm	6.3 mm	45 mm	DCM-025	40.60
.1094		.1094	.109	.2500	2.000	DC-3	42.30
	3.15 mm	.1240	3.9 mm	8 mm	50 mm	DCM-032	54.30
.1250		.1250	.125	.3125	2.125	DC-4	56.55
.1875		.1875	.188	.4375	2.750	DC-5	85.15
.2188		.2188	.219	.5000	3.000	DC-6	109.10

See pg 302 for tool set options

Thread Milling Cutters

Single Form - UN Threads



- 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	
									Tool #	Price	Tool #	Price
TPI	$D_1^{+.000" / -.005"}$	$L_3^{+.015" / -.000"}$	D ₃	$F^{+.0010" / -.0000"}$	L ₂		D ₂ (h6)	L ₁				
56 - 80	.060	.250	.030	SHARP	.017	2	.1250	1.5	TM-060-4	61.60	TM-060-4X	63.65
56 - 80	.060	.375	.030	SHARP	.017	2	.1250	1.5	TM-060-6	61.60	TM-060-6X	63.65
40 - 64	.080	.250	.035	SHARP	.026	2	.1250	1.5	TM-080-4	57.80	TM-080-4X	59.90
40 - 64	.080	.500	.035	SHARP	.026	2	.1250	1.5	TM-080-8	57.80	TM-080-8X	59.90
32 - 64	.100	.375	.050	SHARP	.029	2	.1250	1.5	TM-100-6	49.90	TM-100-6X	52.10
32 - 64	.100	.500	.050	SHARP	.029	2	.1250	1.5	TM-100-8	49.90		
32 - 64	.100	.625	.050	SHARP	.029	2	.1250	2.0	TM-100-10	49.90	TM-100-10X	52.10
32 - 56	.120	.375	.070	.0010	.030	3	.1875	2.0	TM-120-6	58.95	TM-120-6X	61.50
32 - 56	.120	.500	.070	.0010	.030	3	.1875	2.0	TM-120-8	58.95	TM-120-8X	61.50
32 - 56	.120	.625	.070	.0010	.030	3	.1875	2.0	TM-120-10	58.95	TM-120-10X	61.50
24 - 56	.140	.500	.075	.0010	.038	3	.1875	2.0	TM-140-8	58.95	TM-140-8X	61.50
24 - 56	.140	.750	.075	.0010	.038	3	.1875	2.0	TM-140-12	58.95	TM-140-12X	61.50
18 - 56	.180	.500	.090	.0015	.055	4	.2500	2.5	TM-180-8	69.35	TM-180-8X	73.90
18 - 56	.180	.750	.090	.0015	.055	4	.2500	2.5	TM-180-12	69.35	TM-180-12X	73.90
18 - 56	.180	1.000	.090	.0015	.055	4	.2500	2.5	TM-180-16	69.35	TM-180-16X	73.90
16 - 48	.240	1.500	.150	.0015	.055	4	.3125	3.5	TM-250-24	77.40	TM-250-24X	84.80
14 - 48	.250	1.000	.100	.0015	.065	4	.2500	2.5	TM-250-16	69.35	TM-250-16X	73.90
16 - 48	.250	1.125	.150	.0015	.060	4	.2500	2.5	TM-250-18	69.35	TM-250-18X	73.90
14 - 40	.290	1.000	.170	.0020	.071	4	.3750	4.0	TM-290-16	86.10	TM-290-16X	94.90
12 - 32	.360	1.000	.210	.0020	.085	4	.3750	4.0	TM-360-16	86.10	TM-360-16X	94.90
11 - 32	.490	1.000	.300	.0020	.095	5	.5000	4.0	TM-490-16	99.45	TM-490-16X	109.45
11 - 32	.490	1.250	.300	.0020	.095	5	.5000	4.0	TM-490-20	99.45	TM-490-20X	109.45
10 - 32	.600	1.000	.420	.0020	.100	6	.6250	4.0	TM-600-16	123.65	TM-600-16X	135.65
10 - 32	.600	1.250	.420	.0020	.100	6	.6250	4.0	TM-600-20	123.65	TM-600-20X	135.65

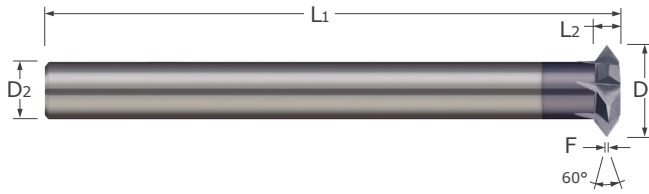
TPI	$D_1^{+.000" / -.005"}$	$L_3^{+.015" / -.000"}$	D ₃	$F^{+.0030" / -.0000"}$	L ₂		D ₂ (h6)	L ₁	Tool #	Price	Tool #	Price
5 - 12	.720	1.250	.360	.0045	.200	6	.7500	4.0	TM-720-20	142.00	TM-720-20X	155.80
5 - 12	.720	2.000	.360	.0045	.200	6	.7500	4.0	TM-720-32	142.00	TM-720-32X	155.80
5 - 12	.720	2.500	.360	.0045	.200	6	.7500	4.0	TM-720-40	142.00	TM-720-40X	155.80

TM



Thread Milling Cutters

Single Form - UN Threads - Reduced Shank



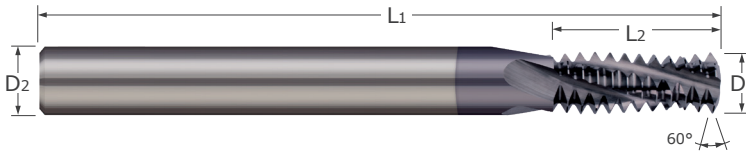
- Mills internal and external 60° threads
- Single thread form designed to mill common UN and metric pitch sizes
- Single form design reduces tool pressure for deep thread milling applications
- Reduced shank design can be chucked at any depth
- Mills right hand and left hand threads
- AlTiN coating 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	
							Tool #	Price	Tool #	Price
TPI	$D_1 \begin{smallmatrix} +.000'' \\ -.005'' \end{smallmatrix}$	$F \begin{smallmatrix} +.0030'' \\ -.0000'' \end{smallmatrix}$	$L_2 \begin{smallmatrix} +.005'' \\ -.005'' \end{smallmatrix}$		D_2 (h6)	L_1				
12-32	.375	.0020	.093	4	.2500	2.59	TM-375*	76.95	TM-375X*	81.40
11-32	.500	.0020	.125	5	.3125	2.63	TM-500*	93.70	TM-500X*	100.00
7-16	.750	.0040	.156	6	.3750	2.65	TM-750	116.20	TM-750X	122.30
5-12	1.000	.0045	.187	7	.5000	3.20	TM-001	151.75	TM-001X	159.00

* Reduced Neck

Thread Milling Cutters

Multi-Form – UN Threads



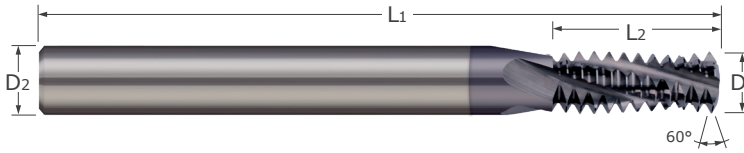
- Mills internal and external 60° UN threads
- Able to cut larger threads of the same pitch
- 100% thread form creates superior threads vs. tapping
- Mills right and left hand threads
- Helical flutes
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials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

Thread Size	Cutter Diameter D1 $\pm .0005"$ $-.0005"$	Length of Cut* L2 $\pm .0500"$ $-.0000"$	Flutes	Shank Diameter D2 (h6)	Overall Length L1	Uncoated		AlTiN Coated	
						Tool #	Price	Tool #	Price
4-40	.0800	.1875	2	.2500	2.0			TM-112-40X	135.40
6-32	.1000	.2500	2	.2500	2.0	TM-138-32	132.65	TM-138-32X	134.50
8-32	.1150	.2500	3	.2500	2.0			TM-164-32X	135.40
10-24	.1200	.3125	3	.2500	2.0	TM-190-24	138.40	TM-190-24X	140.25
10-28	.1200	.3125	3	.2500	2.0			TM-190-28X	140.25
10-32	.1200	.3125	3	.2500	2.0	TM-190-32	138.40	TM-190-32X	140.25
1/4-20	.1800	.5000	3	.2500	2.5	TM-250-20	144.40	TM-250-20X	148.25
1/4-28	.1800	.5000	3	.2500	2.5	TM-250-28	144.40	TM-250-28X	148.25
5/16-18	.2350	.6250	3	.2500	2.5	TM-312-18	158.15	TM-312-18X	161.85
5/16-24	.2350	.6250	3	.2500	2.5			TM-312-24X	161.85
3/8-16	.2850	.7500	4	.3125	2.5	TM-375-16	190.75	TM-375-16X	197.65
3/8-24	.2850	.7500	4	.3125	2.5	TM-375-24	190.75	TM-375-24X	197.65
7/16-14	.3050	.7500	4	.3125	2.5	TM-437-14	190.75	TM-437-14X	197.65
7/16-20	.3350	.8750	4	.3750	3.0	TM-437-20	200.40	TM-437-20X	205.75
1/2-13	.3500	.8750	4	.3750	3.0	TM-500-13	200.40	TM-500-13X	205.75
9/16-12	.3700	.8750	4	.3750	3.0			TM-562-12X	205.75
9/16-18	.3700	.8750	4	.3750	3.0	TM-562-18	200.40	TM-562-18X	205.75
5/8-11	.4700	1.2500	4	.5000	4.0			TM-625-11X	239.65
3/4-10	.4950	1.2500	4	.5000	4.0	TM-750-10	229.45	TM-750-10X	238.25
3/4-12	.4950	1.2500	4	.5000	4.0	TM-750-12	229.45	TM-750-12X	238.25
3/4-16	.4950	1.2500	4	.5000	4.0	TM-750-16	229.45	TM-750-16X	238.25
7/8-14	.4900	1.2500	4	.5000	4.0	TM-875-14	230.35	TM-875-14X	239.15
7/8-9	.6200	1.3750	4	.6250	4.0			TM-875-09X	256.10
1-8	.6200	1.3750	4	.6250	4.0	TM-001-08	247.10	TM-001-08X	259.30

* Length of cut measured to last full tooth.



Thread Milling Cutters Multi-Form – NPT Threads



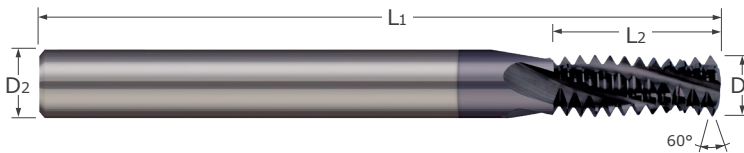
- Mills internal and external 60° NPT threads
- 100% thread form creates superior threads vs. tapping
- Mills right hand and left hand threads
- Helical flutes
- AlTiN coating option for added lubricity and increased wear resistance in difficult-to-machine materials
- Solid carbide ■ CNC ground in the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

Thread Size	Major Cutter Diameter	Length of Cut*	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
						Tool #	Price	Tool #	Price
	$D_1 \begin{smallmatrix} +.0005'' \\ -.0005'' \end{smallmatrix}$	$L_2 \begin{smallmatrix} +.050'' \\ -.000'' \end{smallmatrix}$		D_2 (h6)	L_1				
1/16 & 1/8-27 NPT	.2450	.437	3	.2500	2.5	TM-27NPT	158.70	TM-27NPTX	162.40
1/4 & 3/8-18 NPT	.3050	.625	4	.3125	3.0	TM-18NPT	191.30	TM-18NPTX	198.20
1/2 & 3/4-14 NPT	.4950	.875	4	.5000	4.0	TM-14NPT	192.70	TM-14NPTX	201.80
1 & 2-11.5 NPT	.6200	1.125	4	.6250	4.0	TM-11NPT	256.60	TM-11NPTX	267.35

* Length of cut measured to last full tooth.



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	
						Tool #	Price	Tool #	Price
	$D_1 \begin{smallmatrix} +.0005'' \\ -.0005'' \end{smallmatrix}$	$L_2 \begin{smallmatrix} +.030'' \\ -.000'' \end{smallmatrix}$		D_2 (h6)	L_1				
1/16 & 1/8-27 NPT	.2450	.437	3	.2500	2.5	TM-27NPTF	180.40	TM-27NPTFX	183.90
1/4 & 3/8-18 NPT	.3050	.625	4	.3125	3.0			TM-18NPTFX	210.65
1/2 & 3/4-14 NPT	.4950	.875	4	.5000	4.0	TM-14NPTF	221.80	TM-14NPTFX	230.65
1 & 2-11.5 NPT	.6200	1.125	4	.6250	4.0			TM-11NPTFX	306.40

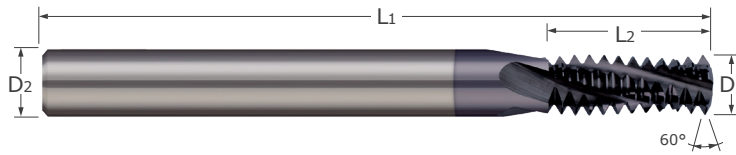
* Length of cut measured to last full tooth.

Thread Milling Cutters

Multi-Form – Metric Threads



TMM



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

Thread Size	Cutter Diameter	Length of Cut*	Flutes	Shank Diameter	Overall Length	Uncoated		AlTiN Coated	
						Tool #	Price	Tool #	Price
	D ₁ (h8)	L ₂ ^{+1.3 mm} _{-0.0 mm}		D ₂ (h6)	L ₁				
M4.5x0.75	3.00 mm	6 mm	3	6 mm	57 mm	TMM-045075	131.15	TMM-045075X	135.10
M5.0x0.80	3.00 mm	8 mm	3	6 mm	57 mm			TMM-050080X	135.10
M6.0x1.00	4.30 mm	12 mm	3	6 mm	57 mm			TMM-060100X	150.05
M8.0x0.75	6.00 mm	16 mm	3	6 mm	57 mm	TMM-080075	183.35	TMM-080075X	186.85
M8.0x1.25	6.00 mm	16 mm	3	6 mm	57 mm			TMM-080125X	186.85
M10.0x1.50	7.62 mm	20 mm	4	8 mm	100 mm	TMM-100150	207.90	TMM-100150X	213.15
M12.0x1.00	9.15 mm	22 mm	4	10 mm	100 mm			TMM-120100X	215.40
M12.0x1.75	9.15 mm	22 mm	4	10 mm	100 mm			TMM-120175X	215.40
M18.0x1.50	11.94 mm	32 mm	4	12 mm	100 mm	TMM-180150	254.45	TMM-180150X	266.40
M20.0x2.50	11.94 mm	32 mm	4	12 mm	100 mm			TMM-200250X	266.40
M24.0x3.00	15.75 mm	35 mm	4	16 mm	100 mm	TMM-240300	296.80		

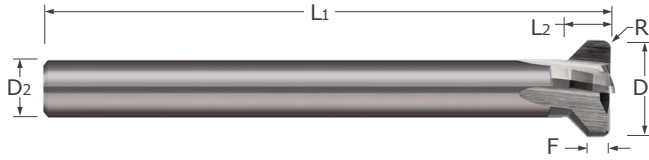
* Length of cut measured to last full tooth.

MTR



Thread Milling Cutters

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	
							Tool #	Price
$D_1 \begin{smallmatrix} +.000'' \\ -.005'' \end{smallmatrix}$	$L_2 \begin{smallmatrix} +.015'' \\ -.015'' \end{smallmatrix}$	$F \begin{smallmatrix} +.000'' \\ -.005'' \end{smallmatrix}$	$R \begin{smallmatrix} +.002'' \\ -.002'' \end{smallmatrix}$		D2 (h6)	L1		
.375	.141	.075	.010	4	.2500	2.64	MTR-375	78.30
.500	.195	.100	.010	5	.3125	2.72	MTR-500	95.45
.750	.250	.125	.015	6	.3750	2.75	MTR-750	118.45
1.000	.250	.125	.015	7	.5000	3.25	MTR-001	154.55



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TOOL # KS-1

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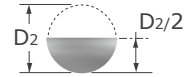
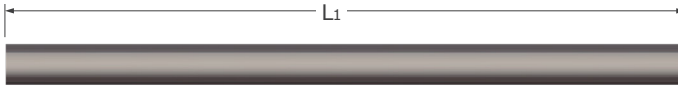
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Blanks

HR / HRM

Half Round



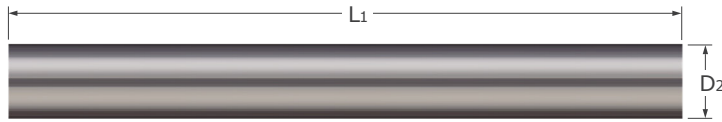
Blanks

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

Split Height		Shank Diameter	Overall Length	Half Round Blank	
$D_2/2$	decimal equiv.	D_2	L_1	Tool #	Price
1 mm	.0394	2 mm	38 mm	HRM-020-38	15.70
1.5 mm	.0591	3 mm	38 mm	HRM-030-38	16.55
2.5 mm	.0984	5 mm	50 mm	HRM-050-50	27.55
3 mm	.1181	6 mm	57 mm	HRM-060-57	32.95
.1250	.1250	.2500	2.5	HR-250	40.15
4 mm	.1575	8 mm	63 mm	HRM-080-63	54.25
5 mm	.1969	10 mm	72 mm	HRM-100-72	76.45

SR / SRM

Blanks
Round Blanks



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

Shank Diameter		Overall Length	Round Blank	
D2 (h6)		L1	Tool #	Price
1 mm	.0394	30 mm	SRM-010-030	4.80
1 mm	.0394	310 mm	SRM-010-310	13.90
1.5 mm	.0591	100 mm	SRM-015-100	6.70
.0625	.0625	1.0	SR-062-1	7.30
.0625	.0625	2.0	SR-062-2	7.20
.0625	.0625	3.0	SR-062-3	7.10
.0625	.0625	4.0	SR-062-4	6.80
.0625	.0625	12.0	SR-062-12	18.85
2 mm	.0787	38 mm	SRM-020-038	5.40
2 mm	.0787	100 mm	SRM-020-100	8.60
2 mm	.0787	310 mm	SRM-020-310	18.75
.0938	.0938	1.0	SR-093-1	8.05
.0938	.0938	3.0	SR-093-3	9.45
.0938	.0938	4.0	SR-093-4	11.65
.0938	.0938	6.0	SR-093-6	12.00
.0938	.0938	12.0	SR-093-12	17.50
2.5 mm	.0984	100 mm	SRM-025-100	8.60
3 mm	.1181	38 mm	SRM-030-038	6.00
3 mm	.1181	100 mm	SRM-030-100	10.30
3 mm	.1181	310 mm	SRM-030-310	25.10
.1250	.1250	1.5	SR-125-1.5	6.50
.1250	.1250	2.0	SR-125-2	7.20
.1250	.1250	3.0	SR-125-3	8.70
.1250	.1250	4.0	SR-125-4	11.00
.1250	.1250	6.0	SR-125-6	16.75
.1250	.1250	12.0	SR-125-12	28.50
3.5 mm	.1378	100 mm	SRM-035-100	14.40
.1562	.1562	1.5	SR-156-1.5	7.85
.1562	.1562	2.0	SR-156-2	9.95
.1562	.1562	3.0	SR-156-3	12.95
.1562	.1562	4.0	SR-156-4	14.95
.1562	.1562	6.0	SR-156-6	25.95
.1562	.1562	12.0	SR-156-12	36.55
4 mm	.1575	50 mm	SRM-040-050	7.10

*Denotes chamfered end.

Continued on next page

Blanks

SR / SRM

Round Blanks (cont.)

Continued from previous page

Shank Diameter		Overall Length	Round Blank	
D2 (h6)		L1	Tool #	Price
	4 mm	.1575	100 mm	SRM-040-100 14.65
	4 mm	.1575	310 mm	SRM-040-310 35.95
	4.5 mm	.1772	100 mm	SRM-045-100 17.30
.1875		.1875	1.5	SR-187-1.5* 8.15
.1875		.1875	2.0	SR-187-2* 9.45
.1875		.1875	4.0	SR-187-4 18.15
.1875		.1875	6.0	SR-187-6 26.20
.1875		.1875	12.0	SR-187-12 47.05
	5 mm	.1969	50 mm	SRM-050-050 8.90
	5 mm	.1969	100 mm	SRM-050-100 19.95
	5 mm	.1969	310 mm	SRM-050-310 57.55
	5.5 mm	.2165	100 mm	SRM-055-100 21.85
	6 mm	.2362	57 mm	SRM-060-057 13.45
	6 mm	.2362	100 mm	SRM-060-100 26.50
	6 mm	.2362	310 mm	SRM-060-310 68.15
.2500		.2500	2.0	SR-250-2* 13.90
.2500		.2500	2.5	SR-250-2.5* 16.55
.2500		.2500	3.0	SR-250-3* 17.30
.2500		.2500	4.0	SR-250-4 26.40
.2500		.2500	6.0	SR-250-6 37.85
.2500		.2500	12.0	SR-250-12 70.50
	6.5 mm	.2559	100 mm	SRM-065-100 27.45
	7 mm	.2756	100 mm	SRM-070-100 35.00
.3125		.3125	2.0	SR-312-2* 17.70
.3125		.3125	2.5	SR-312-2.5* 21.40
.3125		.3125	4.0	SR-312-4* 38.80
.3125		.3125	6.0	SR-312-6 53.95
.3125		.3125	12.0	SR-312-12 97.40
	8 mm	.3150	100 mm	SRM-080-100 35.40
	8 mm	.3150	310 mm	SRM-080-310 92.20
	9 mm	.3543	100 mm	SRM-090-100 36.25
	9 mm	.3543	310 mm	SRM-090-310 110.75
.3750		.3750	2.0	SR-375-2* 21.60
.3750		.3750	2.5	SR-375-2.5* 26.60
.3750		.3750	4.0	SR-375-4* 43.45
.3750		.3750	6.0	SR-375-6 66.15
.3750		.3750	12.0	SR-375-12 126.45
	10 mm	.3937	72 mm	SRM-100-072 32.10
	10 mm	.3937	100 mm	SRM-100-100 53.00
	10 mm	.3937	310 mm	SRM-100-310 149.65
.4375		.4375	2.5	SR-437-2.5* 53.55
.4375		.4375	4.0	SR-437-4 79.20
.4375		.4375	6.0	SR-437-6 121.25
.4375		.4375	12.0	SR-437-12 186.90
	12 mm	.4724	83 mm	SRM-120-083 49.95
	12 mm	.4724	100 mm	SRM-120-100 69.65

*Denotes chamfered end.

Continued on next page

SR / SRM

Blanks

Round Blanks (cont.)

Continued from previous page

Shank Diameter		Overall Length	Round Blank	
D ₂ (h6)		L ₁	Tool #	Price
12 mm	.4724	310 mm	SRM-120-310	198.95
.5000	.5000	2.5	SR-500-2.5*	41.75
.5000	.5000	3.0	SR-500-3*	43.90
.5000	.5000	4.0	SR-500-4	67.10
.5000	.5000	6.0	SR-500-6	102.40
.5000	.5000	12.0	SR-500-12	230.65
13 mm	.5118	310 mm	SRM-130-310	202.65
14 mm	.5512	100 mm	SRM-140-100	99.75
.5625	.5625	3.5	SR-562-3.5*	84.25
.6250	.6250	3.5	SR-625-3.5*	104.20
.6250	.6250	4.0	SR-625-4	104.50
.6250	.6250	6.0	SR-625-6	152.20
.6250	.6250	12.0	SR-625-12	290.25
16 mm	.6299	100 mm	SRM-160-100	102.70
16 mm	.6299	310 mm	SRM-160-310	294.15
.6875	.6875	6.0	SR-687-6	302.65
18 mm	.7087	100 mm	SRM-180-100	140.45
.7500	.7500	4.0	SR-750-4*	124.65
.7500	.7500	6.0	SR-750-6	238.60
.7500	.7500	12.0	SR-750-12	390.40
20 mm	.7874	100 mm	SRM-200-100	151.80
25 mm	.9843	310 mm	SRM-250-310	656.05
1.0000	1.0000	4.0	SR-001-4*	276.25
1.0000	1.0000	5.0	SR-001-5*	405.55
1.0000	1.0000	6.0	SR-001-6	434.20
1.0000	1.0000	12.0	SR-001-12	678.60

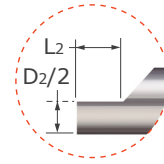
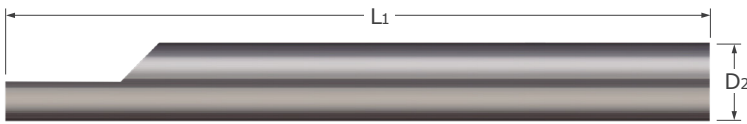
*Denotes chamfered end.

Blanks

Blanks

RS /RSM

Split End – Single Ended



- 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 +.015" -.000"	+1.0 mm -0.0 mm	decimal equiv.	D2 (h6)	L1	Tool #	Price
					4 mm	.1575	2 mm	38 mm	RSM-020-1	9.20
6 mm	.2362	4 mm	50 mm	RSM-040-1	12.85	
8 mm	.3150	6 mm	57 mm	RSM-060-1	18.75	
.375	.3750	.1250	1.5	RS-125-1	16.10	
.375	.3750	.1250	3.0	RS-125-13	18.15	
.375	.3750	.1875	2.0	RS-187-1	19.60	
.375	.3750	.1875	3.0	RS-187-13	26.90	
.375	.3750	.2500	2.5	RS-250-1	25.35	
.375	.3750	.2500	4.0	RS-250-14	40.05	
10 mm	.3937	8 mm	63 mm	RSM-080-1	35.20	
12 mm	.4724	10 mm	72 mm	RSM-100-1	46.55	
.500	.5000	.3125	2.5	RS-312-1	37.85	
.500	.5000	.3125	4.0	RS-312-14	57.65	
.500	.5000	.3750	2.5	RS-375-1	49.50	
.500	.5000	.3750	4.0	RS-375-14	78.25	
.625	.6250	.5000	3.0	RS-500-1	84.25	
.625	.6250	.5000	4.0	RS-500-14	115.75	

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

RS /RSM

Blanks

Split End – Double Ended



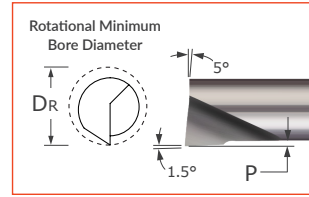
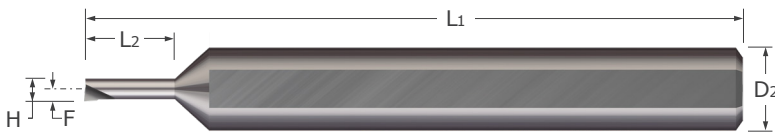
- Precision ground blank designed for custom profiles requiring a split face
- Double-ended allows for maximum utilization of the blank
- Precision manufactured in the USA

Split Length*			Shank Diameter	Overall Length	Double-Ended Blank	
+.015" -.015"	L2 +1.0 mm -0.0 mm	decimal equiv.	D2 (h6)	L1	Tool #	Price
					4 mm	.1575	2 mm	38 mm	RSM-020-2	12.85
5 mm	.1969	3 mm	38 mm	RSM-030-2	13.65	
6 mm	.2362	4 mm	50 mm	RSM-040-2	16.95	
8 mm	.3150	6 mm	57 mm	RSM-060-2	25.00	
.375	.3750	.1250	2.0000	RS-125-2	22.25	
.375	.3750	.1250	3.0000	RS-125-23	23.95	
.375	.3750	.1875	2.0000	RS-187-2	27.15	
.375	.3750	.1875	3.0000	RS-187-23	33.50	
.375	.3750	.2500	2.5000	RS-250-2	34.35	
.375	.3750	.2500	4.0000	RS-250-24	47.15	
10 mm	.3937	8 mm	63 mm	RSM-080-2	44.95	
12 mm	.4724	10 mm	72 mm	RSM-100-2	62.65	
.500	.5000	.3125	2.5000	RS-312-2	50.35	
.500	.5000	.3125	4.0000	RS-312-24	70.70	
.500	.5000	.3750	2.5000	RS-375-2	62.10	
.500	.5000	.3750	4.0000	RS-375-24	92.75	
.625	.6250	.5000	3.0000	RS-500-2	99.85	
.625	.6250	.5000	4.0000	RS-500-24	143.00	

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

Sets

Standard – Boring Tools – Right Hand – Sharp – Miniature



Sets

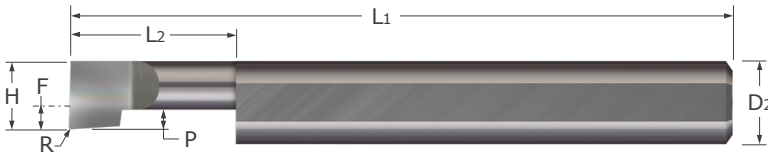
- Designed for facing and boring applications in bores .015" and larger
- Polished face for improved edge retention and chip evacuation while reducing galling
- Split geometry makes the tool as rigid as possible
- On center neck design allows for static and live/rotating applications
- Sharp corner profile
- 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



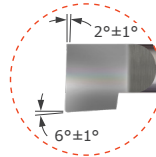
Head Width	Rotational Minimum Bore Diameter	Maximum Bore Depth	Projection	Centerline Offset		Shank Dia.	OAL	Uncoated	Set	
				F				Tool #	Set #	Price
H	DR	L2 ^{+0.010"} / _{-.000"}	P	F		D2 (h6)	L1			
.0180	.020	.075	.0020	.0100		.1250	1.5	MBB-020075	MBB-Q	201.00
.0225	.025	.100	.0025	.0125		.1250	1.5	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		

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

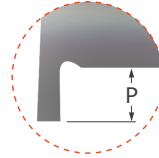
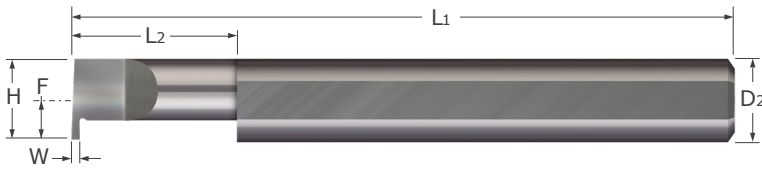


Shank Dia.	Head Width	Minimum Bore Dia.*	Maximum Bore Depth	Radius	Projection	Centerline Offset	Overall Length	Uncoated	Set	
D2 (h6)	H	L2 $^{+.050"}_{-.000}"$	R $^{+.003"}_{-.000}"$	P	F	L1	Tool #	Set #	Price	
1/8	.050	.060	.300	.003	.012	-.0125	1.5	BB-050300	BB-1	153.00
	.060	.070	.300	.003	.015	-.0025	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		
3/16	.120	.132	.500	.006	.030	.0263	2.0	BB-120500	BB-2	163.00
	.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	176.00
	.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	236.00
	.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	323.00
	.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



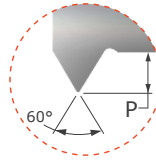
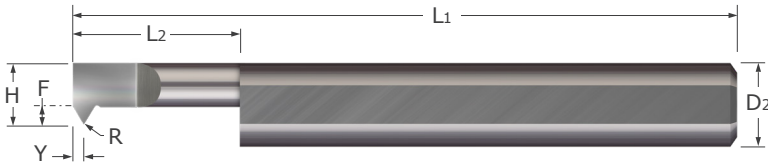
- Designed for generating retaining ring grooves
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Sharp corner profile
- Lockdown flat automatically locates tool on center
- Coating options provide added lubricity and increased wear resistance in difficult 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 ^{+0.001"} / _{-0.000"}	H		L2 ^{+0.050"} / _{-0.000"}	P	F	D2 (h6)	L1	Tool #	Set #	Price
.017	.250	.272	.250	.050	.1250	.2500	2.5	RR-017-4	RR-1	222.00
.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 ^{+0.002"} / _{-0.000"}	H		L2 ^{+0.050"} / _{-0.000"}	P	F	D2 (h6)	L1	Tool #	Set #	Price
.039	.375	.397	.750	.100	.1875	.3750	2.5	RR-039-12	RR-2	334.00
.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



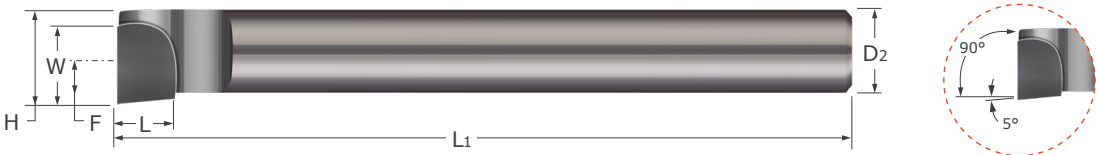
- Designed for threading multiple thread pitches (ANSI, UN, and Metric 60°)
- Polished split face for improved edge retention and chip evacuation while reducing galling
- Split geometry makes the tool as rigid as possible
- Corner radius profile
- Lockdown flat automatically locates tool on center
- 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	
										Tool #	Set #	Price
TPI	H		L2	Y	P	R	F	D2 (h6)	L1			
			$^{+.050"}_{-.000"}$	$^{+.010"}_{-.000"}$		$^{+.001"}_{-.000"}$						
24-56	.180	.202	.500	.023	.040	.002	.0550	.2500	2.5	IT-180500	IT-1	280.00
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

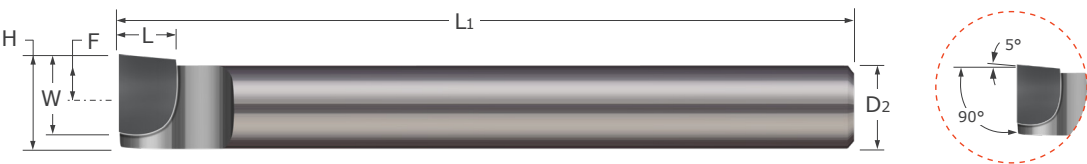


- Designed for right hand facing and boring applications in bores .320" and larger
- Long shank enables flexible reach options (preset at any length)
- Sharp corner profile
- Solid carbide tipped with zinc coated steel shank for durability and corrosion resistance
- CNC ground in the USA

Head Width	Width	Length	Centerline Offset	Shank Diameter	Overall Length	Brazed Style	Set	
H	W	L	F	D2 $\begin{smallmatrix} +.000" \\ -.003" \end{smallmatrix}$	L1	Tool #	Set #	Price
.320	.250	.188	.195	.250	4.0	TBB-250	TBB-5	150.00
.463	.313	.250	.276	.375	6.0	TBB-375		
.625	.500	.250	.375	.500	7.0	TBB-500		
.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	D2 $\begin{smallmatrix} +.000" \\ -.003" \end{smallmatrix}$	L1	Tool #	Set #	Price
.320	.250	.188	.195	.250	4.0	TBBL-250	TBBL-5	147.00
.463	.313	.250	.276	.375	6.0	TBBL-375		
.625	.500	.250	.375	.500	7.0	TBBL-500		
.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	
$R_{+0.0005}^{-0.0005}$	$A_{+0.0000}^{-0.0050}$	C	Tool #	Set #	Price
.0625	.3750	2.5	RAD-2	RAD-21	143.00
.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	369.00
.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	398.00
.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	797.00
.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

Sets

Brazed – Forming Tools – 90° Radius Concave – Left Hand



Sets

- 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	Set	
$R \begin{smallmatrix} +.0005'' \\ -.0005'' \end{smallmatrix}$	$A \begin{smallmatrix} +.0000'' \\ -.0050'' \end{smallmatrix}$	C	Tool #	Set #	Price
.0625	.3750	2.5	RAL-2	RAL-21	189.00
.1250	.3750	2.5	RAL-4		
.2500	.3750	2.5	RAL-8		
.3750	.5000	3.5	RAL-12		

Sets

Indexable Boring Bars – Boring – Coolant Through – Right Hand

Set Contents	Holder Nomenclature	Part Number	Set	
		Tool #	Set #	Price
4 SCLCR Tool Holders 1/4", 5/16", 3/8", and 1/2" Shank Diameters	A04F SCLCR 2	20-0821	40-0100	301.25
	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	358.90
	A10M SCLCR 3	20-0852		
	A12Q SCLCR 3	20-0854		
3 Inserts	-	50-1100		
3 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M3.5 x TK-15	-	16-1070		



Sets

Sets

Indexable Boring Bars – Facing – Coolant Through – Right Hand

Set Contents	Holder Nomenclature	Part Number	Set	
		Tool #	Set #	Price
3 STFCR Tool Holders 3/8", 1/2", and 5/8" Shank Diameters	A06J STFCR 2	20-1031	40-2100	253.35
	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 – Profiling – Coolant Through – Right Hand

Sets



Set Contents	Holder Nomenclature	Set		
		Part Number	Set #	Price
3 SDUCR Tool Holders 3/8", 1/2", and 5/8" Shank Diameters	A06J SDUCR 2	20-0931	40-2400	253.35
	A08K SDUCR 2	20-0933		
	A10M SDUCR 2	20-0935		
3 Inserts	-	50-1200		
3 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		

Sets

Indexable Boring Bars – Multi-Purpose Set 1



Set Contents	Holder Nomenclature	Part Number	Set	
			Tool #	Set # Price
6 Assorted Tool Holders 1/4" Square Shank	SCLCR 0404 D2	10-3231	40-7101	272.50
	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	280.65
	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	294.30
	SCLCL 0606 E2	10-3236		
	SCBCR 0606 E2	10-3155		
	SCKCR 0606 E2	10-3213		
	SCMCN 0606 E2	10-3313		
	SCSCR 0606 E2	10-3355		
1 Boring Bar 5/16" Shank Diameter	A06J SCLCR 2	21-0923		
7 Inserts	-	50-1100		
7 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		
6 Assorted Tool Holders 1/2" Square Shank	SCLCR 0808 F2	10-3237	40-7104	315.00
	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

Sets

Indexable Boring Bars – Multi-Purpose Set 1 (cont.)

Sets



Continued from previous page

Set Contents	Holder Nomenclature	Part Number	Set	
			Tool #	Set # Price
6 Assorted Tool Holders 5/8" Square Shank	SCLCR 1010 H2	10-3241	40-7105	424.50
	SCLCL 1010 H2	10-3242		
	SCBCR 1010 H2	10-3159		
	SCKCR 1010 H2	10-3217		
	SCMCN 1010 H2	10-3315		
	SCSCR 1010 H2	10-3359		
1 Boring Bar 1/2" Shank Diameter	A10M SCLCR 2	20-0827		
7 Inserts	-	50-1100		
7 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M2.5 x TK-8	-	16-1060		

Sets

Indexable Boring Bars – Multi-Purpose Set 2



Set Contents	Holder Nomenclature	Part Number	Set	
			Tool #	Set # Price
3 Tool Holders 3/4" Square Shank	SCLCR 1212 J3	10-3251	40-7150	456.80
	SCLCL 1212 J3	10-3252		
	SCSCR 1212 J3	10-3365		
1 Boring Bar 3/4" Shank Diameter	A12Q SCLCR 3	20-0854		
4 Inserts	-	50-1105		
4 M2.5 x T-8 Torx Screws	-	16-1020		
1 Torx Key M3.5 x TK-15	-	16-1070		

Sets

Indexable Boring Bars – Multi-Purpose Set 3

Set Contents	Holder Nomenclature	Part Number	Set	
			Tool #	Set # Price
3 Assorted Tool Holders 5/16" Square Shank	SDJCR 0505 H2	10-3641	40-7200	222.60
	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	246.45
	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	272.50
	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	335.50
	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

Sets

Indexable – Milling – Tool Holders – Coolant Through

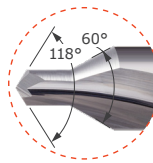
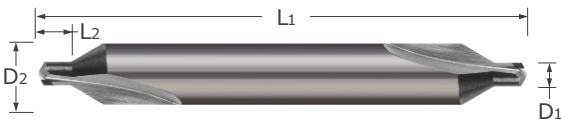
Sets

Set Contents	Holder Nomenclature	Part Number		Set	
		Tool #	Set #	Price	
3 Tool Holders 1/2" Shank Diameters	AAAP 1216 2	30-1216	60-3003	335.50	
	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

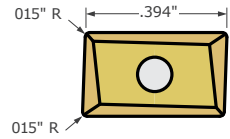
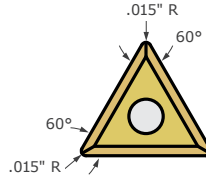
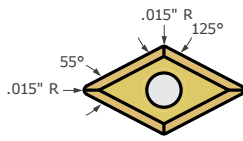
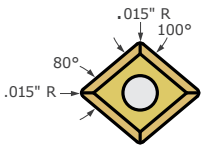


- Designed for predrilling 60° live center holes
- Can be utilized for countersinking and spot drilling
- Double-ended for quicker tool changes
- Solid carbide ■ CNC ground in the USA

Drill Diameter	Drill Length	Shank Diameter	Overall Length	Uncoated	Set	
				Tool #	Set #	Price
D1 $\begin{matrix} +.0030" \\ -.0000" \end{matrix}$	L2	D2 (h6)	L1			
.0469	.047	.1250	1.500	DC-1	DC-0	348.00
.0781	.078	.1875	1.875	DC-2		
.1094	.109	.2500	2.000	DC-3		
.1250	.125	.3125	2.500	DC-4		
.1875	.188	.4375	2.750	DC-5		
.2188	.219	.5000	3.000	DC-6		

Indexable Inserts

Indexable Cutters – Inserts



■ Solid carbide

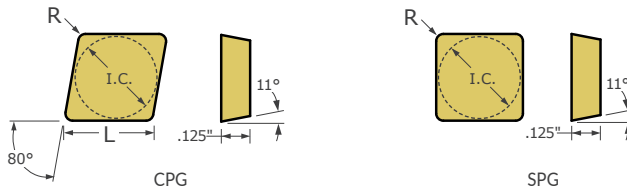
Insert Type	Insert*	
	Tool #	Price
	50-1100	10.65
	50-1105	12.95
	50-1200	11.25
	50-1300	9.55
	50-2100	11.75

*Must be ordered in quantities of 10.

Indexable Inserts

CPG / SPG

Indexable Cutters – Generic Inserts – Diamond Style



Accessories

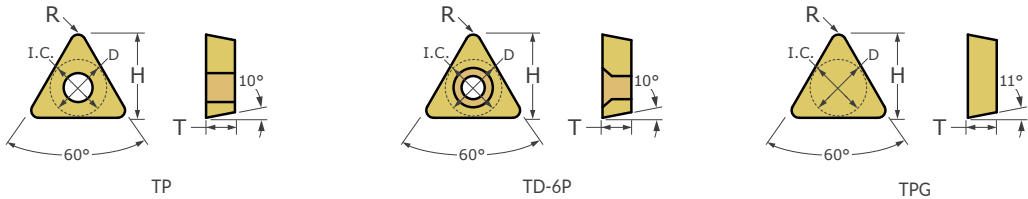
- 80° diamond insert with radius on corner
- For use in clamp locking style holder
- Solid carbide

Inscribed Circle	Length	Radius	Style	Diamond Style Insert	
				Tool #	Price
IC $\begin{matrix} +.001" \\ -.001" \end{matrix}$	L $\begin{matrix} +.001" \\ -.001" \end{matrix}$	R $\begin{matrix} +.003" \\ -.003" \end{matrix}$			
.464	.471	.015	CPG	CPG-4621	14.85
.464	.471	.031	CPG	CPG-4622	14.85
.500	.508	.015	CPG	CPG-421	13.30
.500	.508	.031	CPG	CPG-422	11.20
.375	-	.031	SPG	SPG-322	13.40
.500	-	.031	SPG	SPG-422	11.90

Indexable Inserts

TPG / TP / TD

Indexable Cutters – Generic Inserts – Triangle Style




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

Inscribed Circle	Thickness	Height	Radius	Hole Diameter	Set Screw UN	Style	Triangle Style Insert	
							Tool #	Price
IC $\begin{matrix} +.001" \\ -.001" \end{matrix}$	T $\begin{matrix} +.005" \\ -.005" \end{matrix}$	H	R $\begin{matrix} +.003" \\ -.003" \end{matrix}$	D $\begin{matrix} +.003" \\ -.003" \end{matrix}$				
.250	.094	.3438	.031	.137	4-40	TP	TP-42	12.70
.250	.094	.3600	.015	.137	4-40	TP	TP-41	8.80
.250	.125	.3440	.031			TPG	TPG-222	9.30
.375	.125	.5324	.031			TPG	TPG-322	11.20
.375	.125	.5324	.031	.163	6-32	TP	TP-62	14.75
.375	.125	.5324	.031	.125	4-40	TD	TD-6P-2	14.75
.375	.125	.5479	.015			TPG	TPG-321	10.50
.375	.125	.5479	.015	.163	6-32	TP	TP-61	14.75
.375	.125	.5480	.015	.125	4-40	TD	TD-6P-1	14.75
.500	.188	.7030	.047			TPG	TPG-433	17.15
.500	.188	.7199	.031			TPG	TPG-432	12.50

Accessories

Indexable Accessories

Accessory Type	Compatibility	Description	Accessory	
			Tool #	Price
	Inserts 50-1100 50-1200 50-1300 50-2100	Torx Screw M2.5 x T-8	16-1020	3.95
	Inserts 50-1105	Torx Screw M3.5 x T-15	16-1030	4.60
	Screw 16-1020	Torx Key M2.5 x TK-8	16-1060	3.65
	Screw 16-1030	Torx Key M3.5 x TK-15	16-1070	4.30

Coatings Chart

Coating/ Substrate:	TiN	AlTiN	nACRo®	ZrN
	Titanium Nitride -G	Aluminum Titanium Nitride -X	Aluminum Chromium Nitride Silicone -K	Zirconium Nitride -S
Application/ Benefits:	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Extremely heat and scratch resistant coating that provides exceptional performance for those "tough and difficult" materials where temperatures increase dramatically during the machining application 	<ul style="list-style-type: none"> 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:	.50	.60	0.45	.50
Coating Thickness (microns):	2 - 5	2 - 5	1 - 7	2 - 5
Max. Working Temp:	1000° F	1400° F	2012° F	1100° F

PLEASE NOTE: Information and test results were compiled from multiple sources and testing methods. Data presented is intended to be a general application guideline for comparing various coatings.



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NEW Tool Holder Accessories Starting on Page 78

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Hundreds of
New Sizes
Added to Our
Quick Change
and Standard
Right Hand
Boring Bars



pg 12



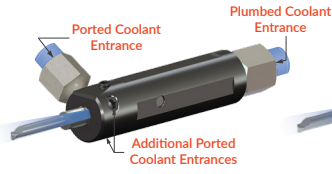
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pg 80



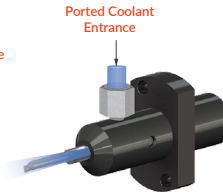
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Quick Change Straight Holders
pgs 59-61



Quick Change
Headed Holders
pgs 62-65



Quick Change Star Swiss
Machines Holders
pgs 68-71

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