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2016 METRIC API RING GROOVE



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Ring Max™ Grooving Inserts

Utilizing the latest cutting tool technology and coatings, there is a Greenleaf high-performance insert grade for every ring groove need:

- WG-300® whisker-reinforced ceramics for Inconel 625 clad overlay
- Carbide grade G-915 for stainless steel
- Carbide grade GA5036 for alloy steel



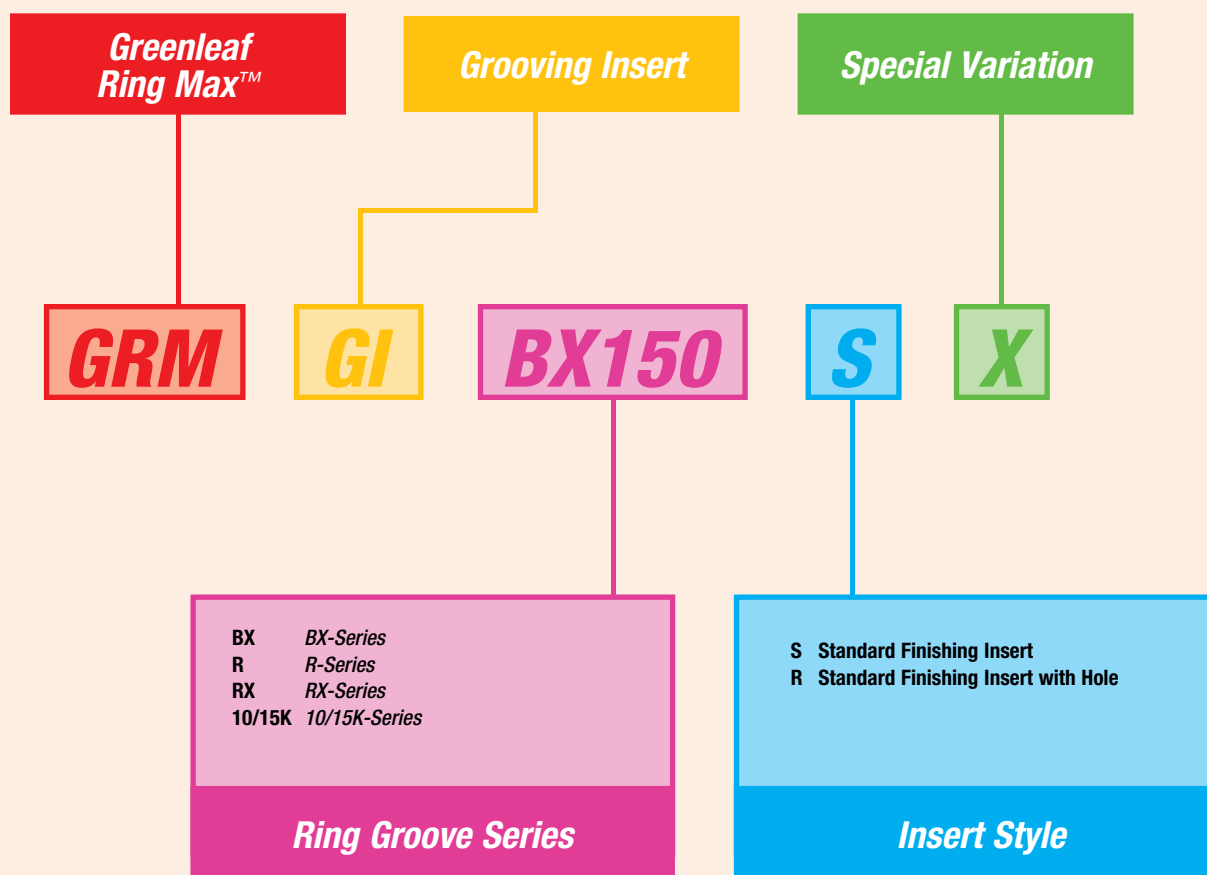
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Ring Max™ Grooving Insert Identification System



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*Insert
Style*

Stocking

*Insert
Geometry*

Dimensions

Part Number

Stocking Status

CARBIDE

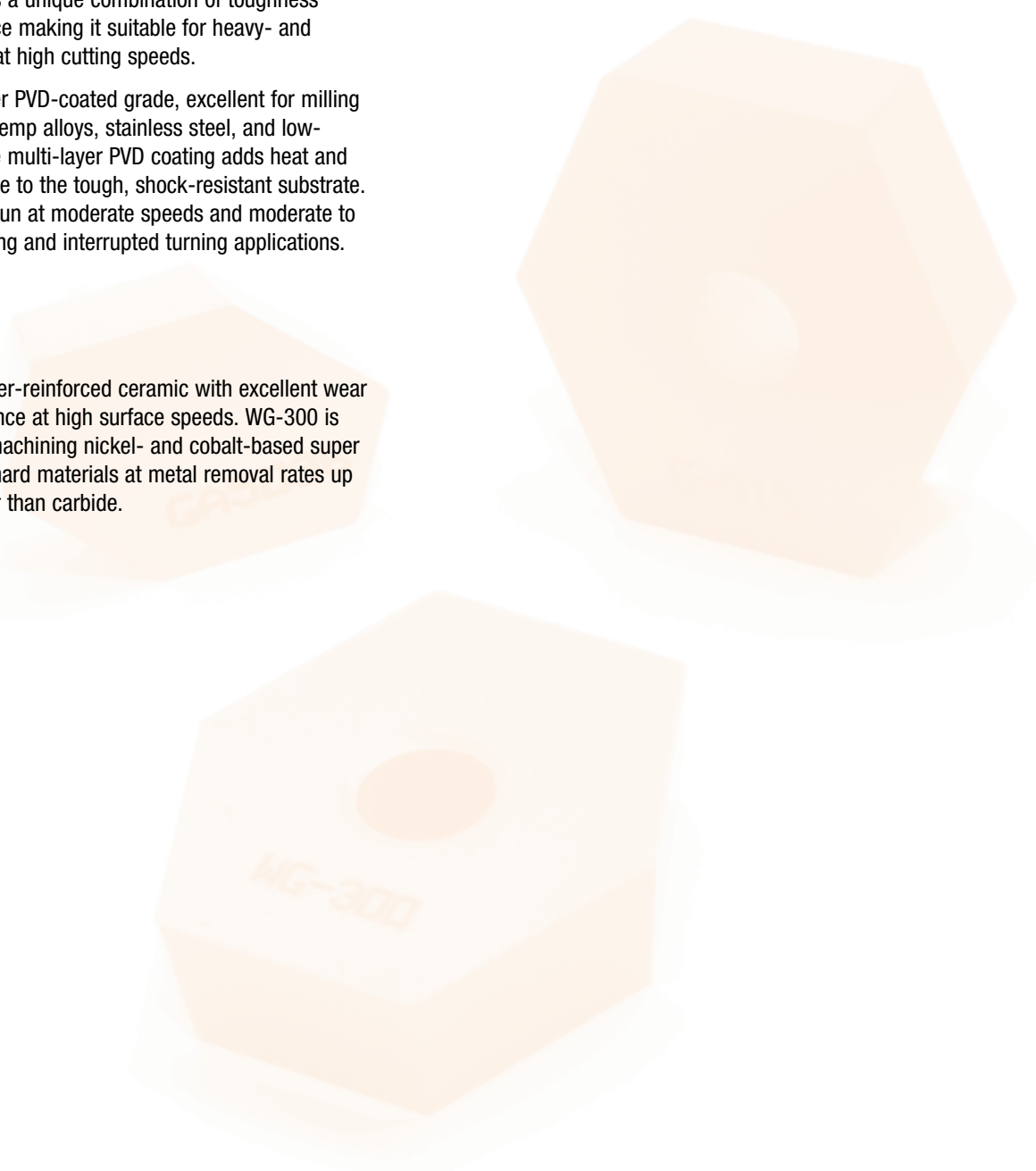
COATED

GA5036 A high-performance MT-CVD coated grade for milling steels at high speed. GA5036 should be used when milling forged and cast steels and selected ductile irons. GA5036 has a unique combination of toughness and heat resistance making it suitable for heavy- and light-duty milling at high cutting speeds.

G-915 Multi-layer PVD-coated grade, excellent for milling and turning high-temp alloys, stainless steel, and low-carbon steels. The multi-layer PVD coating adds heat and abrasion resistance to the tough, shock-resistant substrate. G-915 should be run at moderate speeds and moderate to high feeds in milling and interrupted turning applications.

CERAMIC

WG-300® Whisker-reinforced ceramic with excellent wear and shock resistance at high surface speeds. WG-300 is very effective at machining nickel- and cobalt-based super alloys, and other hard materials at metal removal rates up to 10 times higher than carbide.

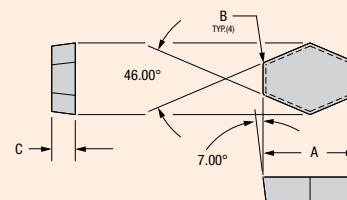


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Ring Max™ Inserts

GRM-GI



Insert	Part Number	WG-300	G-915	GA5036	Dimensions (mm)		
					A	B	C
	GRM-GI-BX150S	●	●	○	15,88	6,35	0,79
	GRM-GI-BX151S	●	●	○	15,88	6,35	0,79
	GRM-GI-BX152S	●	●	○	19,05	6,35	0,79
	GRM-GI-BX153S	●	○	○	19,05	6,35	0,79
	GRM-GI-BX154S	●	●	○	19,05	6,35	0,79
	GRM-GI-BX155R	●	○	●	22,23	6,35	0,79
	GRM-GI-BX156R	●	○	○	25,73	7,93	0,79
	GRM-GI-BX169R	●	○	○	25,40	6,35	0,79
	GRM-GI-RSET1-SX*	●	●	○	25,40	6,35	0,79
	GRM-GI-R46R	○	○	○	25,40	6,35	1,52
	GRM-GI-RSET2-SX*	●	○	○	15,88	3,96	0,79
	GRM-GI-RX201/5SX*	○	○	○	15,34	4,78	0,38
	GRM-GI-10K/15KSX*	●	○	○	15,88	6,35	0,76
		WG-300	G-915	GA5036			

Group	Groove Sizes
R-SET1SX	R-21, R-23, R-24, R-26, R-27, R-30, R-31, R-34, R-35, R-37, R-39, R-41, R-44, R-45, R-49, R-53, R-57, R-61, R-65, R-69, R-82, R-84, R-99
R-SET2SX	R-12, R-13, R-14, R-15, R-16, R-17, R-18, R-19, R-20, R-22, R-25, R-29, R-33, R-36, R-40, R-43, R-48, R-52
10K/15KSX	10K-2 ¹ / ₁₆ ", 10K-3 ¹ / ₁₆ ", 15K-3 ¹ / ₁₆ "

* Denotes multiple groove sizes (See chart to right.)

NOTE: Depending on groove size, some Ring Max™ inserts may have a hole.
All pre-clad groove inserts are designed and built to suit customer specifications.

NOTE: API groove specification GA/ISO-10423 is used for all finish inserts.

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Inserts and Steel Products

● Stocked Standard
○ Stocked or Available Upon Request

Inserts Only

● Stocked
○ Stocked or Available Upon Request

Steel Products Only

● 10 Business Days or Less
○ 10 Business Days or Less

Ring Max™ II Ring Groove Tooling

The Ring Max™ II cutters are designed to use fewer components for even greater dimensional accuracy and repeatability from groove to groove. Their unique design ensures accurate seating and secure locking of the insert cartridge into the cutter body.

Standard features and benefits include:

- Roughing and finishing of BX, R and RX API ring grooves in Inconel 625 clad overlay in less than one minute
- Adjustable and replaceable cartridge design for easy maintenance
- Machining the groove and chamfers in one operation
- Availability for grooving in stainless and alloy steel



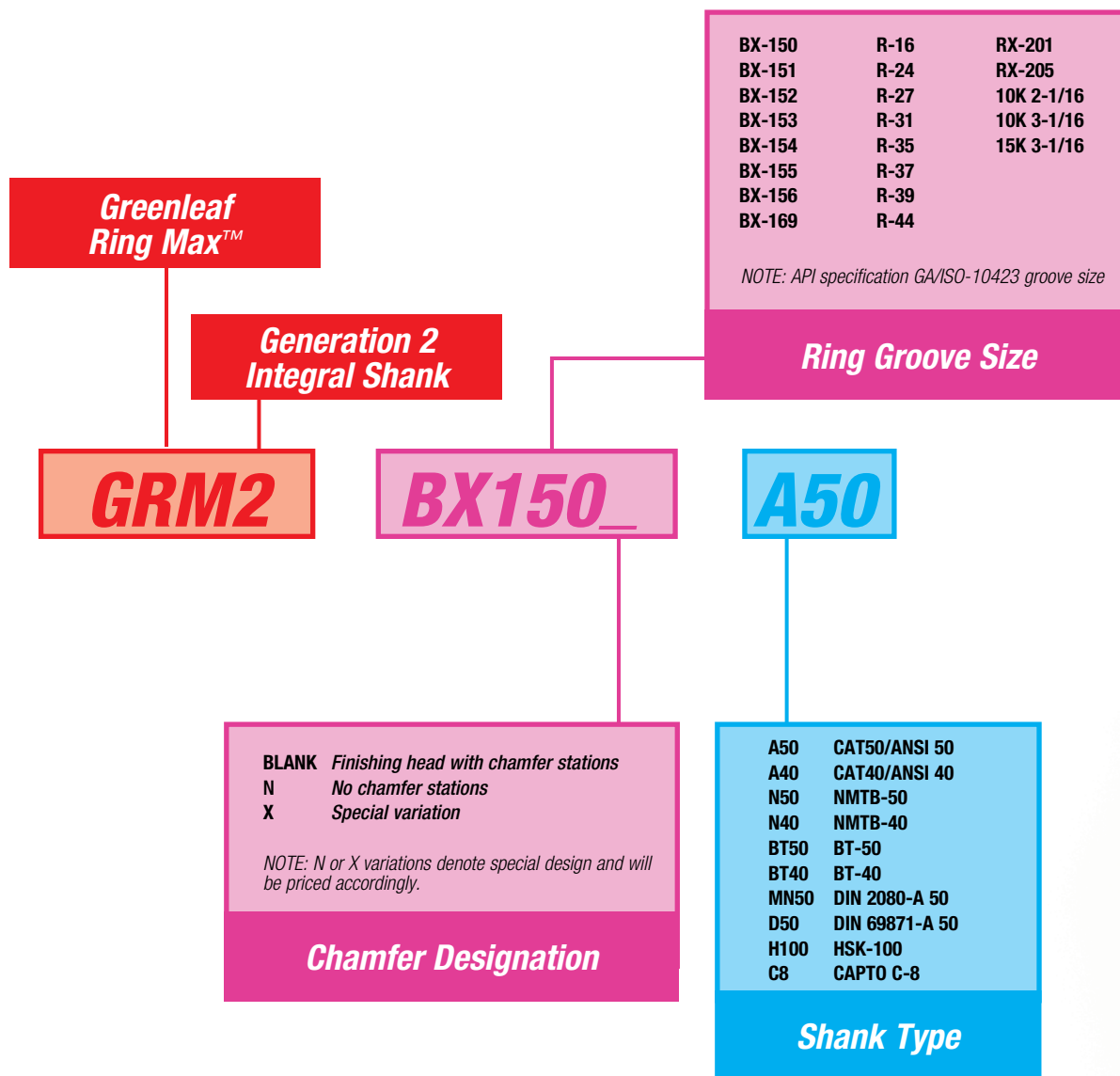
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Ring Max™ II – Finishing Head Identification System



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Ring Max™ II – Ring Groove Tooling Usage Reference Guide

Tooling Style

Tooling Geometry

Part Number

Dimensions

**Ring Max™
BX-Series**

Part Number	Dimensions (inches)	Standard Components	Inserts
GRMZ-BX100	A=2.850, B=0.452, C=0.230	GROOVING CARTRIDGE, CHAMFER INSERT	GRMZ-Q-BX100S, SPKN-322
GRMZ-BX101	A=3.064, B=0.468, C=0.230	GRMZ-Q-BX101S, GRMZ-Q-BX101S	SPKN-322
GRMZ-BX102	A=3.287, B=0.500, C=0.240	GRMZ-Q-BX102S, GRMZ-Q-BX102S	SPKN-322
GRMZ-BX103	A=4.048, B=0.568, C=0.280	GRMZ-Q-BX103S, GRMZ-Q-BX103S	SPKN-322
GRMZ-BX104	A=4.687, B=0.608, C=0.310	GRMZ-Q-BX104S, GRMZ-Q-BX104S	SPKN-322
GRMZ-BX105	A=5.302, B=0.700, C=0.340	GRMZ-Q-BX105S, GRMZ-Q-BX105S	SPKN-322
GRMZ-BX106	A=6.523, B=0.923, C=0.450	GRMZ-Q-BX106S, GRMZ-Q-BX106S	SPKN-322
GRMZ-BX109	A=6.957, B=0.668, C=0.390	GRMZ-Q-BX109S, GRMZ-Q-BX109S	SPKN-322

* See chart to right.

Shank Description	Ordering Code	Stocked Sizes
CAT500AND-50	A50	GRMZ-BX100-A50, GRMZ-BX101-A50, GRMZ-BX102-A50, GRMZ-BX103-A50, GRMZ-BX104-A50, GRMZ-BX105-A50, GRMZ-BX106-A50, GRMZ-BX109-A50
BT-50	BT50	GRMZ-BX100-BT50, GRMZ-BX101-BT50, GRMZ-BX102-BT50, GRMZ-BX103-BT50, GRMZ-BX104-BT50, GRMZ-BX105-BT50, GRMZ-BX106-BT50, GRMZ-BX109-BT50
DIN 6875-A-50	NR50	GRMZ-BX100-NR50, GRMZ-BX101-NR50, GRMZ-BX102-NR50, GRMZ-BX103-NR50, GRMZ-BX104-NR50, GRMZ-BX105-NR50, GRMZ-BX106-NR50, GRMZ-BX109-NR50
ISO-100	H100	GRMZ-BX100-H100, GRMZ-BX101-H100, GRMZ-BX102-H100, GRMZ-BX103-H100, GRMZ-BX104-H100, GRMZ-BX105-H100, GRMZ-BX106-H100, GRMZ-BX109-H100
CAPTS C-8	CR	GRMZ-BX100-CR, GRMZ-BX101-CR, GRMZ-BX102-CR, GRMZ-BX103-CR, GRMZ-BX104-CR, GRMZ-BX105-CR, GRMZ-BX106-CR, GRMZ-BX109-CR

**Ring Max™ II
R-Series**

Part Number	Dimensions (inches)	Standard Components	Inserts
GRMZ-R100	A=2.850, B=0.344, C=0.250	GRMZ-Q-R100S, GRMZ-Q-R100S	SPKN-322
GRMZ-R101	A=3.750, B=0.469, C=0.300	GRMZ-Q-R101S, GRMZ-Q-R101S	SPKN-322
GRMZ-R102	A=4.250, B=0.469, C=0.300	GRMZ-Q-R102S, GRMZ-Q-R102S	SPKN-322
GRMZ-R103	A=4.875, B=0.469, C=0.300	GRMZ-Q-R103S, GRMZ-Q-R103S	SPKN-322
GRMZ-R104	A=5.375, B=0.469, C=0.300	GRMZ-Q-R104S, GRMZ-Q-R104S	SPKN-322
GRMZ-R105	A=6.375, B=0.469, C=0.300	GRMZ-Q-R105S, GRMZ-Q-R105S	SPKN-322
GRMZ-R106	A=7.625, B=0.469, C=0.300	GRMZ-Q-R106S, GRMZ-Q-R106S	SPKN-322
GRMZ-R109	A=6.313, B=0.531, C=0.390	GRMZ-Q-R109S, GRMZ-Q-R109S	SPKN-322

* See chart to right.

Shank Description	Ordering Code	Stocked Sizes
CAT500AND-50	A50	GRMZ-R100-A50, GRMZ-R101-A50, GRMZ-R102-A50, GRMZ-R103-A50, GRMZ-R104-A50, GRMZ-R105-A50, GRMZ-R106-A50, GRMZ-R109-A50
BT-50	BT50	GRMZ-R100-BT50, GRMZ-R101-BT50, GRMZ-R102-BT50, GRMZ-R103-BT50, GRMZ-R104-BT50, GRMZ-R105-BT50, GRMZ-R106-BT50, GRMZ-R109-BT50
DIN 6875-A-50	NR50	GRMZ-R100-NR50, GRMZ-R101-NR50, GRMZ-R102-NR50, GRMZ-R103-NR50, GRMZ-R104-NR50, GRMZ-R105-NR50, GRMZ-R106-NR50, GRMZ-R109-NR50
ISO-100	H100	GRMZ-R100-H100, GRMZ-R101-H100, GRMZ-R102-H100, GRMZ-R103-H100, GRMZ-R104-H100, GRMZ-R105-H100, GRMZ-R106-H100, GRMZ-R109-H100
CAPTS C-8	CR	GRMZ-R100-CR, GRMZ-R101-CR, GRMZ-R102-CR, GRMZ-R103-CR, GRMZ-R104-CR, GRMZ-R105-CR, GRMZ-R106-CR, GRMZ-R109-CR

Stocking Information

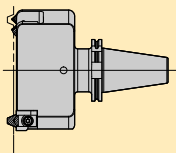
Shank Options

Standard Components

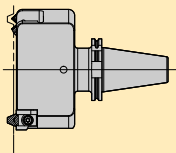
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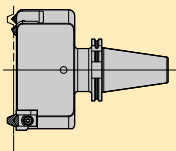
Ring Groove Tooling



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BX Series
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Ring Max™ II
R Series
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Ring Max™ II
RX Series
10/15K Series
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Reference

Ring Max™ II

Models
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Special Toolchanger Clearance

Request Form
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Pre-Clad Head

Quote Request Form
page: RM 19

Ring Max™ II Pre-Clad

Models
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Machining Methods

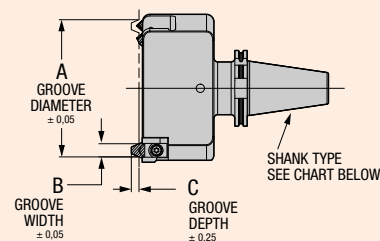
Reference Guide
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Ring Max™ II

BX Series



Part Number	Stock	Dimensions (mm)			Standard Components		Inserts	
		A	B	C	Grooving Cartridge	Chamfer Cartridge	Grooving Insert	Chamfer Insert
GRM2-BX150-_____	See chart below for stocked sizes.	73,53	11,48	5,84	GRM-GC-BX-150	GRMCC01	GRM-GI-BX150S	SPGN-322
GRM2-BX151-_____		77,83	11,89	5,84	GRM-GC-BX-151	GRMCC01	GRM-GI-BX151S	SPGN-322
GRM2-BX152-_____		86,28	12,70	6,10	GRM-GC-BX-152	GRMCC01	GRM-GI-BX152S	SPGN-322
GRM2-BX153-_____		102,82	14,12	7,11	GRM-GC-BX-153	GRMCC01	GRM-GI-BX153S	SPGN-322
GRM2-BX154-_____		119,05	15,44	7,87	GRM-GC-BX-154	GRMCC01	GRM-GI-BX154S	SPGN-322
GRM2-BX155-_____		150,67	17,78	8,64	GRM-GC-BX-155	GRMCC01	GRM-GI-BX155R	SPGN-322
GRM2-BX156-_____		241,88	23,44	11,43	GRM-GC-BX-156	GRMCC01	GRM-GI-BX156R	SPGN-322
GRM2-BX169-_____		176,71	16,97	9,91	GRM-GC-BX-169	GRMCC01	GRM-GI-BX169R	SPGN-322

* See chart to right.

Shank Description	Ordering Code
CAT50/ANSI 50	A50
CAT40/ANSI 40	A40
NMTB-50	N50
NMTB-40	N40
BT-50	BT50
BT-40	BT40
DIN 2080-A 50	MN50
DIN 69871-A 50	D50
HSK-100	H100
CAPTO C-8	C8

Stocked Sizes	
GRM2-BX150-A50	GRM2-BX154-A40
GRM2-BX150-BT50	GRM2-BX154-A50
GRM2-BX150-D50	GRM2-BX154-BT50
GRM2-BX151-A50	GRM2-BX154-D50
GRM2-BX151-BT50	GRM2-BX155-A40
GRM2-BX151-D50	GRM2-BX155-A50
GRM2-BX152-A40	GRM2-BX155-BT50
GRM2-BX152-A50	GRM2-BX155-D50
GRM2-BX152-BT50	GRM2-BX156-A50
GRM2-BX152-D50	GRM2-BX169-A50

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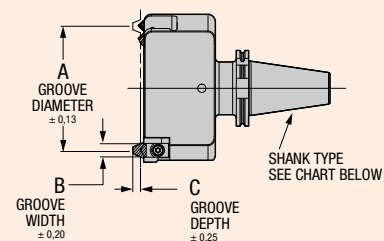
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Ring Max™ II

R Series



Part Number		Dimensions (mm)			Standard Components		Inserts	
		A	B	C	Grooving Cartridge	Chamfer Cartridge	Grooving Insert	Chamfer Insert
Groove Series - Shank Type*	Stock							
GRM2-R16-_____	See chart below for stocked sizes.	50,80	8,74	6,35	GRM-GC-RSET 2 X	GRMCC01	GRM-GI-RSET 2 SX	SPGN-322
GRM2-R24-_____		95,25	11,91	8,13	GRM-GC-RSET 1 X	GRMCC01	GRM-GI-RSET 1 SX	SPGN-322
GRM2-R27-_____		107,95	11,91	8,13	GRM-GC-RSET 1 X	GRMCC01	GRM-GI-RSET 1 SX	SPGN-322
GRM2-R31-_____		123,83	11,91	8,13	GRM-GC-RSET 1 X	GRMCC01	GRM-GI-RSET 1 SX	SPGN-322
GRM2-R35-_____		136,53	11,91	8,13	GRM-GC-RSET 1 X	GRMCC01	GRM-GI-RSET 1 SX	SPGN-322
GRM2-R37-_____		149,23	11,91	8,13	GRM-GC-RSET 1 X	GRMCC01	GRM-GI-RSET 1 SX	SPGN-322
GRM2-R39-_____		161,93	11,91	8,13	GRM-GC-RSET 1 X	GRMCC01	GRM-GI-RSET 1 SX	SPGN-322
GRM2-R44-_____		193,68	11,91	8,13	GRM-GC-RSET 1 X	GRMCC01	GRM-GI-RSET 1 SX	SPGN-322
GRM2-R46-_____		211,15	13,49	9,91	GRM-GC-R46	GRMCC01	GRM-GI-R46R	SPGN-322

* See chart to right.

Shank Description	Ordering Code
CAT50/ANSI 50	A50
CAT40/ANSI 40	A40
NMTB-50	N50
NMTB-40	N40
BT-50	BT50
BT-40	BT40
DIN 2080-A 50	MN50
DIN 69871-A 50	D50
HSK-100	H100
CAPTO C-8	C8

Stocked Sizes
GRM2-R24-A50
GRM2-R24-D50
GRM2-R24N-A50
GRM2-R24N-D50

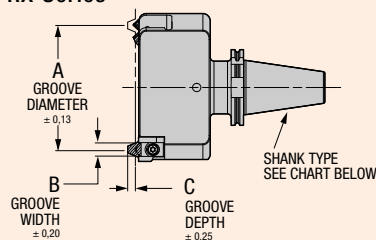
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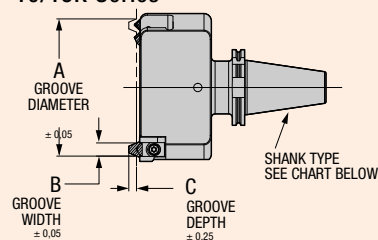
Ring Max™ II

RX Series
10K and 15K Series

RX Series



10/15K Series



Part Number		Dimensions (mm)			Standard Components		Inserts	
		A	B	C	Grooving Cartridge	Chamfer Cartridge	Grooving Insert	Chamfer Insert
GRM2-RX201N-_-_-_-	See chart below for stocked sizes.	46,05	5,56	4,06	GRM-GCRX201/5-X	N/A	GRM-GI-RX201/5SX	N/A
GRM2-RX205N-_-_-_-		57,15	5,56	4,06	GRM-GCRX201/5-X	N/A	GRM-GI-RX201/5SX	N/A
GRM2-10K2-_-_-_-		117,42	9,58	6,55	GRM-GC10/15K-X	GRMCC01	GRM-GI-10/15KSX	SPGN-322
GRM2-10K3N-_-_-_-		146,00	9,58	6,55	GRM-GC10/15K-X	N/A	GRM-GI-10/15KSX	N/A
GRM2-10K5-_-_-_-		222,20	9,58	6,55	GRM-GC10/15K-X	GRMCC01	GRM-GI-10/15KSX	SPGN-322
GRM2-15K3-_-_-_-		168,22	9,58	6,55	GRM-GC10/15K-X	GRMCC01	GRM-GI-10/15KSX	SPGN-322

* See chart to right.

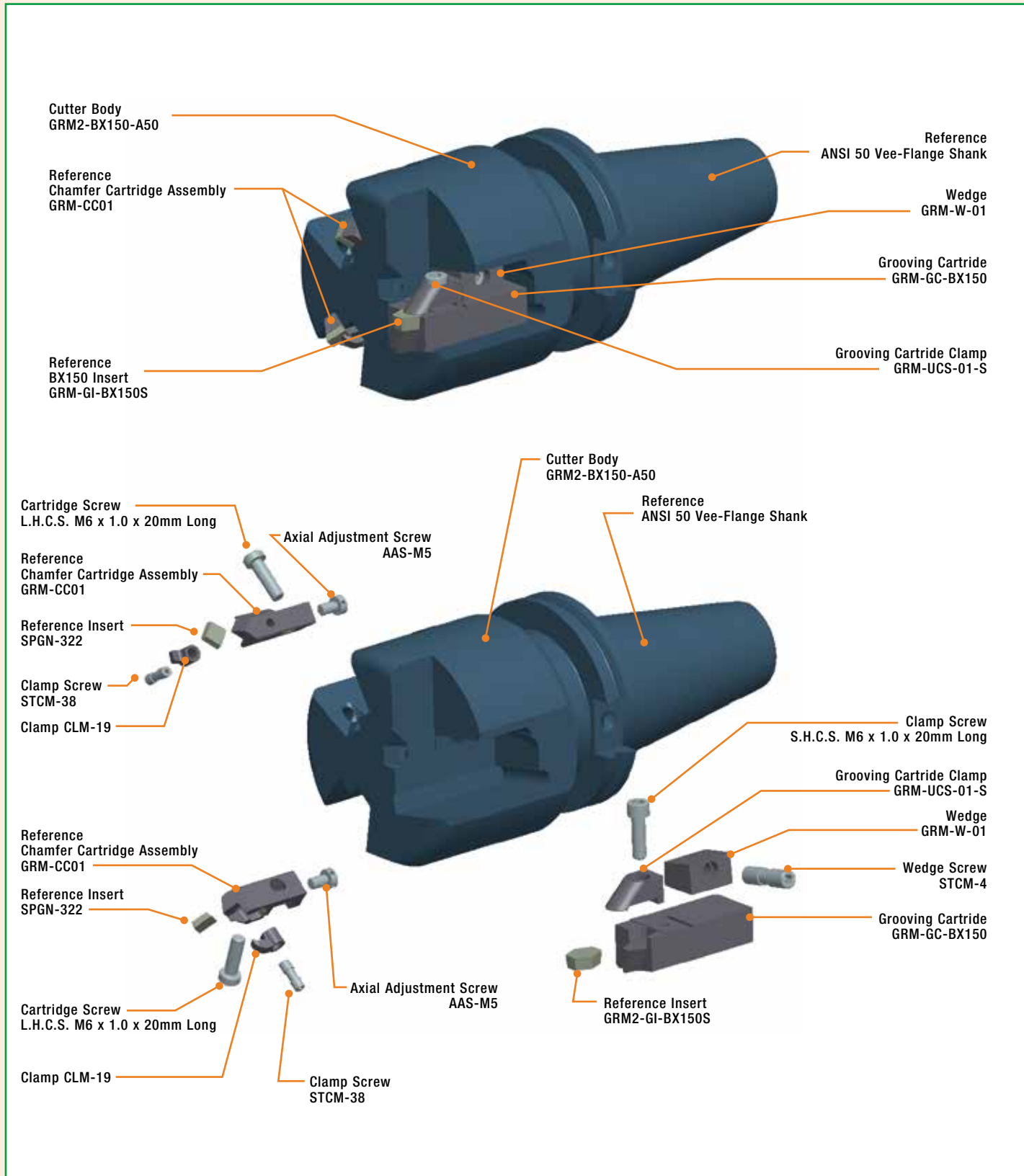
Shank Description	Ordering Code
CAT50/ANSI 50	A50
CAT40/ANSI 40	A40
NMTB-50	N50
NMTB-40	N40
BT-50	BT50
BT-40	BT40
DIN 2080-A 50	MN50
DIN 69871-A 50	D50
HSK-100	H100
CAPTO C-8	C8

Stocked Sizes
Ring Max™ II RX and 10/15K Series are not standard stocked items.

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Ring Max™ II – Assembled & Exploded Views Reference Guide



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engineering@ greenleafcorporation.com
via **FAX**
814-763-4040

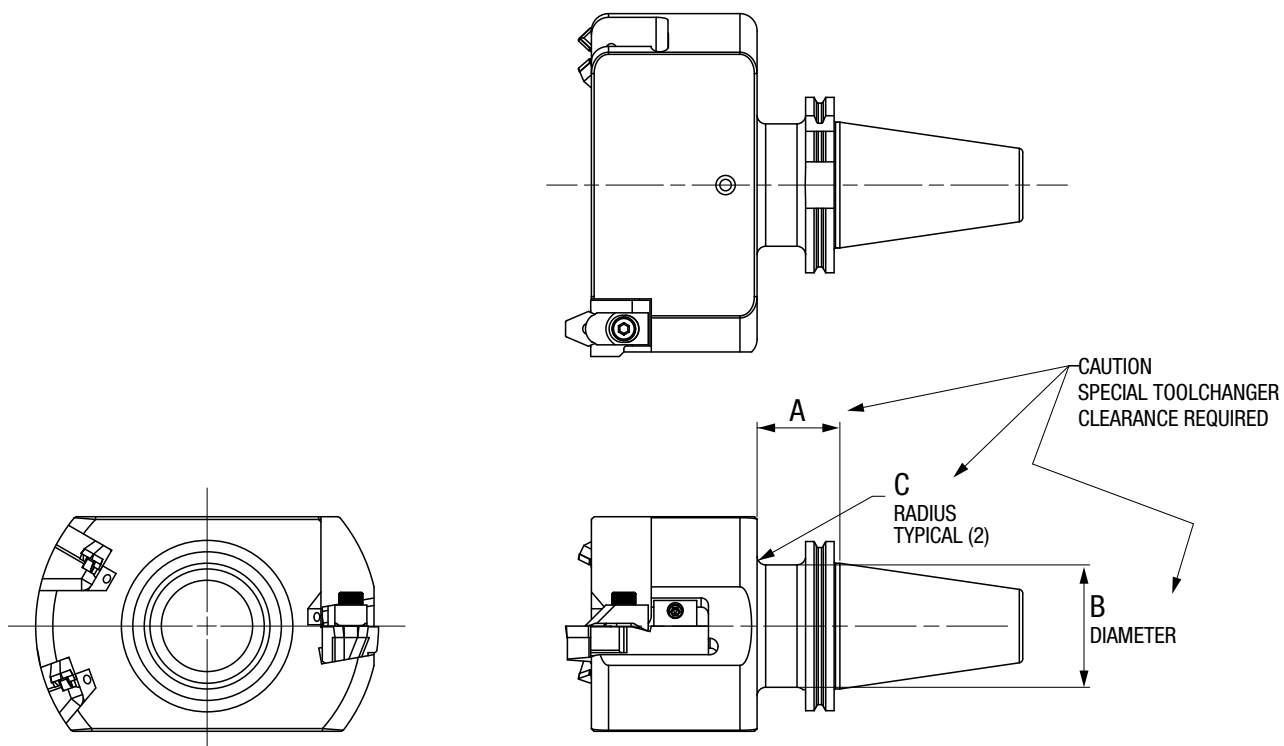
Special Toolchanger Clearance Request Form

Part Information:

Reference Groove Number: _____ Reference Shank Size: _____

A distance: _____ B diameter: _____ C radius: _____

Additional comments: _____



Company _____

Customer Number _____

Attention _____

Customer Inquiry Number _____

Street _____

Ship to City _____ Country _____

City _____ State _____ Zip Code _____

Send Copy to _____

Phone _____ FAX _____

Email _____ Sales Rep _____

Date Received _____

Due Date _____



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Pre-Clad Head Quote Request Form

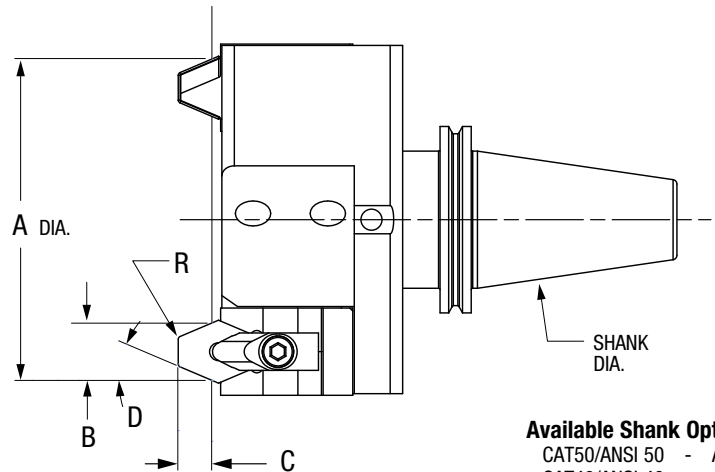
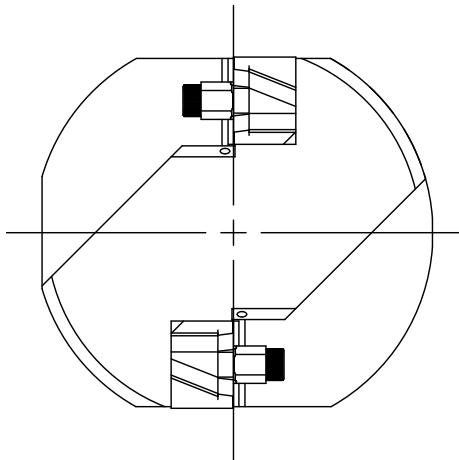
Part Information:

Part Name: _____

Clad Material: _____ Insert Grade: _____

Quote quantities: Heads: _____ Cartridges: _____ Inserts: _____

Additional comments: _____



Available Shank Options:

CAT50/ANSI 50 - A50
CAT40/ANSI 40 - A40
NMTB-50 - N50
NMTB-40 - N40
BT-50 - BT50
BT-40 - BT40
DIN 2080-A 50 - MN50
DIN 69871-A 50 - D50
HSK-100 - H100
CAPTO C-8 - C8

Dimensions <i>(Please provide required tolerances.)</i>					Shank
A ± _____	B ± _____	C ± _____	D ± _____	R ± _____	

Company _____

Customer Number _____

Attention _____

Customer Inquiry Number _____

Street _____

Ship to City _____ Country _____

City _____ State _____ Zip Code _____

Send Copy to _____

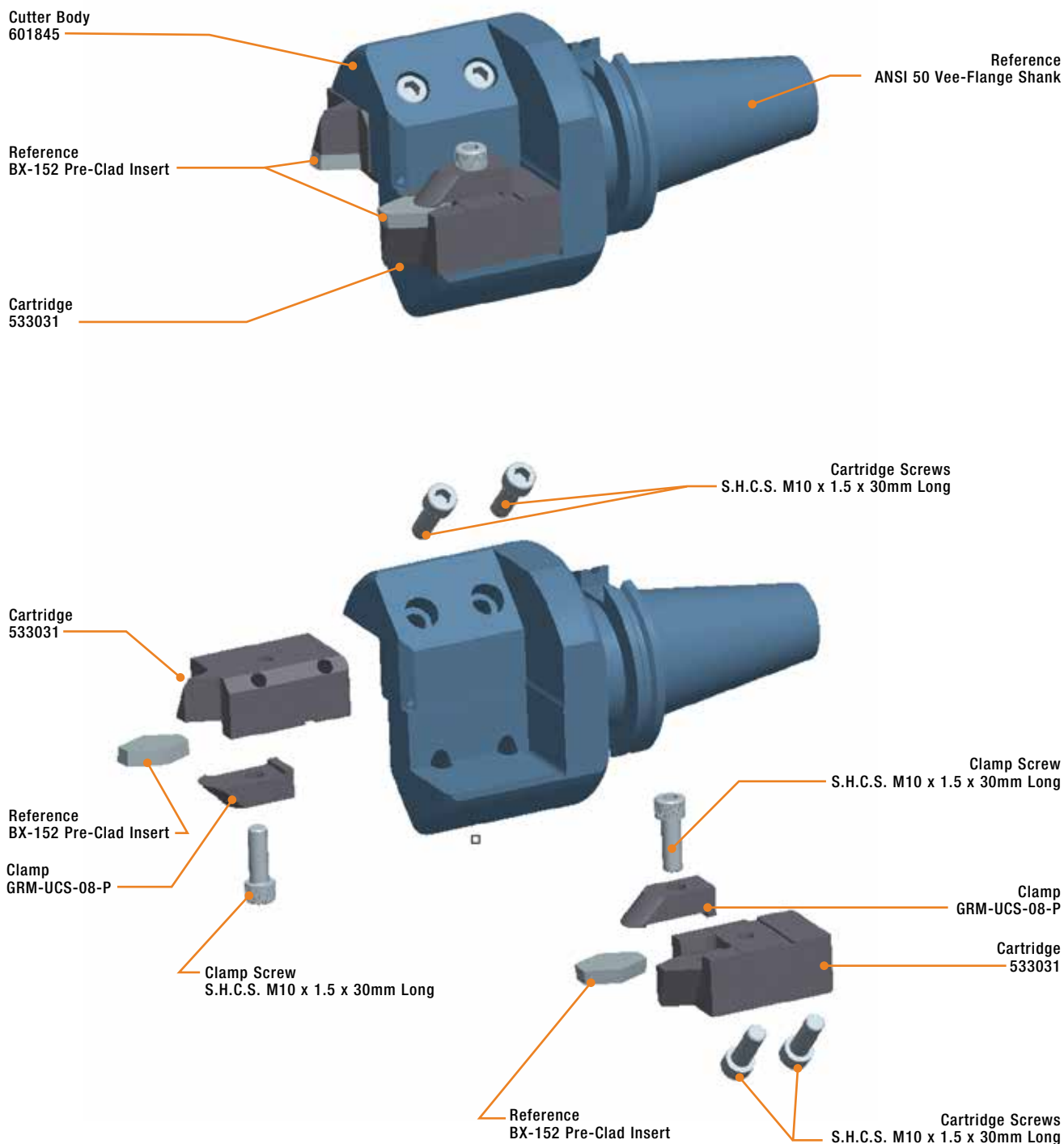
Phone _____ FAX _____

Email _____ Sales Rep _____

Date Received _____

Quote
Due Date

Ring Max™ BX-152 Pre-Clad – Assembled & Exploded Views Reference Guide



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Ring Max™ – Machining Methods Reference Guide

Method One

Use these instructions for setting gage points and establishing target ring groove depths using an optical comparator.

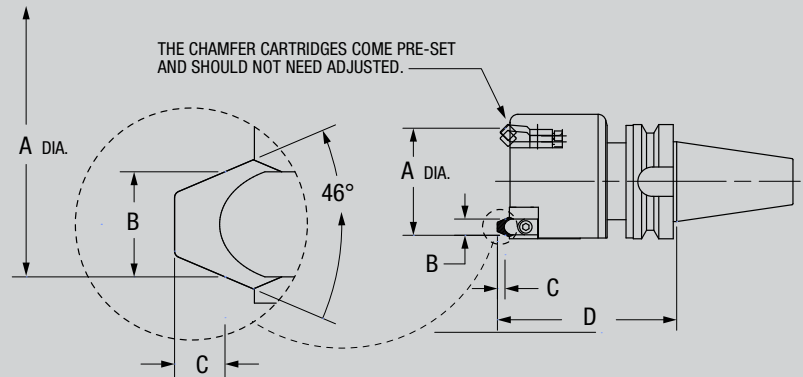
Step One:

Using an optical comparator, find and set the gage points at the groove's A diameter at mid-tolerance. The groove's B dimension will be within the allowable tolerance range.

Step Two:

Once the gage points in Step One have been determined, measure and record the tool's Z length and the actual measured C dimension over the insert nose.

NOTE: The measured C dimension is the target machining depth and will be within the groove's allowable part tolerance.



Example for BX-152

A		B	C		Z
Part print dimension and tolerance	Target this diameter for gage points	Part print dimension and tolerance	Part print dimension and tolerance	Measure and target this depth for programming	Measure and use this depth for programming
86,233mm +0.10 -0.00	86,283mm	12,649mm +0.10 -0.00	5,84mm		

Method Two

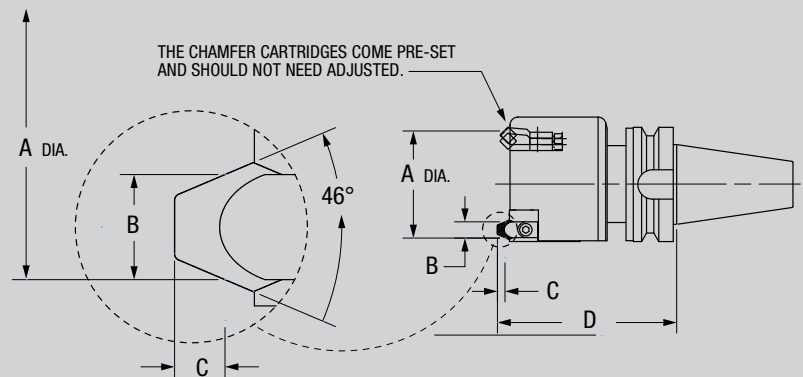
This method is used to machine ring grooves in a rough and finish pass.

Step One:

Machine the groove but reduce the groove depth to leave stock for the finish pass.

Step Two:

Measure the groove's A diameter and use the chart below to determine the additional D depth necessary to bring the A diameter into mid-tolerance.



If the A groove diameter is underrun by:	Increase the groove depth D by:
0.025mm	0.029mm
0.050mm	0.059mm
0.075mm	0.088mm
0.100mm	0.118mm
0.125mm	0.147mm
0.150mm	0.177mm
0.175mm	0.206mm
0.200mm	0.236mm
0.225mm	0.265mm
0.250mm	0.295mm
0.275mm	0.324mm
0.300mm	0.353mm

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Ring Max™ III Ring Groove Tooling

The Ring Max™ III is a high-precision, two-piece modular system for shop versatility. This system offers many head and shank configurations, including adaptability to Greenleaf's Excelerator® face mills. The Ring Max™ III line delivers the ultimate economical and flexible solution for any shop machining multiple API ring groove sizes.

Standard features and benefits include:

- Roughing and finishing of BX, R and RX API ring grooves in Inconel 625 clad overlay in less than one minute
- Adjustable and replaceable cartridge design for easy maintenance
- Machining the groove and chamfers in one operation
- Availability for grooving in stainless and alloy steel



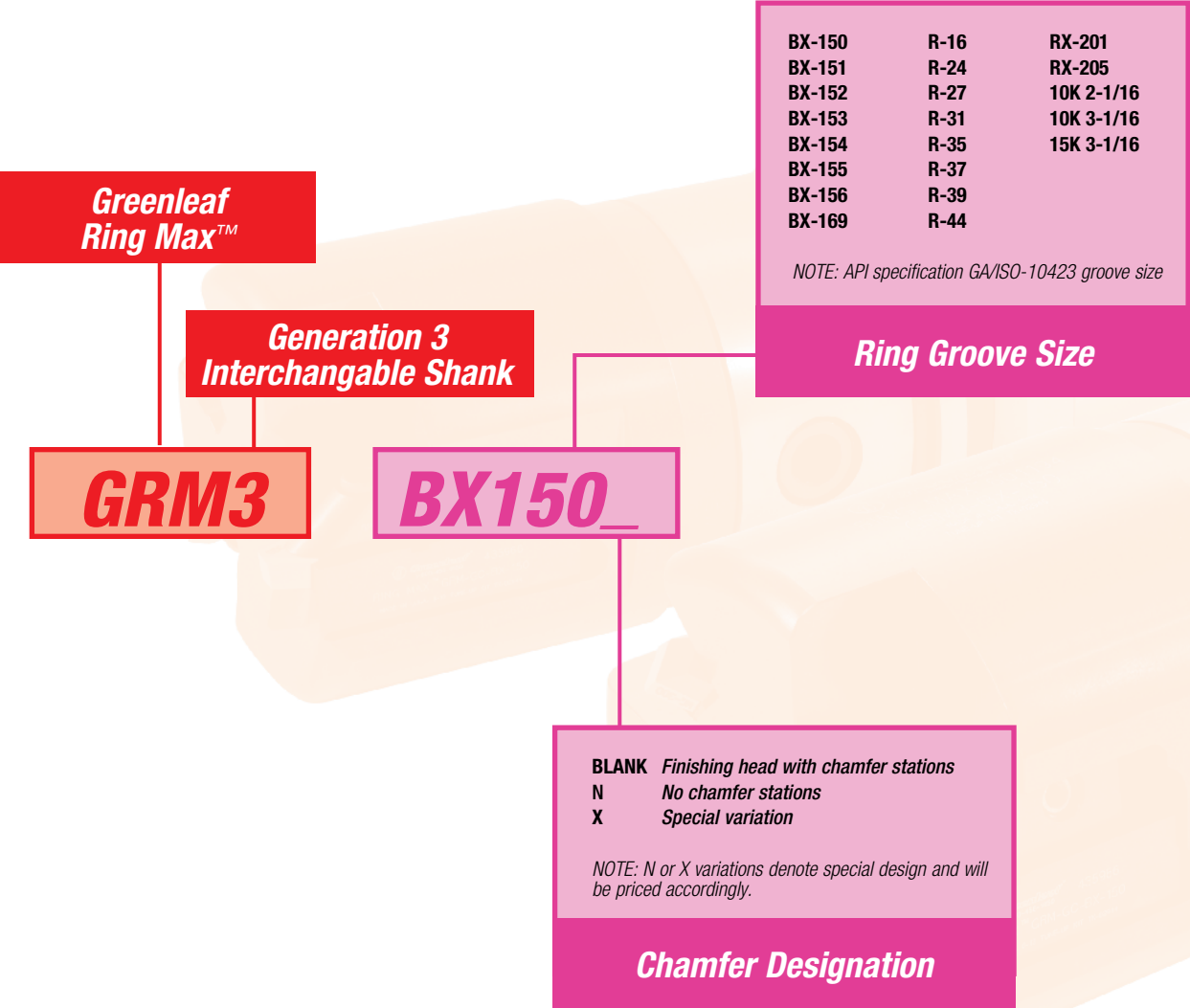
*Greenleaf Corporation is continually upgrading its products.
For the most current information, please visit our web site at:*

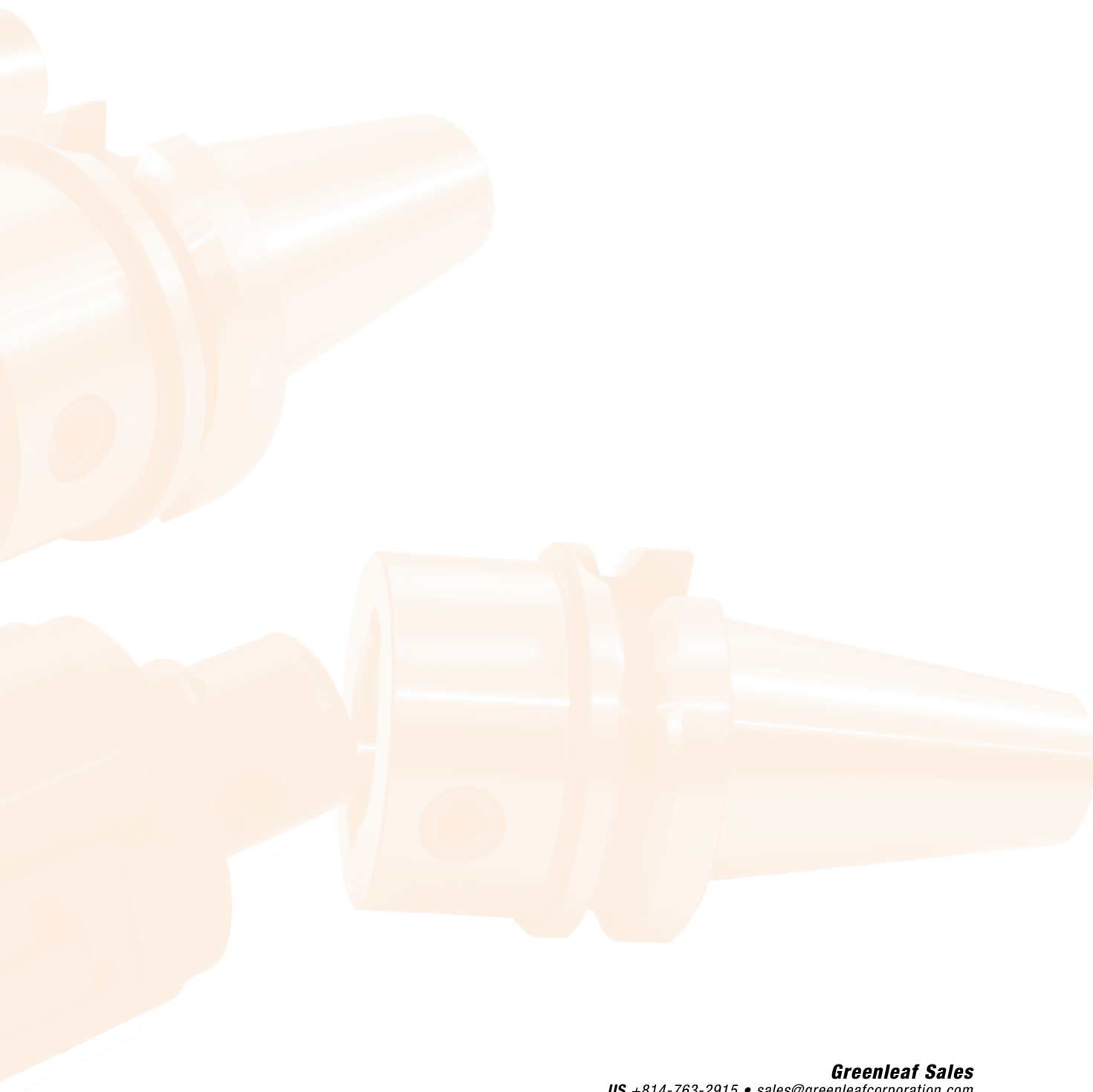
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Ring Max™ III – Finishing Head Identification System



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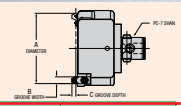
Ring Max™ III – Ring Groove Tooling Usage Reference Guide

Tooling
Style

Tooling
Geometry

Dimensions

Ring Max™ III
R Series
RX and 10/15K Series



Part Number	Stock	Dimensions (Inches)			Standard Components		Inserts	
		A ±0.005	B ±0.005	C ±0.005	Grooving Cartridge	Chamfer Cartridge	Grooving Insert	Chamfer Insert
GRM-BX10	→	0.95	0.422	0.210	GRM-GC-BX-100	GRMCC01	GRM-G-BX1005	SPON-322
GRM-BX101	→	0.94	0.468	0.230	GRM-GC-BX-101	GRMCC01	GRM-G-BX1015	SPON-322
GRM-BX102	→	0.97	0.500	0.240	GRM-GC-BX-102	GRMCC01	GRM-G-BX1025	SPON-322
GRM-BX103	→	0.98	0.556	0.280	GRM-GC-BX103	GRMCC01	GRM-G-BX1035	SPON-322
GRM-BX104	→	4.94	0.608	0.310	GRM-GC-BX-104	GRMCC01	GRM-G-BX1045	SPON-322
GRM-BX105	→	5.932	0.700	0.350	GRM-GC-BX-105	GRMCC01	GRM-G-BX1055	SPON-322
GRM-BX109	→	6.907	0.668	0.190	GRM-GC-BX-109	GRMCC01	GRM-G-BX1095	SPON-322
GRM-R10	→	2.000	0.344	0.250	GRM-GC-RSET 1 X	GRMCC01	GRM-G-RSET 1 SX	SPON-322
GRM-R24	→	3.750	0.469	0.320	GRM-GC-RSET 1 X	GRMCC01	GRM-G-RSET 1 SX	SPON-322
GRM-R27	→	4.250	0.469	0.320	GRM-GC-RSET 1 X	GRMCC01	GRM-G-RSET 1 SX	SPON-322
GRM-R41	→	4.875	0.469	0.320	GRM-GC-RSET 1 X	GRMCC01	GRM-G-RSET 1 SX	SPON-322
GRM-R35	→	5.375	0.469	0.320	GRM-GC-RSET 1 X	GRMCC01	GRM-G-RSET 1 SX	SPON-322
GRM-R37	→	5.875	0.469	0.320	GRM-GC-RSET 1 X	GRMCC01	GRM-G-RSET 1 SX	SPON-322
GRM-R39	→	6.375	0.469	0.320	GRM-GC-RSET 1 X	GRMCC01	GRM-G-RSET 1 SX	SPON-322
GRM-R44	→	7.825	0.469	0.320	GRM-GC-RSET 1 X	GRMCC01	GRM-G-RSET 1 SX	SPON-322
GRM-RX2010	→	1.813	0.219	0.160	GRM-GC-RX2010-X	N/A	GRM-G-RX2010SX	N/A
GRM-RX2004	→	2.250	0.219	0.160	GRM-GC-RX2010-X	N/A	GRM-G-RX2010SX	N/A
GRM-10K2	→	4.623	0.377	0.258	GRM-GC1010K-X	GRMCC01	GRM-G-1010K5X	SPON-322
GRM-10K3N	→	5.748	0.377	0.258	GRM-GC1010K-X	GRMCC01	GRM-G-1010K5X	N/A
GRM-10K3	→	4.623	0.377	0.258	GRM-GC1010K-X	GRMCC01	GRM-G-1010K5X	SPON-322

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Stocking
Program

Part Number

Standard
Components

Greenleaf Sales

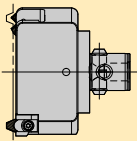
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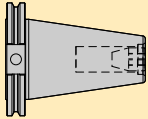
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Ring Groove Tooling



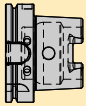
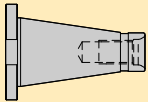
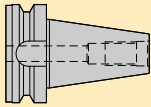
Ring Max™ III

BX Series
R Series
RX Series
10/15K Series
page: RM 28



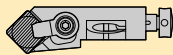
Ring Max™

Shank Options
page: RM 29



Ring Max™

Grooving Cartridge
page: RM 35



Ring Max™

Chamfer Cartridge
page: RM 36

Reference

Ring Max™ III

Models
page: RM 30

Ring Max™ III Pre-Clad

Models
page: RM 31

Pre-Clad Head

Quote Request Form
page: RM 32

Machining Methods

Reference Guide
page: RM 33

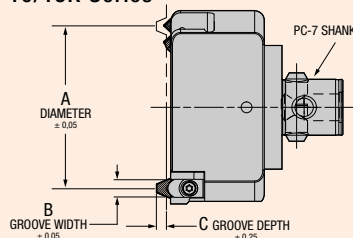
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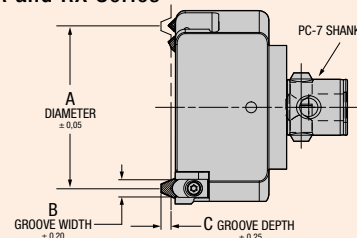
Ring Max™ III

BX Series
R Series
RX and 10/15K Series

BX and 10/15K Series



R and RX Series



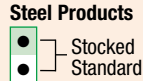
	Part Number	Stock	Dimensions (mm)			Standard Components		Inserts	
			A	B	C	Grooving Cartridge	Chamfer Cartridge	Grooving Insert	Chamfer Insert
BX Series	GRM3-BX150	○	73,53	11,48	5,84	GRM-GI-BX-150	GRMCC01	GRM-GI-BX150S	SPGN-322
	GRM3-BX151	○	77,83	11,89	5,84	GRM-GI-BX-151	GRMCC01	GRM-GI-BX151S	SPGN-322
	GRM3-BX152	●	86,28	12,70	6,10	GRM-GI-BX-152	GRMCC01	GRM-GI-BX152S	SPGN-322
	GRM3-BX153	○	102,82	14,12	7,11	GRM-GI-BX-153	GRMCC01	GRM-GI-BX153S	SPGN-322
	GRM3-BX154	●	119,05	15,44	7,87	GRM-GI-BX-154	GRMCC01	GRM-GI-BX154S	SPGN-322
	GRM3-BX155	●	150,67	17,78	8,64	GRM-GI-BX-155	GRMCC01	GRM-GI-BX155S	SPGN-322
	GRM3-BX169	○	176,71	16,97	9,91	GRM-GI-BX-169	GRMCC01	GRM-GI-BX169S	SPGN-322
R Series	GRM3-R16	○	50,80	8,74	6,35	GRM-GI-RSET 2 AX	GRMCC01	GRM-GC-RSET 2 SX	SPGN-322
	GRM3-R24	●	95,25	11,91	8,13	GRM-GI-RSET 1 X	GRMCC01	GRM-GC-RSET 1 SX	SPGN-322
	GRM3-R27	○	107,95	11,91	8,13	GRM-GI-RSET 1 X	GRMCC01	GRM-GC-RSET 1 SX	SPGN-322
	GRM3-R31	○	123,83	11,91	8,13	GRM-GI-RSET 1 X	GRMCC01	GRM-GC-RSET 1 SX	SPGN-322
	GRM3-R35	○	136,53	11,91	8,13	GRM-GI-RSET 1 X	GRMCC01	GRM-GC-RSET 1 SX	SPGN-322
	GRM3-R37	○	149,23	11,91	8,13	GRM-GI-RSET 1 X	GRMCC01	GRM-GC-RSET 1 SX	SPGN-322
	GRM3-R39	○	161,93	11,91	8,13	GRM-GI-RSET 1 X	GRMCC01	GRM-GC-RSET 1 SX	SPGN-322
	GRM3-R44	○	193,68	11,91	8,13	GRM-GI-RSET 1 X	GRMCC01	GRM-GC-RSET 1 SX	SPGN-322
RX and 10/15K Series	GRM3-RX201N	○	46,05	5,56	4,06	GRM-GIRX201/5-X	N/A	GRM-GI-RX201/5SX	N/A
	GRM3-RX205N	○	57,15	5,56	4,06	GRM-GIRX201/5-X	N/A	GRM-GI-RX201/5SX	N/A
	GRM3-10K2	○	117,42	9,58	6,55	GRM-GI10/15K-X	GRMCC01	GRM-GI-10/15KSX	SPGN-322
	GRM3-10K3N	○	146,00	9,58	6,55	GRM-GI10/15K-X	N/A	GRM-GI-10/15KSX	N/A
	GRM3-15K3	○	168,22	9,58	6,55	GRM-GI10/15K-X	GRMCC01	GRM-GI-10/15KSX	SPGN-322

NOTE: Due to blank availability, special designs may need to be a two-piece weld construction or no quote.

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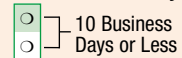
Inserts and Steel Products



Inserts Only



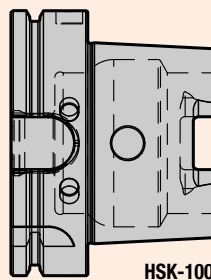
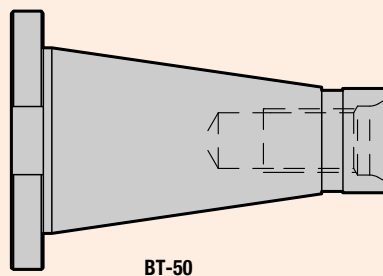
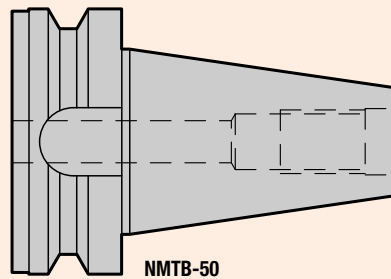
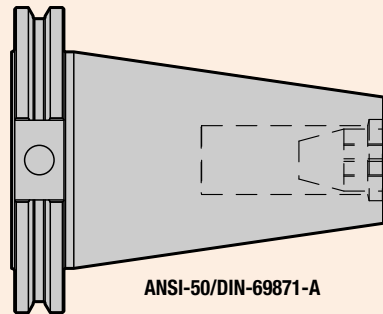
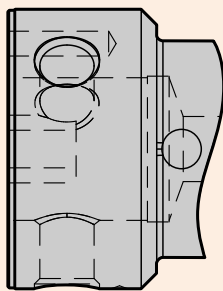
Steel Products Only



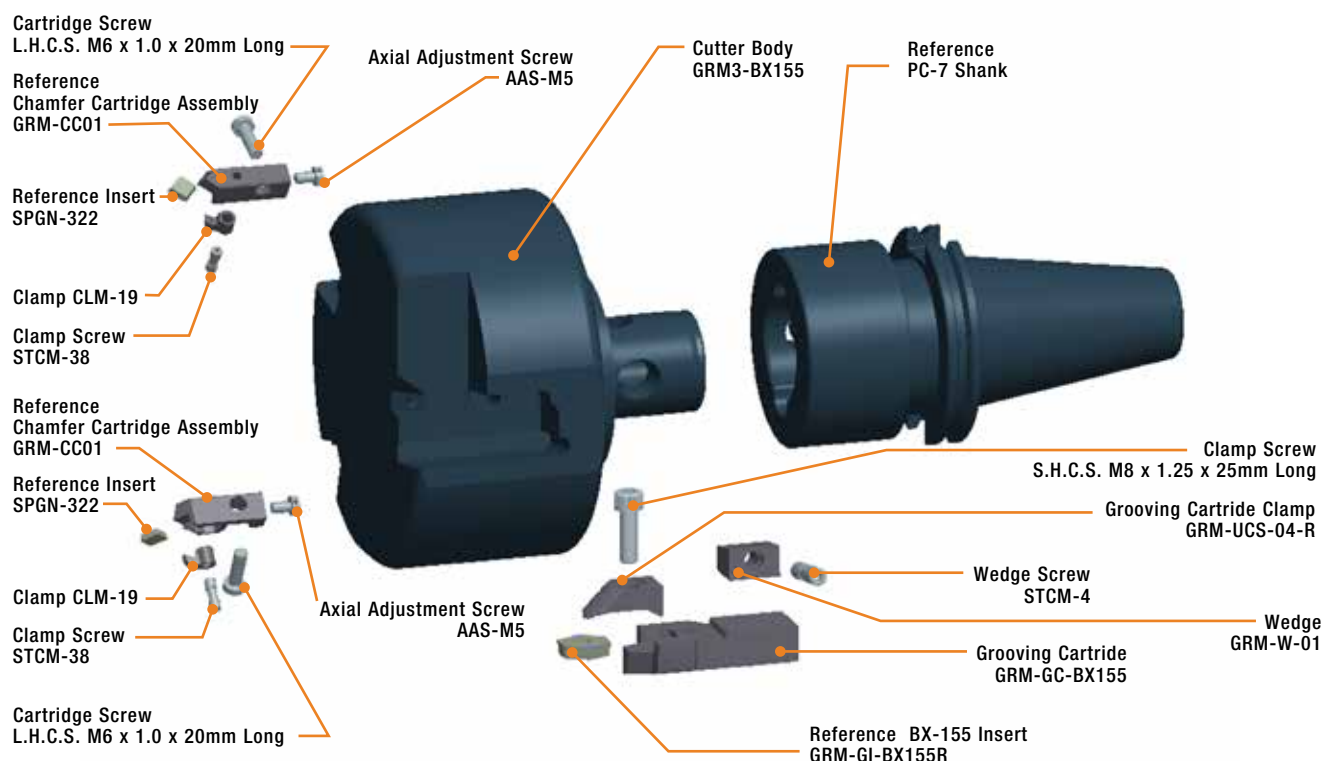
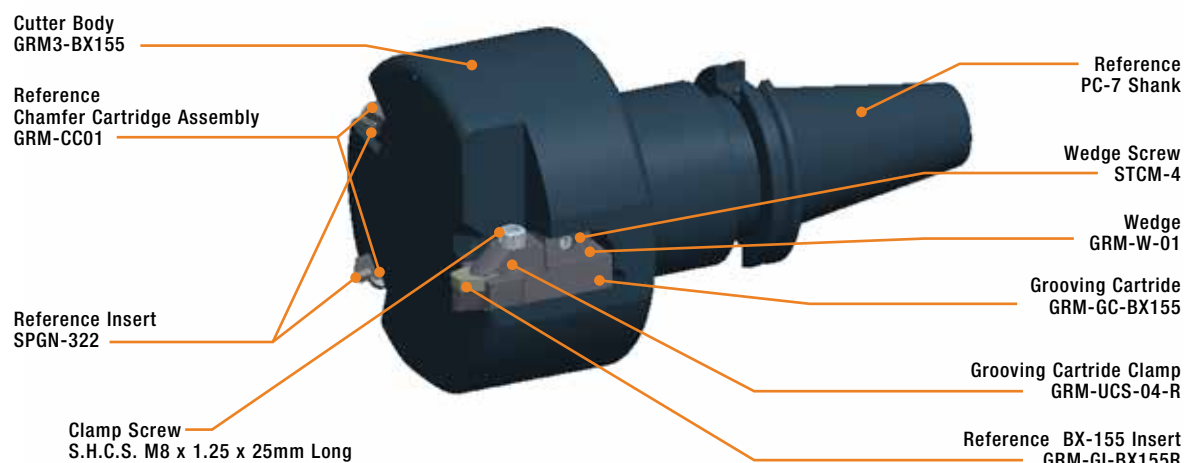
Ring Max™ III

Shank Options

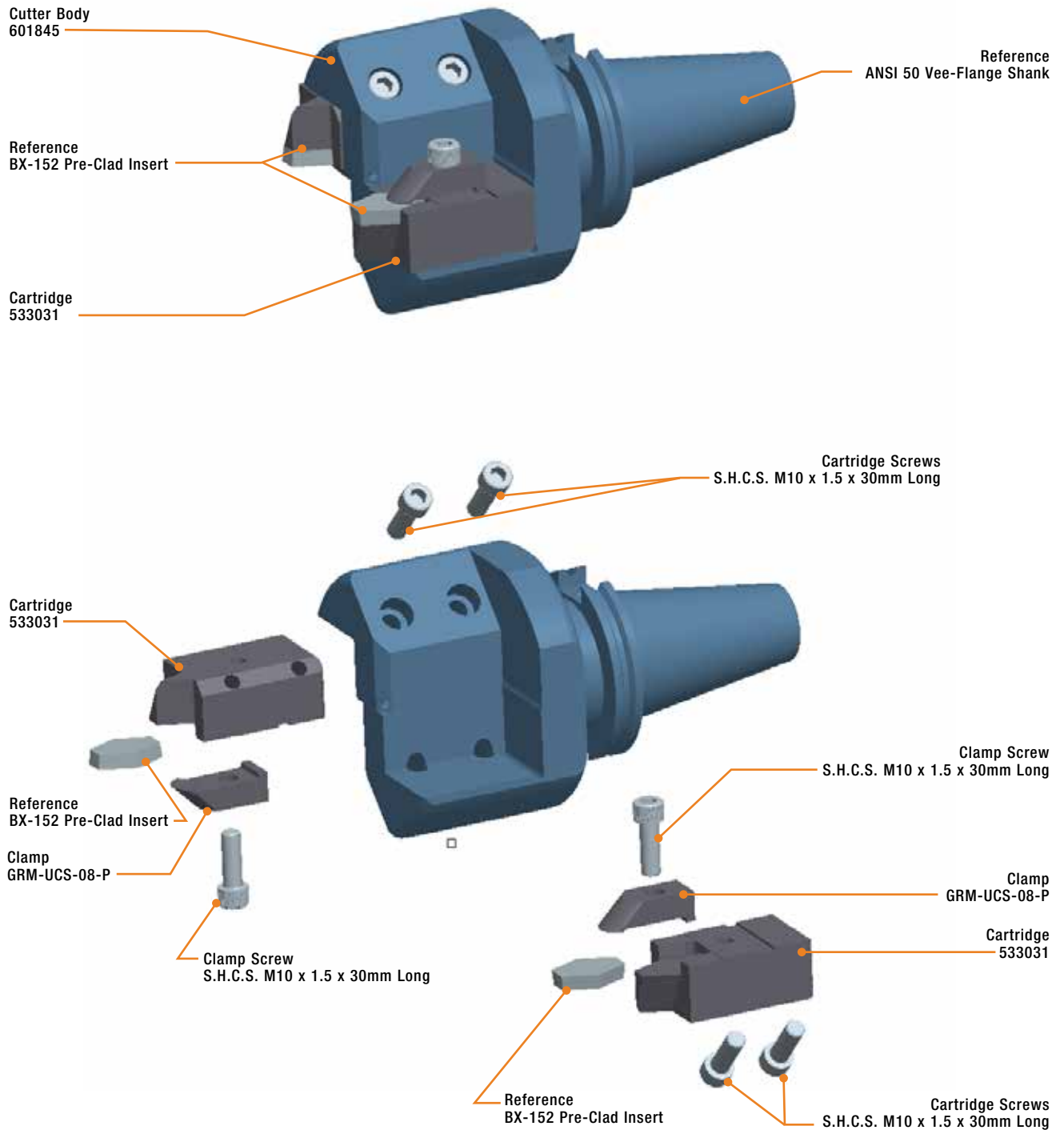
Adapter Designation	Shank A	Shank B
04-GRMA50-000	PC-7	CAT-50 (ANSI-50) Vee Flange
04-GRMD50-000		DIN-69871 (ISO-50) Vee Flange
04-GRMNTB50-000		NMTB-50 Vee Flange
04-GRMBT50-000		BT-50 Vee Flange
04-GRMHSK100-000		HSK-100A



Ring Max™ GRM3-BX155 – Assembled and Exploded Views Reference Guide



Ring Max™ Pre-Clad – Assembled and Exploded Views Reference Guide





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Pre-Clad Head Quote Request Form

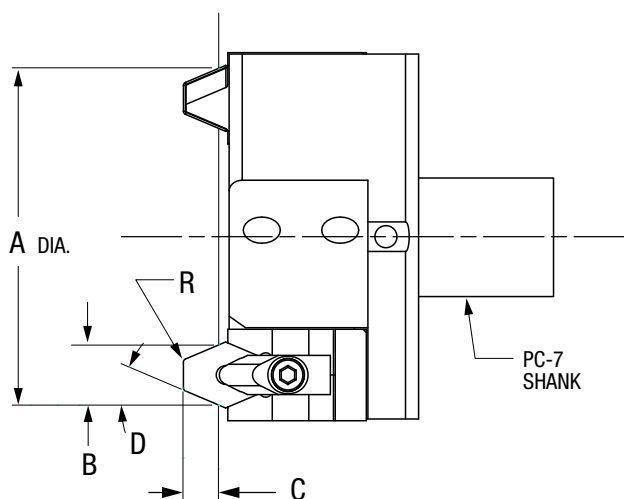
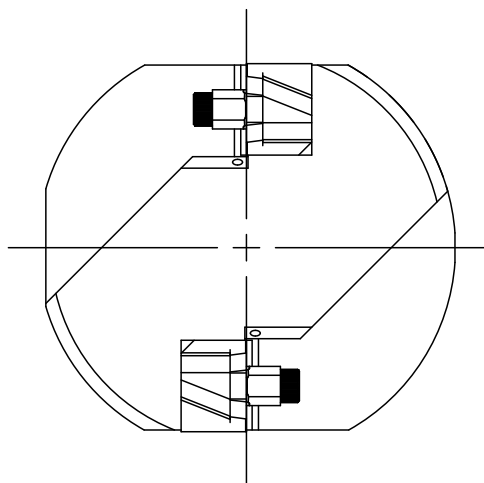
Part Information:

Part Name: _____

Clad Material: _____ Insert Grade: _____

Quote quantities: Heads: _____ Cartridges: _____ Inserts: _____

Additional comments: _____



Dimensions *(Please provide required tolerances.)*

A ± _____	B ± _____	C ± _____	D ± _____	R ± _____

Company _____

Customer Number _____

Attention _____

Rep Number _____

Street _____

Ship to City _____ Country _____

City _____ State _____ Zip Code _____

Send Copy to _____

Phone _____ FAX _____

Email _____ Sales Rep _____

Date Received _____

**Quote
Due Date** _____

Ring Max™ – Machining Methods Reference Guide

Method One

Use these instructions for setting gage points and establishing target ring groove depths using an optical comparator.

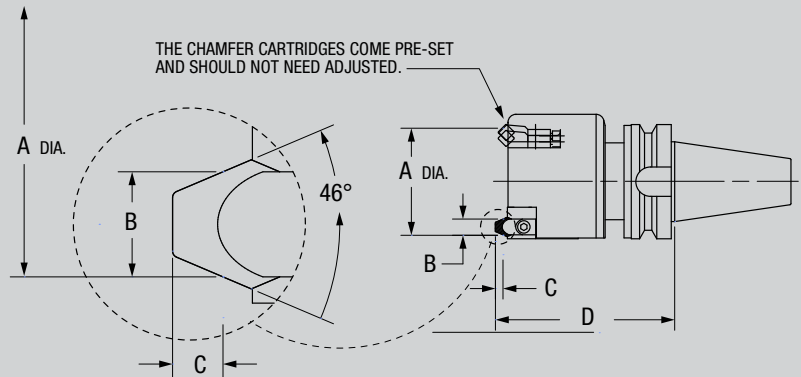
Step One:

Using an optical comparator, find and set the gage points at the groove's A diameter at mid-tolerance. The groove's B dimension will be within the allowable tolerance range.

Step Two:

Once the gage points in Step One have been determined, measure and record the tool's Z length and the actual measured C dimension over the insert nose.

NOTE: The measured C dimension is the target machining depth and will be within the groove's allowable part tolerance.



Example for BX-152

A		B		C		Z
Part print dimension and tolerance	Target this diameter for gage points	Part print dimension and tolerance	Part print dimension and tolerance	Measure and target this depth for programming	Measure and use this depth for programming	
86,233mm +0.10 -0.00	86,283mm	12,649mm +0.10 -0.00	5,84mm			

Method Two

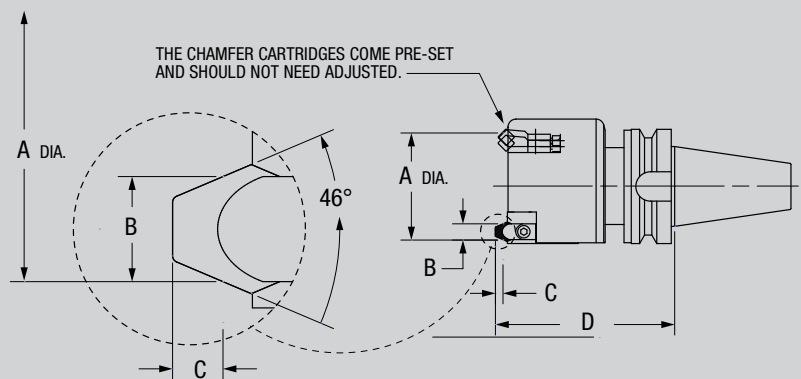
This method is used to machine ring grooves in a rough and finish pass.

Step One:

Machine the groove but reduce the groove depth to leave stock for the finish pass.

Step Two:

Measure the groove's A diameter and use the chart below to determine the additional D depth necessary to bring the A diameter into mid-tolerance.

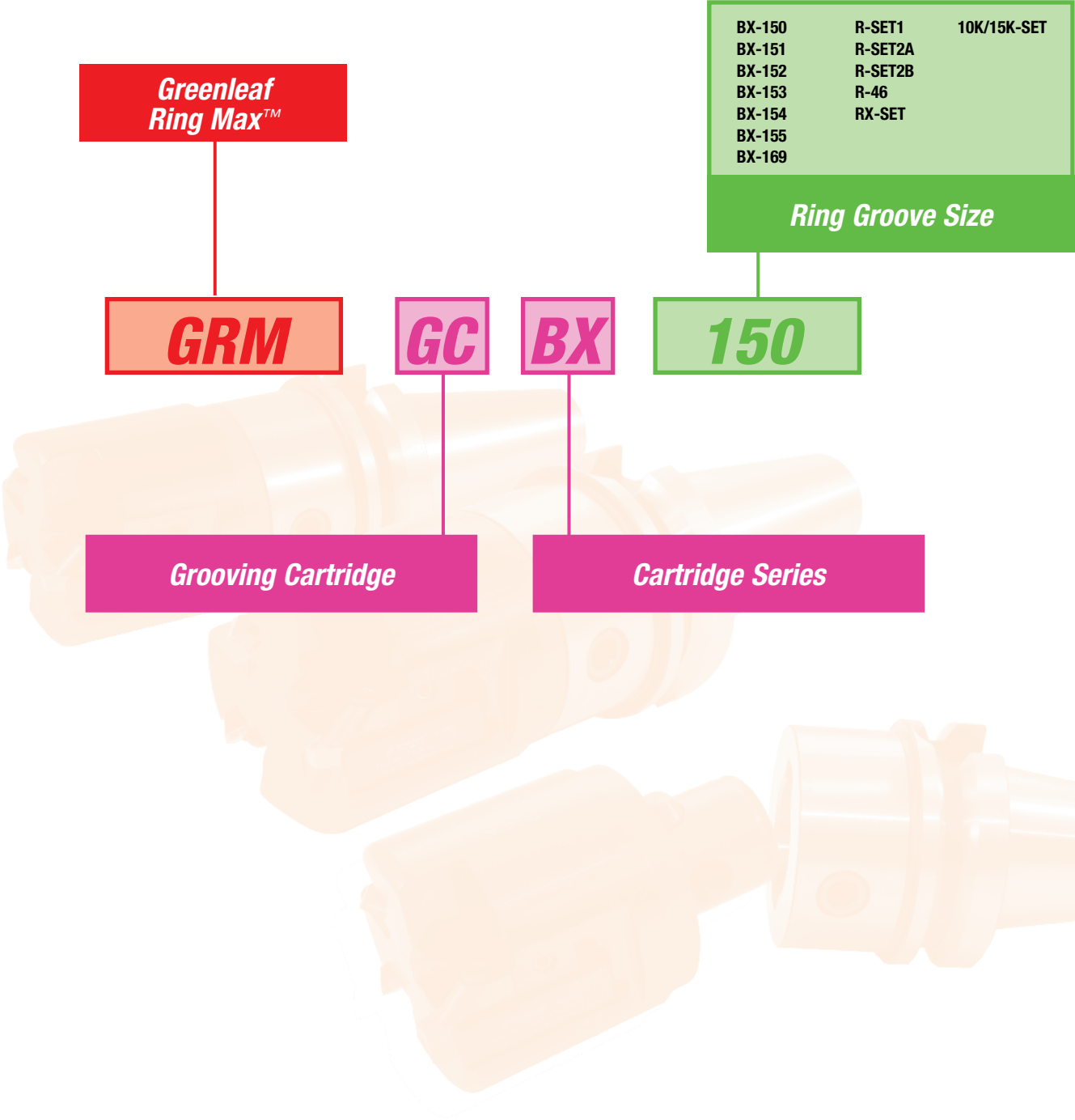


If the A groove diameter is underrun by:	Increase the groove depth D by:
0.025mm	0.029mm
0.050mm	0.059mm
0.075mm	0.088mm
0.100mm	0.118mm
0.125mm	0.147mm
0.150mm	0.177mm
0.175mm	0.206mm
0.200mm	0.236mm
0.225mm	0.265mm
0.250mm	0.295mm
0.275mm	0.324mm
0.300mm	0.353mm

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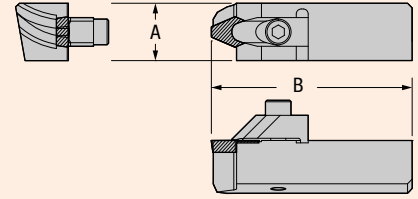
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Ring Max™ – Grooving Cartridge Identification System



Ring Max™

Grooving Cartridge



Cartridge		Stock	Dimensions (mm)		Standard Components		Inserts
Groove Size	Part Number		A	B	Clamp	Clamp Screw	Purchased Separately
BX-150	GRM-GC-BX-150	●	25,40	66,68	GRMUCS01S	M6-1.0 SHCS	GRM-GI-BX150S
BX-151	GRM-GC-BX-151	●	25,40	66,68	GRMUCS01S	M6-1.0 SHCS	GRM-GI-BX151S
BX-152	GRM-GC-BX-152	●	25,40	66,68	GRMUCS01S	M6-1.0 SHCS	GRM-GI-BX152S
BX-153	GRM-GC-BX-153	●	25,40	66,68	GRMUCS01S	M6-1.0 SHCS	GRM-GI-BX153S
BX-154	GRM-GC-BX-154	●	28,37	66,68	GRMUCS01S	M6-1.0 SHCS	GRM-GI-BX154S
BX-155	GRM-GC-BX-155	●	31,98	79,38	GRMUCS04R	M8-1.25 SHCS	GRM-GI-BX155R
BX-156	GRM-GC-BX-156	●	30,18	79,38	GRMUCS04R	M8-1.25 SHCS	GRM-GI-BX156R
BX-169	GRM-GC-BX-169	●	25,40	79,38	GRMUCS04R	M8-1.25 SHCS	GRM-GI-BX169R
R-SET1*	GRM-GCRSET1-X	●	25,40	79,38	GRMUCS03S	M6-1.0 SHCS	GRM-GI-RSET1SX
R-SET2A*	GRM-GCRSET2A-X	○	19,05	66,68	GRMUCS05S	M5-0.8 SHCS	GRM-GI-RSET2SX
R-SET2B*	GRM-GCRSET2B-X	○	25,40	66,68	GRMUCS03S	M5-0.8 SHCS	GRM-GI-RSET2SX
R-46	GRM-GCR46	○	25,40	79,38	GRMUCS04r	M8-1.25 SHCS	GRM-GI-R46R
RX-SET*	GRM-GCRX201/5-X	○	19,05	66,68	GRMUCS05S	M5-0.8 SHCS	GRM-GI-RX201/5SX
10/15K-SET*	GRM-GC10/15-X	○	25,40	66,68	GRMUCS05S	M5-0.8 SHCS	GRM-GI-10/15KSX

* Denotes multiple groove sizes (See chart below.)

Multiple-Groove Compatibility

Single cartridges can produce multiple grooves when used in the proper gage diameter Ring Max™ grooving head. Use this chart for compatibility.

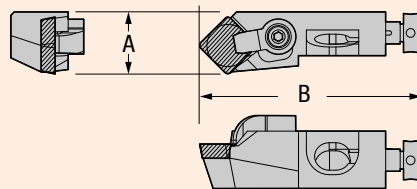
Group	Groove Sizes
R-SET1	R-21, R-23, R-24, R-26, R-27, R-31, R-35, R-37, R-39, R-41, R-44, R-45, R-49, R-53, R-57, R-65, R-69, R-82, R-84
R-SET2A	R-12, R-13, R-14, R-15, R-16, R-17, R-18, R-19, R-20
R-SET2B	R-22, R-25, R-29, R-33, R-36, R-40, R-43, R-48, R-52
RX-SET	RX-201, RX-205
10/15K-SET	10K-2 ¹ / ₁₆ ", 10K-3 ¹ / ₁₆ ", 10K-5 ¹ / ₁₆ ", 15K-3 ¹ / ₁₆ "

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Ring Max™

Chamfer Cartridge



Cartridge	Stock	Dimensions (mm)		Standard Components			Inserts	Mounting Screw
		A	B	Clamp	Clamp Screw	Adj. Screw	Purchased Separately	Supplied with Grooving Head
GRM-CC01	●	14,00	50,06	CLM-19	STCM-38	AAS-M5	SPGN-322	M6-1.0 LHCS

All Ring Max™ heads for generation 2 and 3 use the same chamfer cartridges.

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Ring Max™ STX – Lathe Tooling

The Ring Max™ STX system provides the same productivity gains as the Ring Max™ II and Ring Max™ III systems in a square shank tool. Whether you are machining a large diameter groove, or a standard BX, R, or RX groove, the Ring Max™ STX system is your solution for maximizing productivity in multiple API ring groove sizes.

Standard features and benefits include:

- Roughing and finishing of BX, R and RX API ring grooves in Inconel 625 clad overlay in less than one minute
- Utilization of the same clamping system and inserts as the Ring Max™ II and Ring Max III™ cutter systems.
- Available in common standard inch and metric shank sizes.
- Availability for grooving in stainless and alloy steel



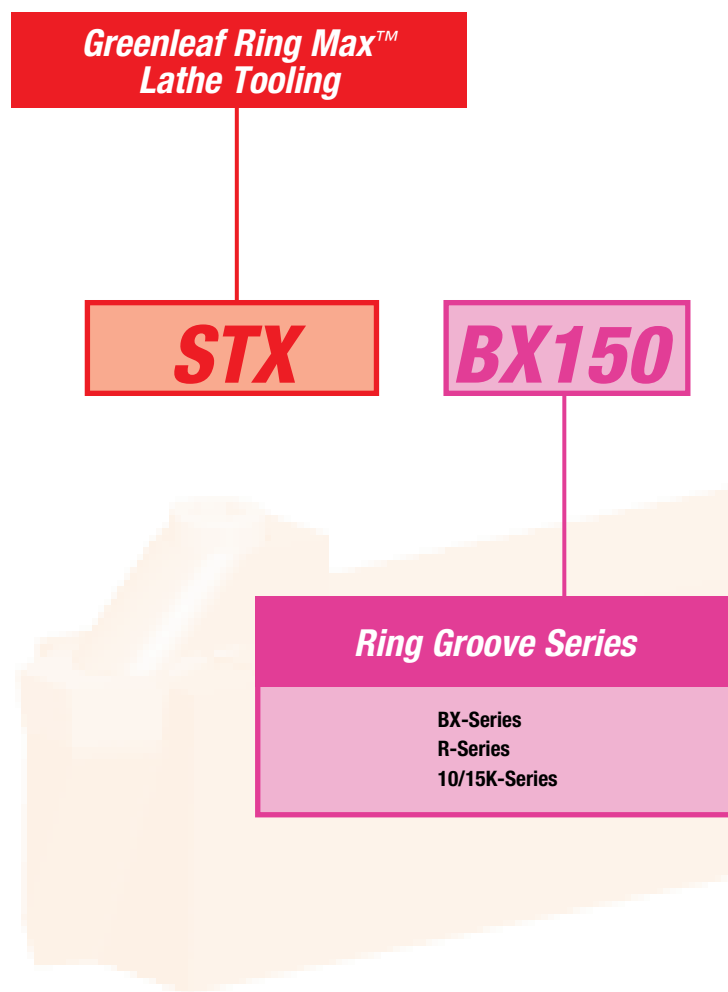
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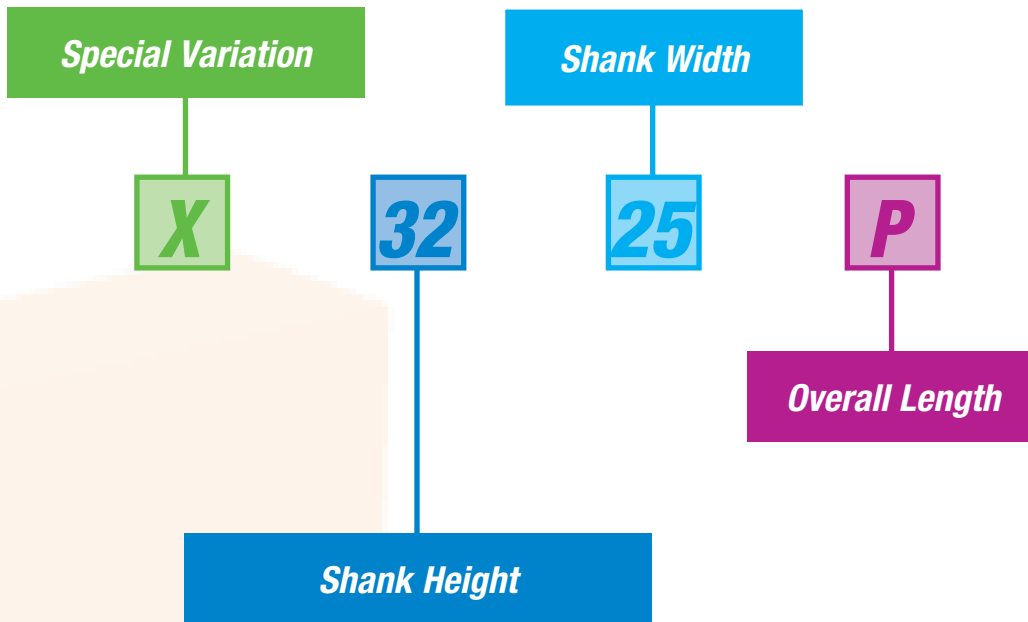
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Ring Max[™] STX – Lathe Tooling Identification System



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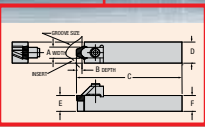
Ring Max™ STX – Lathe Tooling Usage Reference Guide

Tooling
Style

Tooling
Geometry

Part Number

Ring Max™ STX
Lathe Tooling



Groove Size	Holder	Part Number	A	B	C	D	E	F
BX-150	STXBX10140	→	0.452	0.230	6.000	1.000	1.000	1.000
BX-151	STXBX10950	→	0.452	0.230	6.000	1.000	1.250	1.250
BX-151	STXBX10140	→	0.468	0.230	6.000	1.000	1.000	1.000
BX-151	STXBX11860	→	0.468	0.230	6.000	1.000	1.250	1.250
BX-152	STXBX102140	→	0.500	0.240	6.000	1.000	1.000	1.000
BX-152	STXBX10950	→	0.500	0.240	6.000	1.000	1.250	1.250
BX-154	STXBX10140	→	0.608	0.310	6.000	1.000	1.000	1.000
BX-154	STXBX10950	→	0.608	0.310	6.000	1.000	1.250	1.250
BX-155	STXBX10140	→	0.750	0.340	6.000	1.000	1.000	1.000
BX-155	STXBX10950	→	0.750	0.340	6.000	1.000	1.250	1.250
BX-156	STXBX10140	→	0.923	0.400	6.000	1.000	1.000	1.000
BX-156	STXBX10950	→	0.923	0.400	6.000	1.000	1.250	1.250
BX-159	STXBX10950	→	0.688	0.250	6.000	1.000	1.000	1.000
BX-159	STXBX10950	→	0.688	0.250	6.000	1.000	1.250	1.250
R-SET15X*	STXRS11860	→	0.489	0.320	6.000	1.000	1.250	1.250
R-SET25X*	STXRS12140	→	0.489	0.320	6.000	1.000	1.000	1.000
R-SET25X*	STXRS12140	→	0.489	0.320	6.000	1.250	1.250	1.250
R-489	STXRS12140	→	0.531	0.390	6.000	1.000	1.000	1.000
R-489	STXRS12140	→	0.531	0.390	6.000	1.250	1.250	1.250
10/19K3X*	STX1019K340	→	0.377	0.258	6.000	1.000	1.000	1.000
10/19K3X*	STX1019K340	→	0.377	0.258	6.000	1.250	1.250	1.250

* Denotes multiple groove sizes (See chart below right)

Groove Size	Standard Components	Inserts Purchased Separately
BX-150	GMUCS015	MB-1.0 SHCS
BX-151	GMUCS015	MB-1.0 SHCS
BX-152	GMUCS015	MB-1.0 SHCS
BX-154	GMUCS015	MB-1.0 SHCS
BX-155	GMUCS045	MB-1.25 SHCS
BX-156	GMUCS045	MB-1.25 SHCS
BX-159	GMUCS045	MB-1.25 SHCS
R-SET15X*	GMUCS055	MB-1.0 SHCS
R-SET25X*	GMUCS055	MB-1.0 SHCS
R-489	GMUCS055	MB-1.25 SHCS
10/19K3X*	GMUCS055	MB-0.8 SHCS

Multiple-Groove Compatibility
Single cartridges can produce multiple grooves. Use this chart for compatibility.

Group	Groove Sizes
R-SET15X	R-21, R-23, R-24, R-25, R-27, R-31, R-35, R-37, R-39, R-41, R-44, R-45, R-49, R-53, R-57, R-63, R-69, R-82, R-84
R-SET25X	R-12, R-13, R-14, R-15, R-16, R-17, R-18, R-19, R-20
10/19K3X	10/15K, 10K, 21K, 30K, 31K

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RM 34

Standard Components

Dimensions

Stocking Information

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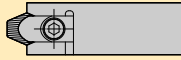
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RING MAX™ Lathe Tooling



Ring Max™ STX

Lathe Tooling
page: *RM 42*

Reference

Ring Max™ STX

Models
page: *RM 43*

Lathe Tool

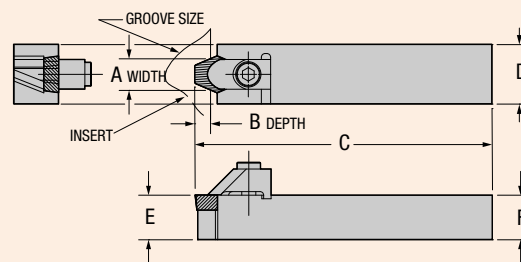
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Ring Max™ STX

Lathe Tooling



Holder			Dimensions (mm)					
Groove Size	Part Number	Stock	A†	B†	C	D	E	F
BX-150	STXBX1502525P	○	11,48	5,84	170	25	25	25
	STXBX1503225P	○	11,48	5,84	170	25	32	32
BX-151	STXBX1512525P	○	11,89	5,84	170	25	25	25
	STXBX1513225P	○	11,89	5,84	170	25	32	32
BX-152	STXBX1522525P	○	12,70	6,10	170	25	25	25
	STXBX1523225P	○	12,70	6,10	170	25	32	32
BX-154	STXBX1542525P	○	15,44	7,87	170	25	25	25
	STXBX1543225P	○	15,44	7,87	170	25	32	32
BX-155	STXBX1552525P	○	17,78	8,64	170	25	25	25
	STXBX1553225P	○	17,78	8,64	170	25	32	32
BX-156	STXBX1562525P	○	23,44	11,43	170	25	25	25
	STXBX1563225P	○	23,44	11,43	170	25	32	32
BX-169	STXBX1692525P	○	16,97	9,91	170	25	25	25
	STXBX1693225P	○	16,97	9,91	170	25	32	32
R-SET1SX*	STXRSET12525P	○	11,91	8,13	170	25	25	25
	STXRSET13225P	○	11,91	8,13	170	25	32	32
R-SET2SX*	STXRSET22525P	○	8,74	6,35	170	25	25	25
	STXRSET23225P	○	8,74	6,35	170	25	32	32
R-46R	STXR462525P	○	13,49	9,91	170	25	25	25
	STXR463225P	○	13,49	9,91	170	25	32	32
10/15KSX*	STX1015KX2525P	○	9,58	6,55	170	25	25	25
	STX1015KX3225P	○	9,58	6,55	170	25	32	32

* Denotes multiple groove sizes (See chart below right.)

† Groove width and depth tolerances comply with API Standard 6A/ISO 10423.

Groove Size	Standard Components		Inserts Purchased Separately
	Clamp	Clamp Screw	
BX-150	GRMUCS01S	M6-1.0 SHCS	GRM-GI-BX150S
BX-151	GRMUCS01S	M6-1.0 SHCS	GRM-GI-BX151S
BX-152	GRMUCS01S	M6-1.0 SHCS	GRM-GI-BX152S
BX-154	GRMUCS01R	M6-1.0 SHCS	GRM-GI-BX154S
BX-155	GRMUCS04R	M8-1.25 SHCS	GRM-GI-BX155R
BX-156	GRMUCS04R	M8-1.25 SHCS	GRM-GI-BX156R
BX-169	GRMUCS04S	M8-1.25 SHCS	GRM-GI-BX169R
R-SET1SX*	GRMUCS03S	M6-1.0 SHCS	GRM-GI-RSET1SX
R-SET2SX*	GRMUCS05S	M5-0.8 SHCS	GRM-GI-RSET2SX
R-46R	GRMUCS04R	M8-1.25 SHCS	GRM-GI-R46R
10/15KSX*	GRMUCS05S	M5-0.8 SHCS	GRM-GI-10/15KSX

Multiple-Groove Compatibility

Single cartridges can produce multiple grooves.

Use this chart for compatibility.

Group	Groove Sizes
R-SET1SX	R-21, R-23, R-24, R-26, R-27, R-31, R-35, R-37, R-39, R-41, R-44, R-45, R-49, R-53, R-57, R-65, R-69, R-82, R-84
R-SET2SX	R-12, R-13, R-14, R-15, R-16, R-17, R-18, R-19, R-20
10/15KSX	10/15K, 10K-2 ¹ / ₁₆ ", 10K-3 ¹ / ₁₆ "

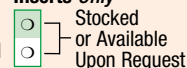
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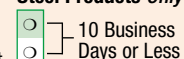
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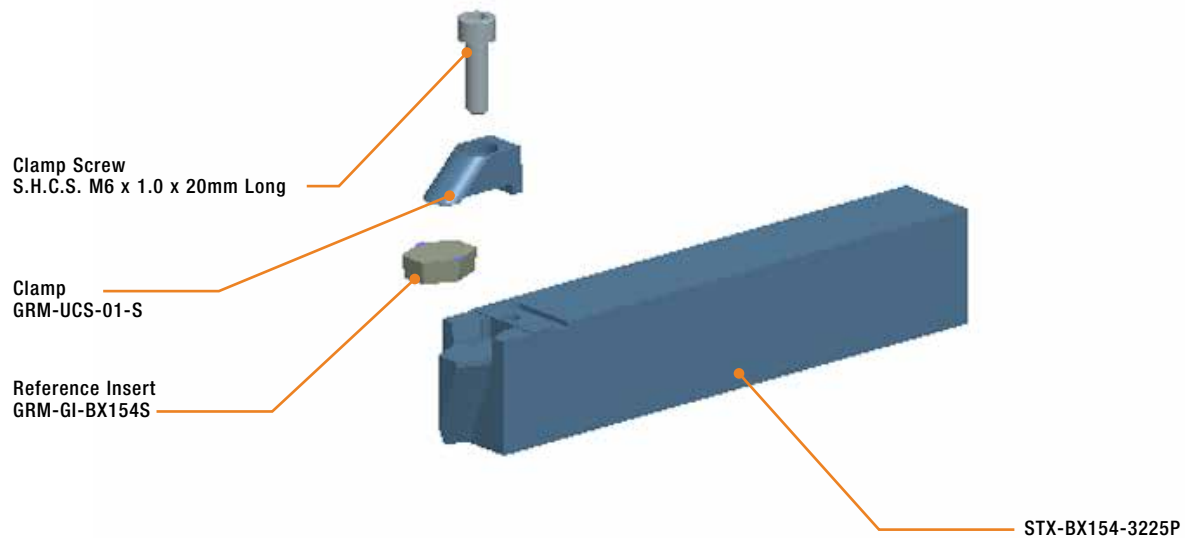
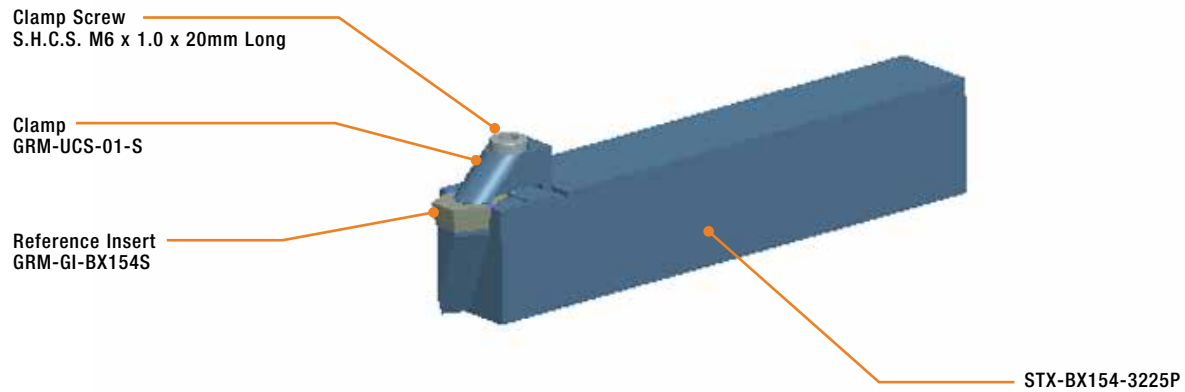
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Ring Max™ STX – Assembled and Exploded Views Reference Guide



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Lathe Tool Quote Request Form

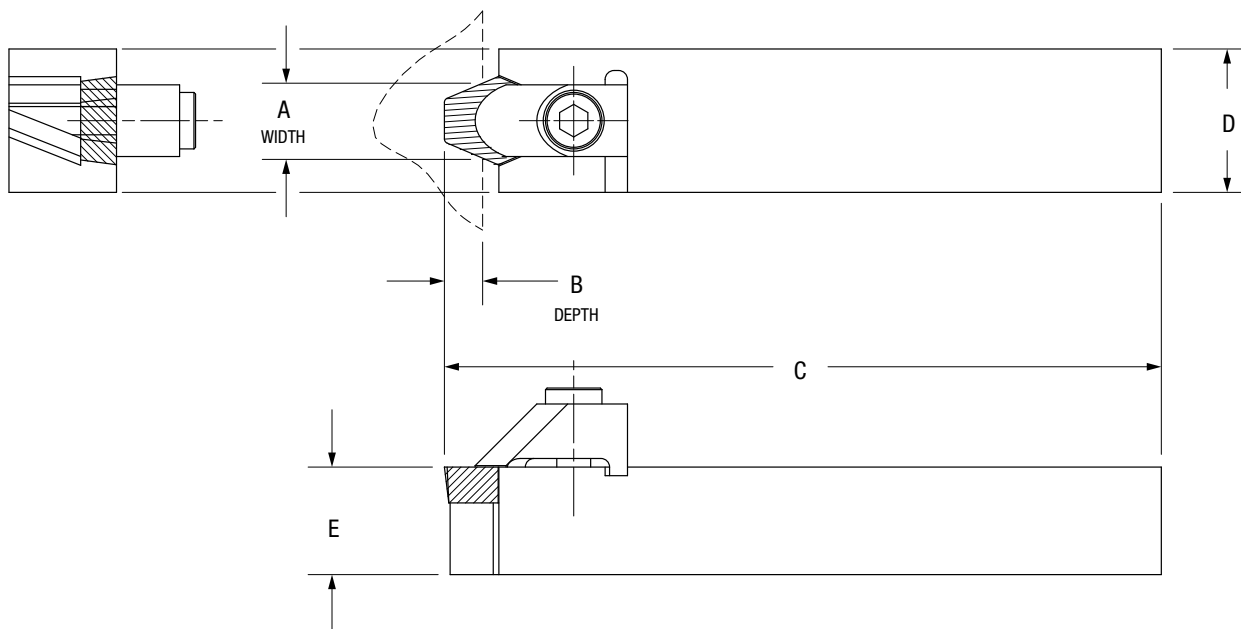
Part Information:

Part Name: _____

Clad Material: _____ Insert Grade: _____

Quote quantities: Heads: _____ Cartridges: _____ Inserts: _____

Additional comments: _____



Dimensions *(Please provide required tolerances.)*

A ± _____	B ± _____	C ± _____	D ± _____	E ± _____

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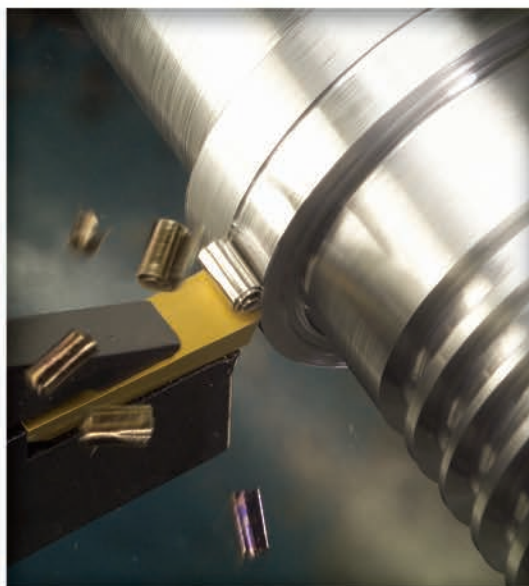
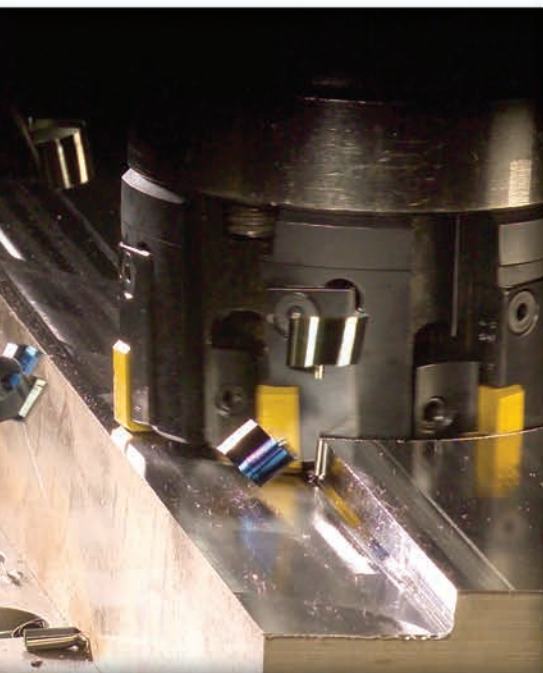
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