



GROOVEX

Innovative Grooving & Turning Solutions

MAIN CATALOG

External Machining | Internal Machining

METRIC

VARGUS is a world leading developer, manufacturer and supplier of high-quality, precision threading, grooving, turning and hand deburring tools.

Established in 1960, VARGUS is the cutting tools division of the NEUMO Ehrenberg Group, a multinational organization headquartered in Germany.

With 13 international subsidiaries, and a network of distributors, warehouses and certified ISO 9001 manufacturing facilities, VARGUS Ltd. serves customers in more than 100 countries around the globe. A customer-focused organization, VARGUS Ltd. is committed to providing products and solutions of the highest quality and excellent value, and is renowned for its technical expertise and uncompromising service.

COMPANY PRODUCTS:

GROOVEX

Innovative Grooving & Turning Solutions

, the newest product line by VARGUS, provides innovative solutions for grooving, boring and turning, in a wide range of applications.

External Machining:

VG-Cut: Complete Range of Turning Solutions for Grooving, Parting Off, Turning & Profiling, Face Grooving, and Threading.

GrooVical: Precise Grooving & Turning for shallow grooves.

Internal Machining:

microscope: Micromachining Solutions for Boring, Grooving & Threading in **Bores from 1.0 mm.**

Mini-V: All-Inclusive Range of Small Parts Machining Solutions for Boring, Grooving & Threading in **Bores from 7.8 mm.**

VARDEX

Advanced Threading Solutions

is the company's prominent product line for Thread Turning, Thread Milling, Gear Milling Solutions, and specialized solutions for the Oil & Gas industry.

SHAVIV

Leading Deburring Solutions

, manufactures world leading hand-deburring solutions for metal, plastic and wood.





Contents

EXTERNAL MACHINING

Semi Finishing



VG-Cut

Introduction..... 10

Technical Data..... 14

Inserts

Ordering Code System..... 21

Parting Off & Deep Grooving:

Double Sided Inserts (2.0 - 6.0 mm)..... 22

Single Sided Inserts (2.0 - 4.0 mm)..... 23

Turning & Profiling (2.0 - 6.0 mm)..... 24

Threading (3.0 mm)..... 25

Toolholders

Ordering Code System..... 27

External Monoblock Tools..... 28

Reinforced External Monoblock Tools..... 29

Blades..... 30

Blade Holders..... 31

Radial Modules..... 32

Radial Bodies..... 33

Radial Modules with HPC..... 34

Face Grooving Modules with HPC..... 35

Modular Bodies with HPC..... 37

Finishing



GrooVical

Introduction..... 40

Technical Data..... 41

Inserts

Ordering Code System..... 43

Close to Shoulder:

Super Positive Rake Grooving..... 44

Turning & Grooving Chip Former..... 45

Square Grooving..... 46

Round Grooving..... 47

Parting Off..... 48

GV29 Neutral:

Square Grooving..... 49

Round Grooving..... 49

Toolholders

Ordering Code System..... 50

Close to Shoulder External Toolholders..... 51

Close to Shoulder External Toolholders 90°... 52

External Toolholders 90° (GV29)..... 53

External Toolholders (GV29)..... 53

INTERNAL MACHINING

Semi Finishing



VG-Cut

Technical Data.....	58
---------------------	----

Toolholders

Ordering Code System.....	61
Internal Grooving & Turning.....	62

Finishing



GrooVical

Technical Data.....	64
---------------------	----

Toolholders

Ordering Code System.....	66
Close to Shoulder Internal Toolholders.....	67
Internal Toolholders (GV29).....	67



Mini-V

Introduction.....	70
Technical Data.....	71

Inserts

Ordering Code System.....	73
Boring.....	74
Boring with Chip Former.....	74
Profiling 30°.....	75
Profiling 45°.....	75
Back Boring.....	76
Chamfering.....	76
Grooving DIN 472 - Sharp Corner Radius.....	77
Grooving - 0.05 mm Corner Radius.....	78
Grooving - 0.2 mm Corner Radius.....	79
Round Grooving DIN 7993.....	80
Square Face Grooving.....	81
Round Face Grooving.....	82
Threading.....	83

Toolholders

Ordering Code System.....	86
Carbide Shank.....	87
Reinforced Carbide Shank.....	88
Alloy Steel Shank.....	89
Sleeves.....	90



microScope

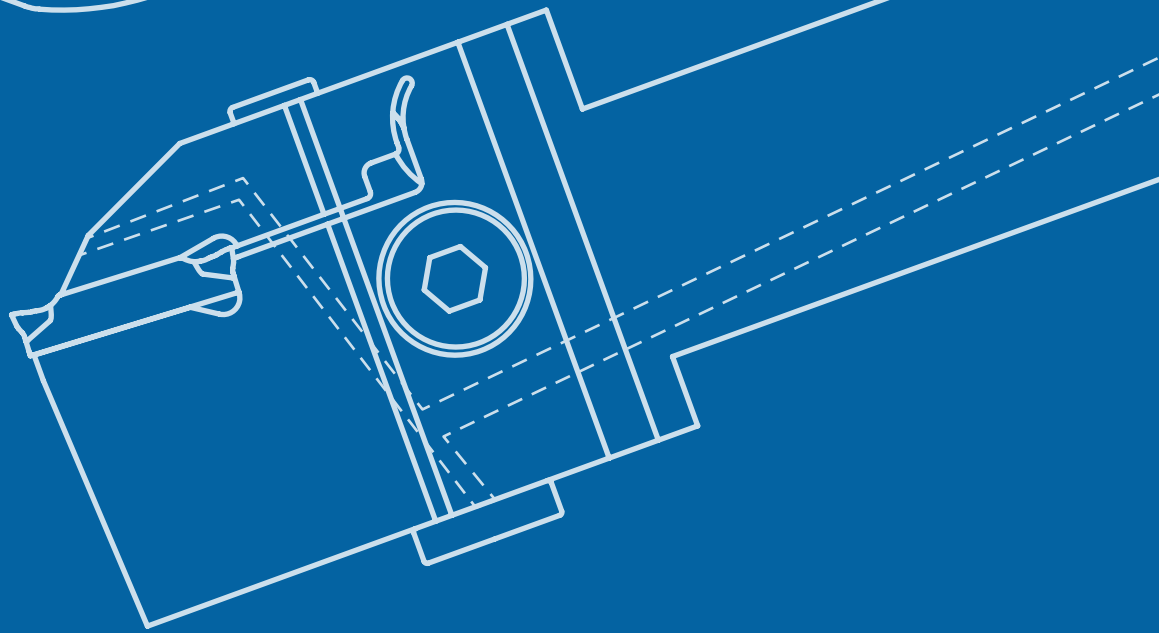
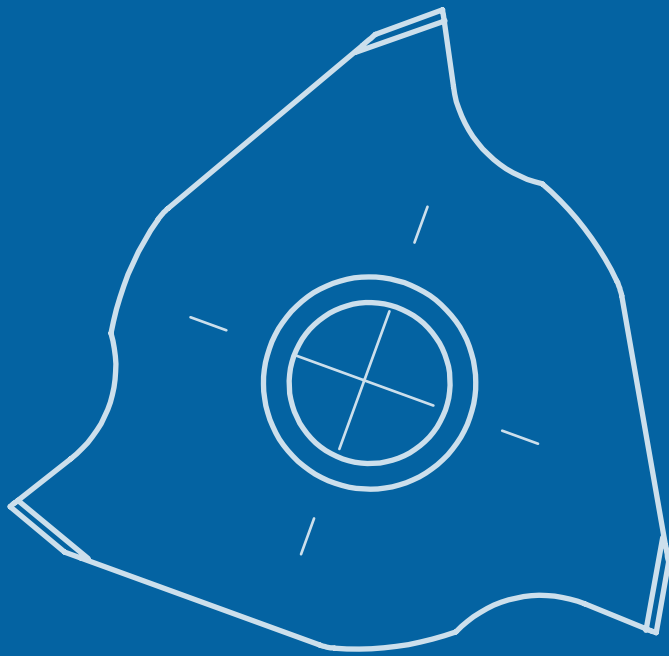
Introduction.....	92
Technical Data.....	94

Inserts

Ordering Code System.....	99
Boring.....	100
Boring with Chip Breaker.....	103
Boring with Chip Former.....	104
Boring 20°.....	105
Boring 90°.....	105
Boring & Profiling.....	106
Back Boring.....	107
Boring & Chamfering 45°.....	108
Face Chamfering 45°.....	108
Square Grooving.....	109
Round Grooving.....	111
Pre-Part Off.....	111
Face Grooving Internal.....	112
Face Grooving External.....	112
Threading.....	113

Toolholders

Ordering Code System.....	116
Shrink Tools.....	117
Round Tools.....	118
Round Double Sided Tools.....	118
Holder with Round Shank - 4 Flats.....	119
Holder with Round Shank - 2 Flats.....	120
Holder with Square Shank.....	121
Holder with Drop Head.....	121



EXTERNAL MACHINING

Semi Finishing

VG-Cut 9

Finishing

GrooVical 39



EXTERNAL MACHINING | **SEMI FINISHING**

VG-Cut

Deep Grooving, Threading, Turning,
Parting Off & Face Grooving Applications

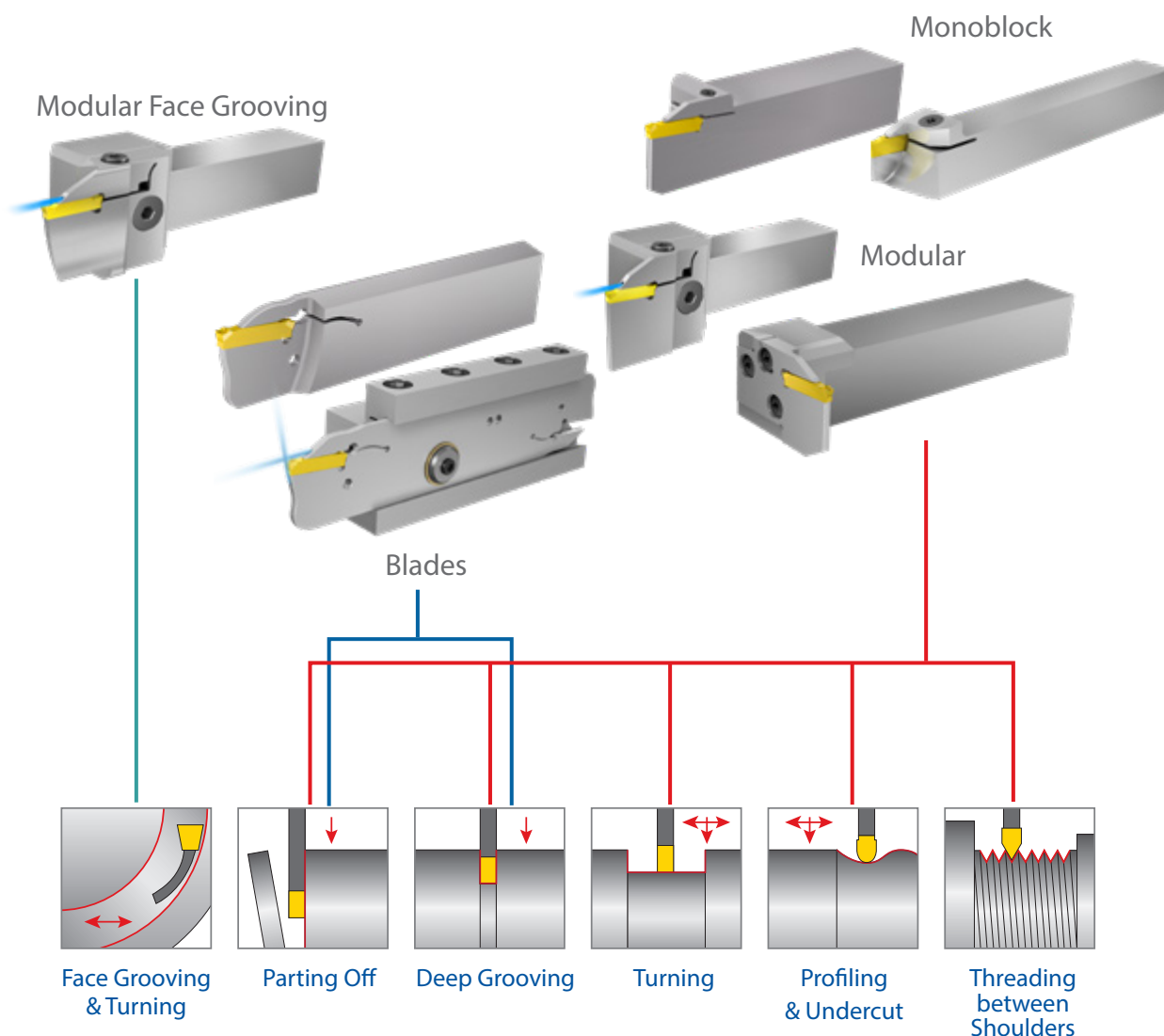
VG-Cut | Complete Range of Turning Solutions

Deep Grooving, Threading, Parting Off, Boring and Face Grooving

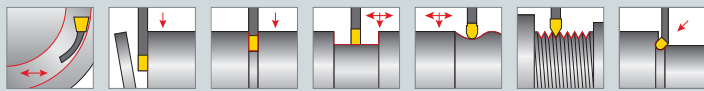
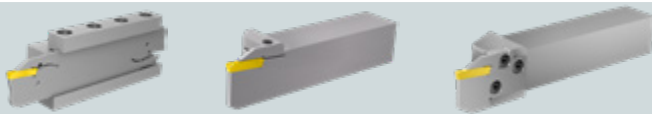
The new family of **VG-Cut** tools by GROOVEX, provides a wider range of applications and options within the same insert pocket of Deep Grooving, Parting Off, Turning, Profiling, Boring, Face Grooving and Threading. VG-Cut inserts also offer a variety of chip formers and carbide grades, making the **VG-Cut** program a distinctly versatile system.

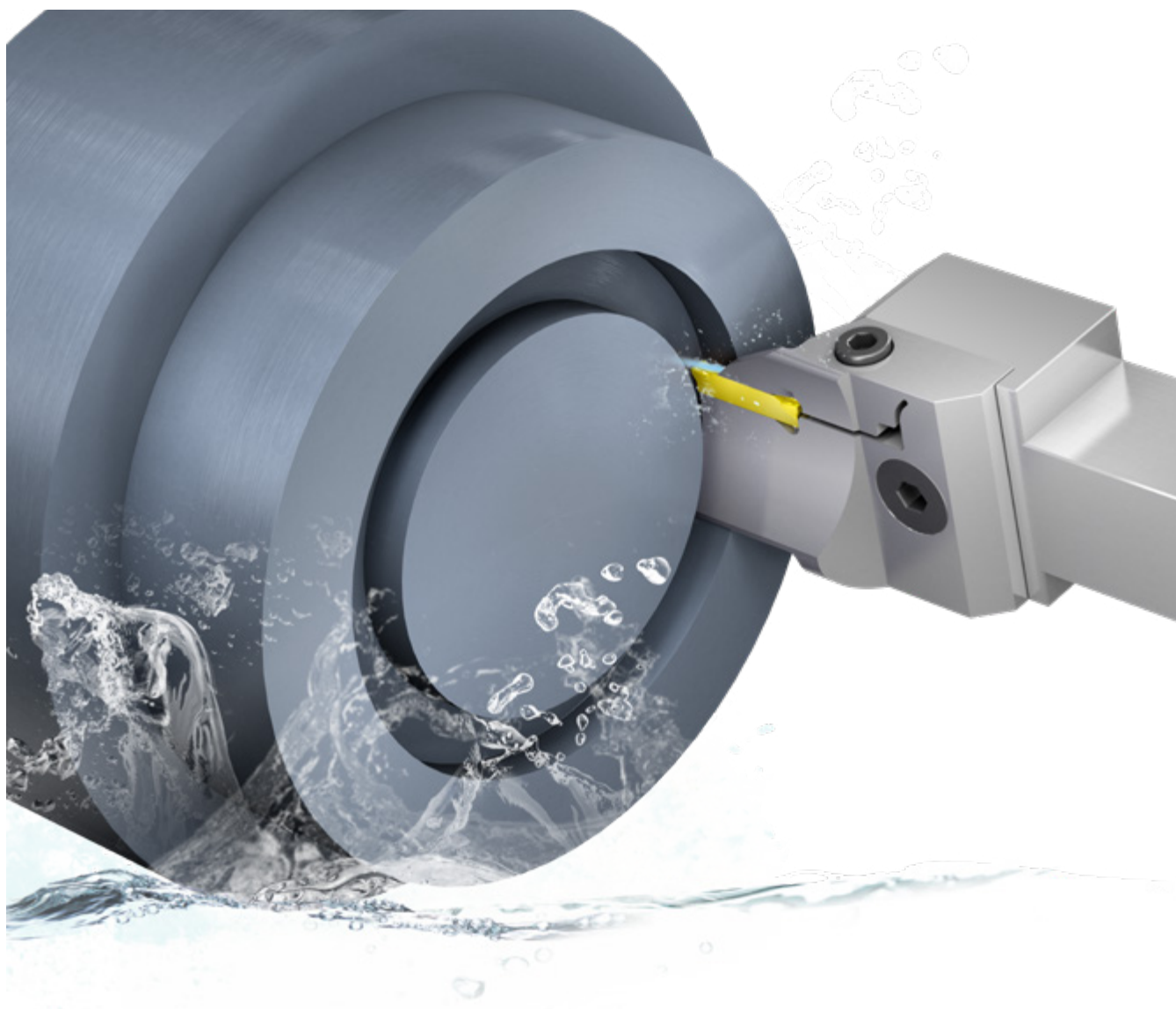
VG-Cut tools cover a wide range of Threading Standards for machining between shoulders and close to the spindle for up to shoulder depth of 10.0 mm.

The **VG-Cut**, with its unique multifunctional geometry, minimizes inventory for the end-user in an extensive selection of applications.

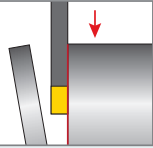
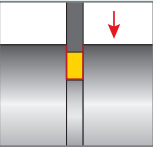


Insert, Tool and Cutting Data Selection Guide

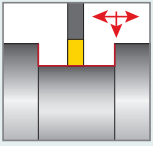
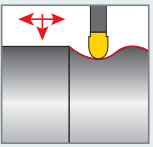
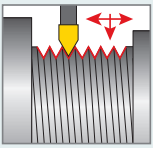
A	Identify the Application																																																									
B	Identify the Designated Work Piece Material	P Alloy Steel	M Stainless Steel	K Cast Iron	N Non-Ferrous	S Heat Resistance	H Hardened Material																																																			
C	Designated Chip Former Geometry for Selected Applications																																																									
D	Designated Carbide Grade for Desired Application	VKG VPG VMG																																																								
E	Selecting Insert and Tool as Required by Operation																																																									
F	Cutting Data According to Selected Items	<table border="1"> <tbody> <tr> <td rowspan="4">Stainless Steel</td> <td>15</td> <td>Stainless Steel</td> <td>Non Hardened</td> <td>200</td> <td>50-120</td> <td>60-160</td> <td></td> </tr> <tr> <td>16</td> <td>Stainless Steel Cast Ferritic</td> <td>Hardened</td> <td>330</td> <td>40-100</td> <td>50-140</td> <td></td> </tr> <tr> <td>17</td> <td>Stainless Steel Cast Austenitic</td> <td>Austenitic</td> <td>200</td> <td>50-120</td> <td>60-160</td> <td></td> </tr> <tr> <td>18</td> <td>Stainless Steel Cast Austenitic</td> <td>Hardened</td> <td>330</td> <td>40-100</td> <td>50-140</td> <td></td> </tr> <tr> <td rowspan="3">Cast Iron</td> <td>28</td> <td>Malleable Cast Iron</td> <td>Ferritic (short chips)</td> <td>130</td> <td></td> <td>160-280</td> <td></td> </tr> <tr> <td>29</td> <td>Cast Iron</td> <td>Pearlitic (long chips)</td> <td>230</td> <td></td> <td>140-260</td> <td></td> </tr> <tr> <td>30</td> <td>Cast Iron</td> <td>Low Tensile Strength</td> <td>180</td> <td></td> <td>160-240</td> <td>160-280</td> </tr> </tbody> </table>						Stainless Steel	15	Stainless Steel	Non Hardened	200	50-120	60-160		16	Stainless Steel Cast Ferritic	Hardened	330	40-100	50-140		17	Stainless Steel Cast Austenitic	Austenitic	200	50-120	60-160		18	Stainless Steel Cast Austenitic	Hardened	330	40-100	50-140		Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130		160-280		29	Cast Iron	Pearlitic (long chips)	230		140-260		30	Cast Iron	Low Tensile Strength	180		160-240	160-280
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Designated Chip Former Geometry for Parting Off and Grooving

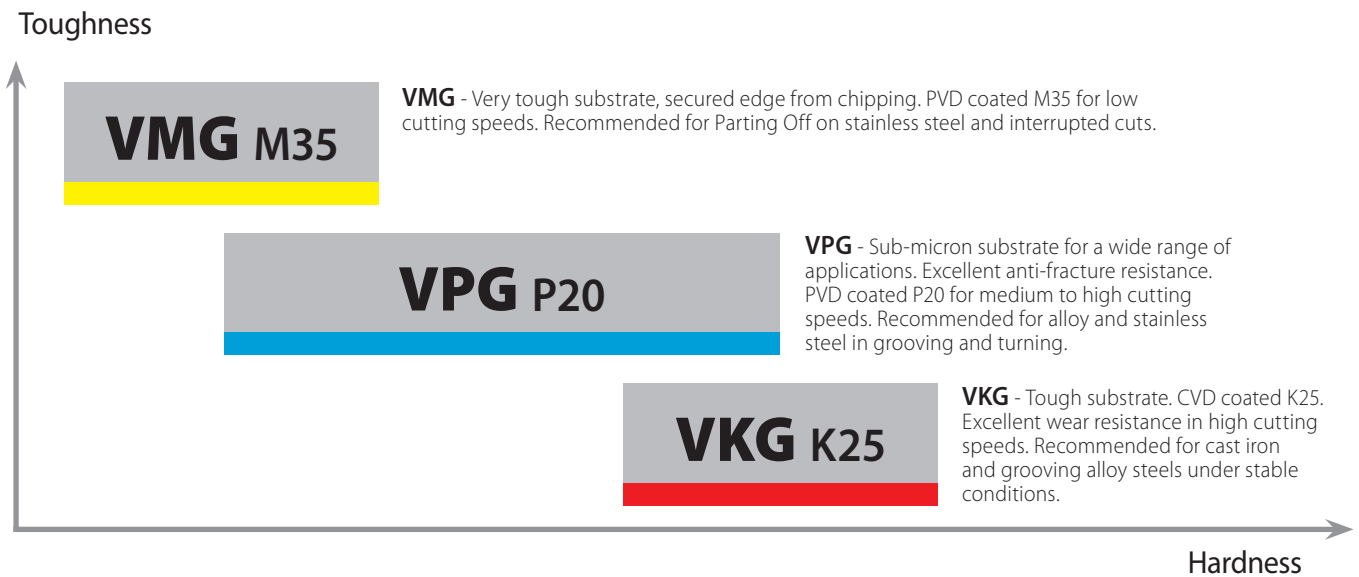
Application	Material Group	Standard Conditions	Extreme Conditions
 Parting Off	P Alloy Steel K Cast Iron H Hardened Material	 GT Recommended choice for machining alloy and stainless steel. Positive rake chip former leads to low cutting forces during cutting. A multifunctional chip former for parting, grooving and turning.	 GP Recommended choice for machining cast iron, for interrupted cuts and for unstable applications where accuracy and overall machining stability are not clear. Reinforced cutting edge for parting off and grooving.
 Grooving	M Stainless Steel N Non-Ferrous S Heat Resistance P Mild Steel	 GM/GF Recommended choice for stainless steel. Positive sharp cutting edge decreases build-up on edge for parting off and grooving in low feeds.	 GT Recommended choice for machining alloy and stainless steel. Positive rake chip former leads to low cutting forces during cutting, with multifunctional chip former for parting, grooving and turning.

Designated Chip Former Geometry for Turning, Profiling and Threading

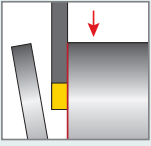
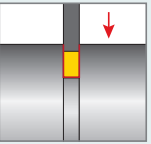
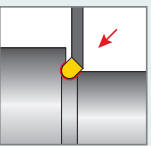
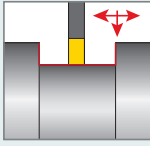
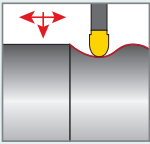
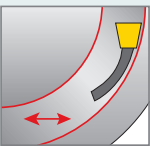
Application	Standard Conditions
 Turning	 GT Recommended choice for machining alloy and stainless steel. Positive rake chip former leads to low cutting forces during cutting, with multifunctional chip former for parting off, grooving and turning.
 Profiling	 GR Recommended choice for grooving, undercut and profiling. Round shape geometric for profiling, and positive rake chip former with multifunctional chip control.
 Threading	 RS/LS Varied range of threading standards for machining between shoulders and close to the spindle.

Designated Carbide Grade for Desired Application

Toughness vs. Hardness

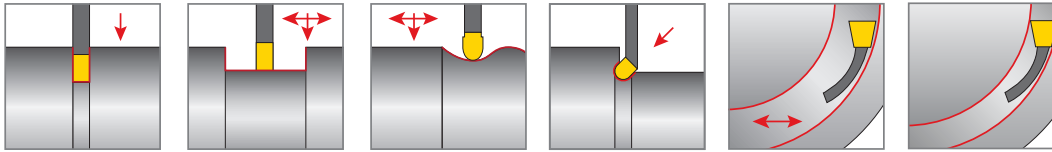


Recommended Carbide Grade for Designated Application

Application	Improved Chipping Resistance	Improved Wear Resistance
 Parting Off	VMG M35 ↔ VPG P20	
 Grooving	VPG P20 ↔ VKG K25	
 Undercut	VMG M35 ↔ VPG P20	
Application	Improved Chipping Resistance	Improved Wear Resistance
 Turning	VPG P20 ↔ VKG K25	
 Profiling	VPG P20 ↔ VKG K25	
 Face Turning	VPG P20 ↔ VKG K25	

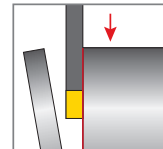
Technical Data

Recommended Cutting Speeds Vc [m/min]



Material Group	Vargus No.	Material		Hardness Brinell HB	Carbide Grade		
					VMG PVD M35	VPG PVD P20	VKG CVD K25
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	100-160	120-260	120-280
	2		Medium Carbon (C=0.25-0.55%)	150	80-140	90-220	90-250
	3		High Carbon (C=0.55-0.85%)	170	80-140	90-220	90-250
	4	Low Alloy Steel (alloying elements ≤ 5%)	Non Hardened	180	80-140	90-220	90-250
	5		Hardened	275	50-120	60-150	60-180
	6	High Alloy Steel (alloying elements > 5%)	Annealed	200	50-100	90-150	90-250
	7		Hardened	325	40-70	50-100	60-160
	8	Cast Steel	Low Alloy (alloying elements < 5%)	200	50-100	90-150	90-250
	9		High Alloy (alloying elements > 5%)	225	50-100	60-150	60-180
	10						
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	50-80	60-160	
	12		Hardened	330	40-80	50-140	
	13	Stainless Steel Austenitic	Austenitic	180	50-80	60-160	
	14		Super Austenitic	200	50-80	60-160	
	15	Stainless Steel Cast Ferritic	Non Hardened	200	50-80	60-160	
	16		Hardened	330	40-80	50-140	
	17	Stainless Steel Cast Austenitic	Austenitic	200	50-80	60-160	
	18		Hardened	330	40-80	50-140	
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130		160-200	160-280
	29		Pearlitic (long chips)	230		140-220	140-260
	30	Grey Cast Iron	Low Tensile Strength	180		160-200	160-280
	31		High Tensile Strength	260		100-200	100-240
	32	Nodular Sg Iron	Ferritic	160		100-200	100-240
	33		Pearlitic	260		100-200	100-240
N(k) Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	150-300		
	35		Aged	100	150-250		
	36	Aluminium Alloys	Cast	75	150-300		
	37		Cast & Aged	90	150-300		
	38	Aluminium Alloys	Cast Si 13-22%	130	150-250		
	39	Copper and Copper Alloys	Brass	90	150-300		
	40		Bronze And Non Lead Copper	100	150-300		
S(M) Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	25-40	30-50	
	20		Aged (iron based)	280	25-35	20-50	
	21		Annealed (nickel or cobalt based)	250	25-35	20-50	
	22		Aged (nickel or cobalt based)	350	25-35	20-50	
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	25-40	30-50	
	24		α+β Alloys	1050Rm	25-60	30-70	
H(k) Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRC		20-40	30-50
	26			51-55HRC		15-30	25-45

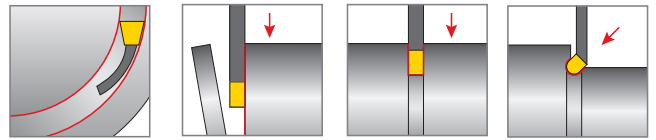
Vc [m/min] for Parting Off



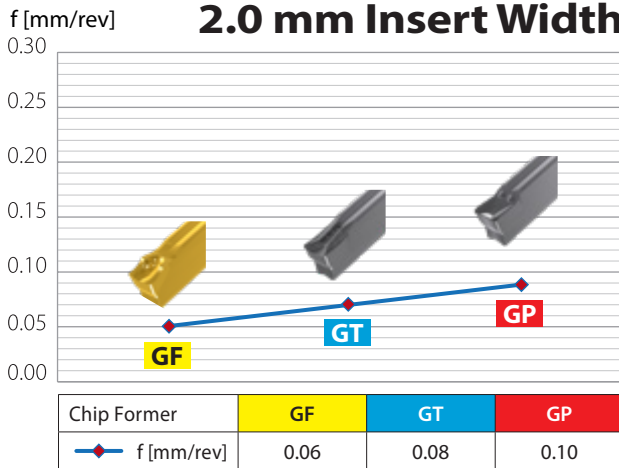
For Parting Off, improved chip forming and chip evacuation; **reduce speed by ≈ 30%.**

For gummy materials, such as stainless steel and heat resistant metals or in case of build up on edge (cold welding), **increase speed by ≈ 20%.**

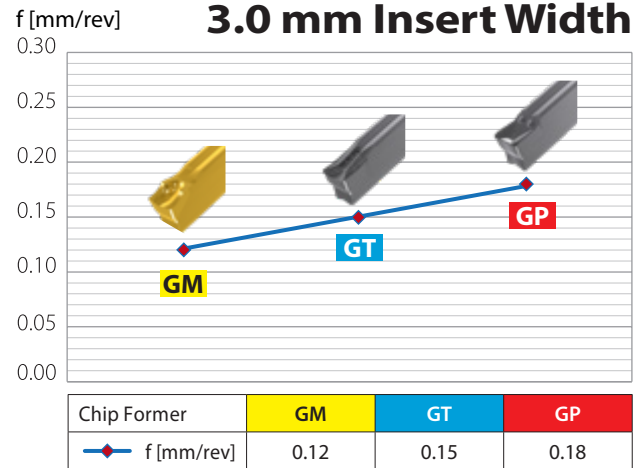
Feed Rate (f) Starting Point for Deep Grooving, Face Grooving & Parting Off



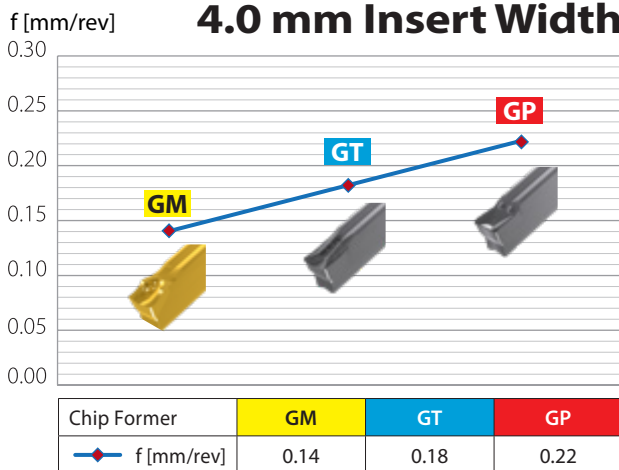
2.0 mm Insert Width



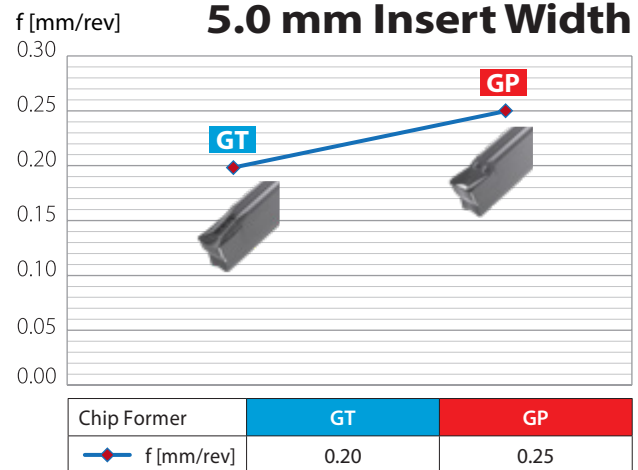
3.0 mm Insert Width



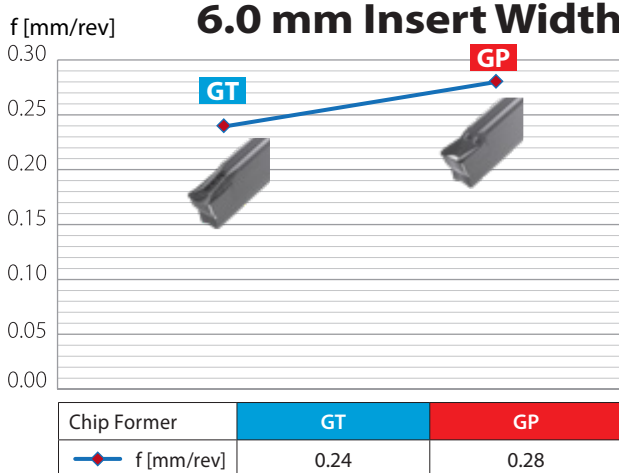
4.0 mm Insert Width



5.0 mm Insert Width



6.0 mm Insert Width



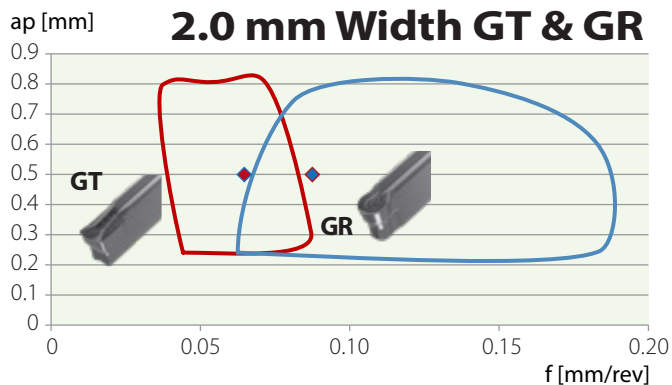
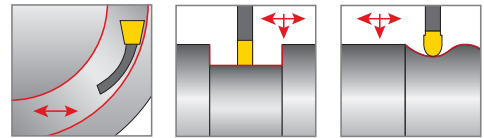
Correct chip forming is essential for chip evacuation. Low feed rates with sufficient chip evacuation improve process stability and tool life. Feed rate should be increased only when improved evacuation is needed to prevent wall scratching or chip entanglement.

For Parting Off, it is recommended to reduce feed rate by 30% while using R / L inserts.

For Parting Off, it is recommended to reduce feed rate by 50% as the insert approaches rotation center. Reduce feed when the insert approaches approx. 6.0 mm diameter.

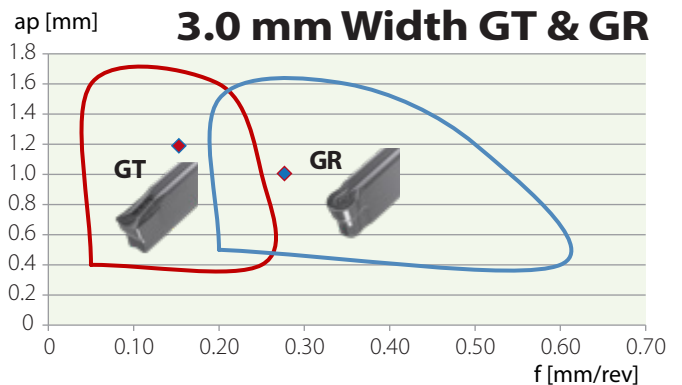
For better chip evacuation in **Face Grooving**, creating short chips is preferable. It is therefore recommended to work in short intervals (pecking), at a maximum grooving depth of twice the insert width. Taking into consideration the workpiece material and groove diameter, it is recommended to begin the first cut at no longer than the insert's width.

Feed Rate (f) and Depth of Cuts for Axial Turning, Profiling and Face Grooving



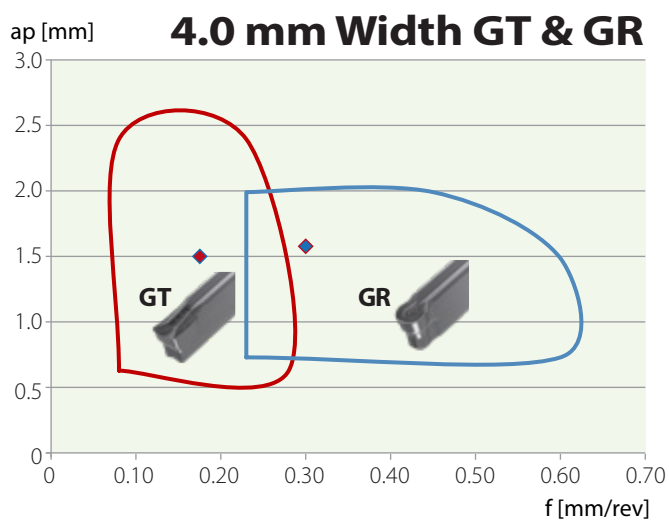
Recommended Starting Point:

	GT 2.0 mm	GR 2.0 mm
ap [mm]	0.5	0.5
f [mm/rev]	0.06	0.08



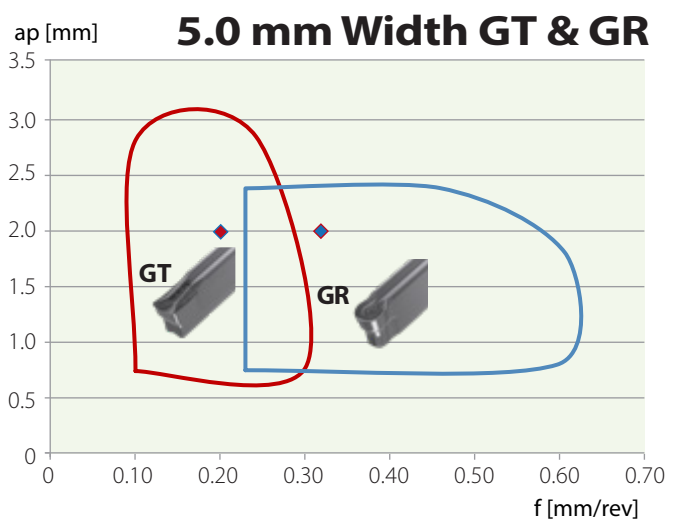
Recommended Starting Point:

	GT 3.0 mm	GR 3.0 mm
ap [mm]	1.20	1.00
f [mm/rev]	0.14	0.25



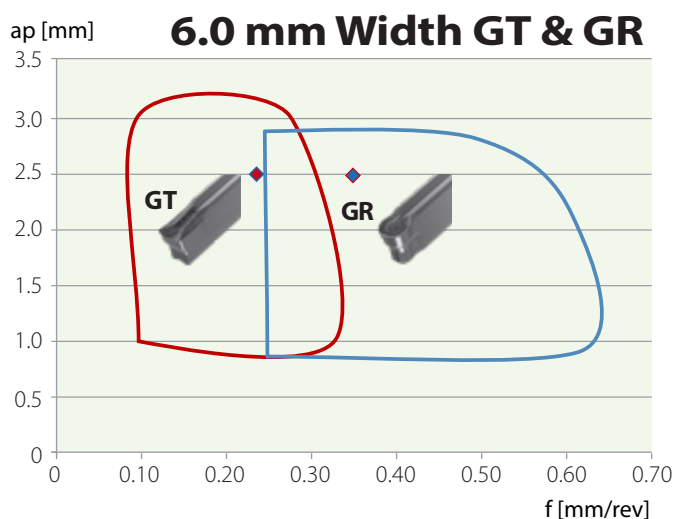
Recommended Starting Point:

	GT 4.0 mm	GR 4.0 mm
ap [mm]	1.50	1.60
f [mm/rev]	0.18	0.30



Recommended Starting Point:

	GT 5.0 mm	GR 5.0 mm
ap [mm]	2.0	2.0
f [mm/rev]	0.20	0.32



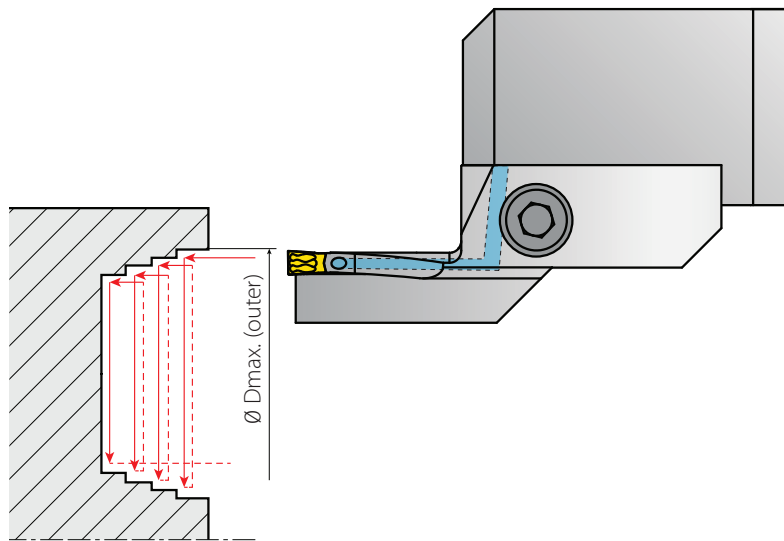
Recommended Starting Point:

	GT 6.0 mm	GR 6.0 mm
ap [mm]	2.50	2.50
f [mm/rev]	0.24	0.35

Face Groove and Turn Machining Recommendations

Roughing:

Method 1:



1. Start by face grooving close to outer diameter, followed by face turning toward the center.
2. Axial retract away from the workpiece for about .012" (0.3 mm).
3. Repeat the above cycle (points 1 & 2), each time deeper into the workpiece, with a maximum grooving depth of twice the insert width.
4. Keep about .016" (0.4 mm) of additional material on workpiece, which will be removed in the finishing operation as recommended below.

Method 2:

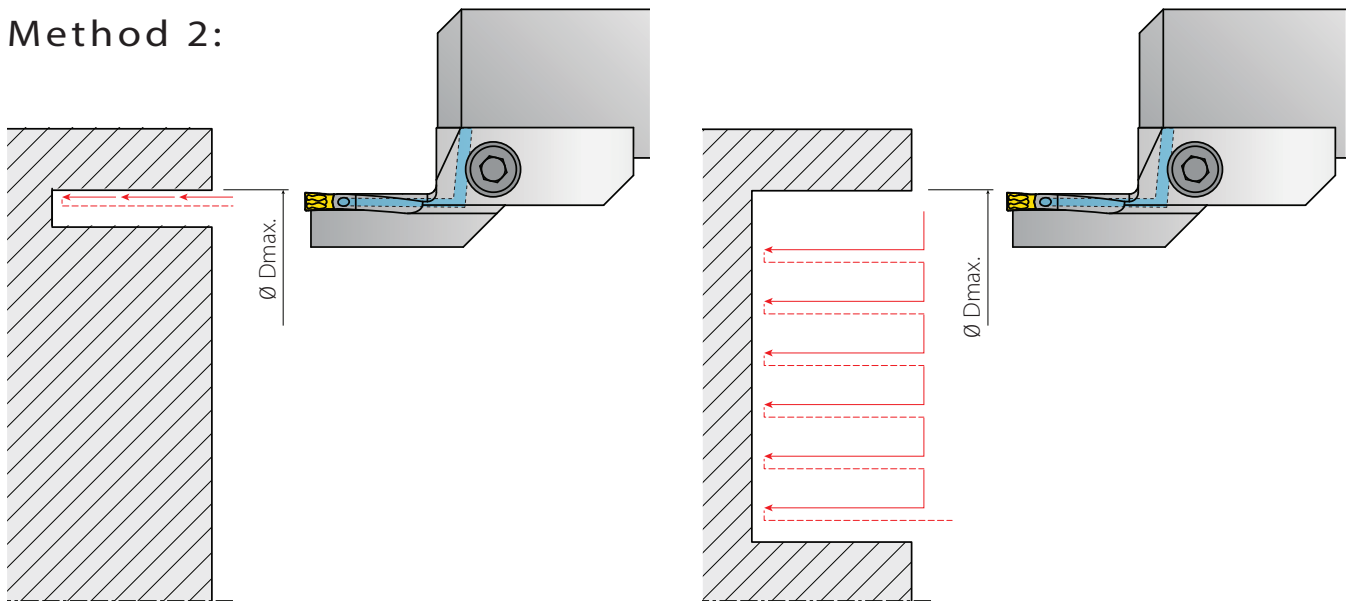


Figure A

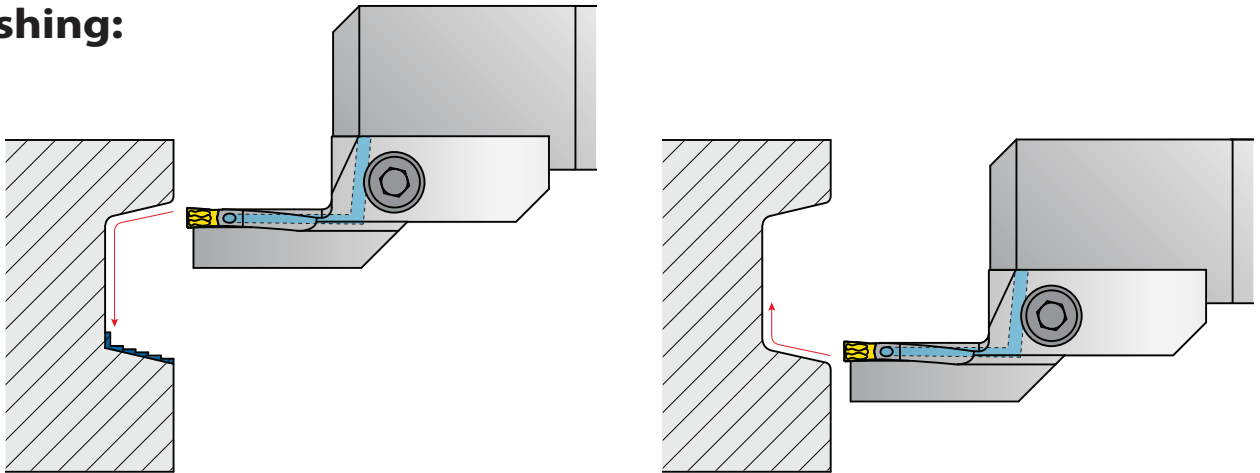
Figure B

1. Start by face grooving close to outer diameter (Figure A). Work in short intervals (pecking) at maximum grooving depth of twice the insert width.
2. Follow this by face grooving towards the center of the workpiece as required for covering the entire pocket shape (Figure B). Each additional groove width should be smaller than the insert width by approx. 0.3 mm.
3. Only the first groove (Figure A) is done in short intervals (pecking) for better chip evacuation. Other grooves can be done continuously based on recommended feeds for the application.
4. Recommended chip forming for Alloy Steel is GP. For Stainless Steel please use GT.

See the following page for Finishing Recommendations.

Face Groove and Turn Machining Recommendations

Finishing:



1. Start the Profiling operation from the outer diameter of the workpiece and work in. Generate the desired radius followed by the face turning operation close to the tangential point of the inner radius.
2. Start the Profiling operation from the inner diameter towards the bottom of the workpiece, generate the desired radius as needed.

Selecting the Correct Face Grooving Module

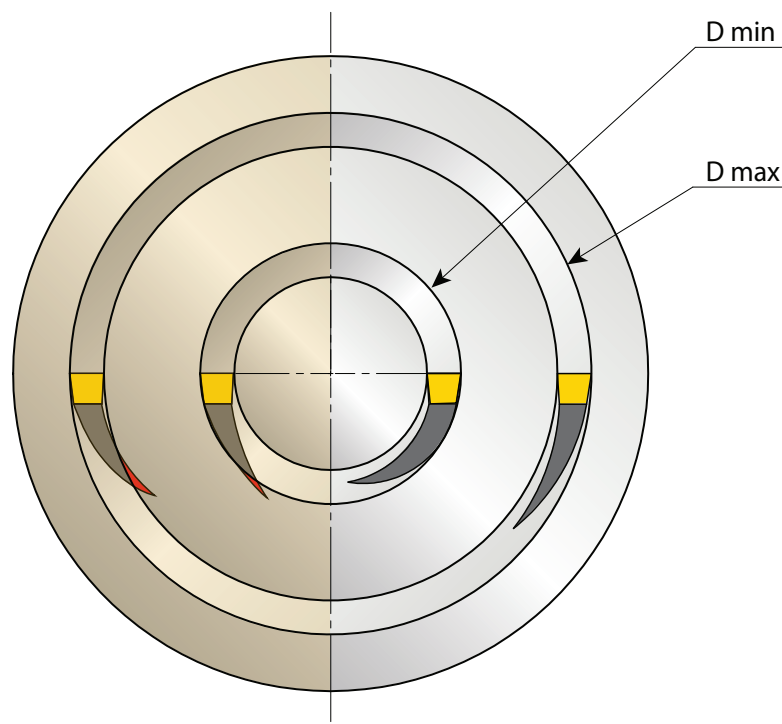
VG Cut Ordering Code Example: **VGFR-4860-T24-4C**

D max

D min

Wrong Support

Correct Support

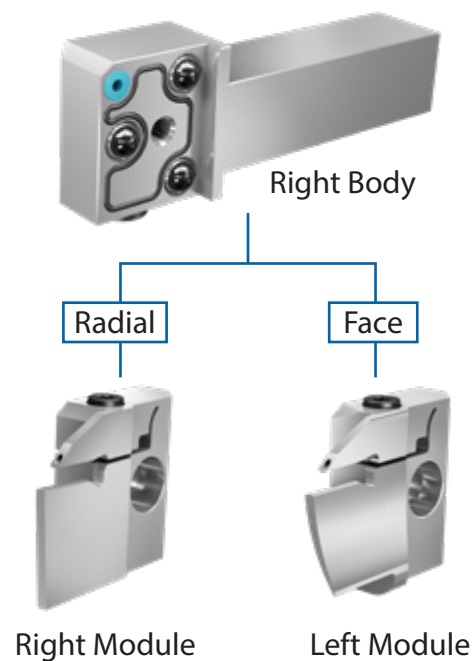


User Guide for Modular System

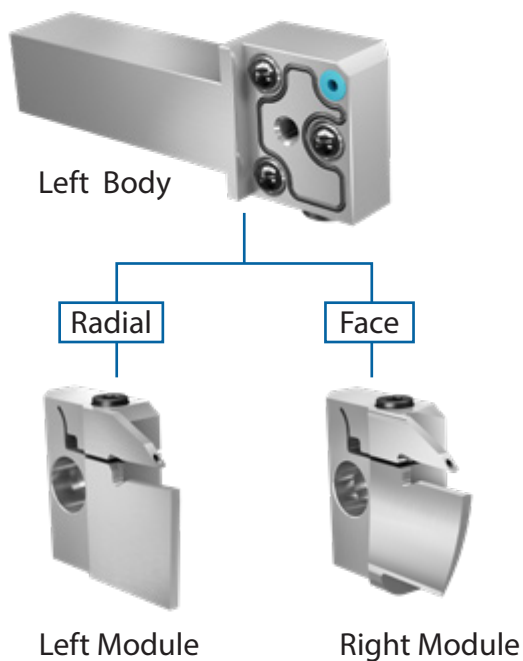
Choosing the correct Holder for the application (Body + Module):

* High pressure coolant system shown.

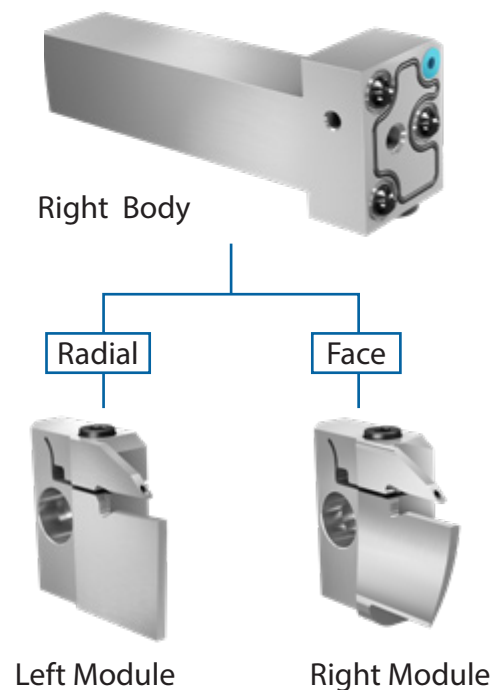
Parallel Right Tools



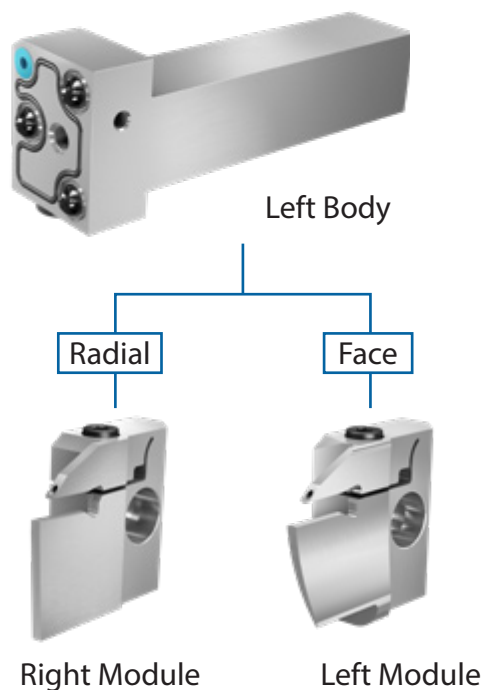
Parallel Left Tools



90° Right Tools

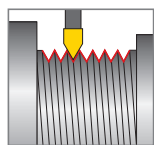


90° Left Tools



Technical Data

Recommended Cutting Speeds Vc [m/min] for Threading



Material Group	Vargus No.	Material		Hardness Brinell HB	Carbide Grade
					VPG PVD P20
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	120-260
	2		Medium Carbon (C=0.25-0.55%)	150	90-220
	3		High Carbon (C=0.55-0.85%)	170	90-220
	4	Low Alloy Steel (alloying elements ≤ 5%)	Non Hardened	180	90-220
	5		Hardened	275	60-160
	6		Hardened	350	50-100
	7	High Alloy Steel (alloying elements > 5%)	Annealed	200	90-220
	8		Hardened	325	50-100
	9	Cast Steel	Low Alloy (alloying elements < 5%)	200	90-220
	10		High Alloy (alloying elements > 5%)	225	60-160
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	60-160
	12		Hardened	330	50-140
	13	Stainless Steel Austenitic	Austenitic	180	60-160
	14		Super Austenitic	200	60-160
	15	Stainless Steel Cast Ferritic	Non Hardened	200	60-160
	16		Hardened	330	50-140
	17	Stainless Steel Cast Austenitic	Austenitic	200	60-160
	18		Hardened	330	50-140
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	160-240
	29		Pearlitic (long chips)	230	140-220
	30	Grey Cast Iron	Low Tensile Strength	180	160-240
	31		High Tensile Strength	260	100-200
	32	Nodular Sg Iron	Ferritic	160	100-200
	33		Pearlitic	260	100-200
N(k) Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	200-450
	35		Aged	100	200-350
	36	Aluminium Alloys	Cast	75	200-450
	37		Cast & Aged	90	200-450
	38	Aluminium Alloys	Cast Si 13-22%	130	200-350
	39	Copper and Copper Alloys	Brass	90	200-450
	40		Bronze And Non Leaded Copper	100	200-450
S(m) Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	30-50
	20		Aged (iron based)	280	20-50
	21		Annealed (nickel or cobalt based)	250	20-50
	22		Aged (nickel or cobalt based)	350	20-50
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	30-50
	24		α+β Alloys	1050Rm	30-70
H(k) Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	20-40
	26			51-55HRc	15-30

VG-Cut Inserts

Parting Off & Deep Grooving - Double Sided Inserts (2.0 - 6.0 mm).....	22
Parting Off & Deep Grooving - Single Sided Inserts (2.0 - 4.0 mm).....	23
Turning & Profiling (2.0 - 6.0 mm).....	24
Threading (3.0 mm).....	25



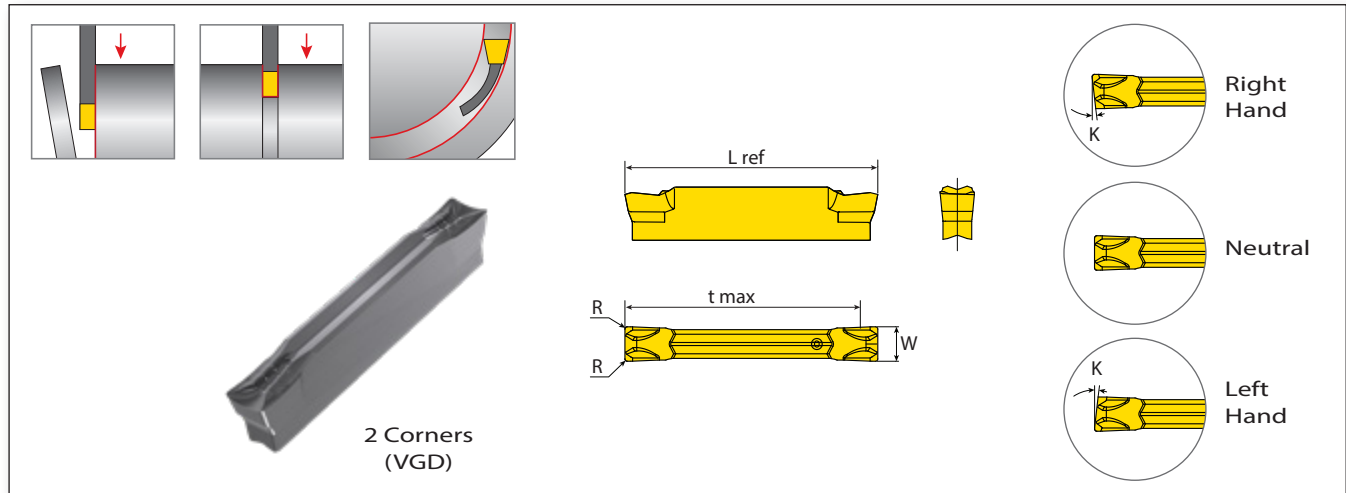
VG-Cut Inserts Ordering Code

VG	D	3.00	020	6R	GP	VPG
1	2	3	4	5	6	7

1 – Line Name Deep Grooving & Parting Off	2 – Number of Cutting Corners D - Double S - Single	3 – Insert Width 2.0, 3.0, 4.0, 5.0, 6.0 mm	4 – Corner Radius 0.20 mm Threading Standard
5 – RH or LH (for Grooving) 4, 6, 15 Deg. RH or LH None - Neutral	5 – RH or LH (for Threading) RH Helix LH Helix	6 – Top Rake Geometry GP, GM, GT, GR RS - Close to right shoulder LS - Close to left shoulder	7 – Carbide Grade VPG, VMG, VKG

Parting Off & Deep Grooving - Double Sided Inserts

2.0 - 6.0 mm Width

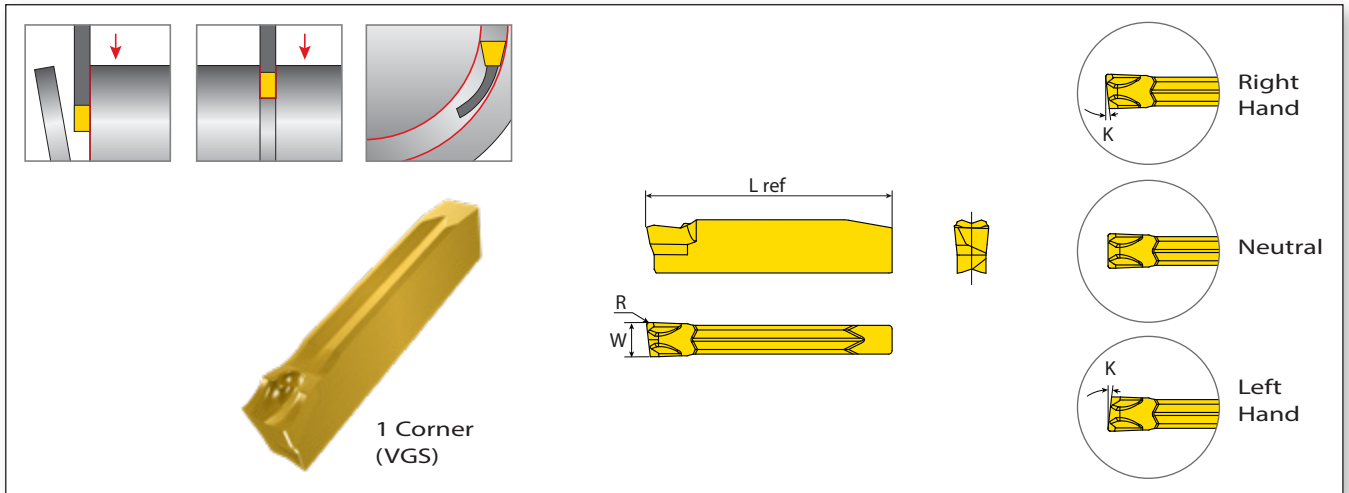


	Pocket Size	Ordering Code	Dimensions mm					Feed Range (mm/rev)	Grade		
			W ± 0.04	R	t max	K°	L ref		VPG	VMG	VKG
Positive cutting edge, for small parts, thin wall pipes & soft materials	GF	2 VGD2.00-020-GF	2.00	0.20	20.0	0.0	22.0	0.03 - 0.10	•	•	○
		2 VGD2.00-015-6R-GF	2.00	0.15	20.0	6.0	22.0	0.03 - 0.10	•	○	○
		2 VGD2.00-015-6L-GF	2.00	0.15	20.0	6.0	22.0	0.03 - 0.10	•	○	○
		2 VGD2.00-020-15R-GF	2.00	0.20	20.0	15.0	22.0	0.03 - 0.08	•	○	○
		2 VGD2.00-020-15L-GF	2.00	0.20	20.0	15.0	22.0	0.03 - 0.08	•	○	○
Positive sharp cutting edge, for low feed & speed	GM	3 VGD3.00-015-GM	3.00	0.15	20.0	0.0	22.0	0.06 - 0.16	•	○	•
		3 VGD3.00-030-GM	3.00	0.30	20.0	0.0	22.0	0.08 - 0.22	•	•	•
		3 VGD3.00-020-6R-GM	3.00	0.20	20.0	6.0	22.0	0.05 - 0.16	•	•	○
		3 VGD3.00-020-6L-GM	3.00	0.20	20.0	6.0	22.0	0.05 - 0.16	•	•	○
		4 VGD4.00-040-GM	4.00	0.40	23.0	0.0	25.0	0.08 - 0.25	•	•	○
Multipurpose geometry, for general use	GT	2 VGD2.00-020-GT	2.00	0.20	20.0	0.0	22.0	0.03 - 0.12	•	○	•
		3 VGD3.00-030-GT	3.00	0.30	20.0	0.0	22.0	0.05 - 0.15	•	○	•
		4 VGD4.00-020-GT	4.00	0.20	23.0	0.0	25.0	0.05 - 0.15	•	○	○
		4 VGD4.00-040-GT	4.00	0.40	23.0	0.0	25.0	0.05 - 0.18	•	○	•
		5 VGD5.00-040-GT	5.00	0.40	23.0	0.0	25.0	0.08 - 0.25	•	○	•
		6 VGD6.00-040-GT	6.00	0.40	23.0	0.0	25.0	0.10 - 0.25	•	○	•
Round multipurpose geometry for profiling & undercut	GR	2 VGD2.00-100-GR	2.00	1.00	18.0	0.0	22.0	0.03 - 0.12	•	○	○
		3 VGD3.00-150-GR	3.00	1.50	18.0	0.0	22.0	0.05 - 0.15	•	○	○
		4 VGD4.00-200-GR	4.00	2.00	20.0	0.0	25.0	0.05 - 0.18	•	○	•
		6 VGD6.00-300-GR	6.00	3.00	20.0	-	25.0	0.06 - 0.20	•	○	○
Blunt reinforced cutting edge for high feed & speed	GP	2 VGD2.00-020-GP	2.00	0.20	20.0	0.0	22.0	0.03 - 0.14	•	○	•
		3 VGD3.00-020-GP	3.00	0.20	20.0	0.0	22.0	0.06 - 0.20	•	•	•
		3 VGD3.00-015-6R-GP	3.00	0.15	20.0	6.0	22.0	0.06 - 0.16	•	•	○
		3 VGD3.00-015-6L-GP	3.00	0.15	20.0	6.0	22.0	0.06 - 0.16	○	•	○
		4 VGD4.00-030-GP	4.00	0.30	23.0	0.0	25.0	0.08 - 0.24	•	•	•
		4 VGD4.00-020-4R-GP	4.00	0.20	23.0	4.0	25.0	0.06 - 0.22	○	•	○
		4 VGD4.00-020-4L-GP	4.00	0.20	23.0	4.0	25.0	0.06 - 0.22	○	•	○
		5 VGD5.00-040-GP	5.00	0.40	23.0	0.0	25.0	0.08 - 0.28	•	○	•
		6 VGD6.00-040-GP	6.00	0.40	23.0	0.0	25.0	0.10 - 0.30	•	○	•

• In stock ○ Available upon request

Parting Off & Deep Grooving - Single Sided Inserts

2.0 - 4.0 mm Width

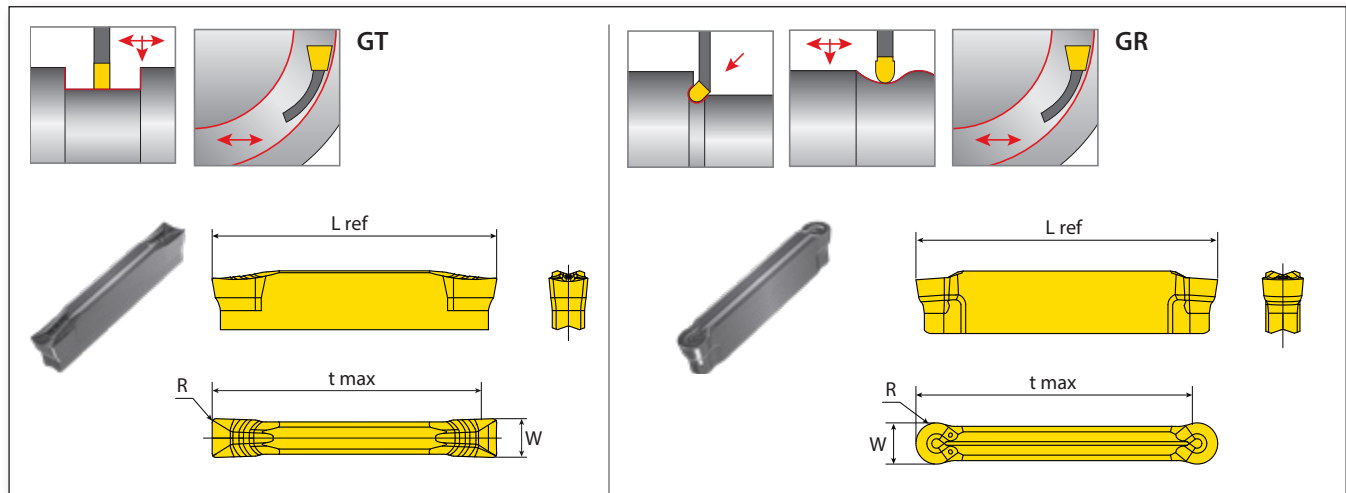


	Pocket Size	Ordering Code	Dimensions mm					Feed Range (mm/rev)	Grade			
			W ± 0.04	R	t max	K°	L ref		VPG	VMG	VKG	
Positive cutting edge, for small parts, thin wall pipes & soft materials	GF	2	VGS2.00-015-6R-GF	2.00	0.15	∞	6.0	21.3	0.03 - 0.10	○	●	○
		2	VGS2.00-015-6L-GF	2.00	0.15	∞	6.0	21.3	0.03 - 0.10	○	●	○
	Positive sharp cutting edge, for low feed & speed	GM	3	VGS3.00-020-GM	3.00	0.20	∞	0.0	22.0	0.08 - 0.22	●	●
3			VGS3.00-020-6R-GM	3.00	0.20	∞	6.0	21.3	0.05 - 0.16	○	●	○
3			VGS3.00-020-6L-GM	3.00	0.20	∞	6.0	21.3	0.05 - 0.16	○	●	○
4			VGS4.00-040-GM	4.00	0.40	∞	0.0	25.0	0.08 - 0.25	●	●	○
4			VGS4.00-040-4R-GM	4.00	0.40	∞	4.0	24.3	0.06 - 0.18	○	●	○
4			VGS4.00-040-4L-GM	4.00	0.40	∞	4.0	24.3	0.06 - 0.18	○	●	○
Blunt reinforced cutting edge for high feed & speed	GP	3	VGS3.00-020-GP	3.00	0.20	∞	0.0	22.0	0.06 - 0.20	●	●	○
		3	VGS3.00-020-6R-GP	3.00	0.20	∞	6.5	21.3	0.06 - 0.16	○	●	○
		3	VGS3.00-020-6L-GP	3.00	0.20	∞	6.5	21.3	0.06 - 0.16	○	●	○
		4	VGS4.00-030-GP	4.00	0.30	∞	0.0	25.0	0.08 - 0.24	●	●	○
		4	VGS4.00-030-4R-GP	4.00	0.30	∞	4.0	24.3	0.06 - 0.22	○	●	○
		4	VGS4.00-030-4L-GP	4.00	0.30	∞	4.0	24.3	0.06 - 0.22	○	●	○

● In stock ○ Available upon request

Turning & Profiling

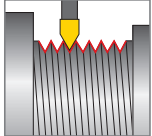
2.0 - 6.0 mm Width



	Pocket Size	Ordering Code	Dimensions mm					Feed Range (mm/rev)	Grade		
			W ± 0.05	R	t max	K°	L ref		VPG	VMG	VKG
Positive rake chip former with multifunctional chip control. Low cutting forces during cutting. GT	2	VG D2.00-020-GT	2.00	0.20	20.0	-	22.0	0.05 - 0.10	•	◦	•
	3	VG D3.00-030-GT	3.00	0.30	20.0	-	22.0	0.05 - 0.25	•	◦	•
	4	VG D4.00-020-GT	4.00	0.20	23.0	-	25.0	0.05 - 0.18	•	◦	◦
	4	VG D4.00-040-GT	4.00	0.40	23.0	-	25.0	0.08 - 0.28	•	◦	•
	5	VG D5.00-040-GT	5.00	0.40	23.0	-	25.0	0.08 - 0.25	•	◦	•
	6	VG D6.00-040-GT	6.00	0.40	23.0	-	25.0	0.10 - 0.28	•	◦	•
Round shape geometric design for profiling. Positive rake chip former and multifunctional chip control for undercut and profiling. GR	2	VG D2.00-100-GR	2.00	1.00	18.0	-	22.0	0.06 - 0.12	•	◦	◦
	3	VG D3.00-150-GR	3.00	1.50	18.0	-	22.0	0.06 - 0.18	•	◦	◦
	4	VG D4.00-200-GR	4.00	2.00	20.0	-	25.0	0.06 - 0.20	•	◦	•
	6	VG D6.00-300-GR	6.00	3.00	20.0	-	25.0	0.06 - 0.20	•	◦	◦

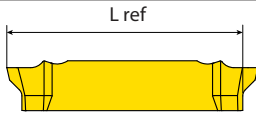
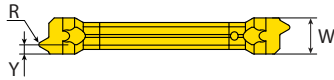
• In stock ◦ Available upon request

Threading 3.0 mm Width

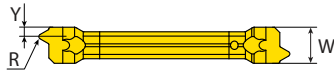


RS/LS Varied range of threading standards for machining between shoulders and close to spindle.



RS Full Profile



LS Full Profile



Partial Profile

To be used with Monoblock tools (VGE..T08 or T12) or reinforced monoblock tools (PH) only.

Partial Profile 60°

Pocket Size	Ordering Code	Dimensions mm					No. of Passes	Helix	Grade	Min. Thread Diameter
		W ref	Pitch mm	R	Y	L ref				
3	VGD3.0A60RH	3.00	0.5-1.5	0.05	1.68	21.9	5 - 8	1.5°	•	Partial Profile A60

■ In stock
 ○ Available upon request

Partial Profile 55°

Pocket Size	Ordering Code	Dimensions mm					No. of Passes	Helix	Grade	Min. Thread Diameter
		W ref	Pitch TPI	R	Y	L ref				
3	VGD3.0A55RH	3.00	48-16	0.05	1.68	21.9	5 - 8	1.5°	•	Partial Profile A55

■ In stock
 ○ Available upon request

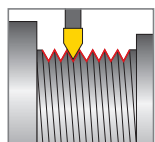
ISO Metric

Pocket Size	Ordering Code	Dimensions mm					No. of Passes	Helix	Grade	Min. Thread Diameter
		W ref	Pitch mm	h min	Y	L ref				
3	VGD3.0ISO0.50RH-RS/LS	3.00	0.50	0.31	0.53	21.9	5 - 7	2.5°	•	M3x0.5
3	VGD3.0ISO0.75RH-RS/LS		0.75	0.46	0.64		5 - 8		•	M5x0.75
3	VGD3.0ISO1.00RH-RS/LS		1.00	0.61	0.74		5 - 9		•	M6x1
3	VGD3.0ISO1.25RH-RS/LS		1.25	0.77	0.85		6 - 10		•	M8x1.25
3	VGD3.0ISO1.50RH-RS/LS		1.50	0.92	1.10		7 - 12		•	M10x1.5 Coarse
3	VGD3.0ISO1.75RH-RS/LS		1.75	1.07	1.20		8 - 14		•	M12x1.75 Coarse
3	VGD3.0ISO2.00RH-RS/LS		2.00	1.23	1.30		9 - 14		•	M16x2.0 Coarse
3	VGD3.0ISO2.50RH-RS/LS		2.50	1.53	1.55		8 - 14		•	M18x2.5 Coarse

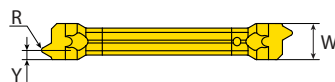
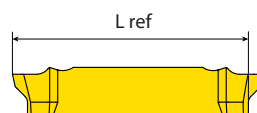
Defined by: R262 (DIN 13)
Tolerance class: 6H

■ In stock
 ○ Available upon request

Threading 3.0 mm Width (con't)



RS/LS Varied range of threading standards for machining between shoulders and close to spindle.



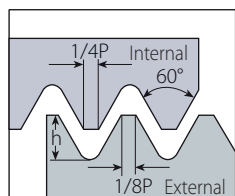
RS Full Profile



LS Full Profile

To be used with Monoblock tools (VGE..T08 or T12) or reinforced monoblock tools (PH) only.

American UN

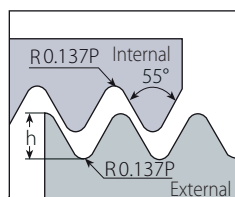


Defined by: ANSI B1.1:74
Tolerance class: 2B

Pocket Size	Ordering Code	Dimensions mm					No. of Passes	Helix	Grade	Min. Thread Diameter
		W ref	Pitch TPI	h min	Y	L ref		Deg	VPG	
3	VGD3.0UN32RH-RS/LS	3.00	32	0.49	0.66	21.9	5 - 8	2.5°	•	5/32-32 UNC
3	VGD3.0UN28RH-RS/LS		28	0.56	0.71		5 - 9		•	3/16-28 UNC
3	VGD3.0UN24RH-RS/LS		24	0.65	0.77		5 - 9		•	7/32-24 UNC
3	VGD3.0UN20RH-RS/LS		20	0.78	0.86		6 - 10		•	1/4-20 UNC
3	VGD3.0UN18RH-RS/LS		18	0.87	0.93		7 - 12		•	5/16-18 UNC
3	VGD3.0UN16RH-RS/LS		16	0.97	1.10		7 - 12		◦	3/8-16 UNC
3	VGD3.0UN14RH-RS		14	1.11	1.09		8 - 14		•	7/16-14 UNC
3	VGD3.0UN14RH-LS		14	1.11	1.09		8 - 14		◦	7/16-14 UNC
3	VGD3.0UN12RH-RS		12	1.30	1.30		8 - 14		•	9/16-14 UNC
3	VGD3.0UN12RH-LS		12	1.30	1.30		8 - 14		◦	9/16-14 UNC

• In stock ◦ Available upon request | LH Helix threads available upon request

Whitworth

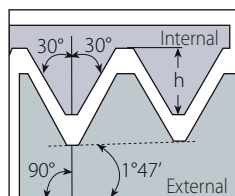


Defined by: B.S.84:1956,
DIN 259, ISO228/1:1982
Tolerance class: Medium class A

Pocket Size	Ordering Code	Dimensions mm					No. of Passes	Helix	Grade	Min. Thread Diameter
		W ref	Pitch TPI	h min	Y	L ref		Deg	VPG	
3	VGD3.0W19RH-RS/LS	3.00	19	0.86	0.95	21.9	7 - 12	2.5°	•	1/2-19BSW
3	VGD3.0W14RH-RS/LS		14	1.16	1.15		8 - 14		•	1/2-14BSW
3	VGD3.0W11RH/LH		11	1.48	1.68		8-14		•	5/8-11BSW

• In stock ◦ Available upon request | LH Helix threads available upon request

NPT



Defined by: USAS
B2.1:1968
Tolerance class: Standard NPT

Pocket Size	Ordering Code	Dimensions mm					No. of Passes	Helix	Grade	Min. Thread Diameter
		W ref	Pitch TPI	h min	Y	L ref		Deg	VPG	
3	VGD3.0NPT18RH-RS/LS	3.00	18	1.01	1.20	21.9	7 - 12	1.5°	•	1/4-18NPT
3	VGD3.0NPT14RH-RS/LS		14	1.33	1.40		8 - 14		•	1/2-14NPT
3	VGD3.0NPT11.5RH-RS/LS		11.5	1.64	1.60		9 - 15		◦	1-11.5NPT

• In stock ◦ Available upon request | LH Helix threads available upon request

VG-Cut Tools

External Monoblock Tools.....	28
Reinforced External Monoblock Tools.....	29
Blades for Grooving & Parting Off.....	30
Blade Holders.....	31
Radial Modules.....	32
Radial Bodies.....	33
Radial Modules with HPC.....	34
Face Grooving Modules with HPC.....	35
Modular Bodies with HPC.....	37

VG-Cut Tools Ordering Code

Monoblock Toolholders

VG	E	R	2525	3	T12	PH	C
1	2	9	3	4	5	10	11

Blades

VG	P	32	4	D	C
1	2	7	4	8	11

Modules

VG	A	R	20	T25	4	S	C
1	2	9	7	5	4	8	11

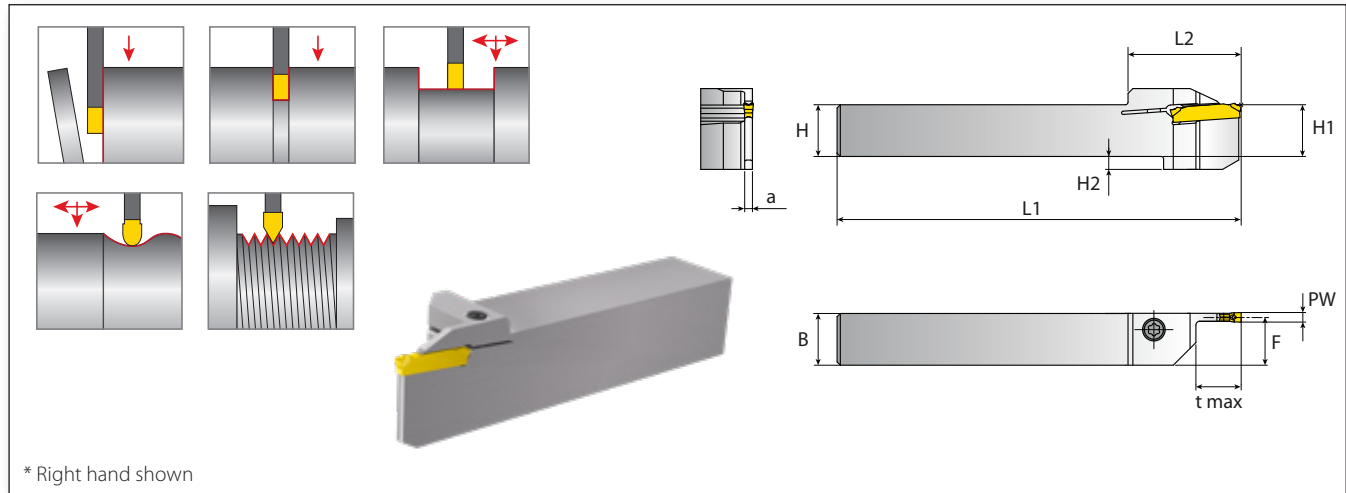
Holders/Bodies

VB	A	R	2525	32	C
1	6	9	3	7	11

1 – Tools/Holders VG - Deep Grooving & Parting Off VB - Holders	2 – Type E - External tool P - Universal blade W - Reinforced blade A - Radial module F - Face module	3 – For External Holders Shank Size	4 – Pocket Size 2, 3, 4, 5, 6
5 – Depth of Cut T12 - Limit Depth of Cut 12 mm	6 – Holders A - Universal	7 – Blade Height 20, 25, 26, 32 00, 45, 90 Approach angle	8 – Number of Pockets D - Double S - Single
9 – RH or LH R - RH L - LH None - Neutral	10 – PH PH - Reinforced blade structure	11 – Coolant C - Coolant	

External Monoblock Tools

Grooving, Parting Off, Turning & Threading

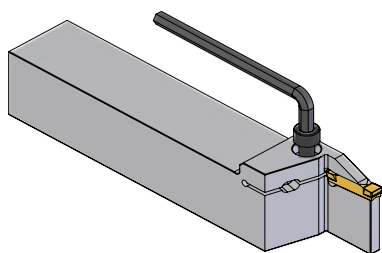


Ordering Code										Spare Parts	
Dimensions mm											
RH/LH	PW	t max	HXB	H1	F	L1	L2	a	H2	Cylindrical Screw*	Key
VGER/L1616-2T12	2	12	16x16	16	15.3	125	35	1.4	4.0	SM4.0x16-T20	K6T
VGER/L2020-2T12			20x20	20	19.3	125	35	1.4	---	SM4.0x18-T20	
VGER/L2525-2T08		8	25x25	25	24.3	125	35	1.4	---	SM4.0x16-T20	
VGER/L1212-3T12	3	12	12x12	12	10.8	125	35	2.4	4.0	SM3.5x14-T15	KT15
VGER/L1616-3T12		12	16x16	16	14.8	125	35	2.4	4.0	SM4.0x18-T20	K6T
VGER/L1616-3T21		21	16x16	16	14.8	125	35	2.4	4.0		
VGER/L2020-3T08		8	20x20	20	18.8	125	35	2.4	---		
VGER/L2020-3T12		12	20x20	20	18.8	125	35	2.4	---		
VGER/L2020-3T21		21	20x20	20	18.8	125	35	2.4	---		
VGER/L2525-3T08		8	25x25	25	23.8	125	35	2.4	---		
VGER/L2525-3T12	4	12	25x25	25	23.8	125	35	2.4	---	SM4.0x18-T20	K6T
VGER/L2525-3T21		21	25x25	25	23.8	125	35	2.4	---		
VGER/L1616-4T21		21	16x16	16	14.5	125	35	3.0	4.0		
VGER/L2020-4T21		21	20x20	20	18.5	125	35	3.0	---		
VGER/L2525-4T08		8	25x25	25	23.52	125	35	2.95	---		
VGER/L2525-4T12	5	22	25x25	25	23.5	125	35	3.0	---	SM6.0x20	K5H
VGER/L2525-4T21			25x25	25	23.5	125	35	3.0	---		
VGER/L3232-4T21			32x32	32	32.52	125	35	2.95	---		
VGER/L2525-5T22**	6	24	25x25	25	23.0	150	43	4.0	---	SM6.0x20	K5H
VGER/L3232-5T22**			32x32	32	30.0	170	43	4.0	---		
VGER/L2525-6T24**	6	24	25x25	25	22.5	150	45	5.0	---	SM6.0x20	K5H
VGER/L3232-6T24**			32x32	32	29.5	170	45	5.0	---		

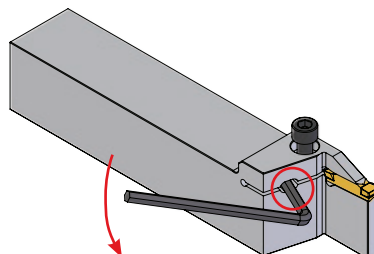
* Tightening Torque: T15 screws - 5 Nm max , T20 screws - 7 Nm max

** Mounting and Replacing Inserts for 5mm & 6mm Monoblock Toolholders:

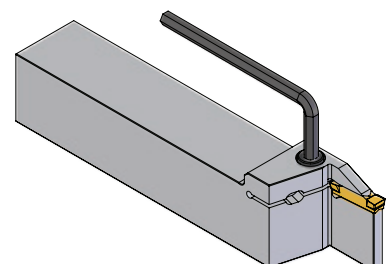
- 1 Unlock the top screw using the key provided.



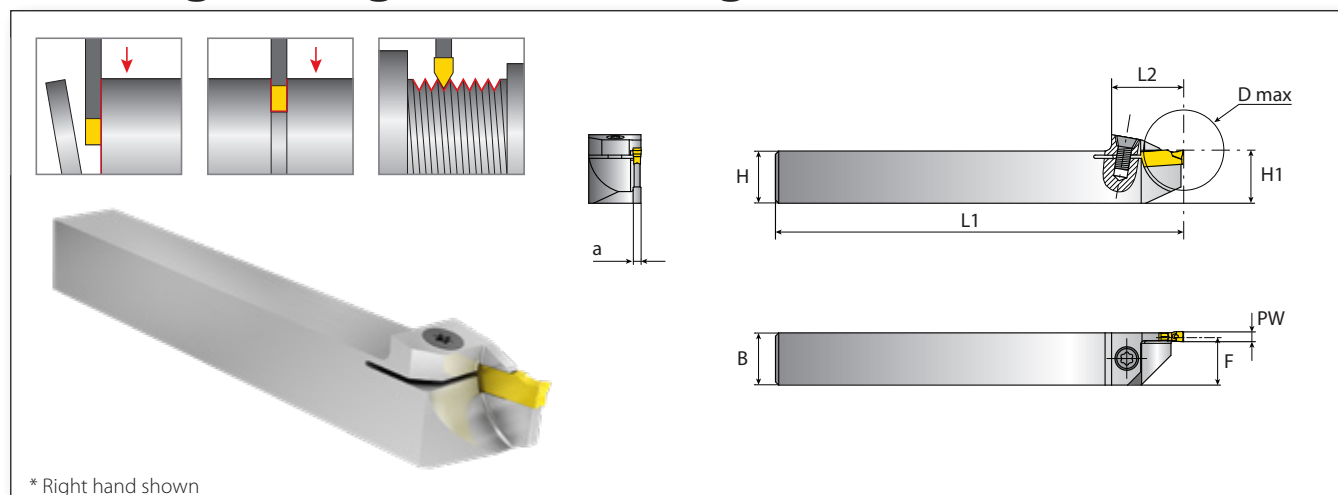
- 2 Place the same key in the "pocket." Turn and hold the key to loosen the pocket and remove the insert. Place the new insert in the pocket.



- 3 Now remove the key from the pocket and secure the insert by firmly locking the top screw.



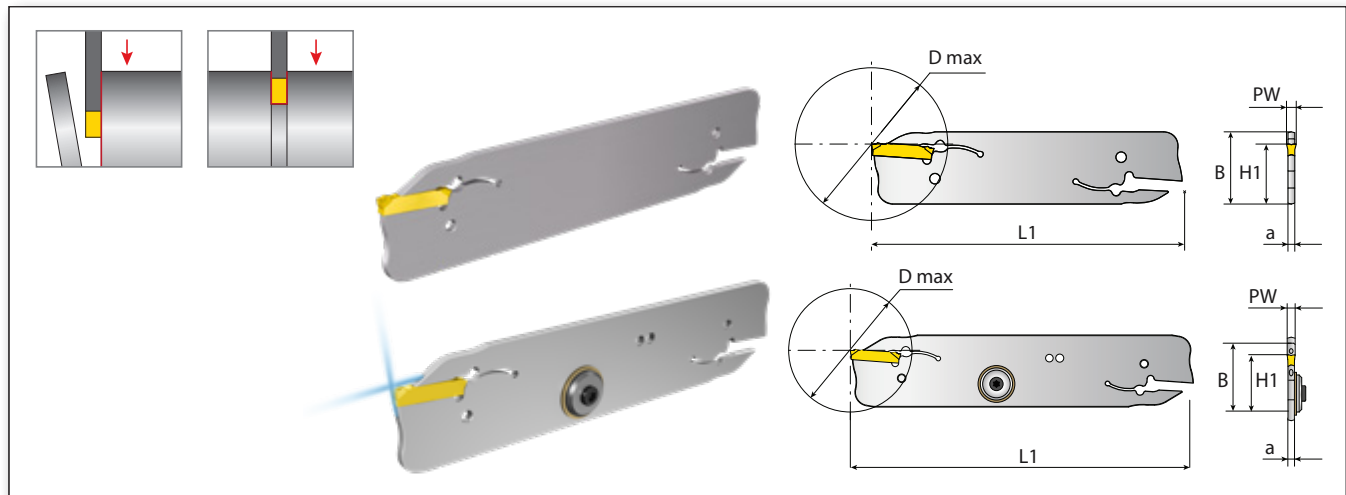
Reinforced Monoblock Tools Grooving, Parting Off & Threading



Ordering Code									Spare Parts	
Dimensions mm										
RH/LH	PW	D max	HXB	H1	F	L1	L2	a	Cylindrical Screw*	Key
VGER/L1212-2T12PH	2	26	12x12	12	11.3	125	22	1.4	SCM4x14	KT-15
VGER/L1616-2T12PH		26	16x16	16	15.3	125	22	1.4		
VGER/L1616-2T21PH		42	16x16	16	15.3	125	30	1.4		
VGER/L2020-2T12PH		26	20x20	20	19.3	125	22	1.4		
VGER/L2020-2T21PH		42	20x20	20	19.3	125	30	1.4		
VGER/L2525-2T21PH		42	25x25	25	24.3	125	30	1.4		
VGER/L1616-3T12PH	3	26	16x16	16	14.8	125	22	2.4		
VGER/L2020-3T12PH		26	20x20	20	18.8	125	22	2.4		
VGER/L2020-3T21PH		42	20x20	20	18.8	125	30	2.4		
VGER/L2525-3T12PH		26	25x25	25	18.8	125	22	2.4		
VGER/L2525-3T21PH		42	25x25	25	23.8	125	30	2.4		

* Tightening Torque 5 Nm max.

Blades for Grooving & Parting Off



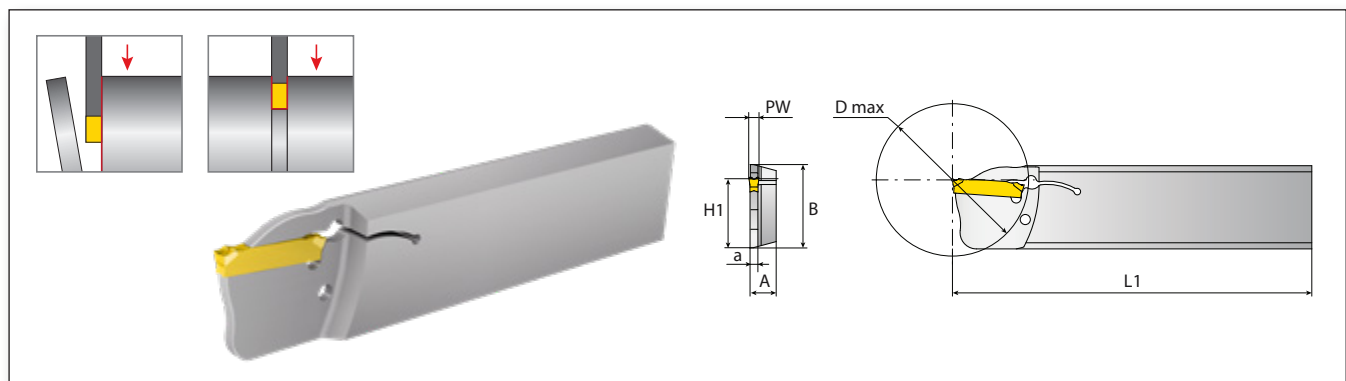
Ordering Code							Spare Parts		
Dimensions mm									
	B	PW	D max*	H1	L1	a	Key	Key	Sealing Cap
VGP26-2D	26	2	50	21.4	110	1.4	VP-3**	-	-
VGP32-2D	32	2	50	24.8	150	1.8		-	-
VGP26-3D	26	3	70	21.4	110	2.4		M4x3-15IP	WS-15IP
VGP26-3DC	26	3	70	21.4	110	2.4		-	-
VGP32-3D	32	3	100	24.8	150	2.4		M4x3-15IP	WS-15IP
VGP32-3DC	32	3	100	24.8	150	2.4		-	-
VGP35-3S	35	3	100	33.5	150	2.4	VP-4**	-	-
VGP32-4D	32	4	100	24.8	150	3.0		M4x3-15IP	WS-15IP
VGP32-4DC	32	4	100	24.8	150	2.95	VP-G**	-	-
VGP32-5D	32	5	100	24.8	150	4.0		-	-
VGP32-6D	32	6	100	24.8	150	5.0		-	-

Blades marked with **C** are offered with High Pressure Coolant.

* D max figures presented are for single sided insert (VGS).

** Not included. Please order separately.

Reinforced Blades for Grooving & Parting Off

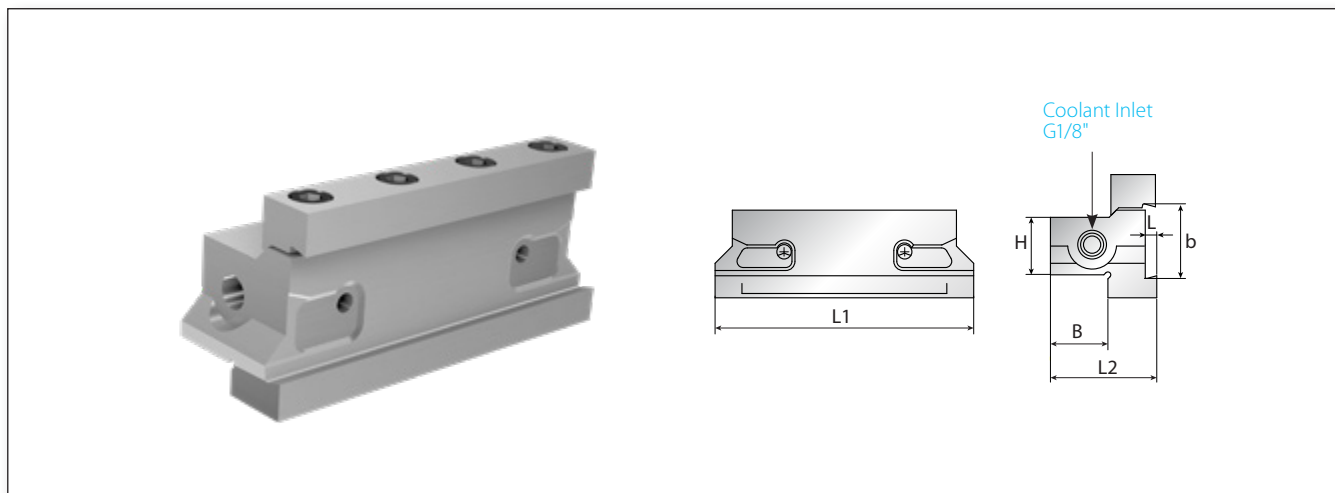


Ordering Code								Spare Parts	
Dimensions mm									
RH/LH	B	PW	D max*	H1	L1	A	a	Key	
VGWR/L26-2S	26	2	50	21.4	110	8.0	1.4	VP-3**	
VGWR/L26-3S	26	3	50	21.4	110	8.0	2.4		

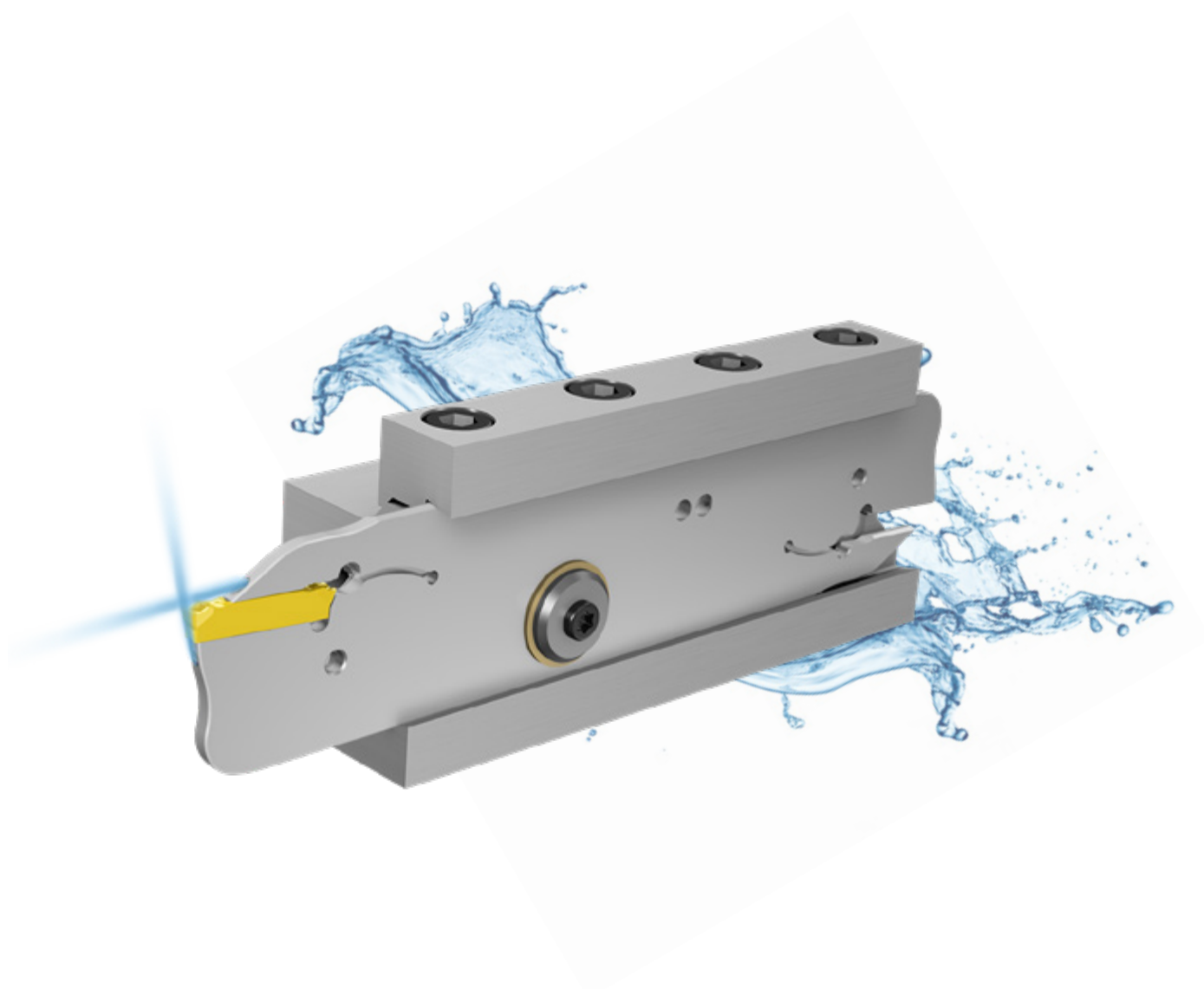
* D max figures presented are for single sided insert (VGS).

** Not included. Please order separately.

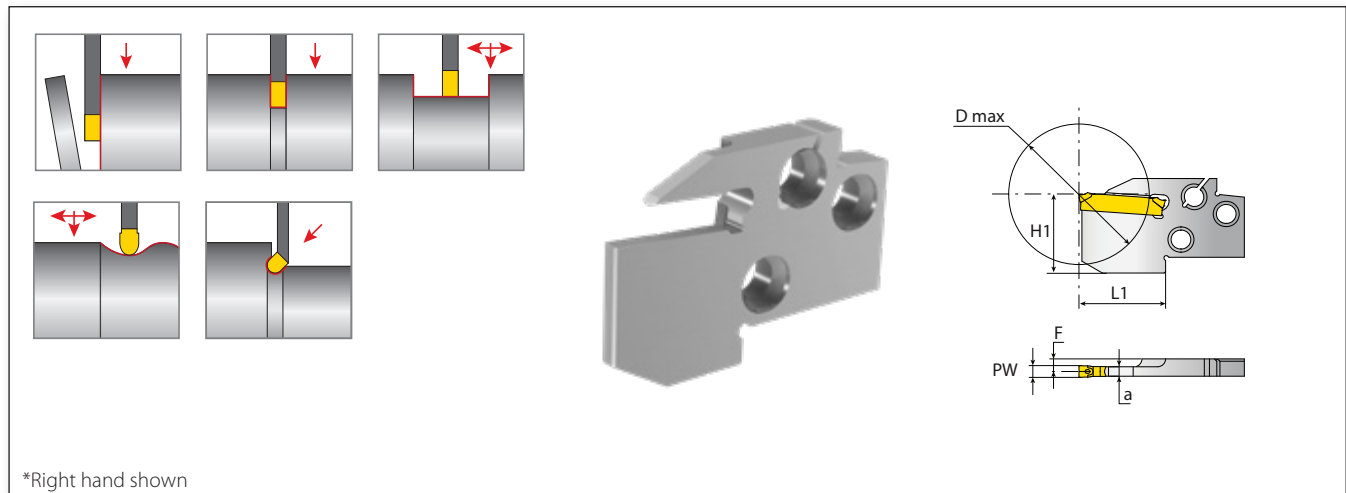
Blade Holders



Ordering Code							Spare Parts			
Dimensions mm										
	b	H	B	L	L1	L2	Clamping Screw	Key	Plug Screw	Indent Plug Screw
VBA 2020-26	26	20	20	4	90	37.0	M6x1.0x25	K5	Plug G1/8"	Plug M6x8
VBA 2520-32	32	25	20	5.2	110	37.7				



Modules for Grooving, Parting Off & Turning

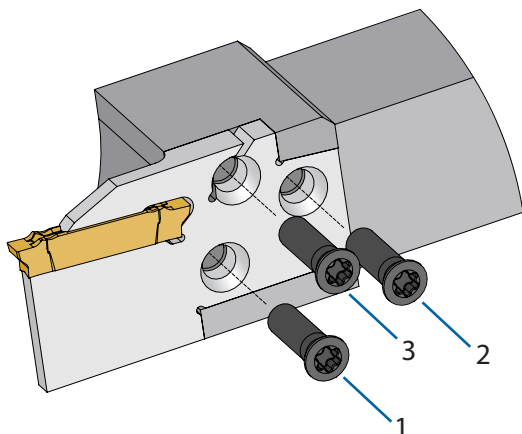


Ordering Code		Dimensions mm				
RH/LH	PW	D max	H1	F	L1	a
VGAR/L20T25-2S	2	40	20	3.7	22	1.4
VGAR/L20T25-3S	3	40	20	3.2	24	2.4
VGAR/L20T25-4S	4	44	20	2.9	24	3.0
VGAR/L25T25-2S	2	40	25	5.2	22	1.4
VGAR/L25T25-3S	3	40	25	4.7	24	2.4
VGAR/L25T25-4S	4	44	25	4.4	24	3.0

Depth of Groove in Relation to Workpiece Diameter (00° - 90°)

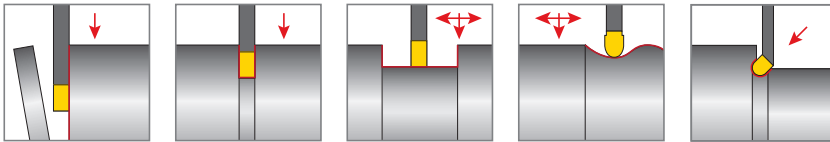
Dimensions mm	
D max	t max
50	20.0
100	17.0
150	16.0
200	15.2

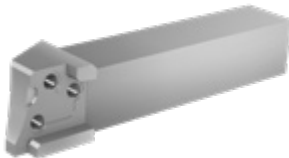
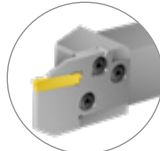
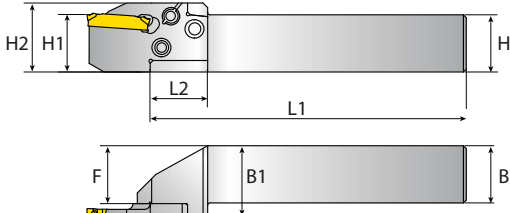
Mounting and Replacing Modules:



- 1 Clamp the module using screws 1,2 and 3.
- 2 First clamp the module to the body with screw no. 1, followed by screw no. 2.
- 3 Finally, clamp the insert to the holder with screw no. 3.

Modular Bodies for Grooving, Parting Off & Turning



									
* Right hand shown			Spare Parts						
Ordering Code			Dimensions mm						
RH/LH	H/H1	B	B1	H2	F	L1	L2	Conical Screw*	Key
VBMR/L2020-00	20	20.0	24.3	24	20.15	110	20	SM4x14 T15	TK-T15
VBMR/L2525-00	25	25.0	31.0	30	25.50	140	25	SM5x18 T20	TK-T20

* Right hand shown

Spare Parts

Conical Screw*

Key

Ordering Code

Dimensions mm

RH/LH

H/H1

B

H2

L1

L2

VBMR/L2020-90

20

20.0

24

110

20

SM4x14 T15

TK-T15

VBMR/L2525-90

25

25.0

30

140

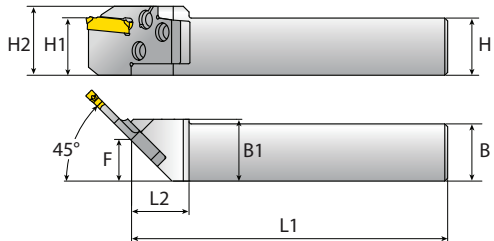
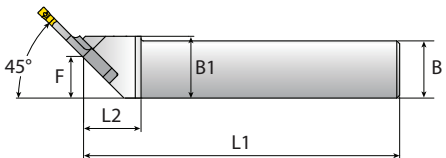
28

SM5x18 T20

TK-T20

For 90° Right-hand Tool: Use right-hand body with left-hand module.



* Left hand shown

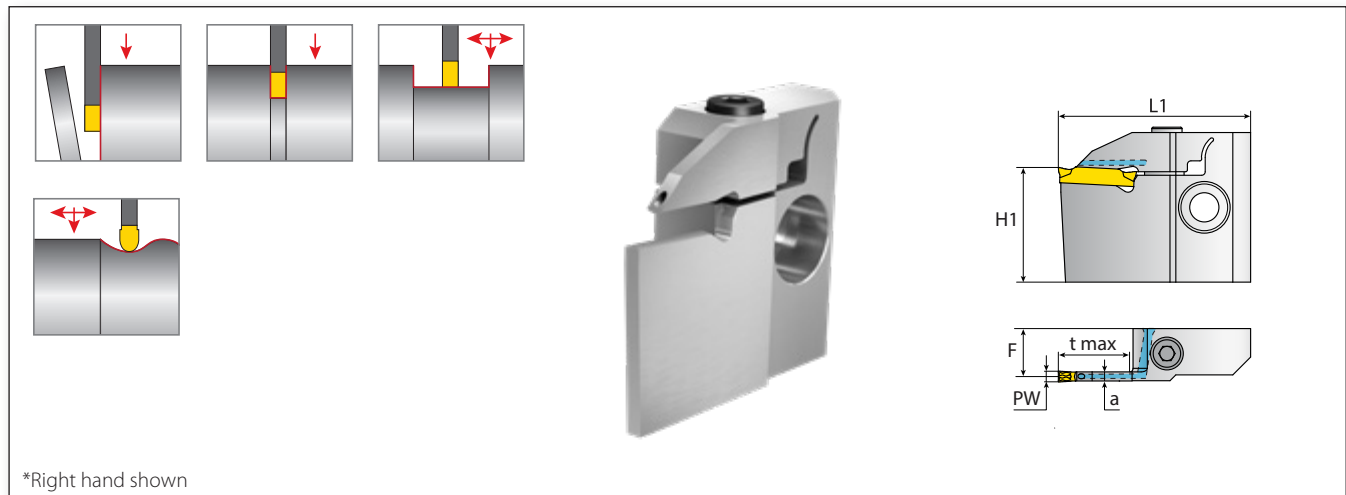
Spare Parts

Ordering Code		Dimensions mm							
RH/LH	H/H1	B	B1	H2	L1	L2	F	Conical Screw*	Key
VBMR/L2020-45	20	20.0	21.5	24	110	20	14.5	SM4x10.5 T15 SM4x14 T15	TK-T15
VBMR/L2525-45	25	25.0	26.0	30	140	25	18	SM5x13.5 T20 SM5x18 T20	TK-T20

For 45° Right-hand Tool: Use right-hand body with left-hand module.

* Tightening Torque: T15 screws - 5 Nm max , T20 screws - 7 Nm max.

Radial Grooving Modules with High Pressure Coolant Thru



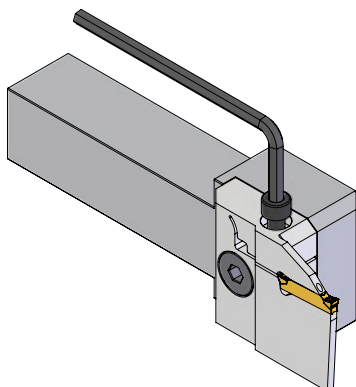
Ordering Code							Spare Parts	
Dimensions mm								
RH/LH	PW	t max	H1	F	L1	a	Screw*	Key
VGAR/L-T09-2C	2	9	32	13.9	43	1.58	SM5x16	K4H
VGAR/L-T18-2C	2	18	32	13.9	52	1.58		
VGAR/L-T10-3C	3	10	32	13.3	44	2.48		
VGAR/L-T20-3C	3	20	32	13.3	54	2.48		
VGAR/L-T12-4C	4	12	32	13.0	46	3.10		
VGAR/L-T24-4C	4	24	32	13.0	58	3.10		
VGAR/L-T15-5C	5	15	32	13.5	49	4.00		
VGAR/L-T30-5C	5	30**	32	12.5	64	4.00		
VGAR/L-T20-6C	6	20	32	13.0	54	5.00		
VGAR/L-T40-6C	6	40**	32	13.0	74	5.00		

* Tightening Torque 7 Nm max.

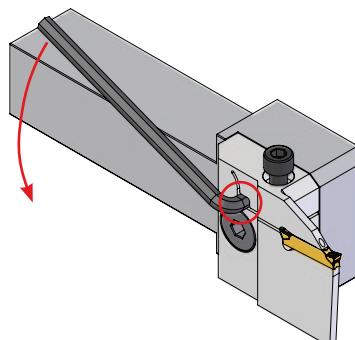
** T max figures presented for single sided inserts (VGS).

Mounting and Replacing Inserts for Radial and Face Grooving Modules with High Pressure Coolant Thru:

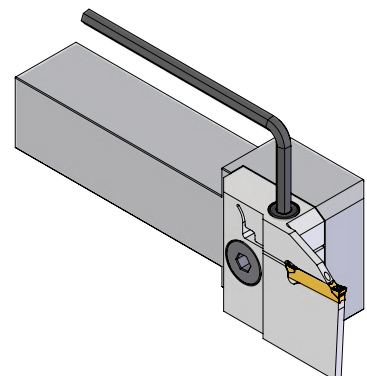
- 1 Unlock the top screw using the key provided.



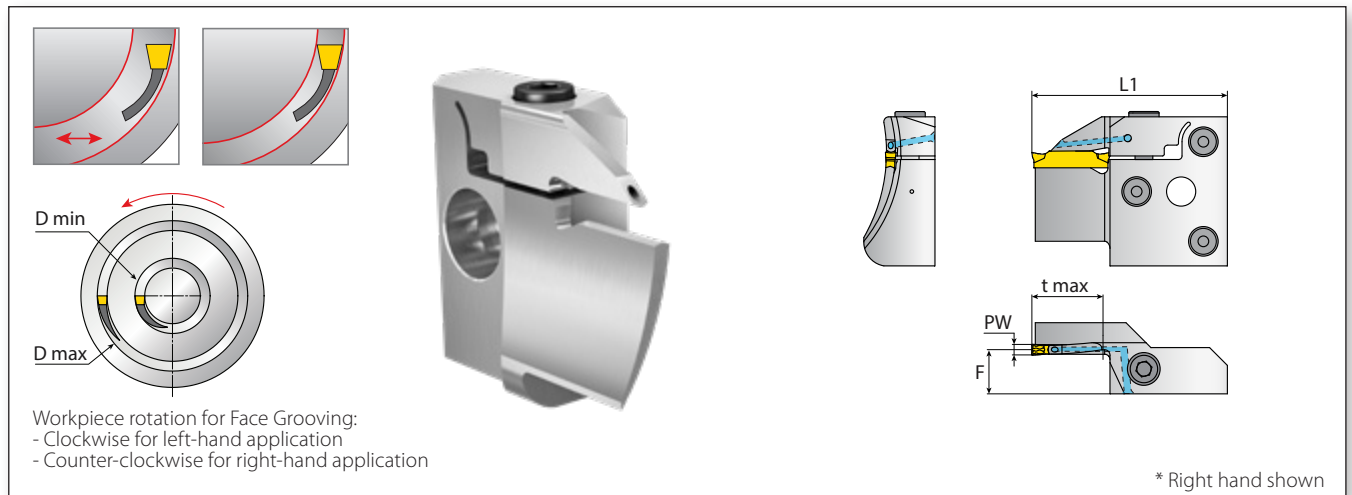
- 2 Place the same key in the "pocket." Turn and hold the key to loosen the pocket and remove the insert. Place the new insert in the pocket.



- 3 Now remove the key from the pocket and secure the insert by firmly locking the top screw.



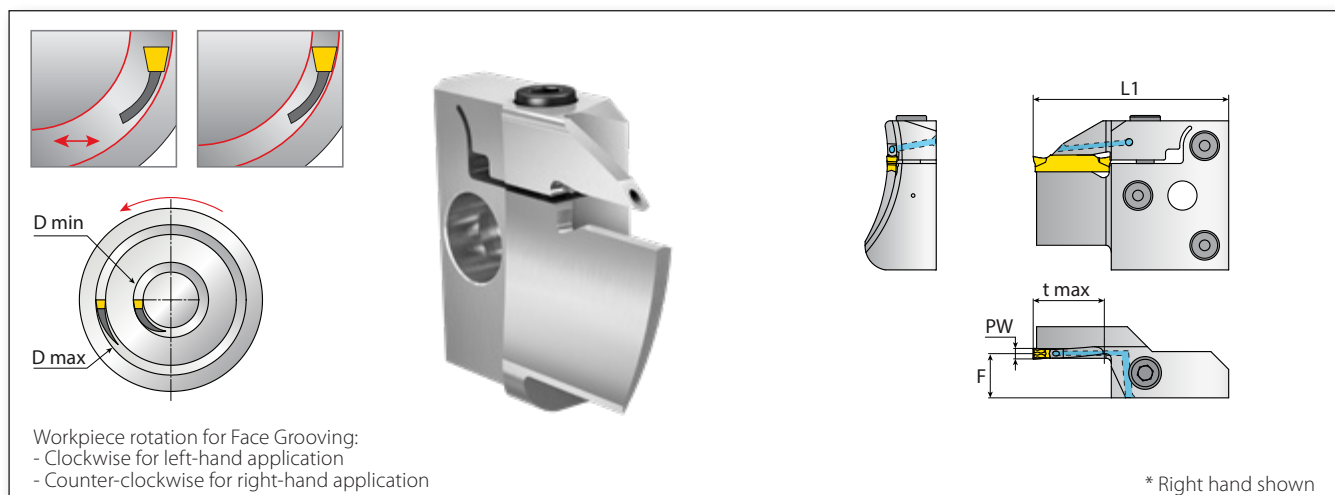
Face Grooving Modules with High Pressure Coolant Thru



							Spare Parts		
Ordering Code			Dimensions mm						
RH/LH	PW	t max	D min	D max	F	L1	Screw*	Key	
VGFR/L-2530-T10-3C	3	10	25	30	12.5	45	SM5x16	K4H	
VGFR/L-3038-T10-3C			30	38					
VGFR/L-3848-T10-3C			38	48					
VGFR/L-4860-T10-3C			48	60					
VGFR/L-6075-T10-3C			60	75					
VGFR/L-75100-T10-3C			75	100					
VGFR/L-100200-T10-3C			100	200					
VGFR/L-6075-T20-3C	20		60	75		55			
VGFR/L-75100-T20-3C			75	100					
VGFR/L-100200-T20-3C			100	200					
VGFR/L-3048-T12-4C	4	12	30	48	12	47			
VGFR/L-4860-T12-4C			48	60					
VGFR/L-6075-T12-4C			60	75					
VGFR/L-75100-T12-4C			75	100					
VGFR/L-100150-T12-4C			100	150					
VGFR/L-150->-T12-4C			150	>150					
VGFR/L-3048-T24-4C		24		30		48			59
VGR/LF-4860-T24-4C				48		60			
VGFR/L-6075-T24-4C				60		75			
VGFR/L-75100-T24-4C				75		100			
VGFR/L-100150-T24-4C				100		150			
VGFR/L-150->-T24-4C				150		>150			
VGFR/L-4255-T22-5C	5	22	42	55	13.5	60			
VGFR/L-5575-T22-5C			55	75					
VGFR/L-75130-T22-5C			75	130					
VGFR/L-130200-T22-5C			130	200					
VGFR/L-200 ->-T22-5C			200	>200					
VGFR/L-130200-T45-5C		45	130	200		92			
VGFR/L-200400-T45-5C			200	400					
VGFR/L-450->-T45-5C			450	>450					

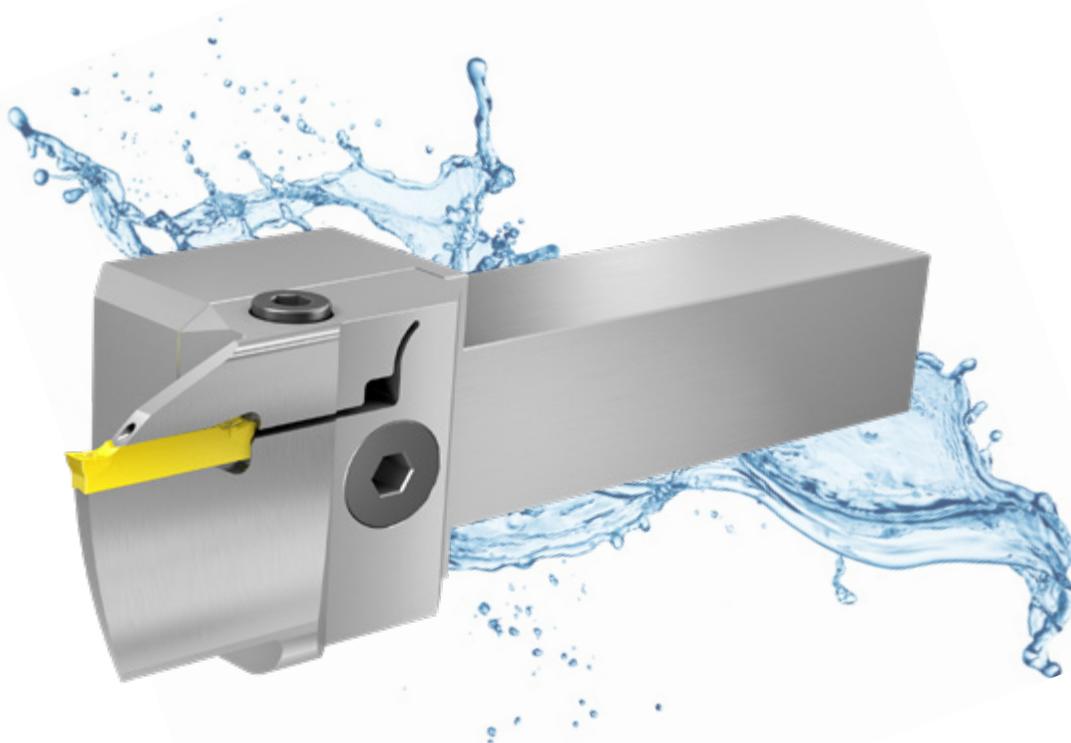
* Tightening Torque 7 Nm max.

Face Grooving Modules with High Pressure Coolant Thru (con't)

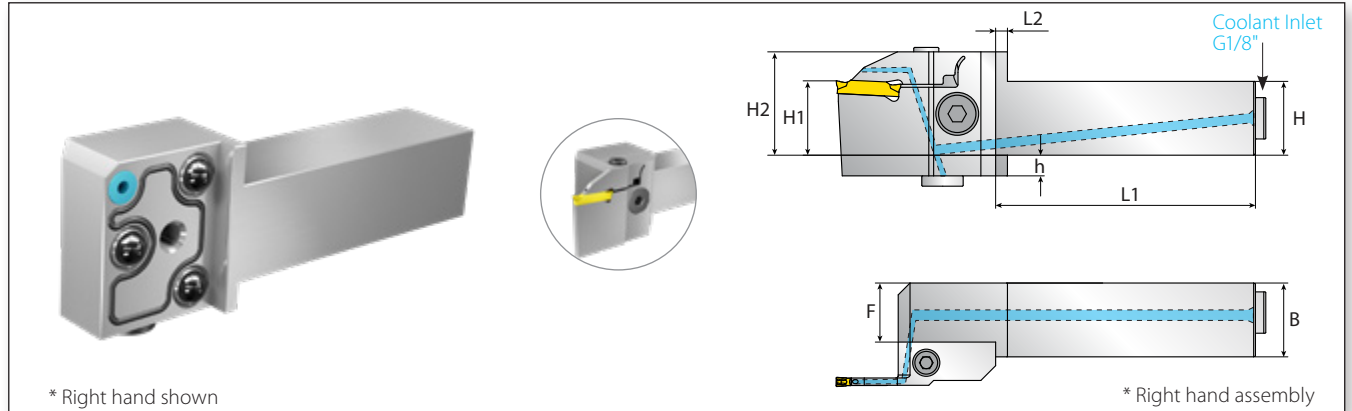
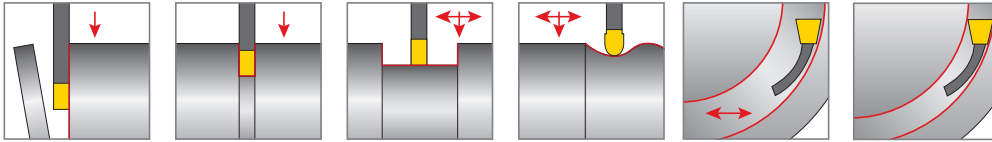


Ordering Code							Spare Parts	
Dimensions mm								
RH/LH	PW	t max	D min	D max	F	L1	Screw*	Key
VGFR/L-4255-T22-6C	6	22	42	55	13	60	SM5x16	K4H
VGFR/L-5575-T22-6C			55	75				
VGFR/L-75130-T22-6C			75	130				
VGFR/L-130200-T22-6C			130	200				
VGFR/L-200->-T22-6C			200	>200				
VGFR/L-130200-T45-6C	45	45	130	200	13	92	SM5x16	K4H
VGFR/L-200400-T45-6C			200	400				
VGFR-450->-T45-6C			450	>450				

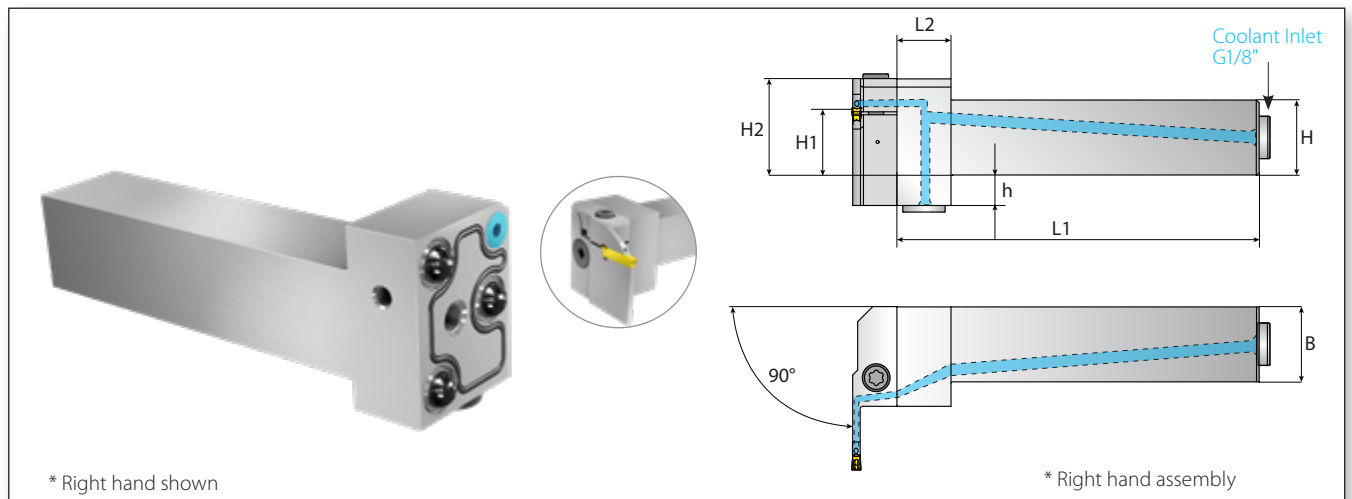
* Tightening Torque 7 Nm max.



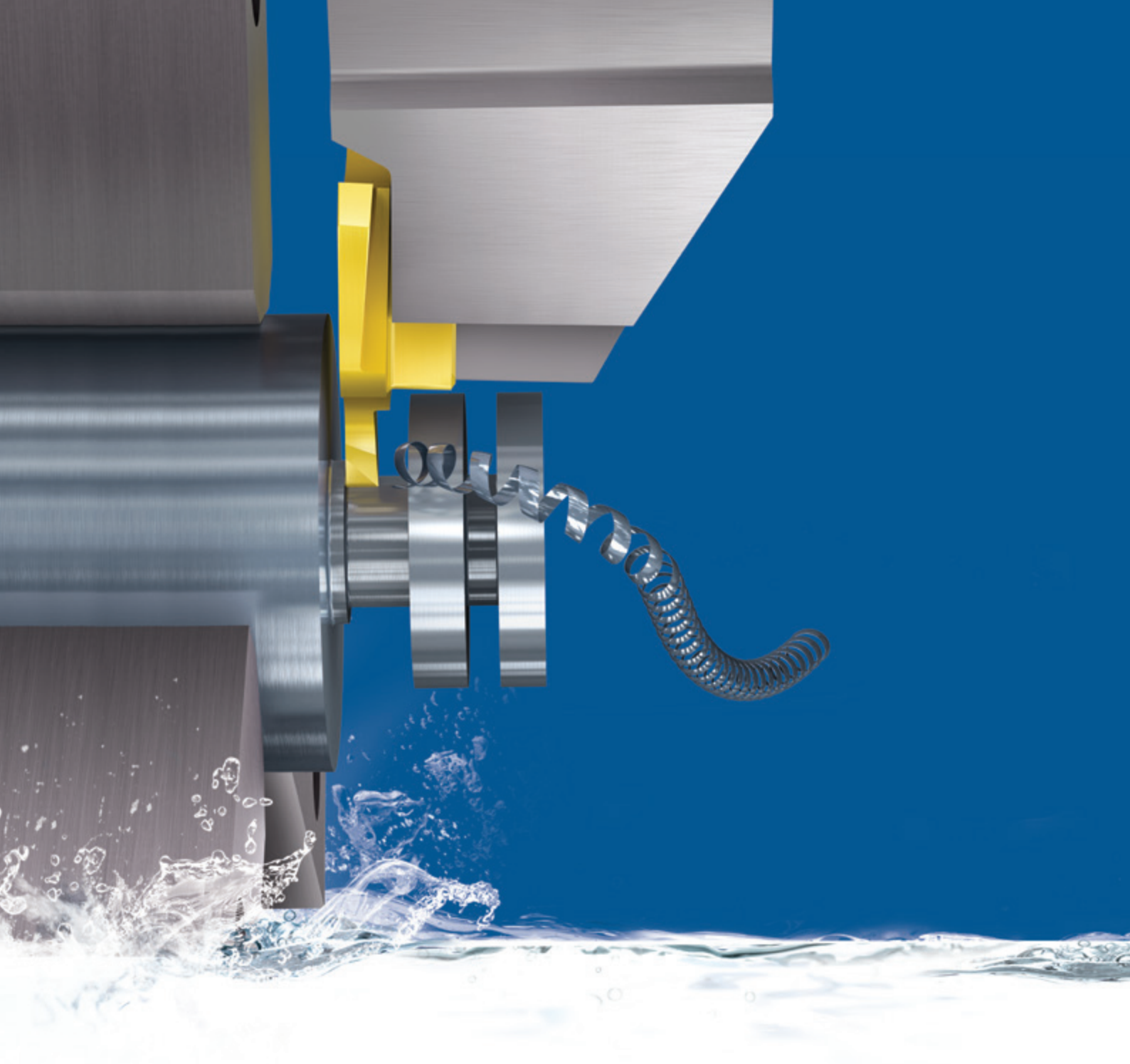
Modular Bodies with High Pressure Coolant Thru for Grooving, Face Grooving, Parting Off and Turning



Ordering Code								Spare Parts		
Dimensions mm										
H/H1	B	H2	h	F	L1	L2		Clamping Screw	Key	Plug Screw
VBMR/L2020-00-C	20	20	30	12	15	106	4	SM8x25	K6H	G1/8"
VBMR/L2525-00-C	25	25	35	7	20	121	4			
VBMR/L3225-00-C	32	25	42	0	20	136	4			



							Spare Parts		
Ordering Code		Dimensions mm							
RH/LH	H/H1	B	H2	h	L1	L2	Clamping Screw	Key	Plug Screw
VBMR/L2020-90-C	20	20	30	12	111	18	SM8x25	K6H	G1/8"
VBMR/L2525-90-C	25	25	35	7	120	18			
VBMR/L3225-90-C	32	25	42	0	130	18			



EXTERNAL MACHINING | **FINISHING**

GrooVical

Precise Grooving & Turning Applications

New Range of Indexable Grooving Inserts

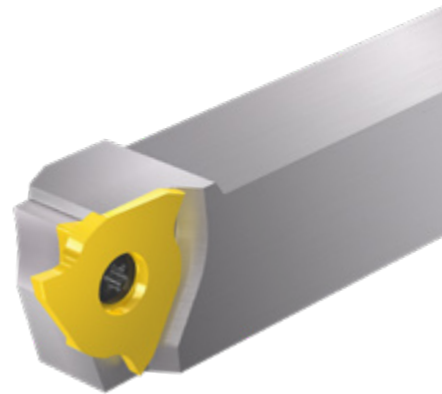
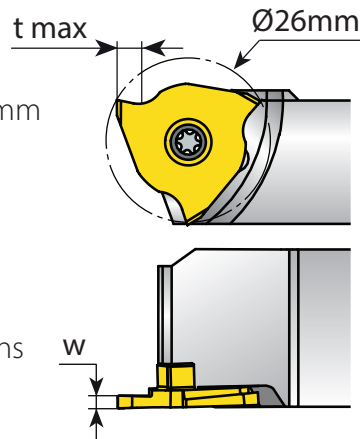
The **Groovical** family of products by Groovex offers improved solutions for internal and external grooving and turning applications. GVN26 and GV29/GVN29 feature inserts with three cutting corners and a unique rigid clamping system for improved productivity.

The new GVN style inserts offer new applications in the Groovical line, including Turning and Grooving chip former to form helical chips, spiral chips for grooving, new parting off inserts, machining close to shoulders and left hand toolholders.

GVN26

t_{max} = Groove
Depths up to 5.5mm

W = Groove Widths
from 0.5-2.5mm

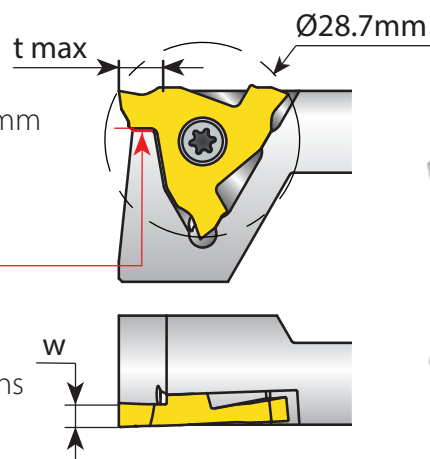


GVN29

t_{max} = Groove
Depths up to 6.5mm

**Additional
Corner Support**

W = Groove Widths
from 2-6.35mm



Groovical Technical Data

Recommended Grades and Cutting Data

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [m/min]
					Coated
					VKX
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	140-200
	2		Medium Carbon (C=0.25-0.55%)	150	120-180
	3		High Carbon (C=0.55-0.85%)	170	110-180
	4	Low Alloy Steel (alloying elements ≤ 5%)	Non Hardened	180	100-155
	5		Hardened	275	110-180
	6		Hardened	350	80-135
	7	High Alloy Steel (alloying elements > 5%)	Annealed	200	70-115
	8		Hardened	325	50-100
	9	Cast Steel	Low Alloy (alloying elements < 5%)	200	30-50
	10		High Alloy (alloying elements > 5%)	225	20-40
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	70-120
	12		Hardened	330	60-95
	13	Stainless Steel Austenitic	Austenitic	180	70-120
	14		Super Austenitic	200	40-90
	15	Stainless Steel	Non Hardened	200	80-110
	16	Cast Ferritic	Hardened	330	65-110
	17	Stainless Steel	Austenitic	200	85-100
	18	Cast Austenitic	Hardened	330	60-100
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	70-120
	29		Pearlitic (long chips)	230	70-120
	30	Grey Cast Iron	Low Tensile Strength	180	70-120
	31		High Tensile Strength	260	60-100
	32	Nodular Sg Iron	Ferritic	160	50-80
	33		Pearlitic	260	60-90
N(k) Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	100-240
	35		Aged	100	80-170
	36	Aluminium Alloys	Cast	75	100-150
	37		Cast & Aged	90	80-120
	38	Aluminium Alloys	Cast Si 13-22%	130	100-150
	39	Copper and Copper Alloys	Brass	90	80-200
	40		Bronze And Non Leaded Copper	100	80-200
S(M) Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	45-60
	20		Aged (iron based)	280	35-50
	21		Annealed (nickel or cobalt based)	250	20-30
	22		Aged (nickel or cobalt based)	350	15-25
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	140-170
	24		α+β Alloys	1050Rm	50-70
H(k) Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	45-60
	26			51-55HRc	40-50

! The maximum recommended **feed rate** is one-tenth of the insert width (W).

! The minimum recommended **depth of cut** is twice the corner radius (r).

VTX

Excellent for Grooving applications in medium-to-high cutting speeds and in dry conditions. Multi-layered AlTiN coated, general purpose grade for prevention of peeling and chipping.

* For **VTX Grade**, increase speed by 20%.

VKX

Standard grade for Grooving applications. Single-layered AlTiN+TiN coated.

Recommended Feed Rate for Grooving & Turning Finishing Operations

Insert Width (mm)	High Alloy Steel, 330 HB, 2100 Kc [N/mm ²]		Austenitic Stainless Steel, 200 HB, 2600 Kc [N/mm ²]	
	Depth ap = Insert Width x variable	Average f mm/rev	Depth ap = Insert Width x variable	Average f mm/rev
0.4 mm - 0.9 mm	0.055	0.04	0.035	0.02
1.0mm - 1.5mm	0.055	0.07	0.035	0.04
1.6 mm -2.0 mm	0.060	0.11	0.040	0.07
2.1 mm - 2.5 mm	0.060	0.14	0.040	0.09
2.6 mm - 3.0 mm	0.060	0.17	0.040	0.11
3.1 mm - 4.0mm	0.060	0.21	0.040	0.14
4.1 mm - 5.5 mm	0.060	0.28	0.040	0.19

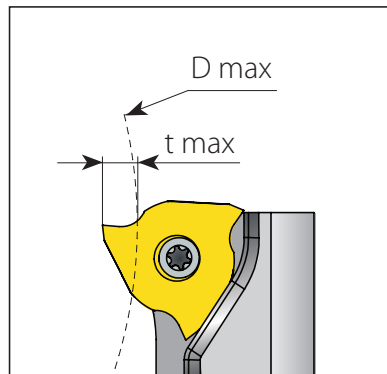
The above recommendations are for achieving a stable and recurring tool life.

Exceeding higher feed rates may cause excessive wear and breakage.

D max Limitations

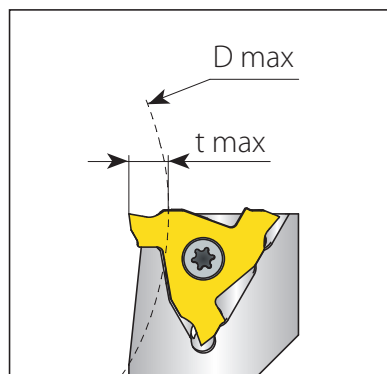
GVN26 External - Depth of Groove in Relation to Workpiece Dia.

D max is 150mm



GV29 / GVN29 External - Depth of Groove in Relation to Workpiece Dia.

Dimensions mm	
t max	D max
0.5	1085.0
1	590.0
1.5	408.0
2	310.0
2.5	250.0
3	210.0
3.5	180.0
4	160.0
4.5	145.0
5	130.0
5.5	120.0
6	110.0
6.5	105.0



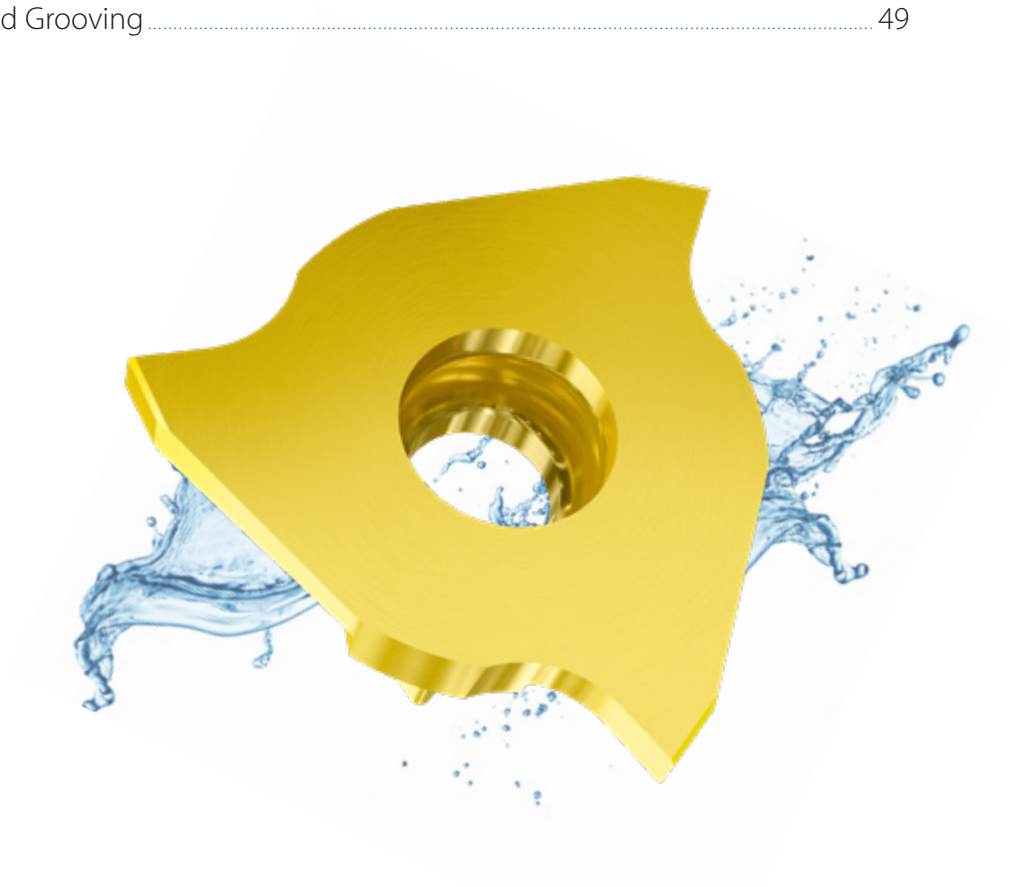
GrooVical Inserts

Close to Shoulder (GVN):

Super Positive Rake Grooving.....	44
Turning & Grooving Chip Former	45
Square Grooving.....	46
Round Grooving.....	47
Parting Off.....	48

GV29 Neutral:

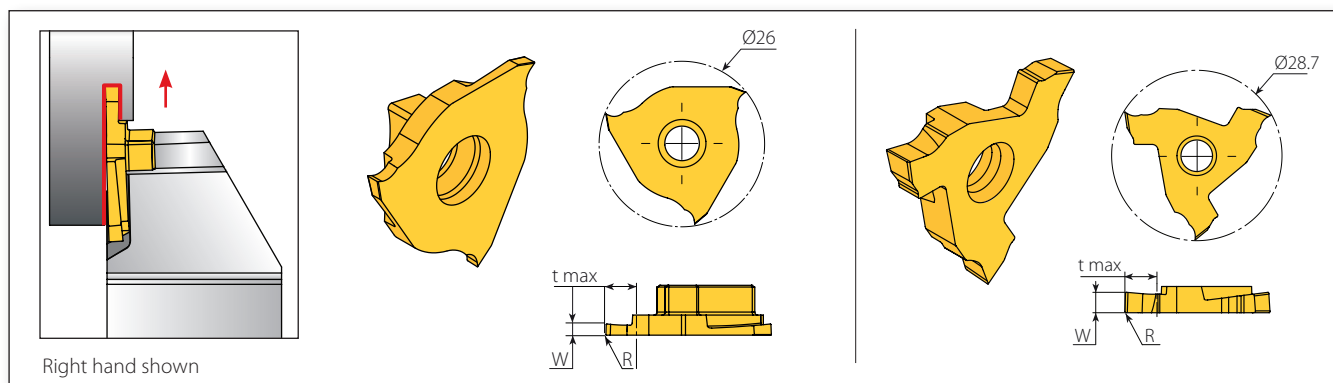
Square Grooving.....	49
Round Grooving.....	49



GrooVical Inserts Ordering Code System

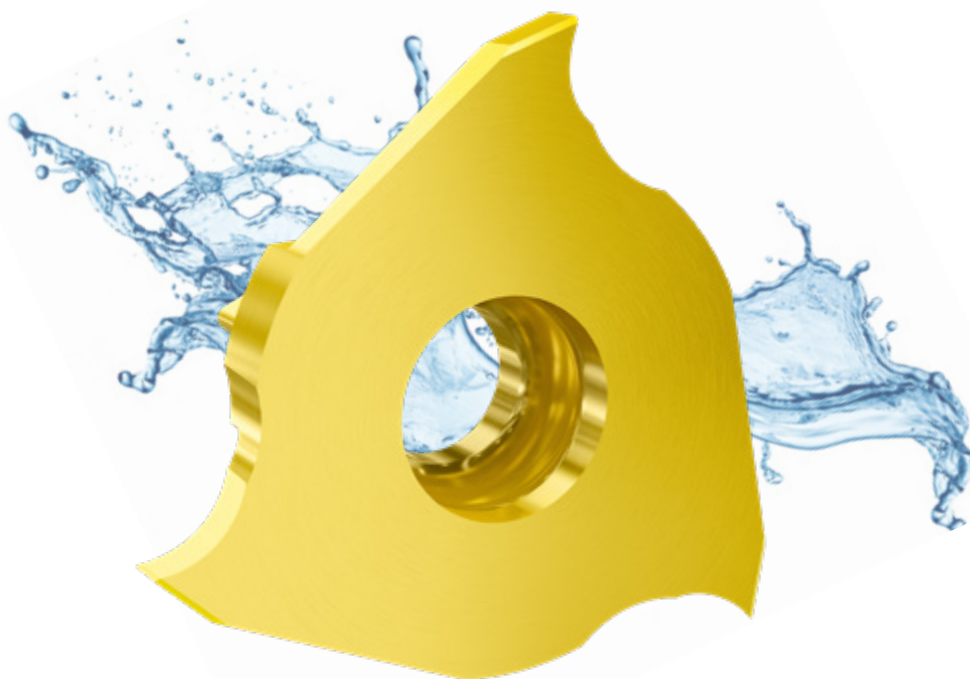
GVN 1	26 2	R 3	P 4	0.5 5	- 	0.05 6	- 	15 7	R 8	VKX 9
1 - Insert Type GVN - Groovical Close to Shoulder GV - Groovical Neutral			2 - Circular Circumference 26 - 26 mm 29 - 28.7 mm		3 - RH or LH R - RH L - LH N - RH/LH		4 - Type of Application T - Turning & Grooving S - Square Grooving SP - Positive Rake Grooving R - Round Grooving P - Parting Off X - Special Profile		5 - Grooving Width 0.5 to 6.35mm	
7 - Approach Angle 6 - 6 Deg. 15 - 15 Deg.			8 - Cutting Side R - Right corner leading L - Left corner leading None - Neutral		9 - Carbide Grade VTX, VKX		6 - Corner Radius 0.0 - 1mm			

Close to Shoulder **Super Positive** Rake Grooving (SP)

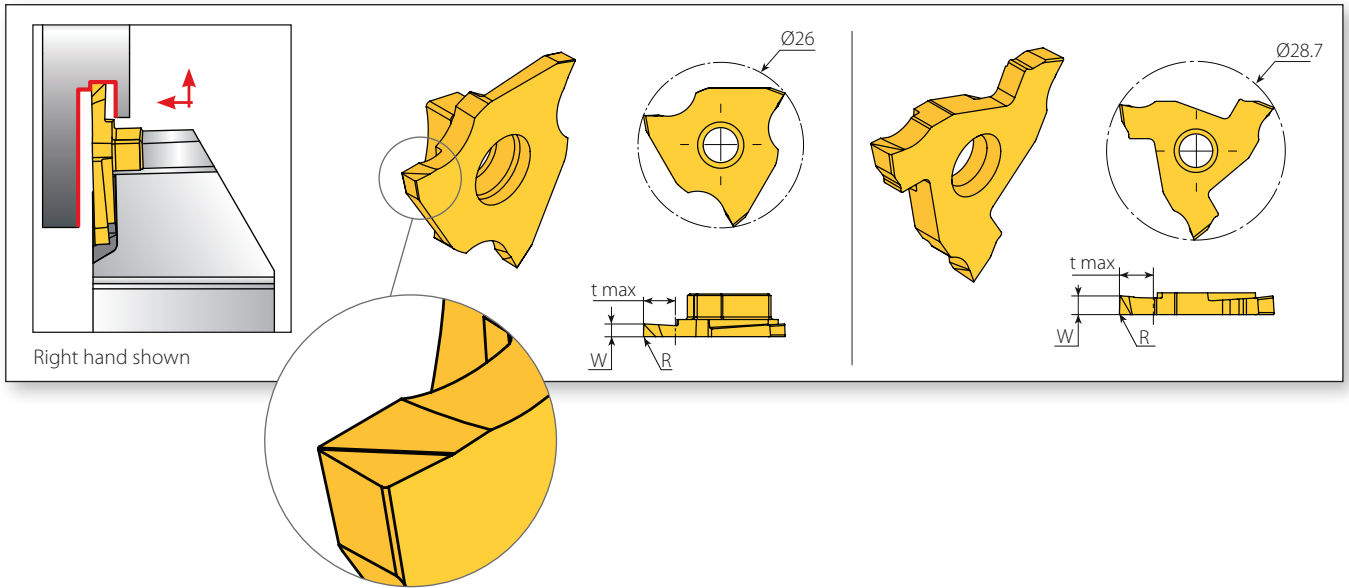


Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W ± 0.02	R ± 0.03	t max	VKX	VTX	
26	GVN26R/LSP1.0-0.08	1.0	0.08	2.25	◦	•	GVNE...-26, GVNE90...-26
	GVN26R/LSP1.5-0.08	1.5	0.08	3.00	◦	•	
	GVN26R/LSP2.0-0.1	2.0	0.10	3.75	◦	•	
	GVN26R/LSP2.5-0.15	2.5	0.15	3.75	◦	•	
29	GVN29R/LSP3.0-0.2	3.0	0.20	4.90	◦	•	GVNE...-29-1, GVNE90...-29-2, GVNI...-29

• In stock ◦ Available upon request



Close to Shoulder Square **Turning** & Grooving Chip Former



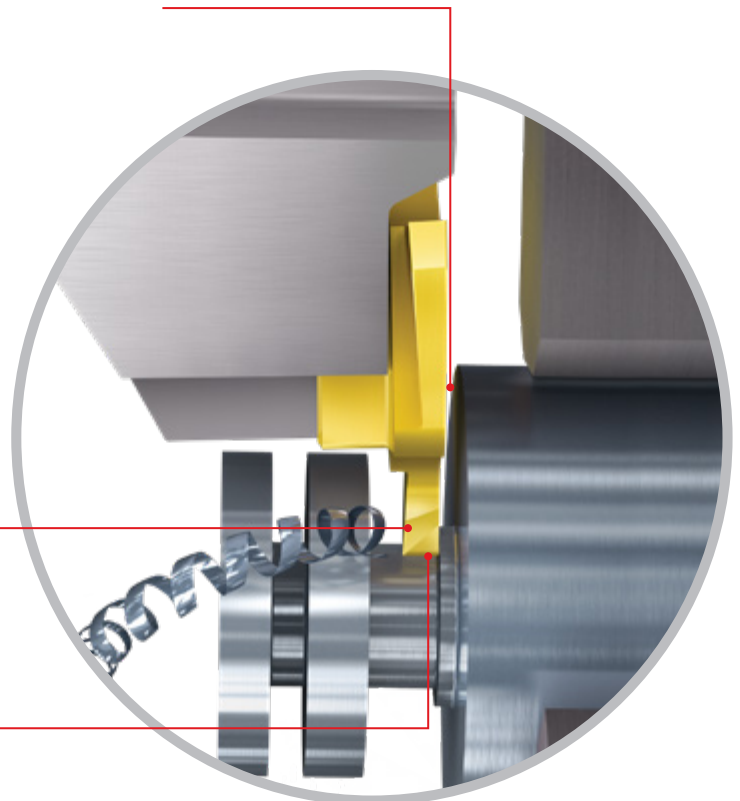
Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W ± 0.02	R ± 0.03	t max	VKX	VTX	
26	GVN26R/LT1.0-0.08	1.0	0.08	3.0	◦	•	GVNE...-26, GVNE90...-26
	GVN26R/LT1.5-0.08	1.5	0.08	4.0	◦	•	
	GVN26R/LT2.0-0.1	2.0	0.10	5.0	◦	•	
	GVN26R/LT2.5-0.15	2.5	0.15	5.0	◦	•	
29	GVN29R/LT3.0-0.2	3.0	0.2	6.5	◦	•	GVNE...-29-1, GVNE90...-29-2, GVNI...-29

◼ • In stock ◦ Available upon request

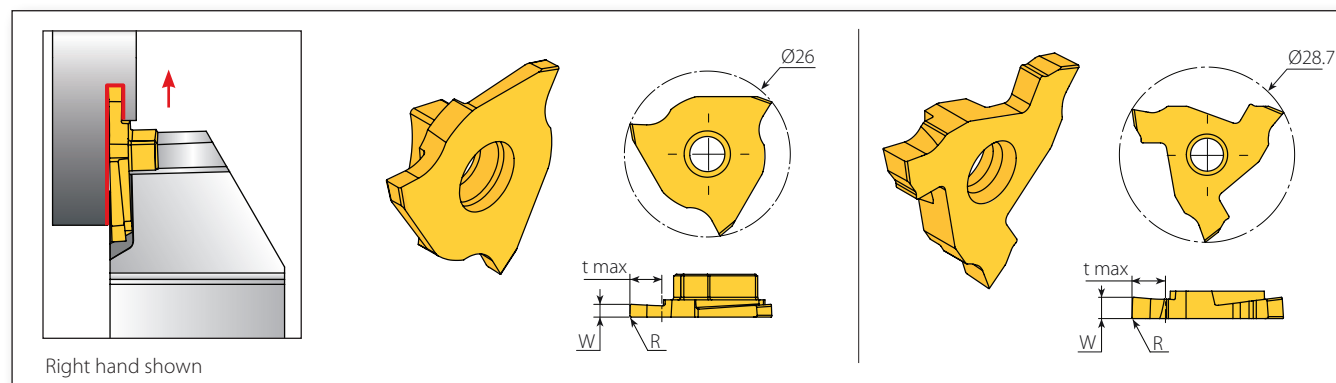
Close to shoulder machining

Turning and Grooving positive Chip Former, preventing tangled chips around the workpiece

Grooving up to 6.5mm depth



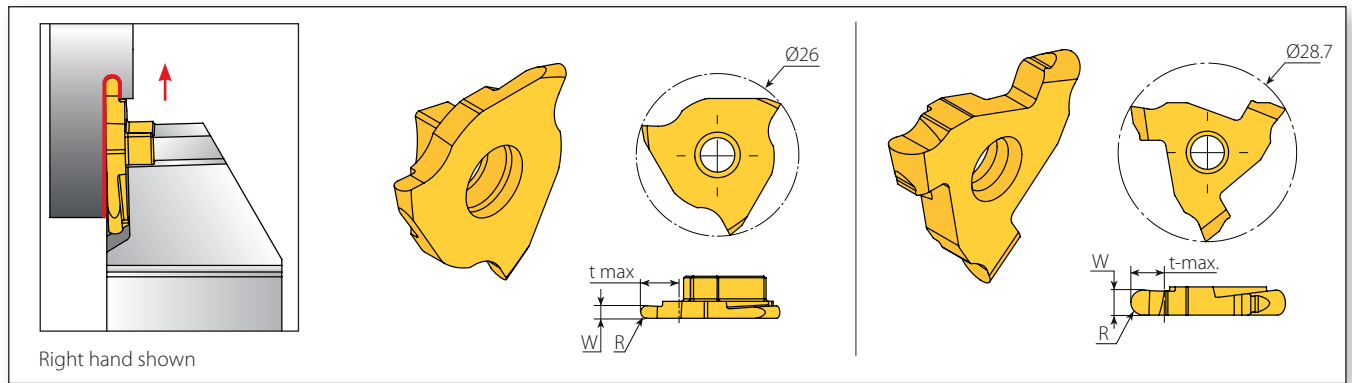
Close to Shoulder Square Grooving



Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W ± 0.02	R ± 0.03	t max	VKX	VTX	
26	GVN26R/LS0.57-00	0.57	0.00	1.0	•	◦	GVNE...-26, GVNE90...-26
	GVN26R/LS0.79-00	0.79	0.00	1.6	•	◦	
	GVN26R/LS0.79-0.2	0.79	0.20	1.6	•	◦	
	GVN26R/S0.8-0.2	0.80	0.20	2.0	•	◦	
	GVN26R/LS0.87-00	0.87	0.00	2.0	•	◦	
	GVN26R/LS0.97-00	0.97	0.00	2.0	•	◦	
	GVN26R/LS1.0-0.1	1.00	0.10	2.0	•	◦	
	GVN26R/LS1.07-00	1.07	0.00	2.0	•	◦	
	GVN26R/LS1.2-00	1.20	0.00	2.0	•	◦	
	GVN26R/LS1.24-00	1.24	0.00	2.0	•	◦	
	GVN26R/LS1.4-00	1.40	0.00	2.0	•	◦	
	GVN26R/LS1.44-00	1.44	0.00	2.0	•	•	
	GVN26R/LS1.5-0.1	1.50	0.10	3.0	•	◦	
	GVN26R/LS1.5-0.2	1.50	0.20	5.0	•	◦	
	GVN26R/LS1.58-0.2	1.58	0.20	3.0	•	◦	
	GVN26R/LS1.6-00	1.60	0.00	3.0	•	◦	
	GVN26R/LS1.7-0.1	1.70	0.10	3.0	•	◦	
	GVN26R/LS1.74-00	1.74	0.00	3.0	•	◦	
	GVN26R/LS2.0-00	2.00	0.00	3.0	•	◦	
	GVN26R/LS2.0-0.1	2.00	0.10	3.0	•	◦	
	GVN26RS2.0-0.2	2.00	0.20	5.0	•	•	
	GVN26LS2.0-0.2	2.00	0.20	5.0	•	◦	
29	GVN26R/LS2.22-0.15	2.22	0.15	5.0	•	◦	GVNE...-29-1, GVNE90...-29-1, GVNI...-29
	GVN26R/LS2.39-0.15	2.39	0.15	5.0	•	◦	
	GVN26R/LS2.47-0.2	2.47	0.20	5.0	•	◦	
	GVN29R/LS2.38-0.1	2.38	0.10	6.5	•	◦	
	GVN29R/LS2.5-0.1	2.50	0.10	6.5	•	◦	
	GVN29R/LS2.7-0.1	2.70	0.10	6.5	•	◦	GVNE...-29-2, GVNE90...-29-2, GVNI...-29
	GVN29R/LS3.0-0.2	3.00	0.20	6.5	•	◦	
	GVN29R/LS3.17-0.2	3.17	0.20	6.5	•	◦	
	GVN29R/LS3.5-0.2	3.50	0.20	6.5	•	•	
	GVN29R/LS4.0-0.4	4.00	0.40	6.5	•	•	
	GVN29R/LS5.0-0.4	5.00	0.40	6.5	•	•	

• In stock ◦ Available upon request

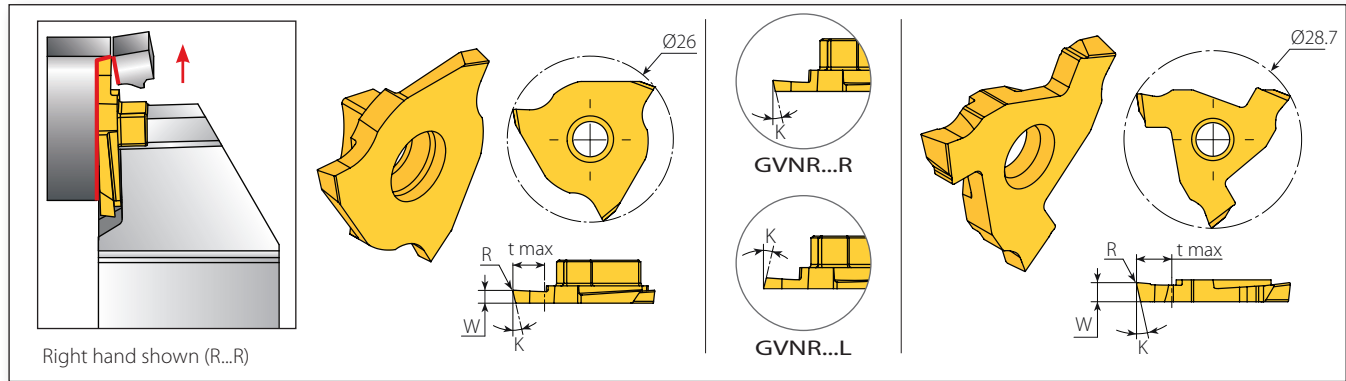
Close to Shoulder Round Grooving



Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W ± 0.02	R ± 0.03	t max	VKX	VTX	
26	GVN26R/LR0.5-0.25	0.50	0.25	1.0	•	◦	GVNE...-26, GVNE90...-26
	GVN26R/LR0.79-0.39	0.79	0.39	1.6	•	◦	
	GVN26R/LR1.0-0.5	1.00	0.50	2.0	•	◦	
	GVN26RR1.2-0.6	1.20	0.60	2.0	•	•	
	GVN26RL1.2-0.6	1.20	0.60	2.0	•	◦	
	GVN26R/LR1.5-0.75	1.50	0.75	5.0	•	◦	
	GVN26R/LR1.6-0.8	1.60	0.80	3.0	•	◦	
	GVN26R/LR2.0-1.0	2.00	1.00	3.0	•	◦	
29	GVN26R/LR2.39-1.19	2.39	1.19	5.0	•	◦	GVNE...-29-1, GVNE90...-29-1, GVNI...-29
	GVN29R/LR2.38-1.19	2.38	1.19	6.5	•	◦	
	GVN29R/LR2.5-1.25	2.50	1.25	6.5	•	◦	
	GVN29R/LR3.0-1.5	3.00	1.50	6.5	•	◦	
	GVN29R/LR3.17-1.59	3.17	1.59	6.5	•	◦	
	GVN29R/LR4.0-2.0	4.00	2.00	6.5	•	•	GVNE...-29-2, GVNE90...-29-2, GVNI...-29

• In stock ◦ Available upon request

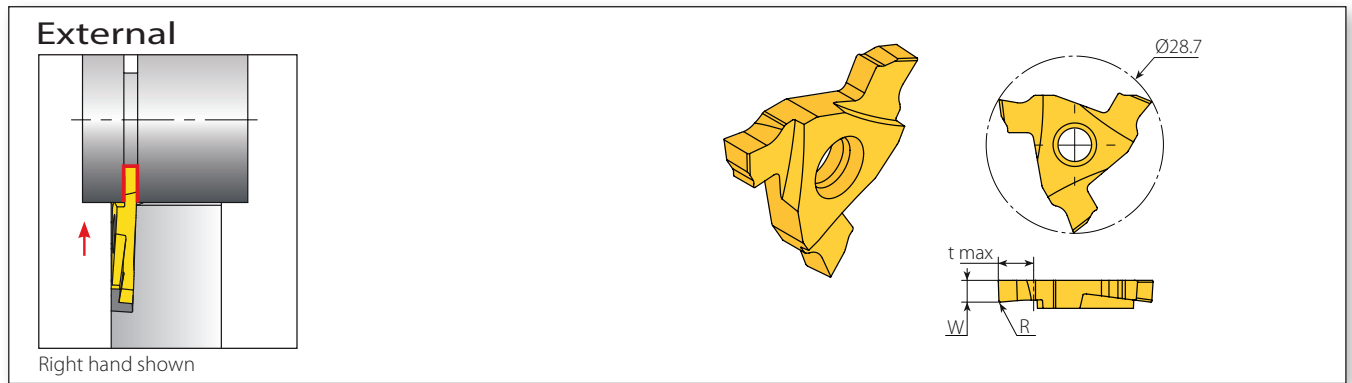
Close to Shoulder Parting Off



Insert Size		Ordering Code		Dimensions mm			Grade		Toolholder	
IC	RH/LH	W ± 0.02	R ± 0.03	t max	K°	VKX	VTX			
26	GVN26RP0.5-0.05-06R	0.5	0.05	1.0	6	●	○	GVNE...-26, GVNE90...-26		
	GVN26RP0.5-0.05-06L	0.5	0.05	1.0	6	○	○			
	GVN26LP0.5-0.05-06R	0.5	0.05	1.0	6	○	○			
	GVN26LP0.5-0.05-06L	0.5	0.05	1.0	6	●	○			
	GVN26RP0.5-0.05-15R	0.5	0.05	1.0	15	●				
	GVN26RP0.5-0.05-15L	0.5	0.05	1.0	15	●	○			
	GVN26LP0.5-0.05-15R	0.5	0.05	1.0	15	●	○			
	GVN26LP0.5-0.05-15L	0.5	0.05	1.0	15	●	○			
	GVN26R P1.2-0.08-05R	1.2	0.08	1.0	5	●	○			
	GVN26RP1.4-0.05-06R	1.4	0.05	5.0	6	●	○			
	GVN26RP1.4-0.05-06L	1.4	0.05	5.0	6	○	○			
	GVN26LP1.4-0.05-06R	1.4	0.05	5.0	6	○	○			
	GVN26LP1.4-0.05-06L	1.4	0.05	5.0	6	●	○			
	GVN26RP1.4-0.05-15R	1.4	0.05	5.0	15	●	○			
	GVN26RP1.4-0.05-15L	1.4	0.05	5.0	15	●	○			
	GVN26LP1.4-0.05-15R	1.4	0.05	5.0	15	●	○			
	GVN26LP1.4-0.05-15L	1.4	0.05	5.0	15	●	○			
	GVN26RP2.0-0.1-06R	2.0	0.10	5.0	6	●	●			
	GVN26RP2.0-0.1-06L	2.0	0.10	5.0	6	●	○			
	GVN26LP2.0-0.1-06R	2.0	0.10	5.0	6	○	○			
	GVN26LP2.0-0.1-06L	2.0	0.10	5.0	6	●	○			
	GVN26RP2.0-0.1-15R	2.0	0.10	5.0	15	●	○			
	GVN26RP2.0-0.1-15L	2.0	0.10	5.0	15	●	○			
	GVN26LP2.0-0.1-15R	2.0	0.10	5.0	15	●	○			
	GVN26LP2.0-0.1-15L	2.0	0.10	5.0	15	●	○			
29	GVN29RP2.5-0.2-06R	2.5	0.20	6.5	6	●	●	GVNE...-29-1, GVNE90...-29-1, GVNI...-29		
	GVN29RP2.5-0.2-06L	2.5	0.20	6.5	6	○	○			
	GVN29LP2.5-0.2-06R	2.5	0.20	6.5	6	○	○			
	GVN29LP2.5-0.2-06L	2.5	0.20	6.5	6	●	●			
	GVN29RP2.5-0.2-15R	2.5	0.20	6.5	15	●	●			
	GVN29RP2.5-0.2-15L	2.5	0.20	6.5	15	○	○			
	GVN29LP2.5-0.2-15R	2.5	0.20	6.5	15	○	○			
	GVN29LP2.5-0.2-15L	2.5	0.20	6.5	15	●	●			
	GVN29RP3.0-0.2-06R	3.0	0.20	6.5	6	●	●			
	GVN29RP3.0-0.2-06L	3.0	0.20	6.5	6	○	○			
	GVN29LP3.0-0.2-06R	3.0	0.20	6.5	6	○	○			
	GVN29LP3.0-0.2-06L	3.0	0.20	6.5	6	●	●			
	GVN29RP3.0-0.2-15R	3.0	0.20	6.5	15	●	●			
	GVN29RP3.0-0.2-15L	3.0	0.20	6.5	15	○	○			
	GVN29LP3.0-0.2-15R	3.0	0.20	6.5	15	○	○			
	GVN29LP3.0-0.2-15L	3.0	0.20	6.5	15	●	●			

● In stock ○ Available upon request

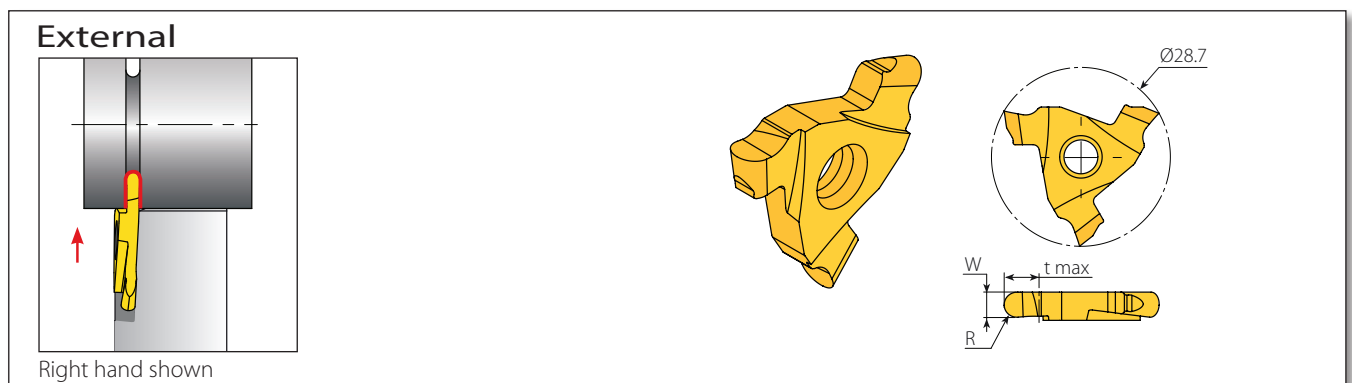
Square Grooving (GV29)



Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W ± 0.02	R ± 0.03	t max	VKX	VTX	
29	GV29R/LS2.38-0.1	2.38	0.10	6.5	•	•	GVE...-29-1, GVE90...-2901, GVI...-29
	GV29R/LS2.5-0.1	2.50	0.10	6.5	•	•	
	GV29R/LS2.7-0.1	2.70	0.10	6.5	•	•	
	GV29R/LS3.0-0.2	3.00	0.20	6.5	•	•	
	GV29R/S3.0-0.4	3.00	0.40	6.5	•	•	GVE...-29-2, GVE90...-29-2, GVI...-29, GVNE...-29-2, GVNE90...-29-2, GVNI...-29
	GV29R/LS3.17-0.2	3.17	0.20	6.5	•	•	
	GV29R/LS3.5-0.2	3.50	0.20	6.5	•	•	
	GV29R/LS4.0-0.4	4.00	0.40	6.5	•	•	
	GV29R/LS5.0-0.4	5.00	0.40	6.5	•	•	

• In stock ◦ Available upon request

Round Grooving (GV29)

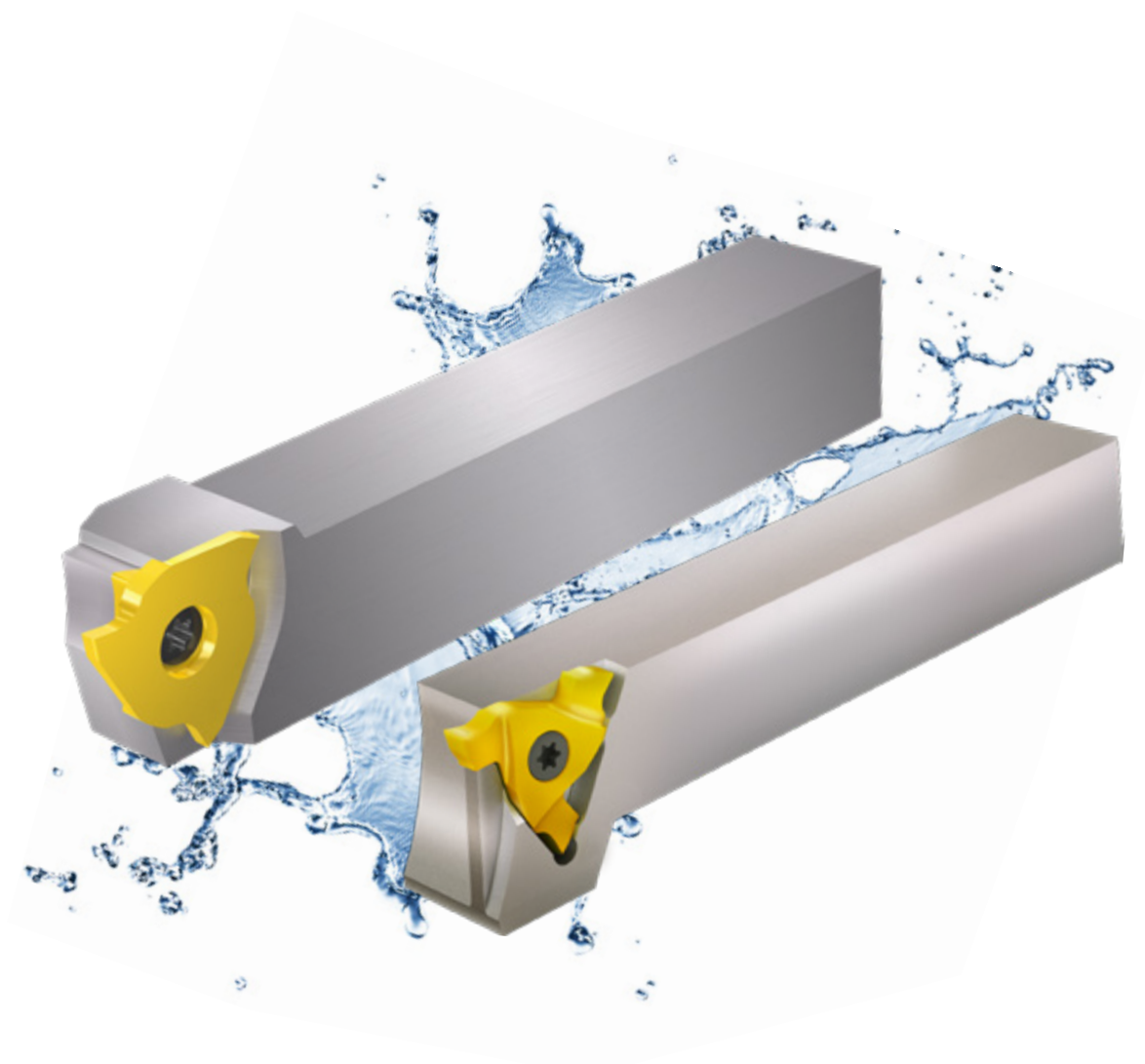


Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W ± 0.02	R ± 0.03	t max	VKX	VTX	
29	GV29R/LR2.38-1.19	2.38	1.19	6.5	•	•	GVE...-29-1, GVE90...-2901, GVI...-29
	GV29R/LR2.5-1.25	2.50	1.25	6.5	•	•	
	GV29R/LR3.0-1.5	3.00	1.50	6.5	•	•	
	GV29R/LR3.17-1.59	3.17	1.59	6.5	•	•	
	GV29R/LR4.0-2.0	4.00	2.00	6.5	•	•	GVE...-29-2, GVE90...-29-2, GVI...-29, GVNE...-29-2, GVNE90...-29-2, GVNI...-29

• In stock ◦ Available upon request

GrooVical Holders

Close to Shoulder External Toolholders.....	51
Close to Shoulder External Toolholders 90°.....	52
External Toolholders (GV29).....	53
External Toolholders 90° (GV29).....	53

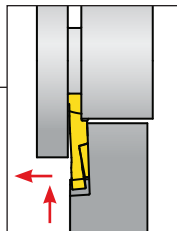


GrooVical Holders - Ordering Code System

GVN	E	R	20	-	29	-	1
1	2	3	4		5		6

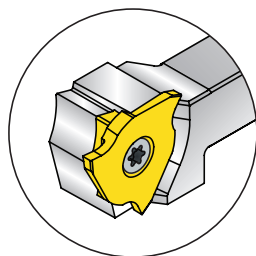
1 - Insert Type	2 - External Type	3 - RH or LH	4 - Shank Size
GVN - Groovical Close to Shoulder GV - Groovical Neutral	E - External E90 - External 90°	R - RH L - LH	10, 12, 16, 20, 25, 32, 40 mm

5 - Insert Size	6 - Insert Width (for GVN29 & GV29)
26 29	1 - 2.5 - 3.5mm 2 - 3.6 - 5.5mm

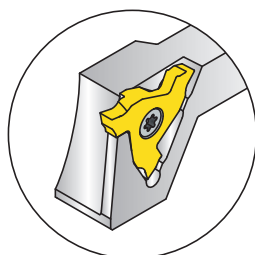


Right hand shown

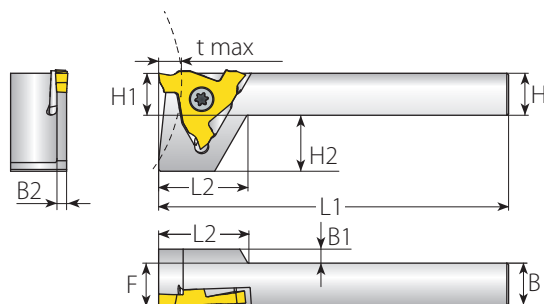
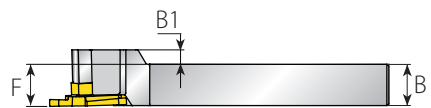
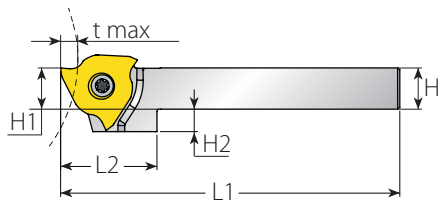
Close to Shoulder External Toolholders



GVN26

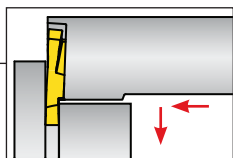


GVN29



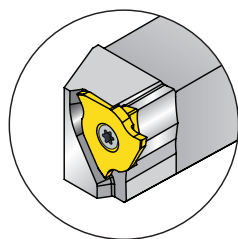
											Spare Parts		
Insert Size	Ordering Code	Dimensions mm											
	RH/LH	H=B	L1	H1	L2	H2	F	B1	B2	t max/D max	Insert Screw*	Torx Key	
26	GVNER/L10-26	10	125	10	28.0	8.5	10.2	6.2			See page 42	SGM5	L20IP
	GVNER/L12-26	12	125	12	28.0	6.5	12.2	4.2					
	GVNER/L16-26	16	125	16	28.0	2.5	16.2	-	-				
	GVNER/L20-26	20	125	20	28.0	-	20.2	-					
	GVNER/L25-26	25	150	25	28.0	-	25.2	-					
29	GVNER/L12-29-1	12	100	12	25.5	16	12.5	4	1.75				
	GVNER/L12-29-2	12	100	12	25.5	16	12.5	4	2.75				
	GVNER/L16-29-1	16	125	16	23.2	12	16.5	-	1.75				
	GVNER/L16-29-2	16	125	16	23.2	12	16.5	-	2.75				
	GVNER/L20-29-1	20	125	20	20.9	8	20.5	-	1.75				
	GVNER/L20-29-2	20	125	20	20.9	8	20.5	-	2.75				
	GVNER/L25-29-1	25	150	25	18.0	3	25.5	-	1.75				
	GVNER/L25-29-2	25	150	25	18.0	3	25.5	-	2.75				

* Tightening Torque 4.5 Nm

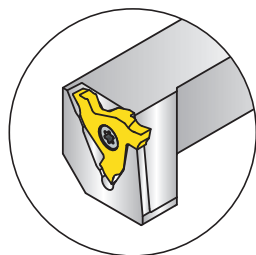
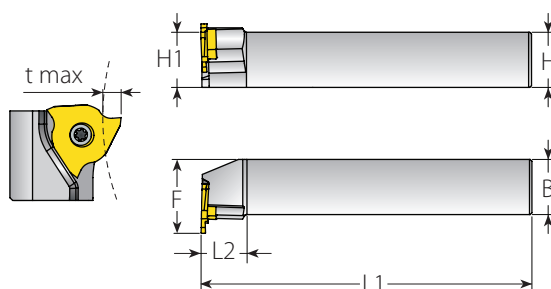


Right hand shown

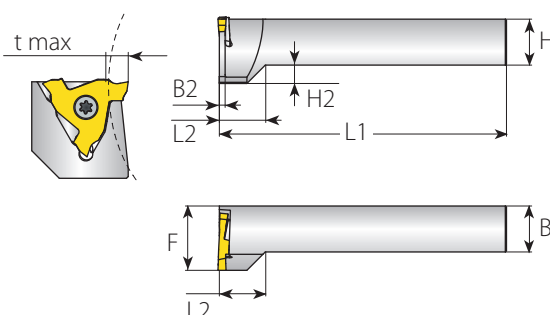
Close to Shoulder External Toolholders 90°



GVN26



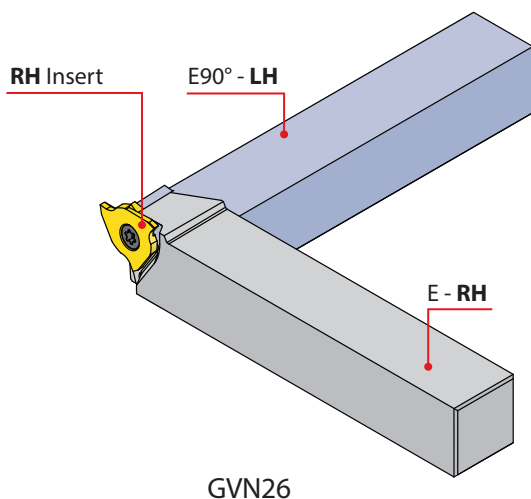
GVN29



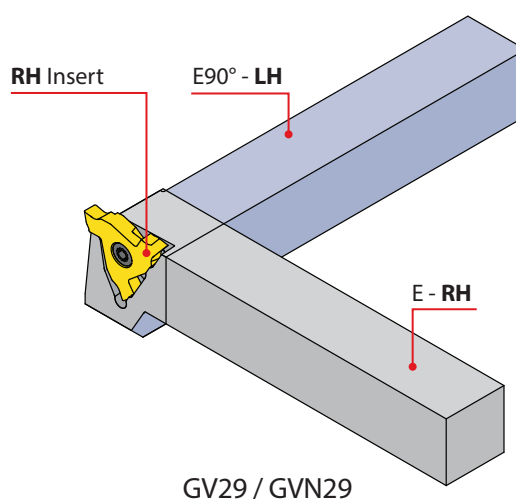
										Spare Parts		
Insert Size	Ordering Code								Dimensions mm			
	RH/LH	H=B	L1	H1	L2	B2	H2	F	t max/D max	Insert Screw*	Torx Key	
26	GVNE90R/L20-26	20	125	20	20.0	-	-	28.5	See page 42	SGM5	L20IP	
	GVNE90R/L25-26	25	150	25	20.0	-	-	33.5				
29	GVNE90R/L20-29-1	20	125	20	20.2	1.75	8	28.0				
	GVNE90R/L20-29-2	20	125	20	20.2	2.75	8	28.0				
	GVNE90R/L25-29-1	25	150	25	25.0	1.75	3	33.0				
	GVNE90R/L25-29-2	25	150	25	25.0	2.75	3	33.0				

* Tightening Torque 4.5 Nm

For **LH90°** work applications use **LH toolholder** with **RH insert** and vice versa.

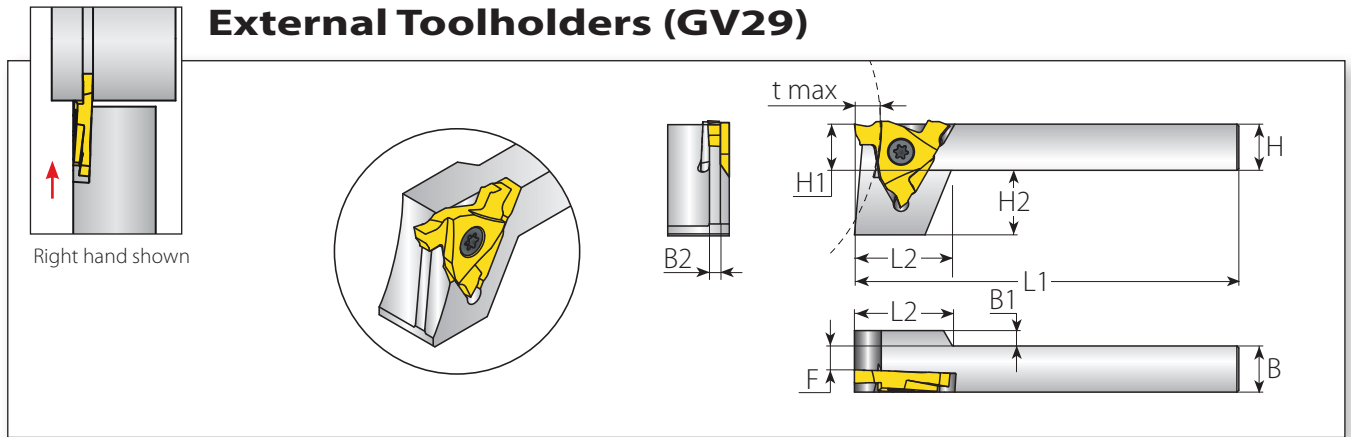


GVN26



GV29 / GVN29

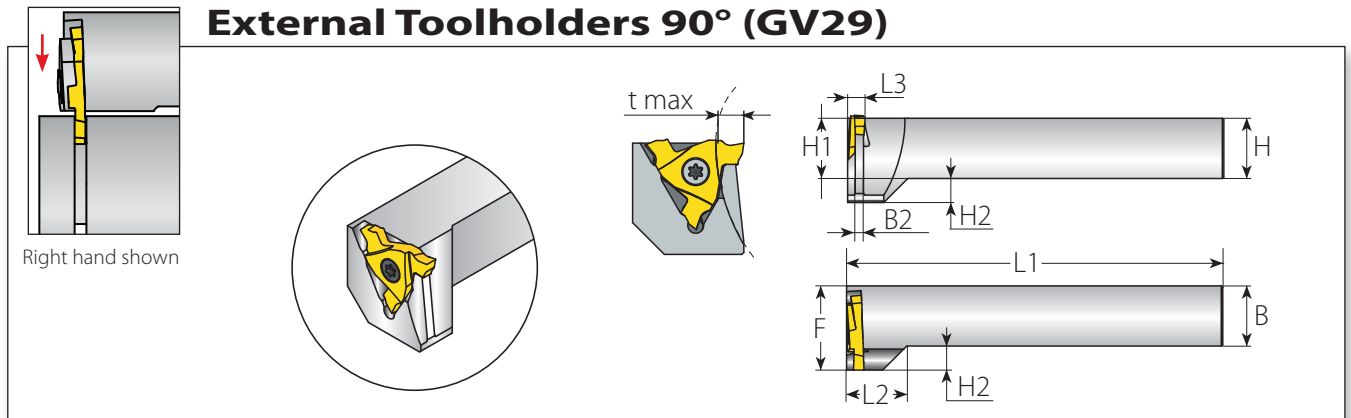
External Toolholders (GV29)



											Spare Parts											
Insert Size	Ordering Code										Dimensions mm											
	RH/LH	H=B	L1	H1	L2	H2	F	B1	B2	t max/D max		Insert Screw*	Torx Key									
29	GVER/L12-29-1	12	100	12	25.5	16	7.2	4	1.75	See page 42	SGM5	L20IP										
	GVER/L12-29-2	12	100	12	25.5	16	6.2	4	2.75													
	GVER/L16-29-1	16	125	16	23.2	12	11.2	-	1.75													
	GVER/L16-29-2	16	125	16	23.2	12	10.2	-	2.75													
	GVER/L20-29-1	20	125	20	20.9	8	15.2	-	1.75													
	GVER/L20-29-2	20	125	20	20.9	8	14.2	-	2.75													
	GVER/L25-29-1	25	150	25	18	3	20.2	-	1.75													
	GVER/L25-29-2	25	150	25	18	3	19.2	-	2.75													

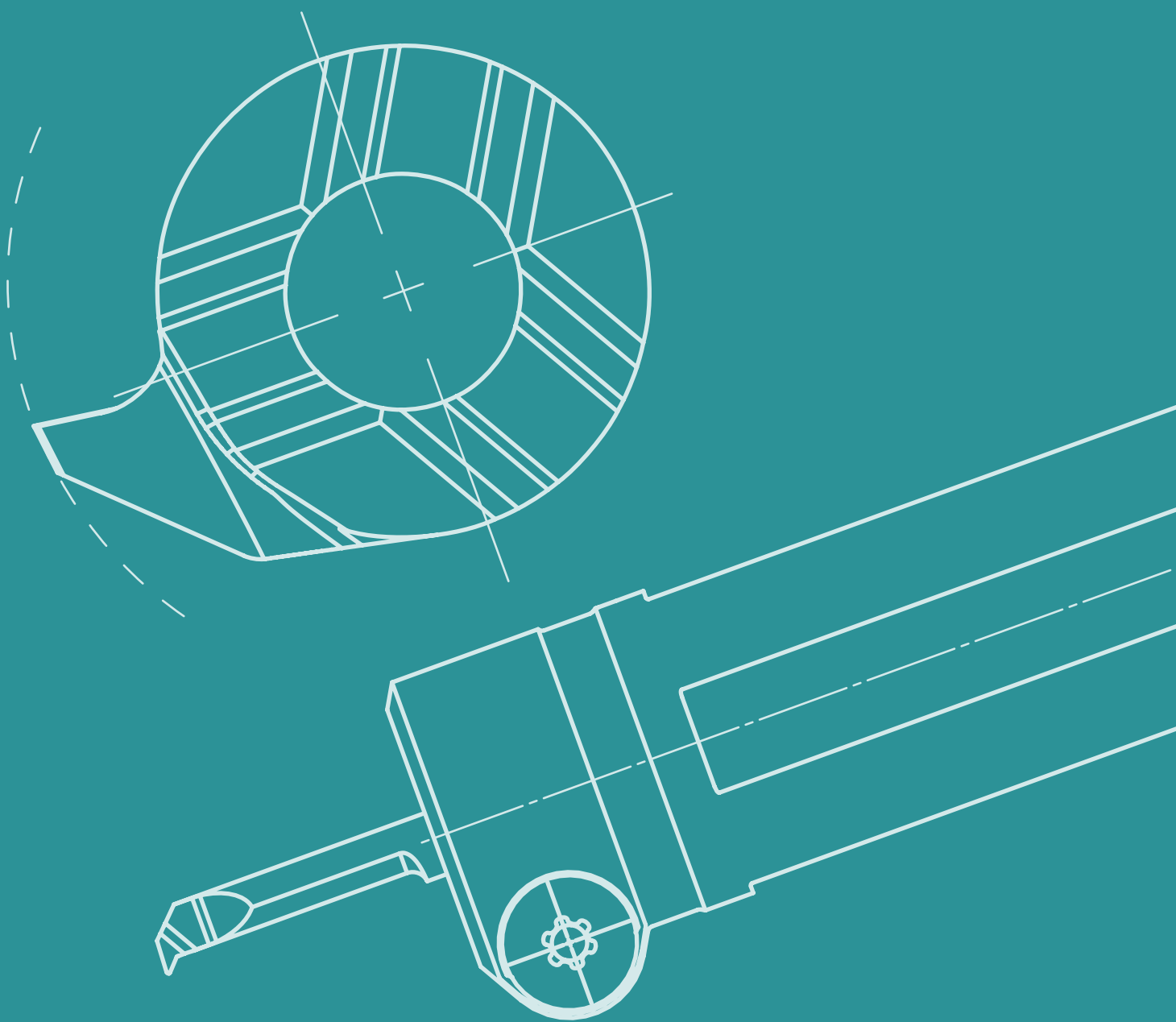
* Tightening Torque 4.5 Nm

External Toolholders 90° (GV29)



											Spare Parts	
Insert Size	Ordering Code		Dimensions mm									
	RH/LH	H=B	L1	H1	L2	H2	F	L3	B2	t max/D max	Insert Screw*	Torx Key
29	GVE90R/L20-29-1	20	125	20	20.2	8	28	4.8	1.75	See page 42	SGM5	L20IP
	GVE90R/L20-29-2	20	125	20	20.2	8	28	5.8	2.75			
	GVE90R/L25-29-1	25	150	25	25.2	8	33	4.8	1.75			
	GVE90R/L25-29-2	25	150	25	25.2	8	33	5.8	2.75			

* Tightening Torque 4.5 Nm



INTERNAL MACHINING

Semi Finishing	
VG-Cut	57
Finishing	
GrooVical	63
Mini-V	69
microscope	91



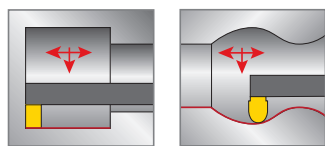
INTERNAL MACHINING | **SEMI FINISHING**

VG-Cut

Internal Grooving & Turning Applications

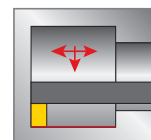
Tech Guide

Recommended Cutting Speeds Vc [m/min] for Grooving and Turning



Material Group	Vargus No.	Material		Hardness Brinell HB	Carbide Grade		
					VMG PVD M35	VPK PVD P20	VKG CVD K25
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	100-160	120-260	120-280
	2		Medium Carbon (C=0.25-0.55%)	150	80-140	90-220	90-250
	3		High Carbon (C=0.55-0.85%)	170	80-140	90-220	90-250
	4	Low Alloy Steel (alloying elements ≤ 5%)	Non Hardened	180	80-140	90-220	90-250
	5		Hardened	275	50-120	60-150	60-180
	6	High Alloy Steel (alloying elements > 5%)	Annealed	200	50-100	90-150	90-250
	7		Hardened	325	40-70	50-100	60-160
	8	Cast Steel	Low Alloy (alloying elements < 5%)	200	50-100	90-150	90-250
	9		High Alloy (alloying elements > 5%)	225	50-100	60-150	60-180
	10						
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	50-80	60-160	
	12		Hardened	330	40-80	50-140	
	13	Stainless Steel Austenitic	Austenitic	180	50-80	60-160	
	14		Super Austenitic	200	50-80	60-160	
	15	Stainless Steel Cast Ferritic	Non Hardened	200	50-80	60-160	
	16		Hardened	330	40-80	50-140	
	17	Stainless Steel Cast Austenitic	Austenitic	200	50-80	60-160	
	18		Hardened	330	40-80	50-140	
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130		160-200	160-280
	29		Pearlitic (long chips)	230		140-220	140-260
	30	Grey Cast Iron	Low Tensile Strength	180		160-200	160-280
	31		High Tensile Strength	260		100-200	100-240
	32	Nodular Sg Iron	Ferritic	160		100-200	100-240
	33		Pearlitic	260		100-200	100-240
N(K) Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	150-300		
	35		Aged	100	150-250		
	36	Aluminium Alloys	Cast	75	150-300		
	37		Cast & Aged	90	150-300		
	38	Aluminium Alloys	Cast Si 13-22%	130	150-250		
	39	Copper and Copper Alloys	Brass	90	150-300		
	40		Bronze And Non Leaded Copper	100	150-300		
S(M) Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	25-40	30-50	
	20		Aged (iron based)	280	25-35	20-50	
	21		Annealed (nickel or cobalt based)	250	25-35	20-50	
	22		Aged (nickel or cobalt based)	350	25-35	20-50	
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	25-40	30-50	
	24		α+β Alloys	1050Rm	25-60	30-70	
H(K) Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRC		20-40	30-50
	26			51-55HRC		15-30	25-45

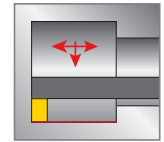
Vc [m/min] for Boring



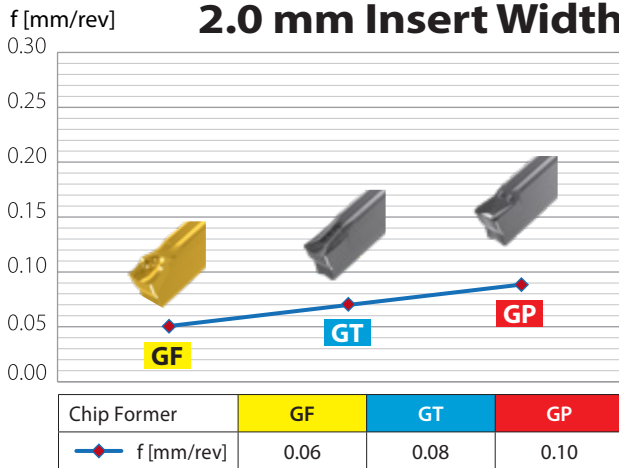
Reduce speed by ≈ 30%
for improved chip
forming and evacuation.

For gummy materials, such as stainless steel and heat resistant metals or in case of build up on edge (cold welding), **increase speed by ≈ 20%.**

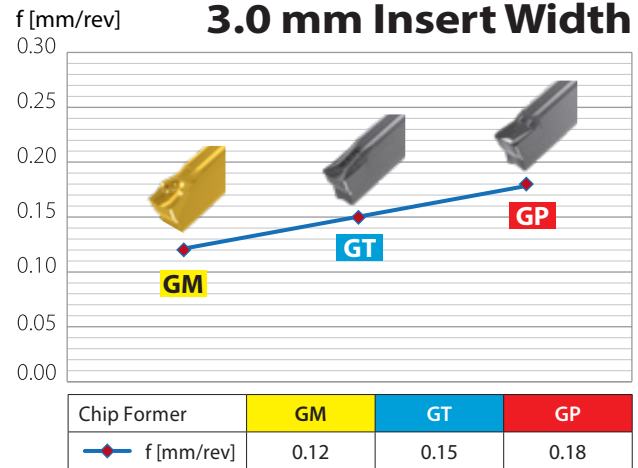
Feed Rate (f) Starting Point for Boring



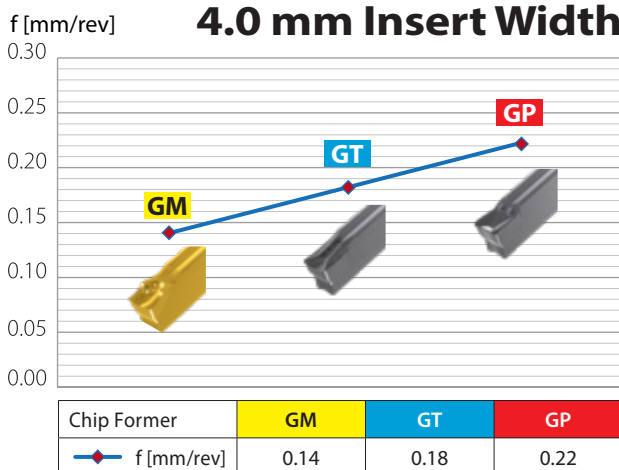
2.0 mm Insert Width



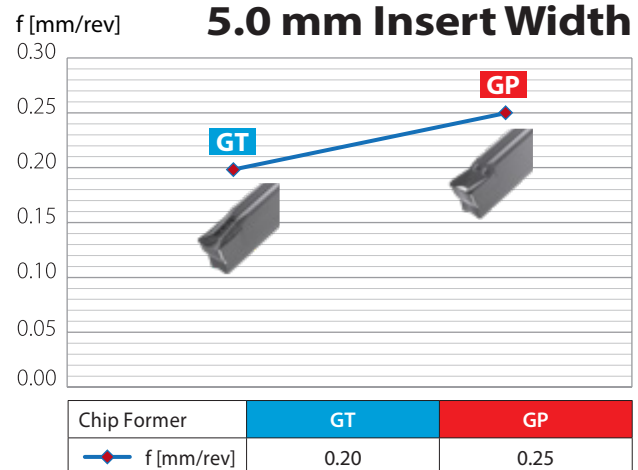
3.0 mm Insert Width



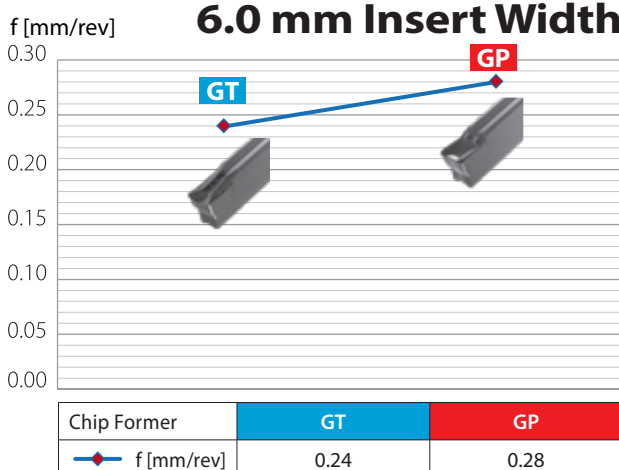
4.0 mm Insert Width



5.0 mm Insert Width



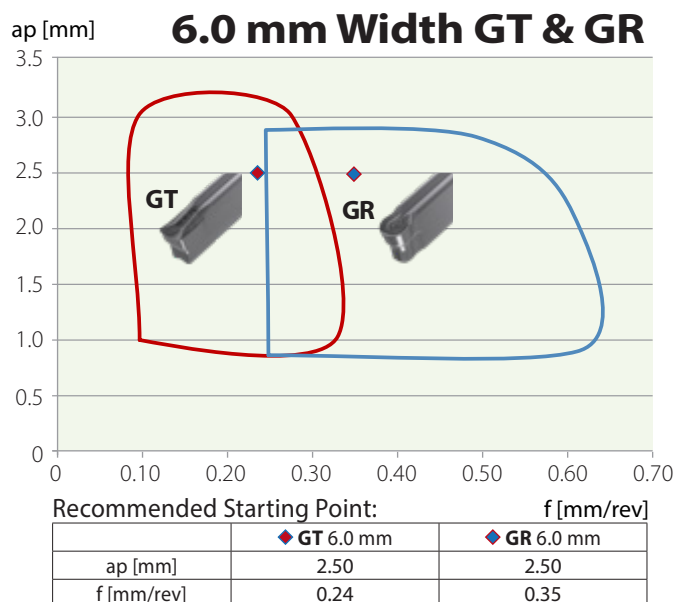
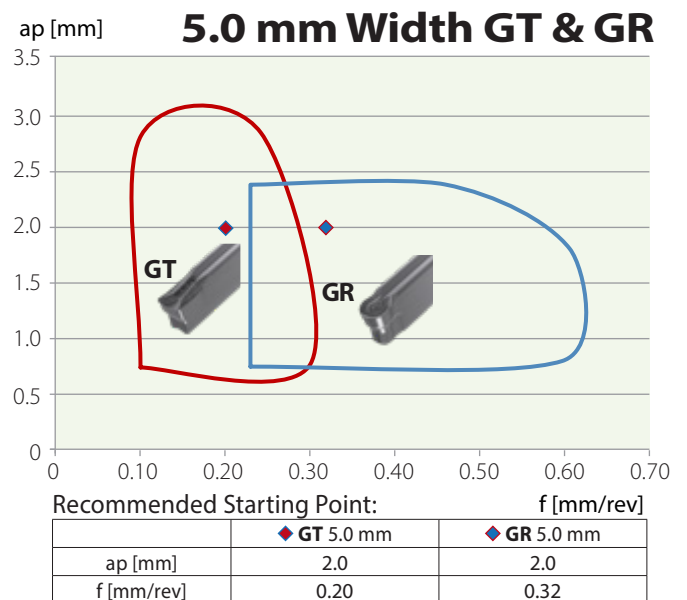
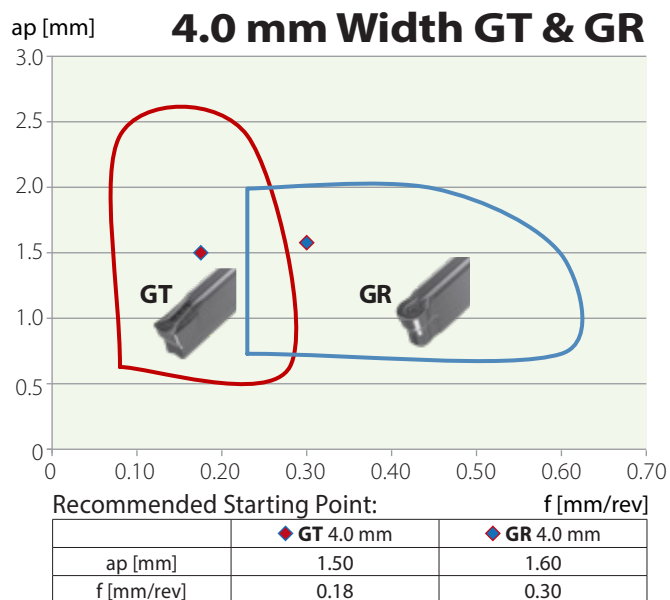
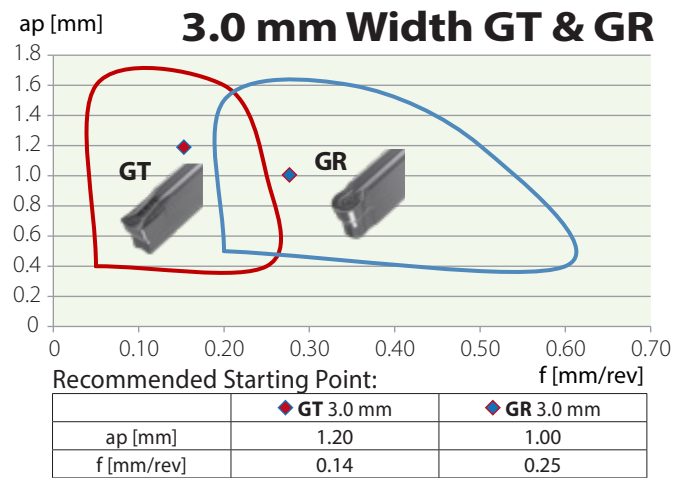
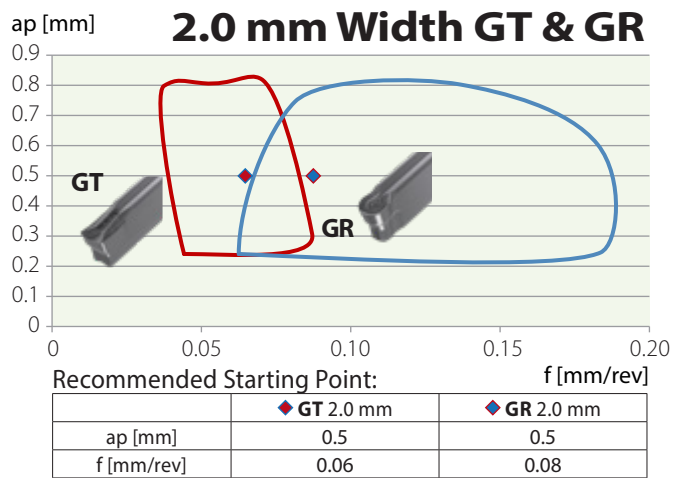
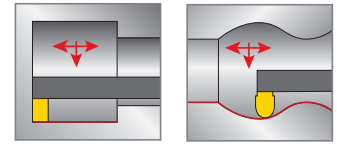
6.0 mm Insert Width



For better chip evacuation in Grooving, creating short chips is preferable. It is therefore recommended to work in short intervals (pecking), at a maximum grooving depth of twice the insert width. Taking into consideration the workpiece material and groove diameter, it is recommended to begin the first cut at no longer than the insert's width.

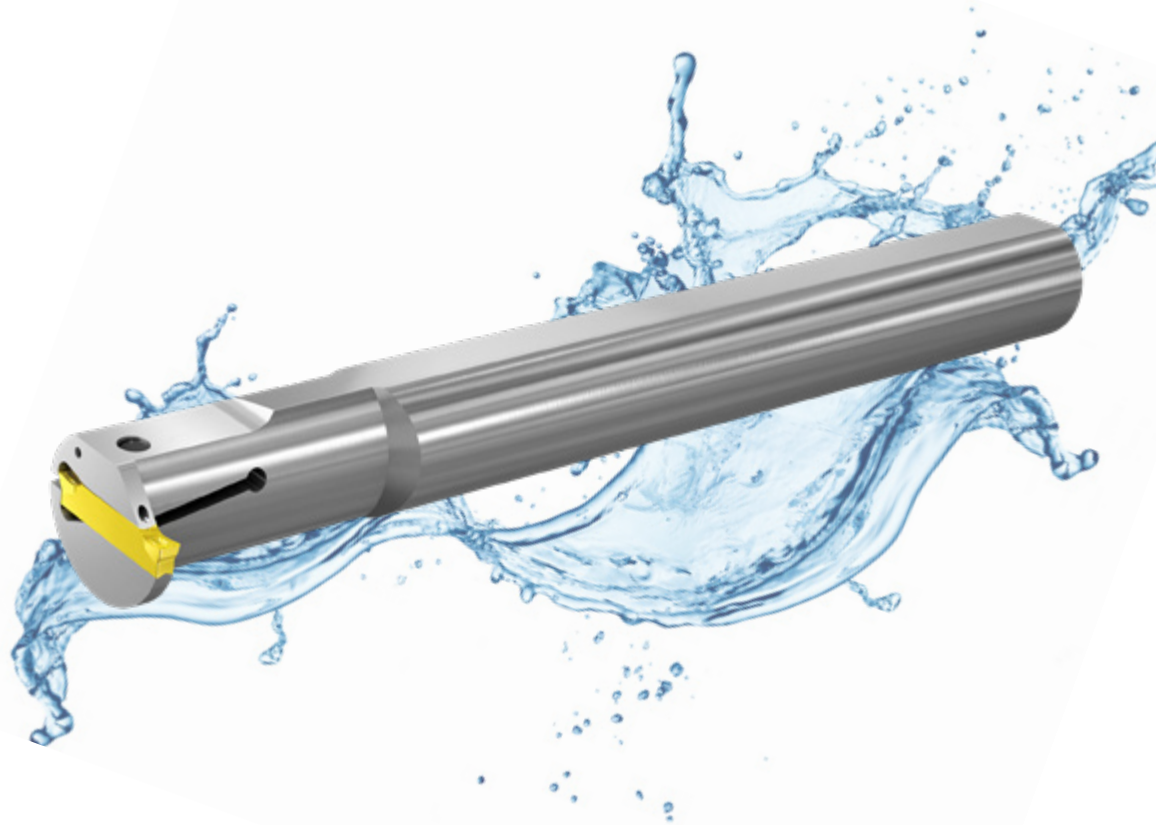
Reduce feed by 25% when exceeding machining depth of 3xD shank diameter.

Feed Rate (f) and Depth of Cut for Boring and Internal Profiling



VG-Cut Internal Tools

Internal Grooving & Turning..... 62

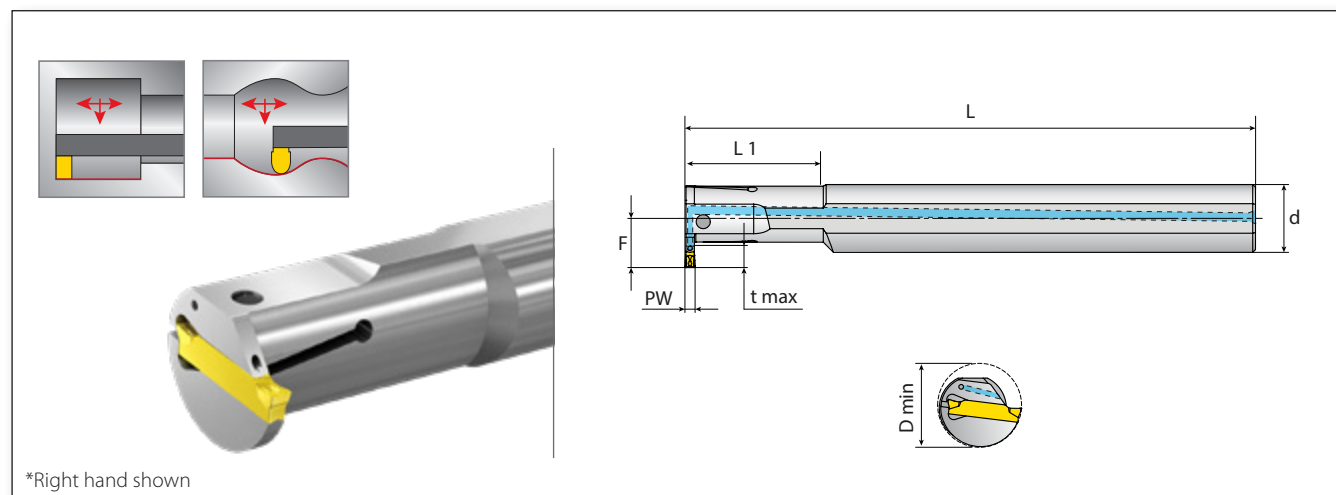


VG-Cut Tools Ordering Code

VG	I	R	20-25	3	C
1	2	3	4	5	6

1 – Tools/Holders VG - Grooving & Turning	2 – Type I - Internal	3 – RH or LH R - RH L - LH	4 – Shank Diameter Shank Dia. - D min. - Ex. 20-25
5 – Pocket Size 2, 3, 4, 5, 6	6 – Coolant C - Coolant		

Internal Grooving & Turning



								Spare Parts	
Ordering Code		Dimensions mm							
RH/LH	PW	t max	L1	D min	d	F	L	Screw*	Key
VGIR/L-20-25-2C	2	7	40.5	25	20	14.5	180	SM5x12	K4H
VGIR/L-25-32-2C		9	50.5	32	25	18.0	200		
VGIR/L-20-25-3C	3	7	40.5	25	20	14.4	180	SM5x16	
VGIR/L-25-32-3C		9	50.5	32	25	18.0	200	SM5x20	
VGIR/L-32-40-3C		11	64	40	32	22.0	250	SM5x12	
VGIR/L-20-28-4C	4	9	41.0	28	20	16.5	180	SM5x16	
VGIR/L-25-32-4C		9	51.0	32	25	18.0	200	SM5x20	
VGIR/L-32-40-4C		11	64.0	40	32	22.0	250		
VGIR-32-40-5C	5	11	64.0	40	32	22.0	250		
VGIR-40-50-6C	6	10	80.0	51	40	30.0	295		

* Tightening Torque 7 Nm max.

For suitable VG-Cut inserts, please see pages 22-24.



INTERNAL MACHINING | **FINISHING**

GrooVical

Precise Grooving & Turning Applications

Technical Guide

Recommended Grades and Cutting Data

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [m/min]
					Coated
					VKX
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	140-200
	2		Medium Carbon (C=0.25-0.55%)	150	120-180
	3		High Carbon (C=0.55-0.85%)	170	110-180
	4	Low Alloy Steel (alloying elements ≤ 5%)	Non Hardened	180	100-155
	5		Hardened	275	110-180
	6		Hardened	350	80-135
	7	High Alloy Steel (alloying elements > 5%)	Annealed	200	70-115
	8		Hardened	325	50-100
	9	Cast Steel	Low Alloy (alloying elements < 5%)	200	30-50
	10		High Alloy (alloying elements > 5%)	225	20-40
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	70-120
	12		Hardened	330	60-95
	13	Stainless Steel Austenitic	Austenitic	180	70-120
	14		Super Austenitic	200	40-90
	15	Stainless Steel	Non Hardened	200	80-110
	16	Cast Ferritic	Hardened	330	65-110
	17	Stainless Steel Cast Austenitic	Austenitic	200	85-100
	18		Hardened	330	60-100
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	70-120
	29		Pearlitic (long chips)	230	70-120
	30	Grey Cast Iron	Low Tensile Strength	180	70-120
	31		High Tensile Strength	260	60-100
	32	Nodular Sg Iron	Ferritic	160	50-80
	33		Pearlitic	260	60-90
N(k) Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	100-240
	35		Aged	100	80-170
	36	Aluminium Alloys	Cast	75	100-150
	37		Cast & Aged	90	80-120
	38	Aluminium Alloys	Cast Si 13-22%	130	100-150
	39	Copper and Copper Alloys	Brass	90	80-200
	40		Bronze And Non Leaded Copper	100	80-200
S(M) Heat Resistant Material	19	High Temperature Alloys	Annealed (iron based)	200	45-60
	20		Aged (iron based)	280	35-50
	21		Annealed (nickel or cobalt based)	250	20-30
	22		Aged (nickel or cobalt based)	350	15-25
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	140-170
	24		α+β Alloys	1050Rm	50-70
H(k) Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	45-60
	26			51-55HRc	40-50

! The maximum recommended **feed rate** is one-tenth of the insert width (W).

! The minimum recommended **depth of cut** is twice the corner radius (r).

VTX

Excellent for Grooving applications in medium-to-high cutting speeds and in dry conditions. Multi-layered AlTiN coated, general purpose grade for prevention of peeling and chipping.

* For **VTX Grade**, increase speed by 20%.

VKX

Standard grade for Grooving applications. Single-layered AlTiN+TiN coated.

Recommended Feed Rate for Grooving & Turning Finishing Operations

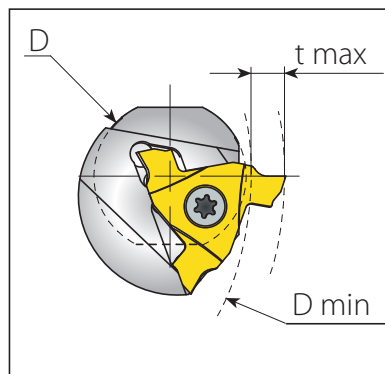
Insert Width (mm)	High Alloy Steel, 330 HB, 2100 Kc [N/mm ²]		Austenitic Stainless Steel, 200 HB, 2600 Kc [N/mm ²]	
	Depth ap = Insert Width x variable	Average f mm/rev	Depth ap = Insert Width x variable	Average f mm/rev
0.4 mm - 0.9 mm	0.055	0.04	0.035	0.02
1.0 mm - 1.5 mm	0.055	0.07	0.035	0.04
1.6 mm - 2.0 mm	0.060	0.11	0.040	0.07
2.1 mm - 2.5 mm	0.060	0.14	0.040	0.09
2.6 mm - 3.0 mm	0.060	0.17	0.040	0.11
3.1 mm - 4.0 mm	0.060	0.21	0.040	0.14
4.1 mm - 5.5 mm	0.060	0.28	0.040	0.19

- The above recommendations are for achieving a stable and recurring tool life.
- Exceeding higher feed rates may cause excessive wear and breakage.

D max Limitations

GV29 / GVN29 Internal - Depth of Groove in Relation to Bore Dia.

Dimensions mm	
t max	D min
0.5	41.8
1	42.3
1.5	42.8
2	43.5
2.5	44.2
3	45.1
3.5	46.1
4.0	47.2
4.5	48.3
5.0	49.9
5.5	54.2
6.0	73.5
6.5	104.5



GrooVical Holders

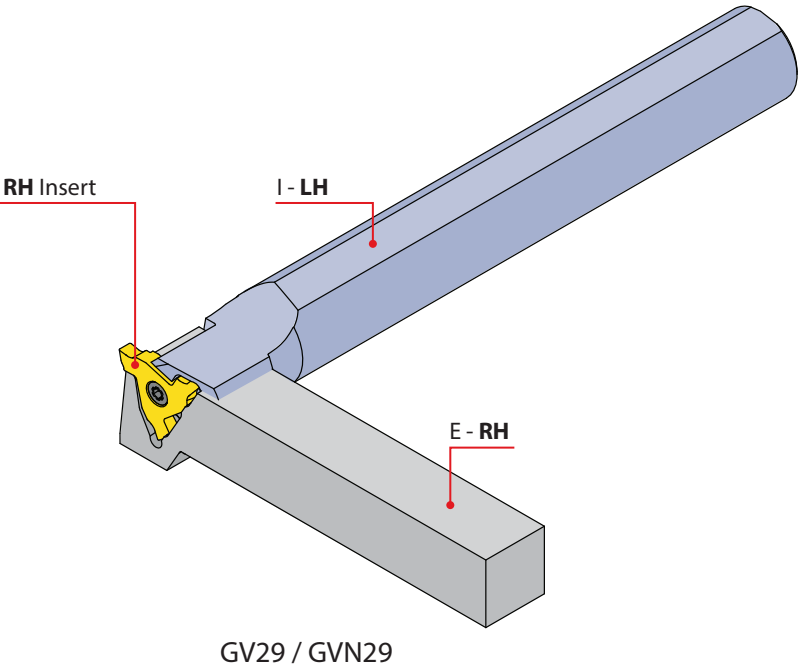
Close to Shoulder Internal Toolholders (GVN29)	67
Internal Toolholders (GV29)	67

GrooVical Holders Ordering Code

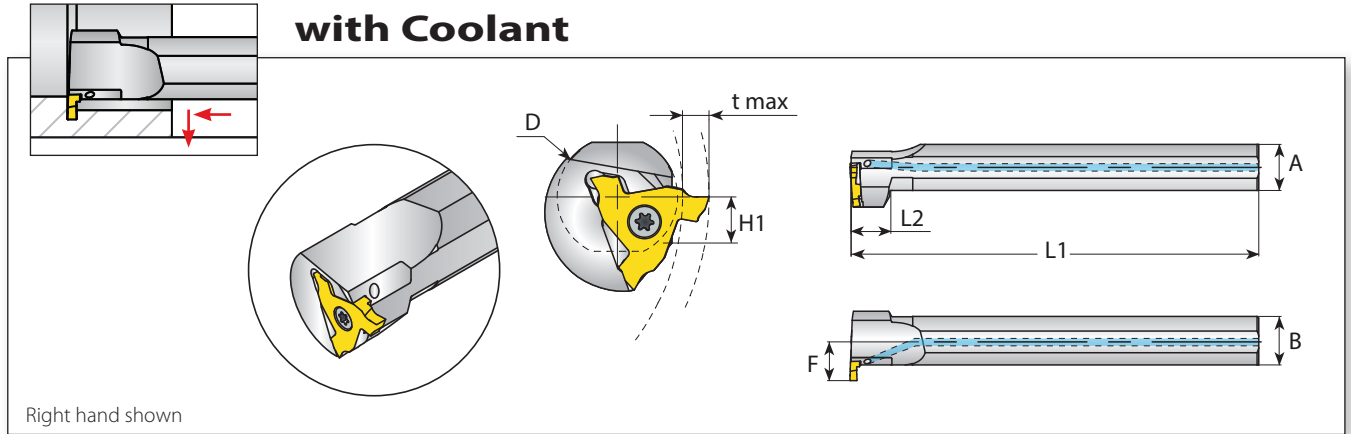
GVN	I	R	25	-	29
1	2	3	4		5

1 - Insert Type	2 - Type	3 - RH or LH	4 - Shank Size	5 - Insert Size
GVN - Groovical Close to Shoulder GV - Groovical Neutral	I - Internal	R - RH L - LH	25, 32 mm	29

I For **LH Internal** work applications use **LH toolholder** with **RH insert** and vice versa.



Close to Shoulder Internal Toolholders with Coolant

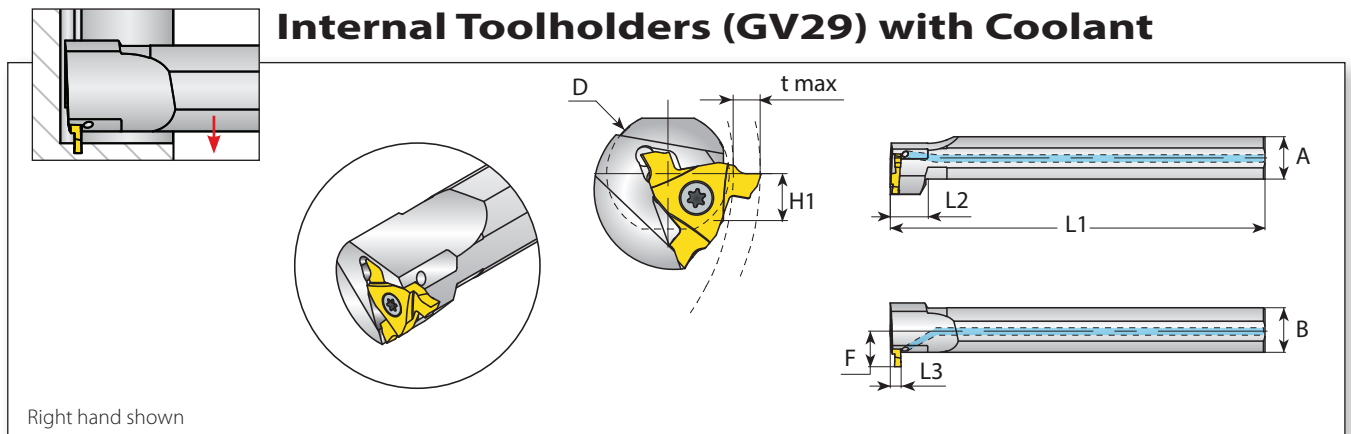


										Spare Parts	
Insert Size	Ordering Code		Dimensions mm								
	RH/LH	D	L1	L2	A	B	H1	F	t max/D max	Insert Screw*	Torx Key
29	GVNIR/L25-29	25	200	19	22.6	23.8	11.3	19.0	See page 65	SGM5	L20IP
	GVNIR/L32-29	32	250	19	29.0	30.5	14.5	22.2			

For suitable GVN29 inserts, please see pages 44-48.

* Tightening Torque 4.5 Nm.

Internal Toolholders (GV29) with Coolant



											Spare Parts	
Insert Size	Ordering Code		Dimensions mm									
	RH/LH	D	L1	L2	L3	A	B	H1	F	t max/D max	Insert Screw*	Torx Key
29	GVIR25-29	25	200	19	5.8	22.6	23.8	11.3	19.0	See page 65	SGM5	L20IP
	GVIR32-29	32	250	19	5.8	29.0	30.5	14.5	22.2			

For suitable GV29 inserts, please see page 49.

* Tightening Torque 4.5 Nm.



INTERNAL MACHINING | **FINISHING**

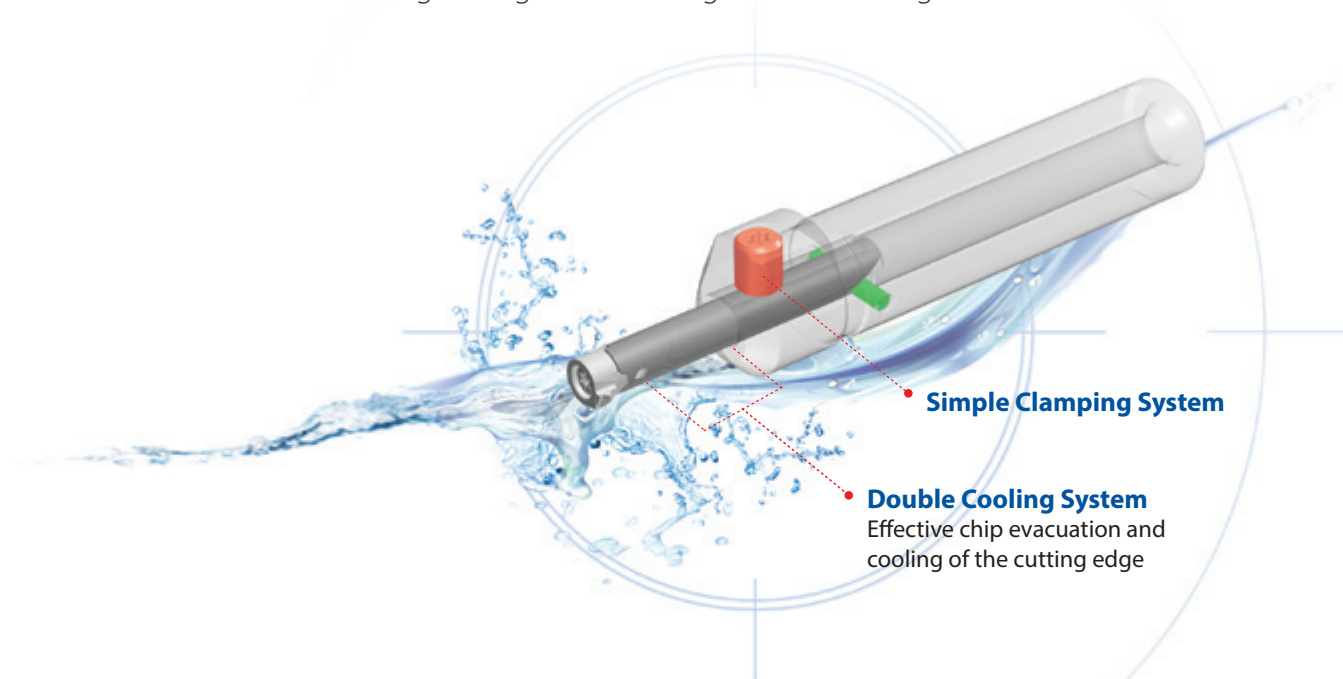
Mini-V

Precise Turning, Grooving,
Threading & Face Grooving

Mini-V

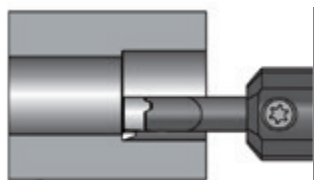
Mini Tools for Small & Medium Bores

The Mini-V line by **Groovex** offers improved solutions for mini boring, grooving and threading in bores starting from 7.8 mm.



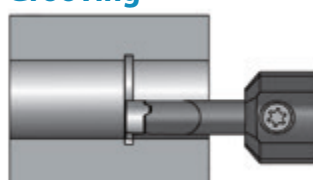
Applications

Boring



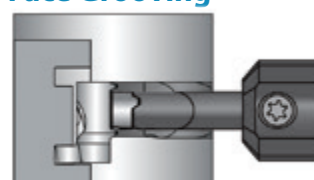
- Boring
- Boring with Chip Former
- Profiling
- Back Boring
- Chamfering

Grooving



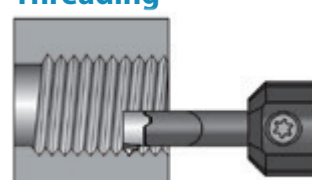
- Square Grooving D472
- Square Grooving
- Round Grooving

Face Grooving



- Square Face Grooving Internal
- Square Face Grooving External
- Round Face Grooving Internal
- Round Face Grooving External

Threading



- Partial 60°
- Partial 55°
- ISO Metric
- American UN
- Whitworth
- BSPT
- NPT
- NPTF
- Trapez

Mini-V Technical Data

Recommended Grades, Cutting Speeds Vc [m/min],
Feed f [mm/rev] and Max. Depth [mm]

Material Group	Vargus No.	Material		Hardness Brinell HB	VBX		Max Depth on R [mm]
					Vc [m/min]		
					Threading Boring	Grooving	Boring
P Steel	1	Unalloyed steel	Low carbon (C=,1-.25%)	125	40-80	40-180	0.30-0.50
	2		Medium carbon (C=,25-.55%)	150	40-80	40-170	0.30-0.50
	3		High Carbon (C=,55-.85%)	170	40-80	40-160	0.25-0.35
	4	Low alloy steel (alloying elements≤5%)	Non hardened	180	40-80	40-155	0.28-0.45
	5		Hardened	275	40-80	40-160	0.25-0.45
	6		Hardened	350	40-80	40-150	0.25-0.40
	7	High alloy steel (alloying elements>5%)	Annealed	200	40-60	40-115	0.20-0.30
	8		Hardened	325	40-60	40-100	0.18-0.30
	9	Cast steel	Low alloy (alloying elements <5%)	200	40-60	40-170	0.20-0.30
	10		High alloy (alloying elements >5%)	225	40-60	40-130	0.17-0.30
M Stainless Steel	11	Stainless steel Ferritic	Non hardened	200	40-60	40-180	0.22-0.34
	12		Hardened	330	40-60	40-180	0.21-0.32
	13	Stainless steel Austenitic	Austenitic	180	40-60	40-140	0.25-0.40
	14		Super Austenitic	200	40-60	40-140	0.17-0.26
	15	Stainless steel Cast Ferritic	Non hardened	200	40-60	40-140	0.25-0.37
	16		Hardened	330	40-60	40-140	0.17-0.26
	17	Stainless steel Cast austenitic	Austenitic	200	40-60	40-120	0.20-0.30
	18		Hardened	330	40-60	40-120	0.17-0.26
K Cast Iron	28	Malleable Cast iron	Ferritic (short chips)	130	40-80	40-120	0.25-0.37
	29		Pearlitic (long chips)	230	40-80	40-100	0.20-0.30
	30	Grey cast iron	Low tensile strength	180	40-80	40-100	0.22-0.34
	31		High tensile strength	260	40-80	40-100	0.20-0.30
	32	Nodular SG iron	Ferritic	160	40-80	40-100	0.15-0.25
	33		Pearlitic	260	40-80	40-90	0.20-0.30
N(K) Non-Ferrous Metals	34	Aluminium alloys Wrought	Non aging	60	40-120	40-400	0.60-1.00
	35		Aged	100	40-120	40-400	0.50-0.90
	36	Aluminium alloys	Cast	75	40-120	40-400	0.50-0.90
	37		Cast & aged	90	40-120	40-200	0.40-0.60
	38	Aluminium alloys	Cast Si 13-22%	130	40-120	40-200	0.50-0.90
	39	Copper and Copper alloys	Brass	90	40-120	40-200	0.60-1.00
	40		Bronze and non leaded copper	100	40-120	40-200	0.50-0.90
S(M) Heat Resistant Material	19	High temperature alloys	Annealed (Iron based)	200	20-30	20-30	0.12-0.22
	20		Aged (Iron based)	280	20-30	20-30	0.10-0.20
	21		Annealed (Nickel or Cobalt based)	250	15-20	15-20	0.08-0.20
	22		Aged (Nickel or Cobalt based)	350	10-15	10-15	0.08-0.20
	23	Titanium alloys	Pure 99.5 Ti	400Rm	40-60	40-60	0.10-0.20
	24		α+β alloys	1050Rm	20-30	20-30	0.10-0.20

VTX

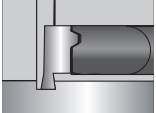
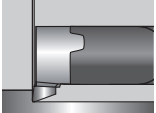
Excellent for Boring applications in medium-to-high cutting speeds and in dry conditions.
Multi-layered AlTiN PVD coated, general purpose grade for prevention of peeling and chipping.

* For **VTX Grade**, increase speed by 20%.

VBX

Excellent for all applications and outstanding wear resistance in low-to-medium cutting speeds, combined with good fracture toughness.
TiCN PVD coated.

Feed Rate f [mm/rev]

Grooving 	0.01 - 0.03 mm
Boring 	0.03 - 0.10 mm

Threading

Depths of Cut and Number of Passes

1. High pressure coolant is recommended
2. Infeed method - modified flank infeed 1°

Option of modified volume chip

	Pitch mm	0.5	0.75		1	1.25		1.5	1.75	2	2.5	3	3.5	4	
	Pitch tpi	48	32	27	24	20	19	18	16	14	12	10	8	7	6
Insert Style	Standard	Passes (modified volume)													
V08	ISO														
	UN	13	19		25	16			19	22					
	W														
	NPT			28				43							
	NPTF														
V11	ISO														
	UN	13	19		25	16			19	22	24				
	W														
	BSPT						19								
V14	ISO														
	UN	7	10		13	16			19	22	24	32	38		
	W														
V16	ISO														
	UN	7	10		13	16			19	22	24	32	38		
	W														

Option of constant depth chip

	Pitch mm	0.5	0.75		1	1.25		1.5	1.75	2	2.5	3	3.5	4	
	Pitch tpi	48	32	27	24	20	19	18	16	14	12	10	8	7	6
Insert Style	Standard	Passes (same)													
V08	ISO														
	UN	11-24	17-35		23-48	18-28			21-34	25-40					
	W														
	NPT														
	NPTF			25-53				40-83							
V11	TR									50-104		70-145			
	ISO														
	UN	11-24	17-35		23-48	14-28			17-34	20-40	23-46				
	W														
	BSPT						21-34								
V14	TR														90-187
	ISO														
	UN	11-24	17-35		23-48	14-28			9-15	11-18	11-18	12-21	18-24		
V16	W														
	ISO														
	UN	11-24	17-35		23-48	14-28			9-15	11-18	11-18	12-21	18-24		

Number of passes can be decreased when high pressure coolant is used.

Mini-V Inserts

Boring.....	74	Grooving - 0.05mm Corner Radius.....	78
Boring with Chip Former.....	74	Grooving - 0.2mm Corner Radius.....	79
Profiling 30°.....	75	Round Grooving DIN 7993.....	80
Profiling 45°.....	75	Square Face Grooving.....	81
Back Boring.....	76	Round Face Grooving.....	82
Chamfering.....	76	Threading.....	83
Grooving DIN 472 - Sharp Corner Radius.....	77		

Mini-V Inserts Ordering Code System

Boring Inserts

V	08	CL		R	VBX
1	2	3	4	5	6
1 - Line Name	3 - Type of Application				
V - Mini-V	BC - Boring BCF - Boring with Chip Former CL - Profiling BB - Back Boring CH45 - Chamfering 45°				
2 - Insert Size	4 - Copy Angle				
08, 11, 14, 16	None - Profiling 20° 3 - Profiling 30° CL+ None - Profiling 45°				
	5 - RH or LH				
	R - RH L - LH				
	6 - Carbide Grade				
	VBX VTX				

Grooving Inserts

V	08	GS	W120	T 100	R	VBX		
1	2	3	4	5	6	7		
1 - Line Name		3 - Type of Application			4 - Groove Width		5 - Groove Depth	
V - Mini-V								
2 - Insert Size								
08 , 11, 14, 16		D472 - Square Grooving Sharp Corner Radius GS - Square Grooving 0.05 mm Corner Radius GSR - Square Grooving 0.2 mm Corner Radius D7993 - Round Grooving D7993 FGW - Square Face Grooving Internal FGR - Round Face Grooving Internal FEGW - Square Face Grooving External FEGR - Round Face Grooving External			W070 - 0.7 mm W080 - 0.8 mm W090 - 0.9 mm W100 - 1.0 mm W110 - 1.1 mm W120 - 1.2 mm W130 - 1.3 mm W150 - 1.5 mm W160 - 1.6 mm W180 - 1.8 mm W200 - 2.0 mm W250 - 2.5 mm W300 - 3.0 mm W350 - 3.5 mm W400 - 4.0 mm		T100 - 1.0 mm T230 - 2.3 mm T400 - 4.0 mm T430 - 4.3 mm	
					6 - RH or LH		7 - Carbide Grade	
					R - RH L - LH		VBX VTX	

Threading Inserts

V	08	TH	.5	ISO	R	VBX
1	2	3	4	5	6	7

1 - Line Name
V - Mini-V

2 - Insert Size
08, 11, 14, 16

3 - Type of Application
TH - Threading

4 - Pitch (for Threading)			
Full Profile - Pitch Range			
TPI		mm	
32-12		0.5-2.0	
Partial Profile - Pitch Range			
	TPI		mm
H	48-32	H	0.5-.75
I	24-20	I	1.0-1.25
J	16-14	J	1.5-1.75
G	14-8	G	1.75-3.0
AG	48-8	AG	0.5-3.0

5 - Threading Standard
60° - Partial Profile 60°
55° - Partial Profile 55°
ISO - ISO Metric
UN - American UN
W - Whitworth for BSW, BSP
BSPT - British Standard Pipe Thread
NPT - NPT National Pipe Thread
NPTF - NPTF National Seal Pipe Thread
TR - Trapez Din 103

6 - RH or LH
R - RH
L - LH

7 - Carbide Grade
VBX
VTX

Boring



Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	r	d	T	t max	AL1	F	mm	VBX	VTX
V08	V08BC R	0.2	6	3.65	1.3	69.8°	4.65	7.8	•	•
V11	V11BC R	0.2	8	4.0	2.3	69.8°	6.70	11.0	•	•
V14	V14BC R	0.2	9	5.6	4.0	69.8°	8.7	13.8	•	•
V16	V16BC R	0.2	11	5.6	4.3	69.8°	9.7	15.5	•	•

• In stock ◦ Available upon request

Boring with Chip Former



Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	r	d	T	t max	AL1	F	mm	VBX	VTX
V08	V08BCF R	0.2	6	3.65	1.3	69.8°	4.65	7.8	•	•
V11	V11BCF R	0.2	8	4.0	2.2	69.8°	6.70	11.0	•	•

• In stock ◦ Available upon request

Profiling 30°



Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	r	d	T	t max	AL1	F	mm	VBX	VTX
V08	V08BC3 R	0.2	6	3.65	1.3	59.8°	4.65	7.8	•	•
V11	V11BC3 R	0.2	8	4.0	2.3	59.8°	6.70	11.0	•	•

• In stock ◦ Available upon request

Profiling 45°



Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	r	d	T	t max	AL1	F	mm	VBX	VTX
V08	V08CL R	0.2	6	3.65	1.2	43°	4.65	7.8	•	•
V11	V11CL R	0.2	8	4.1	2.3	43°	6.70	11.0	•	•
V14	V14CL R	0.2	9	5.6	4.0	43°	8.7	13.7	•	•
V16	V16CL R	0.2	11	5.6	4.3	43°	10.2	15.8	•	•

• In stock ◦ Available upon request

Back Boring



Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grades	
	RH	r	d	T	t max	AL1	F	mm		VBX	VTX
V08	V08BB R	0.2	6	3.8	1.2	59.5°	4.65	7.8		•	•
V11	V11BB R	0.2	8	4.0	2.2	59.5°	6.70	11.0		•	•
V14	V14BB R	0.2	9	5.6	3.5	59.5°	8.70	13.8		•	•

• In stock ◦ Available upon request

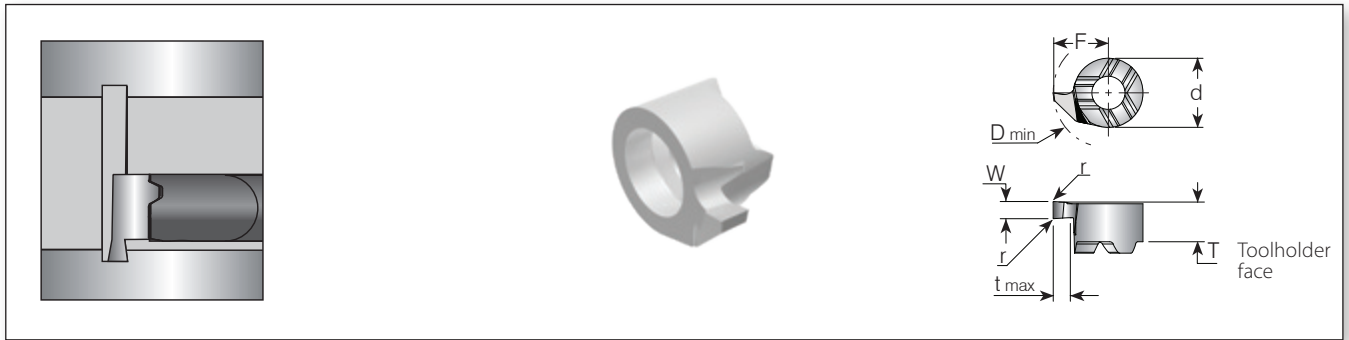
Chamfering



Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grades	
	RH	r	d	$W^{+0.03}$	T	t max	AL1	F	mm	VBX	VTX
V08	V08CH45 R	0.2	6	1.3	3.8	1.0	45°	4.65	8.0	•	•
V14	V14CH45 R	0.2	9	2.7	5.6	2.6	45°	9	14.0	•	•

• In stock ◦ Available upon request

Grooving DIN 472 - Sharp Corner Radius



Insert Style	Ordering Code	Width of Circlip		Dimensions mm						Min. Bore Dia.	Grades	
		mm	W ^{+0.03}	d	t max	T	F	r	D min		VBX	VTX
V08	RH											
	V08D472 W070T100 R	0.7	0.73	6	1.0	3.6	4.8	0	8		•	•
	V08D472 W080T100 R	0.8	0.83								•	•
	V08D472 W090T100 R	0.9	0.93								•	•
	V08D472 W110T100 R	1.1	1.20								•	•
	V08D472 W130T100 R	1.3	1.40								•	•
	V08D472 W160T100 R	1.6	1.70								•	•
V11	V11D472 W070T120 R	0.7	0.73	8	1.2	4.0	6.7	0	11		•	•
	V11D472 W080T130 R	0.8	0.83		1.3						•	•
	V11D472 W090T150 R	0.9	0.93		1.5						•	•
	V11D472 W110T230 R	1.1	1.20		2.2						•	•
	V11D472 W130T230 R	1.3	1.40		2.2						•	•
	V11D472 W160T230 R	1.6	1.70		2.2						•	•
V14	V14D472 W130T400 R	1.3	1.40	9	4.3	5.6	9	0	14		•	•
	V14D472 W160T400 R	1.6	1.70								•	•

• In stock ◦ Available upon request

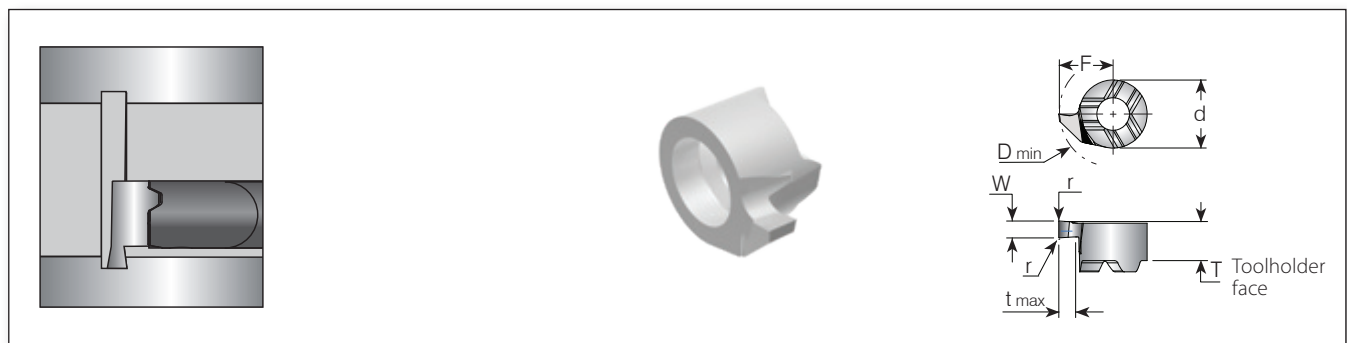
Grooving - 0.05 mm Corner Radius



Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	W ^{+0.03}	t max	T	F	r	D min	VBX	VTX
V08	V08GS W078T100 R	6	0.78	1.0	3.6	4.8	0.05	8	•	•
	V08GS W086T100 R		0.86						•	•
	V08GS W100T100 R		1.00						•	•
	V08GS W117T100 R		1.17						•	•
	V08GS W150T100 R		1.50						•	•
	V08GS W157T100 R		1.57						•	•
	V08GS W198T100 R		1.98						•	•
	V08GS W200T100 R		2.00						•	•
V11	V11GS W100T230 R	8	1.00	2.3	4.0	6.7	0.05	11	•	•
	V11GS W117T230 R		1.17						•	•
	V11GS W120T230 R		1.20						•	•
	V11GS W142T230 R		1.42						•	•
	V11GS W150T230 R		1.50						•	•
	V11GS W157T230 R		1.57						•	•
	V11GS W198T230 R		1.98						•	•
	V11GS W200T230 R		2.00						•	•
	V11GS W238T230 R		2.38						•	•
	V11GS W250T230 R		2.50						•	•
V14	V14GS W318T230 R	9	3.18	4.0	5.6	9.0	0.05	14	•	•
	V14GS W117T400 R		1.17						•	•
	V14GS W150T400 R		1.50						•	•
	V14GS W157T400 R		1.57						•	•
	V14GS W198T400 R		1.98						•	•
	V14GS W200T400 R		2.00						•	•
	V14GS W238T400 R		2.38						•	•
	V14GS W250T400 R		2.50						•	•
V16	V16GS W300T400 R	11	3.00	4.3	5.6	10.2	0.05	16	•	•
	V16GS W318T400 R		3.18						•	•
	V16GS W117T430 R		1.17						•	•
	V16GS W142T430 R		1.42						•	•
	V16GS W157T430 R		1.57						•	•
	V16GS W400T430 R		4.00						•	•
	V16GS W198T430 R		1.98						•	•
	V16GS W200T430 R		2.00						•	•
	V16GS W238T430 R		2.38						•	•
	V16GS W300T430 R		3.00						•	•
	V16GS W318T430 R		3.18						•	•
	V16GS W350T430 R		3.50						•	•

• In stock ◦ Available upon request

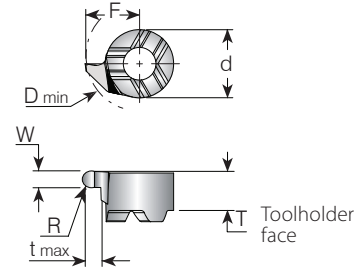
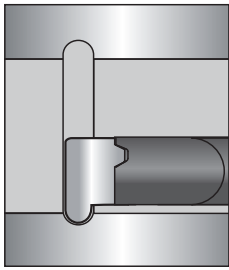
Grooving - 0.2 mm Corner Radius



Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grades	
	RH	d	W ^{+0.03}	t max	T	F	r	D min		VBX	VTX
V08	V08GSR W078T100 R	6	0.78	1.0	3.6	4.8	0.2	8		•	•
	V08GSR W117T100 R		1.17							•	•
	V08GSR W150T100 R		1.50							•	•
	V08GSR W157T100 R		1.57							•	•
	V08GSR W198T100 R		1.98							•	•
V11	V11GSR W117T230 R	8	1.17	2.3	4.0	6.7	0.2	11		•	•
	V11GSR W157T230 R		1.57							•	•
	V11GSR W198T230 R		1.98							•	•
	V11GSR W200T230 R		2.00							•	•
	V11GSR W238T230 R		2.38							•	•
V14	V11GSR W318T230 R	9	3.18	4.0	5.6	9.0	0.2	14		•	•
	V14GSR W078T400 R		0.78							•	•
	V14GSR W117T400 R		1.17							•	•
	V14GSR W150T400 R		1.50							•	•
	V14GSR W157T400 R		1.57							•	•
	V14GSR W198T400 R		1.98							•	•
	V14GSR W200T400 R		2.00							•	•
	V14GSR W238T400 R		2.38							•	•
V16	V14GSR W318T400 R	11	3.18	4.3	5.6	10.2	0.2	16		•	•
	V16GSR W117T430 R		1.17							•	•
	V16GSR W157T430 R		1.57							•	•
	V16GSR W198T430 R		1.98							•	•
	V16GSR W238T430 R		2.38							•	•
	V16GSR W318T430 R		3.18							•	•

• In stock ◦ Available upon request

Round Grooving

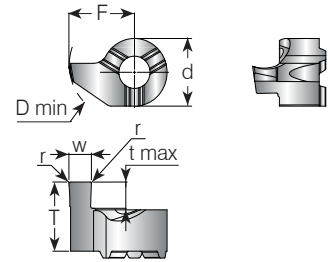
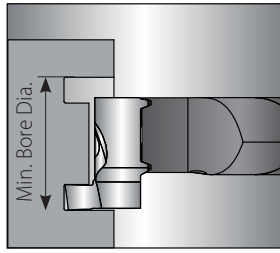


Insert Style		Ordering Code		Dimensions mm				Min. Bore Dia.	Grades	
	RH	d	W ^{+0.03}	t max	T	F	r	D min	VBX	VTX
V08	V08D7993 W080T100 R	6	0.80	1.0	3.6	4.8	0.4	8	●	●
	V08D7993 W120T100 R		1.20				0.6		●	●
	V08D7993 W160T100 R		1.60				0.8		●	●
	V08D7993 W180T100 R		1.80				0.9		●	●
	V08D7993 W200T100 R		2.00				1.0		●	●
V11	V11D7993 W080T230 R	8	0.80	2.3	4.0	6.7	0.4	11	●	●
	V11D7993 W120T230 R		1.20				0.6		●	●
	V11D7993 W157T230 R		1.57				0.785		●	●
	V11D7993 W180T230 R		1.80				0.9		●	●
	V11D7993 W200T230 R		2.00				1.0		●	●
	V11D7993 W240T230 R		2.40				1.2		●	●
	V11D7993 W300T230 R		3.00				1.5		●	●
V14	V14D7993 W120T400 R	9	1.20	4.0	5.6	9.0	0.6	14	●	●
	V14D7993 W157T400 R		1.57				0.785		●	●
	V14D7993 W180T400 R		1.80				0.9		●	●
	V14D7993 W200T400 R		2.00				1.0		●	●
	V14D7993 W220T400 R		2.20				1.1		●	●
	V14D7993 W238T400 R		2.38				1.19		●	●
	V14D7993 W300T400 R		3.00				1.5		●	●
	V14D7993 W318T400 R		3.18				1.59		●	●

• In stock ◦ Available upon request

Square Face Grooving

Internal

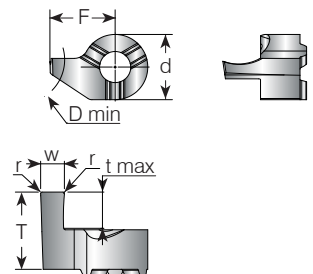
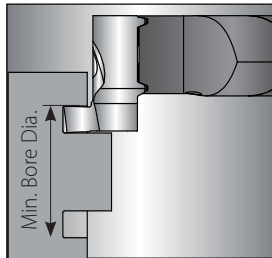


Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	W ^{+0.03}	t max	T	F	r	D min	VBX	VTX
V-14	V14FGW100T150 R	9	1.00	1.5	7.7	9	0.2	14	•	◦
	V14FGW150T250 R		1.50	2.5	8.7				•	◦
	V14FGW200T300 R		2.00	3.0	9.2				•	◦
	V14FGW200T500 R		2.00	5.0	10.7				•	◦
	V14FGW250T300 R		2.50	3.0	9.2				•	◦
	V14FGW250T500 R		2.50	5.0	10.7				•	◦
	V14FGW300T300 R		3.00	3.0	9.2				•	◦

• In stock ◦ Available upon request

Square Face Grooving

External

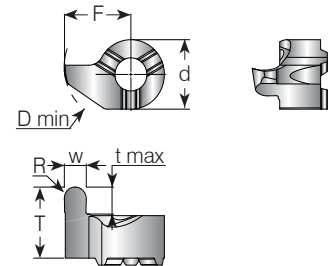
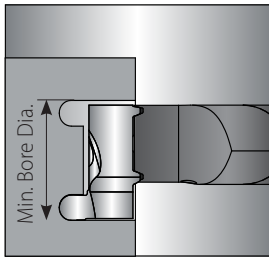


Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	W ^{+0.03}	t max	T	F	r	D min	VBX	VTX
V-14	V14FEGW100T150 R	9	1.00	1.5	7.3	9	0.2	12	•	◦
	V14FEGW150T250 R		1.50	2.5	8.3				•	◦
	V14FEGW200T300 R		2.00	3.0	8.8				•	◦
	V14FEGW200T500 R		2.00	5.0	10.7				•	◦
	V14FEGW250T300 R		2.50	3.0	8.8				•	◦
	V14FEGW250T500 R		2.50	5.0	10.7				•	◦
	V14FEGW300T300 R		3.00	3.0	8.8				•	◦

• In stock ◦ Available upon request

Round Face Grooving

Internal

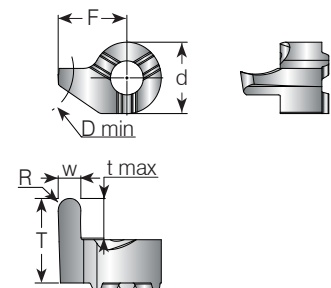
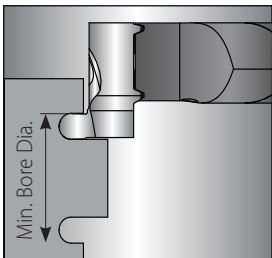


Insert Style		Ordering Code		Dimensions mm				Min. Bore Dia.	Grades	
RH		d	W ^{+0.03}	t max	T	F	r	D min	VBX	VTX
V-14	V14FGR050T150 R	9	1.00	1.5	7.7	9	0.5	14	●	○
	V14FGR100T300 R		2.00	3	9.2		1.0		●	○
	V14FGR150T300 R		3.00	3	9.2		1.5		●	○

• In stock ◦ Available upon request

Round Face Grooving

External

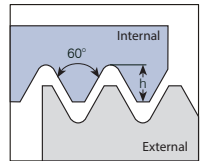
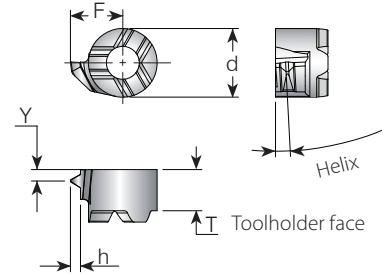
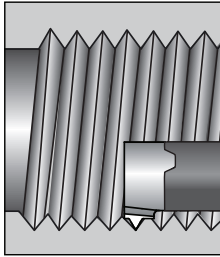


Insert Style	Ordering Code	Dimensions mm					Min. Bore Dia.	Grades		
	RH	d	W ^{+0.03}	t max	T	F	r	D min	VBX	VTX
V-14	V14FEGR100T500 R	9	2.00	5	10.7	9	1.00	12	●	○
	V14FEGR125T500 R		2.50				1.25		●	○

• In stock ◦ Available upon request

Threading

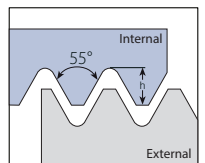
Internal



Partial Profile 60°

Insert Style	Pitch		Ordering Code		Dimensions mm					Helix	Grades	
	TPI	mm	RH	d	T	F	Y	r	h max	Deg.	VBX	VTX
V08	48-32	0.5-.75	V08TH H60 R	6	3.8	4.20	0.5	0.025	0.49	1.5	●	●
	24-20	1.0-1.25	V08TH I60 R			4.46	0.8	0.095	0.74	2.5	●	●
	16-14	1.5-1.75	V08TH J60 R			4.76	0.9	0.137	1.04	3	●	●
V11	48-32	0.5-.75	V11TH H60 R	8	4.2	5.80	0.5	0.025	0.49	1.5	●	●
	24-20	1.0-1.25	V11TH I60 R			6.06	0.8	0.095	0.74	1.5	●	●
	16-14	1.5-1.75	V11TH J60 R			5.61	0.9	0.137	1.04	3	●	●
V14	48-16	0.5-1.5	V14TH A60 R	9	5.7	9	0.9	0.05	1.485	1.5	●	●
	14-8	1.75-3.0	V14TH G60 R				1.7	0.16	2.350		●	●
	48-8	0.5-3.0	V14TH AG60 R				1.7	0.05	2.350		●	●
V16	48-16	0.5-1.5	V16TH A60 R	11	5.7	10.2	0.9	0.05	1.485	1.5	●	●
	14-8	1.75-3.0	V16TH G60 R				1.7	0.16	2.835		●	●
	48-8	0.5-3.0	V16TH AG60 R				1.7	0.05	2.835		●	●

• In stock ◦ Available upon request



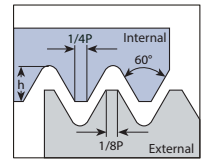
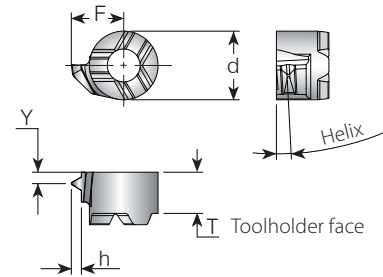
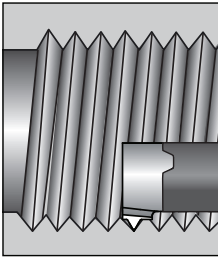
Partial Profile 55°

Insert Style	Pitch		Ordering Code	Dimensions mm						Helix	Grades	
	TPI	mm	RH	d	T	F	Y	r	h max	Deg.	VBX	VTX
V14	48-16	0.5-1.5	V14TH A55 R	9	5.7	9	0.9	0.05	1.71	1.5	•	•
	14-8	1.75-3.0	V14TH G55 R				1.7	0.21	2.700		•	•
	48-8	0.5-3.0	V14TH AG55 R				1.7	0.07	2.700		•	•
V16	48-16	0.5-1.5	V16TH A55 R	11	5.7	10.2	0.9	0.07	1.71	1.5	•	•
	14-8	1.75-3.0	V16TH G55 R				1.7	0.25	3.236		•	•
	48-8	0.5-3.0	V16TH AG55 R				1.7	0.07	3.236		•	•

• In stock ◦ Available upon request

Threading

Internal

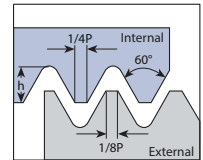


Defined by: R262 (DIN 13)
Tolerance class: 6g/6H

ISO Metric

Min Thread	Insert Style	Ordering Code	Dimensions mm					Helix		Grades	
	mm	RH	d	T	F	Y	h min	Deg.		VBX	VTX
M8x.5	0.5	V08TH .50ISO R	6	3.8	3.86	0.35	0.29	1		•	•
M8.5x.75	.75	V08TH .75ISO R			4.19	0.5	0.43	1.5		•	•
M9x1.0	1	V08TH 1.00ISO R			4.29	0.5	0.58	2		•	•
M10x1.25	1.25	V08TH 1.25ISO R			4.44	0.8	0.72	2.5		•	•
M10x1.5	1.5	V08TH 1.50ISO R			4.58	0.9	0.87	3		•	•
M12x1.75	1.75	V08TH 1.75ISO R			4.80	0.9	1.01	3		•	•
M14x2.0	V11 2	V11TH 2.00ISO R	8	4.2	6.47	1.1	1.15	2.5		•	•

• In stock ◦ Available upon request

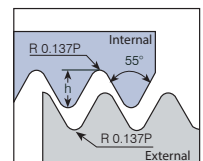


Defined by: ANSI B1.1:74
Tolerance class: 2A/2B

American UN

Min Thread	Insert Style	Ordering Code	Dimensions mm					Helix		Grades	
	TPI	RH	d	T	F	Y	h min	Deg.		VBX	VTX
3/8"-32UNEF	32	V08TH 32UN R	6	3.8	4.21	0.5	0.46	1.5		•	•
3/8"-28UN	28	V08TH 28UN R			4.28	0.5	0.52	2		•	•
3/8"-24UNF	24	V08TH 24UN R			4.32	0.65	0.61	2		•	•
3/8"-20UN	V08 20	V08TH 20UN R			4.45	0.8	0.73	2.5		•	•
3/8"-18UNS	18	V08TH 18UN R			4.53	0.85	0.81	2.5		•	•
3/8"-16UNC	16	V08TH 16UN R			4.33	0.95	0.92	2.5		•	•
7/16"-14UNC	14	V08TH 14UN R	8	4.2	4.78	1.1	1.05	3		•	•
9/16"-12UNC	V11 12	V11TH 12UN R			6.44	1.24	1.22	2.5		•	•

• In stock ◦ Available upon request



Defined by: B.S.84:1956, DIN 259,
ISO228/1:1982
Tolerance class: Medium Class A

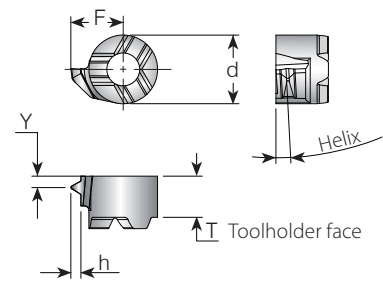
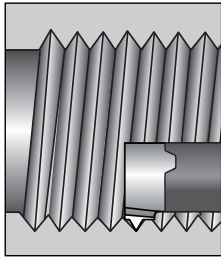
Whitworth - BSW, BSP, BSF, BSB

Min Thread	Insert Style	Ordering Code	Dimensions mm					Helix		Grades	
	TPI	RH	d	T	F	Y	h min	Deg.		VBX	VTX
1/2"x19W	V11 19	V11TH 19W R	8	4.2	6.18	0.8	0.86	2		•	•

• In stock ◦ Available upon request

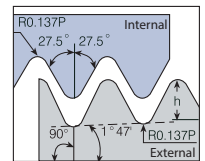
Threading

Internal



BSPT

Defined by: B.S.21:1985
Tolerance class: Standard BSPT

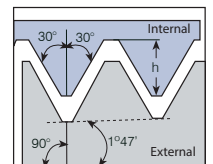


Min Thread	Insert Style	Ordering Code	Dimensions mm						Helix	Grades	
	TPI	RH	d	T	F	Y	h min	Deg.		VBX	VTX
1/4"-19BSPT	V11	19	V11TH 19BSPT R	8	4.2	6.13	0.9	0.86	2.5	•	•

• In stock ◦ Available upon request

NPT

Defined by: USAS B2.1:1968
Tolerance class: Standard NPT

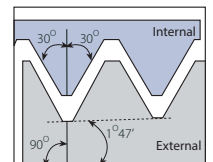


Min Thread	Insert Style	Ordering Code	Dimensions mm						Helix	Grades	
	TPI	RH	d	T	F	Y	h min	Deg.		VBX	VTX
1/8"-27NPT	V08	27	V08TH 27NPT R	6	3.8	4.35	0.6	0.64	2	•	•
1/4"-18NPT		18	V08TH 18NPT R			4.8	0.9	1.0	2	•	•

• In stock ◦ Available upon request

NPTF

Defined by: ANSI 1.2.3-1976
Tolerance class: Standard NPTF

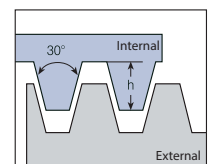


Min Thread	Insert Style	Ordering Code	Dimensions mm						Helix	Grades	
	TPI	RH	d	T	F	Y	h min	Deg.		VBX	VTX
1/4"-18NPTF	V08	18	V08TH 18NPTF R	6	3.8	4.64	0.9	1.0	2	•	•

• In stock ◦ Available upon request

Trapez

Defined by: DIN 103
Tolerance class: 7e/7H



Min Thread	Insert Style	Ordering Code	Dimensions mm						Helix	Grades	
	mm	RH	d	T	F	Y	h min	Deg.		VBX	VTX
TR10x2.0	V08	2	V08TH 2.0TR R	6	3.8	4.79	0.9	1.25	3.5	•	•
TR11x3.0		3	V08TH 3.0TR R			4.95	1.18	1.75	5	•	•
TR16x4.0	V11	4	V11TH 4.0TR R	8	4.2	6.53	1.55	2.25	4.5	•	•

• In stock ◦ Available upon request

Mini-V Holders

Carbide Shank.....	87
Reinforced Carbide Shank.....	88
Alloy Steel Shank.....	89
Sleeve Clamping System.....	90



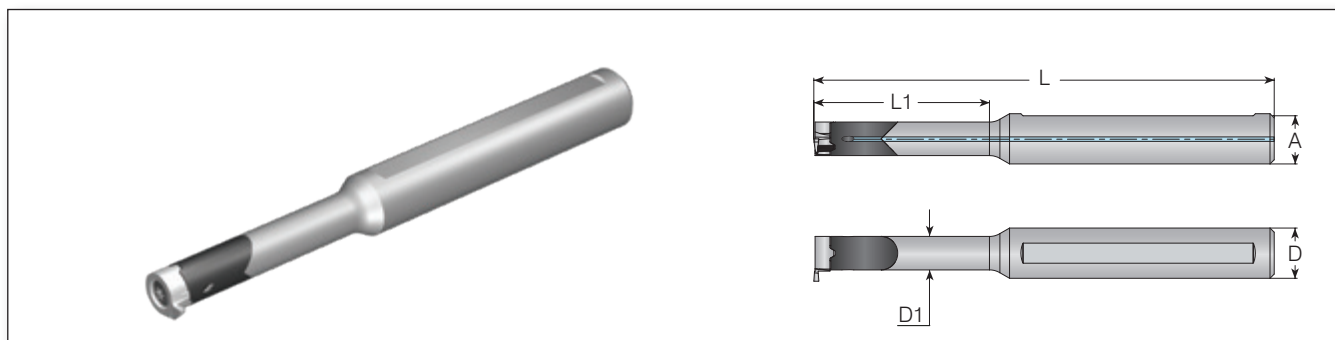
Mini-V Holders Ordering Code System

C	V	08	-	12	21	-	
1	2	3		4	5	6	
1- Holder Type		2 - Product Line	3 - Insert Size		4 - Shank Diameter	5 - Tool Overhang	6 - RH or LH
C - Carbide Shank None - Steel Shank		V - Mini-V	08, 11, 14, 16		6, 8, 12, 16	12, 21, 29, 30, 42, 50, 56, 64, 80	None - RH L - LH

Mini-V Sleeves

MH	C	16	-	6	
1	2	3		4	
1- Holder Type		2 - Coolant		3 - Shank Diameter	4 - Sleeve Bore Dia.
MH - Microscope Holder		C - Coolant Channels		12, 16 , 20	6, 8

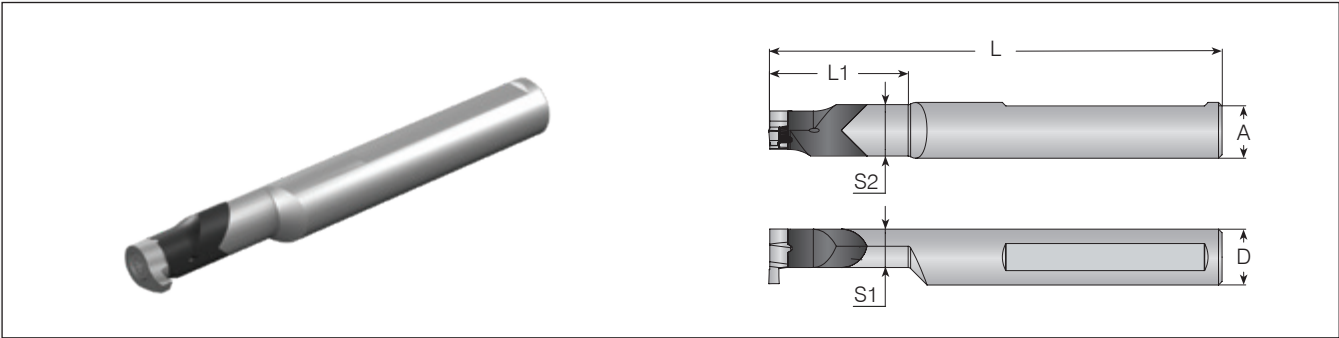
Carbide Shank



Insert Style							Spare Parts		
Dimensions mm									
	Holder RH	A	L	L1	D	D1	Screw	Size	Key
V08	CV08-1221	11.5	80.5	21	12	6	SNV08	M2.6x.45x8	K2T
	CV08-1230		90.5	30					
	CV08-1242 *		100.5	42					
	CV08-1250 *		115	50					
V11	CV11-1229	11.5	95	29	12	8	SNV11	M3.5x.6x10	K3T
	CV11-1242		110	42					
	CV11-1256 *		120	56					
	CV11-1264 *		130	64					
V16	CV16-1240	11.0	130	40	12	11	SNV16	M5x0.8x12	K4T
	CV16-1256		130	56					
	CV16-1280		150	80					

* For Boring and Chamfering only.

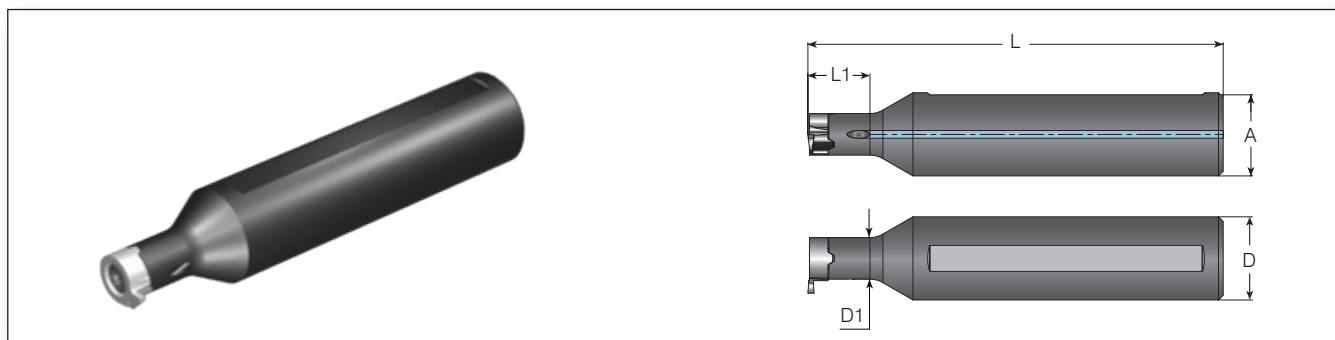
Reinforced Carbide Shank



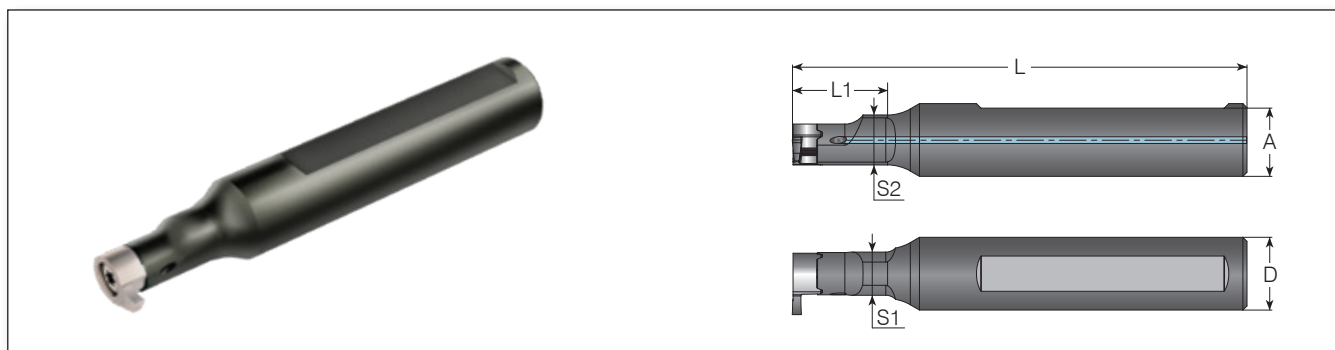
								Spare Parts					
Insert Style	Ordering Code	Dimensions mm											
	Holder RH	A	L	L1	D	S1	S2	Screw	Size	Key			
V14	CV14-1234	11	100	34	12	9.3	11.9	SNV14	M4x0.7x12	KT15			
	CV14-1245*		110	45									
	CV14-1264*		130	64									
	CV14-1634	15	100	34	16	9.3	12.45						
	CV14-1645*		110	45									
	CV14-1664*		130	64									
	CV14-1675*		145	75									
V16	CV16-1640	15	129.7	39.7	16	11	14.75	SNV16	M5x0.8x12	K4T			
	CV16-1656*		129.7	55.7									
	CV16-1680*		149.7	79.7									

* For boring, chamfering and face grooving only.

Alloy Steel Shank

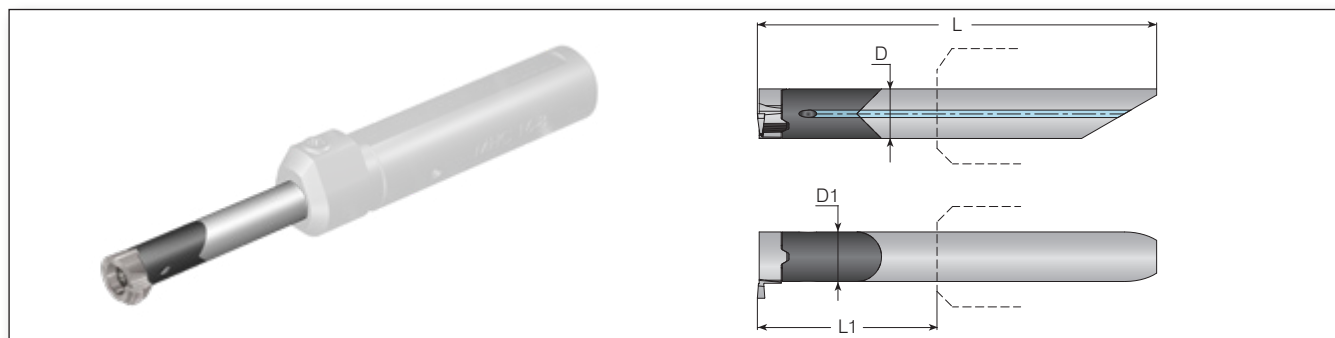


							Spare Parts		
Insert Style	Ordering Code	Dimensions mm							
	Holder RH	A	L	L1	D	D1	Screw	Size	Key
V08	V08-1612	15.6	80	12	16	6	SNV08	M2.6x.45x8	K2T
V11	V11-1612	15.6	80	12	16	8	SNV11	M3.5x.6x10	K3T
V16	V16-1622	15	100	22	16	11	SNV16	M5.0x.8x12	K4T



								Spare Parts		
Insert Style	Ordering Code	Dimensions mm								
	Holder RH	A	L	L1	D	S1	S2	Screw	Size	Key
V14	V14-1620	15.0	100	20	16	9.5	11	SNV14	M4x.7x12	KT15

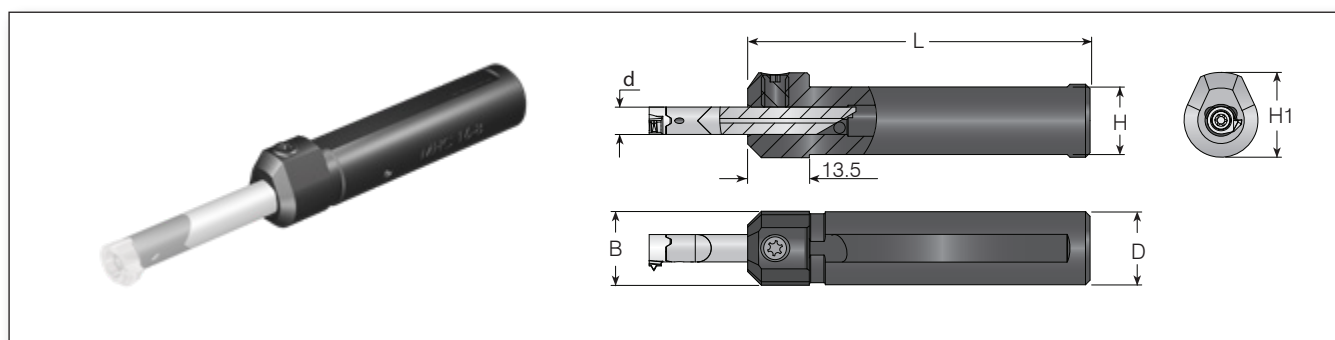
Sleeve Clamping Carbide Shank



								Spare Parts		
Insert Style	Ordering Code	Dimensions mm					Ordering Code			
	Holder RH	A	L	L1	D	D1	Sleeve	Screw	Size	Key
V08	CV08-0621	-	45	21	6	6	MHC ...-6	SNV08	M2.6x.45x8	K2T
	CV08-0630 *	-	54	30						
V11	CV11-0829	-	64.5	29	8	8	MHC...-8	SNV11	M3.5x.6x10	K3T
	CV11-0842*	-	77.5	42						

* For boring and chamfering only.

Sleeves



						Spare Parts	
Ordering Code		Dimensions mm					
d	Sleeve	D=B	H1	H	L	Screw	Key
6	MHC 12-6	12	16	10.8	70	SL7DT 15	KT15
	MHC 16-6	16	18.6	14.8	75		
	MHC 20-6	20	22	18.8	84		
8	MHC 16-8	16	18.6	14.8	100		
	MHC 20-8	20	22	18.8	103.5		



INTERNAL MACHINING | **FINISHING**

microscope

Precise Turning, Grooving, Threading &
Face Grooving

microscope

Micro Tools for Small Bores

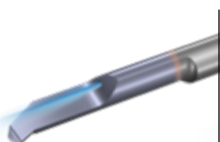
The **Microscope** line offers new and improved solutions for micro boring, grooving, chamfering and threading in bores as small as 1.0 mm.

The **Microscope** line offers a large and extended range of single-ended inserts and a full range of toolholders with a simple clamping system.



Internal Tools with High Pressure Coolant Thru

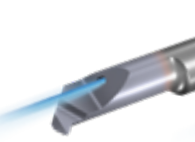
NEW



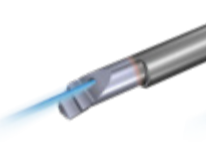
Boring with
Chip Breaker



Boring



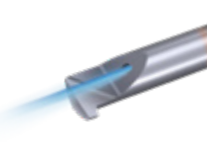
Boring &
Profiling



Boring with
Chip Former



Square
Grooving



Pre-Part Off

Miniature Toolholders

NEW



Shrink
Toolholders



Round Toolholders
without Shoulder

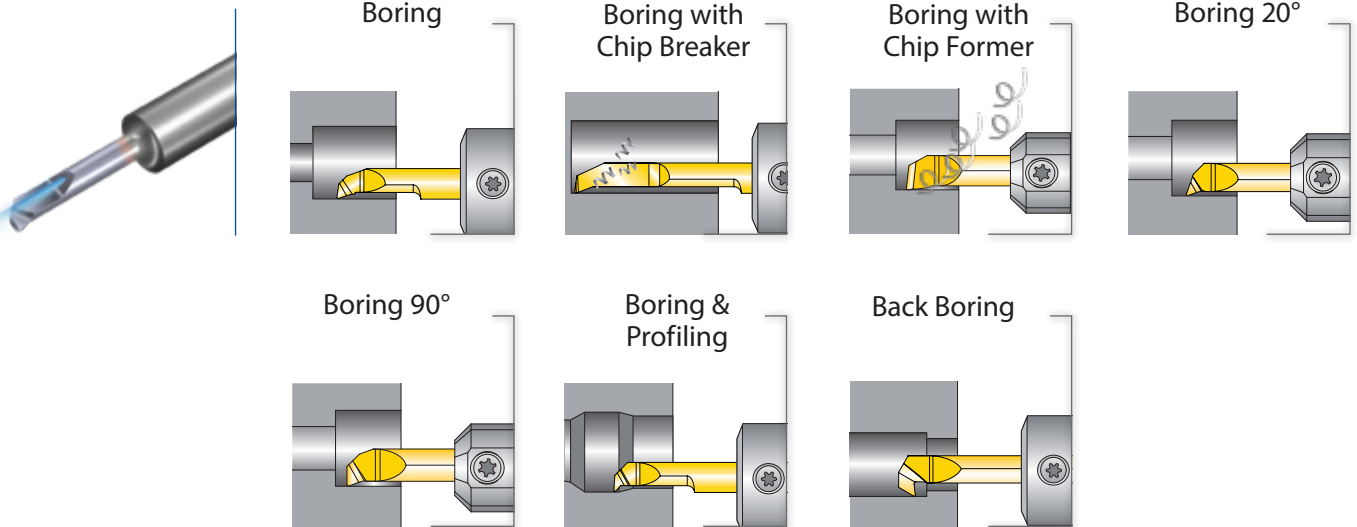


Double Sided Round
Toolholders without
Shoulder

Applications

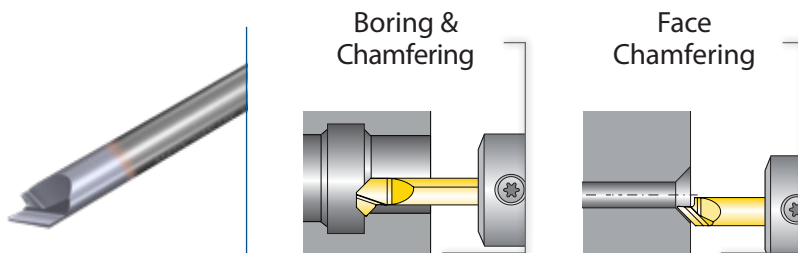
Boring

Pages 100 - 107



Chamfering

Page 108

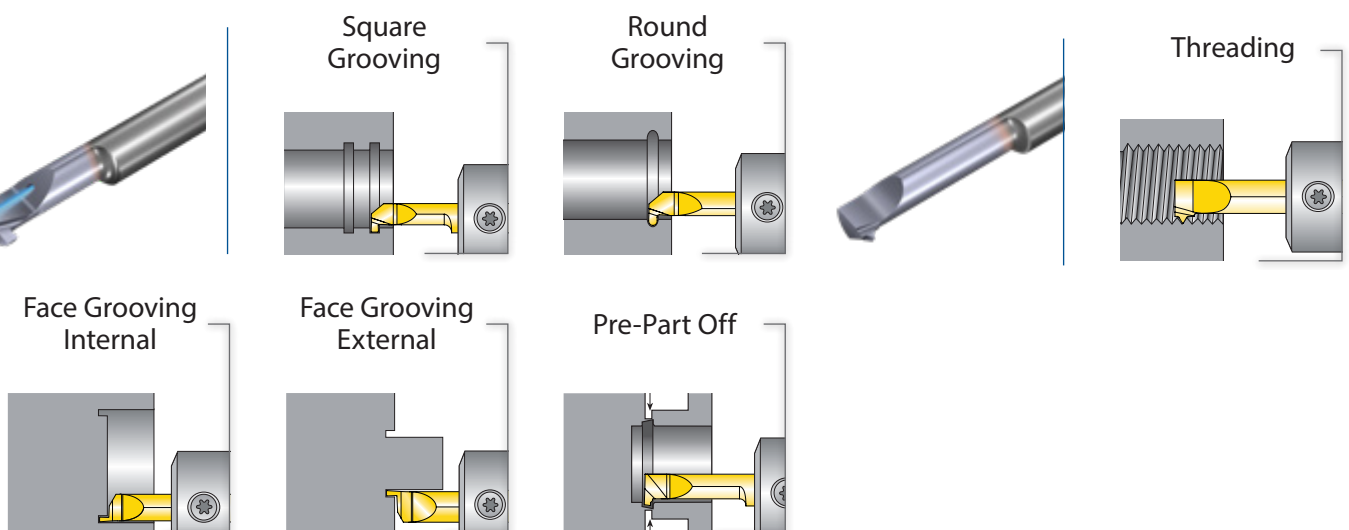


Grooving

Pages 109 - 112

Threading

Pages 113 - 115



Boring Technical Data

Recommended VBX Cutting Speeds Vc [m/min]

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc[m/min] (Coated)
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	80-150
	2		Medium Carbon (C=0.25-0.55%)	150	80-130
	3		High Carbon (C=0.55-0.85%)	170	70-110
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	70-110
	5		Hardened	275	70-100
	6		Hardened	350	70-100
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	80-120
	8		Hardened	325	70-110
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	80-110
	10		High Alloy (alloying elements >5%)	225	80-110
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	80-100
	12		Hardened	330	70-110
	13	Stainless Steel Austenitic	Austenitic	180	80-110
	14		Super Austenitic	200	80-110
	15	Stainless Steel Cast Ferritic	Non Hardened	200	40-60
	16		Hardened	330	30-50
	17	Stainless Steel Cast Austenitic	Austenitic	200	40-60
	18		Hardened	330	30-50
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	80-110
	29		Pearlitic (long chips)	230	80-110
	30	Grey Cast Iron	Low Tensile Strength	180	80-110
	31		High Tensile Strength	260	80-110
	32	Nodular SG Iron	Ferritic	160	80-110
	33		Pearlitic	260	80-110
N(K) Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	100-300
	35		Aged	100	100-150
	36	Aluminium Alloys	Cast	75	100-150
	37		Cast & Aged	90	60-100
	38	Aluminium Alloys	Cast Si 13-22%	130	100-150
	39	Copper and Copper Alloys	Brass	90	60-100
	40		Bronze and non leaded Copper	100	60-100
	S(M) Heat Resistant Material	19	High Temperature Alloys	Annealed (Iron based)	200
20		Aged (Iron based)		280	20-30
21		Annealed (Nickel or Cobalt based)		250	15-20
22		Aged (Nickel or Cobalt based)		350	10-15
23		Titanium Alloys	Pure 99.5 Ti	400Rm	60-100
24			α+β Alloys	1050Rm	40-50
H(K) Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	20-45
	26			51-55HRc	20-40

Carbide Grade



VBX - TiCN PVD coated

VTX - AlTiN PVD coated

VTX

Excellent for Boring applications in medium-to-high cutting speeds and in dry conditions.

Multilayered AlTiN PVD coated, general purpose grade for prevention of peeling and chipping.

* For **VTX Grade**, increase speed by 20%.

VBX

Excellent for all applications and outstanding wear resistance in low-to-medium cutting speeds, combined with good fracture toughness.

TiCN PVD coated.

Boring Technical Data

Boring and Profiling in Finishing Operations – Recommended Depth of Cut [a_p max. (mm)] and feed rate f [mm/rev]

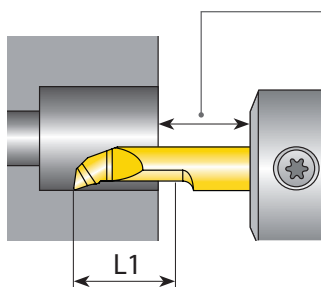
High Alloy Steel, 330 HB, 2100 Kc [N/mm ²]			
D min.	Vmax mm ²	a_p max. (mm)	f mm/rev
1 mm - 1.7 mm	0.0012	0.08	0.015
1.8 mm - 2.7 mm	0.0017	0.10	0.017
2.8 mm - 3.2 mm	0.0031	0.18	0.017
3.3 mm - 3.7 mm	0.0040	0.22	0.018
3.8 mm - 4.2 mm	0.0050	0.25	0.020
4.3 mm - 5.2 mm	0.0084	0.30	0.028
5.2 mm - 6.2 mm	0.0150	0.30	0.050
6.3 mm - 7.2 mm	0.0210	0.35	0.060

Austenitic Stainless Steel, 200 HB, 2600 Kc [N/mm ²]			
D min.	Vmax mm ²	a_p max. (mm)	f mm/rev
1 mm - 1.7 mm	0.0009	0.06	0.015
1.8 mm - 2.7 mm	0.0015	0.10	0.015
2.8 mm - 3.2 mm	0.0018	0.12	0.015
3.3 mm - 3.7 mm	0.0023	0.15	0.015
3.8 mm - 4.2 mm	0.0027	0.18	0.015
4.3 mm - 5.2 mm	0.0030	0.20	0.015
5.2 mm - 6.2 mm	0.0050	0.20	0.025
6.3 mm - 7.2 mm	0.0063	0.25	0.025

Machining Recommendation

- V_{max} = Feed mm/rev x a_p (mm)
- Exceeding the V_{max} value may cause corner excessive wear and breakage
- Recommendations listed are for average roughness of 0.5 (Ra)
- Lower Hardness and Lower Kc enable to increase the value of V_{max} , for higher metal removal
- Recommendations listed are for medium L1. Increase V_{max} value by using shorter L1 tools

When encountering chip flow evacuation problems, it is recommended to increase the distance between the workpiece and sleeve.

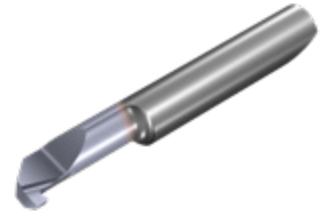


Grooving Technical Data

Recommended VBX Cutting Speeds Vc [m/min] and Feed f [mm/rev]

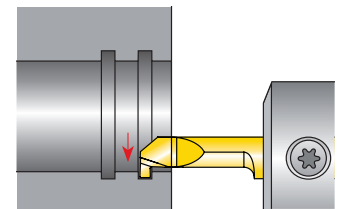
Material Group	Vargus No.	Material		Hardness Brinell HB	Vc[m/min] (Coated)	Feed f [mm/rev]
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	50-120	0.05
	2		Medium Carbon (C=0.25-0.55%)	150	40-100	0.05
	3		High Carbon (C=0.55-0.85%)	170	30-80	0.05
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	50-70	0.05
	5		Hardened	275	40-60	0.05
	6		Hardened	350	30-50	0.05
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	30-50	0.05
	8		Hardened	325	25-40	0.05
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	30-50	0.05
	10		High Alloy (alloying elements >5%)	225	25-40	0.05
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	60-100	0.05
	12		Hardened	330	40-60	0.05
	13	Stainless Steel Austenitic	Austenitic	180	50-90	0.05
	14		Super Austenitic	200	40-60	0.05
	15	Stainless Steel Cast Ferritic	Non Hardened	200	40-60	0.05
	16		Hardened	330	30-50	0.05
	17	Stainless Steel Cast Austenitic	Austenitic	200	40-60	0.05
	18		Hardened	330	30-50	0.05
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	50-70	0.04
	29		Pearlitic (long chips)	230	50-70	0.04
	30	Grey Cast Iron	Low Tensile Strength	180	50-70	0.04
	31		High Tensile Strength	260	40-60	0.04
	32	Nodular SG Iron	Ferritic	160	50-70	0.04
	33		Pearlitic	260	60-80	0.04
N(K) Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	100-300	0.04
	35		Aged	100	100-150	0.04
	36	Aluminium Alloys	Cast	75	100-150	0.04
	37		Cast & Aged	90	60-100	0.04
	38	Aluminium Alloys	Cast Si 13-22%	130	100-150	0.04
	39	Copper and Copper Alloys	Brass	90	60-100	0.03
	40		Bronze and non leaded Copper	100	60-100	0.04
S(M) Heat Resistant Material	19	High Temperature Alloys	Annealed (Iron based)	200	25-45	0.02
	20		Aged (Iron based)	280	20-30	0.02
	21		Annealed (Nickel or Cobalt based)	250	15-20	0.02
	22		Aged (Nickel or Cobalt based)	350	10-15	0.02
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	60-100	0.02
	24		α+β Alloys	1050Rm	40-50	0.02
H(K) Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	20-40	0.02
	26			51-55HRc	20-35	0.02

Carbide Grade



VBX - TiCN PVD coated
VTX - AlTiN PVD coated

Machining Recommendation



Machine the groove in one motion instead of intervals.

VTX

Excellent for Boring applications in medium-to-high cutting speeds and in dry conditions.
Multilayered AlTiN PVD coated, general purpose grade for prevention of peeling and chipping.

* For **VTX Grade**, increase speed by 20%.

VBX

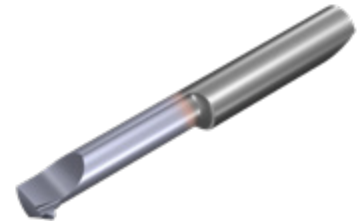
Excellent for all applications and outstanding wear resistance in low-to-medium cutting speeds, combined with good fracture toughness.
TiCN PVD coated.

Threading Technical Data

Recommended VBX Cutting Speeds Vc [m/min]

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc[m/min] (Coated)
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	140-200
	2		Medium Carbon (C=0.25-0.55%)	150	120-180
	3		High Carbon (C=0.55-0.85%)	170	110-180
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	100-155
	5		Hardened	275	90-145
	6		Hardened	350	80-135
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	65-115
	8		Hardened	325	50-100
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	30-50
	10		High Alloy (alloying elements >5%)	225	25-40
M Stainless Steel	11	Stainless Steel Ferritic	Non Hardened	200	80-120
	12		Hardened	330	55-95
	13	Stainless Steel Austenitic	Austenitic	180	60-100
	14		Super Austenitic	200	50-90
	15	Stainless Steel Cast Ferritic	Non Hardened	200	60-80
	16		Hardened	330	45-65
	17	Stainless Steel Cast Austenitic	Austenitic	200	50-70
	18		Hardened	330	40-60
K Cast Iron	28	Malleable Cast Iron	Ferritic (short chips)	130	60-80
	29		Pearlitic (long chips)	230	60-80
	30	Grey Cast Iron	Low Tensile Strength	180	60-80
	31		High Tensile Strength	260	40-70
	32	Nodular SG Iron	Ferritic	160	60-80
	33		Pearlitic	260	70-90
N(K) Non-Ferrous Metals	34	Aluminium Alloys Wrought	Non Aging	60	80-240
	35		Aged	100	100-170
	36	Aluminium Alloys	Cast	75	100-150
	37		Cast & Aged	90	60-100
	38	Aluminium Alloys	Cast Si 13-22%	130	100-150
	39	Copper and Copper Alloys	Brass	90	80-200
	40		Bronze and non leaded Copper	100	80-200
S(M) Heat Resistant Material	19	High Temperature Alloys	Annealed (Iron based)	200	25-45
	20		Aged (Iron based)	280	20-30
	21		Annealed (Nickel or Cobalt based)	250	15-20
	22		Aged (Nickel or Cobalt based)	350	10-15
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	60-100
	24		α+β Alloys	1050Rm	40-50
H(K) Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	20-40
	26			51-55HRc	20-40

Carbide Grade

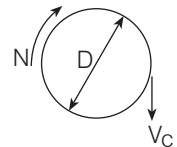


VBX - TiCN PVD coated
VTX - AlTiN PVD coated

Calculation of N [RPM]

$$N = \frac{1000 \times V_c}{\pi \times D}$$

$$V_c = \frac{N \times \pi \times D}{1000}$$



N - Revolution Per Minute [RPM]

V_c - Cutting Speed [m/mm]

D - Workpiece Diameter [mm]

Number of Passes for Threading

Pitch	mm	0.50	0.75	1.00	1.25	1.50	1.75	2.00
tpi		48	32	24	20	16	14	12
No. of Passes (Microscope)		6-9	6-11	6-12	8-14	9-15	11-18	11-18

VTX

Excellent for Boring applications in medium-to-high cutting speeds and in dry conditions. Multilayered AlTiN PVD coated, general purpose grade for prevention of peeling and chipping.

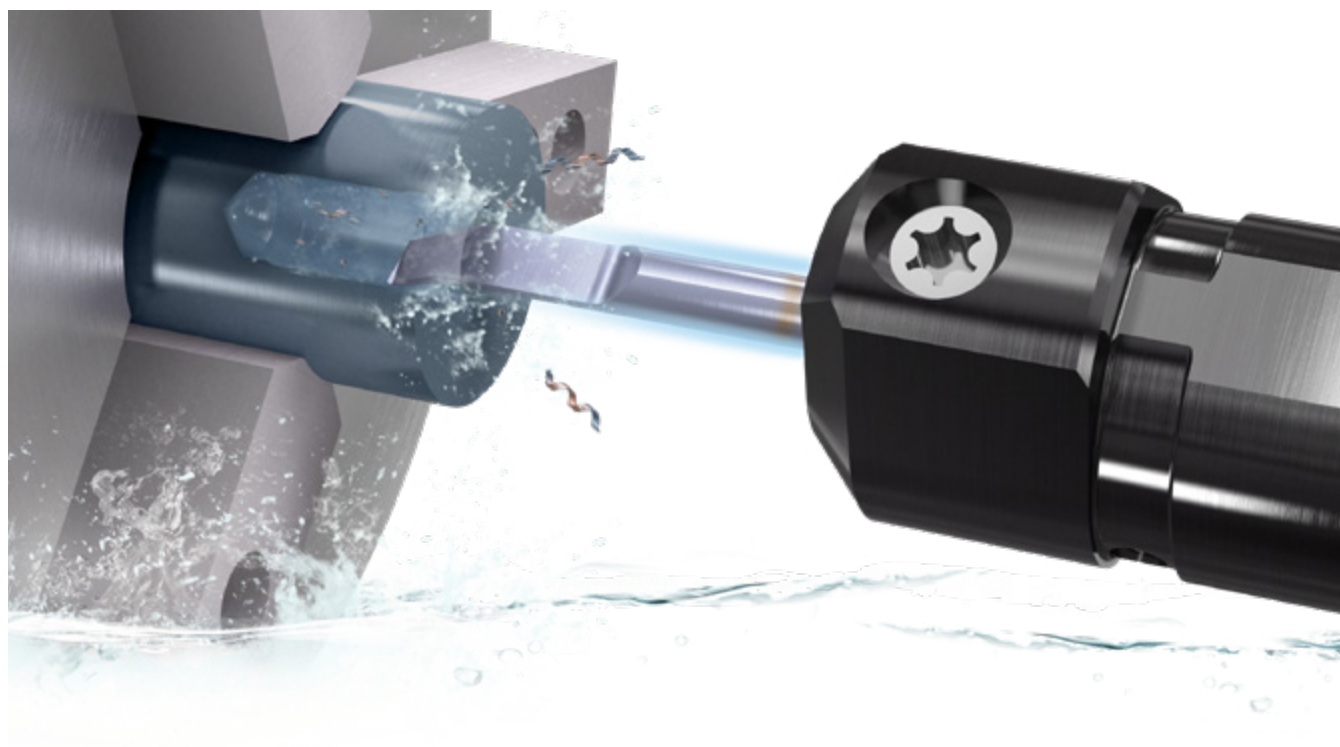
* For **VTX Grade**, increase speed by 20%.

VBX

Excellent for all applications and outstanding wear resistance in low-to-medium cutting speeds, combined with good fracture toughness. TiCN PVD coated.

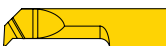
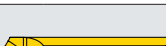
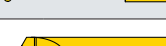
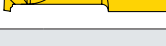
microscope Inserts

Boring.....	100
Boring with Chip Breaker.....	103
Boring with Chip Former.....	104
Boring 20°.....	105
Boring 90°.....	105
Boring & Profiling.....	106
Back Boring.....	107
Boring & Chamfering 45°.....	108
Face Chamfering 45°.....	108
Square Grooving.....	109
Round Grooving.....	111
Pre-Part Off.....	111
Face Grooving Internal.....	112
Face Grooving External.....	112
Threading.....	113

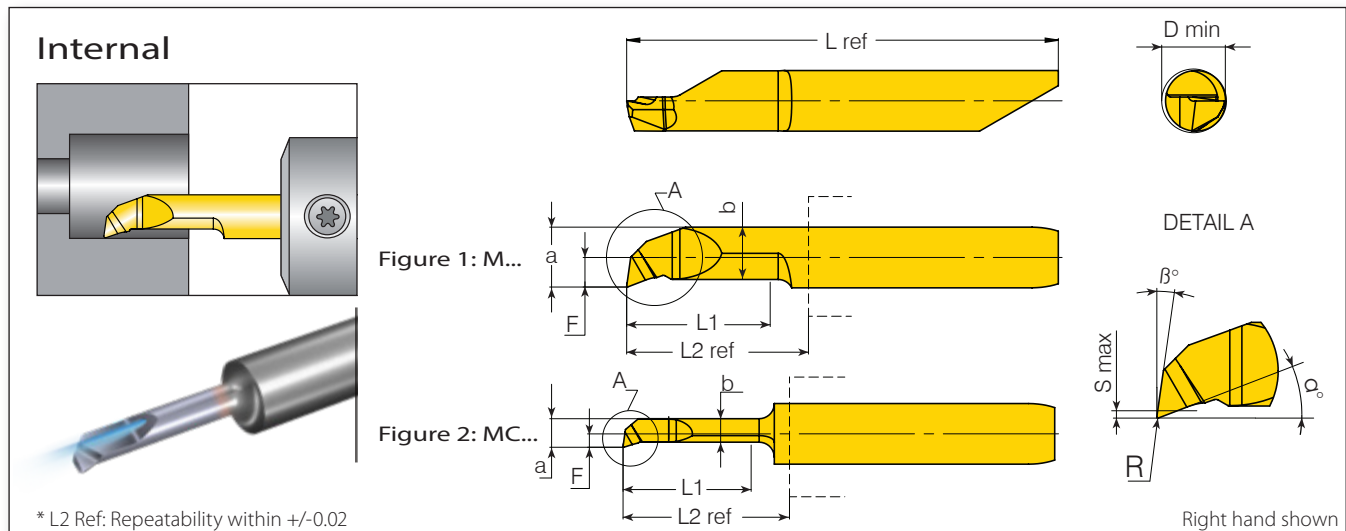


microscope Insert Ordering Code

Boring:	M 1	4 2	42 3	BC 4	R05 5	- 6	L10 7	R 8	C 9	VTX 10
Grooving:	M 1	5 2	52 3	GS 4	W100 5	- 6	L10 7	R 8	C 9	VBX 10
Threading:	M 1	5 2	42 3	TH 4	0.5 5	ISO 6	L16 7	R/L 8	- 9	VBX 10

1 - Product Line M/ MS - Microscope MC - Microscope central location of cutting tip	4 - Application Type BC Boring  BE Boring with Edge Prep  B20 Boring 20°  B90 Boring 90°  CL Boring & Profiling  BCB Boring with Chip Breaker  BCF Boring with Chip Former  BB Back Boring  CH4545 Boring & Chamfering 45°  CH45 Face Chamfering 45°  GS Square Grooving  GR Round Grooving  FG Face Grooving Internal  FP Face Grooving External  PP Pre-Part Off  TH Threading 	5 - Boring Nose Radius 0.05, 0.1, 0.15, 0.2 (mm) 5 - Grooving Width 079 - 318 (mm) 5 - Threading Pitch Full Profile - Pitch Range mm TPI 0.5 - 1.5 28-18 Partial Profile - Pitch Range mm TPI A 0.5 - 1.5 A 48-16 F 0.5 - 1.0 F 48-24 6 - Threading Standard A60 - Partial Profile 60° A55 - Partial Profile 55° ISO - ISO Metric UN - American UN NPT - NPT W - Whitworth for BSW, BSP TR - Trapez 7 - Maximum Length of Cut (mm) L10 - 10mm, L15 - 15mm... 8 - RH or LH R - RH L - LH 9 - Coolant C - Internal Coolant NONE - Without Coolant 10 - Carbide Grade VBX, VTX
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Boring



* L2 Ref: Repeatability within +/-0.02

Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	1.0	MC410BCR05L04R/L	4.0	0.05	0.48	0.1	0.96	0.71	16.4	8	8.8	25.75	•	○
		MC410BCR10L04R/L	4.0	0.1	0.48	0.1	0.96	0.71	17		8.8	25.75	•	○
		MC410BCR05L06R/L	6.0	0.05	0.48	0.15	0.96	0.71	16.4		8.8	25.75	•	○
		MC410BCR10L06R/L	6.0	0.1	0.48	0.15	0.96	0.81	17		8.8	25.75	•	○
	1.5	MC415BCR10L09R/L	9.0	0.1	0.74	0.15	1.45	1.22	16		11.5	28.5	•	○
	1.7	MC417BCR05L06R/L	6.0	0.05	0.62	0.2	1.43	1.02	16		11.5	28.5	•	○
		MC417BCR10L06R/L	6.0	0.1	0.77		1.58	1.18	16		11.5	28.5	•	•
		MC417BCR05L09R/L	9.0	0.05	0.62		1.43	1.04	16		11.5	28.5	•	○
		MC417BCR10L09R/L	9.0	0.1	0.82		1.63	1.3	16		11.5	28.5	•	○
	1.9	MC419BCR05L6R**	6.0	0.05	0.72		1.62	1.2	16		11.5	28.5	•	○
		MC419BCR05L9R**	9.0	0.05	0.72		1.62	1.2	16		11.5	28.5	•	○
	2.2	MC422BCR05L06R/L	6.0	0.05	0.88		1.88	1.55	17.7		11.5	28.5	•	○
		MC422BCR10L06R/L	6.0	0.1	0.93		1.93	1.55	17.7		11.5	28.5	•	○
		MC422BCR05L09R/L	9.0	0.05	0.88		1.88	1.55	17.7		11.5	28.5	•	○
		MC422BCR10L09R/L	9.0		0.1		2.06	1.76	17.7		11.5	28.5	•	○
		MC422BCR10L14R/L	14.0	0.1	1.04		2.04	1.76	17.7		18.2	35.2	•	•
		MC422BER10L14R**	14.0		1.04		2.04	1.76	17.7		18.2	35.2	○	•
	2.7	MC427BCR05L10R/L	10.0	0.15	0.05	0.2	2.47	2.06	17.5		11.5	28.5	•	○
		MC427BCR15L10R/L	10.0		1.19		2.41	2.06	17.5		11.5	28.5	•	○
		MC427BCR15L15R/L	15.0		0.15		2.48	2.06	17.5	8	18.2	35.2	•	•
		MC427BER15L15R**	15.0		0.15		2.48	2.06	17.5		18.2	35.2	○	•
		MC427BCR05L16R/L	16.0	0.05	1.22		2.47	2.06	17.5		18.2	35.2	•	•
		MC427BER05L16R**	16.0	0.05	1.22		2.47	2.06	17.5		18.2	35.2	○	•
	3.0	MC430BCR05L10R**	10.0	0.05	1.33		2.7	2.25	17.5		11.5	28.7	○	•
		MC430BCR05L16R/L	16.0	0.05	1.33		2.7	2.25	17.5		18.2	35.2	•	○
		MC430BCR15L20R/L	20.0	0.15	1.36		2.7	2.36	17.5		22.8	39.8	•	○
		M430BCR15L20RC**	20.0	0.15	1.36		2.7	2.36	17.5		22.8	39.8	○	•
		MC430BCR05L26R**	26.0	0.05	1.33		2.7	2.25	17.5		28.7	45.7	•	○
	3.2	MC432BCR05L10R/L	10.0	0.05	1.43	0.2	2.9	2.45	17.5	8	11.5	28.5	•	○
		MC432BCR15L10R/L	10.0	0.15	1.44		2.9	2.5	17.5		11.5	28.5	•	○
		M432BCR15L10RC**	10.0	0.15	1.44		2.9	2.5	17.5		11.5	28.5	○	•
		MC432BCR05L16R/L	16.0	0.05	1.43		2.9	2.45	17.5		18.2	35.2	•	•

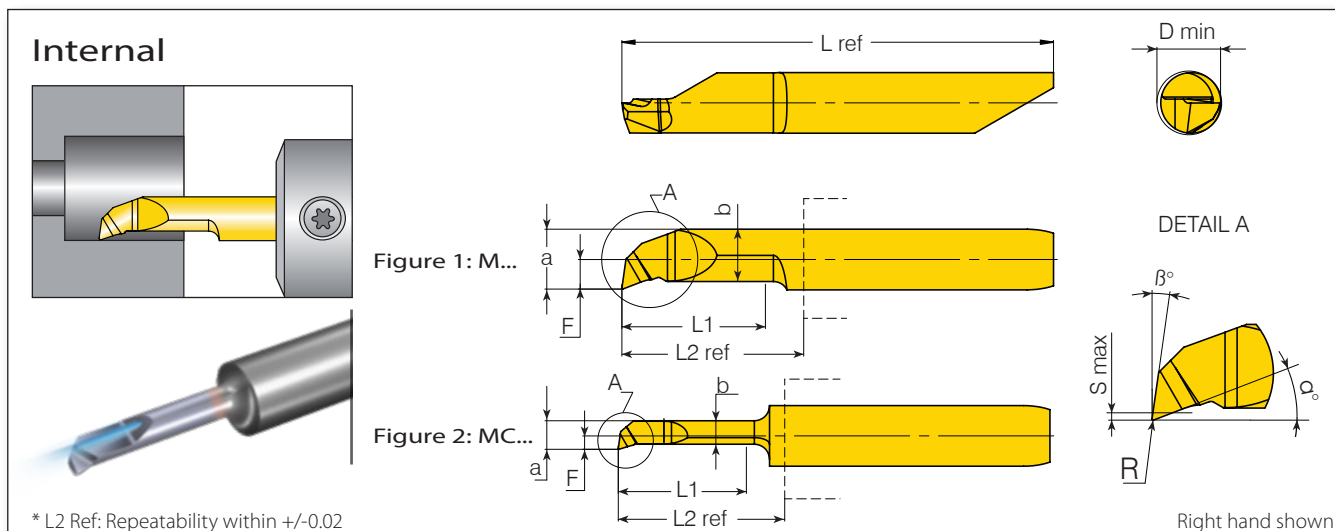
** LH Tools are available upon request.

• In stock ○ Available upon request

Inserts marked with C are available with internal coolant.

Inserts marked with E are available with edge prep.

Boring (con't)



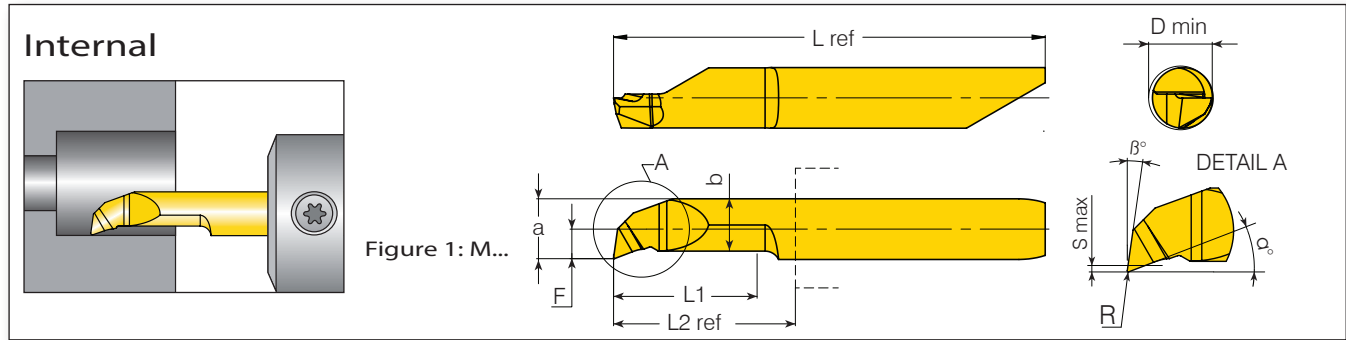
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
3.2	3.2	MC432BER05L16R**	16.0	0.05	1.43	0.2	2.9	2.45	17.5	8	18.2	35.2	○	●
		MC432BCR15L16R/L	16.0	0.15	1.44		2.87	2.5	17.5		18.2	35.2	●	●
		MC432BER15L16R**	16.0	0.15	1.44		2.87	2.5	17.5		18.2	35.2	○	●
		MC432BCR05L20R/L	20.0	0.05	1.43		2.9	2.45	17.5		22.8	39.8	●	●
		MC432BER05L20R**	20.0	0.05	1.43		2.9	2.45	17.5		22.8	39.8	○	●
		MC432BCR15L20R/L	20.0	0.15	1.4		2.87	2.45	17.5		22.8	39.8	●	●
		MC432BER15L20R**	20.0	0.15	1.4		2.87	2.45	17.5		22.8	39.8	○	●
		M432BCR15L20RC**	20.0	0.15	1.4		2.87	2.45	17.5		22.8	39.8	○	●
	3.7	MC437BCR05L10R**	10.0	0.05	1.78	0.2	3.48	3.05	17.5	8	11.5	28.5	●	○
		MC437BCR15L10R/L	10.0	0.15	1.74		3.44	3.05	17.5		11.5	28.5	●	○
		MC437BCR15L15R/L	15.0	0.15	1.74		3.44	3.05	17.5		18.2	35.2	●	○
		MC437BER15L15R**	15.0	0.15	1.74		3.44	3.05	17.5		18.2	35.2	○	●
		MC437BCR15L20R/L	20.0	0.15	1.74		3.44	3.05	17.5		22.8	39.8	●	○
		MC437BER15L20R**	20.0	0.15	1.74		3.44	3.05	17.5		22.8	39.8	○	●
		MC437BCR05L26R**	26.0	0.05	1.78		3.48	3.05	17.5		28.7	45.7	●	○
	4.2	M442BCR03L10R**	10.0	0.03	1.98	0.3	3.98	3.13	19	8	11.5	28.5	○	●
		M442BCR05L10R**	10.0	0.05	1.95		3.95	3.45	21		11.5	28.5	●	○
		MS442BCR15L10R/L	10.0	0.15	1.93		3.93	3.13	19		11.5	28.5	●	○
		M442BCR15L10RC**	10.0	0.15	1.93		3.93	3.13	19		11.5	28.5	○	●
		M442BCR05L16R/L	16.0	0.05	1.95		3.95	3.45	21		18.2	35.2	●	○
		M442BER05L16R**	16.0	0.05	1.95		3.95	3.45	21		18.2	35.2	○	●
		M442BCR03L15R**	15.0	0.03	1.98		3.98	3.13	19		18.2	35.2	○	●
		MS442BCR15L16R/L	16.0	0.15	1.93		3.93	3.13	19		18.2	35.2	●	○
		MS442BER15L16R**	16.0	0.15	1.93		3.93	3.13	19		18.2	35.2	○	●
		M442BCR15L21R/L	21.0	0.05	1.95		3.95	3.45	21		22.8	39.8	●	○
		M442BER05L21R**	21.0	0.05	1.95		3.95	3.45	21		22.8	39.8	○	●
		MS442BCR15L21R/L	21.0	0.15	1.93		3.93	3.13	19		22.8	39.8	●	○
		MS442BER15L21R**	21.0	0.15	1.93		3.93	3.13	19		22.8	39.8	○	●
		M442BCR15L21RC**	21.0	0.15	1.93		3.93	3.13	19		22.8	39.8	○	●
		M442BCR03L25R**	25.0	0.03	1.98		3.98	3.13	19		28.7	45.7	○	●
		M442BCR05L26R/L	26.0	0.05	1.95		3.95	3.45	21		28.7	45.7	●	○
		MS442BCR15L26R/L	26.0	0.15	1.93		3.93	3.13	19		28.7	45.7	●	○
		M442BCR05L30R**	30.0	0.05	1.95		3.95	3.45	21		33.7	50.7	●	○

** LH Tools are available upon request.

● In stock ○ Available upon request

Inserts marked with C are available with internal coolant. Inserts marked with E are available with edge prep.

Boring (con't)



Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
5.0	5.2	M552BCR05L10R**	10.0	0.05	2.43		4.93	4.24	19		12.15	35	○	●
		M552BCR20L10R**	10.0	0.20	2.44		4.94	4.04			12.15	35	●	○
		M552BCR20L10R/L	10.0	0.20	2.44		4.94	4.04		8	12.15	35	●	○
		M552BCR03L15R**	15.0	0.03	2.44		4.94	4.24			18.15	41	○	●
		M552BCR20L16R/L	16.0	0.20	2.44		4.94	4.04			18.15	41	●	○
		M552BCR05L20R**	20.0	0.05	2.43		4.93	4.24			23.15	46	●	○
		M552BCR20L21R**	21.0	0.20	2.44		4.94	4.04			23.15	46	○	●
		M552BCR20L21R/L	21.0	0.20	2.44		4.94	4.04			23.15	46	●	●
		M552BER20L21R**	21.0	0.20	2.44	0.5	4.94	4.04	21		23.15	46	○	●
		M552BCR20L26R/L	26.0	0.20	2.44		4.94	4.04			28.15	51	●	●
		M552BER20L26R**	26.0	0.20	2.44		4.94	4.04		8	28.15	51	○	●
		M552BCR05L30R**	30.0	0.05	2.42		4.92	4.24			32.15	55	●	○
		M552BCR20L30R/L	30.0		2.44		4.94	4.04			32.15	55	●	○
		M552BCR20L30R**	30.0	0.20	2.44		4.94	4.04			32.15	55	○	●
		M552BCR20L35R/L	35.0		2.44		4.94	4.04			37.15	60	●	○
		M552BCR20L35R**	35.0		2.44		4.94	4.04			37.15	60	○	●
6.0	6.2	M662BCR20L16R/L	16.0	0.20							18.3	42	●	○
		M662BCR05L20R**	20.0	0.05							23.3	47	○	●
		M662BCR20L21R/L	21.0								23.3	47	●	○
		M662BCR20L26R/L	26.0								28.3	52	●	○
		M662BCR20L30R/L	30.0								32.3	56	●	●
		M662BER20L30R**	30.0	0.20	2.93	0.5	5.93	4.73	22	8	32.3	56	○	●
		M662BCR20L35R/L	35.0								37.3	61	●	●
		M662BER20L35R**	35.0								37.3	61	○	●
		M662BCR20L40R/L	40.0								42.3	66	●	○
		M662BCR05L30R**	30.0	0.05							32.3	56	○	●
7.0	7.2	M772BCR20L15R**	15.0								16.4	41	●	○
		M772BCR20L25R/L	25.0								26.4	51	●	○
		M772BCR20L30R**	30.0								31.4	56	○	●
		M772BCR20L35R/L	35.0								36.4	61	●	○
		M772BCR20L40R/L	40.0	0.20	3.44	0.5	6.94	5.74	22	8	41.4	66	●	●
		M772BER20L40R**	40.0								41.4	66	○	●
		M772BCR20L45R/L	45.0								46.4	71	●	●
		M772BER20L45R**	45.0								46.4	71	○	●
		M772BCR20L50R/L	50.0								51.4	76	●	○

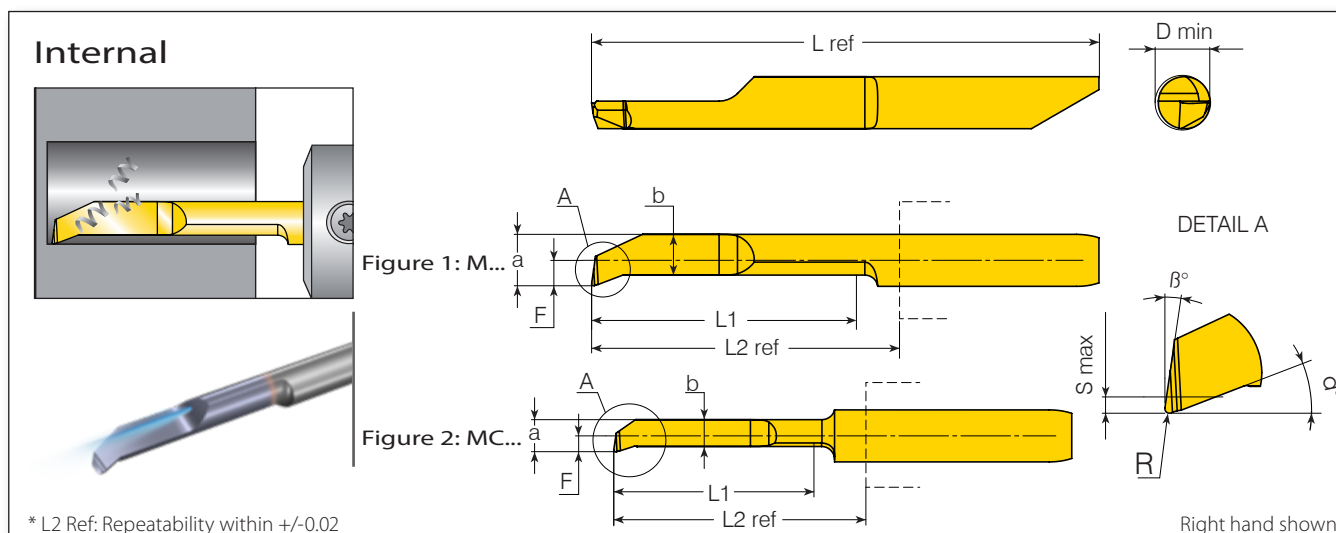
** LH Tools are available upon request.

● In stock ○ Available upon request

Inserts marked with C are available with internal coolant.

Inserts marked with E are available with edge prep.

Boring with Chip Breaker

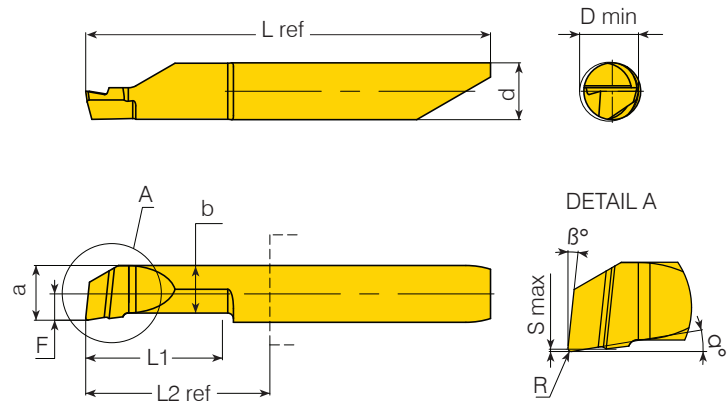
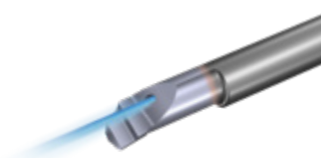
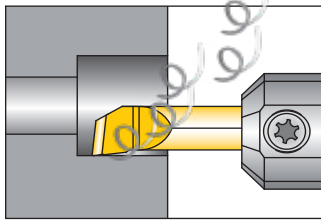


Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	2.2	MC422BCBR10L14R	14	0.1	1.04		2.04	1.76	18		18.2	35.2	•	○
	2.7	MC427BCBR15L15R	15	0.15	1.22		2.47	2.06			18.2	35.2	•	○
		MC427BCBR05L15R		0.05	1.22		2.47	2.06			18.2	35.2	•	○
	3.2	MC432BCBR05L15R	15	0.05	1.43		2.90	2.45			18.2	35.2	•	○
		MC432BCBR15L15R		0.15	1.43	0.2	2.90	2.45			18.2	35.2	•	○
		MC432BCBR05L20R		0.05	1.43		2.90	2.45			22.8	39.8	•	○
	3.7	MC432BCBR15L20R	20	0.15	1.43		2.90	2.45			22.8	39.8	•	○
		MC437BCBR15L15R	15	0.15	1.77		3.47	3.05	21	8	18.2	35.2	•	○
	4.2	MC437BCBR15L20R	20	0.15	1.77		3.47	3.05			22.8	39.8	•	○
		M442BCBR05L15R	15	0.05	1.95		3.95	3.13			18.2	35.2	•	○
		M442BCBR15L15R		0.15	1.95		3.95	3.13			18.2	35.2	•	○
		M442BCBR05L20R	20	0.05	1.95	0.3	3.95	3.13			22.8	39.8	•	○
		M442BCBR15L20R		0.15	1.95		3.95	3.13			22.8	39.8	•	○
5.0	5.2	M552BCBR20L20R	25		2.44		4.94	4.04	22		23.15	46	•	○
		M552BCBR20L25R			2.44		4.94	4.04			28.15	51	•	○
		M552BCBR20L25R ^C			2.44		4.94	4.04			28.15	51	○	•
6.0	6.2	M662BCBR20L30R	30	0.2	2.93	0.5	5.93	4.73	22		32.3	56	•	○
		M662BCBR20L35R	35		2.93		5.93	4.73			37.3	61	•	○
7.0	7.2	M772BCBR20L40R	40		3.44		6.94	5.74	22		41.4	66	•	○
		M772BCBR20L45R	45		3.44		6.94	5.74			46.4	71	•	○

- In stock ○ Available upon request
- All tools are available in LH upon request.
- Inserts marked with ^C are available with internal coolant.

Boring with Chip Former

Internal



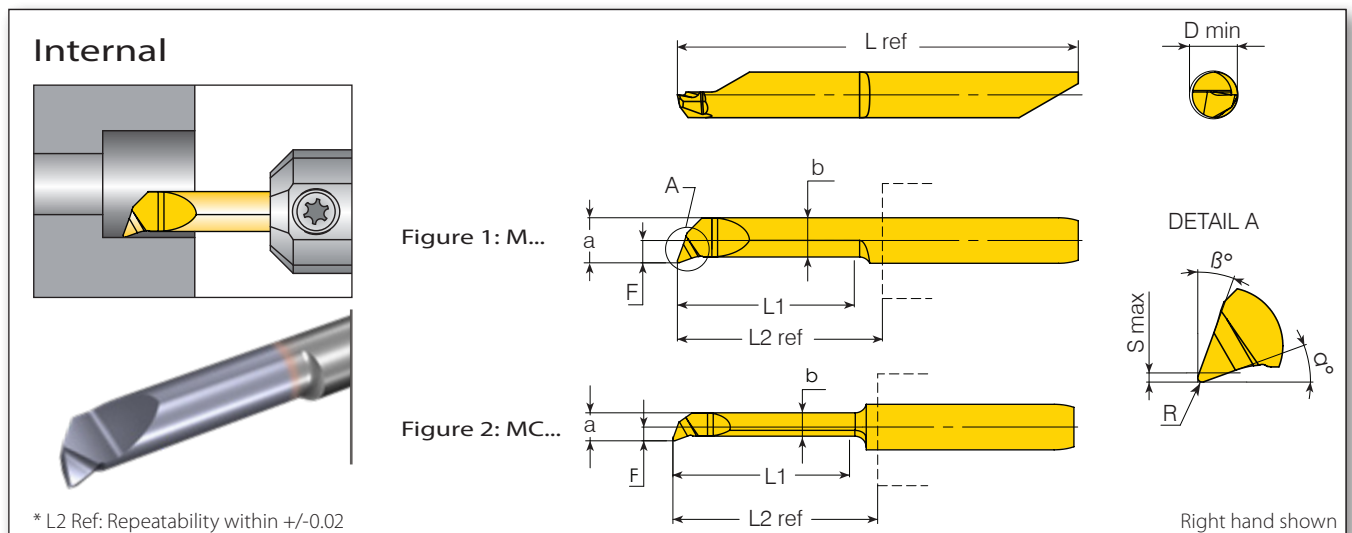
* L2 Ref: Repeatability within +/-0.02

Right hand shown

Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	4.2	MS442BCFR15L10R/L	10.0	0.15	1.85		3.85	3.35			11.5	28.5	●	○
		M442BCFR15L10R	10.0								11.5	28.5	○	●
		MS442BCFR15L15R/L	15.0								18.2	35.2	●	○
		MS442BCFR15L20R/L	20.0								22.8	39.8	●	○
5.0	5.2	M552BCFR20L10R	10.0		2.35		4.85	4.25			12.15	35	●	○
		M552BCFR20L15R	15.0								18.15	41	●	○
		M552BCFR20L20R/L	20.0								23.15	46	●	○
		M552BCFR20L25R	25.0								28.15	51	●	○
		M552BCFR20L30R	30.0								32.15	55	●	○
6.0	6.2	M662BCFR20L15R	15.0	0.2	2.85	0.05	5.85	5.1	9.4	6	18.3	42	●	○
		M662BCFR20L20R/L	20.0								23.3	47	●	○
		M662BCFR20L25R	25.0								28.3	52	●	○
		M662BCFR20L30R	30.0								32.3	56	●	○
		M662BCFR20L35R	35.0								37.3	61	●	○
7.0	7.2	M772BCFR20L15R	15.0	3.4			6.9	6.1			16.4	41	●	○
		M772BCFR20L20R	20.0								26.4	51	●	○
		M772BCFR20L25R	25.0								26.4	51	●	○
		M772BCFR20L30R	30.0								36.4	61	●	○
		M772BCFR20L35R/L	35.0								36.4	61	●	○
		M772BCFR20L40R	40.0								41.4	66	●	○

- In stock ○ Available upon request
- All tools are available in LH upon request.
- Inserts marked with C are available with internal coolant.

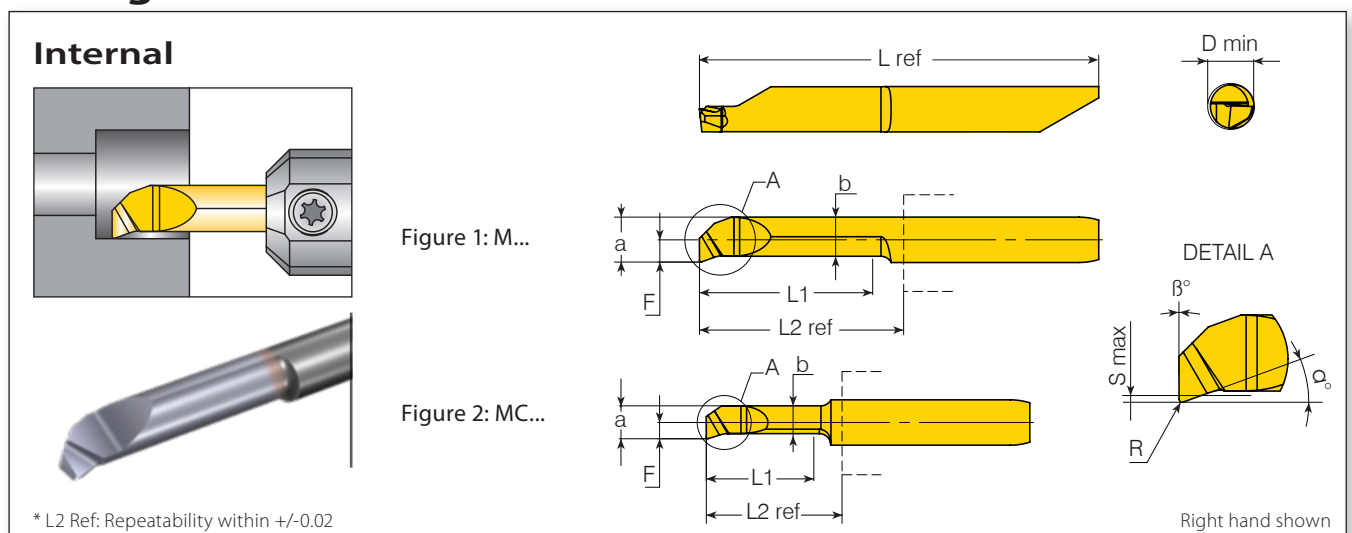
Boring 20°



Shank Dia.	Min. Bore Dia.	Ordering Code					Dimensions mm						Grades		
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX	
4.0	2.2	MC422B20R10L09R	9.0	0.1	0.95	0.2	1.95	1.55	20	20	11.5	28.5	●	○	
	2.7	MC427B20R15L10R	10.0	0.15	1.2		2.45	2.05			18.2	35.2	●	○	
		MC427B20R15L16R	16.0			1.45	2.95	2.55			11.5	28.5	●	○	
	3.2	MC432B20R15L10R	10.0		1.95		0.3	3.95			3.45	18.2	35.2	●	○
		MC432B20R15L16R	16.0			22.8						39.8	●	○	
	4.2	M442B20R15L16R	16.0												
		M442B20R15L21R	21.0												

• In stock ◦ Available upon request
 All tools are available in LH upon request.

Boring 90°

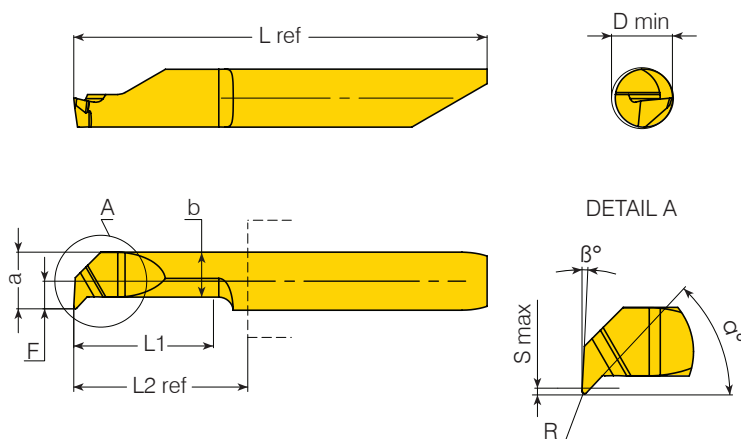
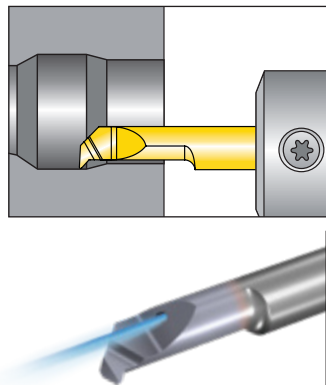


Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	3.2	MC432B90R15L10R/L	10.0	0.15	1.43	0.2	2.90	2.45	18	0	11.5	25.8	•	◦
	4.2	M442B90R15L16R/L	16.0		1.95	0.3	3.95	3.45			18.2	35.2	•	◦
5.0	5.2	M552B90R20L10R/L	10.0	0.2	2.44	0.5	4.94	4.2	20		12.15	35	•	◦
		M552B90R20L16R/L	16.0								18.15	41	•	◦
		M552B90R20L21R/L	21.0								23.15	46	•	◦

• In stock ◦ Available upon request

Boring & Profiling

Internal



* L2 Ref: Repeatability within +/-0.02

Right hand shown

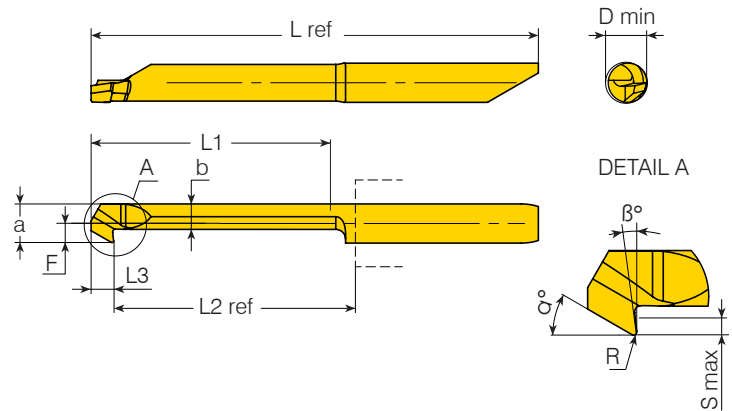
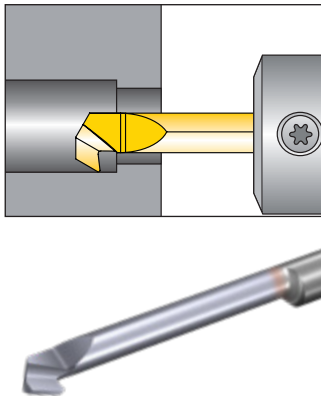
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	4.2	M442CLR15L10R/L	10	0.15	1.9	0.7	3.9	3.1	47		11.5	28.5	●	○
		M442CLR15L10R C	10								11.5	28.5	○	●
		MS442CLR15L16R/L	16								18.2	35.2	●	○
		M442CLR15L21R C	21								18.2	35.2	○	●
		MS442CLR15L21R/L	21								22.8	39.8	●	○
5.0	5.2	M552CLR20L16R/L	16	0.2	2.4	0.95	4.9	3.8	49	3	18.15	41	●	○
		M552CLR20L25R/L	25								28.15	51	●	○
		M552CLR20L25R C	25								28.15	51	○	●
6.0	6.2	M662CLR20L16R/L	16		2.78	1.75	5.78	3.9			18.3	42	●	○
		M662CLR20L21R/L	21								23.3	47	●	○
		M662CLR20L30R/L	30								32.3	56	●	○

● In stock ○ Available upon request

Inserts marked with **C** are available with internal coolant.

Back Boring

Internal



* L2 Ref: Repeatability within +/-0.03

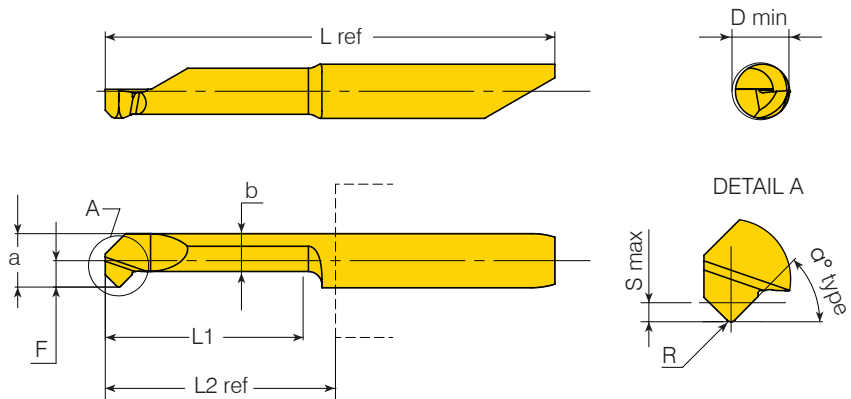
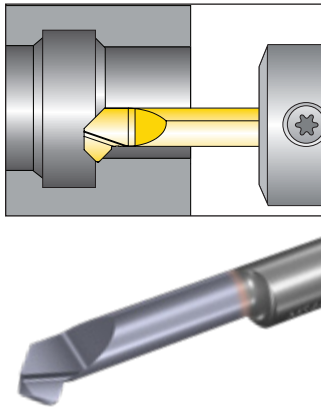
Right hand shown

Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades		
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L3	L ref	VBX	VTX
4.0	4.2	M442BBR15L25R/L	25.0	0.15	1.95	0.8	3.95	2.6	30	6	26.4	2.30	45.7	•	◦
5.0	5.2	M552BBR15L30R/L			2.45	1.0	4.95	3.8			29.85		55.0	•	◦
6.0	6.2	M662BBR15L30R/L	30.0		2.95	1.8	5.95	4.0		7	29.8	2.45	56.0	•	◦
7.0	7.2	M772BBR15L30R/L			3.45	2.5	6.95	4.3			34		61.0	•	◦

• In stock ◦ Available upon request

Boring & Chamfering 45°

Internal



* L2 Ref: Repeatability within +/-0.02

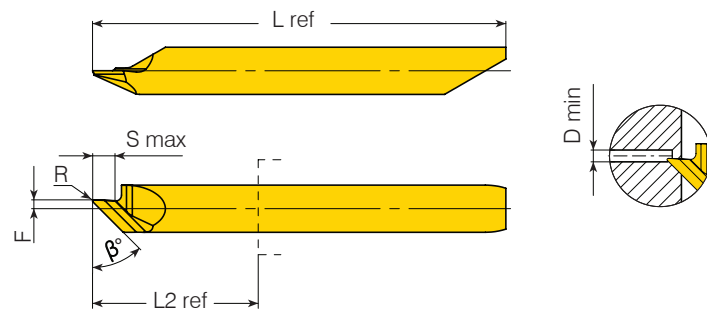
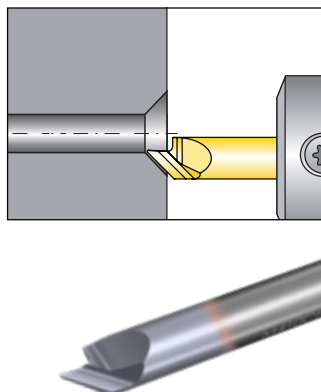
Right hand shown

Shank Dia.	Min. Bore Dia.	Ordering Code				Dimensions mm					Grades			
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	L2 ref*	L ref	VBX	VTX	
4.0	4.2	MS442CH4545L15R/L	15.0	0.2	1.95	0.7	3.95	2.8	45	18.4	35.4	●	○	
5.0	5.2	M552CH4545L15R/L	15.0		2.45		4.95	3.7		18.35	41.2	●	○	
		M552CH4545L20R/L	20.0							23.35	46.2	●	○	
6.0	6.2	M662CH4545L20R/L	20.0		2.95		5.95	4.0		23.5	47.2	●	○	
		M662CH4545L25R/L	25.0							28.5	52.2	●	○	
7.0	7.2	M772CH4545L20R/L	20.0		3.45		6.95	4.25		26.6	51.2	●	○	
		M772CH4545L40R/L	40.0							41.6	66.2	●	○	

• In stock ○ Available upon request

Face Chamfering 45°

Internal



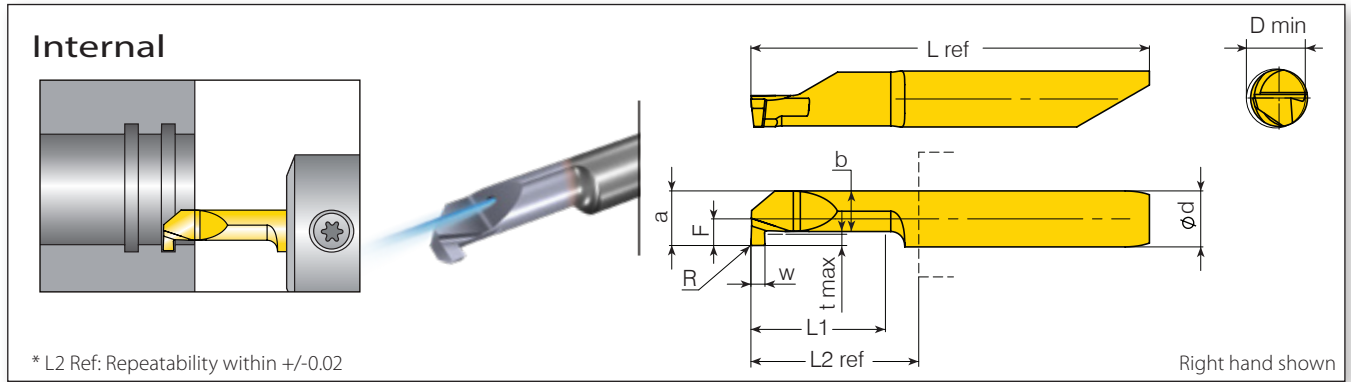
* L2 Ref: Repeatability within +/-0.02

Right hand shown

Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm						Grades	
d (mm)	D min. (mm)	RH/LH	R	F	S max	β°	L2 ref*	L ref	VBX	VTX
4.0	1.0	M410CH45L15R	0.1	0.75	2.4	45	18.2	35.2	•	○
		M410CH45L15L							•	○

• In stock ○ Available upon request

Square Grooving



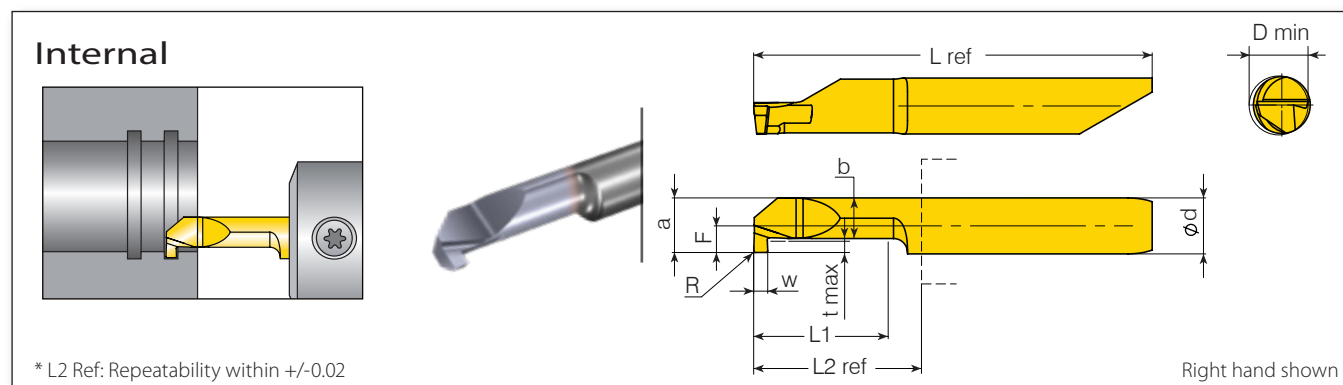
Shank Dia.	Min. Bore Dia.	Ordering Code				Dimensions mm						Grades			
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX		
4.0	4.2	MS442GSW079L10R/L	0.79	0.8	10	1.96	0.1	3.96	2.9	11.5	28.5	●	○		
		MS442GSW100L10R/L	1.00									●	○		
		MS442GSW150L10R**	1.50			1.90		3.90				●	○		
		M442GSW150L10R C **	1.50					○		●					
		MS442GSW079L15R/L	0.79		15	1.96		3.96		18.2	35.2	●	○		
		MS442GSW100L15R/L	1.00									●	○		
		M442GSW100L15R C **	1.00									○	●		
		MS442GSW100L20R/L	1.00		20	1.90		3.90		22.8	39.8	●	○		
		M442GSW100L20R C **	1.00									○	●		
		MS442GSW079L25R/L	0.79			25		1.96	3.96			28.7	45.7	●	○
5.0	5.2	M552GSW100L10R/L	1.00	1	10	0.1		4.90	3.7	12.15	35	●	○		
		M552GSW100L10R C **	1.00											○	●
		M552GSW150L10R**	1.50											●	○
		M552GSW200L10R**	2.00								●	○			
		M552GSW100L15R/L	1.00		15					2.40	18.15	41	●	○	
		M552GSW100L15R C **	1.00											○	●
		M552GSW150L15R/L	1.50											●	○
		M552GSW150L15R C **	1.50		20					23.15	46	○	●		
		M552GSW200L15R**	2.00											●	○
		M552GSW100L20R/L	1.00									●	○		
		M552GSW150L20R/L	1.50						●	○					
		M552GSW150L20R C **	1.50						○	●					
		M552GSW200L20R**	2.00						●	○					
6.0	6.2	M662GSW079L10R**	0.79	1.8	10		2.96	0.1	5.96	4.0	12.3	36	●	○	
		M662GSW100L10R/L	1.00				2.90		5.90				●	○	
		M662GSW117L10R**	1.17				2.96		5.96				●	○	
		M662GSW150L10R**	1.50				2.90		5.90				●	○	
		M662GSW157L10R**	1.57				2.96		5.96				●	○	
		M662GSW198L10R**	1.98				2.96		5.96				●	○	
		M662GSW200L10R/L	2.00		15		2.90		5.90		18.3	42	●	○	
		M662GSW079L15R**	0.79				2.96		5.96				●	○	
		M662GSW100L15R/L	1.00				2.90		5.90				●	○	
		M662GSW117L15R**	1.17				2.96		5.96	●			○		
		M662GSW150L15R/L	1.50			2.90	5.90		●	○					
		M662GSW157L15R**	1.57			2.96	5.96		●	○					
		M662GSW198L15R**	1.98		20	23.3	47		●	○					
		M662GSW200L15R/L	2.00								●	○			
		M662GSW100L20R/L	1.00								●	○			
											○	●			

** LH Tools are available upon request.

● In stock ○ Available upon request

Inserts marked with C are available with internal coolant.

Square Grooving (con't)



Shank Dia.	Min. Bore Dia.	Ordering Code			Dimensions mm							Grades		
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX	
6.0	6.2	M662GSW150L20R/L	1.50	1.8	20	2.90	0.1	5.90	4.0	23.3	47	●	○	
		M662GSW200L20R/L	2.00									●	○	
		M662GSW079L25R**	0.79		25	2.96				5.96	28.3	52	●	○
		M662GSW117L25R**	1.17										●	○
		M662GSW157L25R**	1.57										●	○
		M662GSW198L25R**	1.98										●	○
		M662GSW100L30R/L	1.00		30	2.90		5.90			32.3	56	●	○
		M662GSW150L30R/L	1.50										●	○
		M662GSW200L30R/L	2.00							●			○	
		M662GSW079L35R**	0.79		35	2.96		5.96		37.3	61	●	○	
		M662GSW117L35R**	1.17									●	○	
		M662GSW157L35R**	1.57									●	○	
7.0	7.2	M772GSW079L10R**	0.79	2.5	10	3.46	0.1	6.96	4.1	11.4	36	●	○	
		M772GSW100L10R/L	1.00					●				○		
		M772GSW150L10R/L	1.50			3.40		6.90				●	○	
		M772GSW200L10R/L	2.00					●				○		
		M772GSW079L15R**	0.79		15	3.46		6.96		16.4	41	●	○	
		M772GSW100L15R**	1.00			3.40		6.90				●	○	
		M772GSW117L15R**	1.17			3.46		6.96				●	○	
		M772GSW150L15R/L	1.50			3.40		6.90				●	○	
		M772GSW157L15R**	1.57					●				○		
		M772GSW198L15R**	1.98			3.46		6.96				●	○	
		M772GSW200L15R/L	2.00		3.40	6.90		●		○				
		M772GSW079L20R**	0.79		20	3.46		6.96		26.4	51	●	○	
		M772GSW117L20R**	1.17									●	○	
		M772GSW157L20R**	1.57									●	○	
		M772GSW198L20R**	1.98									●	○	
		M772GSW100L25R**	1.00		25	3.40		6.90		36.4	61	●	○	
		M772GSW150L25R/L	1.50									●	○	
		M772GSW200L25R/L	2.00									●	○	
		M772GSW100L35R**	1.00									●	○	
		M772GSW150L35R/L	1.50		35							●	○	
		M772GSW200L35R/L	2.00									●	○	

** LH Tools are available upon request.

• In stock ◦ Available upon request

Round Grooving

Internal

* L2 Ref: Repeatability within +/-0.02

Right hand shown

Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	$W_{\pm 0.025}$	t max	L1	F	R	a	b	L2 ref*	L ref		VBX	VTX
4.0	4.2	MS442GRR050L15R/L	1.0	0.8	15	1.95	0.5	3.95	2.8	18.2	35.2		•	○
		M552GRR050L20R/L	1.0										•	○
5.0	5.2	M552GRR075L20R/L	1.5	1	20	2.45	0.75	4.95	3.7	23.15	46		•	○
		M552GRR100L20R**	2.0				1						•	○
6.0	6.2	M662GRR050L25R/L	1.0				0.5						•	○
		M662GRR075L25R/L	1.5	1.8	25	2.95	0.75	5.95	4	28.3	52		•	○
		M662GRR100L25R/L	2.0				1						•	○
7.0	7.2	M772GRR100L30R**	2.0	2.5	30	3.45	1	6.95	4.1	36.4	61		•	○

** LH Tools are available upon request.

• In stock ○ Available upon request

Pre-Part Off

Internal

* L2 Ref: Repeatability within +/-0.02

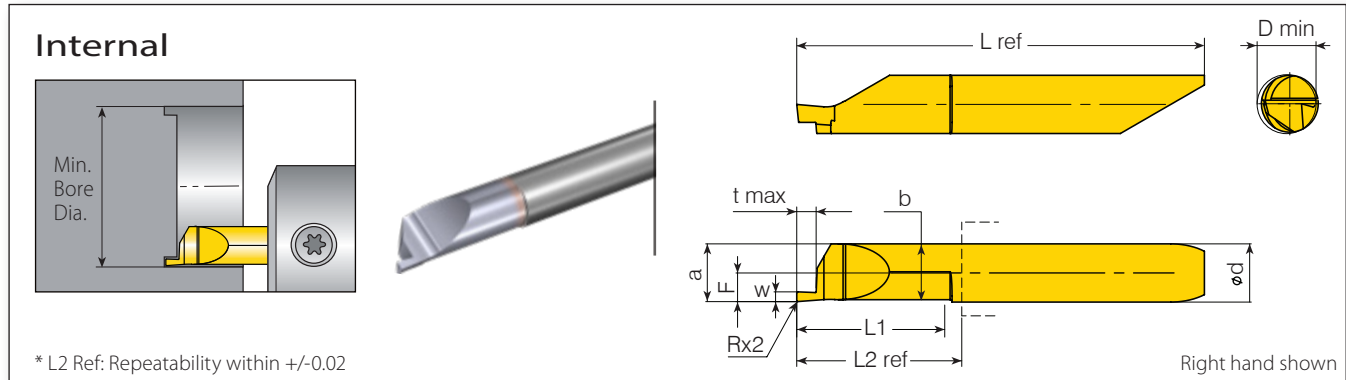
Right hand shown

Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	$W_{\pm 0.025}$	t max	L1	F	t	a	b	L2 ref*	L ref		VBX	VTX
5.0	5.2	M552PPW100L15R/L			15					18.15	41		•	○
		M552PPW100L20R/L			20					23.15	46		•	○
		M552PPW100L20RC**	1.0	0.7	20	2.44	0.3	4.94	3.88	23.15	46		○	•
		M552PPW100L25R/L			25					28.15	51		•	○
		M552PPW100L30R**			30					32.15	55		•	○

** LH Tools are available upon request.

• In stock ○ Available upon request

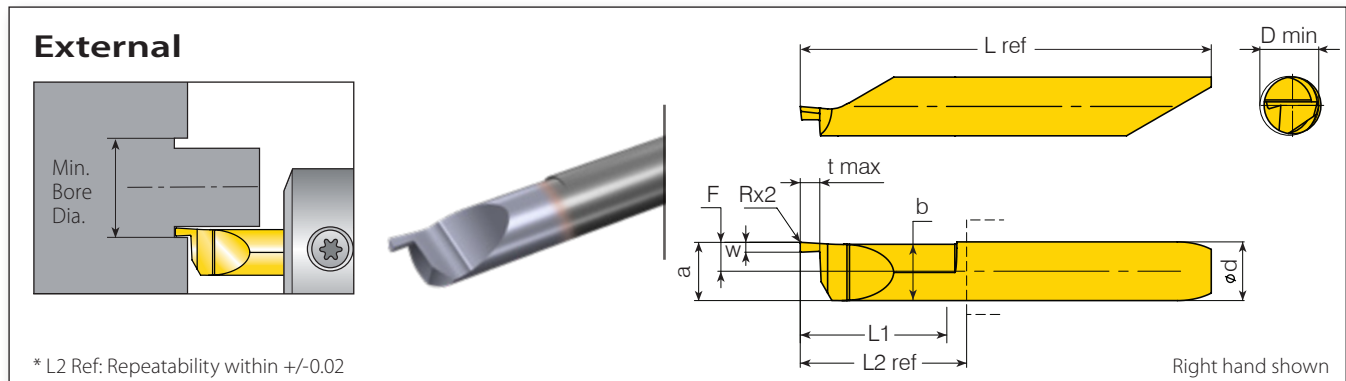
Face Grooving Internal



Shank Dia.	Min. Bore Dia.	Ordering Code				Dimensions mm						Grades	
d (mm)	D min. (mm)	RH/LH	W ^{±0.025}	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
6.0	6.2	M662FGW10L15R/L	1.00	2.0	15	2.95	0.10	5.95	5.75	18.3	42.0	●	○
		M662FGW117L15R/L	1.17				0.15					●	○
		M662FGW15L15R/L	1.50	3.0			0.10					●	○
		M662FGW157L15R/L	1.57				0.15					●	○
		M662FGW198L15R/L	1.98	4.0			0.15					●	○
		M662FGW20L15R/L	2.00				0.10					●	○
		M662FGW239L15R/L	2.39	5.0			0.15					●	○
		M662FGW25L15R/L	2.50				0.10					●	○
		M662FGW30L15R/L	3.00	6.0			0.10					●	○
		M662FGW318L15R/L	3.18				0.15					●	○

• In stock ◦ Available upon request

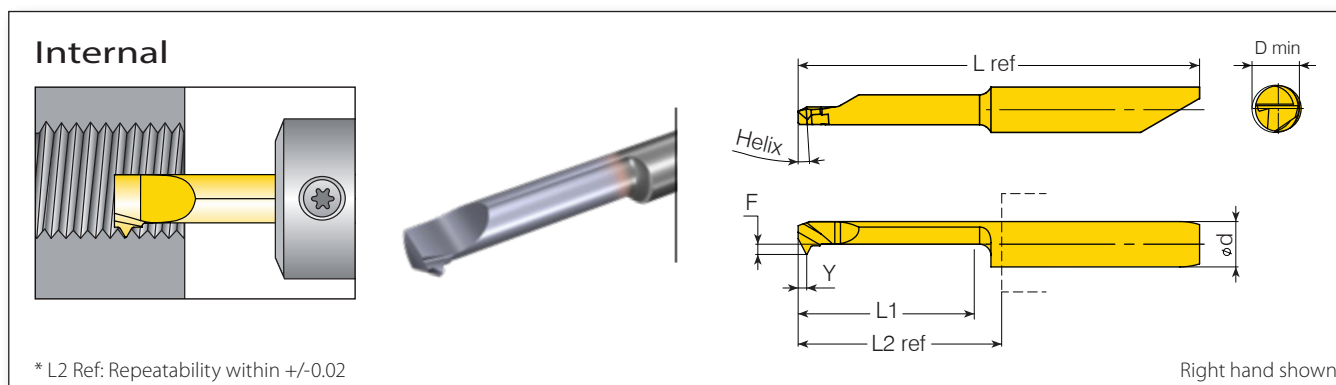
Face Grooving External



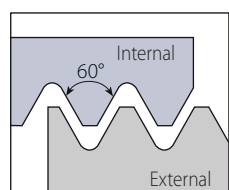
Shank Dia.	Min. Bore Dia.	Ordering Code			Dimensions mm							Grades	
d (mm)	D min. (mm)	RH/LH	W ± 0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
6.0	6.2	M662FPW10L15R/L	1.00	2.0	15	2.95	0.10	5.95	5.75	18.3	42	●	○
		M662FPW117L15R/L	1.17				0.15					●	○
		M662FPW15L15R/L	1.50	3.0			0.10					●	○
		M662FPW157L15R/L	1.57				0.15					●	○
		M662FPW198L15R/L	1.98	4.0			0.15					●	○
		M662FPW20L15R/L	2.00				0.10					●	○
		M662FPW239L15R/L	2.39	5.0			0.15					●	○
		M662FPW25L15R/L	2.50				0.10					●	○
		M662FPW30L15R/L	3.00	6.0			0.10					●	○
		M662FPW318L15R/L	3.18				0.15					●	○

• In stock ◦ Available upon request

Threading



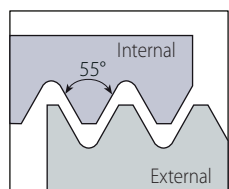
Partial Profile 60°



	Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch		Dimensions mm							Grades	
Thread	d (mm)	D min. (mm)	RH/LH	mm	TPI	Helix °	L1	F	Y	h (min)	L2 ref*	L ref	VBX	VTX
M1-M2x0.25	4.0	0.73	M407TH0.25P60L02R	0.25		4.9	2.5		0.14	0.29	13.0	29.8	○	●
M1.6-M3x0.35		1.22	M412TH0.35P60L04R	0.35		3.8	4	1.95	0.18	0.29			○	●
M2x0.4		1.57	M416TH0.40P60L05R	0.4		4.2	5		0.2	0.41			○	●
M2.2-M2.5x0.45		1.71	M417TH0.45P60L06R	0.45		4.0	6		0.22	0.46			○	●
-	4.0	3.2	MS429THF60L16R/L	0.5-1.0	48-24	3.5	16	0.9			18.4	35.4	●	○
		4.2	MS439THF60L16R/L	0.5-1.0	48-24			1.9	0.9	-			●	○
	6.0	6.2	M659THA60L16R/L	0.5-1.5	48-16				2.9					18.5

● In stock ○ Available upon request

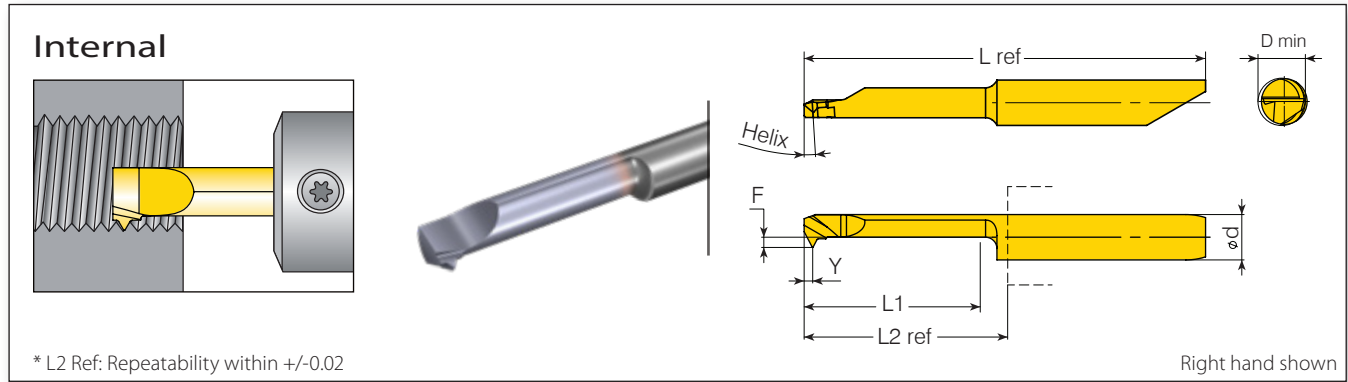
Partial Profile 55°



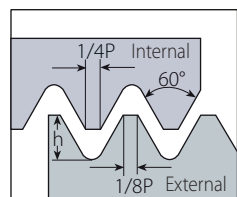
Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch			Dimensions mm					Grades	
d (mm)	D min. (mm)	RH/LH	mm	TPI	Helix	L1	F	Y	L2 ref*	L ref	VBX	VTX
4.0	3.2	MS429THF55L16R/L	0.5-1.0	48-24	3.5	16	0.9		18.4	35.4	●	○
	4.2	MS439THF55L16R/L	0.5-1.0	48-24			1.9	0.75			●	○
6.0	6.2	M659THA55L16R/L	0.5-1.5	48-16			2.9	0.9	18.5	42.2	●	○

● In stock ○ Available upon request

Threading



ISO Metric

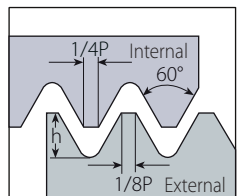


Defined by: R262 (DIN 13)
Tolerance Class: 6g/6H

	Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch		Dimensions mm						Grades			
Thread	d (mm)	D min. (mm)	RH/LH	mm	Helix °	L1	F	Y	h (min)	L2 ref*	L ref	VBX	VTX		
M3-M5x0.5	4.0	2.46	M425TH0.50ISOL08R	0.50	3.0	7.6	1.95	0.40	0.58	13.0	29.8	○	●		
M4x0.7		3.24	M432TH0.70ISOL10R	0.70	3.6	10.2		0.60	0.29			○	●		
M4x0.5		3.4	MS429TH0.50ISOL16R/L	0.50	3.5	16		0.9	0.4	0.29	18.4	35.4	●	○	
M5x0.5		4.4	MS439TH0.50ISOL16R/L	0.50				1.9	0.4	0.29			●	○	
M4x0.7		3.2	MS429TH0.70ISOL16R/L	0.70				0.9	0.6	0.41			●	○	
M4.5-M6x0.75		3.1	M429TH0.75ISOL16R	0.75				1.9	0.6	0.44			○	●	
M5x0.8		4.0	MS429TH0.80ISOL16R/L	0.80				0.9	0.6	0.46			●	○	
M6x1.0		4.8	MS439TH1.00ISOL16R/L	1.00				1.9	0.7	0.58			●	○	
M5.5x0.5	5.0	4.9	M542TH0.50ISOL16R/L	0.50			1.7	0.4	0.29	18.35			41.2	●	○
M5.5x0.75		4.6	M542TH0.75ISOL16R/L	0.75			1.7	0.6	0.43					●	○
M7x1.0		5.8	M549TH1.00ISOL16R/L	1.00	2.4	0.7	0.58	●	○						
M6x0.5	6.0	5.4	M649TH0.50ISOL16R/L	0.50	3.0	18	1.9	0.4	0.29	18.5	42.2	●	○		
M6.5x0.75		5.6	M649TH0.75ISOL16R/L	0.75			1.9	0.6	0.43			●	○		
M7.5x1.0		6.3	M659TH1.00ISOL16R/L	1.00			2.9	0.7	0.58			●	○		
M8x1.25		6.5	M659TH1.25ISOL16R/L	1.25			2.9	0.9	0.72			●	○		
M10x1.5		8.3	M659TH1.50ISOL16R/L	1.50			2.9	1.0	0.87			●	○		

● In stock ○ Available upon request
All tools are available in LH upon request.

American UN

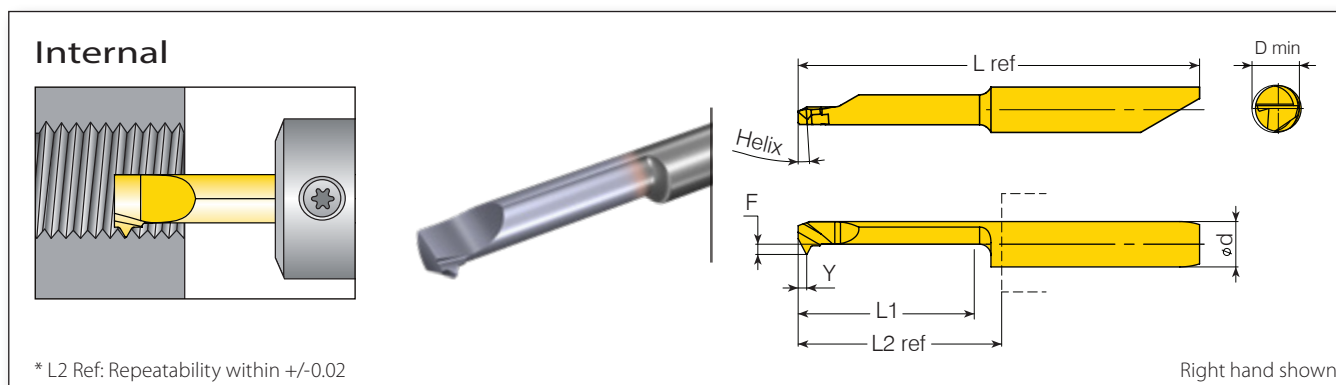


Defined by: ANSI B1.1:74
Tolerance Class: 2A/2B

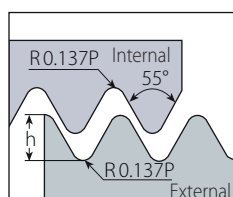
	Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch	Dimensions mm							Grades	
Thread	d (mm)	D min. (mm)	RH/LH	TPI	Helix °	L1	F	Y	h (min)	L2 ref*	L ref	VBX	VTX
No.8-32UNC	4.0	3.3	MS429TH32UNL16R/L	32	3.5	16	0.92	0.6	0.46	18.4	35.4	●	○
No.10-28UNS		3.6	MS429TH28UNL16R/L	28			0.92	0.65	0.52			●	○
1/4"-27UNS	5.0	5.3	M549TH27UNL16R**	27			2.4	0.75	0.54	18.35	41.2	●	○
1/4"-24UNS		5.1	M542TH24UNL16R**	24			1.7	0.75	0.61			●	○
1/4"-20UNC		4.6	M542TH20UNL16R**	20			1.7	0.9	0.73			●	○
5/16"-18UNC	6.0	6.3	M659TH18UNL16R**	18			2.9	1.05	0.81	18.5	42.2	●	○
3/8"-16UNC		7.7	M659TH16UNL16R**	16			2.9	1	0.92			●	○

** LH Tools are available upon request.
● In stock ○ Available upon request

Threading



Whitworth for BSW, BSP



Defined by:

B.S.84:1956, DIN 259,
ISO228/1:1982

Tolerance Class:

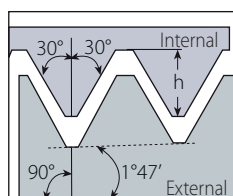
Medium Class A

	Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch	Dimensions mm							Grades	
Thread	d (mm)	D min. (mm)	RH/LH	TPI	Helix °	L1	F	Y	h (min)	L2 ref*	L ref	VBX	VTX
1/16"-28BSP	6.0	6.5	M659TH28WL16R**	28	3.5	16	2.9	0.65	0.58	18.5	42.2	•	◦
1/4"-19BSP		11.4	M659TH19WL16R**	19				0.95	0.86			•	◦

** LH Tools are available upon request.

• In stock ◦ Available upon request

NPT



Defined by:

USAS B2.1:1968

Tolerance Class:

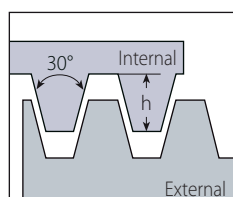
Standard NPT

	Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch	Dimensions mm							Grades	
Thread	d (mm)	D min. (mm)	RH/LH	TPI	Helix °	L1	F	Y	h (min)	L2 ref*	L ref	VBX	VTX
1/16"-27NPT	6.0	6.1	M659TH27NPTL16R**	27	3.5	16	2.9	0.75	0.66	18.5	42.2	•	◦
1/4"-18NPT		10.7	M659TH18NPTL16R/L	18				1	1.01			•	◦
1/2"-14NPT		17	M659TH14NPTL16R**	14				1.05	1.33			•	◦

** LH Tools are available upon request.

• In stock ◦ Available upon request

Trapez



Defined by: DIN 103

Tolerance class: 7e/7H

	Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch	Dimensions mm							Grades	
Thread	d (mm)	D min. (mm)	RH/LH	mm	Helix °	L1	F	Y	h (min)	L2 ref*	L ref	VBX	VTX
TR8-TR10x1.5	6.0	6.2	M662TH1.5TRL20R	1.5	3.3	20.3	2.95	1.1	0.9	23	46.7	◦	•
TR9-TR12x2.0		6.2	M662TH2.0TRL20R	2.0	4		2.95	1.3	1.25			◦	•
TR10-TR14x2.0	7.0	7.2	M772TH2.0TRL20R	2.0	3.4	20.3	3.45	1.5	1.75			◦	•
TR11-TR16x3.0		7.2	M772TH3.0TRL20R	3.0	4.75		3.45	1.5	1.75			◦	•

• In stock ◦ Available upon request

All tools are available in LH upon request.

microscope Toolholders

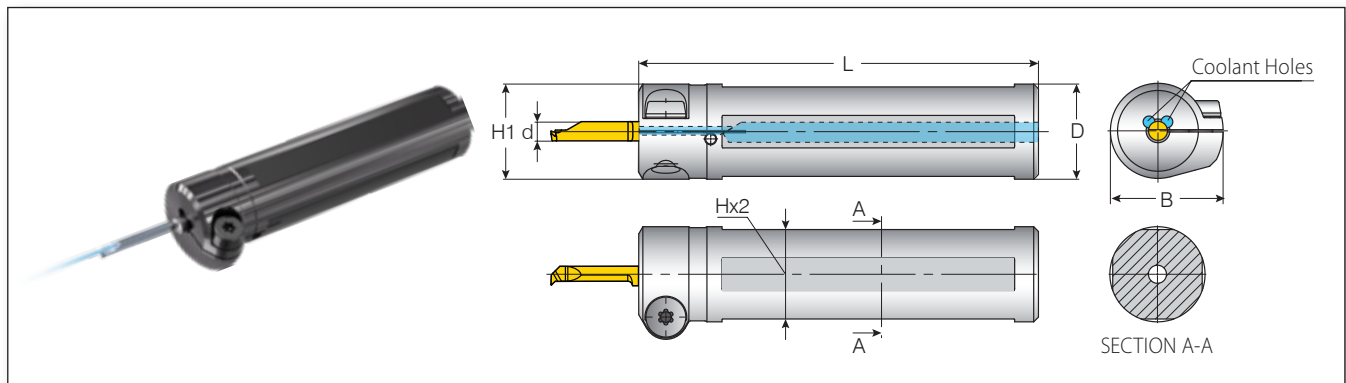
Shrink Tools	117
Round Tools	118
Round Double Sided Tools	118
Holder with Round Shank - 4 Flats	119
Holder with Round Shank - 2 Flats	120
Holder with Square Shank	121
Holder with Drop Head	121

microscope Toolholders Ordering Code

MH	C	R	22	-	4	-	5	-	4F
1	2	3	4		5		6		7
1 - Product Line				2 - Coolant		3 - Round Tools		4 - Shank Size (mm)	
MH - Microscope Round Holder MHS - Microscope Holder with Square Shank MHD - Microscope with Drop Head				C or D - Coolant Thru		R - Round Bore S - Shrink by Screw		10 - 28	
				5 - Bore Size (mm)		6 - Bore Size (mm) for Double Bore		7 - 4 Flats	
				4, 5, 6, 7		4, 5, 6, 7		4F - Four Flats None - Two Flats	



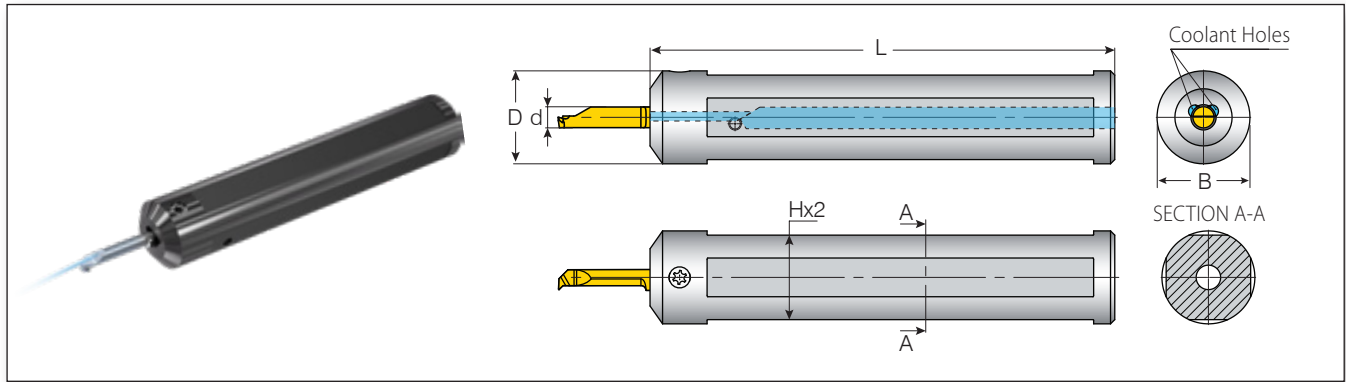
Shrink Toolholders



							Spare Parts	
Micro Insert Dia.	Ordering Code	Dimensions mm						
d (mm)		D	B	H1	H	L	Shrink Screw	Key
4.0	MHCS10-4-4F	10.0	19.7	13.3	8.8	65.0	SM5x10-15IPx2*	F15IP*
	MHCS12-4-4F	12.0	19.7	13.8	10.8	70.0		
	MHCS16-4-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-4-4F	20.0	23.7	20.0	18.8	84.0		
	MHCS22-4-4F	22.0	24.7	22.0	20.0	110.0		
5.0	MHCS16-5-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-5-4F	20.0	23.7	20.0	18.8	84.0		
6.0	MHCS12-6-4F	12.0	19.7	13.8	10.8	70.0		
	MHCS16-6-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-6-4F	20.0	23.7	20.0	18.8	84.0		
	MHCS22-6-4F	22.0	24.7	22.0	20.0	110.0		
7.0	MHCS16-7-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-7-4F	20.0	23.7	20.0	18.8	84.0		

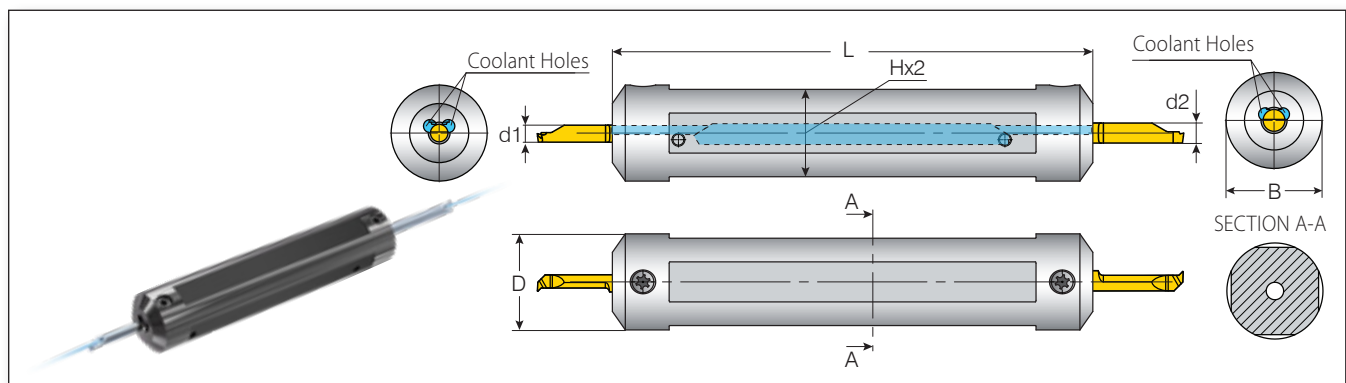
* SM5x10-15IPx2 is a special screw which can be used from both its sides.
For an alternative screw, please use MS5x10 (key: S4).

Round Tools without Shoulder



Micro Insert Dia.					Spare Parts	
Ordering Code						
Dimensions mm					Clamping Screw	Key
d (mm)		B=D	H	L		
4.0	MHCR20-4-4F	20	18.8	83.5	SLDBT15IP	F15IP
	MHCR22-4-4F	22	20.0	110.0		
5.0	MHCR20-5-4F	20	18.8	83.5		
	MHCR22-5-4F	22	20.0	110.0		
6.0	MHCR20-6-4F	20	18.8	83.5		
	MHCR22-6-4F	22	20.0	110.0		
7.0	MHCR25-7-4F	25	20.0	110.0		

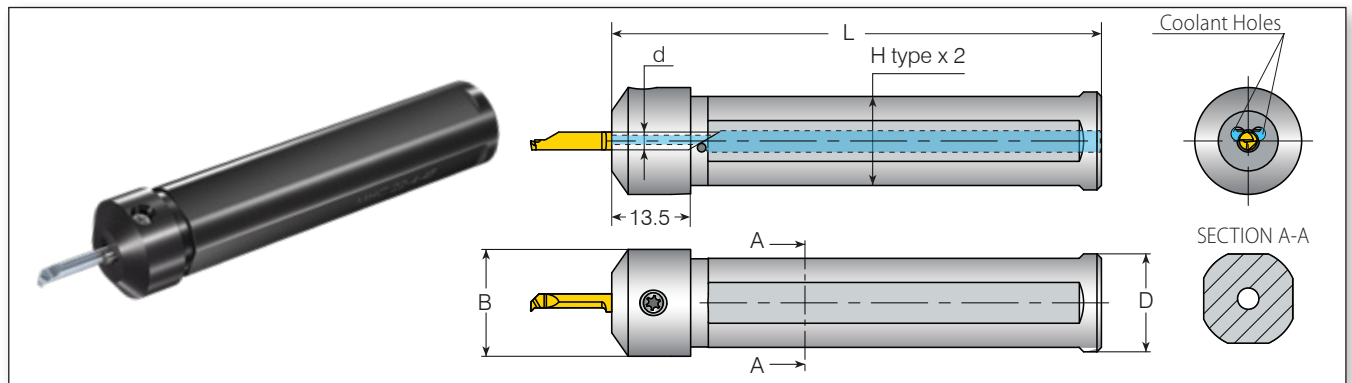
Round Double Sided Toolholders



Micro Insert Dia.					Spare Parts	
Ordering Code						
Dimensions mm					Clamping Screw	Key
d1 - d2 (mm)		B=D	H	L		
4.0 - 5.0	MHCR075-4-5-4F*	19.05	17.8	83.5	SLDBT15IP	F15IP
	MHCR20-4-5-4F*	20	18.8	83.5		
	MHCR22-4-5-4F	22	20.0	110.0		
	MHCR25-4-5-4F	25	23.0	110.0		
6.0 - 7.0	MHCR20-6-7-4F*	20	18.8	83.5		
	MHCR25-6-7-4F	25	23.0	110.0		

* Front screw must be removed in order to mount the toolholder on the machine. Once mounted, set the screw back in place and secure the insert.

Holder with Round Shank - 4 Flats

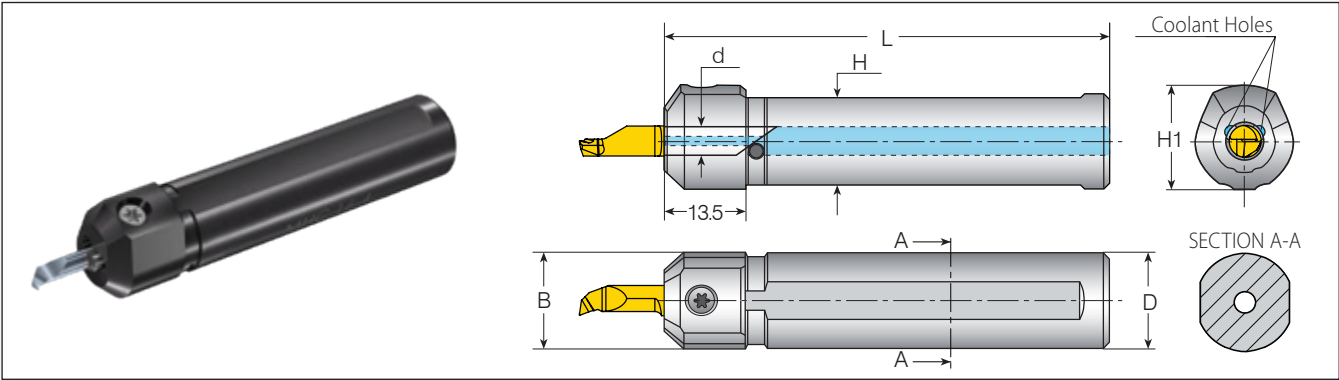


						Spare Parts			
Micro Insert Dia.	Ordering Code	Dimensions mm							
d (mm)		D	B	H	L	Clamping Screw	Key		
4.0	MHC20-4-4F	20.0	22.0	18.8	83.5	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*		
	MHC22-4-4F	22.0	24.0	20.0	110				
	MHC23-4-4F	23.0	25.0	21.0					
	MHC25-4-4F	25.0	27.0	23.0					
	MHC28-4-4F	28.0	30.0	26.0					
5.0	MHC20-5-4F	20.0	22.0	18.8	83.5				
	MHC22-5-4F	22.0	24.0	20.0	110				
	MHC23-5-4F	23.0	25.0	21.0					
	MHC25-5-4F	25.0	27.0	23.0					
	MHC28-5-4F	28.0	30.0	26.0					
6.0	MHC20-6-4F	20.0	22.0	18.8	83.5				
	MHC22-6-4F	22.0	24.0	20.0	110				
	MHC23-6-4F	23.0	25.0	21.0					
	MHC25-6-4F	25.0	27.0	23.0					
	MHC28-6-4F	28.0	30.0	26.0					
7.0	MHC22-7-4F	22.0	24.0	20.0					
	MHC23-7-4F	23.0	25.0	21.0					
	MHC25-7-4F	25.0	27.0	23.0					
	MHC28-7-4F	28.0	30.0	26.0					

* Torx+ screw and key are now available for improved clamping.

Holder with Round Shank - 2 Flats

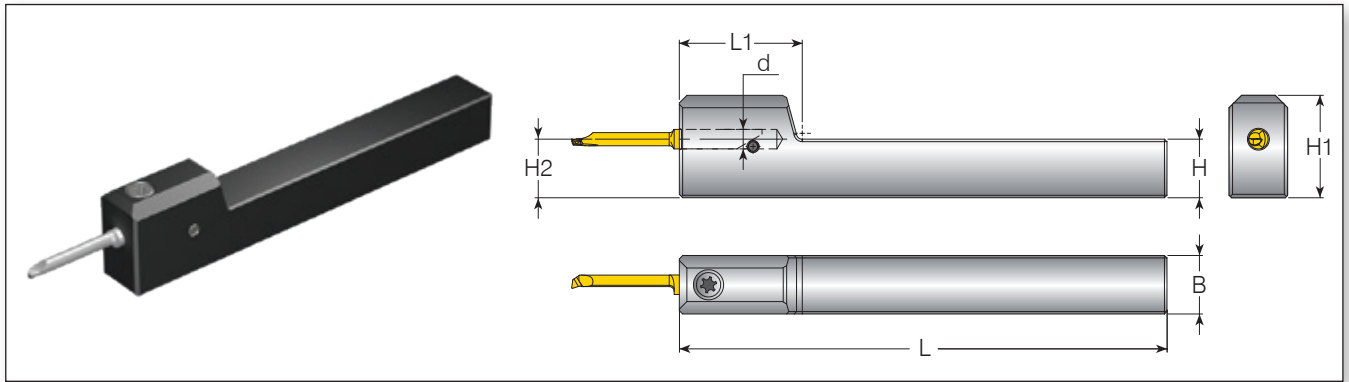
microscope



						Spare Parts	
Micro Insert Dia.	Ordering Code	Dimensions mm					
d (mm)		D=B	H1	H	L	Clamping Screw	Key
4.0	MHC 10-4	10.0	14.0	8.8	65.0	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*
	MHC 12-4	12.0	16.0	10.8	70.0		
	MHC 16-4	16.0	17.6	14.8	75.0		
	MHC 20-4	20.0	22.0	18.8	84.0		
5.0	MHC 10-5	10.0	14.0	8.8	65.0		
	MHC 12-5	12.0	16.0	10.8	70.0		
	MHC 16-5	16.0	18.6	14.8	75.0		
	MHC 20-5	20.0	22.0	18.8	84.0		
6.0	MHC 12-6	12.0	16.0	10.8	70.0		
	MHC 16-6	16.0	18.6	14.8	75.0		
	MHC 20-6	20.0	22.0	18.8	84.0		
7.0	MHC 16-7	16.0	18.6	14.8	75.0		
	MHC 20-7	20.0	22.0	18.8	84.0		

* Torx+ screw and key are now available for improved clamping.

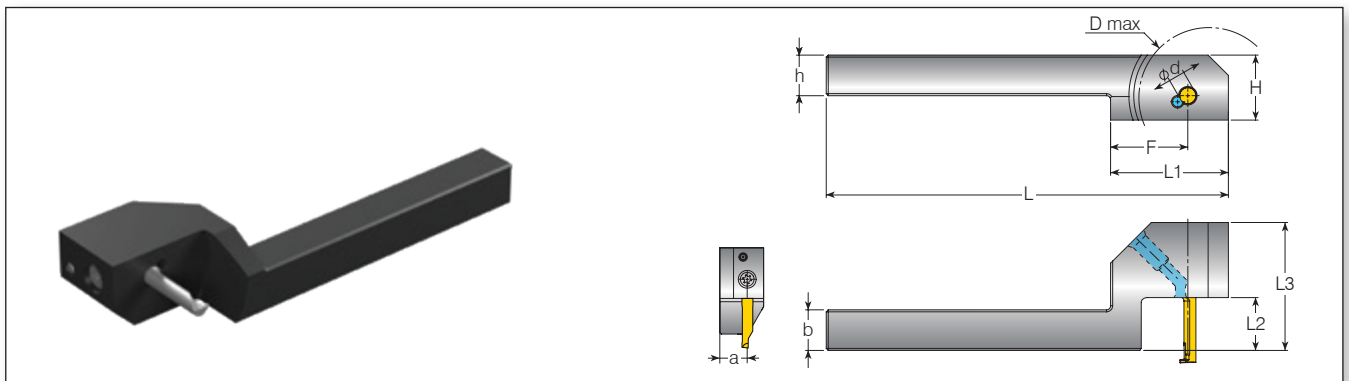
Holder with Square Shank



Micro Insert Dia.	Ordering Code	Dimensions mm				Spare Parts	
		H=H2=B	H1	L	L1	 Clamping Screw	 Key
d (mm)							
4.0	MHS 1010-4	10.0	19.0	100.0	25.0	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*
5.0	MHS 1010-5	10.0	19.5	100.0	25.0		
4.0	MHS 1212-4	12.0	21.0	100.0	25.0		
5.0	MHS 1212-5	12.0	21.5	100.0	27.0		
6.0	MHS 1212-6	12.0	22.0	100.0	27.0		

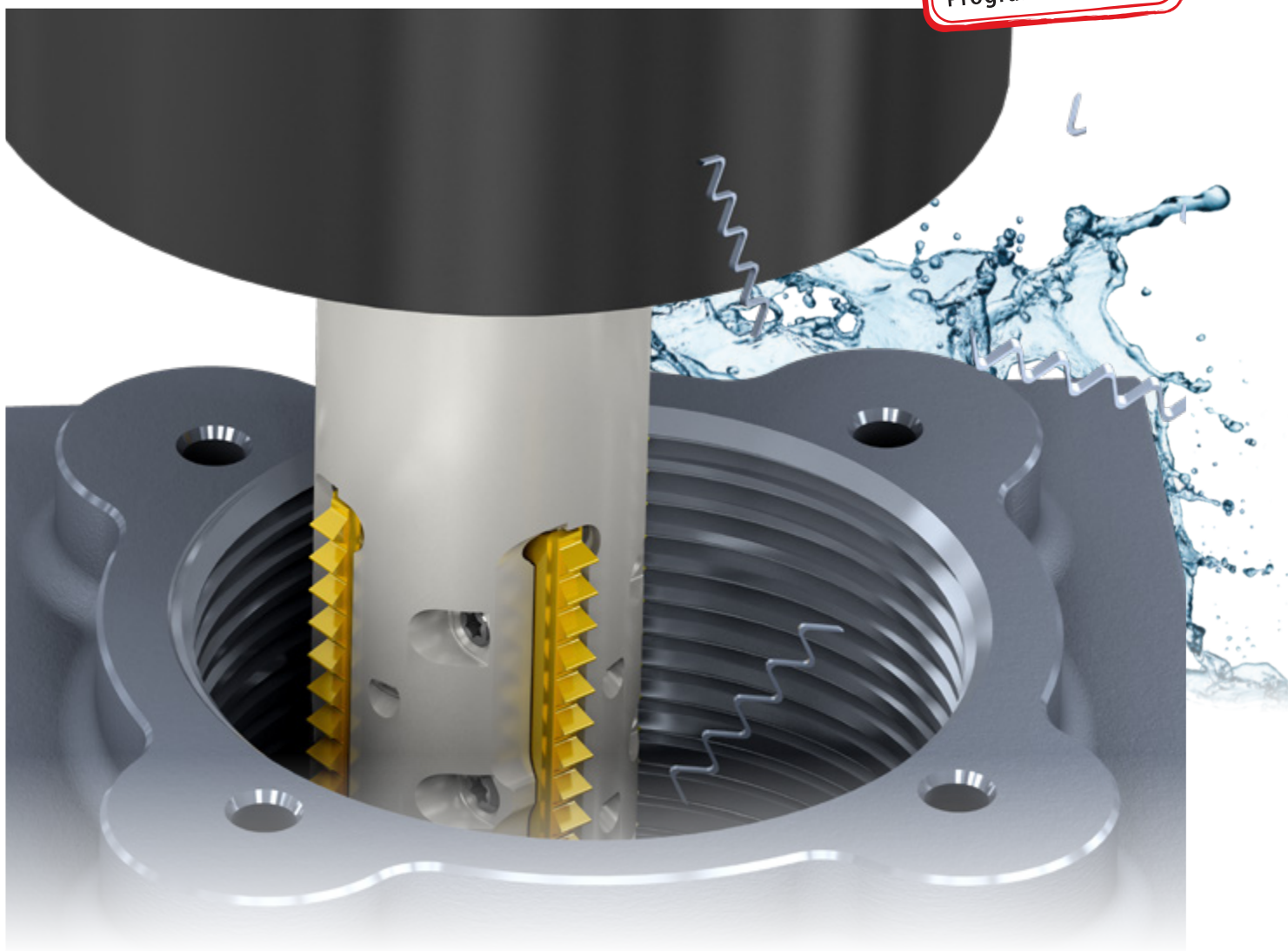
* Torx+ screw and key are now available for improved clamping.

Holder with Drop Head



										Spare Parts					
Micro Insert Dia.	Ordering Code	Dimensions mm													
d (mm)		a=b=h	L3	H	L	L1	F	D max	L2	Clamping Screw	Key				
4.0	MHD 1010-4 L0500	10.0	31.5	16.0	99.0	29.0	19.0	26.0	13.0	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*				
5.0	MHD 1010-5 L0800		48.0						23.0						
6.0	MHD 1010-6 L1000		53.0						28.0						
4.0	MHD 1212-4 L0700	12.0	36.5						18.0						
5.0	MHD 1212-5 L0800		48.0						23.0						
6.0	MHD 1212-6 L1000		53.0						28.0						

* Torx+ screw and key are now available for improved clamping.



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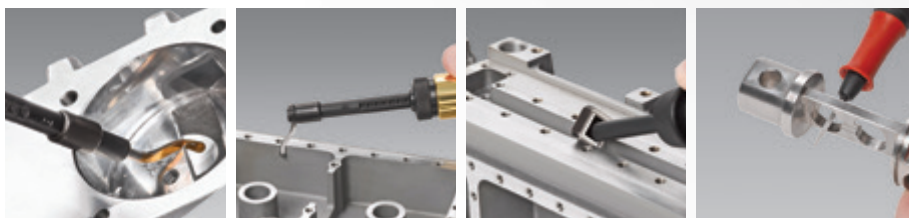
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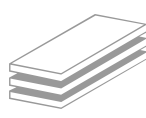
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Aluminum



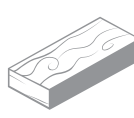
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 **DENMARK**
VARGUS Scandinavia
+45 8794 4100
vargus@vargus.dk

 **FRANCE**
VARGUS France
+33 1 4601 7060
commercial@vargus.fr

 **GERMANY**
VARGUS Germany
+49 7043 36 161
info@vargus.de

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 **POLAND**
VARGUS Poland
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vargus@neumo.pl

 **SPAIN**
VARGUS Ibérica
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 **SWITZERLAND**
VARGUS Switzerland
+41 41784 2121
info@vargus.ch

 **TURKEY**
VARGUS Turkey
+90 212 875 01 41
info@vargusturkey.com

 **UNITED KINGDOM**
VARGUS Tooling UK
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ASIA

 **CHINA**
VARGUS China
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info@varguschina.net

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VARGUS India
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