vargus
NEUMO Ehrenberg Group

GROOVEX
Innovative Grooving & Turning Solutions

MAIN CATALOG

External Machining | Internal Machining

METRIC

vargus
NEUMO Ehrenberg Group

Company Profile

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 smaller than 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.

IQNet
THE INTERNATIONAL CERTIFICATION NETWORK

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SI ISO 9001: 2015
THE STANDARDS INSTITUTION OF ISRAEL

GROOVEX
Innovative Grooving & Turning Solutions

Contents

EXTERNAL MACHINING

Semi Finishing

VG-Cut

Finishing

GrooVical

INTERNAL MACHINING

Semi Finishing

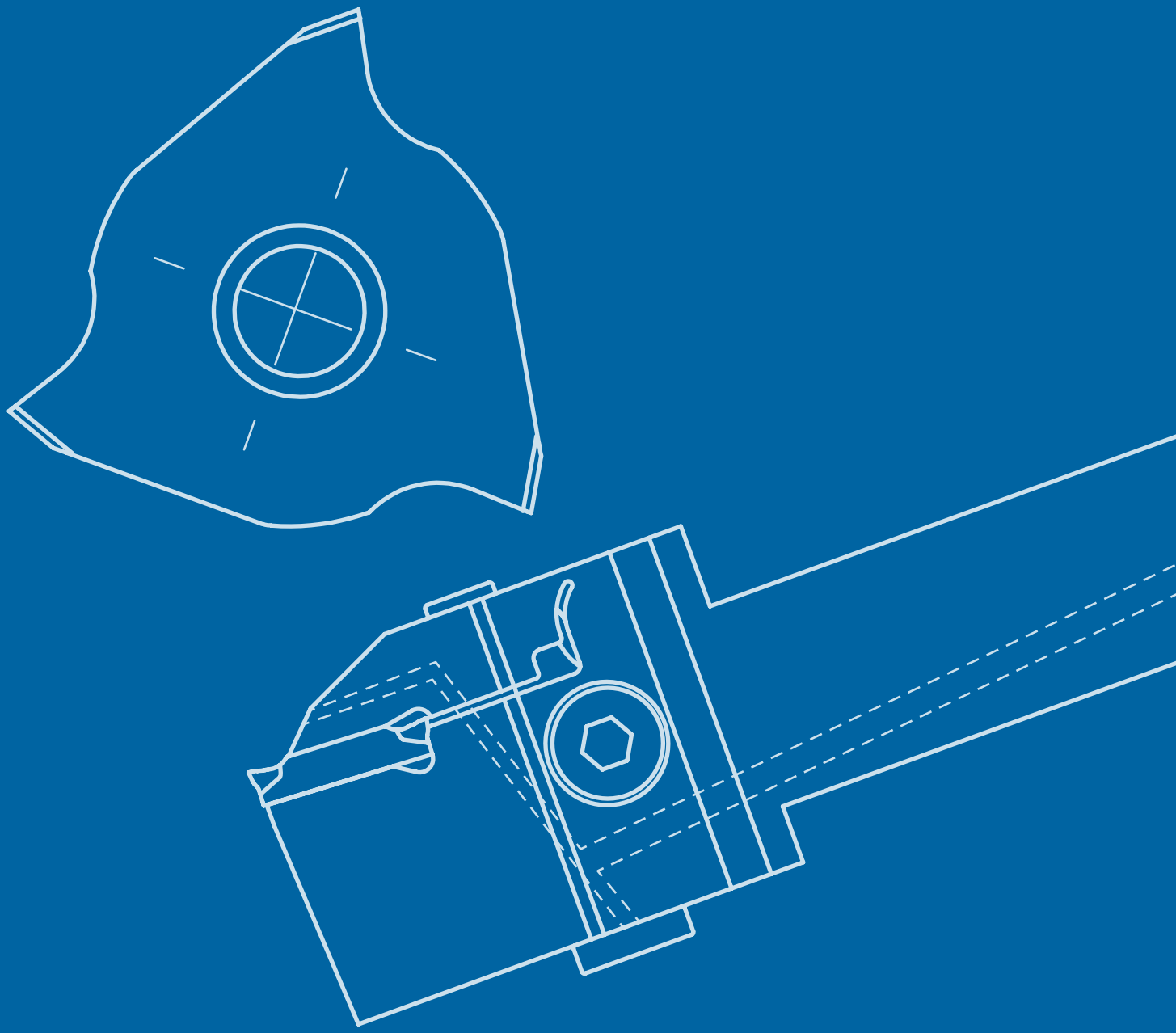
VG-Cut

Finishing

GrooVical

Mini-V

micrOscope



EXTERNAL MACHINING

EXTERNAL MACHINING | **SEMI FINISHING**

VG-Cut

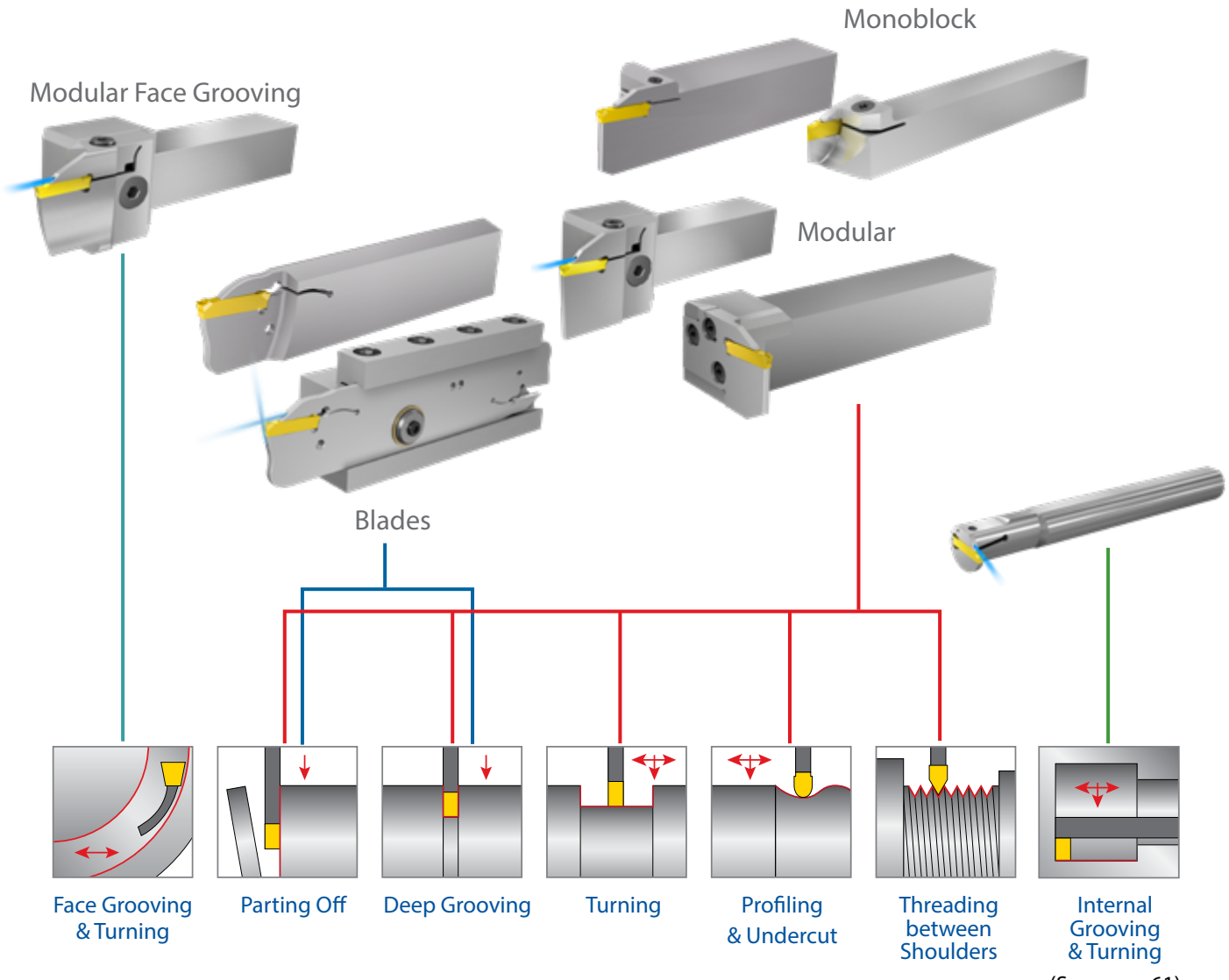
Deep Grooving, Threading, Turning, Parting Off & Face Grooving Applications

VG-Cut | Complete Range of Turning Solutions

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

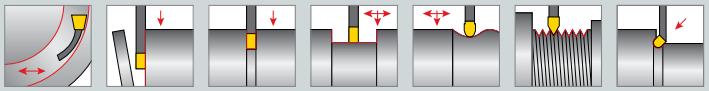
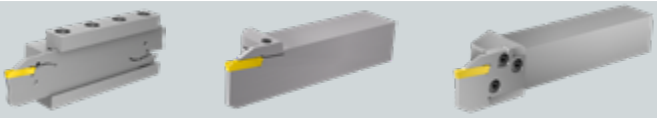
VG-Cut tools provide a wider range of applications and options within the same insert pocket of Deep Grooving, Parting Off, Turning, Profiling, Boring, Face Grooving and Threading. VG-Cut inserts also offer a variety of chip formers and carbide grades, making the **VG-Cut** program a distinctly versatile system. **VG-Cut** inserts are designed with a unique multifunctional and diverse geometry, to minimize inventory for the end-user.

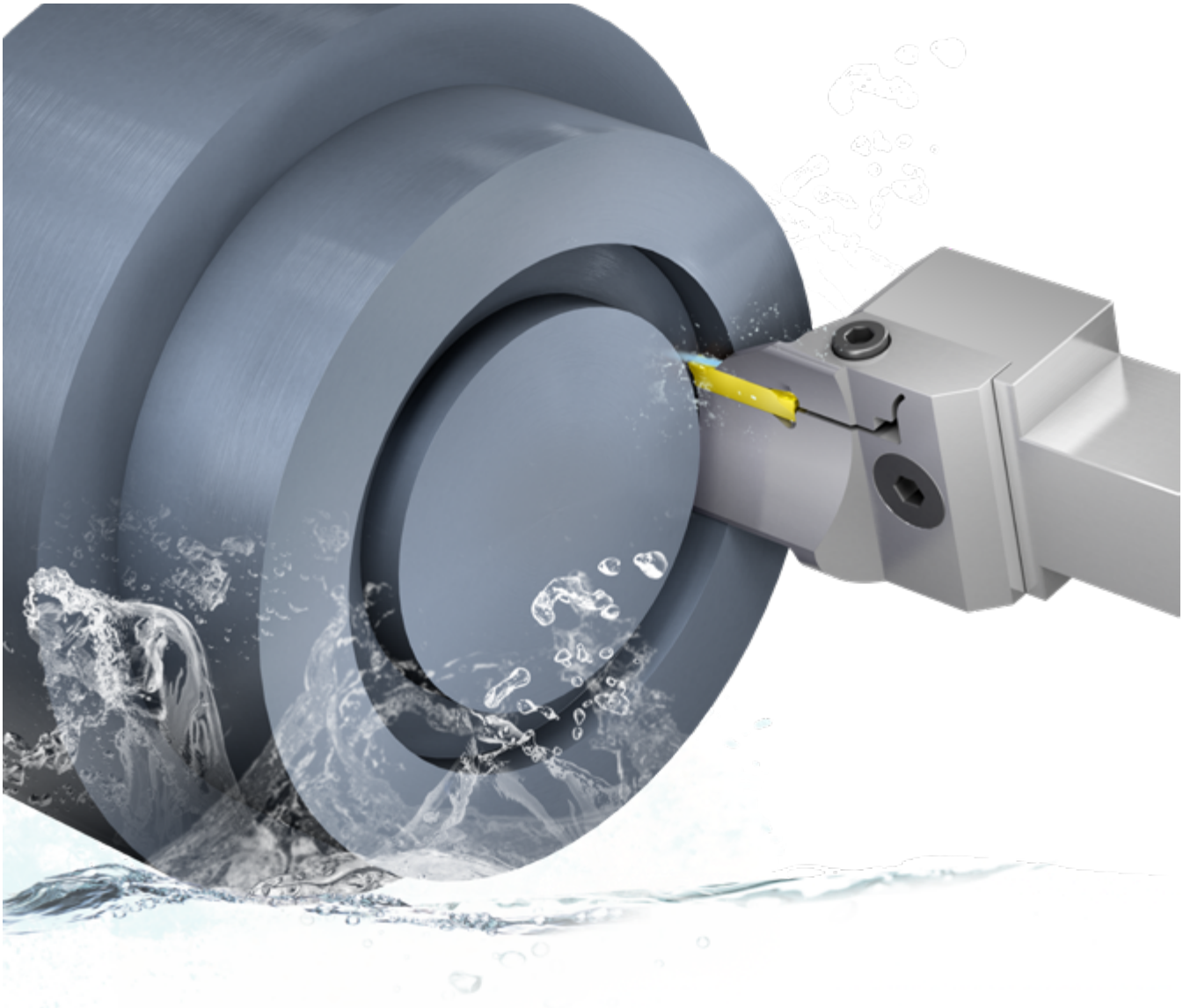
VG-Cut tools cover a wide range of Threading Standards for machining between shoulders and close to the spindle for up to shoulder depth of 10.0 mm.



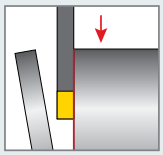
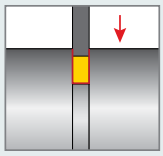
(See page 61)

Insert, Tool and Cutting Data Selection Guide

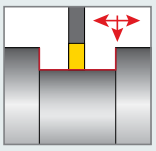
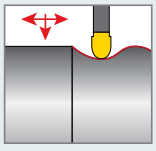
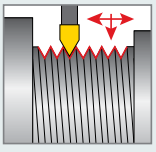
A	Identify the Application		
B	Identify the Designated Work Piece Material	**P** Alloy Steel **M** Stainless Steel **K** Cast Iron **N** Non-Ferrous **S** Heat Resistance **H** Hardened Material	
C	Designated Chip Former Geometry for Selected Applications		Page 10
D	Designated Carbide Grade for Desired Application	**VKG** **VPG** **VMG**	Page 11
E	Selecting Insert and Tool as Required by Operation		Pages 23 - 39
F	Cutting Data According to Selected Items		Pages 12-19



Designated Chip Former Geometry for Parting Off and Grooving

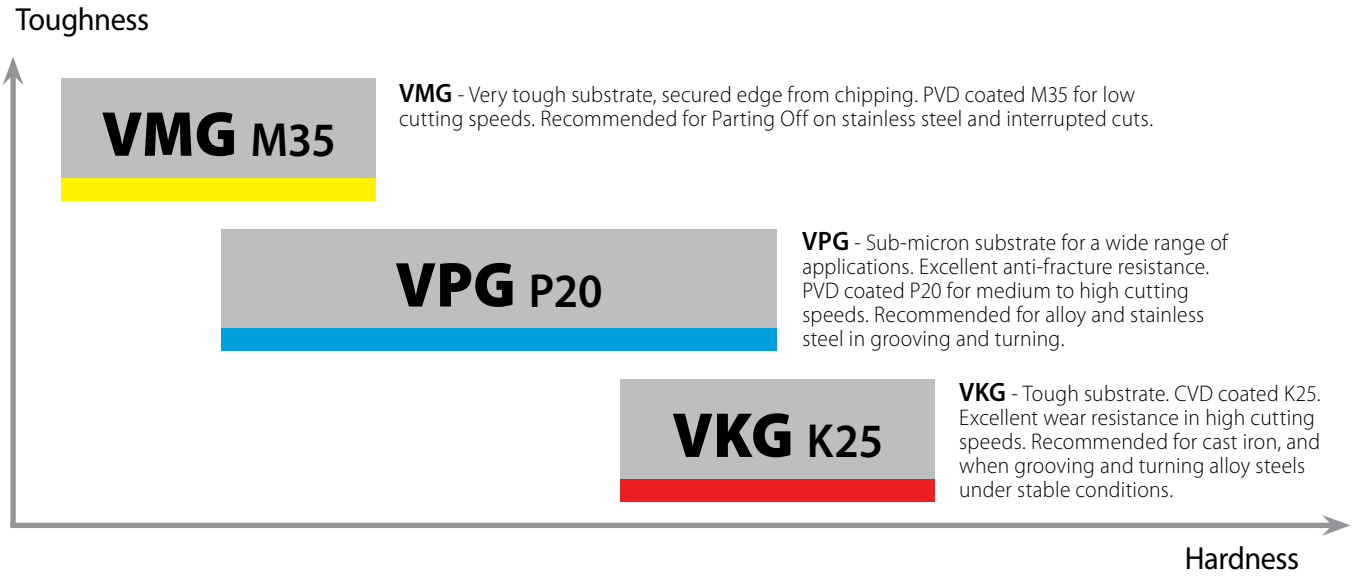
Application	Material Group	Standard Conditions	Extreme Conditions
 Parting Off	**P** Alloy Steel **H** Hardened Material **K** Cast Iron	 **GT** Recommended choice for machining alloy and stainless steel. Positive rake chip former leads to low cutting forces during cutting. A multifunctional chip former 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 **S** Heat Resistance **N** Non-Ferrous **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. **GM2** Ideal use for parting off and grooving in very 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

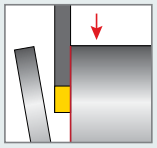
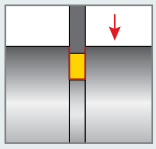
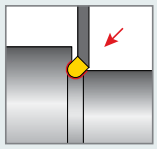
Application	Standard Conditions
 Turning	 **GT** Recommended choice for machining alloy and stainless steel. Positive rake chip former leads to low cutting forces during cutting, with multifunctional chip former for parting off, grooving and turning.
 Profiling	 **GR** Recommended choice for grooving, 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.

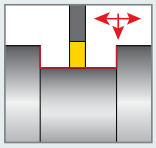
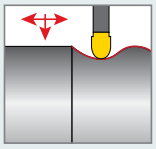
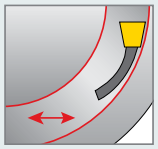
Designated Carbide Grade for Desired Application

Toughness vs. Hardness



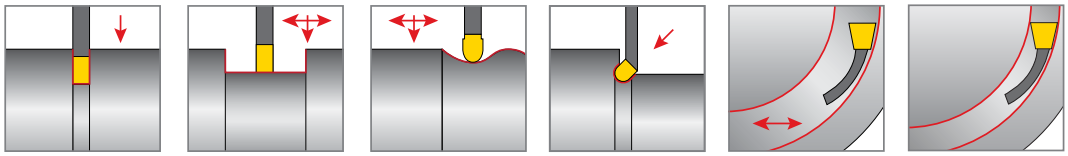
Recommended Carbide Grade for Designated Application

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

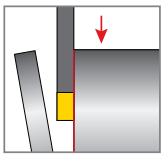
Technical Data

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		Hardened	350	40-70	50-100	60-160
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	50-100	90-150	90-250
	8		Hardened	325	40-70	50-100	60-160
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	50-100	90-150	90-250
	10		High Alloy (alloying elements >5%)	225	50-100	60-150	60-180
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 Parting Off

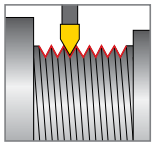


For Parting Off, improved chip forming and chip evacuation; **reduce speed by ≈ 30%.**

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%.**

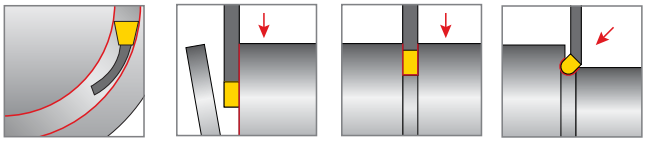
Technical Data

Recommended Cutting Speeds Vc [m/min] for Threading

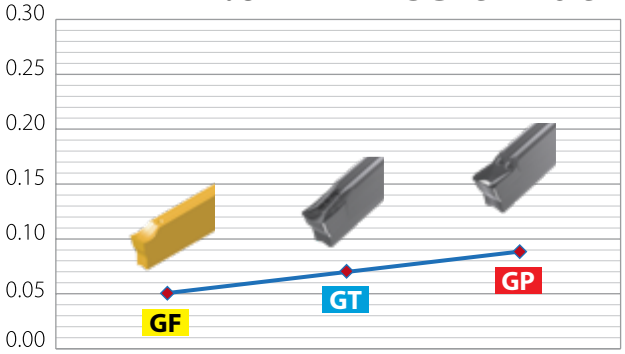


Material Group	Vargus No.	Material		Hardness Brinell HB	Carbide Grade VPG PVD P20
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	120-260
	2		Medium Carbon (C=0.25-0.55%)	150	90-220
	3		High Carbon (C=0.55-0.85%)	170	90-220
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	90-220
	5		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

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

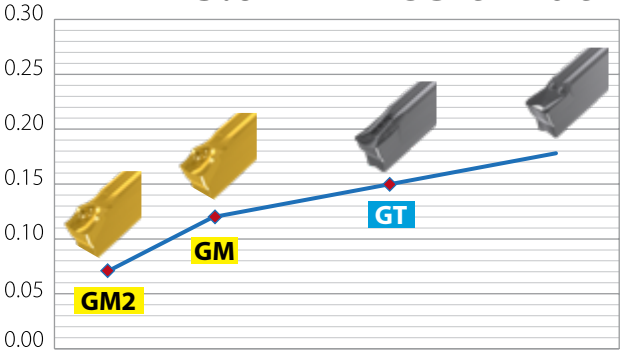


2.0 mm Insert Width



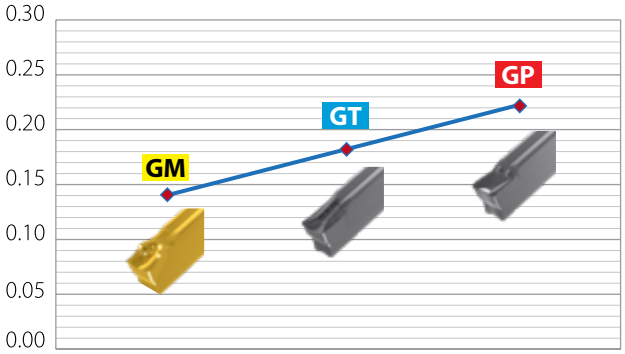
Chip Former	GF	GT	GP
f [mm/rev]	0.06	0.08	0.10

3.0 mm Insert Width



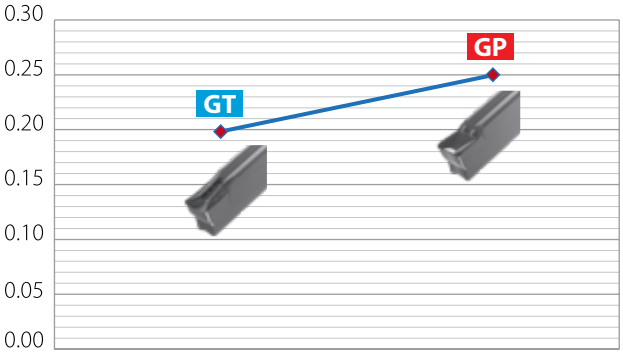
Chip Former	GM2	GM	GT	GP
f [mm/rev]	0.07	0.12	0.15	0.18

4.0 mm Insert Width



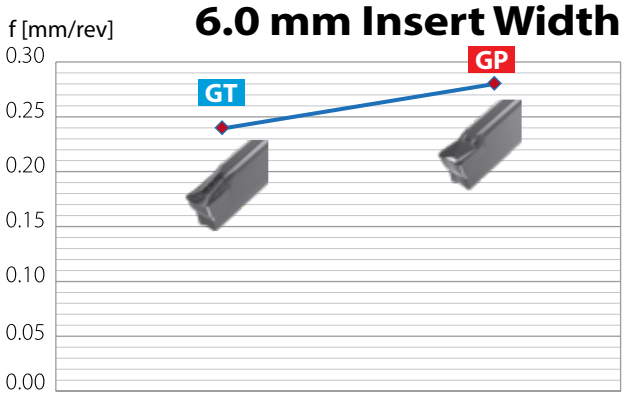
Chip Former	GM	GT	GP
f [mm/rev]	0.14	0.18	0.22

5.0 mm Insert Width



Chip Former	GT	GP
f [mm/rev]	0.20	0.25

6.0 mm Insert Width



Chip Former	GT	GP
f [mm/rev]	0.24	0.28

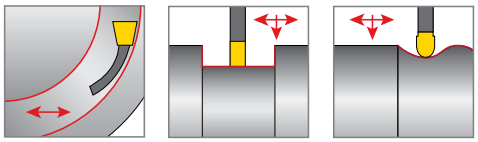
Correct chip forming is essential for chip evacuation. Low feed rates with sufficient chip evacuation improve process stability and tool life.
Feed rate should be increased only when improved evacuation is needed to prevent wall scratching or chip entanglement.

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

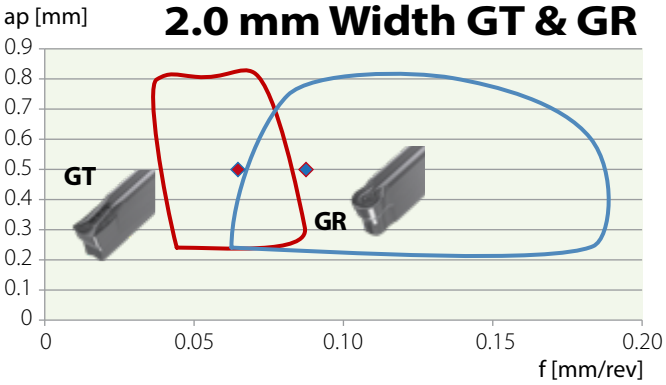
For Parting Off, it is recommended to reduce feed rate by 50% as the insert approaches rotation center. Reduce feed when the insert approaches approx. 3.0 mm diameter.

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



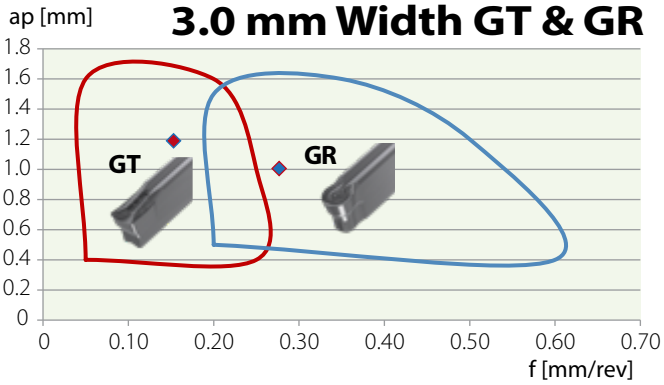
2.0 mm Width GT & GR



Recommended Starting Point:

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

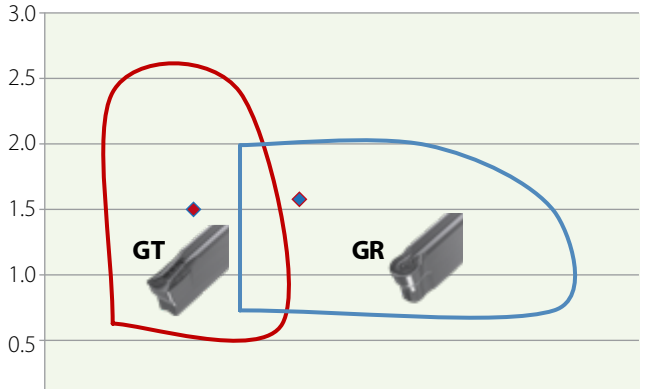
3.0 mm Width GT & GR



Recommended Starting Point:

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

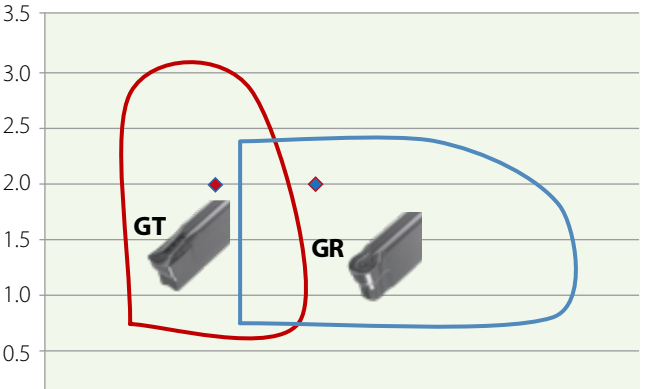
4.0 mm Width GT & GR



Recommended Starting Point:

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

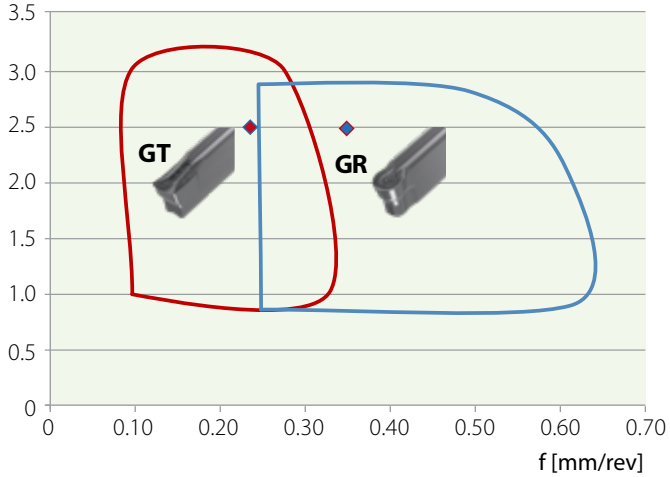
5.0 mm Width GT & GR



Recommended Starting Point:

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

6.0 mm Width GT & GR



Recommended Starting Point:

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

Radial Groove and Turn Machining Recommendations

Roughing:

Method 1:

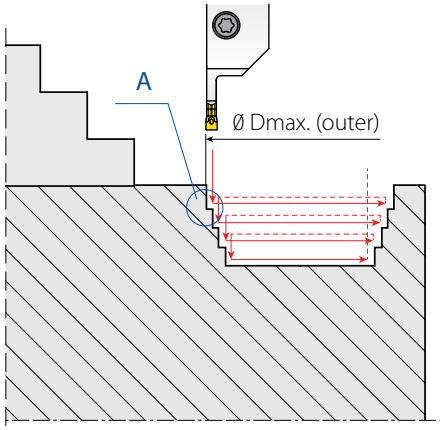


Figure A

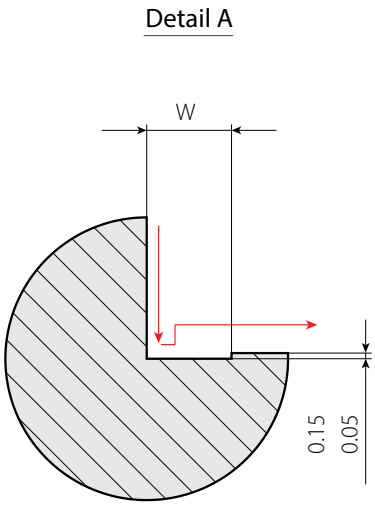


Figure B

1. Start by radial grooving close to spindle.
2. Radial retract back by 0.10 mm (see Figure B), followed by longitudinal turning from spindle.
3. Radial retract by 0.10 mm and return towards spindle.
4. Repeat the above cycle (1, 2 & 3), each time deeper into the workpiece, with a maximum grooving depth 0.2 - 0.45 of insert width.
5. Keep about 0.4 mm of additional material on workpiece, which will be removed in the finishing operation as recommended in the next page.

Method 2:

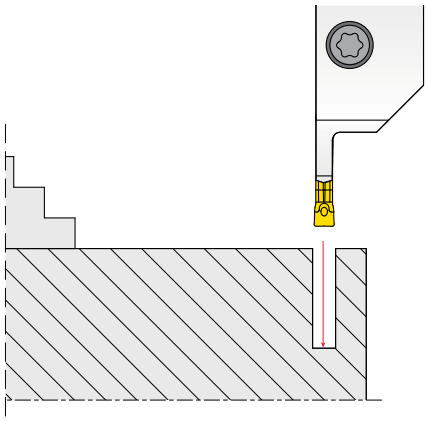


Figure A

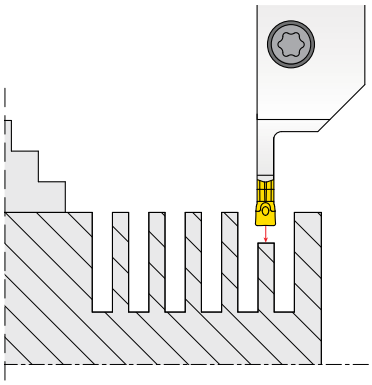


Figure B

1. Start by radial grooving far from spindle (Figure A), making sure that the material is always being machined at the center of the insert.
2. Continue to work towards spindle, leaving excess material between each groove. The excess material should not be wider than the insert's width minus 2 times the radius: W-Rx2=max. grooving width.
3. Radial groove the excess material (Figure B).

See the following page for Finishing Recommendations.

Radial Groove and Turn Machining Recommendations

Finishing:

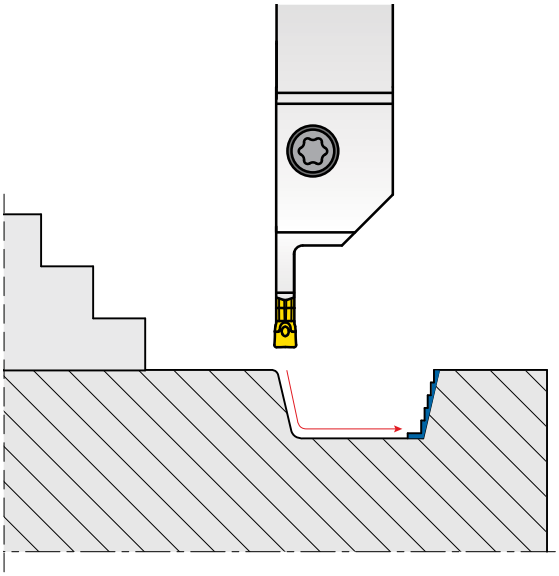


Figure A

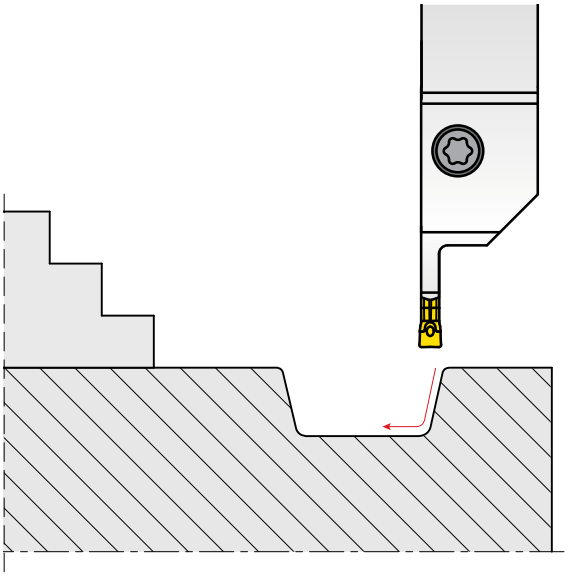


Figure B

1. Start the profiling operation close to spindle, and towards the workpiece's inner diameter. Generate the desired radius followed by longitudinal turning close to the tangential point of the second inner radius (Figure A).
2. Start the Profiling operation far from spindle, and towards the workpiece's inner diameter. Generate the desired radius as needed (Figure B).

Face Groove and Turn Machining Recommendations

Roughing:

Method 1:

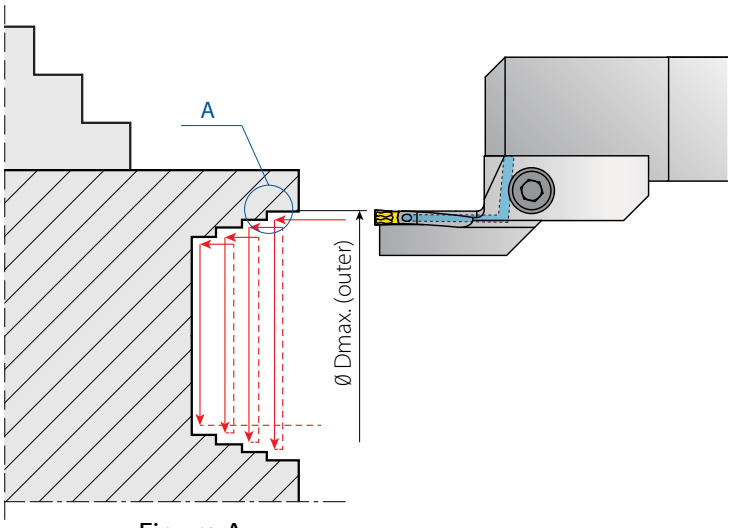


Figure A

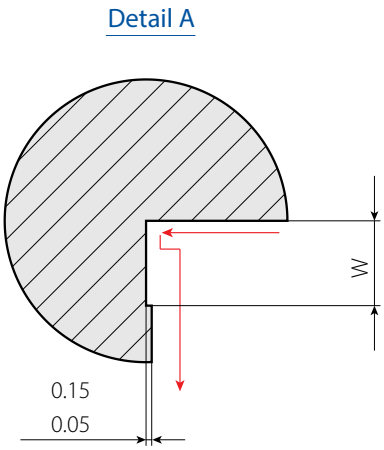


Figure B

1. Start by face grooving close to outer diameter.
2. Retract back by 0.10 mm (see Figure B), followed by face turning towards the center.
3. Axial retract away from the workpiece for about 0.1 mm.
4. Repeat the above cycle (1, 2 & 3), each time deeper into the workpiece, with a maximum grooving depth 0.2 - 0.45 insert width.
5. Keep about 0.4 mm of additional material on workpiece, which will be removed in the finishing operation as recommended below.

Method 2:

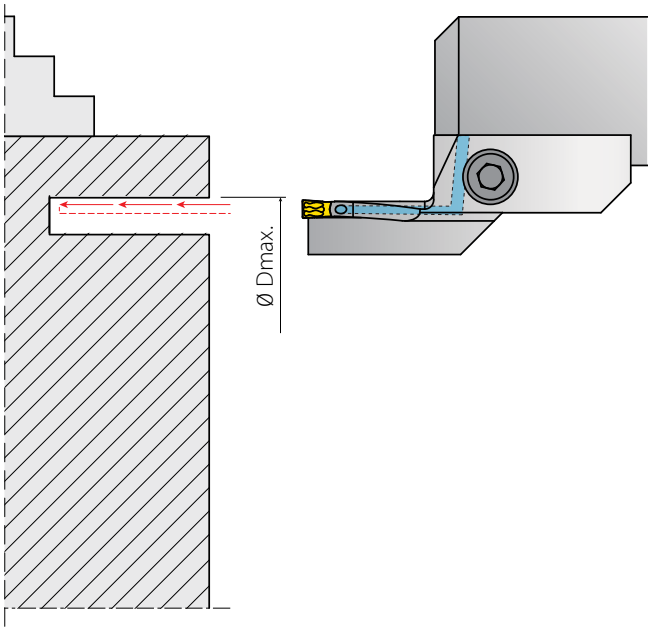


Figure A

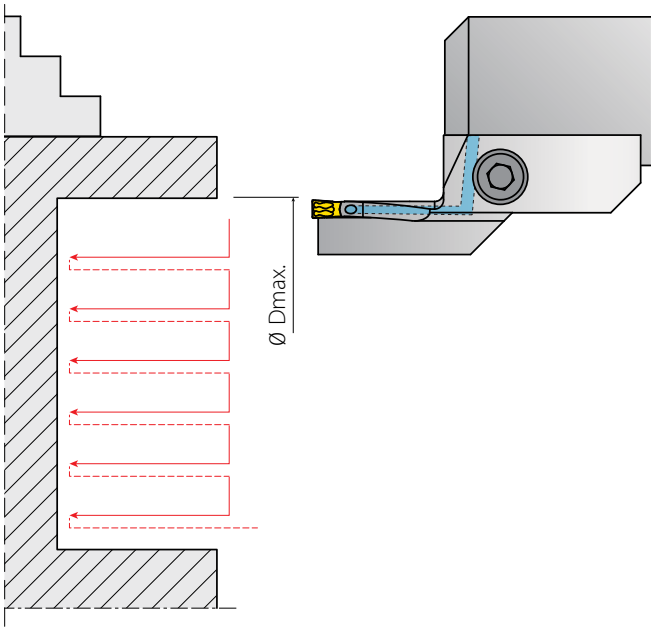
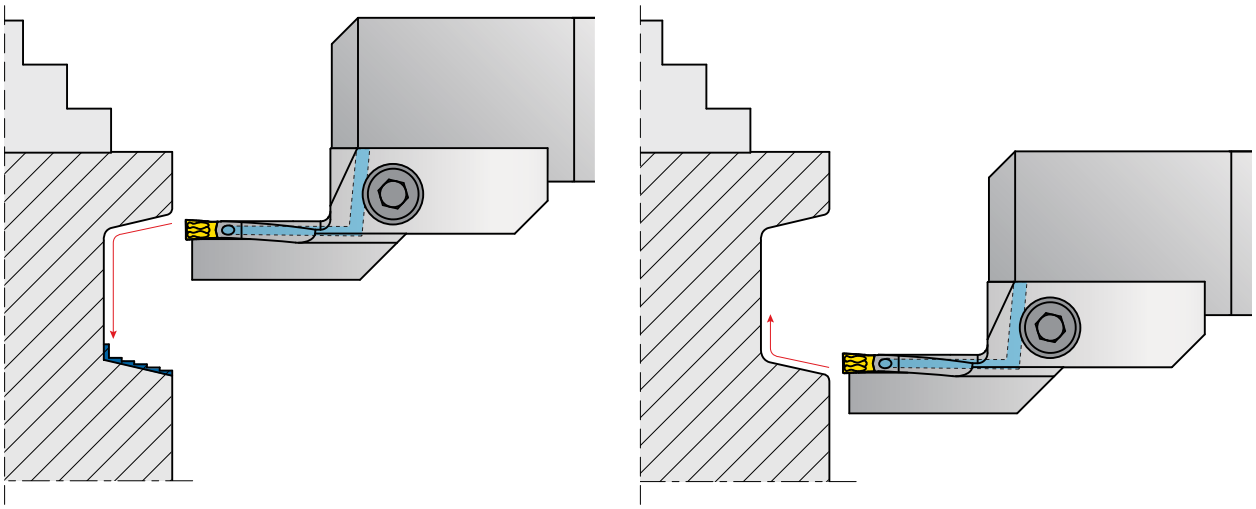


Figure B

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.

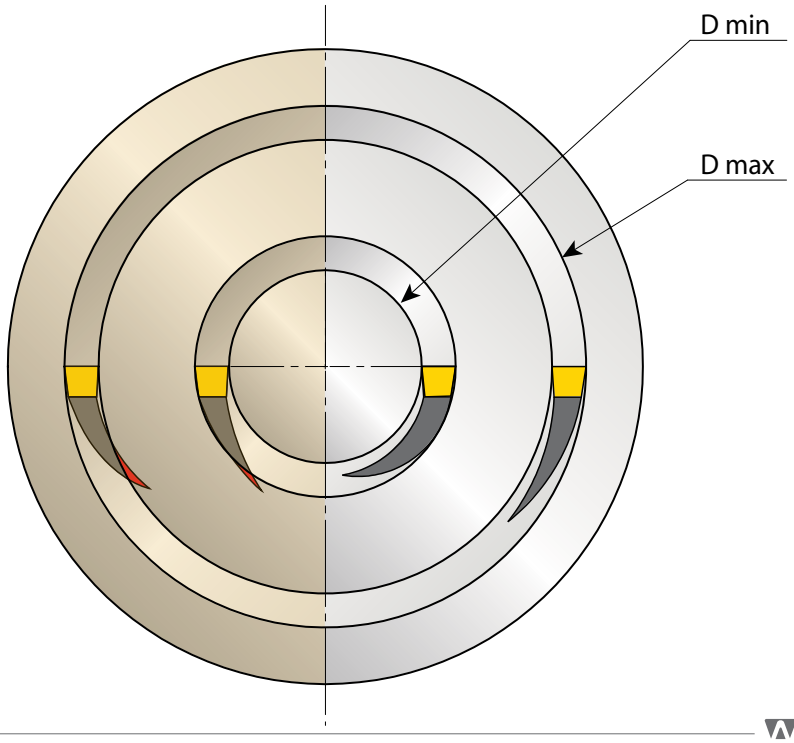
Selecting the Correct Face Grooving Module

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

D max

D min

Wrong Support **Correct Support**



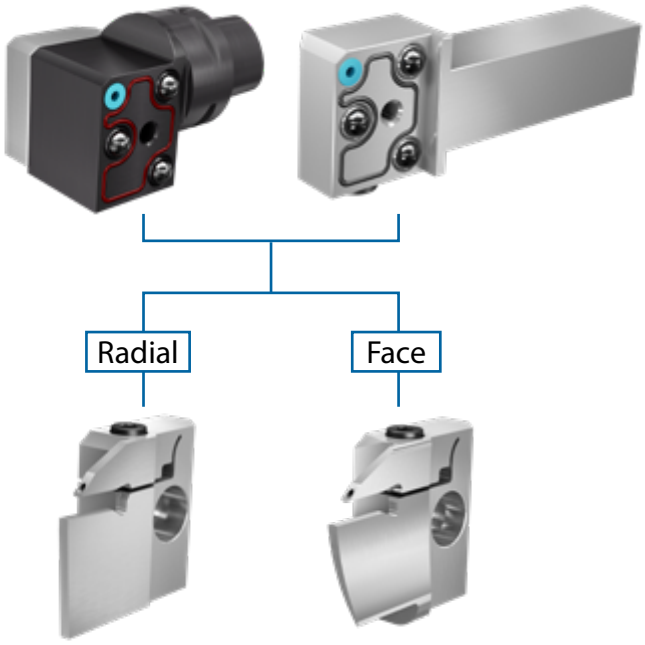
User Guide for Modular System

Choosing the Correct Holder for the Application (Body + Module):

*** High pressure coolant system shown.**

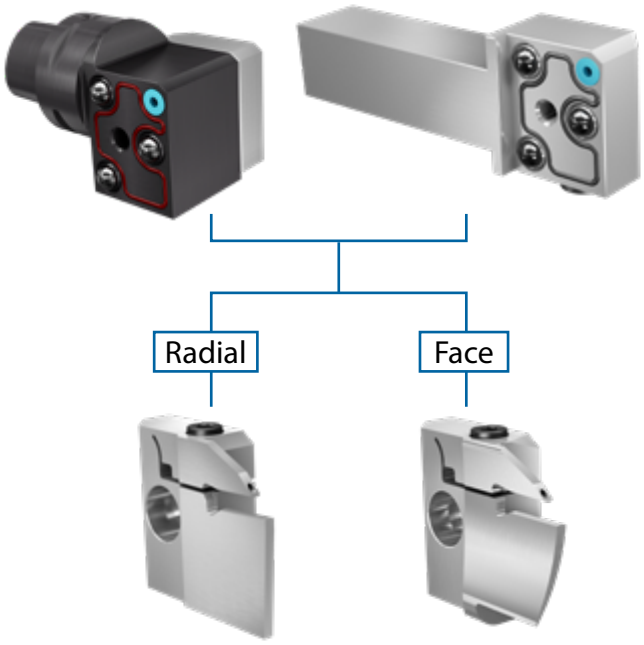
Parallel Right Tools

Right Body



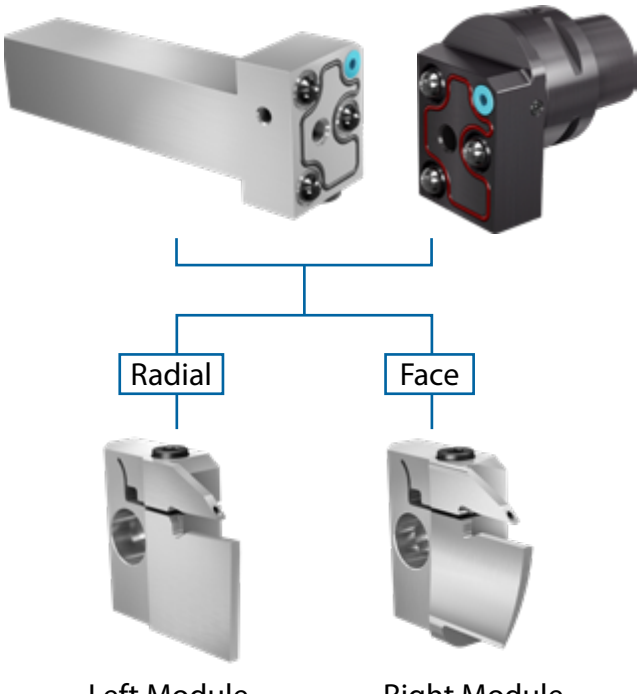
Parallel Left Tools

Left Body



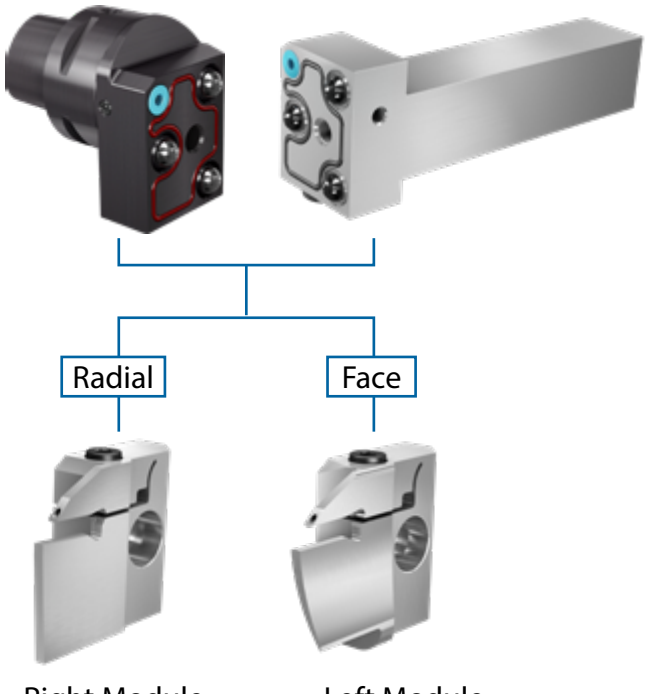
90° Right Tools

Right Body



90° Left Tools

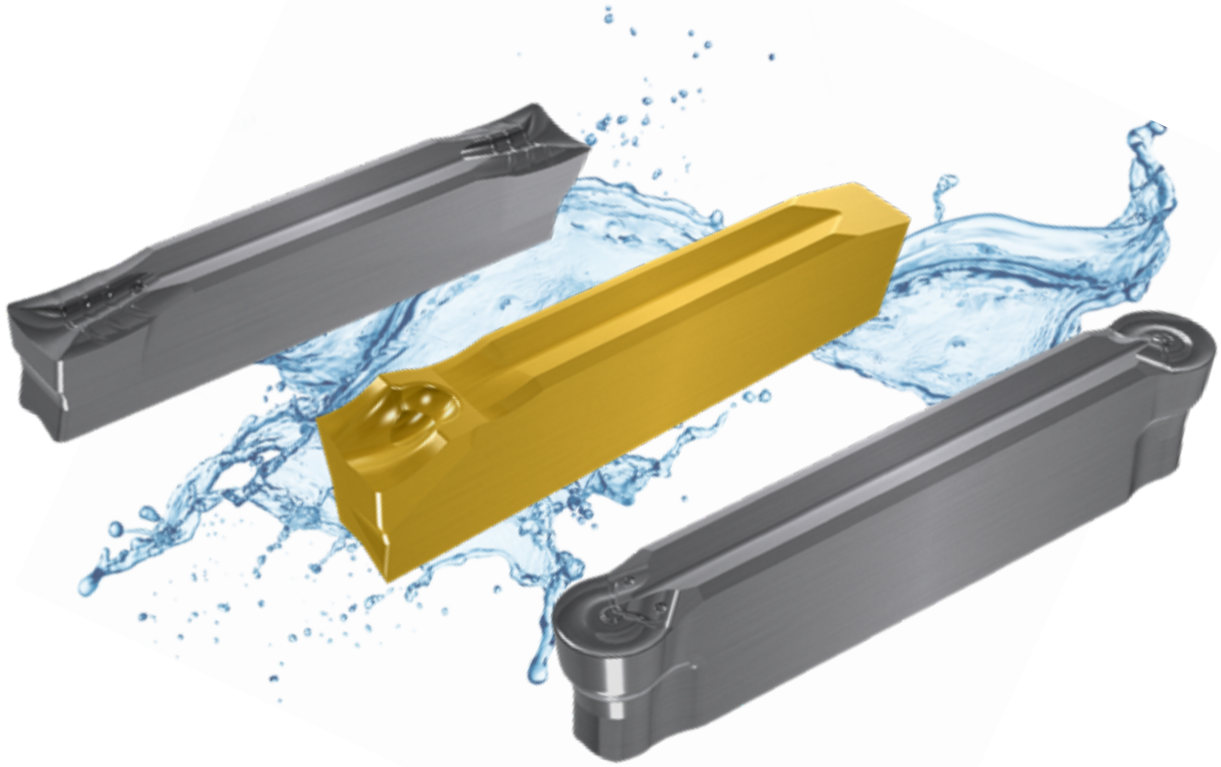
Left Body



High Pressure Coolant Accessories and Spare Parts

Image	Ordering Code	Item Number	Relevant Tools
	Tube Connector 25-6P	013-00941	VG-Cut Blade Holders See page 33 VG-Cut / GrooVical Modular Bodies See page 38 VG-Cut / GrooVical V-Cap Bodies See page 39
	Angled Fitting G1_8x6P	013-00947	
	Straight Fitting G1_8x6P	013-00942	
	Plug G1/8"P	013-00948	VG-Cut Blade Holders See page 33
	Plug DIN 916 GALV M6x8P	013-00940	
	Coolant Sleeve	013-00946	VG-Cut / GrooVical Modular Bodies See page 38 VG-Cut / GrooVical V-Cap Bodies See page 39
	O-RING Body Seal	013-00944	

VG-Cut Inserts



VG-Cut Inserts Ordering Code

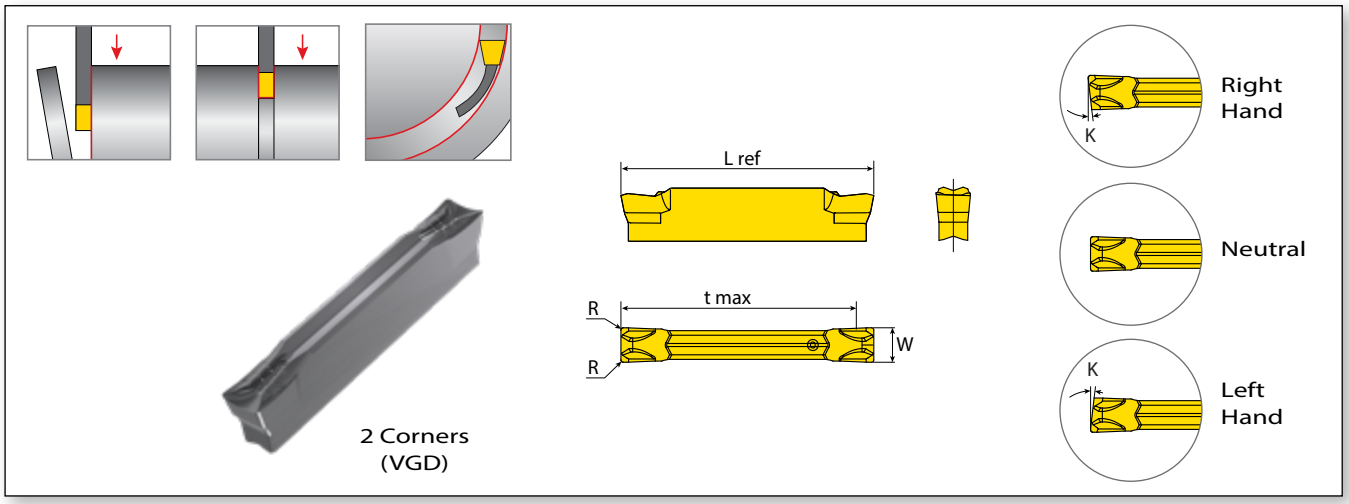
VG	D	3.00	020	6R	GP	VPG
1	2	3	4	5	6	7

1 – Line Name	2 – Number of Cutting Corners	3 – Insert Width	4 – Corner Radius
VG - Deep Grooving & Parting Off	D - Double S - Single	2.0, 3.0, 4.0, 5.0, 6.0 mm	0.20 mm Threading Standard

5 – RH or LH (for Grooving)	5 – RH or LH (for Threading)	6 – Top Rake Geometry	7– Carbide Grade
4, 6, 15 Deg. RH or LH None - Neutral	RH Helix LH Helix	GP, GM, GM2, GT, GR RS - Close to right shoulder LS - Close to left shoulder	VPG, VMG, VKG

Parting Off & Deep Grooving - Double Sided Inserts

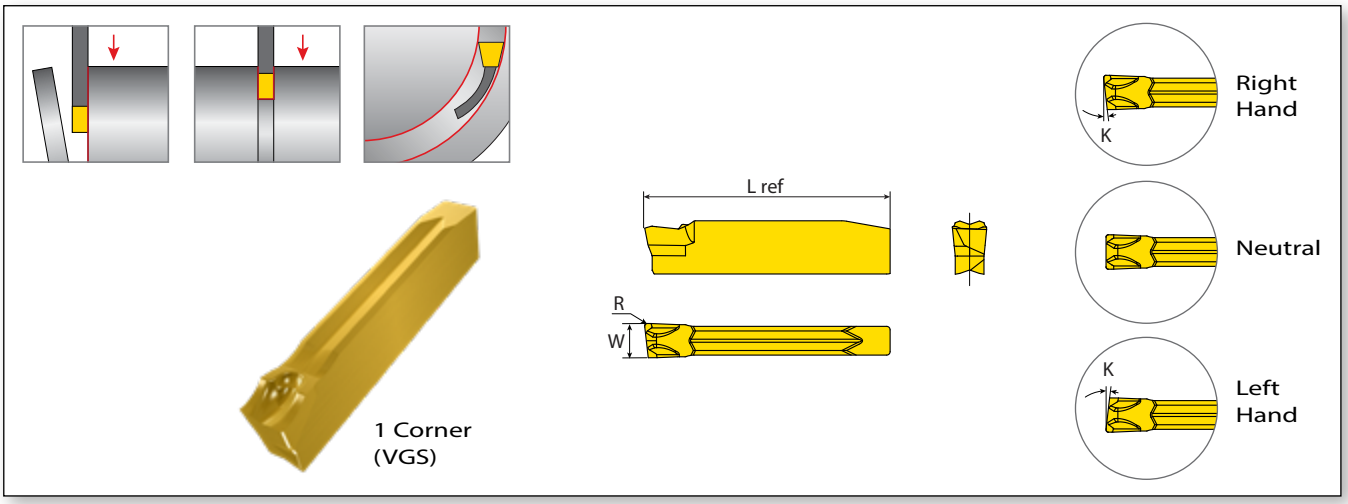
2.0 - 6.0 mm Width



		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	VGD3.00-030-GM2	3.00	0.30	20.0	0.0	22.0	0.04 - 0.12	○	●	○
		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	●	○	●
		4	VGD4.00-080-GT	4.00	0.80	23.0	0.0	25.0	0.05 - 0.22	●	○	○
		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	0.0	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	●	●	●
		2	VGD2.00-020-15R-GP	2.00	0.20	20.0	15.0	22.0	0.03 - 0.10	○	●	○
		2	VGD2.00-020-15L-GP	2.00	0.20	20.0	15.0	22.0	0.03 - 0.10	○	●	○
		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

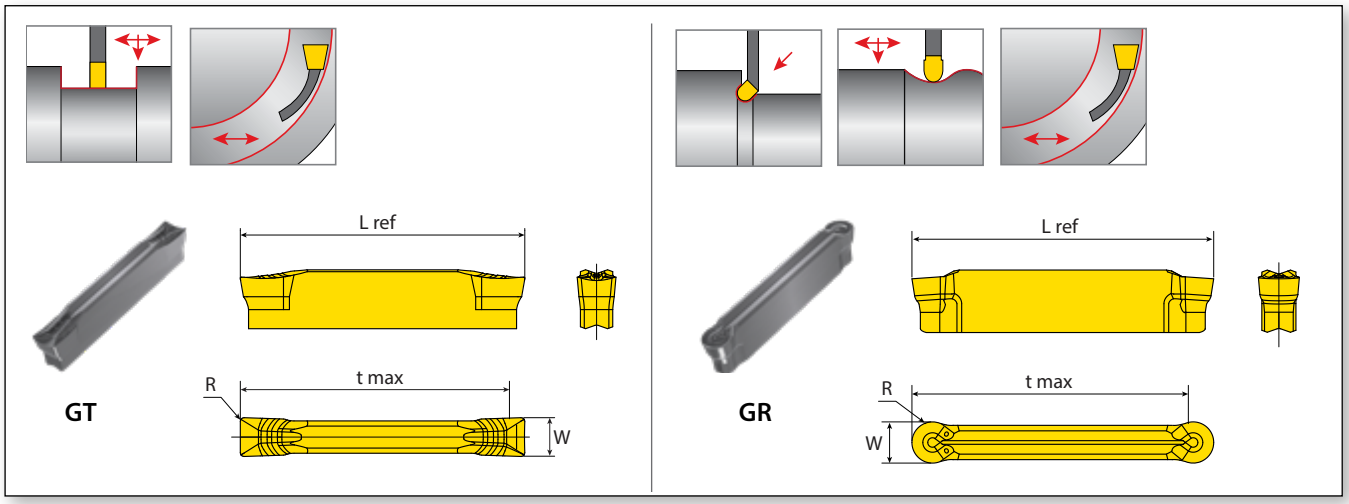
Parting Off & Deep Grooving - Single Sided Inserts
2.0 - 4.0 mm Width



		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

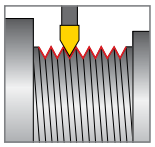
Turning & Profiling
2.0 - 6.0 mm Width



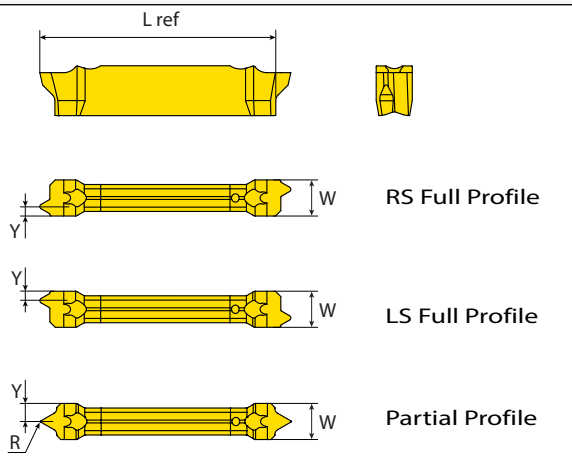
		Pocket Size	Ordering Code	Dimensions mm					Feed Range (mm/rev)	Grade		
				W ±0.05	R	t max	K°	L ref		VPG	VMG	VKG
Positive rake chip former with multifunctional chip control. Low cutting forces during cutting.	GT	2	VGD2.00-020-GT	2.00	0.20	20.0	-	22.0	0.05 - 0.10	●	○	●
		3	VGD3.00-030-GT	3.00	0.30	20.0	-	22.0	0.05 - 0.25	●	○	●
		4	VGD4.00-020-GT	4.00	0.20	23.0	-	25.0	0.05 - 0.18	●	○	○
		4	VGD4.00-040-GT	4.00	0.40	23.0	-	25.0	0.08 - 0.28	●	○	●
		4	VGD4.00-080-GT	4.00	080	23.0	-	25.0	0.05 - 0.22	●	○	○
		5	VGD5.00-040-GT	5.00	0.40	23.0	-	25.0	0.08 - 0.25	●	○	●
		6	VGD6.00-040-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	VGD2.00-100-GR	2.00	1.00	18.0	-	22.0	0.06 - 0.12	●	○	●
		3	VGD3.00-150-GR	3.00	1.50	18.0	-	22.0	0.06 - 0.18	●	○	●
		4	VGD4.00-200-GR	4.00	2.00	20.0	-	25.0	0.06 - 0.20	●	○	●
		6	VGD6.00-300-GR	6.00	3.00	20.0	-	25.0	0.06 - 0.20	●	○	○

● In stock ○ Available upon request

Threading
3.0 mm Width

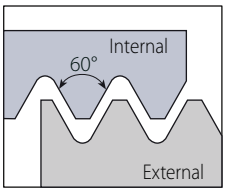


RS/LS Varied range of threading standards for machining between shoulders and close to spindle.



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

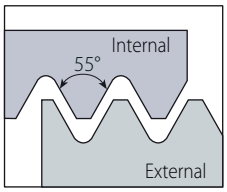
Partial Profile 60°



Pocket Size	Ordering Code	Dimensions mm					No. of Passes	Helix	Grade	Min. Thread Diameter
		W ref	Pitch mm	R	Y	L ref		Deg	VPG	
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

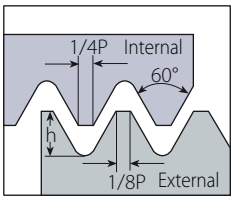
Partial Profile 55°



Pocket Size	Ordering Code	Dimensions mm					No. of Passes	Helix	Grade	Min. Thread Diameter
		W ref	Pitch TPI	R	Y	L ref		Deg	VPG	
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

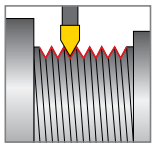


Defined by: R262 (DIN 13)
Tolerance class: 6g

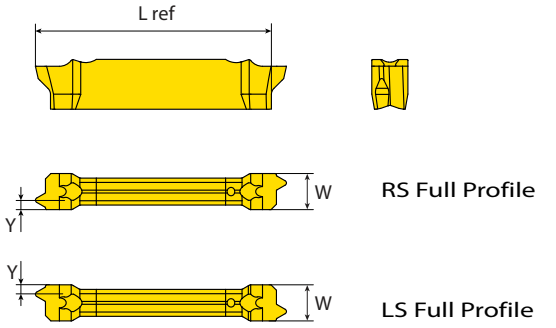
Pocket Size	Ordering Code	Dimensions mm					No. of Passes	Helix	Grade	Min. Thread Diameter
		W ref	Pitch mm	h min	Y	L ref		Deg	VPG	
3	VGD3.0ISO0.50RH-RS/LS	3.00	0.50	0.31	0.53	21.9	5 - 7	2.5°	•	M3x0.5
3	VGD3.0ISO0.75RH-RS/LS		0.75	0.46	0.64		5 - 8		•	M5x0.75
3	VGD3.0ISO1.00RH-RS/LS		1.00	0.61	0.74		5 - 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

• In stock ∘ Available upon request

Threading
3.0 mm Width (con't)

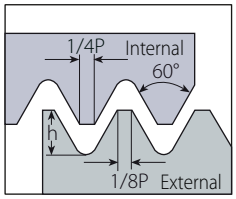


RS/LS Varied range of threading standards for machining between shoulders and close to spindle.



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

American UN

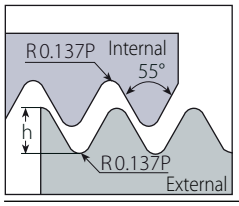


Defined by: ANSI B1.1:74
Tolerance class: 2A

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"-32UNC
3	VGD3.0UN28RH-RS/LS		28	0.56	0.71		5 - 9		•	3/16"-28UNC
3	VGD3.0UN24RH-RS/LS		24	0.65	0.77		5 - 9		•	7/32"-24UNC
3	VGD3.0UN20RH-RS/LS		20	0.78	0.86		6 - 10		•	1/4"-20UNC
3	VGD3.0UN18RH-RS/LS		18	0.87	0.93		7 - 12		•	5/16"-18UNC
3	VGD3.0UN16RH-RS/LS		16	0.97	1.10		7 - 12		•	3/8"-16UNC
3	VGD3.0UN14RH-RS		14	1.11	1.09		8 - 14		•	7/16"-14UNC
3	VGD3.0UN14RH-LS		14	1.11	1.09		8 - 14		•	7/16"-14UNC
3	VGD3.0UN12RH-RS		12	1.30	1.30		8 - 14		•	9/16"-14UNC
3	VGD3.0UN12RH-LS		12	1.30	1.30		8 - 14		•	9/16"-14UNC

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

Whitworth

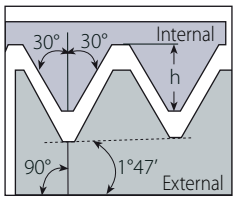


Defined by: B.S.84:1956, DIN 259, ISO228/1:1982
Tolerance class: Medium class A

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

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

Face Grooving Modules

VG	F	R	4860	T24	4	C
1	2	9	12	5	4	11

Blade Holders / Modular Bodies

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

V-CAP Bodies

VB	C	R	C5	-	90	-	C
1	2	9	3		7		11

1 – Tools/Holders
VG - Holders, Blades, Modules
VB - Blade Holders, Modular Bodies

2 – Type
A - Radial module
C - V-CAP body
E - External tool
F - Face module
M - Square body
P - Universal blade
W - Reinforced blade

3 – For External Holders
Shank Size

3 – For V-CAP Holders
Polygon Size (C4, C5, C6)

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

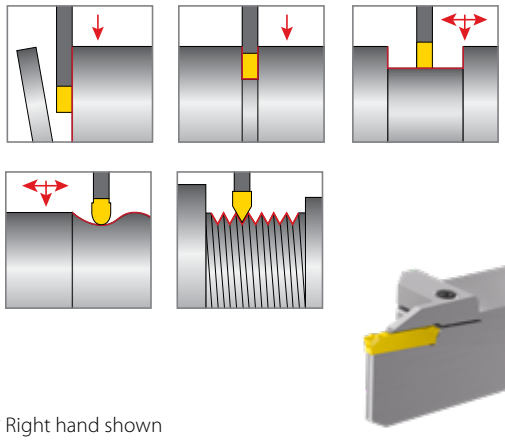
9 – RH or LH
R - RH
L - LH
None - Neutral

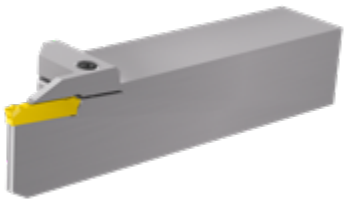
10 – PH
PH - Reinforced blade structure

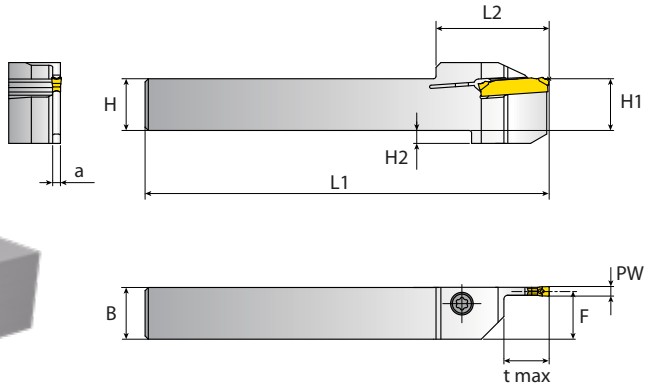
11 – Coolant
C - Coolant

12 – Dmin - Dmax
Dmin - Dmax (For Face Grooving)

External Monoblock Tools
Grooving, Parting Off, Turning & Threading







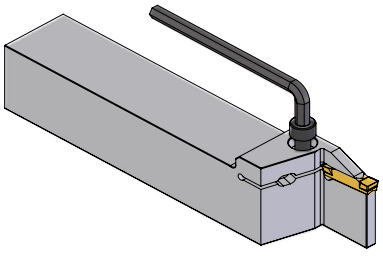
* Right hand shown

Ordering Code			Dimensions mm							Spare Parts		
RH/LH	PW	t max	HXB	H1	F	L1	L2	a	H2	Cylindrical Screw*	Key	Key
VGER/L1616-2T12	2	12	16x16	16	15.3	125	35	1.75	4.0	SM4x16-T20	K4TF	-
VGER/L2020-2T12			20x20	20	19.3	125	35	1.75	__	SM4x18-T20		
VGER/L2525-2T08		8	25x25	25	24.3	125	35	1.75	__	SM4x18-T20		
VGER1212-3T08	3	8	12x12	12	10.8	125	35	2.5	4.0	SM3.5x14-T15	-	KT-15
VGER/L1212-3T12		12	12x12	12	10.8	125	35	2.5	4.0			
VGER/L1616-3T12		12	16x16	16	14.8	125	35	2.5	4.0	SM4x16-T20		K6T
VGER/L1616-3T21		21	16x16	16	14.8	125	35	2.5	4.0	SM4x18-T20		
VGER/L2020-3T08		8	20x20	20	18.8	125	35	2.5	__			
VGER/L2020-3T12		12	20x20	20	18.8	125	35	2.5	__			
VGER/L2020-3T21		21	20x20	20	18.8	125	35	2.5	__			
VGER/L2525-3T08		8	25x25	25	23.8	125	35	2.5	__			
VGER/L2525-3T12		12	25x25	25	23.8	125	35	2.5	__			
VGER/L2525-3T21		21	25x25	25	23.8	125	35	2.5	__			
VGER/L1616-4T21	4	21	16x16	16	14.5	125	35	3.4	4.0			K6T
VGER/L2020-4T21		21	20x20	20	18.5	125	35	3.4	__			
VGER/L2525-4T08		8	25x25	25	23.52	125	35	3.4	__			
VGER/L2525-4T12		12	25x25	25	23.5	125	35	3.4	__			
VGER/L2525-4T21		21	25x25	25	23.5	125	35	3.4	__			
VGER/L3232-4T21		21	32x32	32	32.52	125	35	3.4	__			
VGER/L2525-5T22**	5	22	25x25	25	23.0	150	43	4.0	__	SM6x20		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	__			K5H
VGER/L3232-6T24**			32x32	32	29.5	170	45	5.0	__			

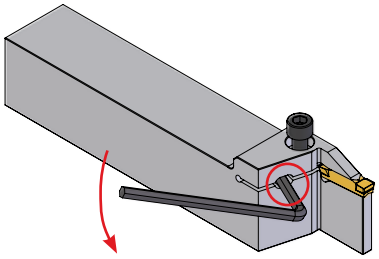
* Tightening Torque: T15 screws - 5 Nm max , T20 screws - 7 Nm max, SM6x20 screw - 10 Nm max.

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

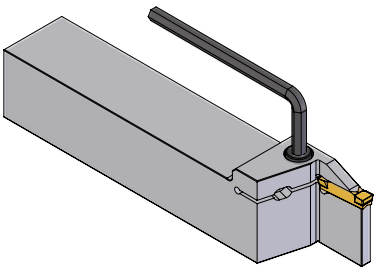
1 Unlock the top screw using the key provided.



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.

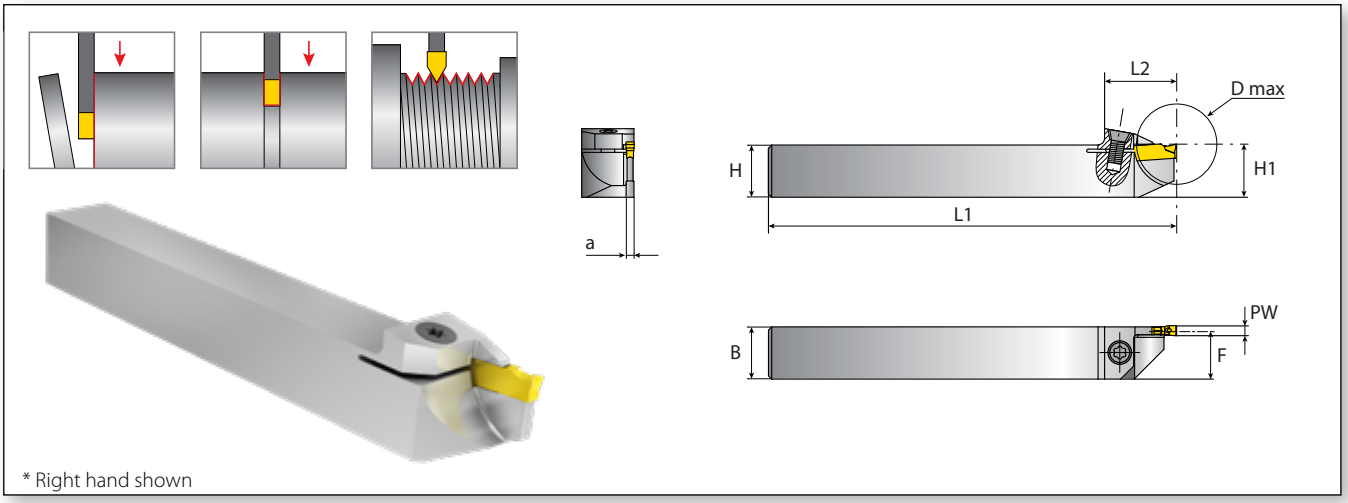


3 Now remove the key from the pocket and secure the insert by firmly locking the top screw.



Tools should not be clamped without an insert inside the pocket.

Reinforced Monoblock Tools
Grooving, Parting Off & Threading



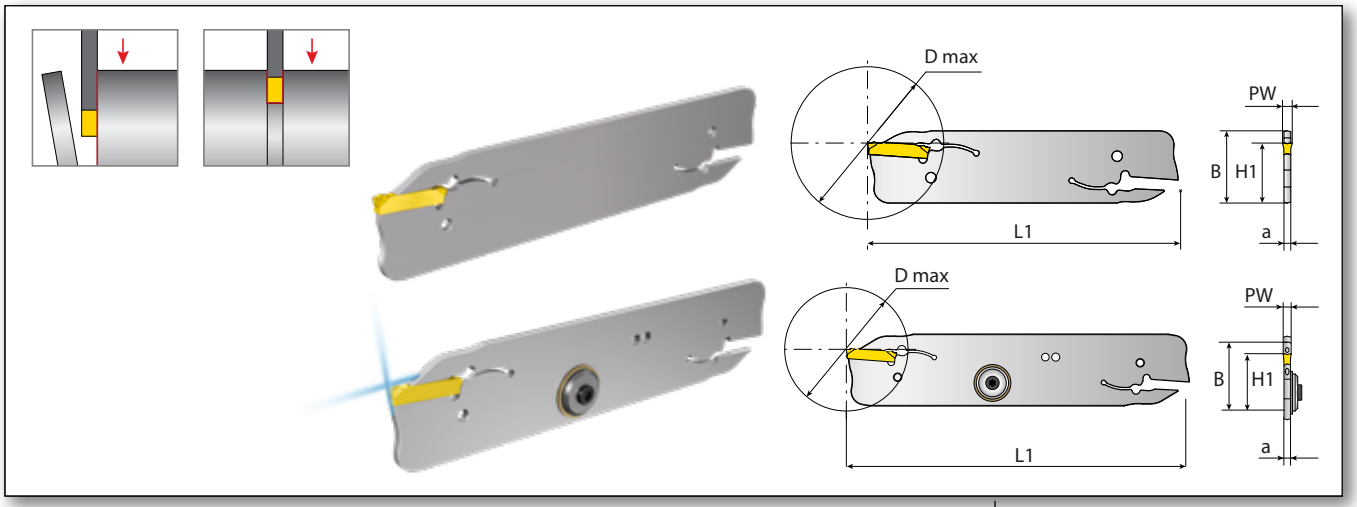
* Right hand shown

Ordering Code		Dimensions mm							Spare Parts		
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	1.75	SM4x14 T15	K3TF	-
VGER/L1616-2T12PH		26	16x16	16	15.3	125	22	1.75			
VGER/L1616-2T21PH		42	16x16	16	15.3	125	30	1.75			
VGER/L2020-2T12PH		26	20x20	20	19.3	125	22	1.75			
VGER/L2020-2T21PH		42	20x20	20	19.3	125	30	1.75			
VGER/L2525-2T21PH		42	25x25	25	24.3	125	30	1.75			
VGER/L1616-3T12PH	3	26	16x16	16	14.8	125	22	2.5		-	KT-15
VGER/L1616-3T21PH		42	16x16	16	14.75	125	30	2.5			
VGER/L2020-3T12PH		26	20x20	20	18.8	125	22	2.5			
VGER/L2020-3T21PH		42	20x20	20	18.8	125	30	2.5			
VGER/L2525-3T12PH		26	25x25	25	18.8	125	22	2.5			
VGER/L2525-3T21PH		42	25x25	25	23.8	125	30	2.5			

* Tightening Torque: K3TF Key - 3 Nm max; KT-15 Key - 5 Nm max.

| Tools should not be clamped without an insert inside the pocket.

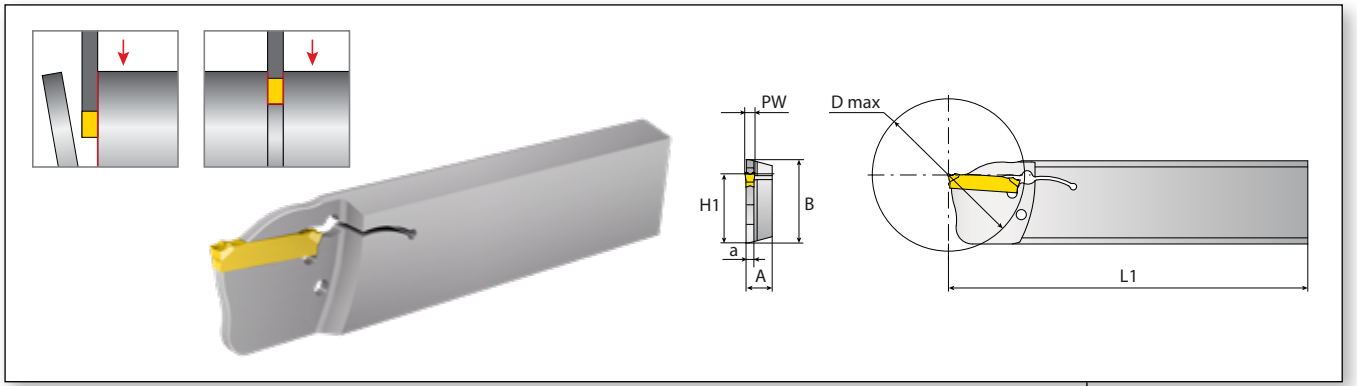
Blades for Grooving & Parting Off



Ordering Code	Dimensions mm						Spare Parts		
	B	PW	D max*	H1	L1	a	Key**	Sealing Cap Key***	Sealing Cap
VGP26-2D	26	2	50	21.4	110	1.8	VP-3	-	-
VGP32-2D	32	2	50	24.8	150	1.8			
VGP26-3D	26	3	70	21.4	110	2.5			
VGP26-3DC	26	3	70	21.4	110	2.5		Key WS-15IP	WS-15IP
VGP32-3D	32	3	100	24.8	150	2.5		-	-
VGP32-3DC	32	3	100	24.8	150	2.5		Key WS-15IP	WS-15IP
VGP35-3S	35	3	100	33.5	150	2.5		-	-
VGP32-4D	32	4	100	24.8	150	3.4	VP-4		
VGP32-4DC	32	4	100	24.8	150	3.4		Key WS-15IP	WS-15IP
VGP32-5D	32	5	100	24.8	150	4.0	VP-G	-	-
VGP32-6D	32	6	100	24.8	150	5.2			

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.
*** Tightening Torque: 5 Nm max

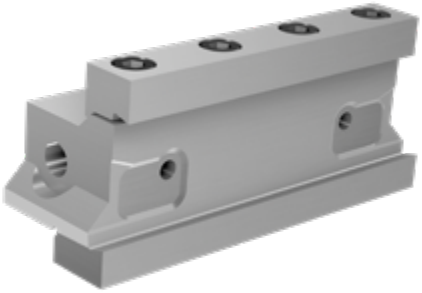
Reinforced Blades for Grooving & Parting Off

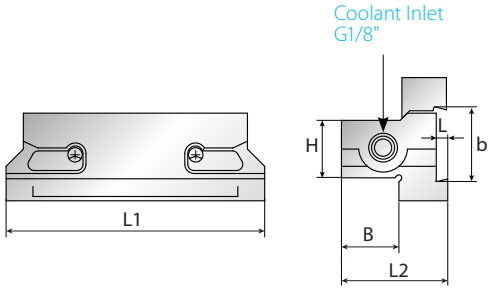


Ordering Code	Dimensions mm							Spare Parts
RH/LH	B	PW	D max*	H1	L1	A	a	Key**
VGWR/L26-2S	26	2	50	21.4	110	8.0	1.8	VP-3
VGWR/L32-2S	32	2	50	24.7	110	8.0	1.8	
VGWR/L26-3S	26	3	50	21.4	110	8.0	2.5	
VGWR/L32-3S	32	3	50	24.7	110	8.0	2.5	

* D max figures presented are for single sided insert (VGS).
** Not included. Please order separately.

Blade Holders





Ordering Code	Dimensions mm						Spare Parts	
	b	H	B	L	L1	L2	Clamping Screw*(x4)	Key
VBA 2020-26	26	20	20	4	90	37.0	M6x1.0x25	K5H
VBA 2520-32	32	25	20	5.2	110	37.7		

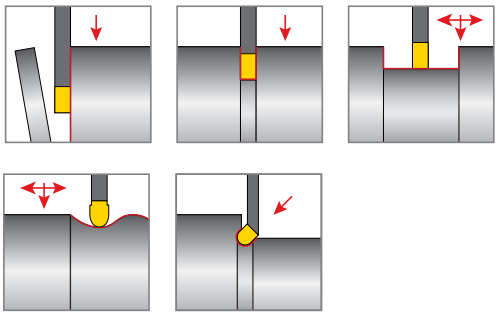
* Tightening Torque: 10 Nm max

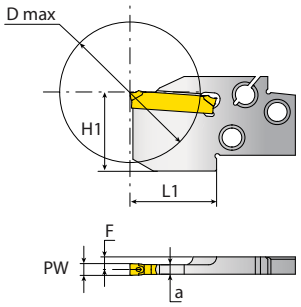
Necessary Parts When Using Blades with High Pressure Coolant Thru:

1. Plug G1/8"P (x1)
2. Plug DIN 916 GALV M6x8P (x1)
3. Tube Connector 25-6P (x1)
4. Fittings (x2): Straight Fitting G1_8x6P or Angled Fitting G1_8x6P

The above items are not included and should be ordered separately.
For more information please see page 21.

Modules for Grooving, Parting Off & Turning





*Right hand shown

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

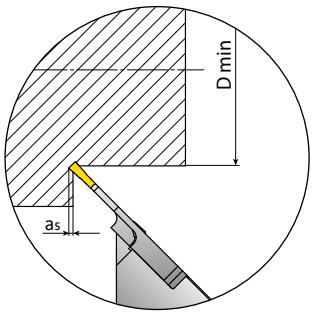
Radial (0°-90°) Module Limitations

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

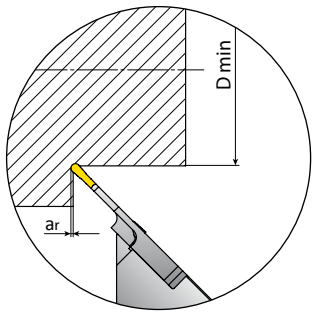
45° (Undercut) Module Limitations

Dimensions mm			
Pocket Width PW	Square Groove as max	Round Groove ar max	D min
2	0.91	0.5	48
3	1.12		
4	1.32		

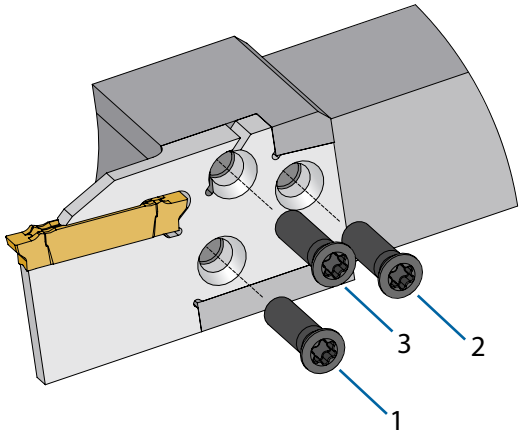
Square Groove



Round Groove

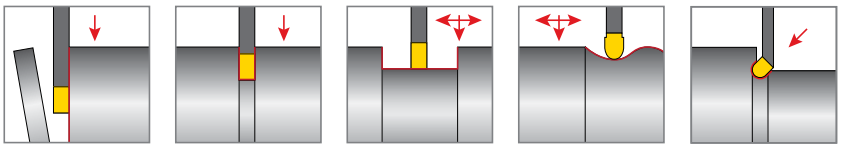


Mounting and Replacing Modules:

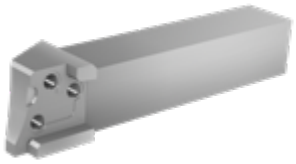


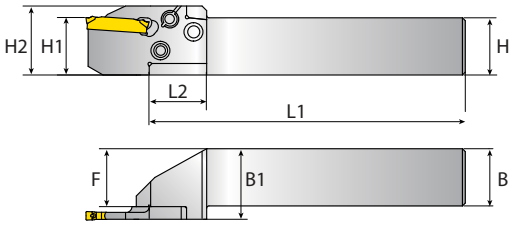
1. Clamp the module using screws 1, 2 and 3.
2. Clamp module to body with screw no. 1, followed by screw no. 2.
3. Finally, clamp the insert to the holder using screw no. 3.

Modular Bodies for Grooving, Parting Off & Turning



Parallel Square Bodies



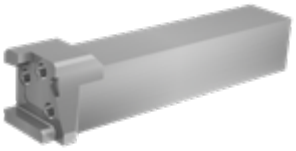


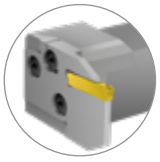
* Right hand shown

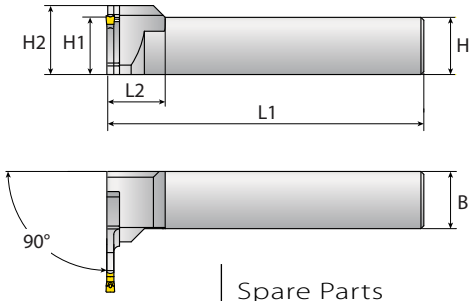
Spare Parts

Ordering Code	Dimensions mm							Spare Parts	
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	KT-15
VBMR/L2525-00	25	25.0	31.0	30	25.50	140	25	SM5x18 T20	K6T

90° Square Bodies







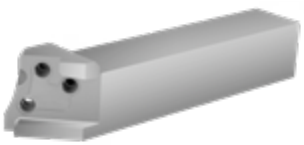
* Right hand shown

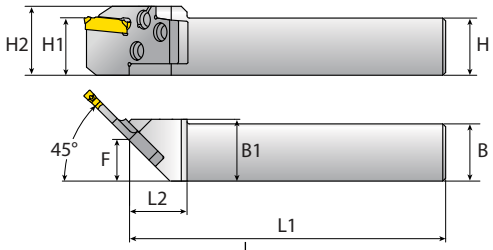
Spare Parts

Ordering Code	Dimensions mm					Spare Parts	
RH/LH	H/H1	B	H2	L1	L2	Conical Screw*	Key
VBMR/L2020-90	20	20.0	24	110	20	SM4x14 T15	KT-15
VBMR/L2525-90	25	25.0	30	140	28	SM5x18 T20	K6T

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

45° Square Bodies





* Left hand shown

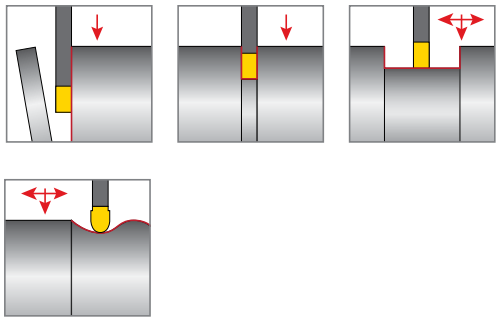
Spare Parts

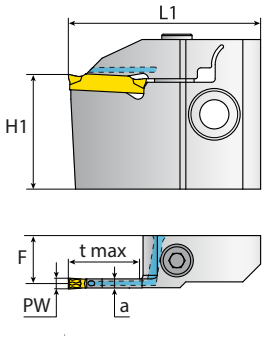
Ordering Code	Dimensions mm							Spare Parts	
RH/LH	H/H1	B	B1	H2	L1	L2	F	Conical Screw*	Key
VBMR/L2020-45	20	20.0	21.5	24	110	20	14.5	SM4x10.5 T15 SM4x14 T15	KT-15
VBMR/L2525-45	25	25.0	26.0	30	140	25	18	SM5x13.5 T20 SM5x18 T20	K6T

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





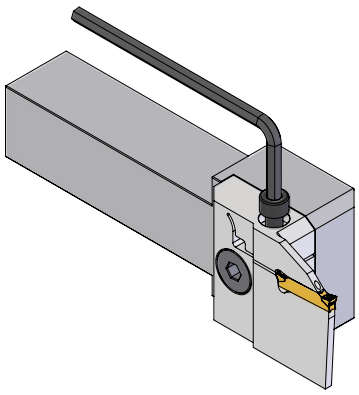
*Right hand shown

							Spare Parts	
Ordering Code			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		

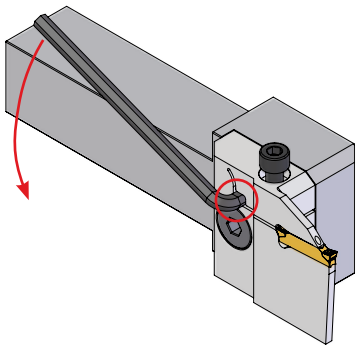
* Tightening Torque: PW 2 mm - 4 Nm max; PW 3, 4, 5, 6 mm - 7 Nm max.
** T max figures presented for single sided inserts (VGS).

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

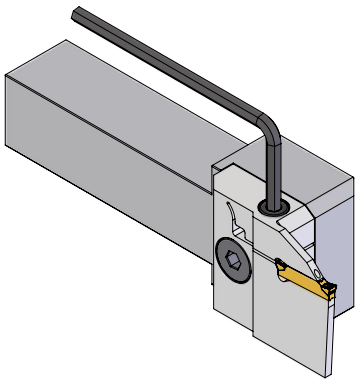
1 Unlock the top screw using the key provided.



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.

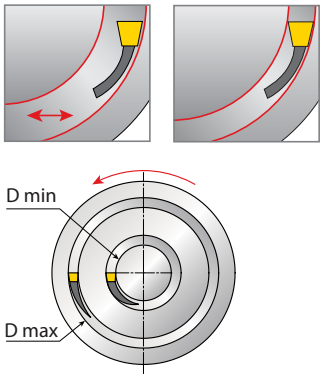


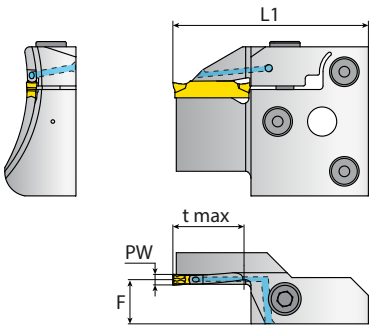
3 Now remove the key from the pocket and secure the insert by firmly locking the top screw.



Tools should not be clamped without an insert inside the pocket.

Face Grooving Modules with High Pressure Coolant Thru





Workpiece rotation for Face Grooving:
- Clockwise for left-hand application
- Counter-clockwise for right-hand application

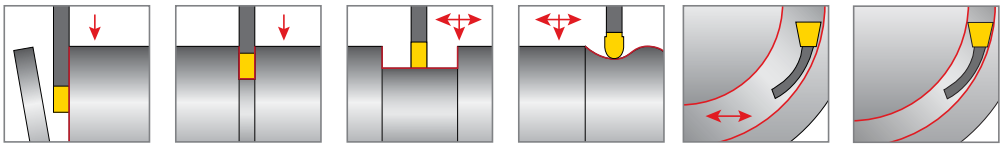
* Right hand shown

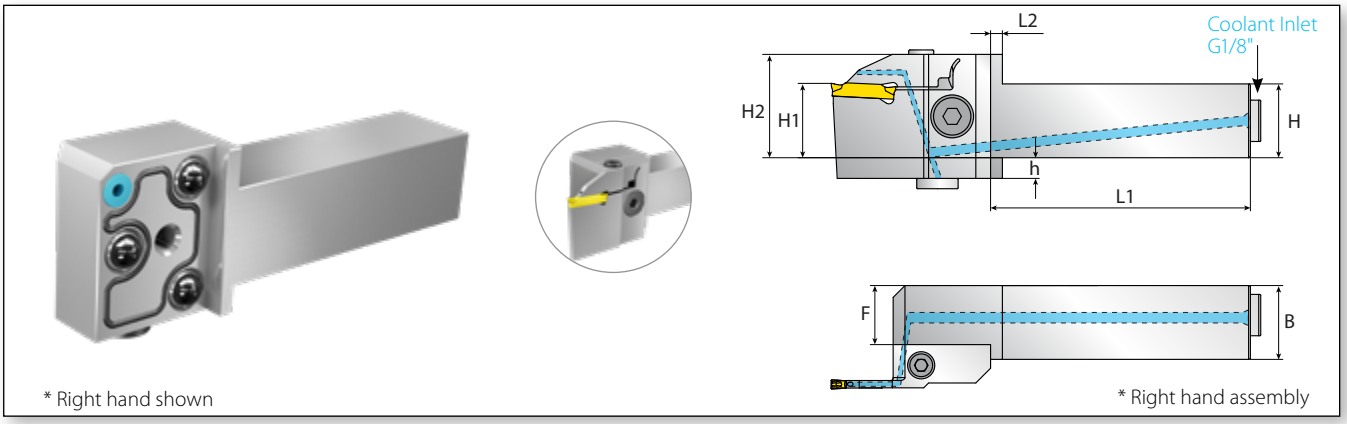
Ordering Code	Dimensions mm						Spare Parts	
RH/LH	PW	t max	D min	D max	F	L1	Screw*	Key
VGFR/L-2530-T10-3C	3	10	23.50	32.00	12.5	45	SM5x16	K4H
VGFR/L-3038-T10-3C			28.60	40.40				
VGFR/L-3848-T10-3C			36.60	50.40				
VGFR/L-4860-T10-3C			46.60	62.80				
VGFR/L-6075-T10-3C			58.70	78.20				
VGFR/L-75100-T10-3C			73.70	103.20				
VGFR/L-100200-T10-3C			99.20	204.60				
VGFR/L-6075-T20-3C		20	58.30	77.50		55		
VGFR/L-75100-T20-3C			73.70	103.20				
VGFR/L-100200-T20-3C			99.20	204.60				
VGFR/L-3048-T12-4C	4	12	27.60	49.00	12	47		
VGFR/L-4860-T12-4C			44.50	60.50				
VGFR/L-6075-T12-4C			55.60	75.10				
VGFR/L-75100-T12-4C			69.60	99.60				
VGFR/L-100150-T12-4C			92.30	147.70				
VGFR/L-150->-T12-4C			134.50	285.50				
VGFR/L-3048-T24-4C		24	27.60	49.00		59		
VGR/LF-4860-T24-4C			44.50	60.50				
VGFR/L-6075-T24-4C			55.60	75.10				
VGFR/L-75100-T24-4C			69.60	99.60				
VGFR/L-100150-T24-4C			92.30	147.70				
VGFR/L-150->-T24-4C			134.50	275.50				
VGFR/L-4255-T22-5C	5	22	38.40	61.00	13.5	60		
VGFR/L-5575-T22-5C			51.10	81.90				
VGFR/L-75130-T22-5C			70.30	143.90				
VGFR/L-130200-T22-5C			123.10	222.30				
VGFR/L-200 ->-T22-5C			189.00	788.40				
VGFR/L-130200-T45-5C		45	123.10	222.30		92		
VGFR/L-200400-T45-5C			189.00	475.90				
VGFR/L-450->-T45-5C			400.70	911.80				
VGFR/L-4255-T22-6C	6	22	36.50	63.30	13	60		
VGFR/L-5575-T22-6C			49.00	83.50				
VGFR/L-75130-T22-6C			68.20	145.00				
VGFR/L-130200-T22-6C			121.10	223.90				
VGFR/L-200 ->-T22-6C			188.40	813.10				
VGFR/L-130200-T45-6C		45	121.10	223.90		92		
VGFR/L-200400-T45-6C			189.10	492.00				
VGFR-450->-T45-6C			408.90	973.60				

* Tightening Torque 7 Nm max.

| Tools should not be clamped without an insert inside the pocket.

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



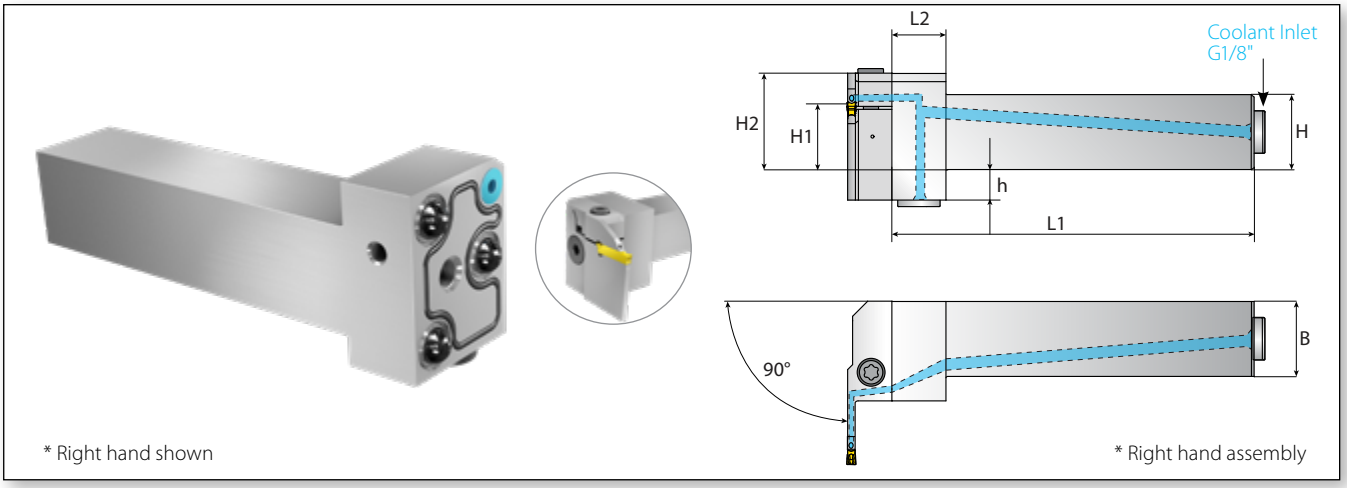


Parallel Square Bodies with HPC

Ordering Code	Dimensions mm						
	H/H1	B	H2	h	F	L1	L2
VBMR/L2020-00-C	20	20	30	12	15	106	4
VBMR/L2525-00-C	25	25	35	7	20	121	4
VBMR/L3225-00-C	32	25	42	0	20	136	4

Spare Parts

Clamping Screw*	Key	Plug Screw	Coolant Seal	Anti Vibration O-Ring
SM8x25	K6H	Plug G1/8"	Coolant Sleeve	O-RING Body Seal



90° Square Bodies with HPC

Ordering Code	Dimensions mm					
RH/LH	H/H1	B	H2	h	L1	L2
VBMR/L2020-90-C	20	20	30	12	111	18
VBMR/L2525-90-C	25	25	35	7	120	18
VBMR/L3232-90-C	32	32	42	0	130	18

Spare Parts

Clamping Screw*	Key	Plug Screw	Coolant Seal	Anti Vibration O-Ring
SM8x25	K6H	Plug G1/8"	Coolant Sleeve	O-RING Body Seal

* Tightening Torque: 26 NM max.

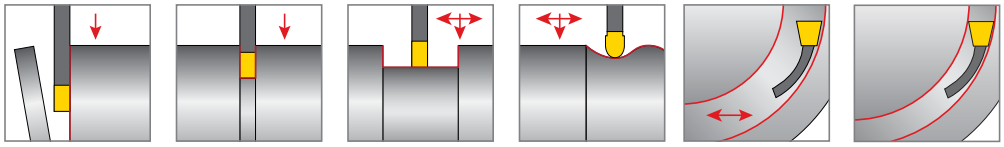
Necessary Parts When Using Modules with High Pressure Coolant Thru:

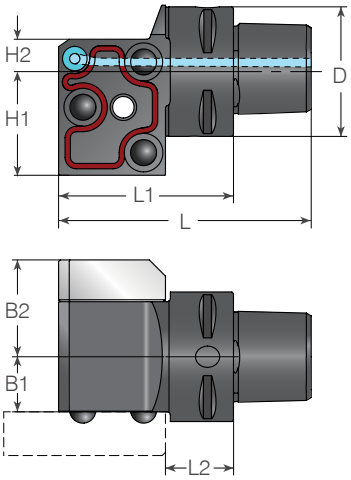
1. Tube Connector 25-6P (x1)
2. Fittings (x2): Straight Fitting G1_8x6P or Angled Fitting G1_8x6P

The above items are not included and should be ordered separately. **For more information please see page 21.**

Modular V-CAP Holders with HPC

NEW

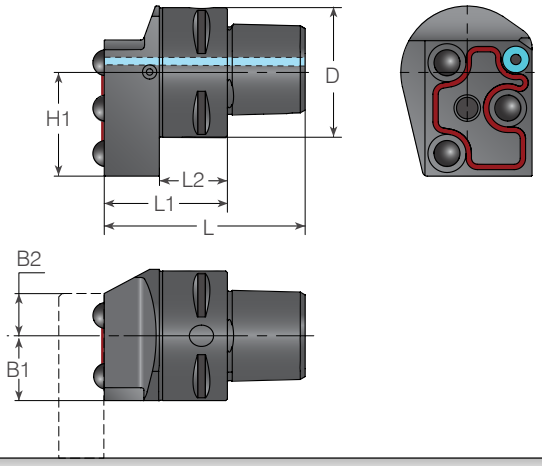




* Right hand shown

Parallel V-CAP Bodies with HPC

Ordering Code	Dimensions mm							Spare Parts				
	D	L	L1	L2	B1	B2	H1	Clamping Screw* (x2)	Key	Modular Cover	Coolant Seal	Anti Vibration O-Ring
VBC C4-00-C	40	78	54	21	17	29.9	32	SM8x18	K6H	VG-MC	Coolant Sleeve	O-RING Body Seal
VBC C5-00-C	50	88	58	21	19.5	32.4						
VBC C6-00-C	63	98	60	23	24.5	37.4						



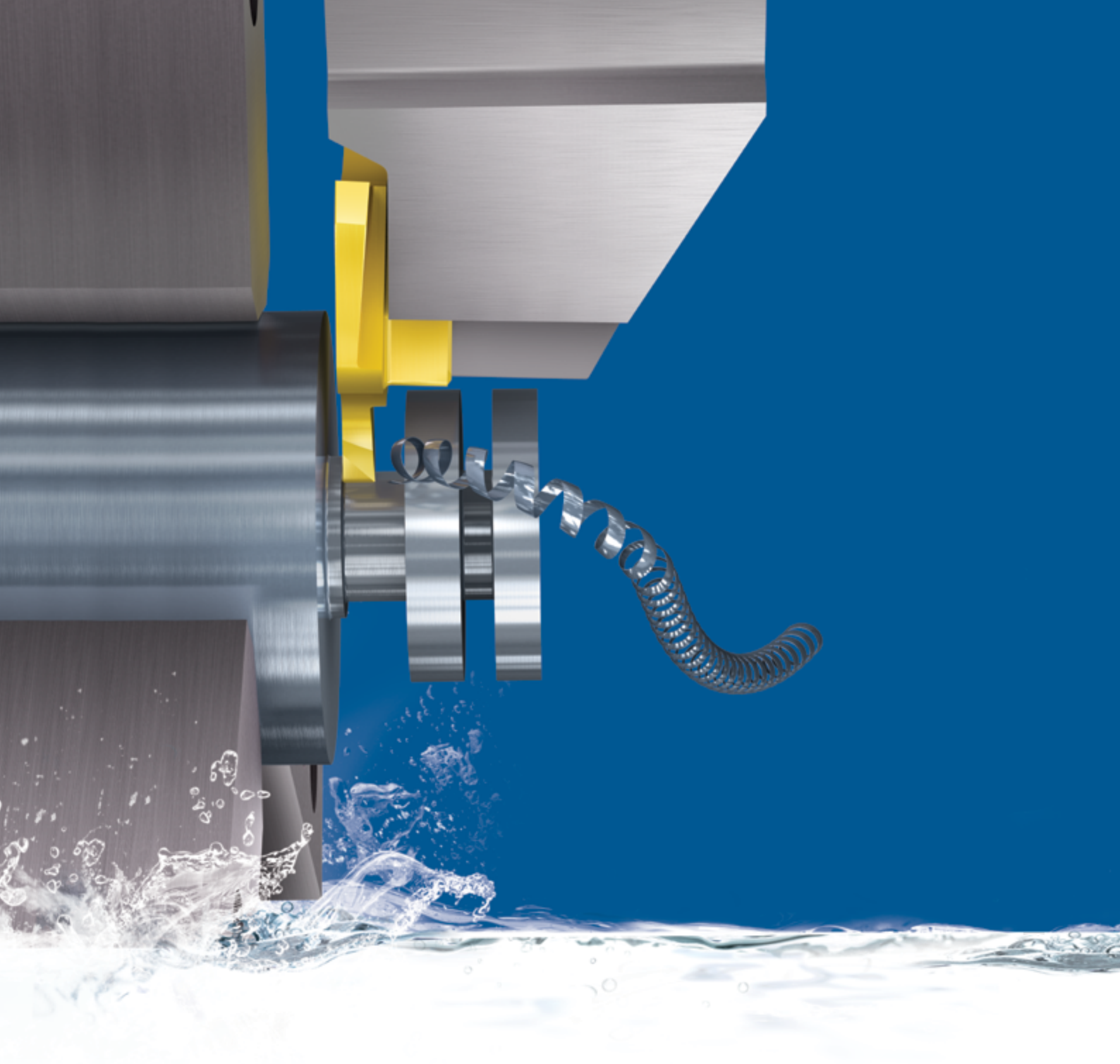
* Right hand shown

90° V-CAP Bodies with HPC

Ordering Code	Dimensions mm							Spare Parts			
RH/LH	D	L	L1	L2	B1	B2	H1	Clamping Screw*	Key	Coolant Seal	Anti Vibration O-Ring
VBCR/L C4-90-C	40	64	40	21	20	13.0	32	SM8x18	K6H	Coolant Sleeve	O-RING Body Seal
VBCR/L C5-90-C	50	70	40	21	26.5	6.75					
VBCR/L C6-90-C	63	78	40	23	32.7	0.5					

V-CAP holders are according to ISO 26623.

* Tightening Torque: 26 Nm max.



EXTERNAL MACHINING | **FINISHING**

GrooVical

Precise Grooving & Turning Applications

GrooVical

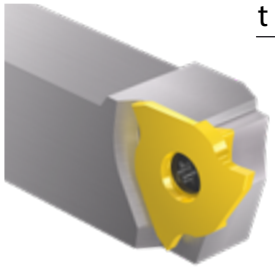
Precise Grooving & Turning Applications

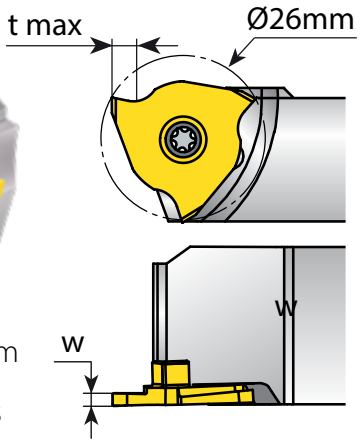
Versatile Range of Indexable Grooving Inserts

The **Groovical** family of products by Groovex offers improved solutions for precise 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

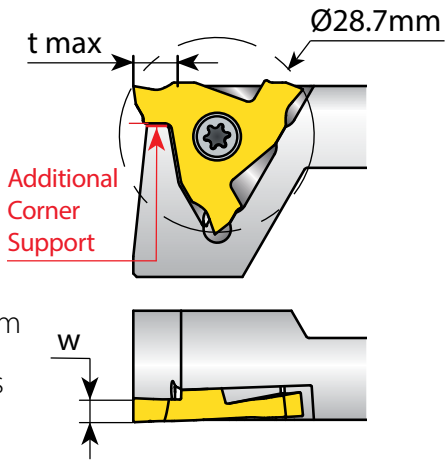




t max = Groove Depths up to 6.0mm

W = Groove Widths from 0.5-2.5mm

GVN29

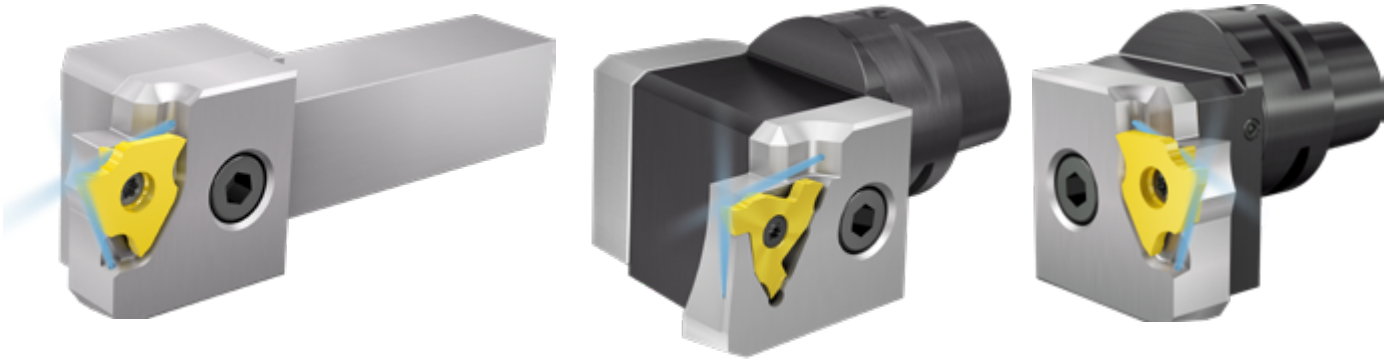


t max = Groove Depths up to 6.5mm

W = Groove Widths from 2-6.35mm

Modular Holders with High Pressure Coolant (HPC) NEW

- Quick change modules for **GrooVical** GVN26 and GVN29 inserts for precise grooving, turning and parting off
- High pressure coolant up to 100 bar
- Modules are suitable for parallel and 90° modular square bodies and the **NEW** GROOVEX polygon shaped V-CAP holders (C4, C5, C6)
- Groovex V-Cap holders are according to ISO 26623



For more information see page 55.

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 Cast Ferritic	Non Hardened	200	80-110
	16		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

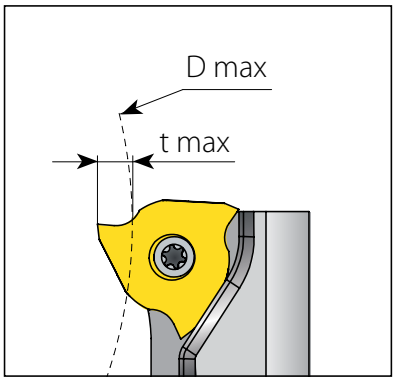
	High Alloy Steel, 330 HB, 2100 Kc [N/mm²]		**Austenitic Stainless Steel**, 200 HB, 2600 Kc [N/mm²]	
Insert Width (mm)	Depth ap = Insert Width x variable	Average f mm/rev	Depth ap = Insert Width x variable	Average f mm/rev
0.4 mm - 0.9 mm	0.055	0.04	0.035	0.02
1.0mm - 1.5mm	0.055	0.07	0.035	0.04
1.6 mm -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

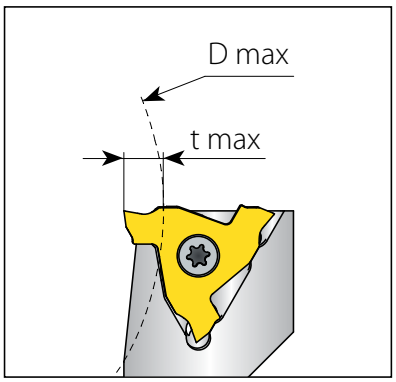
GVN26 External - Depth of Groove in Relation to Workpiece Dia.

D max is 150mm



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

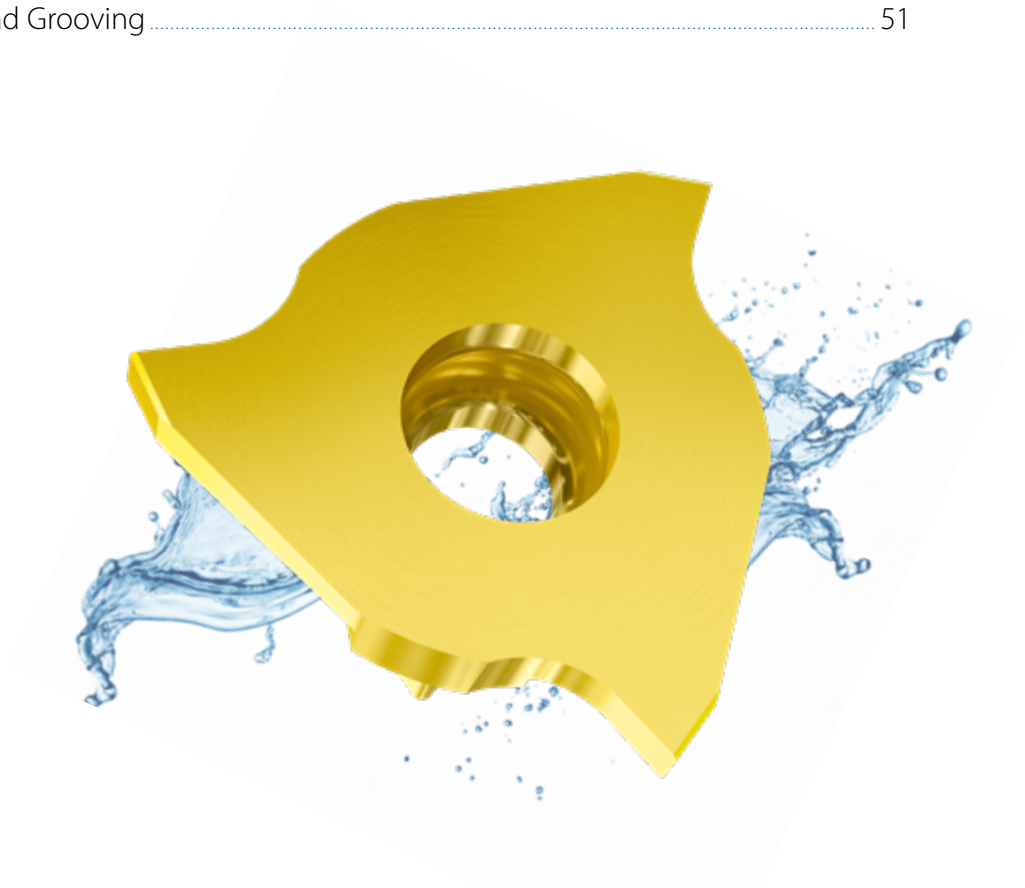
Dimensions mm	
t max	D max
0.5	1085.0
1	590.0
1.5	408.0
2	310.0
2.5	250.0
3	210.0
3.5	180.0
4	160.0
4.5	145.0
5	130.0
5.5	120.0
6	110.0
6.5	105.0



GrooVical Inserts

Close to Shoulder (GVN):

GV29 Neutral:



GrooVical Inserts Ordering Code System

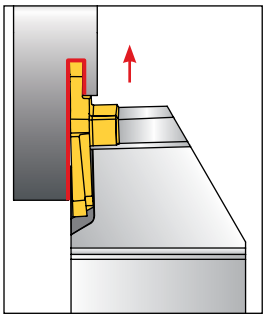
GVN	26	R	P	0.5	-	0.05	-	15	R	VKX
1	2	3	4	5		6		7	8	9

1- Insert Type	2 - Circular Circumference	3 - RH or LH	4 - Type of Application	5 - Grooving Width
GVN - Groovical Close to Shoulder **GV** - Groovical Neutral	**26** - 26 mm **29** - 28.7 mm	**R** - RH **L** - LH **N** - RH/LH	**T** - Turning & Grooving **S** - Square Grooving **SP** - Positive Rake Grooving **R** - Round Grooving **P** - Parting Off **X** - Special Profile	0.5 to 6.35mm

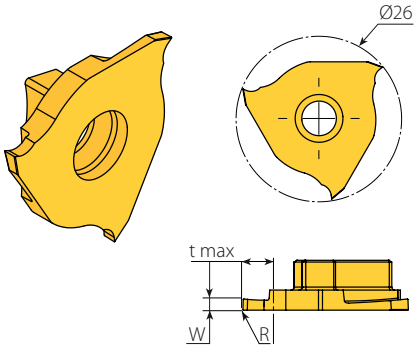
6 - Corner Radius
0.0 - 1mm

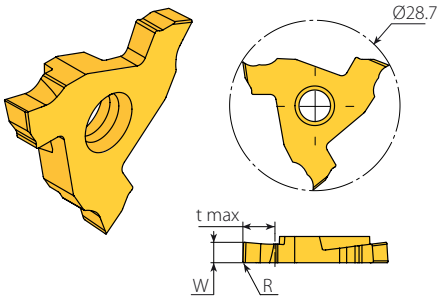
7 - Approach Angle	8 - Cutting Side	9 - Carbide Grade
6 - 6 Deg. **15** - 15 Deg.	**R** - Right corner leading **L** - Left corner leading **None** - Neutral	VTX, VKX

Close to Shoulder Super Positive Rake Grooving (SP)



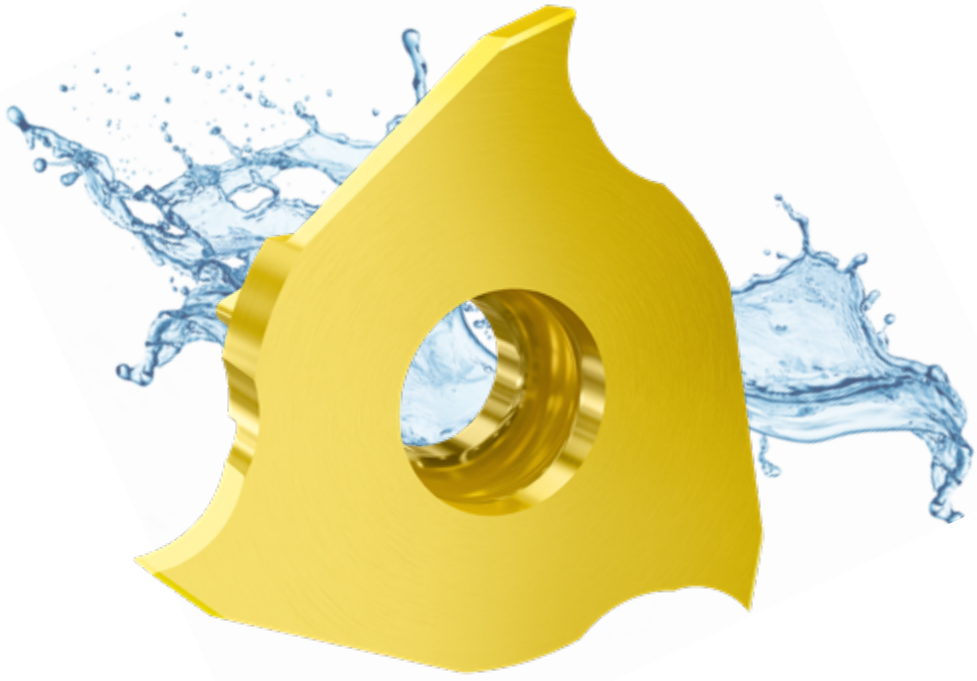
Right hand shown



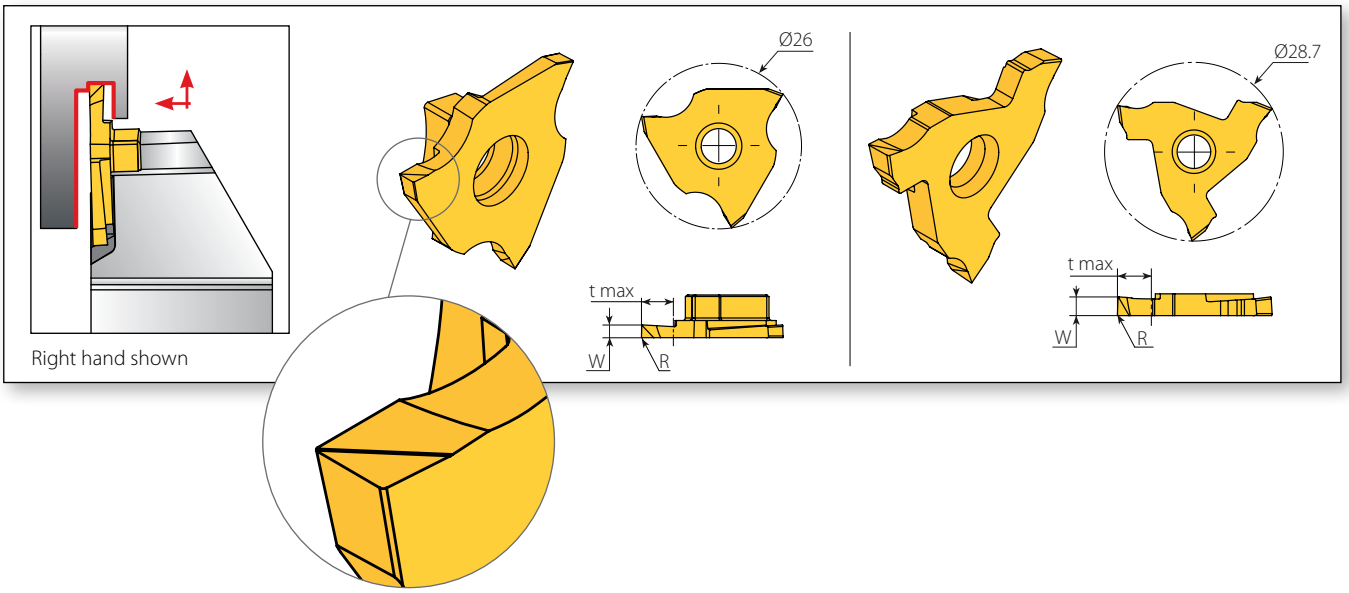


Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W$^{\pm 0.02}$	R$^{\pm 0.03}$	t max	**VKX**	**VTX**	
26	GVN26R/LSP1.0-0.08	1.0	0.08	2.25	○	•	GVNE...-26, GVNE90...-26
	GVN26R/LSP1.5-0.08	1.5	0.08	3.00	○	•	
	GVN26R/LSP2.0-0.1	2.0	0.10	3.75	○	•	
	GVN26R/LSP2.5-0.15	2.5	0.15	3.75	○	•	
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

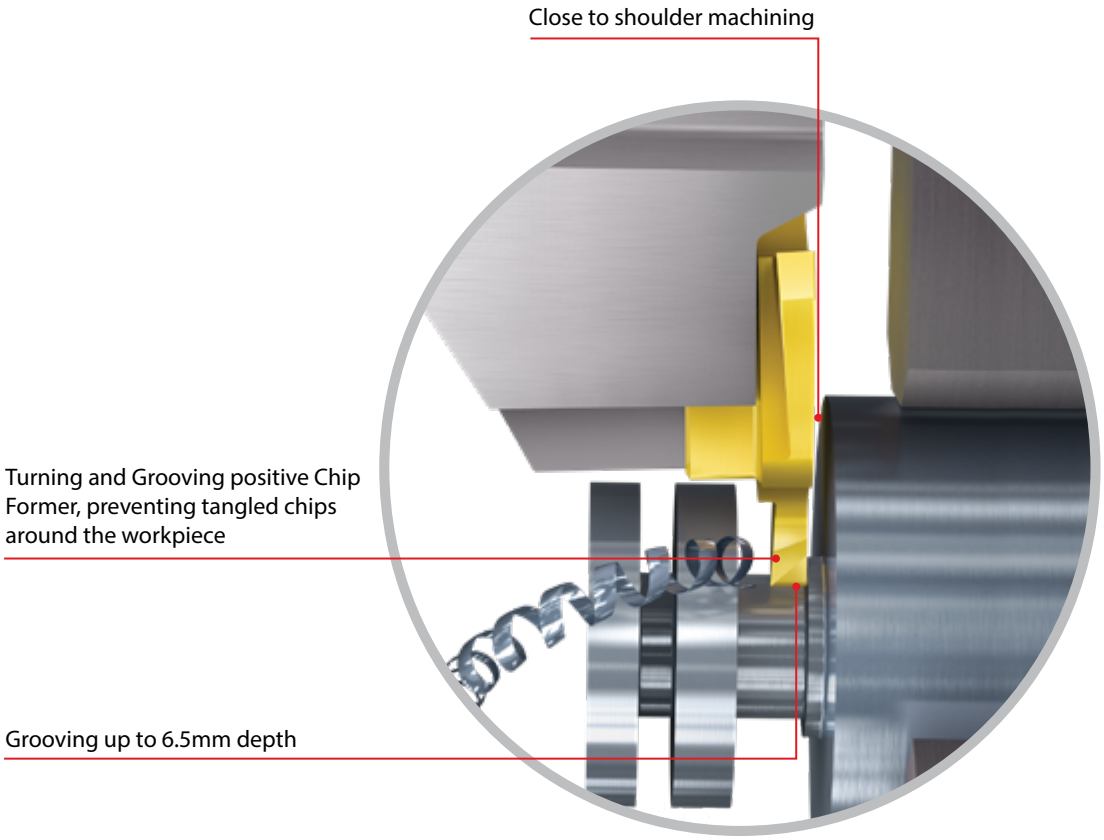


Close to Shoulder Square Turning & Grooving Chip Former

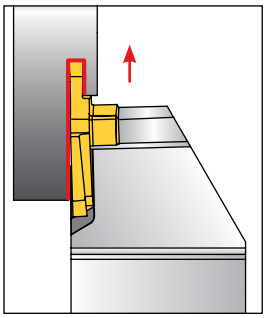


Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W±0.02	R±0.03	t max	VKX	VTX	
26	GVN26R/LT1.0-0.08	1.0	0.08	3.0	○	•	GVNE...-26, GVNE90...-26
	GVN26RT1.0-0.12	1.0	0.12	1.5	○	•	
	GVN26RT1.4-0.05	1.4	0.05	2.0	○	•	
	GVN26R/LT1.5-0.08	1.5	0.08	4.0	○	•	
	GVN26RT1.5-0.20	1.5	0.20	3.0	○	•	
	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	0.20	6.5	○	•	GVNE...-29-1, GVNE90...-29-2, GVNI...-29

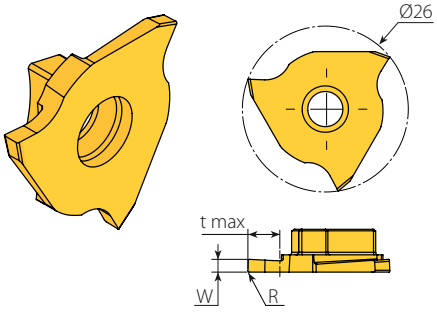
• In stock ○ Available upon request

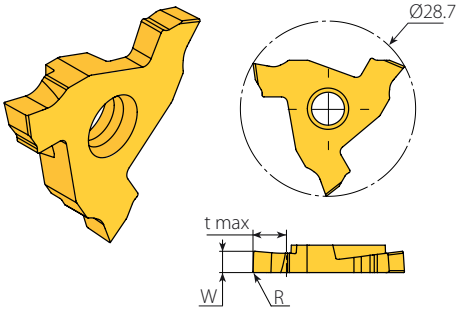


Close to Shoulder Square Grooving



Right hand shown





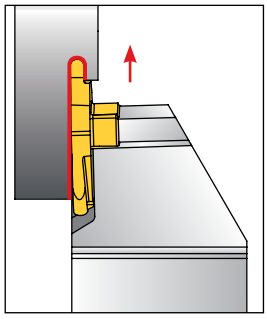
Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W$^{\pm 0.02}$	R$^{\pm 0.03}$	t max	**VKX**	**VTX**	
	GVN26R/LS0.5-0.12	0.50	0.12	1.0	○	●	
	GVN26R/LS0.57-00	0.57	0.00	1.0	●	●	
	GVN26R/LS0.77-00	0.77	0.00	1.6	○	●	
	GVN26R/LS0.79-00	0.79	0.00	1.6	●	○	
	GVN26R/LS0.79-0.2	0.79	0.20	1.6	●	●	
	GVN26RS0.8-0.2	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	●	○	
	GVN26RS1.0-0.1	1.00	0.10	2.0	●	●	
	GVN26LS1.0-0.1	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	●	●	
	GVN26RS1.5-0.1	1.50	0.10	3.0	●	●	
	GVN26LS1.5-0.1	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	●	○	
26	GVN26R/LS1.6-00	1.60	0.00	3.0	●	○	GVNE...-26, GVNE90...-26
	GVN26RS1.6-0.4	1.60	0.40	3.5	○	●	
	GVN26R/LS1.7-0.1	1.70	0.10	3.0	●	○	
	GVN26R/LS1.74-00	1.74	0.00	3.0	●	○	
	GVN26RS1.8-0.15	1.80	0.15	4.5	○	●	
	GVN26RS1.8-0.4	1.80	0.40	4.5	○	●	
	GVN26RS1.9-0.4	1.90	0.40	4.5	○	●	
	GVN26R/LS2.0-00	2.00	0.00	3.0	●	○	
	GVN26R/LS2.0-0.1	2.00	0.10	3.0	●	○	
	GVN26RS2.0-0.15	2.00	0.15	4.5	○	●	
	GVN26RS2.0-0.2	2.00	0.20	5.0	●	●	
	GVN26LS2.0-0.2	2.00	0.20	5.0	●	○	
	GVN26RS2.0-0.4	2.00	0.40	4.5	○	●	
	GVN26R/LS2.22-0.15	2.22	0.15	5.0	●	○	
	GVN26RS2.25-0.4	2.25	0.40	4.5	○	●	
	GVN26RS2.25-0.8	2.25	0.80	5.0	○	●	
	GVN26R/LS2.39-0.15	2.39	0.15	5.0	●	○	
	GVN26RS2.4-0.15	2.40	0.15	4.5	○	●	
	GVN26LS2.45-0.3	2.45	0.30	4.5	○	●	
	GVN26R/LS2.47-0.2	2.47	0.20	5.0	●	○	

Close to Shoulder Square Grooving (con't)

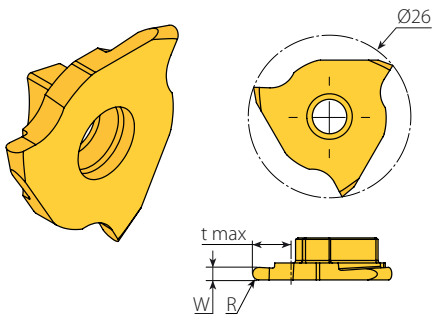
Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W±0.02	R±0.03	t max	VKX	VTX	
29	GVN29R/LS2.38-0.1	2.38	0.10	6.5	•	○	GVNE...-29-1, GVNE90...-29-1, GVNI...-29
	GVN29R/LS2.5-0.1	2.50	0.10	6.5	•	○	
	GVN29RS2.5-0.2	2.50	0.20	6.5	○	•	
	GVN29R/LS2.7-0.1	2.70	0.10	6.5	•	○	
	GVN29R/LS3.0-0.2	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	•	•	GVNE...-29-2, GVNE90...-29-2, GVNI...-29
	GVN29R/LS4.0-0.4	4.00	0.40	6.5	•	•	
	GVN29RS4.15-0.6	4.15	0.60	6.5	○	•	
	GVN29R/LS5.0-0.4	5.00	0.40	6.5	•	•	

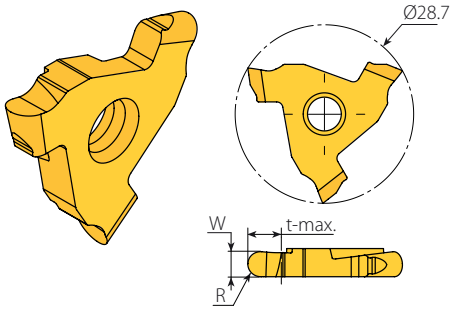
• In stock ○ Available upon request

Close to Shoulder Round Grooving



Right hand shown

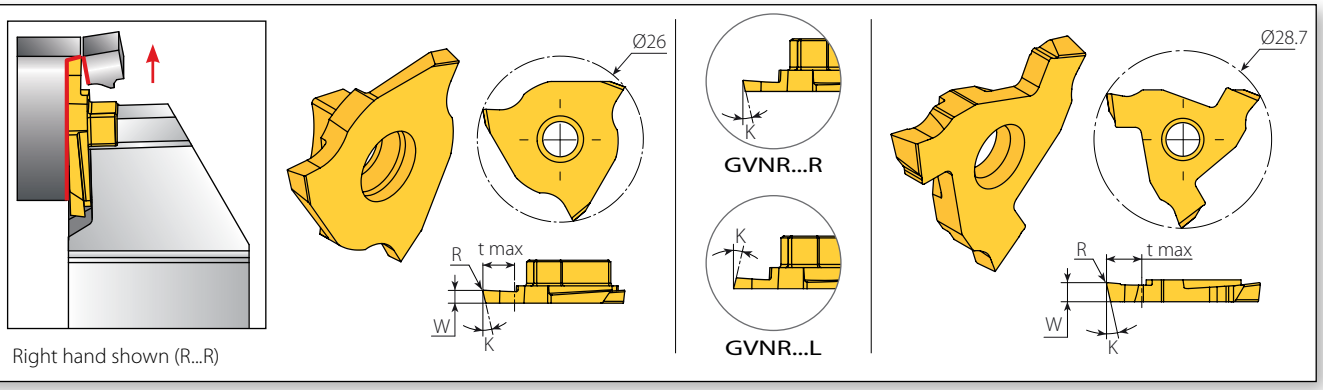




Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W±0.02	R±0.03	t max	VKX	VTX	
26	GVN26R/LR0.5-0.25	0.50	0.25	1.0	•	○	GVNE...-26, GVNE90...-26
	GVN26R/LR0.79-0.39	0.79	0.39	1.6	•	○	
	GVN26R/LR1.0-0.5	1.00	0.50	2.0	•	○	
	GVN26RR1.2-0.6	1.20	0.60	2.0	•	•	
	GVN26LR1.2-0.6	1.20	0.60	2.0	•	○	
	GVN26RR1.5-0.75	1.50	0.75	5.0	•	•	
	GVN26LR1.5-0.75	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	•	○	
	GVN26RR2.39-1.19	2.39	1.19	5.0	•	•	
	GVN26LR2.39-1.19	2.39	1.19	5.0	•	○	
29	GVN29RR1.5-0.75	1.50	0.75	6.5	○	•	GVNE...-29-1, GVNE90...-29-1, GVNI...-29
	GVN29RR2.0-1.0	2.00	2.00	6.0	○	•	
	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

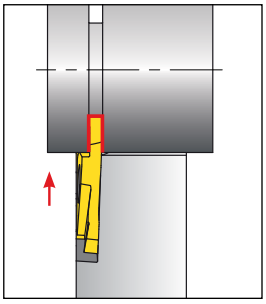


Right hand shown (R...R)

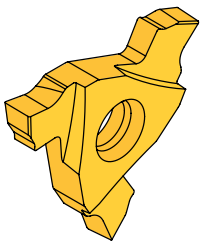
Insert Size	Ordering Code	Dimensions mm				Grade		Toolholder
IC	RH/LH	W±0.02	R±0.03	t max	K°	VKX	VTX	
26	GVN26RP0.5-0.05-06R	0.5	0.05	1.0	6	•	○	GVNE...-26, GVNE90...-26
	GVN26RP0.5-0.05-06L	0.5	0.05	1.0	6	•	○	
	GVN26LP0.5-0.05-06R	0.5	0.05	1.0	6	•	○	
	GVN26LP0.5-0.05-06L	0.5	0.05	1.0	6	•	○	
	GVN26RP0.5-0.05-15R	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	•	○	
	GVN26RP0.8-0.05-06R	0.8	0.05	4.0	6	○	•	
	GVN26RP1.0-0.05-15R	1.0	0.05	3.5	15	○	•	
	GVN26R/LP1.2-0.08-05R	1.2	0.08	1.0	5	•	○	
	GVN26LP1.4-0.00-15R	1.4	0.00	5.0	15	○	•	
	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	•	○	
	GVN26RP1.4-0.2-06R	1.4	0.20	5.0	6	○	•	
	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	•	○	
	GVN26RP2.0-0.1-10R	2.0	0.10	6.2	10	○	•	
	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	•	•	

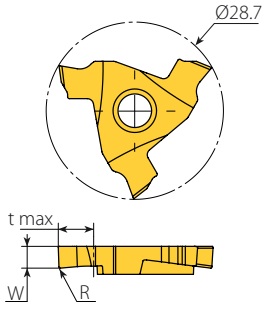
• In stock ○ Available upon request

Square Grooving (GV29)



Right hand shown

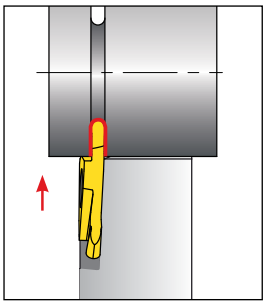




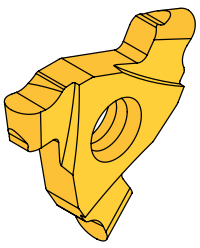
Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W±0.02	R±0.03	t max	VKX	VTX	
29	GV29R/LS2.38-0.1	2.38	0.10	6.5	•	•	GVE...-29-1, GVE90...-2901, GVI...-29
	GV29R/LS2.5-0.1	2.50	0.10	6.5	•	•	
	GV29R/LS2.7-0.1	2.70	0.10	6.5	•	•	
	GV29R/LS3.0-0.2	3.00	0.20	6.5	•	•	
	GV29RS3.0-0.4	3.00	0.40	6.5	•	•	
	GV29R/LS3.17-0.2	3.17	0.20	6.5	•	•	
	GV29R/LS3.5-0.2	3.50	0.20	6.5	•	•	GVE...-29-2, GVE90...-29-2, GVI...-29, GVNE...-29-2, GVNE90...-29-2, GVNI...-29
	GV29R/LS4.0-0.4	4.00	0.40	6.5	•	•	
	GV29RS4.0-0.8	4.00	0.80	6.5	○	•	
	GV29RS4.5-0.3	4.50	0.30	6.5	○	•	
	GV29R/LS5.0-0.4	5.00	0.40	6.5	•	•	

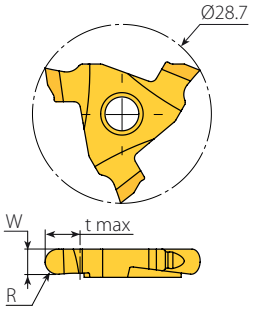
• In stock ○ Available upon request

Round Grooving (GV29)



Right hand shown

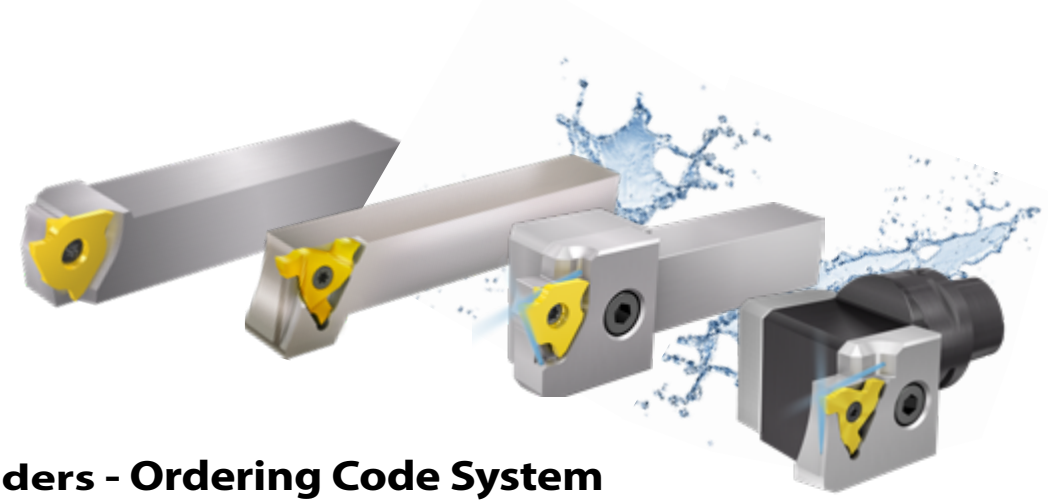




Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W±0.02	R±0.03	t max	VKX	VTX	
29	GV29R/LR2.38-1.19	2.38	1.19	6.5	•	•	GVE...-29-1, GVE90...-2901, GVI...-29
	GV29R/LR2.5-1.25	2.50	1.25	6.5	•	•	
	GV29R/LR3.0-1.5	3.00	1.50	6.5	•	•	
	GV29R/LR3.17-1.59	3.17	1.59	6.5	•	•	
	GV29R/LR4.0-2.0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



GrooVical Holders - Ordering Code System

Square Holders

GVN	E	R	20	-	29	-	1
1	2	3	4		5		7

Modules

GVN	A	R	29	-	T6.5	-
1	2	3	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° A - Module	R - RH L - LH	10, 12, 16, 20, 25, 32, 40 mm

5 - Insert Size	6 - t max (for Modules Only)	7 - Insert Width (for GVN29 & GV29)	8 - Coolant
26 29	T5.5 - 5.5mm T6.5 - 6.5mm	1 - 2.5 - 3.5mm 2 - 3.6 - 5.5mm	C - Coolant (for Modular system)

Square Bodies

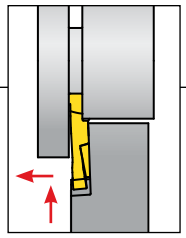
VBM	R	2525	-	90	-	C
1	2	3		4		5

V-CAP Bodies

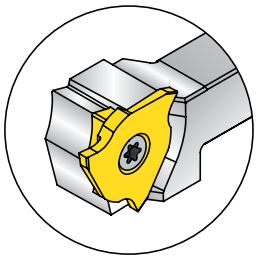
VBM	R	C5	-	90	-	C
1	2	3		4		5

1- Body Type	2 - RH or LH	3 - Shank Width	4 - Approach Angle	5 - Coolant
VBM - Square body VBC - V-CAP body	R - RH L - LH None - Neutral	2525 - Square body dimensions C5 - V-CAP polygon shape	0 -Parallel 0° 90 - 90°	C - Coolant

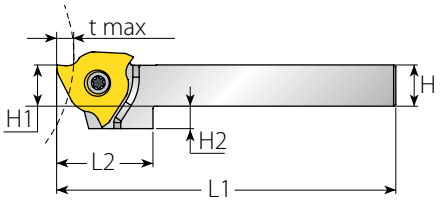
Close to Shoulder External Toolholders

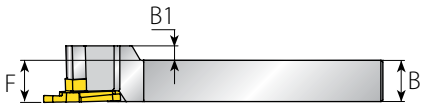


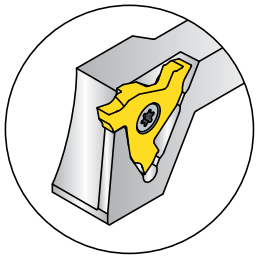
Right hand shown



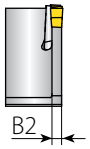
GVN26

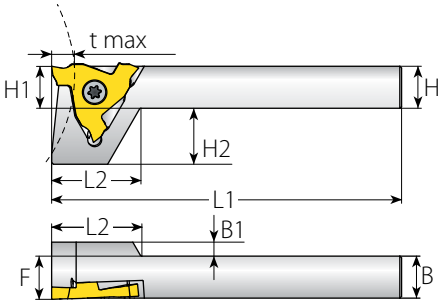






GVN29

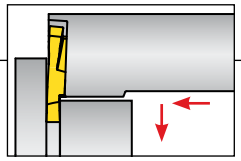




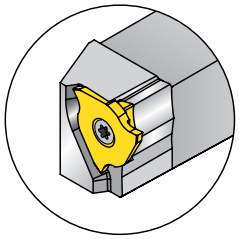
Insert Size	Ordering Code	Dimensions mm									Spare Parts	
	RH/LH	H=B	L1	H1	L2	H2	F	B1	B2	t max/D max	Insert Screw*	Torx Key
26	GVNER/L10-26	10	125	10	28.0	8.5	10.2	6.2	-	See page 44	SGM5	L20IP
	GVNER/L12-26	12	125	12	28.0	6.5	12.2	4.2				
	GVNER/L16-26	16	125	16	28.0	2.5	16.2	-				
	GVNER/L20-26	20	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

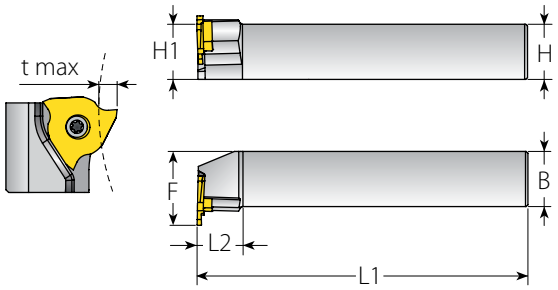
Close to Shoulder External Toolholders 90°

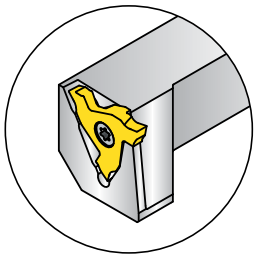


Right hand shown

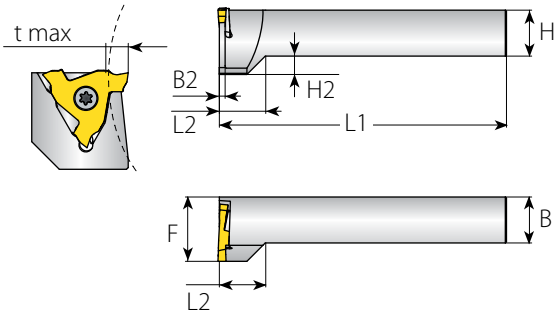


GVN26





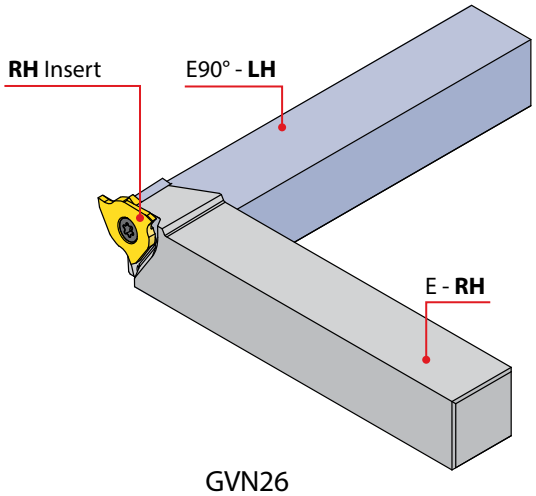
GVN29



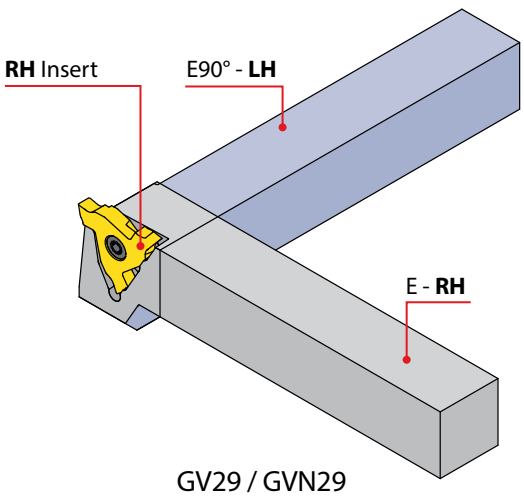
Insert Size	Ordering Code	Dimensions mm								Spare Parts	
	RH/LH	H=B	L1	H1	L2	B2	H2	F	t max/D max	Insert Screw*	Torx Key
26	GVNE90R/L20-26	20	125	20	20.0	-	-	28.5	See page 44	SGM5	L20IP
	GVNE90R/L25-26	25	150	25	20.0	-	-	33.5			
29	GVNE90R/L20-29-1	20	125	20	20.2	1.75	8	28.0			
	GVNE90R/L20-29-2	20	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

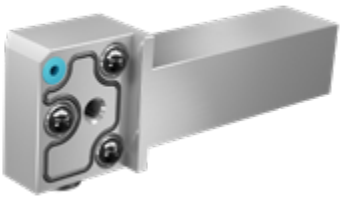


GV29 / GVN29

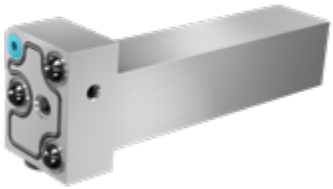
Modular System with High Pressure Coolant (HPC)

NEW

Square Bodies



Parallel



90°

V-CAP Holders

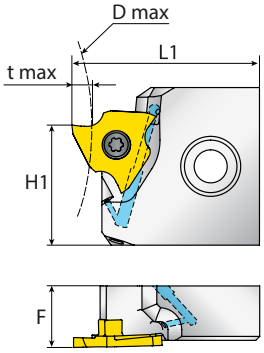
Parallel

90°

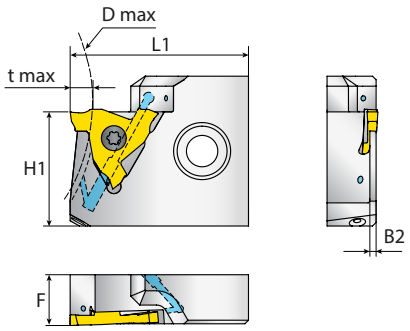
GrooVical Modules

GVN26

GVN29



GVN26



GVN29

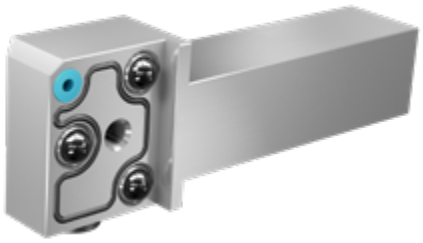
Modules with High Pressure Coolant

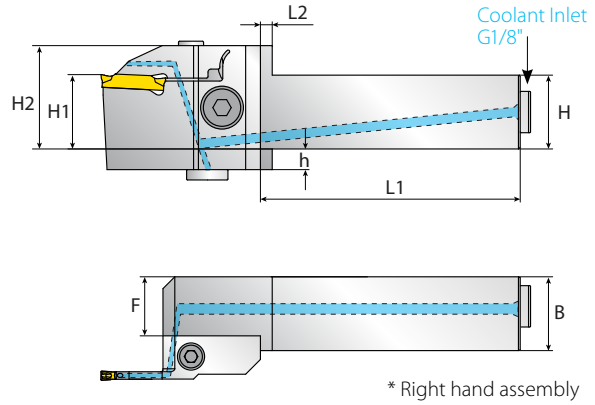
Insert Size	Ordering Code	Dimensions mm						Spare Parts	
	RH/LH	L1	H1	F	B2	t max	D max	Insert Screw*	Torx Key
26	GVNAR/L26-T5.5C	50	32	15.55	-	5.5	See page 44	SGM5	L20IP
29	GVNAR/L29-T6.5-1C	50	32	14.25	1.75	6.5			
	GVNAR/L29-T6.5-2C				2.75	6.5			

* Tightening Torque: 4.5 Nm max.

Modular Bodies with High Pressure Coolant

NEW



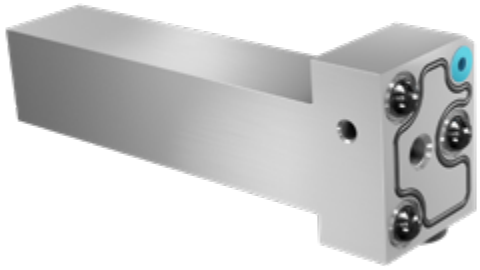


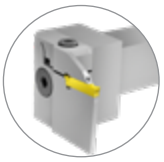
* Right hand shown

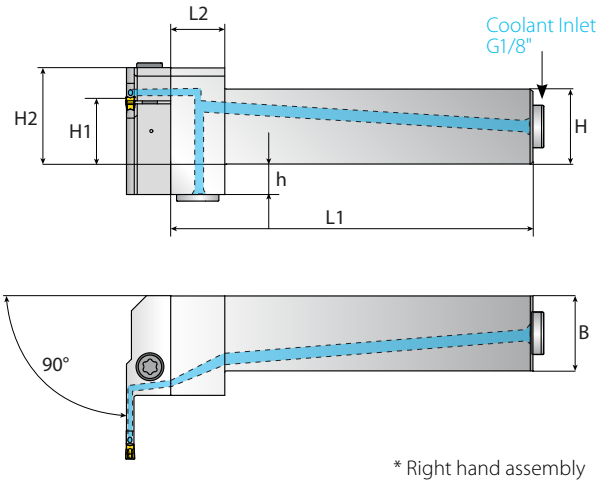
* Right hand assembly

Parallel Square Bodies with HPC

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







* Right hand shown

* Right hand assembly

90° Square Bodies with HPC

Ordering Code	Dimensions mm						Spare Parts				
RH/LH	H/H1	B	H2	h	L1	L2	Clamping Screw*	Key	Plug Screw	Coolant Seal	Anti Vibration O-Ring
VBMR/L2020-90-C	20	20	30	12	111	18	SM8x25	K6H	Plug G1/8"	Coolant Sleeve	O-RING Body Seal
VBMR/L2525-90-C	25	25	35	7	120	18					
VBMR/L3232-90-C	32	32	42	0	130	18					

* Tightening Torque: 26 NM max.

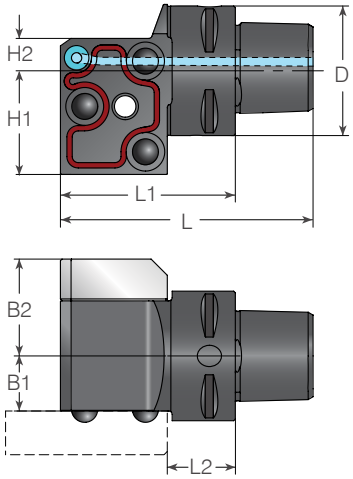
Necessary Parts When Using Modules with High Pressure Coolant Thru:

1. Tube Connector 25-6P (x1)
2. Fittings (x2): Straight Fitting G1_8x6P or Angled Fitting G1_8x6P

The above items are not included and should be ordered separately. **For more information please see page 21.**

Modular V-CAP Holders with HPC

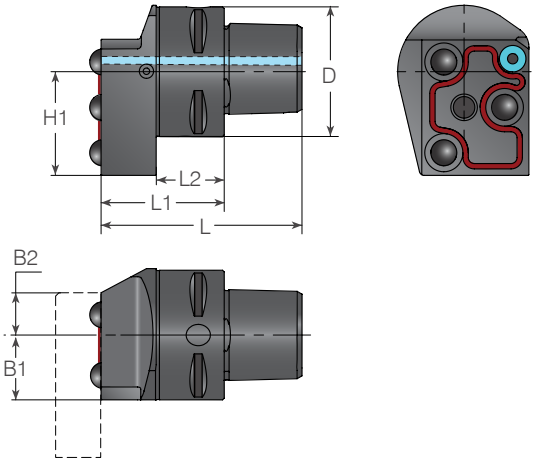
NEW



* Right hand shown

Parallel V-CAP Bodies with HPC

Ordering Code	Dimensions mm							Spare Parts				
	D	L	L1	L2	B1	B2	H1	Clamping Screw* (x2)	Key	Modular Cover	Coolant Seal	Anti Vibration O-Ring
VBC C4-00-C	40	78	54	21	17	29.9	32	SM8x18	K6H	VG-MC	Coolant Sleeve	O-RING Body Seal
VBC C5-00-C	50	88	58	21	19.5	32.4						
VBC C6-00-C	63	98	60	23	24.5	37.4						



* Right hand shown

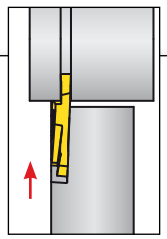
90° V-CAP Bodies with HPC

Ordering Code	Dimensions mm							Spare Parts			
RH/LH	D	L	L1	L2	B1	B2	H1	Clamping Screw*	Key	Coolant Seal	Anti Vibration O-Ring
VBCR/L C4-90-C	40	64	40	21	20	13.0	32	SM8x18	K6H	Coolant Sleeve	O-RING Body Seal
VBCR/L C5-90-C	50	70	40	21	26.5	6.75					
VBCR/L C6-90-C	63	78	40	23	32.7	0.5					

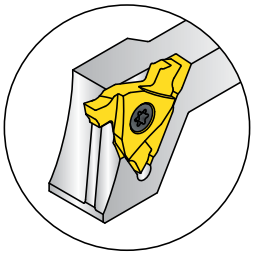
V-CAP holders are according to ISO 26623.

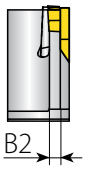
* Tightening Torque: 26 Nm max.

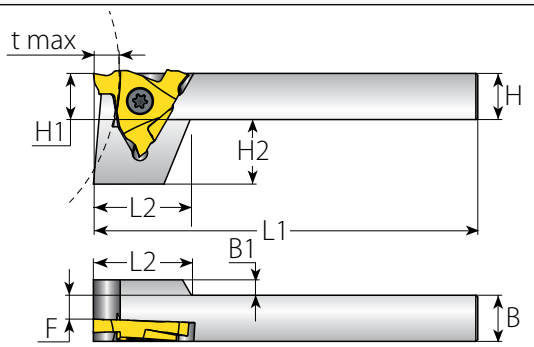
External Toolholders (GV29)



Right hand shown



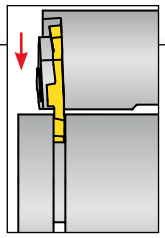




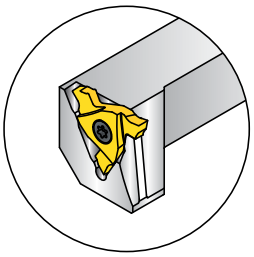
Insert Size	Ordering Code	Dimensions mm									Spare Parts	
	RH/LH	H=B	L1	H1	L2	H2	F	B1	B2	t max/D max	Insert Screw*	Torx Key
29	GVER/L12-29-1	12	100	12	25.5	16	7.2	4	1.75	See page 44	SGM5	L20IP
	GVER/L12-29-2	12	100	12	25.5	16	6.2	4	2.75			
	GVER/L16-29-1	16	125	16	23.2	12	11.2	-	1.75			
	GVER/L16-29-2	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			

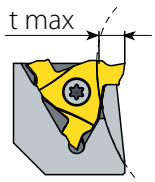
* Tightening Torque 4.5 Nm

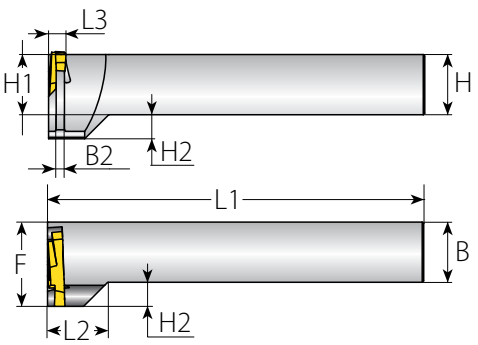
External Toolholders 90° (GV29)



Right hand shown

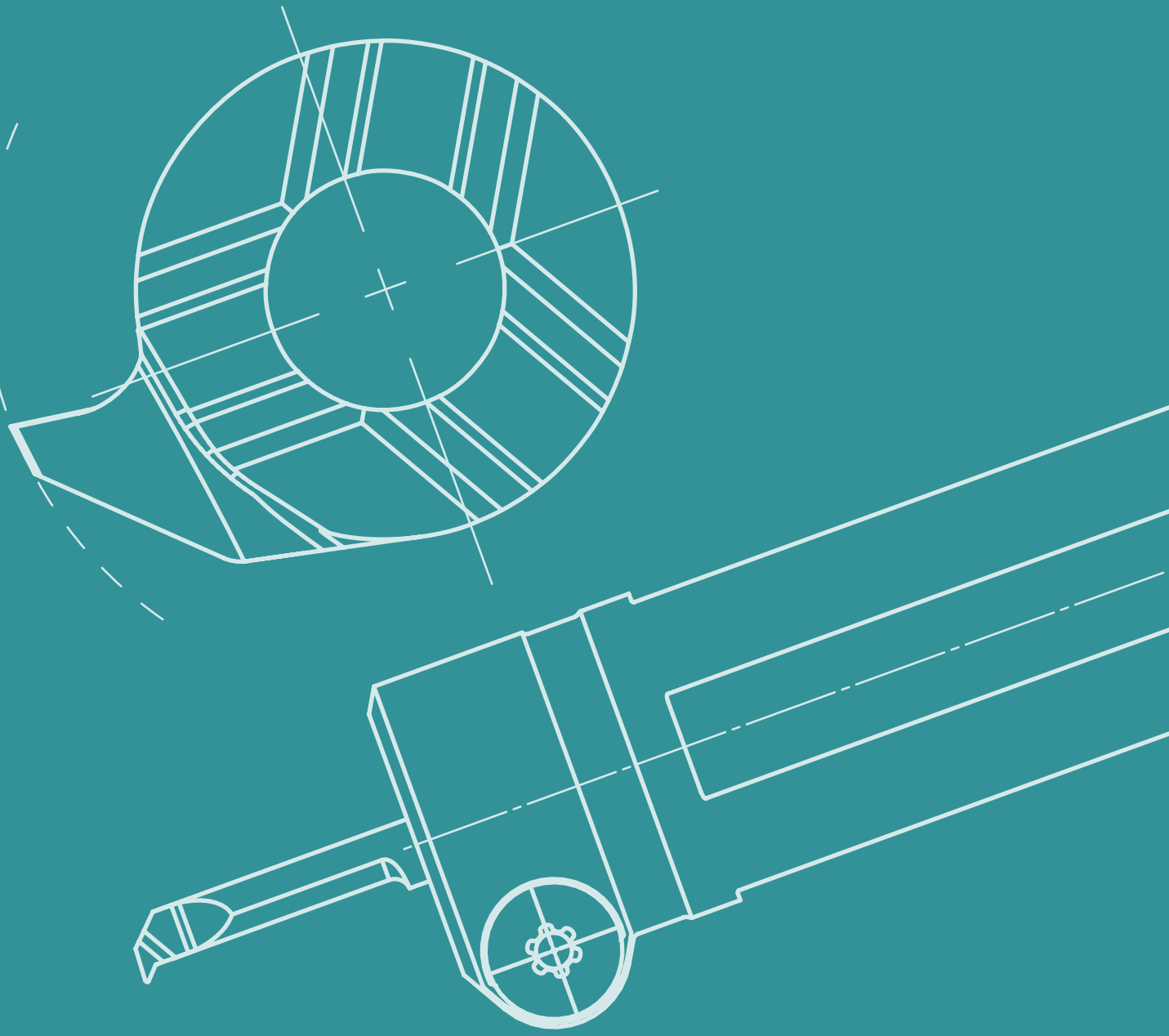






Insert Size	Ordering Code	Dimensions mm									Spare Parts	
	RH/LH	H=B	L1	H1	L2	H2	F	L3	B2	t max/D max	Insert Screw*	Torx Key
29	GVE90R/L20-29-1	20	125	20	20.2	8	28	4.8	1.75	See page 44	SGM5	L20IP
	GVE90R/L20-29-2	20	125	20	20.2	8	28	5.8	2.75			
	GVE90R/L25-29-1	25	150	25	25.2	8	33	4.8	1.75			
	GVE90R/L25-29-2	25	150	25	25.2	8	33	5.8	2.75			

* Tightening Torque 4.5 Nm



INTERNAL MACHINING

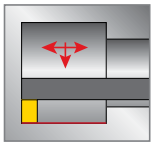
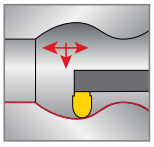
INTERNAL MACHINING | **SEMI FINISHING**

VG-Cut

Internal Grooving & Turning Applications

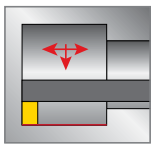
Tech Guide

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

Material Group	Vargus No.	Material		Hardness Brinell HB	Carbide Grade VMG PVD M35	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		Hardened	350	40-70	50-100	60-160
	7	High Alloy Steel (alloying elements>5%)	Annealed	200	50-100	90-150	90-250
	8		Hardened	325	40-70	50-100	60-160
	9	Cast Steel	Low Alloy (alloying elements <5%)	200	50-100	90-150	90-250
	10		High Alloy (alloying elements >5%)	225	50-100	60-150	60-180
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

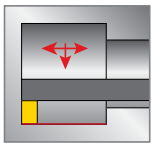
Vc [m/min] for Boring



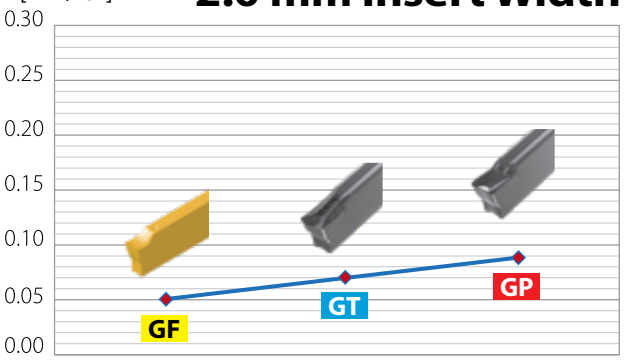
Reduce speed by ≈ 30% for improved chip forming and evacuation.

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

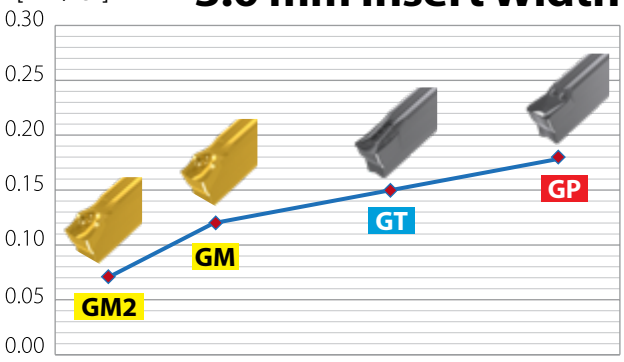


2.0 mm Insert Width



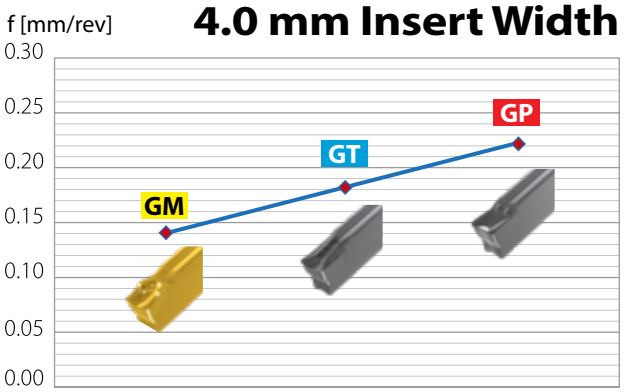
Chip Former	GF	GT	GP
f [mm/rev]	0.06	0.08	0.10

3.0 mm Insert Width



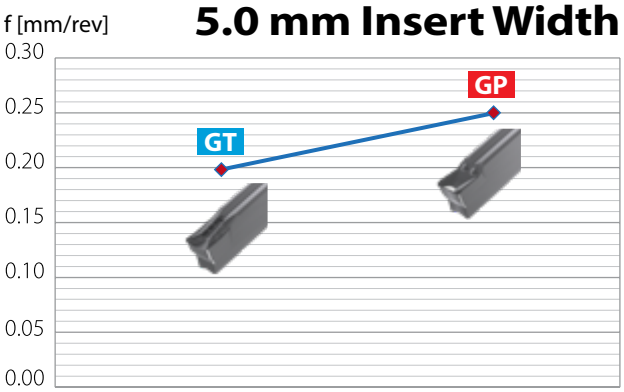
Chip Former	GM2	GM	GT	GP
f [mm/rev]	0.07	0.12	0.15	0.18

4.0 mm Insert Width



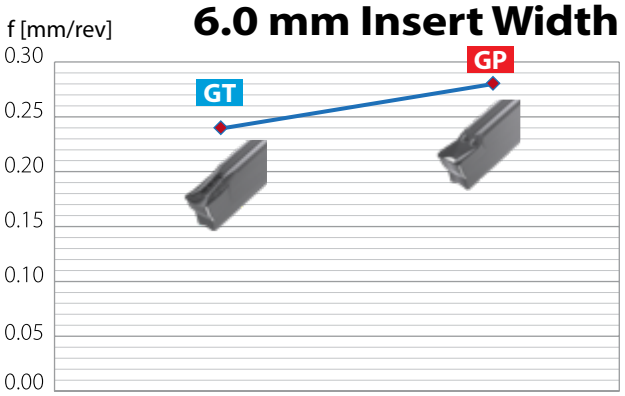
Chip Former	GM	GT	GP
f [mm/rev]	0.14	0.18	0.22

5.0 mm Insert Width



Chip Former	GT	GP
f [mm/rev]	0.20	0.25

6.0 mm Insert Width

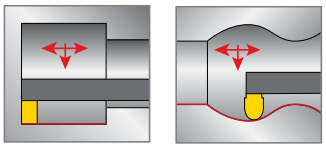


Chip Former	GT	GP
f [mm/rev]	0.24	0.28

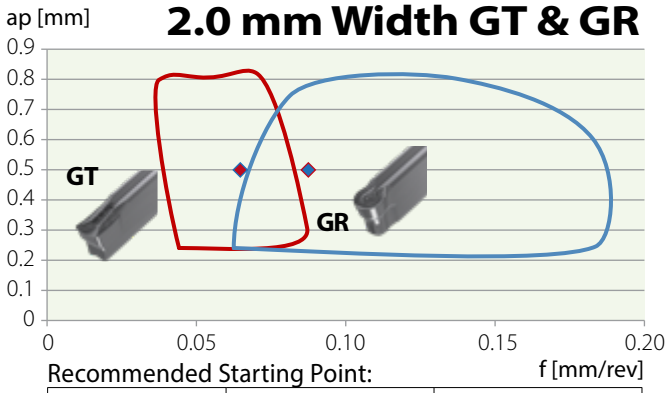
For better chip evacuation in Grooving, creating short chips is preferable. It is therefore recommended to work in short intervals (pecking), at a maximum grooving depth of twice the insert width. Taking into consideration the workpiece material and groove diameter, it is recommended to begin the first 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



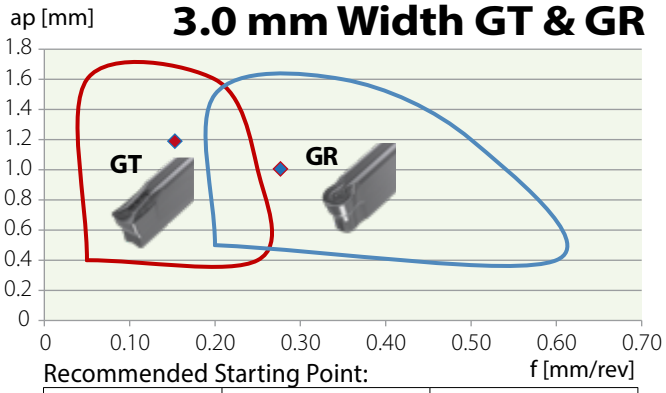
2.0 mm Width GT & GR



Recommended Starting Point:

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

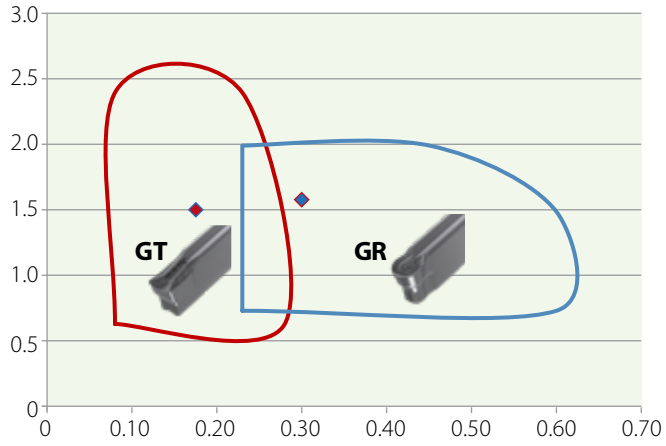
3.0 mm Width GT & GR



Recommended Starting Point:

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

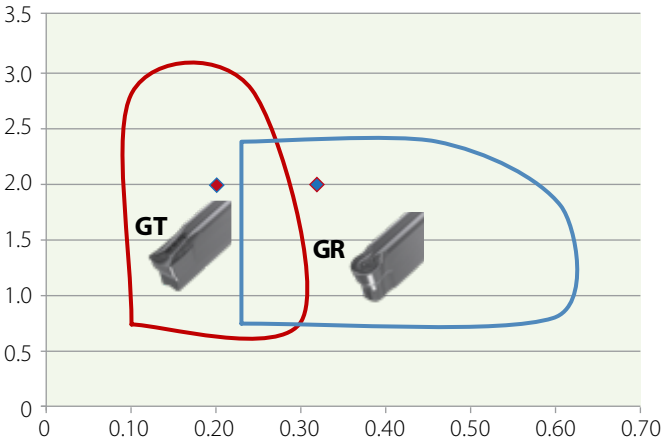
4.0 mm Width GT & GR



Recommended Starting Point:

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

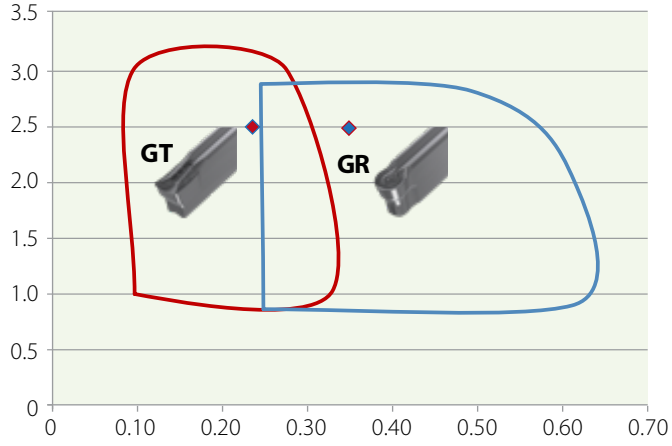
5.0 mm Width GT & GR



Recommended Starting Point:

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

6.0 mm Width GT & GR



Recommended Starting Point:

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

VG-Cut Internal Tools

VG-Cut Tools Ordering Code

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

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

5 – Pocket Size	6 – Coolant
2, 3, 4, 5, 6	C - Coolant

Internal VG-Cut

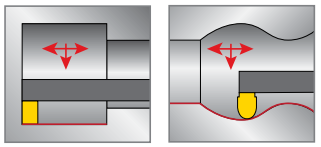
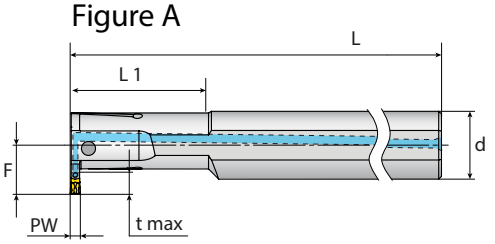


Figure A



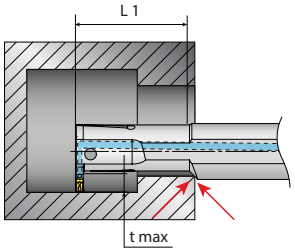
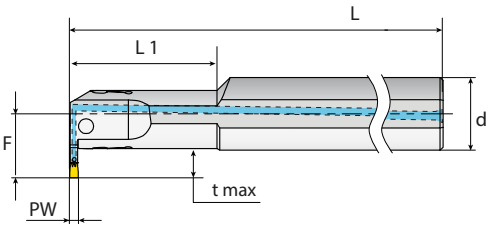
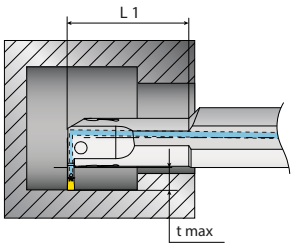


Figure B NEW





*Right hand shown

Figure A

Spare Parts

Ordering Code		Dimensions mm						Spare Parts	
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		
VGIR/L-25-32-3C		9	50.5	32	25	18.0	200	SM5x16	
VGIR/L-32-40-3C		11	64.0	40	32	22.0	250	SM5x20	
VGIR/L-20-28-4C	4	9	41.0	28	20	16.5	180	SM5x12	
VGIR/L-25-32-4C		9	51.0	32	25	18.0	200	SM5x16	
VGIR/L-32-40-4C		11	64.0	40	32	22.0	250	SM5x20	
VGIR-32-40-5C	5	11	64.0	40	32	22.0	250		

* Tightening Torque: For 2 PW holders - 4 Nm max.; For 3-6 PW holders - 7 Nm max.

For suitable VG-Cut inserts, please see page 23.

Figure B - Dimension L1 no longer limits machining on the axial plane NEW

Spare Parts

Ordering Code		Dimensions mm						Spare Parts	
RH/LH	PW	t max	L1	D min	d	F	L	Screw*	Key
VGIR/L-20-24-2C	2	7.5	40.0	24	20	17.5	180	SM5x12	K4H
VGIR/L25-31-2C		9.5	50.0	31	25	22.0	200	SM5X14	
VGIR/L-20-24-3C	3	7.5	40.0	24	20	17.5	180	SM5x12	
VGIR/L-25-31-3C		9.5	50.0	31	25	22.0	200	SM5X14	
VGIR/L-32-39-3C		11.5	63.0	39	32	27.5	250		
VGIR/L-20-27-4C	4	9.5	41.0	27	20	19.5	180	SM5x12	
VGIR/L-25-31-4C		9.5	50.0	31	25	22.0	200	SM5X14	
VGIR/L-32-39-4C		11.5	63.0	39	32	27.5	250		
VGIR-32-39-5C	5	11.5	63.0	39	32	27.5	250		
VGIR-40-50-6C	6	11.5	80.0	50	40	30.5	300	SM5X20	

* Tightening Torque: For 2 PW holders - 4 Nm max.; For 3-6 PW holders - 7 Nm max.

For suitable VG-Cut inserts, please see page 23.

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 Cast Ferritic	Non Hardened	200	80-110
	16		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

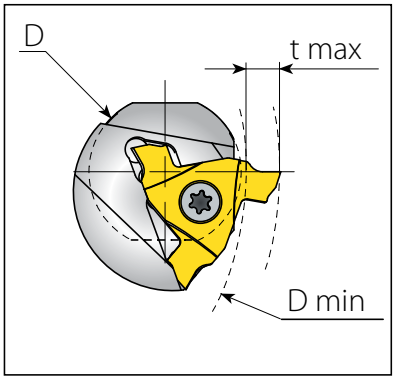
	High Alloy Steel, 330 HB, 2100 Kc [N/mm²]		**Austenitic Stainless Steel**, 200 HB, 2600 Kc [N/mm²]	
Insert Width (mm)	Depth ap = Insert Width x variable	Average f mm/rev	Depth ap = Insert Width x variable	Average f mm/rev
0.4 mm - 0.9 mm	0.055	0.04	0.035	0.02
1.0mm - 1.5mm	0.055	0.07	0.035	0.04
1.6 mm -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

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



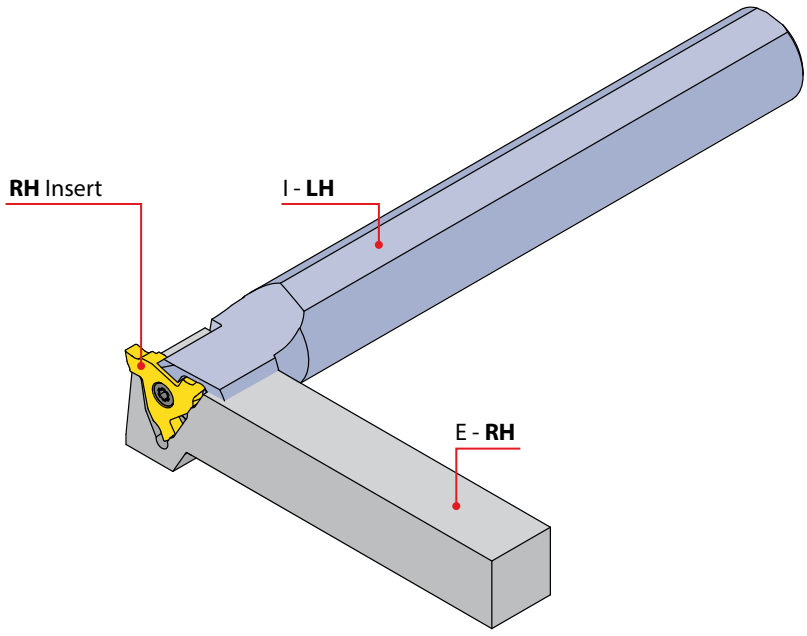
GrooVical Holders

GrooVical Holders Ordering Code

GVN	I	R	25	-	29
1	2	3	4		5

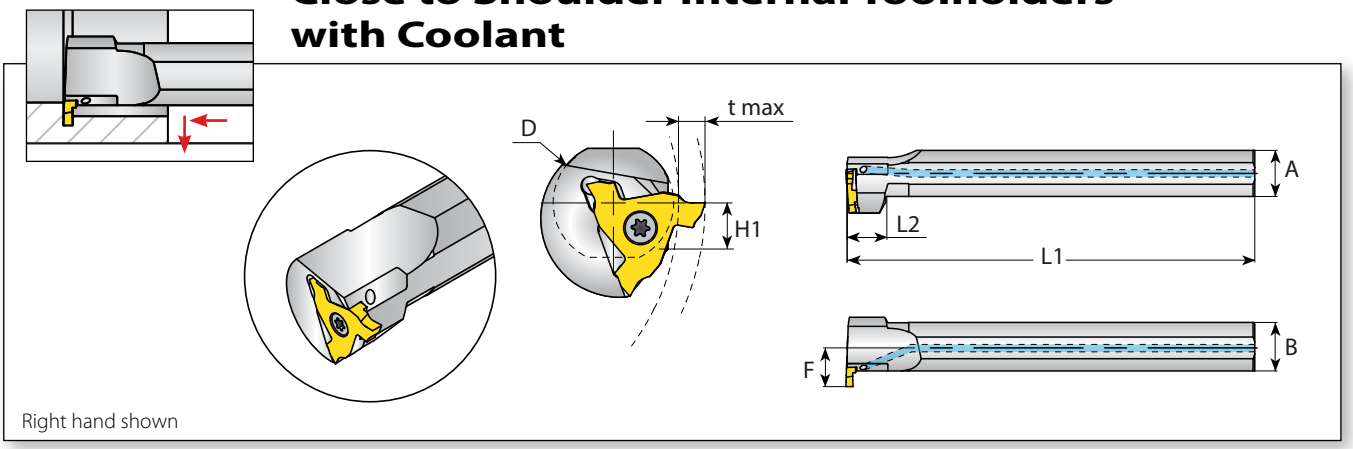
1- Insert Type	2 - Type	3 - RH or LH	4 - Shank Size	5 - Insert Size
GVN - Groovical Close to Shoulder **GV** - Groovical Neutral	**I** - Internal	**R** - RH **L** - LH	25, 32 mm	29

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



GV29 / GVN29

Close to Shoulder Internal Toolholders with Coolant



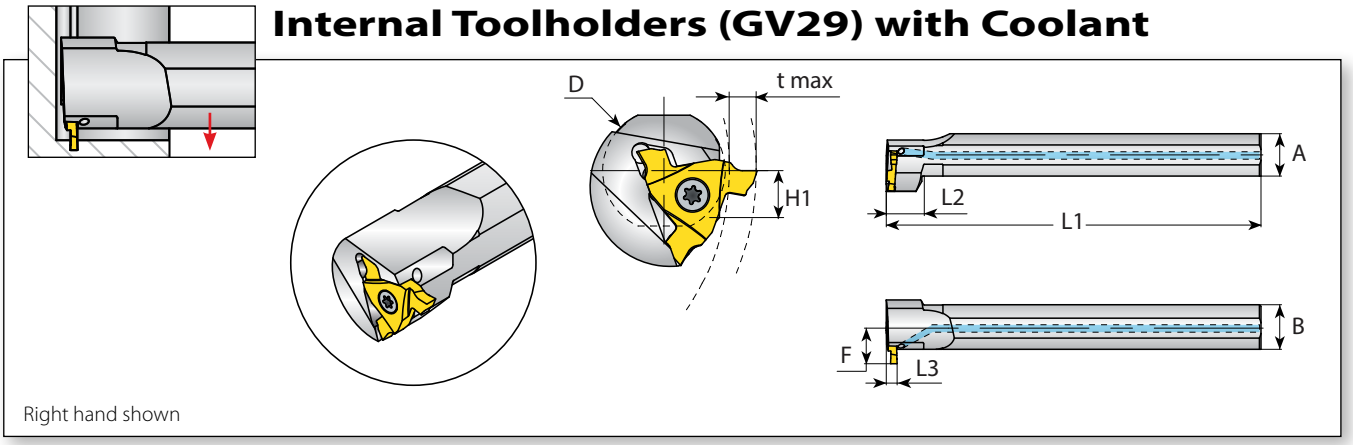
Right hand shown

Insert Size	Ordering Code	Dimensions mm								Spare Parts	
	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 69	SGM5	L20IP
	GVNIR/L32-29	32	250	19	29.0	30.5	14.5	22.2			

For suitable GVN29 inserts, please see pages 46-50.

* Tightening Torque 4.5 Nm.

Internal Toolholders (GV29) with Coolant



Right hand shown

Insert Size	Ordering Code	Dimensions mm									Spare Parts	
	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 69	SGM5	L20IP
	GVIR32-29	32	250	19	5.8	29.0	30.5	14.5	22.2			

For suitable GV29 inserts, please see page 51.

* Tightening Torque 4.5 Nm.

INTERNAL MACHINING | **FINISHING**

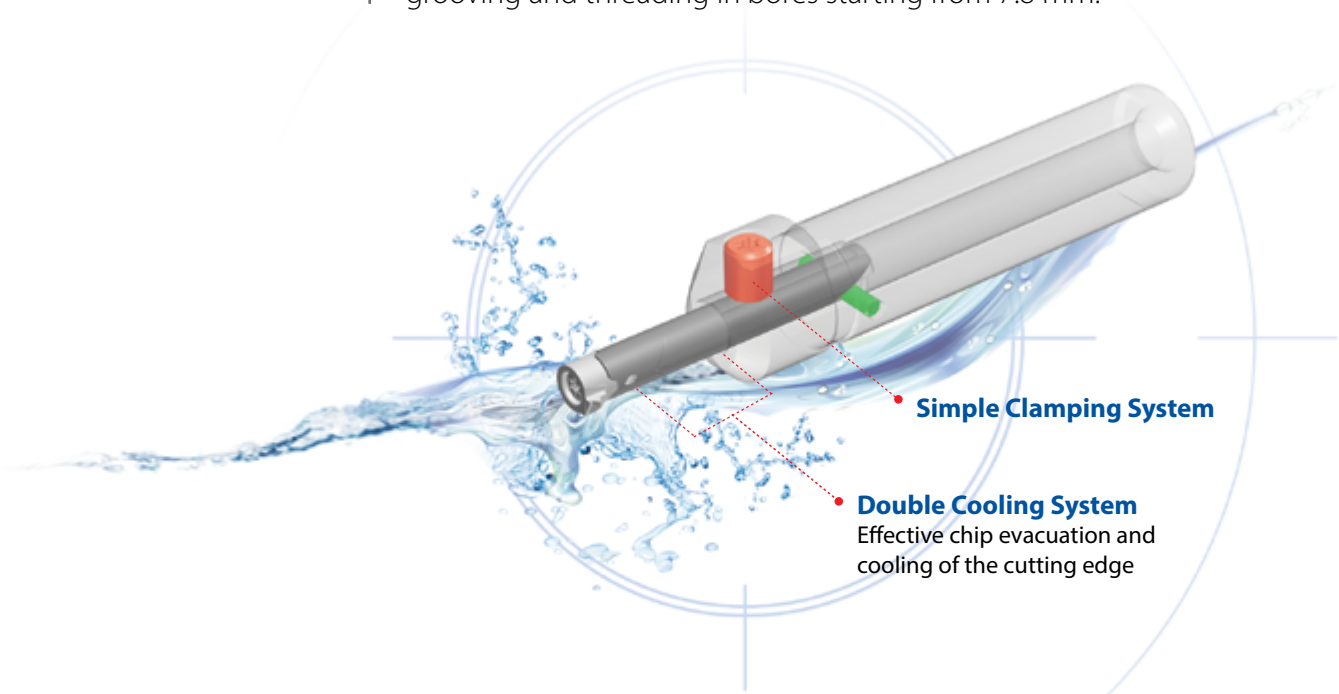
Mini-V

Precise Turning, Grooving, Threading & Face Grooving

Mini-V

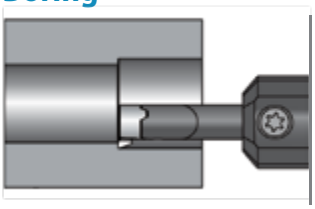
Mini Tools for Small & Medium Bores

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



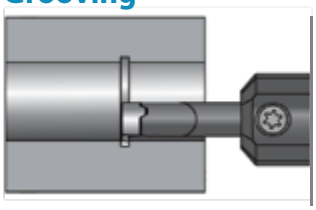
Applications

Boring



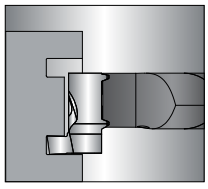
- Boring
- Boring with Chip Former
- Profiling
- Back Boring
- Chamfering

Grooving



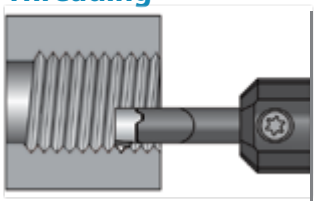
- Square Grooving D472
- Square Grooving
- Round Grooving

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 Vc [m/min]		Max Depth on R [mm]
					Threading	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

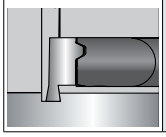
VTX

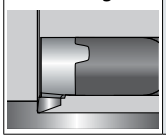
Excellent for Boring applications in medium-to-high cutting speeds and in dry conditions.
Multi-layered AlTiN PVD coated, general purpose grade for prevention of peeling and chipping.
***** For **VTX Grade**, increase speed by 20%.

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	0.02 - 0.05 mm/rev
	

Boring	0.03 - 0.15 mm/rev
	

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														
	NPTF			28				43							
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							
	TR										50-104		70-145		
V11	ISO														
	UN	11-24	17-35		23-48	14-28			17-34	20-40	23-46				
	W														
	BSPT						21-34								
	TR														90-187
V14	ISO														
	UN	11-24	17-35		23-48	14-28			9-15	11-18	11-18	12-21	18-24		
	W														
V16	ISO														
	UN	11-24	17-35		23-48	14-28			9-15	11-18	11-18	12-21	18-24		
	W														

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

Mini-V Inserts

Mini-V Inserts Ordering Code System

Boring Inserts

V	08	CL		R	VBX
1	2	3	4	5	6

1- Line Name
V - Mini-V

2 - Insert Size
08, 11, 14, 16

3 - Type of Application
BC - Boring
BCF - Boring with Chip Former
CL - Profiling
BB - Back Boring
CH45 - Chamfering 45°

4 - Copy Angle
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
V - Mini-V

2 - Insert Size
08 , 11, 14, 16

3 - Type of Application
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

4 - Groove Width
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

5 - Groove Depth
T100 - 1.0 mm
T230 - 2.3 mm
T400 - 4.0 mm
T430 - 4.3 mm

6 - RH or LH
R - RH
L - LH

7 - Carbide Grade
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

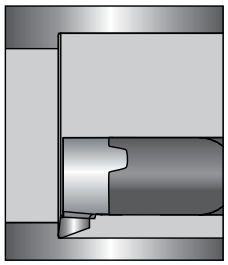
	TPI		mm
H	48-32	H	0.5-.75
I	24-20	I	1.0-1.25
J	16-14	J	1.5-1.75
G	14-8	G	1.75-3.0
AG	48-8	AG	0.5-3.0

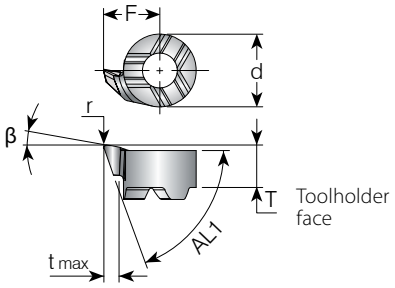
5 - Threading Standard
60° - Partial Profile 60°
55° - Partial Profile 55°
ISO - ISO Metric
UN - American UN
W - Whitworth for BSW, BSP
BSPT - British Standard Pipe Thread
NPT - NPT National Pipe Thread
NPTF - NPTF National Seal Pipe Thread
TR - Trapez Din 103

6 - RH or LH
R - RH
L - LH

7 - Carbide Grade
VBX
VTX

Boring

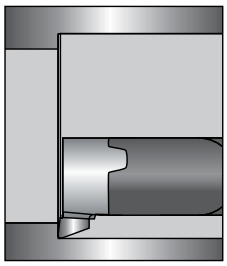


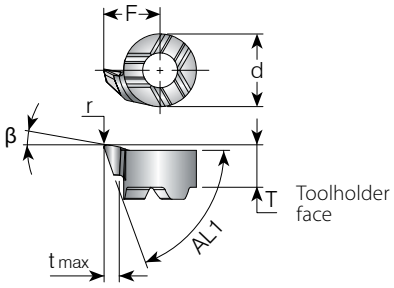


Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grades	
	RH	r	d	T	t max	AL1	β	F	mm	VBX	VTX
V08	V08BC R	0.2	6	3.65	1.3	69.8°	8°	4.65	7.8	•	•
V11	V11BC R	0.2	8	4.0	2.3	69.8°	3°	6.70	11.0	•	•
V14	V14BC R	0.2	9	5.6	4.0	69.8°	8°	8.7	13.8	•	•
V16	V16BC R	0.2	11	5.6	4.3	69.8°	5.5°	9.7	15.5	•	•

• In stock ∘ Available upon request

Boring with Chip Former

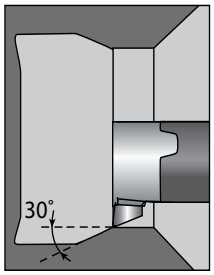


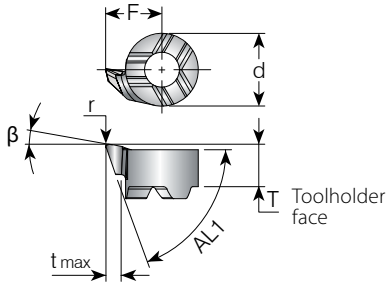


Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grades	
	RH	r	d	T	t max	AL1	β	F	mm	VBX	VTX
V08	V08BCF R	0.2	6	3.65	1.3	69.8°	8°	4.65	7.8	•	•
V11	V11BCF R	0.2	8	4.0	2.2	69.8°	3°	6.70	11.0	•	•

• In stock ∘ Available upon request

Profiling 30°

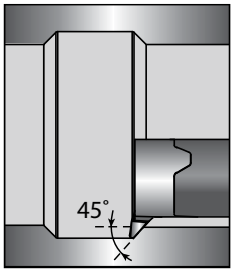


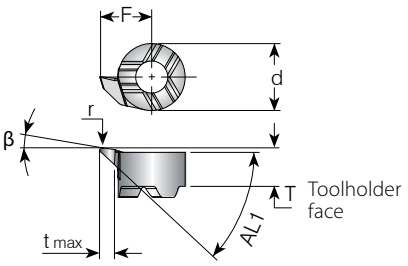


Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grades	
	RH	r	d	T	t max	AL1	β	F	mm	VBX	VTX
V08	V08BC3 R	0.2	6	3.65	1.3	59.8°	8°	4.65	7.8	•	•
V11	V11BC3 R	0.2	8	4.0	2.3	59.8°	3°	6.70	11.0	•	•

• In stock ○ Available upon request

Profiling 45°

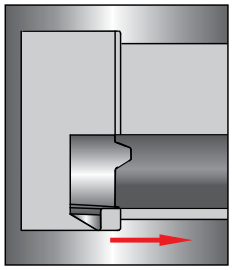


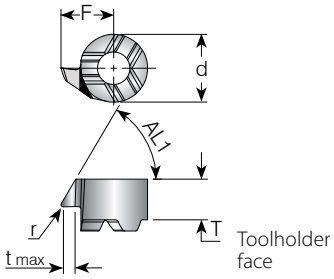


Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grades	
	RH	r	d	T	t max	AL1	β	F	mm	VBX	VTX
V08	V08CL R	0.2	6	3.65	1.2	43°	5.5°	4.65	7.8	•	•
V11	V11CL R	0.2	8	4.1	2.3	43°	7°	6.70	11.0	•	•
V14	V14CL R	0.2	9	5.6	4.0	43°	6°	8.7	13.7	•	•
V16	V16CL R	0.2	11	5.6	4.3	43°	5.5°	10.2	15.8	•	•

• In stock ○ Available upon request

Back Boring

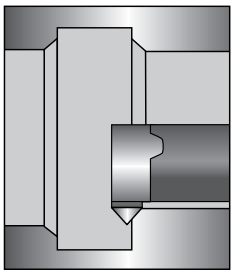


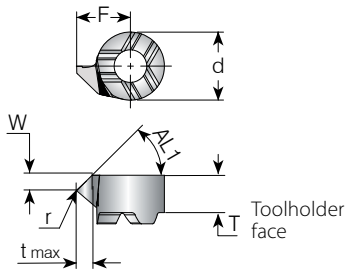


Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	r	d	T	t max	AL1	F	mm	VBX	VTX
V08	V08BB R	0.2	6	3.8	1.2	59.5°	4.65	7.8	•	•
V11	V11BB R	0.2	8	4.0	2.2	59.5°	6.70	11.0	•	•
V14	V14BB R	0.2	9	5.6	3.5	59.5°	8.70	13.8	•	•

• In stock ∘ Available upon request

Chamfering

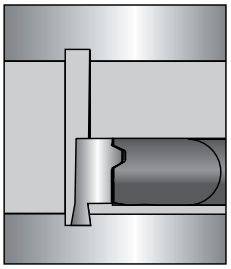


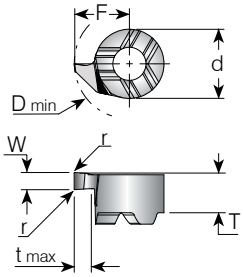


Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grades	
	RH	r	d	W$^{+0.03}$	T	t max	AL1	F	mm	VBX	VTX
V08	V08CH45 R	0.2	6	1.3	3.8	1.0	45°	4.65	8.0	•	•
V14	V14CH45 R	0.2	9	2.7	5.6	2.6	45°	9	14.0	•	•

• In stock ∘ Available upon request

Grooving DIN 472 - Sharp Corner Radius

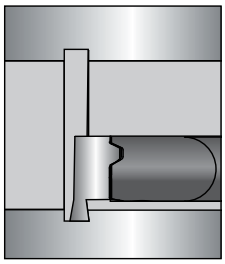


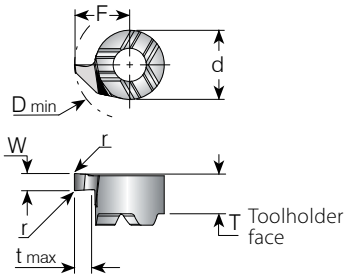


Insert Style	Ordering Code	Width of Circlip		Dimensions mm					Min. Bore Dia.	Grades	
	RH	mm	$W^{+0.03}$	d	t max	T	F	r	D min	VBX	VTX
V08	V08D472 W070T100 R	0.7	0.73	6	1.0	3.6	4.8	0	8	•	•
	V08D472 W080T100 R	0.8	0.83							•	•
	V08D472 W090T100 R	0.9	0.93							•	•
	V08D472 W110T100 R	1.1	1.20							•	•
	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

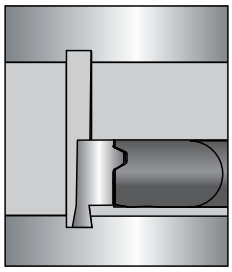


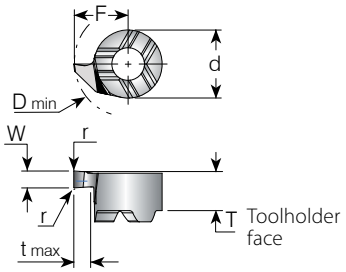


Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	$W^{+0.03}$	t max	T	F	r	D min	VBX	VTX
V08	V08GS W078T100 R	6	0.78	1.0	3.6	4.8	0.05	8	•	•
	V08GS W086T100 R		0.86						•	•
	V08GS W100T100 R		1.00						•	•
	V08GS W117T100 R		1.17						•	•
	V08GS W150T100 R		1.50						•	•
	V08GS 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						•	•
	V11GS W318T230 R		3.18						•	•
V14	V14GS W117T400 R	9	1.17	4.0	5.6	9.0	0.05	14	•	•
	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						•	•
	V14GS W300T400 R		3.00						•	•
	V14GS W318T400 R		3.18						•	•
V16	V16GS W117T430 R	11	1.17	4.3	5.6	10.2	0.05	16	•	•
	V16GS W142T430 R		1.42						•	•
	V16GS W157T430 R		1.57						•	•
	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						•	•
	V16GS W400T430 R		4.00						•	•

• In stock ∘ Available upon request

Grooving - 0.2 mm Corner Radius

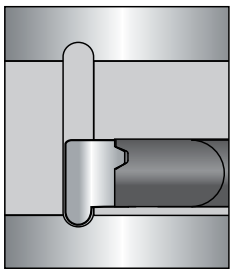


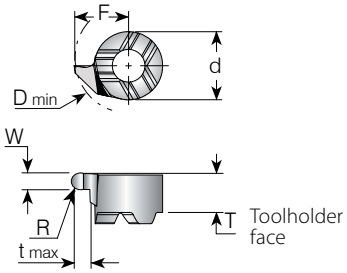


Insert Style	Ordering Code			Dimensions mm				Min. Bore Dia.	Grades	
	RH	d	W$^{+0.03}$	t max	T	F	r	D min	VBX	VTX
V08	V08GSR W078T100 R	6	0.78	1.0	3.6	4.8	0.2	8	•	•
	V08GSR W117T100 R		1.17						•	•
	V08GSR W150T100 R		1.50						•	•
	V08GSR W157T100 R		1.57						•	•
	V08GSR W198T100 R		1.98						•	•
V11	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						•	•
	V11GSR W318T230 R		3.18						•	•
V14	V14GSR W078T400 R	9	0.78	4.0	5.6	9.0	0.2	14	•	•
	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						•	•
	V14GSR W318T400 R		3.18						•	•
V16	V16GSR W117T430 R	11	1.17	4.3	5.6	10.2	0.2	16	•	•
	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 - DIN 7993



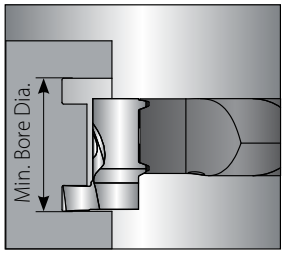


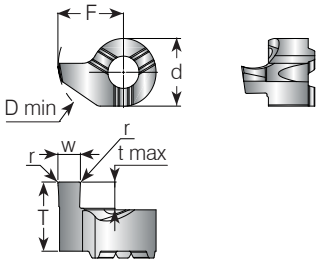
Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	W$^{+0.03}$	t max	T	F	r	D min	VBX	VTX
V08	V08D7993 W080T100 R	6	0.80	1.0	3.6	4.8	0.4	8	•	•
	V08D7993 W120T100 R		1.20				0.6		•	•
	V08D7993 W160T100 R		1.60				0.8		•	•
	V08D7993 W180T100 R		1.80				0.9		•	•
	V08D7993 W200T100 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



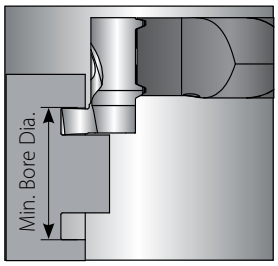


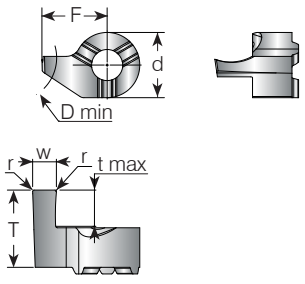
Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	W$^{+0.03}$	t max	T	F	r	D min	VBX	VTX
V-14	V14FGW100T150 R	9	1.00	1.5	7.7	9	0.2	14	•	○
	V14FGW150T250 R		1.50	2.5	8.7				•	○
	V14FGW200T300 R		2.00	3.0	9.2				•	○
	V14FGW200T500 R		2.00	5.0	10.7				•	○
	V14FGW250T300 R		2.50	3.0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



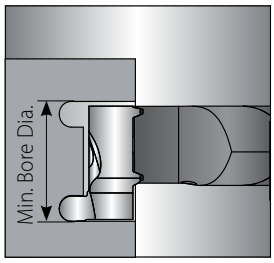


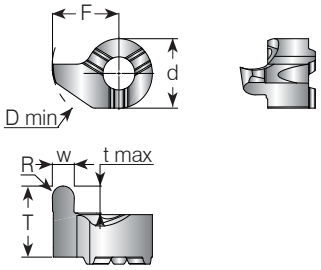
Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	W$^{+0.03}$	t max	T	F	r	D min	VBX	VTX
V-14	V14FEGW100T150 R	9	1.00	1.5	7.3	9	0.2	12	•	○
	V14FEGW150T250 R		1.50	2.5	8.3				•	○
	V14FEGW200T300 R		2.00	3.0	8.8				•	○
	V14FEGW200T500 R		2.00	5.0	10.7				•	○
	V14FEGW250T300 R		2.50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



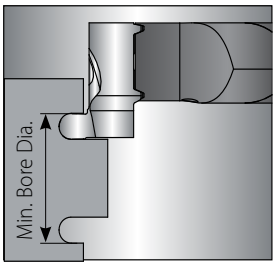


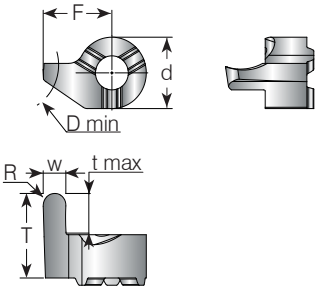
Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	W$^{+0.03}$	t max	T	F	r	D min	VBX	VTX
V-14	V14FGR050T150 R	9	1.00	1.5	7.7	9	0.5	14	•	○
	V14FGR100T300 R		2.00	3	9.2		1.0		•	○
	V14FGR150T300 R		3.00	3	9.2		1.5		•	○

• In stock ○ Available upon request

Round Face Grooving

External



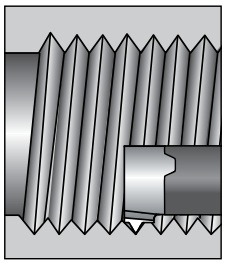


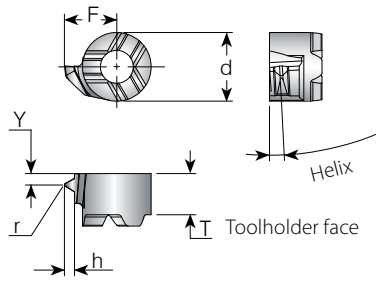
Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	W$^{+0.03}$	t max	T	F	r	D min	VBX	VTX
V-14	V14FEGR100T500 R	9	2.00	5	10.7	9	1.00	12	•	○
	V14FEGR125T500 R		2.50				1.25		•	○

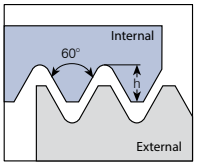
• In stock ○ Available upon request

Threading

Internal



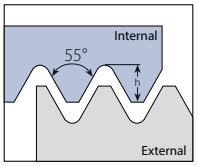




Partial Profile 60°

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



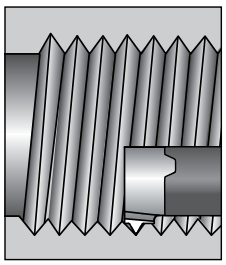
Partial Profile 55°

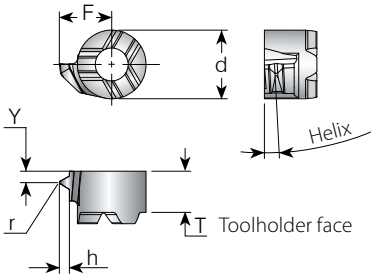
Insert Style	Pitch		Ordering Code	Dimensions mm						Helix	Grades	
	TPI	mm	RH	d	T	F	Y	r	h max	Deg.	VBX	VTX
V14	48-16	0.5-1.5	V14TH A55 R	9	5.7	9	0.9	0.05	1.71	1.5	•	•
	14-8	1.75-3.0	V14TH G55 R				1.7	0.21	2.700		•	•
	48-8	0.5-3.0	V14TH AG55 R				1.7	0.07	2.700		•	•
V16	48-16	0.5-1.5	V16TH A55 R	11	5.7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

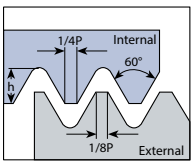
Threading

Internal





ISO Metric

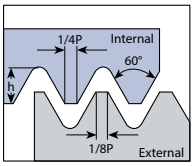


Defined by: R262 (DIN 13)
Tolerance class: 6g/6H

Min Thread	Insert Style	Ordering Code		Dimensions mm				Helix	Grades	
		mm	RH	d	T	F	Y	h min	Deg.	VBX	VTX
M8x.5	V08	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

American UN

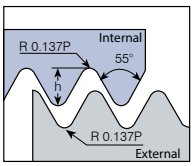


Defined by: ANSI B1.1:74
Tolerance class: 2A/2B

Min Thread	Insert Style	Ordering Code		Dimensions mm				Helix	Grades	
		TPI	RH	d	T	F	Y	h min	Deg.	VBX	VTX
3/8"-32UNEF	V08	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		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			4.78	1.1	1.05	3	•	•
9/16"-12UNC	V11	12	V11TH 12UN R	8	4.2	6.44	1.24	1.22	2.5	•	•

• In stock ∘ Available upon request

Whitworth - BSW, BSP, BSF, BSB



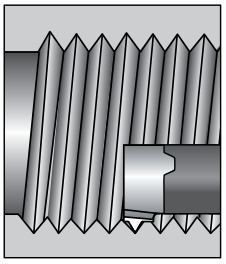
Defined by: B.S.84:1956, DIN 259, ISO228/1:1982
Tolerance class: Medium Class A

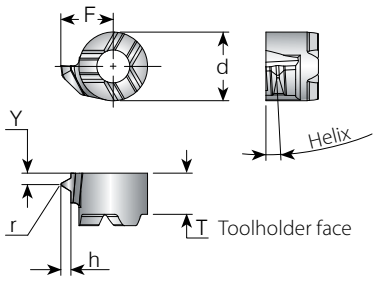
Min Thread	Insert Style	Ordering Code		Dimensions mm				Helix	Grades	
		TPI	RH	d	T	F	Y	h min	Deg.	VBX	VTX
1/2"x19W	V11	19	V11TH 19W R	8	4.2	6.18	0.8	0.86	2	•	•

• In stock ∘ Available upon request

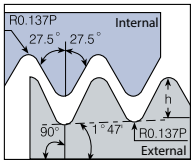
Threading

Internal





BSPT

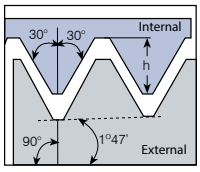


Defined by: B.S.21:1985
Tolerance class: Standard BSPT

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

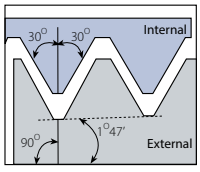


Defined by: USAS B2.1:1968
Tolerance class: Standard NPT

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

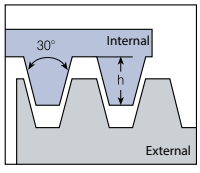


Defined by: ANSI 1.2.3-1976
Tolerance class: Standard NPTF

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

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

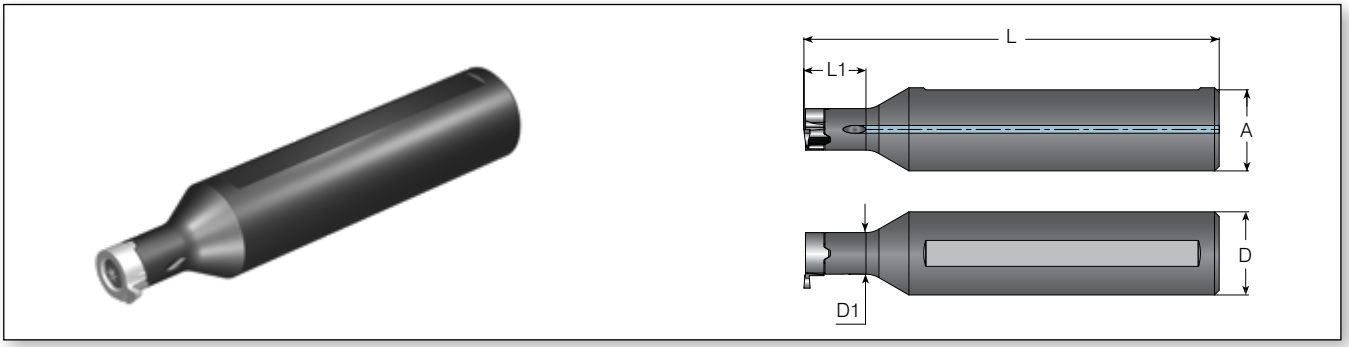
V-CAP Sleeve

MH	C	3	-	8	-	C4
1	2	S		5		6

1- Holder Type	2 - Coolant	3 - V-CAP System	4 - Shank Diameter	5 - Sleeve Bore Dia.
MH - Microscope Holder	**C** - Coolant Channels	**S** - V-CAP System	12, 16 , 20	6, 8

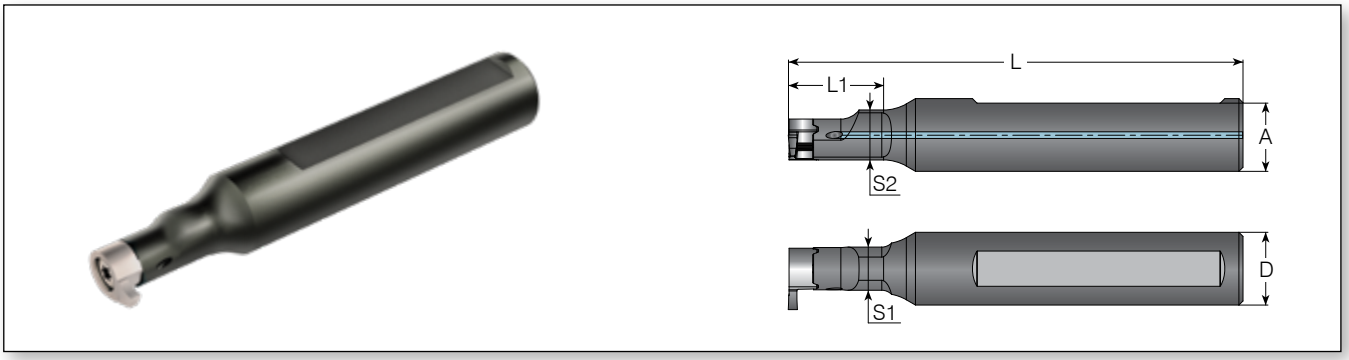
6 - V-CAP polygon Size
C3, C4

Alloy Steel Shank



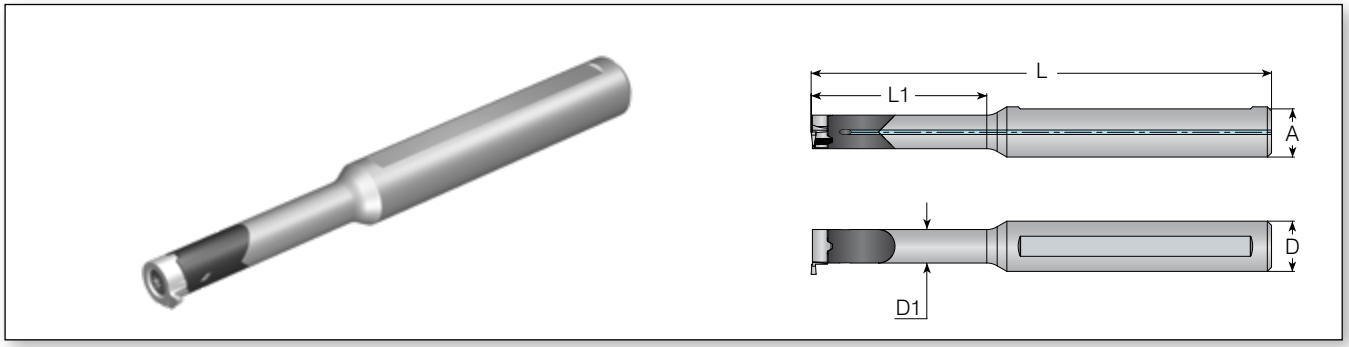
Insert Style	Ordering Code	Dimensions mm					Spare Parts		
	Holder RH	A	L	L1	D	D1	Screw	Tightening Torque	Key
V08	V08-1612	15.6	80	12	16	6	SNV08	0.65 Nm max.	K2T
V11	V11-1612	15.6	80	12	16	8	SNV11	2.0 Nm max.	K3T
V16	V16-1622	15	100	22	16	11	SNV16	5.0 Nm max.	K4T

Reinforced Alloy Steel Shank



Insert Style	Ordering Code	Dimensions mm						Spare Parts		
	Holder RH	A	L	L1	D	S1	S2	Screw	Tightening Torque	Key
V14	V14-1620	15.0	100	20	16	9.5	11	SNV14	2.8 Nm max.	KT15

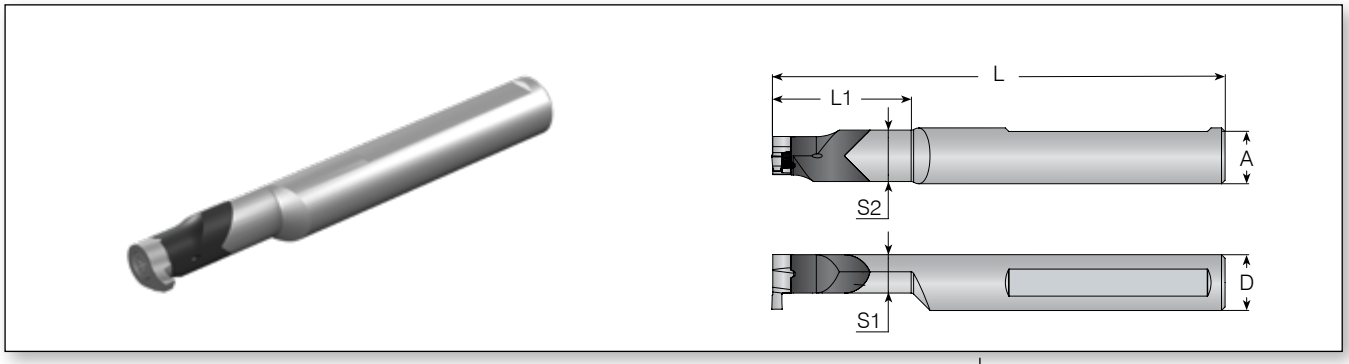
Carbide Shank



Insert Style	Holder RH	Dimensions mm A	L	L1	D	D1	Spare Parts: Screw	Tightening Torque	Key
V08	CV08-1221	11.5	80.5	21	12	6	SNV08	0.65 Nm max.	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	2.0 Nm max.	K3T
	CV11-1242		110	42					
	CV11-1256 *		120	56					
	CV11-1264 *		130	64					
V16	CV16-1240	11.0	130	40	12	11	SNV16	5.0 Nm max.	K4T
	CV16-1256		130	56					
	CV16-1280		150	80					

* For boring and chamfering only.

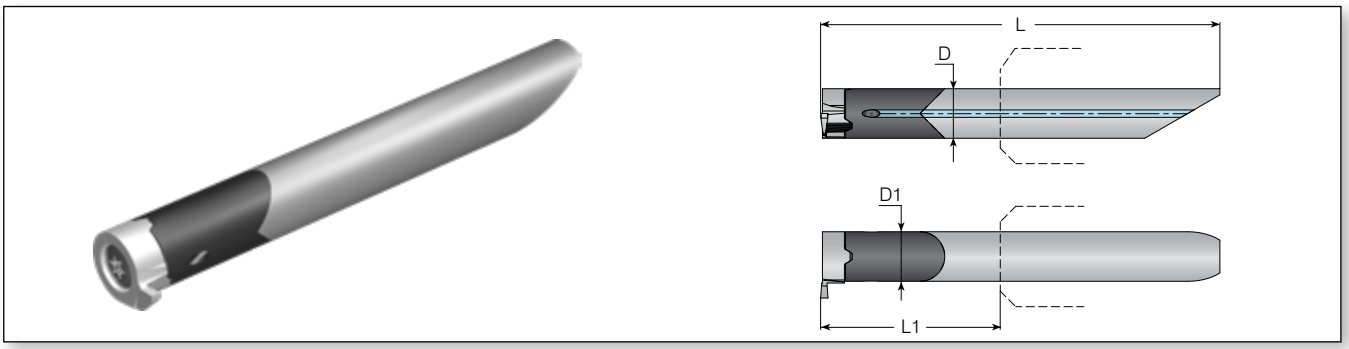
Reinforced Carbide Shank



Insert Style	Ordering Code Holder RH	Dimensions mm A	L	L1	D	S1	S2	Spare Parts: Screw	Tightening Torque	Key
V14	CV14-1234	11	100	34	12	9.3	11.9	SNV14	2.8 Nm max.	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	5.0 Nm max.	K4T
	CV16-1656*		129.7	55.7						
	CV16-1680*		149.7	79.7						

* For boring, chamfering and face grooving only.

Carbide Shank for Sleeves

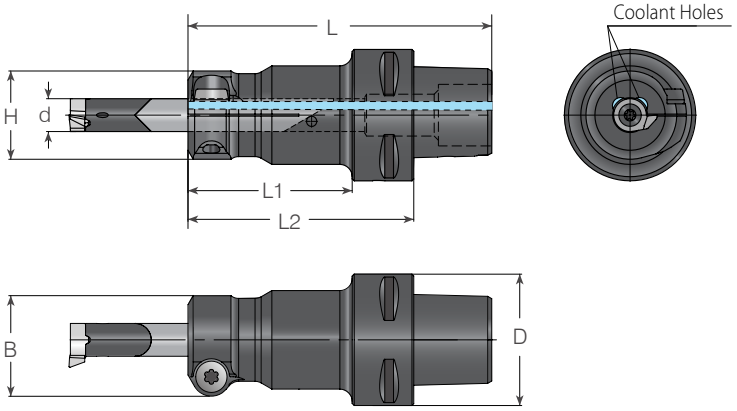


Insert Style	Ordering Code	Dimensions mm					Ordering Code	Spare Parts		
	Holder RH	A	L	L1	D	D1	Sleeve	Screw	Tightening Torque	Key
V08	CV08-0621	-	45	21	6	6	MHC ...-6	SNV08	0.65 Nm max.	K2T
	CV08-0630 *	-	54	30						
V11	CV11-0829	-	64.5	29	8	8	MHC...-8	SNV11	2.0 Nm max.	K3T
	CV11-0842*	-	77.5	42						

* For boring and chamfering only.

V-CAP Holders for Carbide Shank Sleeve Clamping

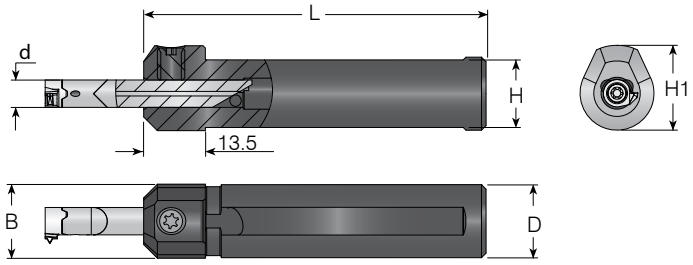
NEW



Micro Insert Dia.	Ordering Code	Dimensions mm						Spare Parts	
d (mm)		D	B	H	L1	L2	L	Shrink Screw*	Key
6.0	MHCS-6-C3	32.0	23.7	20.0	30.0	45.0	64.0	SM5X10-15IPX2**	L15IP / LX15IP
	MHCS-6-C4	40.0	23.7	20.0	30.0	50.0	74.0		
8.0	MHCS-8-C3	32.0	24.5	21.5	40.0	55.0	74.0		
	MHCS-8-C4	40.0	24.5	21.5	40.0	60.0	84.0		

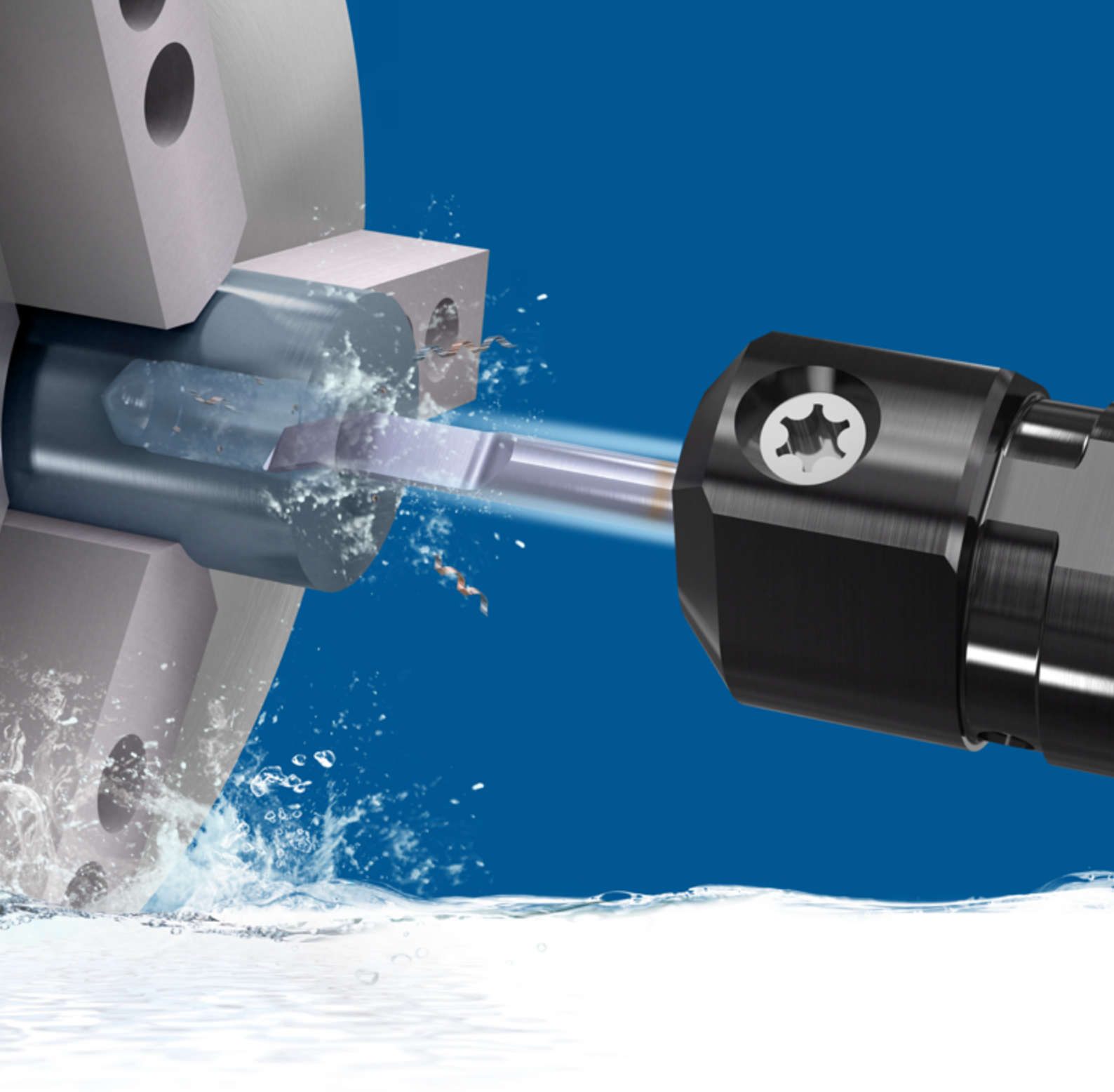
V-CAP holders are according to ISO 26623.
* Tightening Torque: 7 Nm max.
** SM5X10-15IPX2 is a special, double-sided screw. For an alternative screw, please use MS5X10 (key: S4).

Micro Holders for Carbide Shank Sleeve Clamping



Ordering Code		Dimensions mm				Spare Parts	
d		D=B	H1	H	L	Screw*	Key
6	MHC 12-6	12	16	10.8	70	SL7DT15	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		

* Tightening Torque: 2.8 Nm max.



INTERNAL MACHINING | **FINISHING**

micrOscope

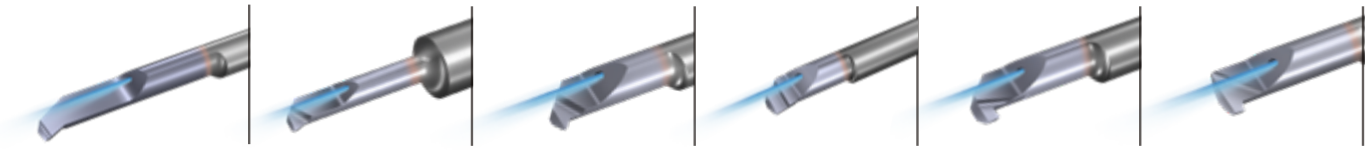
Precise Turning, Grooving, Threading & Face Grooving

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



Boring with Chip Breaker | Boring | Boring & Profiling | Boring with Chip Former | Square Grooving | Pre-Part Off

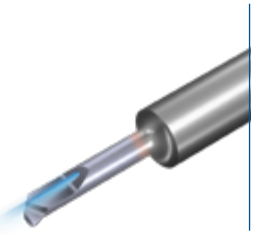
Miniature Toolholders

V-Cap Holder with Shrink Clamping | Shrink Toolholders | Round Toolholders without Shoulder | Double Sided Round Toolholders without Shoulder

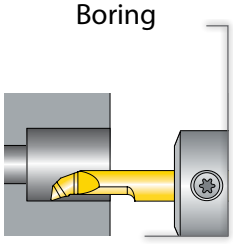
Applications

Boring

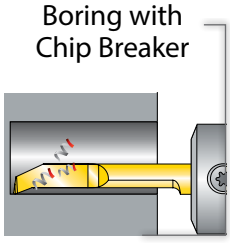
Pages 104 - 111



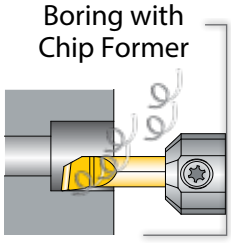
Boring



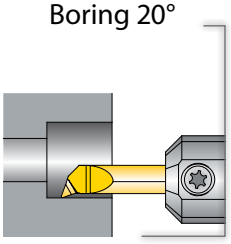
Boring with Chip Breaker



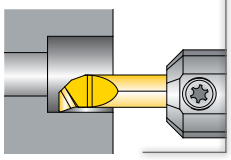
Boring with Chip Former



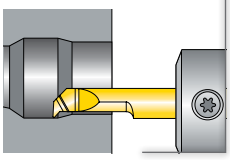
Boring 20°



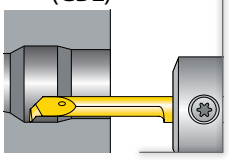
Boring 90°



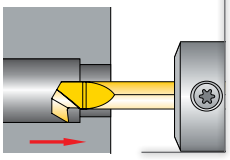
Boring & Profiling (CL)



Boring & Profiling with Chip Breaker (CBL)

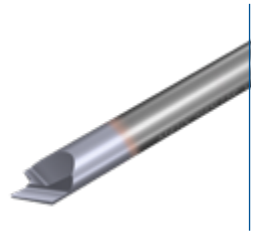


Back Boring

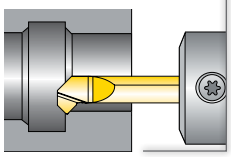


Chamfering

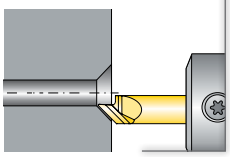
Page 112



Boring & Chamfering

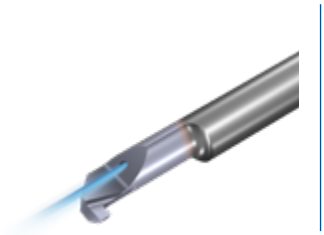


Face Chamfering

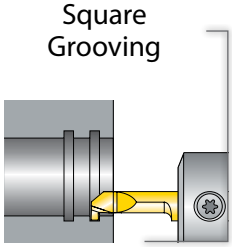


Grooving

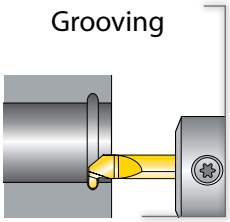
Pages 113 - 116



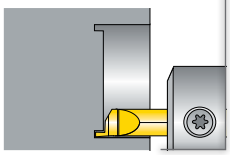
Square Grooving



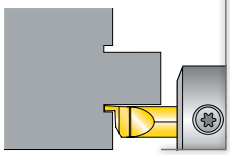
Round Grooving



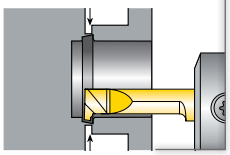
Face Grooving Internal



Face Grooving External

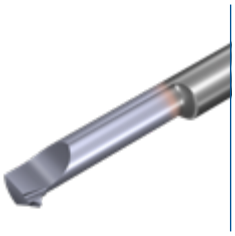


Pre-Part Off

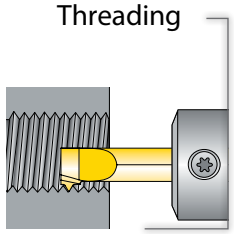


Threading

Pages 117 - 119



Threading

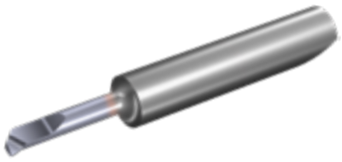


Boring Technical Data

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	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	20-45
	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 [ap max. (mm)] and Feed f[mm/rev]

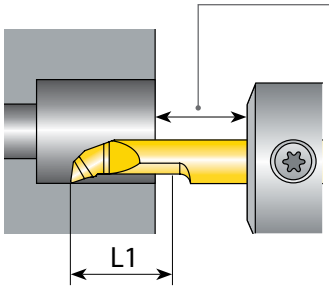
High Alloy Steel, 330 HB, 2100 Kc [N/mm^2]			
D min.	Vmax mm^2	ap max. (mm)	f mm/rev
1 mm - 1.7 mm	0.0012	0.08	0.015
1.8 mm - 2.7mm	0.0017	0.10	0.017
2.8 mm - 3.2 mm	0.0031	0.18	0.017
3.3 mm - 3.7 mm	0.0040	0.22	0.018
3.8 mm - 4.2 mm	0.0050	0.25	0.020
4.3 mm - 5.2 mm	0.0084	0.30	0.028
5.2 mm - 6.2 mm	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	ap max. (mm)	f mm/rev
1 mm - 1.7 mm	0.0009	0.06	0.015
1.8 mm - 2.7mm	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

- Vmax = Feed mm/rev x ap (mm)
- Exceeding the Vmax 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 Vmax, for higher metal removal
- Recommendations listed are for medium L1. Increase Vmax value by using shorter L1 tools

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

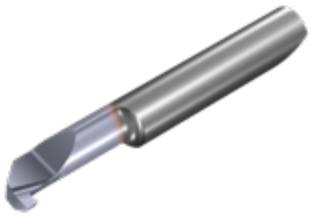


Grooving Technical Data

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

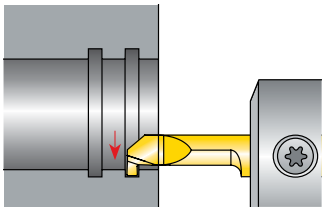
Material Group	Vargus No.	Material		Hardness Brinell HB	Vc[m/min] (Coated)	Feed f [mm/rev]
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	50-120	0.05
	2		Medium Carbon (C=0.25-0.55%)	150	40-100	0.05
	3		High Carbon (C=0.55-0.85%)	170	30-80	0.05
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	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

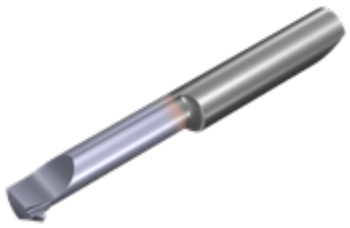
Excellent for all applications and outstanding wear resistance in low-to-medium cutting speeds, combined with good fracture toughness.
TiCN PVD coated.

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

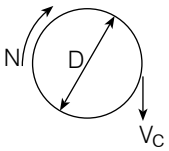


VBX - TiCN PVD coated
VTX - AlTiN PVD coated

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

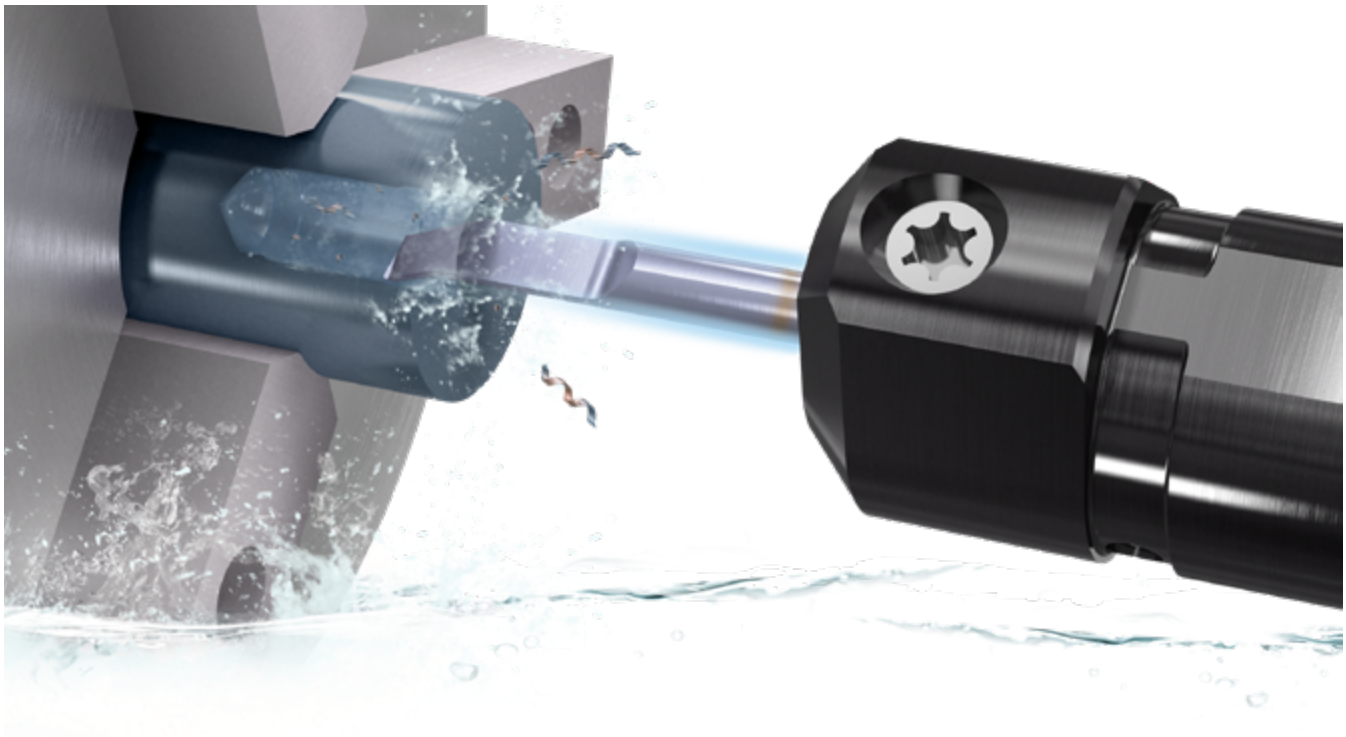
VTX

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



microscope Insert Ordering Code

Boring:

M	4	42	BC	R05	-	L10	R	C	VTX
1	2	3	4	5	6	7	8	9	10

Grooving:

M	5	52	GS	W100	-	L10	R	C	VBX
1	2	3	4	5	6	7	8	9	10

Threading:

M	5	42	TH	0.5	ISO	L16	R/L	-	VBX
1	2	3	4	5	6	7	8	9	10

1- Product Line

M/ MS - Microscope
MC - Microscope central location of cutting tip

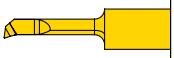
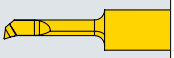
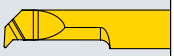
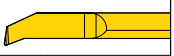
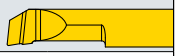
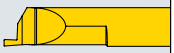
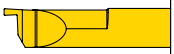
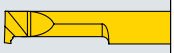
2 - Shank Dia.

4, 5, 6, 7

3 - Min. Bore Dia. (mm)

1.7, 2.2, 3.2…

4 - Application Type

BC	Boring	
BE	Boring with Edge Prep	
B20	Boring 20°	
B90	Boring 90°	
CBLF	Boring & Profiling with Chip Breaker	 NEW
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

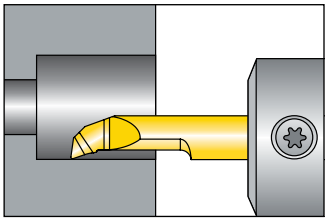
C - Internal Coolant
NONE - Without Coolant

10 - Carbide Grade

VBX, VTX

Boring

Internal



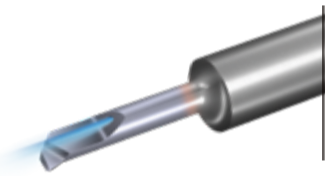


Figure 1: M...

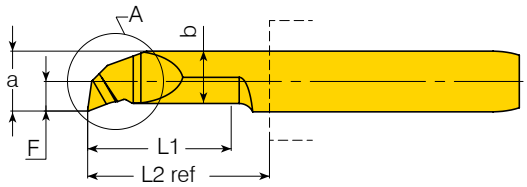
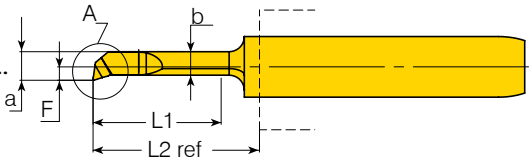
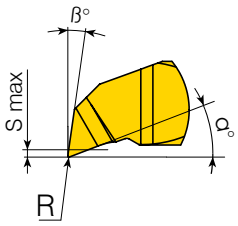


Figure 2: MC...



DETAIL A



* 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	1.0	MC410BCR05L04R	4.0	0.05	0.48	0.1	0.96	0.71	16.4		8.8	25.75	•	•
		MC410BCR05L04L	4.0	0.05	0.48	0.1	0.96	0.71	16.4		8.8	25.75	•	○
		MC410BCR10L04R/L	4.0	0.1	0.48	0.1	0.96	0.71	17		8.8	25.75	•	○
		MC410BCR05L06R	6.0	0.05	0.48	0.15	0.96	0.71	16.4		8.8	25.75	•	•
		MC410BCR05L06L	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	MC415BCR05L04R	4.0	0.05	0.74	0.15	2.74	1.15	16		11.5	28.5	•	○
		MC415BCR10L09R	9.0	0.1	0.74	0.15	1.45	1.22	16	8	11.5	28.5	•	○
		MC415BCR10L09L	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	MC419BCR05L06R**	6.0	0.05	0.72		1.62	1.2	16		11.5	28.5	•	○
		MC419BCR05L09R/L	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		0.05		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	0.15	0.2	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/L	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		2.9	2.45	17.5		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	0.2	2.9	2.5	17.5	8	11.5	28.5	○	•
		MC432BCR05L16R/L	16.0	0.05	1.43		2.9	2.45	17.5		18.2	35.2	•	•
		MC432BER05L16R**	16.0	0.05	1.43		2.9	2.45	17.5		18.2	35.2	○	•
		MC432BCR15L16R/L	16.0	0.15	1.44		2.87	2.5	17.5		18.2	35.2	•	•

** LH Tools are available upon request.

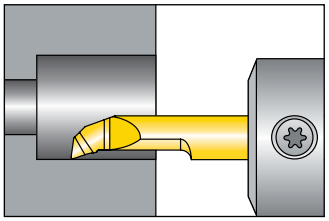
• In stock ○ Available upon request

Inserts marked with C are available with internal coolant.

Inserts marked with E are available with edge prep.

Boring (con't)

Internal



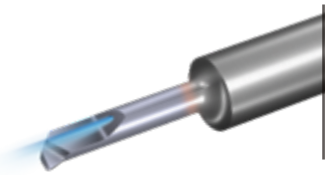


Figure 1: M...

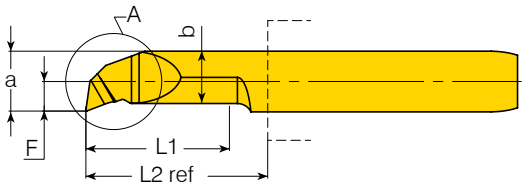
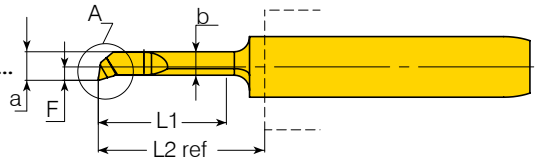
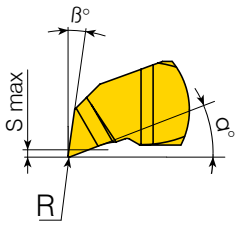


Figure 2: MC...



DETAIL A



* 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	3.2	MC432BER15L16R**	16.0	0.15	1.44	0.2	2.87	2.5	17.5	8	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	○	•
		MC432BER10L23R	23.0	0.10	1.43		2.90	2.45	17.5		22.8	45.7	○	•
	3.7	MC437BCR05L10R**	10.0	0.05	1.78		3.48	3.05	17.5		11.5	28.5	•	○
		MC437BCR15L10R/L	10.0	0.15	1.74		3.44	3.05	17.5		11.5	28.5	•	○
		MC437BCR15L15R	15.0	0.15	1.74		3.44	3.05	17.5		18.2	35.2	•	•
		MC437BCR15L15L	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	20.0	0.15	1.74		3.44	3.05	17.5		22.8	39.8	○	•
		MC437BCR15L20L	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	○	•
	4.0	M440BCR20L10RC	10.0	0.20	1.90	0.25	3.74	3.35	17.5		11.5	28.5	○	•
	4.2	M442BCR03L10R**	10.0	0.03	1.98	0.3	3.98	3.13	19		11.5	28.5	○	•
		M442BCR05L10R**	10.0	0.05	1.95		3.95	3.45	21		11.5	28.5	•	○
		MS442BCR15L10R	10.0	0.15	1.93		3.93	3.13	19		11.5	28.5	•	•
		MS442BCR15L10L	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	○	•
		M442BCR20L10RC**	10.0	0.20	1.98		3.98	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	16.0	0.15	1.93		3.93	3.13	19		18.2	35.2	•	•
		MS442BCR15L16L	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	○	•
		M442BCR05L21R	21.0	0.05	1.95		3.95	3.45	21		22.8	39.8	•	•
		M442BCR05L21L	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	21.0	0.15	1.93		3.93	3.13	19		22.8	39.8	•	•
		MS442BCR15L21L	21.0	0.15	1.93		3.93	3.13	19		22.8	39.8	•	○
		MS442BER15L21R**	21.0	0.15	1.98		3.98	3.13	19		24.7	41.7	○	•
		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

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Boring (con't)

Internal

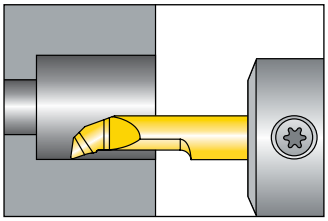
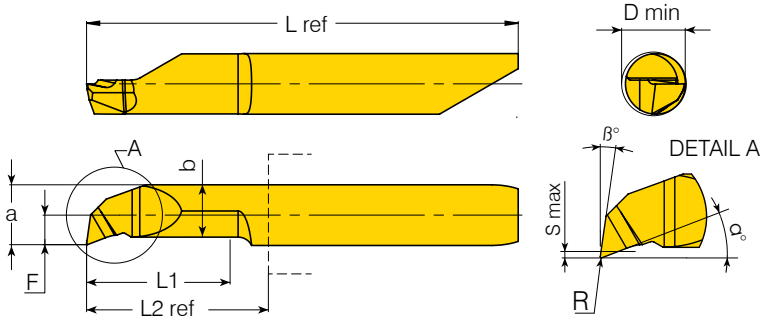


Figure 1: M...

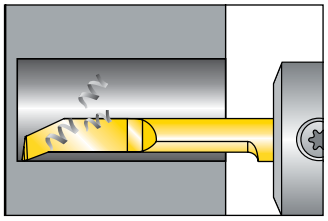


Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
5.0	5.2	M552BCR05L10R**	10.0	0.05	2.43	0.5	4.93	4.24	19	8	12.15	35	○	•
		M552BCR20L10RC**	10.0	0.20	2.44		4.94	4.04	21		12.15	35	•	○
		M552BCR20L10R/L	10.0	0.20	2.44		4.94	4.04			12.15	35	•	○
		M552BCR03L15R**	15.0	0.03	2.44		4.94	4.24			18.15	41	○	•
		M552BCR20L15RC	15.0	0.20	2.44		4.94	4.24			18.15	41	○	•
		M552BCR20L16R	16.0	0.20	2.44		4.94	4.04			18.15	41	•	•
		M552BCR20L16L	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	•	○
		M552BCR20L20R**	20.0	0.20	2.44		4.94	4.04			23.15	46	•	○
		M552BCR20L21RC**	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		4.94	4.04			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			28.15	51	○	•
		M552BCR05L30R**	30.0	0.05	2.42		4.92	4.24			32.15	55	•	•
		M552BCR20L30R/L	30.0	0.20	2.44		4.94	4.04			32.15	55	•	○
		M552BCR20L30RC**	30.0	0.20	2.44		4.94	4.04			32.15	55	○	•
		M552BCR20L35R	35.0	0.20	2.44		4.94	4.04			37.15	60	•	•
		M552BCR20L35L	35.0	0.20	2.44		4.94	4.04			37.15	60	•	○
		M552BCR20L35RC**	35.0	0.20	2.44		4.94	4.04			37.15	60	○	•
6.0	6.2	M662BCR20L16R/L	16.0	0.20	2.93	0.5	5.93	4.73	22	8	18.3	42	•	○
		M662BCR05L20R**	20.0	0.05							23.3	47	○	•
		M662BCR20L21R	21.0	0.20							23.3	47	•	○
		M662BCR20L21L	21.0	0.20							23.3	47	•	•
		M662BCR20L26R	26.0	0.20							28.3	52	•	•
		M662BCR20L26L	26.0	0.20							28.3	52	•	○
		M662BCR05L30R**	30.0	0.05							32.3	56	○	•
		M662BCR20L30R/L	30.0	0.20							32.3	56	•	•
		M662BER20L30R**	30.0	0.20							32.3	56	○	•
		M662BCR20L35R/L	35.0	0.20							37.3	61	•	•
		M662BER20L35R**	35.0	0.20							37.3	61	○	•
		M662BCR20L40R/L	40.0	0.20							42.3	66	•	○
7.0	7.2	M772BCR10L15R**	15.0	0.10	3.44	0.5	6.94	5.74	22	8	16.4	41	○	•
		M772BCR20L15R/L	15.0	0.20							16.4	41	•	○
		M772BCR20L25R	25.0								26.4	51	•	•
		M772BCR20L25L	25.0								26.4	51	•	○
		M772BCR20L30R**	30.0								31.4	56	○	•
		M772BCR20L35R/L	35.0								36.4	61	•	○
		M772BCR20L40R/L	40.0								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

Internal



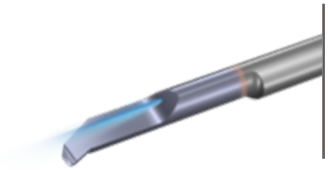
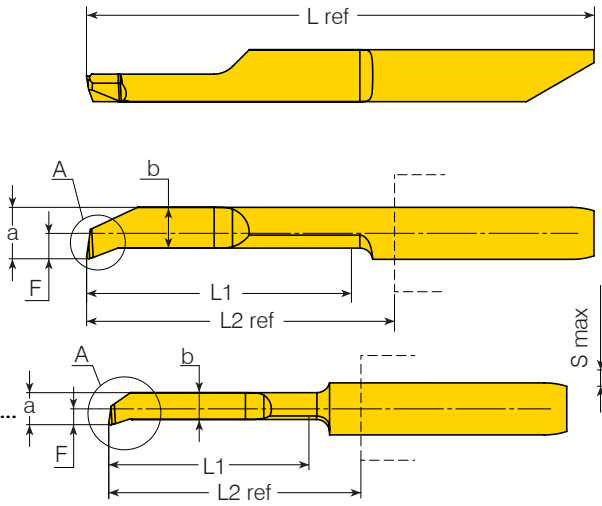


Figure 1: M...

Figure 2: MC...



* 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	2.2	MC422BCBR10L14R	14	0.1	1.04	0.2	2.04	1.76	18	8	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		0.05	1.43		2.90	2.45			18.2	35.2	•	○
		MC432BCBR15L15R		0.15	1.43		2.90	2.45			18.2	35.2	•	•
		MC432BCBR05L20R	20	0.05	1.43		2.90	2.45			22.8	39.8	•	○
		MC432BCBR15L20R		0.15	1.43		2.90	2.45			22.8	39.8	•	○
	3.7	MC437BCBR15L15R	15	0.15	1.77		3.47	3.05			18.2	35.2	•	○
		MC437BCBR15L20R	20	0.15	1.77		3.47	3.05			22.8	39.8	•	○
	4.2	M442BCBR15L12R	12	0.15	1.95	0.3	3.95	3.13	21		15.2	32.2	○	•
		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		3.95	3.13			22.8	39.8	•	○
		M442BCBR15L20R		0.15	1.95		3.95	3.13			22.8	39.8	•	○
		M442BCBR15L20RC		0.15	1.95		3.95	3.13			22.8	39.8	○	•
5.0	5.2	M552BCBR20L15RC	15	0.2	2.44	0.5	4.94	4.04	22		18.15	41	○	•
		M552BCBR20L20R	20		2.44		4.94	4.04			23.15	46	•	•
		M552BCBR20L25R	25		2.44		4.94	4.04			28.15	51	•	○
		M552BCBR20L25RC	25		2.44		4.94	4.04			28.15	51	○	•
6.0	6.2	M662BCBR20L30R	30		2.93		5.93	4.73			32.3	56	•	○
		M662BCBR20L30RC	30		2.93		5.93	4.73			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			41.4	66	•	○
		M772BCBR20L45R	45		3.44		6.94	5.74			46.4	71	•	○

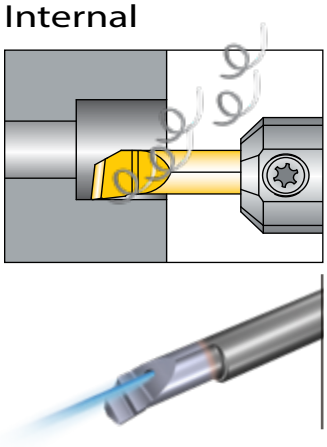
• In stock ○ Available upon request

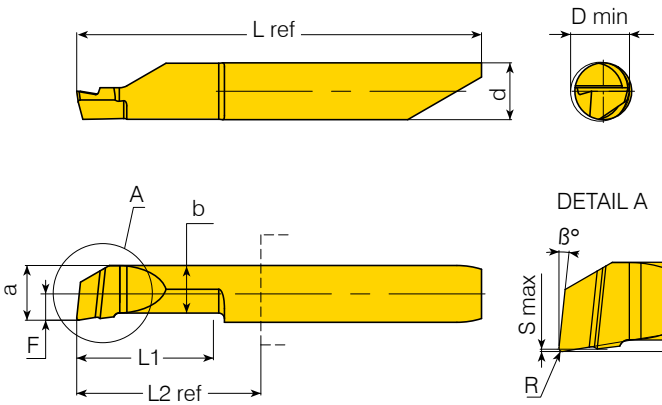
All tools are available in LH upon request.

Inserts marked with C are available with internal coolant.

Boring with Chip Former

Internal





* L2 Ref: Repeatability within +/-0.02

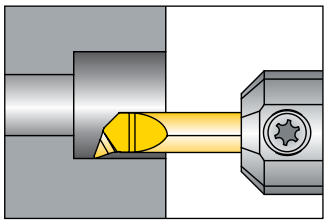
Right hand shown

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	10.0	0.15	1.85	0.05	3.85	3.35	9.47	6	11.50	28.5	●	●
		MS442BCFR15L10L	10.0	0.15							11.50	28.5	●	○
		M442BCFR15L10RC	10.0	0.15					7.5		11.50	28.5	○	●
		M442BCFR20L10R	10.0	0.20							11.50	28.5	○	●
		MS442BCFR15L15R	15.0	0.15					9.47		18.20	35.2	●	●
		MS442BCFR15L15L	15.0	0.15							18.20	35.2	●	○
		MS442BCFR15L20R	20.0	0.15							22.80	39.8	●	●
		MS442BCFR15L20L	20.0	0.15							22.80	39.8	●	○
5.0	5.2	M552BCFR20L10R	10.0		2.35		4.85	4.25			12.15	35.0	●	●
		M552BCFR20L15R	15.0								18.15	41.0	●	●
		M552BCFR20L20R	20.0								23.15	46.0	●	●
		M552BCFR20L20L	20.0								23.15	46.0	●	○
		M552BCFR20L25R	25.0								28.15	51.0	●	●
		M552BCFR20L30R	30.0								32.15	55.0	●	●
6.0	6.2	M662BCFR20L15R	15.0		2.85		5.85	5.1			18.30	42.0	●	●
		M662BCFR20L20R	20.0								23.30	47.0	●	●
		M662BCFR20L20L	20.0								23.30	47.0	●	○
		M662BCFR20L25R	25.0	0.2							28.30	52.0	●	●
		M662BCFR20L30R	30.0								32.30	56.0	●	●
		M662BCFR20L30L	30.0								32.30	56.0	●	○
		M662BCFR20L35R	35.0								37.30	61.0	●	●
7.0	7.2	M772BCFR20L15R	15.0		3.4		6.9	6.1			16.40	41.0	●	●
		M772BCFR20L20R	20.0								26.40	51.0	●	○
		M772BCFR20L25R	25.0								26.40	51.0	●	○
		M772BCFR20L30R	30.0								36.40	61.0	●	○
		M772BCFR20L35R/L	35.0								36.40	61.0	●	○
		M772BCFR20L40R	40.0								41.40	66.0	●	○

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

Boring 20°

Internal



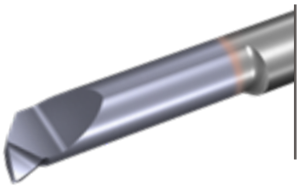


Figure 1: M...

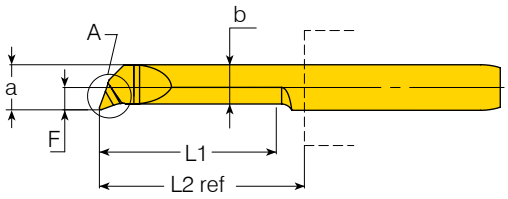
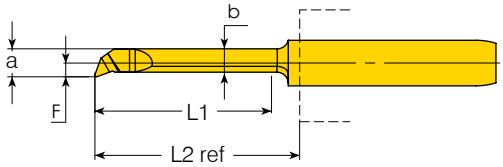
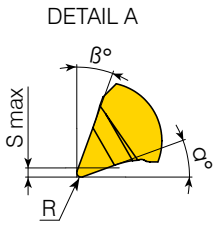


Figure 2: MC...





* 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	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					•	•
		MC427B20R15L16R	16.0								18.2	35.2	•	○
		MC427B20R15L16L	16.0										○	•
	3.2	MC432B20R15L10R	10.0		1.45		2.95	2.55			11.5	28.5	•	•
		MC432B20R15L16R/L	16.0								18.2	35.2	•	•
	4.2	M442B20R15L16R	16.0		1.95	0.3	3.95	3.45					•	•
		M442B20R15L21R/L	21.0								22.8	39.8	•	•

• In stock ○ Available upon request

All tools are available in LH upon request.

Boring 90°

Internal

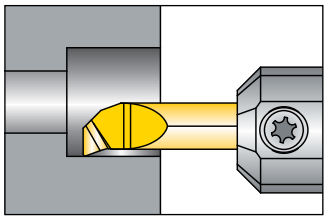


Figure 1: M...

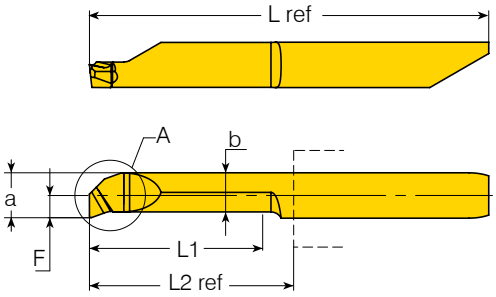
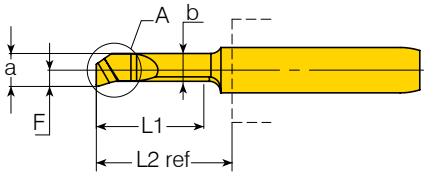
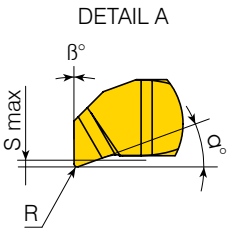


Figure 2: MC...





* L2 Ref: Repeatability within +/-0.02

Right hand shown

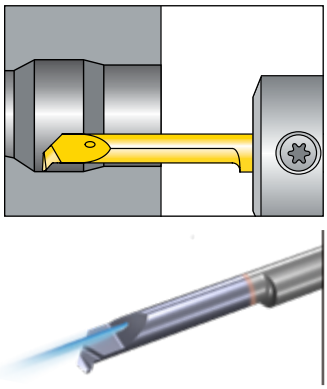
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	3.2	MC432B90R15L10R	10.0	0.15	1.43	0.2	2.90	2.45	18	0	11.5	25.8	•	○
		MC432B90R15L10L	10.0		1.43	0.2	2.90	2.45	18		11.5	25.8	•	•
	4.2	M442B90R15L16R/L	16.0		1.95	0.3	3.95	3.45	20		18.2	35.2	•	○
5.0	5.2	M552B90R20L10R/L	10.0	0.2	2.44	0.5	4.94	4.2			12.15	35	•	○
		M552B90R20L16R/L	16.0								18.15	41	•	○
		M552B90R20L21R/L	21.0								23.15	46	•	○

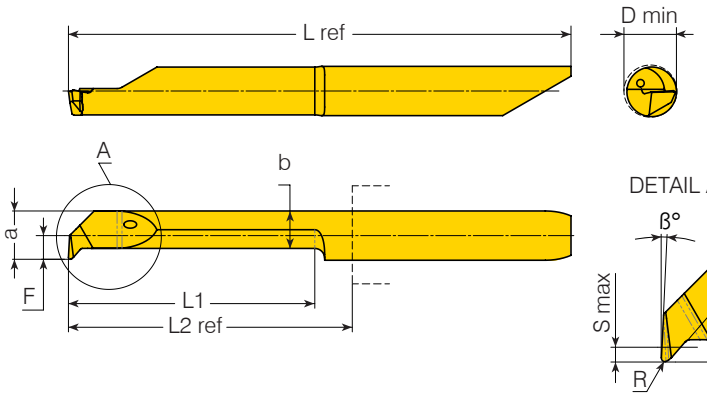
• In stock ○ Available upon request

Boring & Profiling with Chip Breaker (CBLF)

NEW

Internal





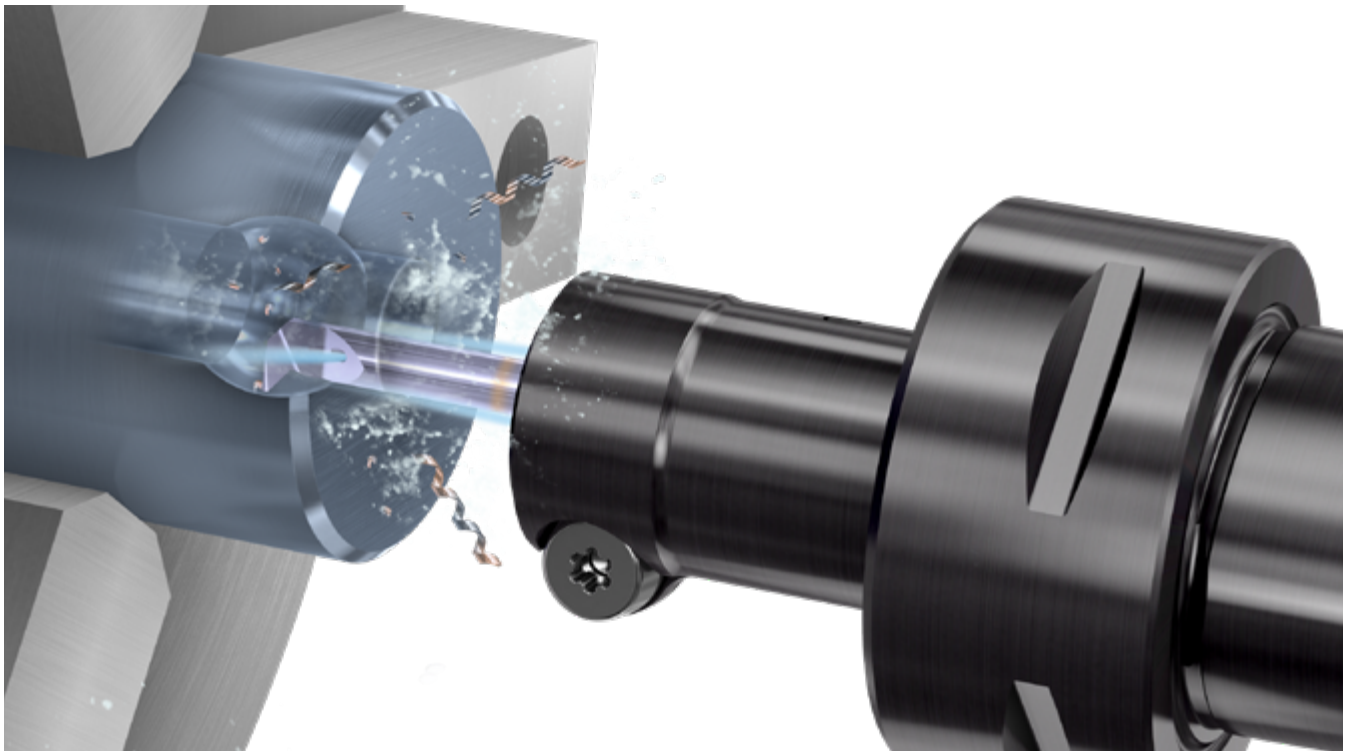
* L2 Ref: Repeatability within +/-0.02

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	M442CBLFR15 L10R/LC	10	0.15	1.9	0.7	3.9	3.1	47	3	11.5	28.5	○	●
		M442CBLFR15L16R/LC	16								18.2	35.2	○	●
		M442CBLFR15L21R/LC	21								22.8	39.8	○	●
5.0	5.2	M552CBLFR20L16R/LC	16	0.2	2.4	0.95	4.9	3.8	49		18.15	41	○	●
		M552CBLFR20L25R/LC	25								28.15	51	○	●
6.0	6.2	M662CBLFR20L16R/LC	16	0.2	2.78	1.75	5.8	3.9	49		18.3	42	○	●
		M662CBLFR20L21R/LC	21								23.3	47	○	●
		M662CBLFR20L30R/LC	30								32.3	56	○	●

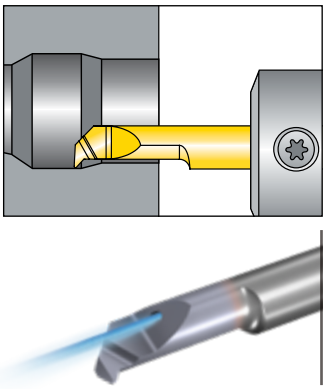
● In stock ○ Available upon request

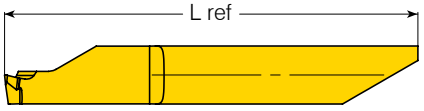
Inserts marked with C are available with internal coolant.

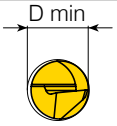


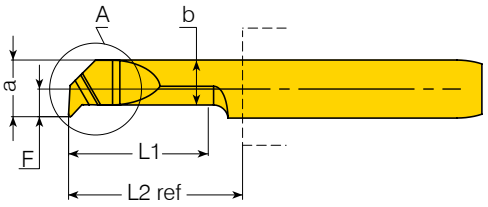
Boring & Profiling (CL)

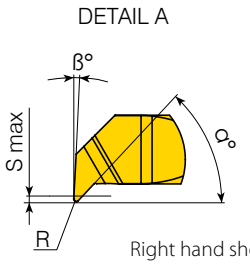
Internal











* L2 Ref: Repeatability within +/-0.02

Right hand shown

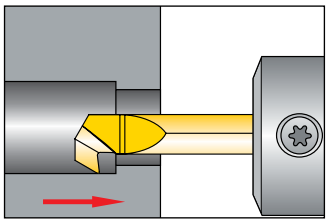
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	4.2	MS442CLR10L10R	10	0.10	1.9	0.7	3.9	3.1	47	3	11.5	28.5	•	○
		MS442CLR15L10R	10	0.15							11.5	28.5	•	•
		MS442CLR15L10L	10								11.5	28.5	•	○
		M442CLR15L10RC	10								11.5	28.5	○	•
		MS442CLR15L16R/L	16								18.2	35.2	•	○
		M442CLR15L21RC	21								18.2	35.2	○	•
		MS442CLR15L21R	21								22.8	39.8	•	•
		MS442CLR15L21L	21								22.8	39.8	•	○
5.0	5.2	M552CLR07L07R	7	0.07	2.4	0.95	4.9	3.75	49		18.2	35.2	○	•
		M552CLR20L16R	16	0.2					49		18.15	41	•	•
		M552CLR20L16L	16								18.15	41	•	○
		M552CLR20L25R	25								28.15	51	•	•
		M552CLR20L25RL	25								28.15	51	•	○
		M552CLR20L25RC	25								28.15	51	○	•
6.0	6.2	M662CLR10L16R	16	0.1	2.78	1.75	5.78	3.9			18.3	42	○	•
		M662CLR20L16R	16	0.2							18.3	42	•	•
		M662CLR20L16L	16								18.3	42	•	○
		M662CLR20L21R/L	21								23.3	47	•	○
		M662CLR20L30R/L	30								32.3	56	•	○

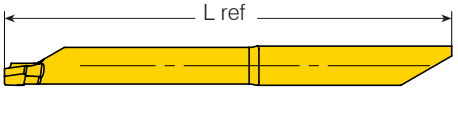
• In stock ○ Available upon request

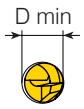
Inserts marked with C are available with internal coolant.

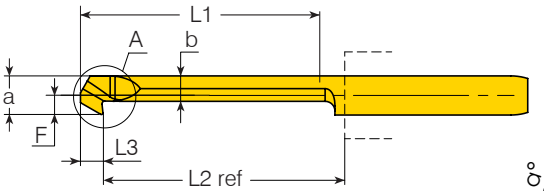
Back Boring

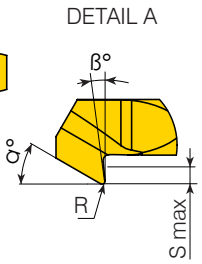
Internal











* L2 Ref: Repeatability within +/-0.03

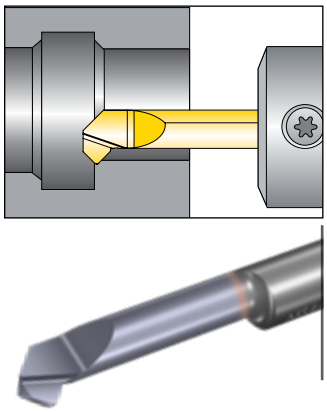
Right hand shown

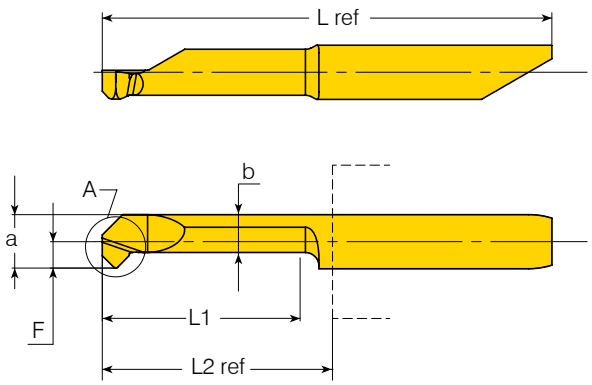
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm											Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L3	L ref	VBX	VTX
4.0	4.2	M442BBR15L25R/L	25.0	0.15	1.95	0.8	3.95	2.6	30	6	26.4	2.30	45.7	•	○
5.0	5.2	M552BBR15L30R/L	30.0		2.45	1.0	4.95	3.8		7	29.85		55.0	•	○
6.0	6.2	M662BBR15L30R/L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

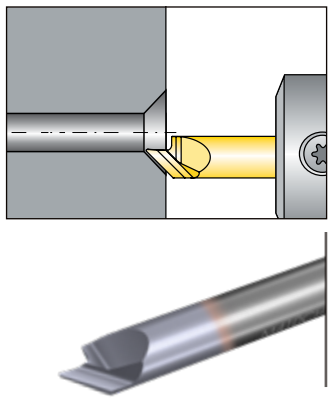
Right hand shown

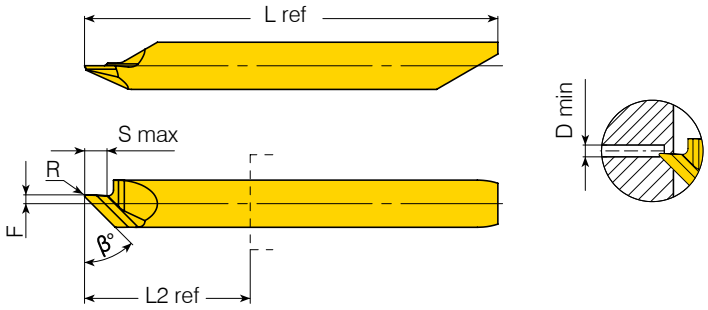
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	L2 ref*	L ref	VBX	VTX
4.0	4.2	MS442CH4545L15R/L	15.0	0.2	1.95	0.7	3.95	2.8	45	18.4	35.4	•	○
5.0	5.2	M552CH4545L15R/L	15.0		2.45		4.95	3.7		18.35	41.2	•	○
		M552CH4545L20R/L	20.0							23.35	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

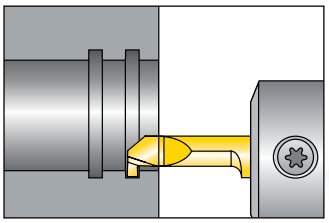
Right hand shown

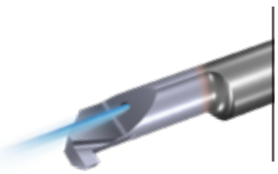
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm						Grades	
d (mm)	D min. (mm)	RH/LH	R	F	S max	β°	L2 ref*	L ref	VBX	VTX
4.0	1.0	M410CH45L15R	0.1	0.75	2.4	45	18.2	35.2	•	○
		M410CH45L15L							•	○

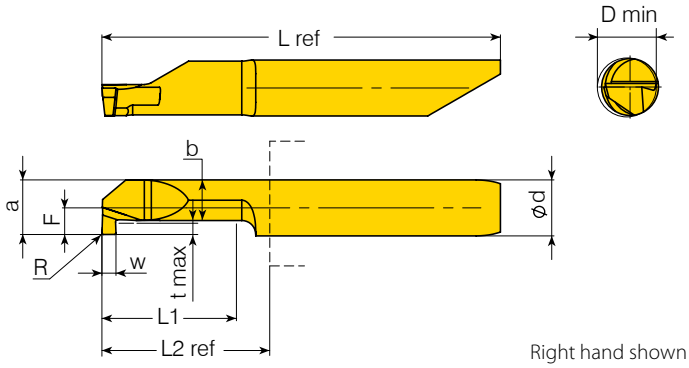
• In stock ○ Available upon request

Square Grooving

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±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
4.0	3.0	MS430GSW070L16R	0.70	0.62	16	1.40	0.1	2.70	1.75	11.5	39.8	○	●
	4.0	MS440GSW100L10R	1.00	1	10	1.90	0	3.90	2.5	18.2	35.2	○	●
	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			1.90	0.1	3.90	2.9	11.5	28.5	●	○
		M442GSW100L10RC**	1.00				0.1	3.90	2.9	11.5	28.5	○	●
		MS442GSW150L10R**	1.50				0.1		2.9	18.2	35.2	●	○
		MS442GSW079L15R/L	0.79		15	1.96	0.1	3.96	2.9	18.2	35.2	●	○
		MS442GSW100L15R/L	1.00			1.90	0.1	3.90	2.9	18.2	35.2	●	○
		M442GSW100L15RC**	1.00				0.1	3.90	2.9	18.2	35.2	○	●
		MS442GSW100L20R/L	1.00		20		0.1	3.90	2.9	22.8	39.8	●	○
		M442GSW100L20RC**	1.00				0.1	3.90	2.9	22.8	39.8	○	●
		MS442GSW079L25R/L	0.79		25	1.96	0.1	3.96	2.9	28.7	45.7	●	○
5.0	5.2	M552GSW070L06L	0.70	1	6	2.40	0.1	4.90	3.7	12.15	32	○	●
		M552GSW100L10R/L	1.00	1	10	2.40	0.1	4.90	3.7	12.15	35	●	○
		M552GSW100L10RC**	1.00	1	10	2.40	0.1	4.90	3.7	12.15	35	○	●
		M552GSW179L10R	1.79	1.35	10	2.40	0.1	4.90	3.7	12.15	35	○	●
		M552GSW150L10R**	1.50	1	10	2.40	0.1	4.90	3.7	12.15	35	●	○
		M552GSW200L10R**	2.00	1	10	2.40	0.1	4.90	3.7	12.15	35	●	○
		M552GSW100L15R/L	1.00	1	15	2.40	0.1	4.90	3.7	18.15	41	●	○
		M552GSW100L15RC**	1.00	1	15	2.40	0.1	4.90	3.7	18.15	41	○	●
		M552GSW150L15R/L	1.50	1	15	2.40	0.1	4.90	3.7	18.15	41	●	○
		M552GSW150L15RC**	1.50	1	15	2.40	0.1	4.90	3.7	18.15	41	○	●
		M552GSW200L15R**	2.00	1	15	2.40	0.1	4.90	3.7	18.15	41	●	○
		M552GSW100L20R/L	1.00	1	20	2.40	0.1	4.90	3.7	23.15	46	●	○
		M552GSW150L20R/L	1.50	1	20	2.40	0.1	4.90	3.7	23.15	46	●	○
		M552GSW150L20RC**	1.50	1	20	2.40	0.1	4.90	3.7	23.15	46	○	●
		M552GSW200L20R**	2.00	1	20	2.40	0.1	4.90	3.7	23.15	46	●	○
		M552GSW050L21R	0.50	1	21	2.40	0.1	4.90	3.7	23.15	46	○	●
6.0	5.2	M652GSW160L10R	1.60	1.8	10	2.20	0.1	5.20	2.9	12.3	36	○	●
	6.2	M662GSW150L06R	1.50	1.8	6	0.40	0.1	3.40	1.7	12.3	40	○	●
		M662GSW080L09R	0.80	1.8	9	2.96	0.1	5.96	4	11.3	35	○	●
		M662GSW079L10R**	0.79	1.8	10	2.90	0.1	5.90	4.0	12.3	36	●	○
		M662GSW100L10R/L	1.00			2.90		5.90		12.3	36	●	○
		M662GSW117L10R**	1.17			2.90		5.90		12.3	36	●	○
		M662GSW150L10R	1.50			2.90		5.90		12.3	36	●	○
		M662GSW150L10L	1.50			2.90		5.90		12.3	36	○	●
		M662GSW157L10R**	1.57			2.90		5.94		12.3	36	●	○
		M662GSW198L10R**	1.98			2.90		5.94		12.3	36	●	○
		M662GSW200L10R/L	2.00			2.90		5.90		12.3	36	●	○
		M662GSW079L15R**	0.79		15	2.90		5.94	4.0	18.3	42	●	○
		M662GSW100L15R	1.00			2.90		5.90		18.3	42	●	●
		M662GSW100L15L	1.00			2.90		5.90		18.3	42	●	○

** LH Tools are available upon request.

● In stock ○ Available upon request

Inserts marked with C are available with internal coolant.

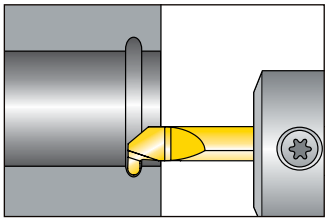
Square Grooving (con't)

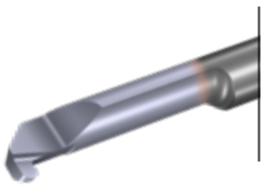
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
6.0	6.2	M662GSW117L15R**	1.17	1.8	15	2.96	0.1	5.96	4.0	18.3	42	●	○
		M662GSW150L15R/L	1.50			2.90		5.90				●	○
		M662GSW157L15R**	1.57			2.96		5.96				●	○
		M662GSW198L15R**	1.98									●	○
		M662GSW200L15R	2.00			2.90		5.90				●	●
		M662GSW200L15L	2.00									●	○
		M662GSW100L20R	1.00		20					23.3	47	●	●
		M662GSW100L20L	1.00									●	○
		M662GSW150L20R/L	1.50						4.0			●	○
		M662GSW200L20R	2.00		20	2.90		5.90	4.0	23.3	47	●	●
		M662GSW200L20L	2.00						4.0			●	○
		M662GSW079L25R**	0.79		25	2.96		5.96	4.0	28.3	52	●	○
		M662GSW100L25R	1.00			2.90		5.90	3.1		56	○	●
		M662GSW117L25R**	1.17			2.96		5.96	4.0		52	●	○
		M662GSW157L25R**	1.57			2.96		5.96	4.0		52	●	○
		M662GSW198L25R**	1.98			2.96		5.96	4.0		52	●	○
		M662GSW200L25R	2.00	1.8		2.90	0.1	5.90	3.2		56	○	●
		M665GSW350L25R	3.50			2.96		5.96	4.0		52	○	●
		M662GSW100L30R/L	1.00		30	2.90		5.90	4.0	32.3	56	●	○
		M662GSW150L30R/L	1.50						4.0			●	○
		M662GSW200L30R/L	2.00						4.0			●	○
		M662GSW079L35R**	0.79		35	2.96		5.96	4.0	37.3	61	●	○
		M662GSW117L35R**	1.17			2.96		5.96	4.0		61	●	○
		M662GSW150L35R	1.50			2.95		5.90	3.95		59.85	○	●
		M662GSW157L35R**	1.57			2.96		5.96	4.0		61	●	○
7.0	6.2	M762GSW250L15R	2.50		15	3.40		6.90	4.1	18.3	42	○	●
	7.2	M772GSW079L10R**	0.79	2.5	10	3.46	0.1	6.96	4.1	11.4	36	●	○
		M772GSW100L10R/L	1.00			3.40		6.90				●	○
		M772GSW150L10R/L	1.50									●	○
		M772GSW200L10R/L	2.00									●	○
		M772GSW600L10R	6.00		10	3.20		6.90		11.4	36	○	●
		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			3.46		6.96				●	○
		M772GSW198L15R**	1.98									●	○
		M772GSW200L15R/L	2.00			3.40		6.90				●	○
		M772GSW150L16R	1.50		16	3.4		6.90		17.4	42	○	●
		M772GSW079L20R**	0.79		20	3.46		6.96		26.4	51	●	○
		M772GSW117L20R**	1.17			3.46					51	●	○
		M772GSW157L20R**	1.57			3.46					51	●	○
		M772GSW198L20R**	1.98			3.46					51	●	○
		M772GSW150L20R	1.50			3.40		6.90			46	○	●
		M772GSW100L25R**	1.00		25	3.40		6.90			51	●	○
		M772GSW150L25R/L	1.50								51	●	○
		M772GSW200L25R/L	2.00								51	●	○
		M772GSW100L35R**	1.00		35					36.4	61	●	○
		M772GSW150L35R/L	1.50									●	○
		M772GSW200L35R/L	2.00									●	○

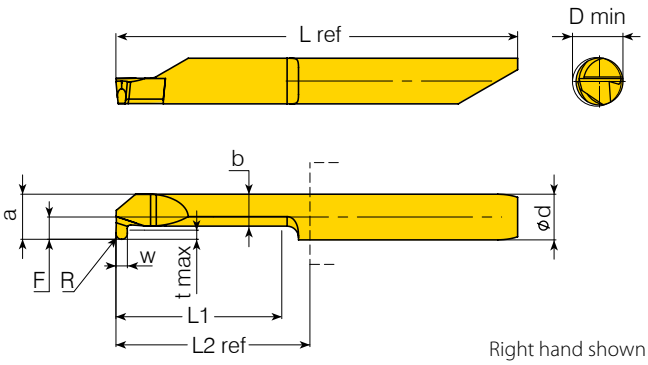
** LH Tools are available upon request.
● In stock ○ Available upon request
Inserts marked with C are available with internal coolant.

Round Grooving

Internal







* L2 Ref: Repeatability within +/-0.02

Right hand shown

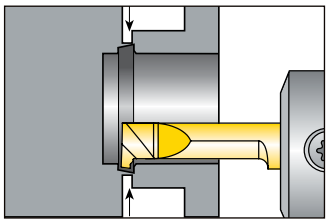
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
4.0	4.2	MS442GRR050L15R/L	1.0	0.8	15	1.95		3.95	2.8	18.2	35.2	•	○
5.0	5.2	M552GRR050L20R	1.0	1	20	2.45	0.5	4.95	3.7	23.15	46	•	•
		M552GRR050L20L	1.0									•	○
		M552GRR075L20R/L	1.5				0.75					•	○
		M552GRR100L20R/L	2.0				1					•	○
6.0	6.2	M662GRR100L05R	2.0	1.6	5	2.95	1	5.95	4	18.3	42	○	•
		M662GRR050L15R	0.5		15							○	•
		M662GRR050L25R/L	1.0	1.8	25	2.95	0.5	5.95	4	28.3	52	•	○
		M662GRR075L25R/L	1.5				0.75					•	○
		M662GRR100L25R/L	2.0				1					•	○
7.0	7.2	M772GRR050L30R	1	2.5	30	3.45	0.5	6.95	4.15	26.4	51	○	•
		M772GRR100L30R**	2.0	2.5	30	3.45	1	6.95	4.1	36.4	61	•	○

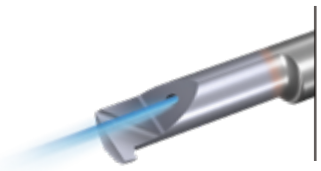
** LH Tools are available upon request.

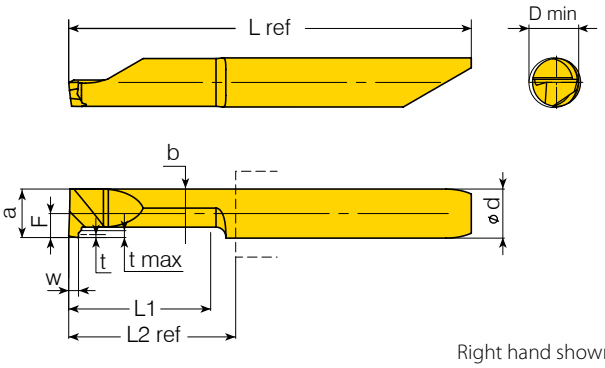
• In stock ○ Available upon request

Pre-Part Off

Internal







* L2 Ref: Repeatability within +/-0.02

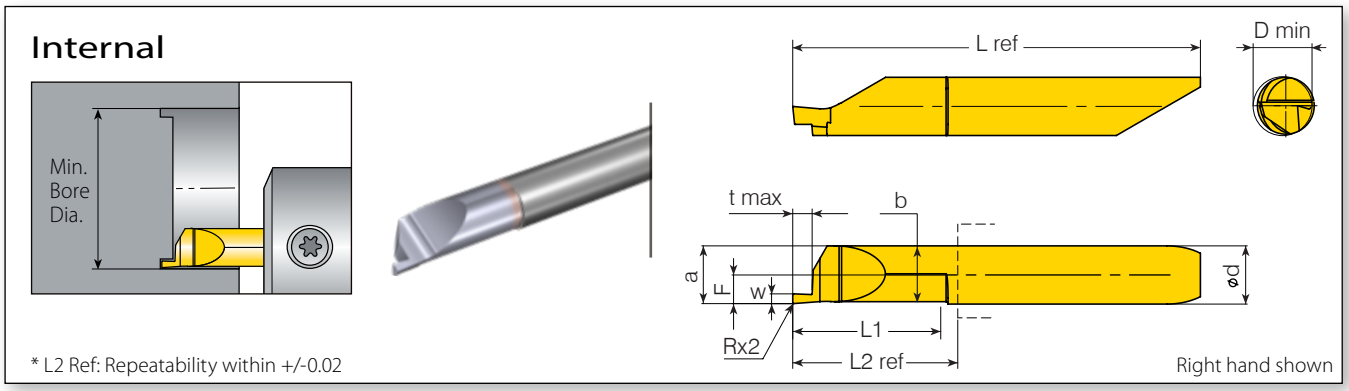
Right hand shown

Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	t	a	b	L2 ref*	L ref	VBX	VTX
5.0	5.2	M552PPW100L15R/L	1.0	0.7	15	2.44	0.3	4.94	3.88	18.15	41	•	○
		M552PPW100L20R/L			20					23.15	46	•	○
		M552PPW100L20RC**			20					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

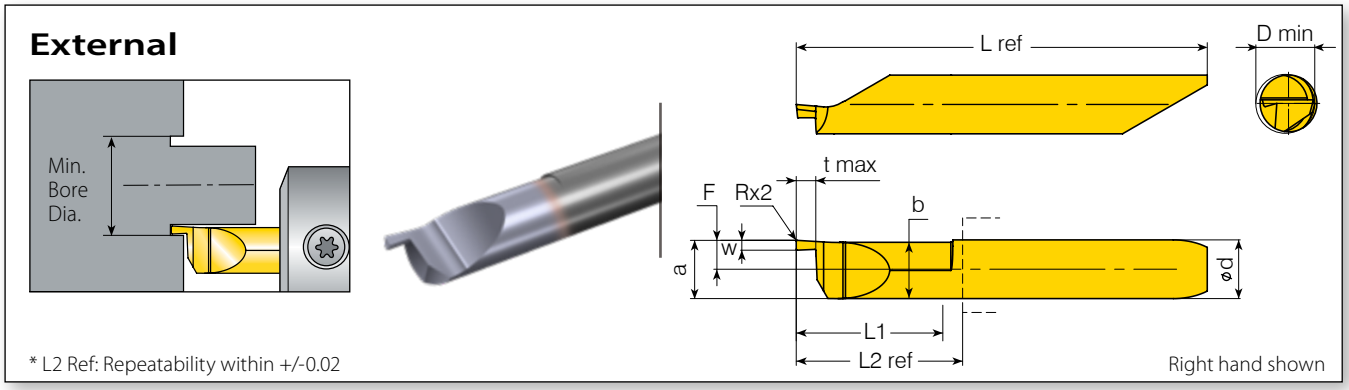
Face Grooving Internal



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

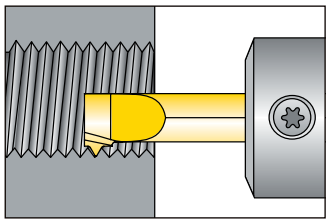


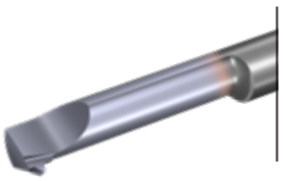
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
6.0	6.2	M662FPW10L15R/L	1.00	2.0	15	2.95	0.10	5.95	5.75	18.3	42	•	○
		M662FPW117L15R/L	1.17				0.15					•	○
		M662FPW15L15R/L	1.50	3.0			0.10					•	○
		M662FPW157L15R/L	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					•	○

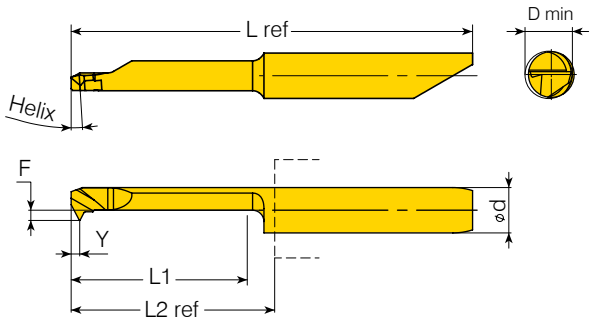
• In stock ○ Available upon request

Threading

Internal



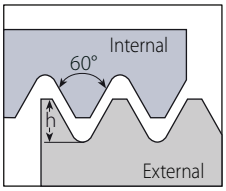




* L2 Ref: Repeatability within +/-0.02

Right hand shown

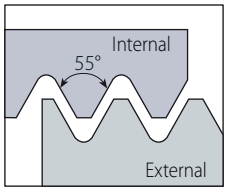
Partial Profile 60°



	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	1.95	0.14	0.29	13.0	29.8	○	●
M1.6-M3x0.35		1.22	M412TH0.35P60L04R	0.35		3.8	4		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	0.5-1.0	48-24	3.5	16	0.9	0.9	-	18.4	35.4	●	○
		3.2	MS429THF60L16L	0.5-1.0	48-24		16	0.9					○	●
		4.2	MS439THF60L16R	0.5-1.0	48-24		16	1.9					●	○
		4.2	MS439THF60L16L	0.5-1.0	48-24		16	1.9					○	●
	6.0	6.2	M659THA60L06R	0.5-1.5	48-16		6	2.9			8.5	36.2	○	●
		6.2	M659THA60L16R	0.5-1.5	48-16		16				18.5	42.2	●	●
		6.2	M659THA60L16L	0.5-1.5	48-16		16						●	○

● In stock ○ Available upon request

Partial Profile 55°

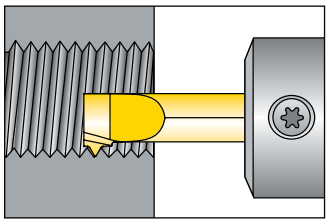


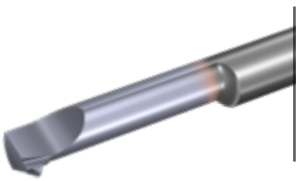
Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch		Dimensions mm						Grades	
d (mm)	D min. (mm)	RH/LH	mm	TPI	Helix	L1	F	Y	L2 ref*	L ref	VBX	VTX
4.0	3.2	MS429THF55L16R/L	0.5-1.0	48-24	3.5	16	0.9	0.75	18.4	35.4	●	○
	4.2	MS439THF55L16R/L	0.5-1.0	48-24			1.9				●	○
6.0	6.2	M659THA55L16R/L	0.5-1.5	48-16			2.9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

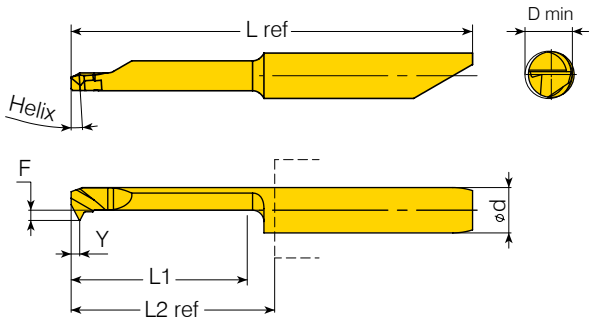
● In stock ○ Available upon request

Threading

Internal



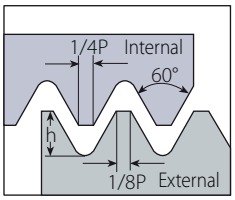




* L2 Ref: Repeatability within +/-0.02

Right hand shown

ISO Metric

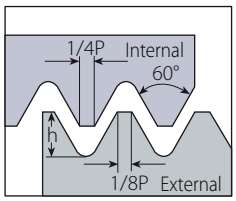


Defined by: R262 (DIN 13)
Tolerance Class: 6g/6H

	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			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	3.0		2.9	1.0	0.87			●	○

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

American UN



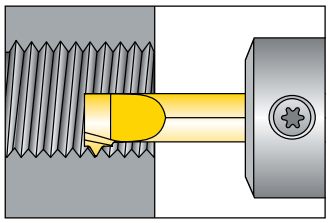
Defined by: ANSI B1.1:74
Tolerance Class: 2A/2B

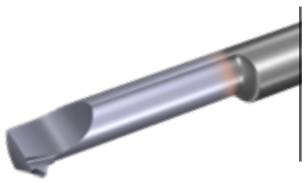
	Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch			Dimensions mm					Grades	
Thread	d (mm)	D min. (mm)	RH/LH	TPI	Helix °	L1	F	Y	h (min)	L2 ref*	L ref	VBX	VTX
No.8-32UNC	4.0	3.3	MS429TH32UNL16R/L	32	3.5	16	0.92	0.6	0.46	18.4	35.4	●	○
No.10-28UNS		3.6	MS429TH28UNL16R/L	28			0.92	0.65	0.52			●	○
1/4"-27UNS	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			●	○

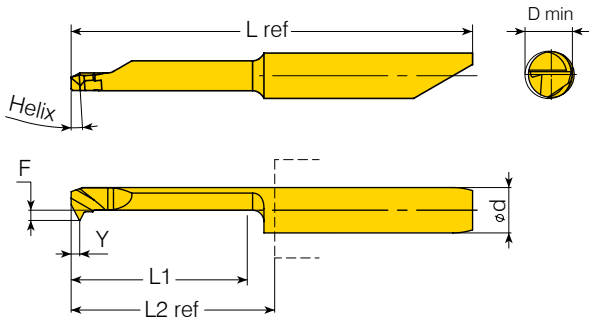
** LH Tools are available upon request.
● In stock ○ Available upon request

Threading

Internal



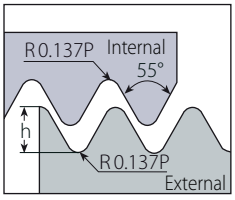




* L2 Ref: Repeatability within +/-0.02

Right hand shown

Whitworth for BSW, BSP

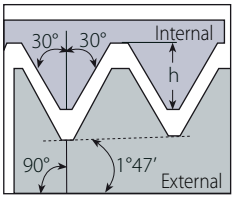


Defined by:
B.S.84:1956, DIN 259,
ISO228/1:1982
Tolerance Class:
Medium Class A

	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

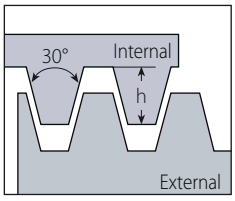


Defined by:
USAS B2.1:1968
Tolerance Class:
Standard NPT

	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		3.45					○	•
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

micrOscope Toolholders Ordering Code

Holders

MH	C	R	22	-	4	-	5	-	4F
1	2	3	4		5		6		7

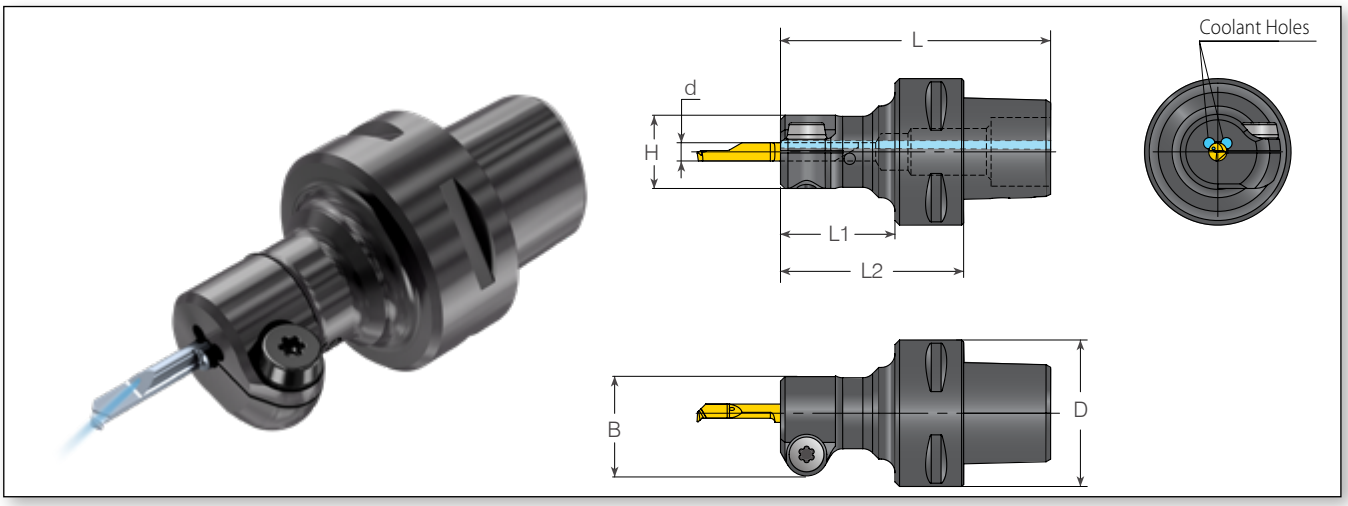
V-CAP Holders

MH	C	S	-	4	-	C3
1	2	3		5		8

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	8 - Polygon Size (V-CAP)
4, 5, 6, 7	4, 5, 6, 7	**4F** - Four Flats **None** - Two Flats	C3, C4

V-CAP Holders

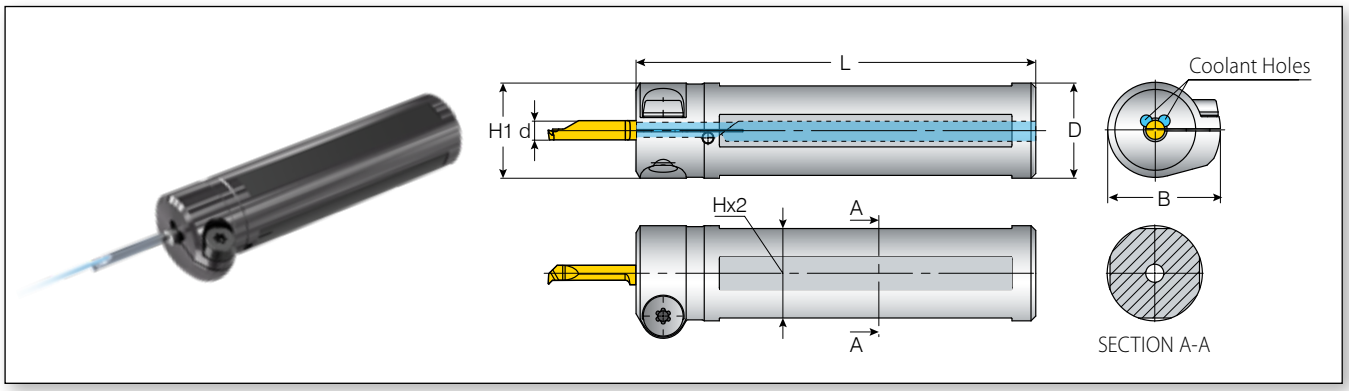


Micro Insert Dia.	Ordering Code	Dimensions mm						Spare Parts	
									
d (mm)		D	B	H	L1	L2	L	Shrink Screw*	Key
4.0	MHCS-4-C3	32.0	21.7	16.0	25.0	40.0	59.0	SM5X10-15IPX2**	L15IP / LX15IP
	MHCS-4-C4	40.0	21.7	16.0	25.0	45.0	69.0		
5.0	MHCS-5-C3	32.0	23.7	20.0	30.0	45.0	64.0		
	MHCS-5-C4	40.0	23.7	20.0	30.0	50.0	74.0		
6.0	MHCS-6-C3	32.0	23.7	20.0	30.0	45.0	64.0		
	MHCS-6-C4	40.0	23.7	20.0	30.0	50.0	74.0		
7.0	MHCS-7-C3	32.0	23.7	20.0	30.0	45.0	64.0		
	MHCS-7-C4	40.0	23.7	20.0	30.0	50.0	74.0		

V-CAP holders are according to ISO 26623.

* Tightening Torque: 7 Nm max.
** SM5X10-15IPX2 is a special, double-sided screw. For an alternative screw, please use MS5X10 (key: S4).

Shrink Toolholders

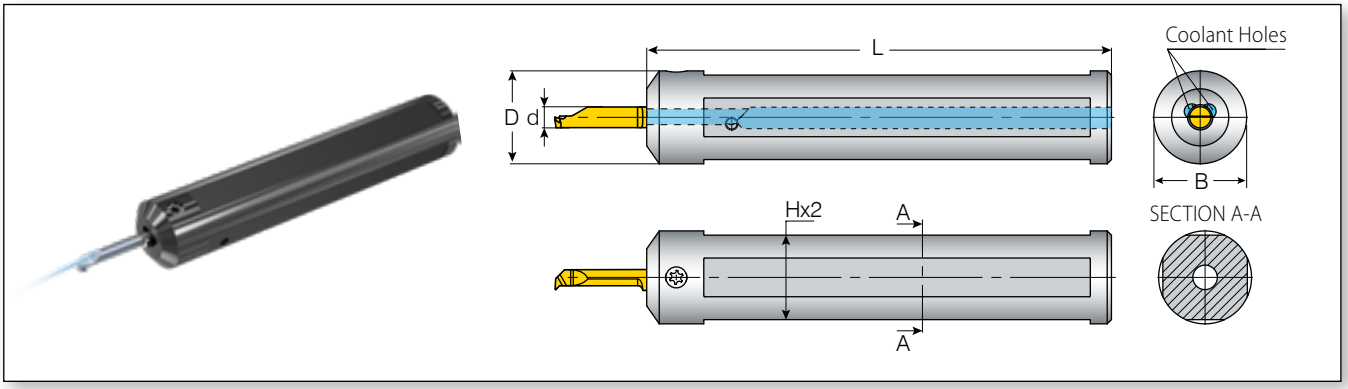


Micro Insert Dia.	Ordering Code	Dimensions mm					Spare Parts	
d (mm)		D	B	H1	H	L	Shrink Screw*	Key
4.0	MHCS10-4-4F	10.0	19.7	13.3	8.8	65.0	SM5X10-15IPX2**	L15IP / LX15IP
	MHCS12-4-4F	12.0	19.7	13.8	10.8	70.0		
	MHCS16-4-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-4-4F	20.0	23.7	20.0	18.8	84.0		
	MHCS22-4-4F	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		

* Tightening Torque: 7 Nm max.

** SM5X10-15IPX2 is a special, double-sided screw. For an alternative screw, please use MS5X10 (key: S4).

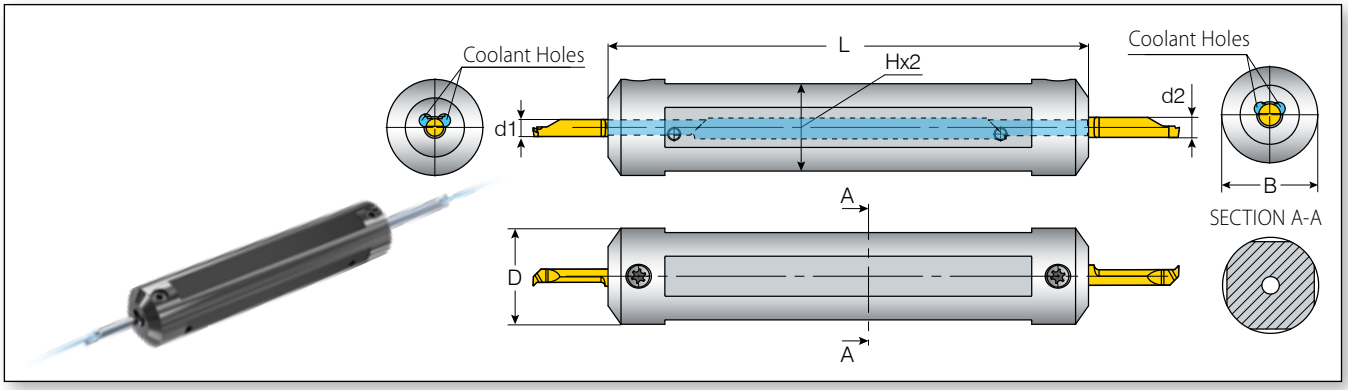
Round Tools without Shoulder



Micro Insert Dia.	Ordering Code	Dimensions mm			Spare Parts	
d (mm)		B=D	H	L	Clamping Screw*	Key
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		

* Tightening Torque: 7 Nm max.

Round Double Sided Toolholders

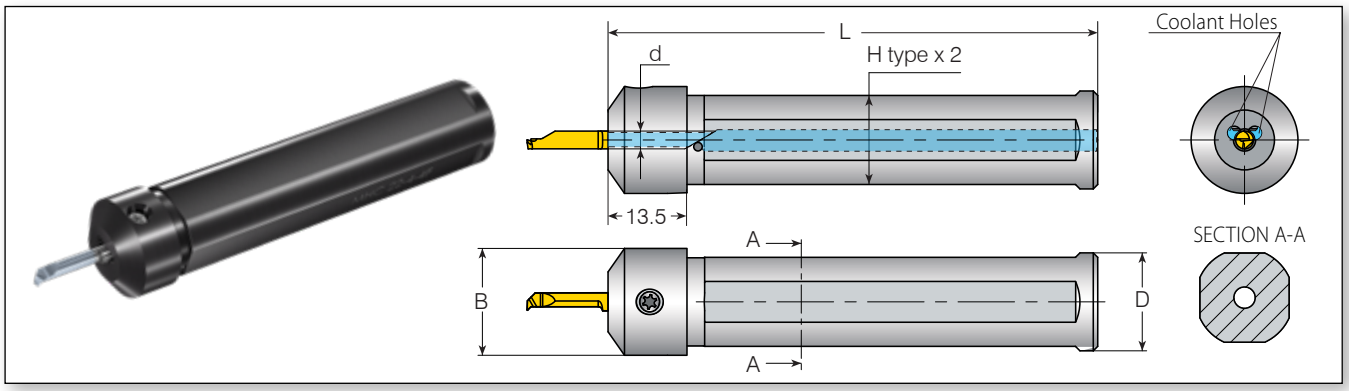


Micro Insert Dia.	Ordering Code	Dimensions mm			Spare Parts	
d1 - d2 (mm)		B=D	H	L	Clamping Screw*	Key
4.0 - 5.0	MHCR075-4-5-4F**	19.05	17.8	83.5	SLDBT15IP	F15IP
	MHCR20-4-5-4F**	20	18.8	83.5		
	MHCR22-4-5-4F	22	20.0	110.0		
	MHCR25-4-5-4F	25	23.0	110.0		
6.0 - 7.0	MHCR20-6-7-4F**	20	18.8	83.5		
	MHCR25-6-7-4F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

* Tightening Torque: 7 Nm max.

** 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

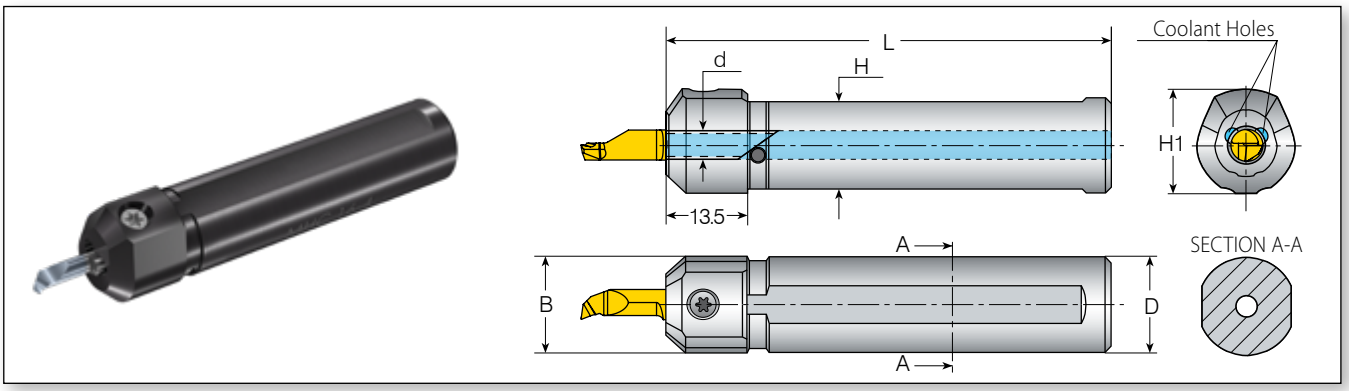


Micro Insert Dia.	Ordering Code	Dimensions mm				Spare Parts	
d (mm)		D	B	H	L	Clamping Screw*	Key
4.0	MHC20-4-4F	20.0	22.0	18.8	83.5	SL7DT15 or SL7DBT15IP**	KT15 or F15IP**
	MHC22-4-4F	22.0	24.0	20.0	110		
	MHC23-4-4F	23.0	25.0	21.0			
	MHC25-4-4F	25.0	27.0	23.0			
	MHC28-4-4F	28.0	30.0	26.0			
5.0	MHC20-5-4F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

* Tightening Torque: 8 Nm max.

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

Holder with Round Shank - 2 Flats

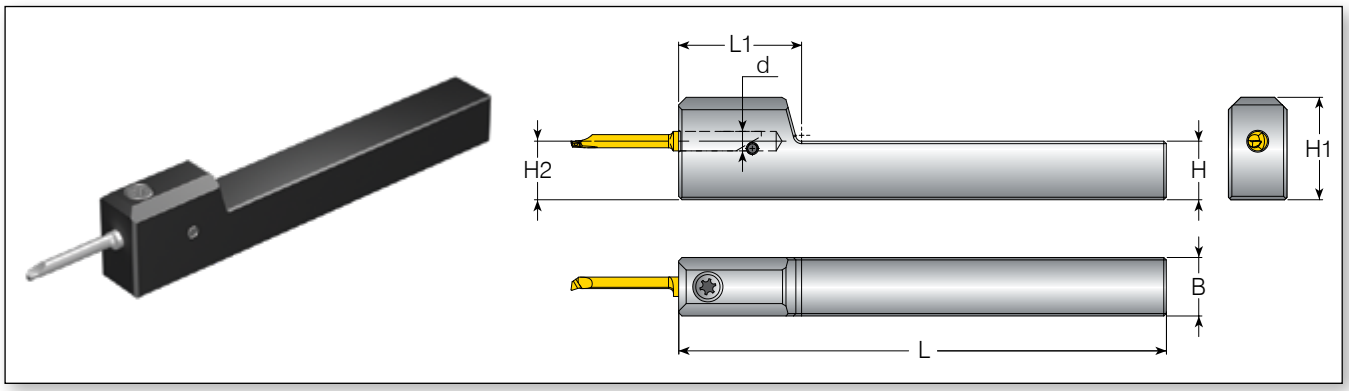


Micro Insert Dia.	Ordering Code	Dimensions mm				Spare Parts	
d (mm)		D=B	H1	H	L	Clamping Screw*	Key
4.0	MHC 10-4	10.0	14.0	8.8	65.0	SL7DT15 or SL7DBT15IP**	KT15 or F15IP**
	MHC 12-4	12.0	16.0	10.8	70.0		
	MHC 16-4	16.0	17.6	14.8	75.0		
	MHC 20-4	20.0	22.0	18.8	84.0		
5.0	MHC 10-5	10.0	14.0	8.8	65.0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

* Tightening Torque: 8 Nm max.

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

Holder with Square Shank

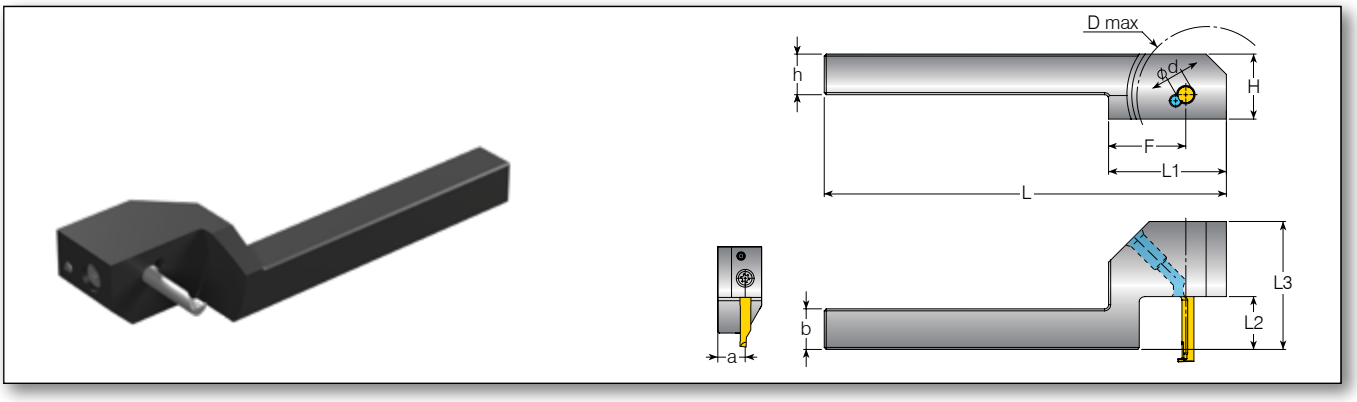


						Spare Parts	
Micro Insert Dia.	Ordering Code	Dimensions mm					
d (mm)		H=H2=B	H1	L	L1	Clamping Screw*	Key
4.0	MHS 1010-4	10.0	19.0	100.0	25.0	SL7DT15 or SL7DBT15IP**	KT15 or F15IP**
5.0	MHS 1010-5	10.0	19.5	100.0	25.0		
4.0	MHS 1212-4	12.0	21.0	100.0	25.0		
5.0	MHS 1212-5	12.0	21.5	100.0	27.0		
6.0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

* Tightening Torque: 8 Nm max.

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

Holder with Drop Head



Micro Insert Dia.	Ordering Code	Dimensions mm								Spare Parts	
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					18.0		
5.0	MHD 1212-5 L0800		48.0						23.0		
6.0	MHD 1212-6 L1000		53.0						28.0		

* Tightening Torque: 8 Nm max.

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

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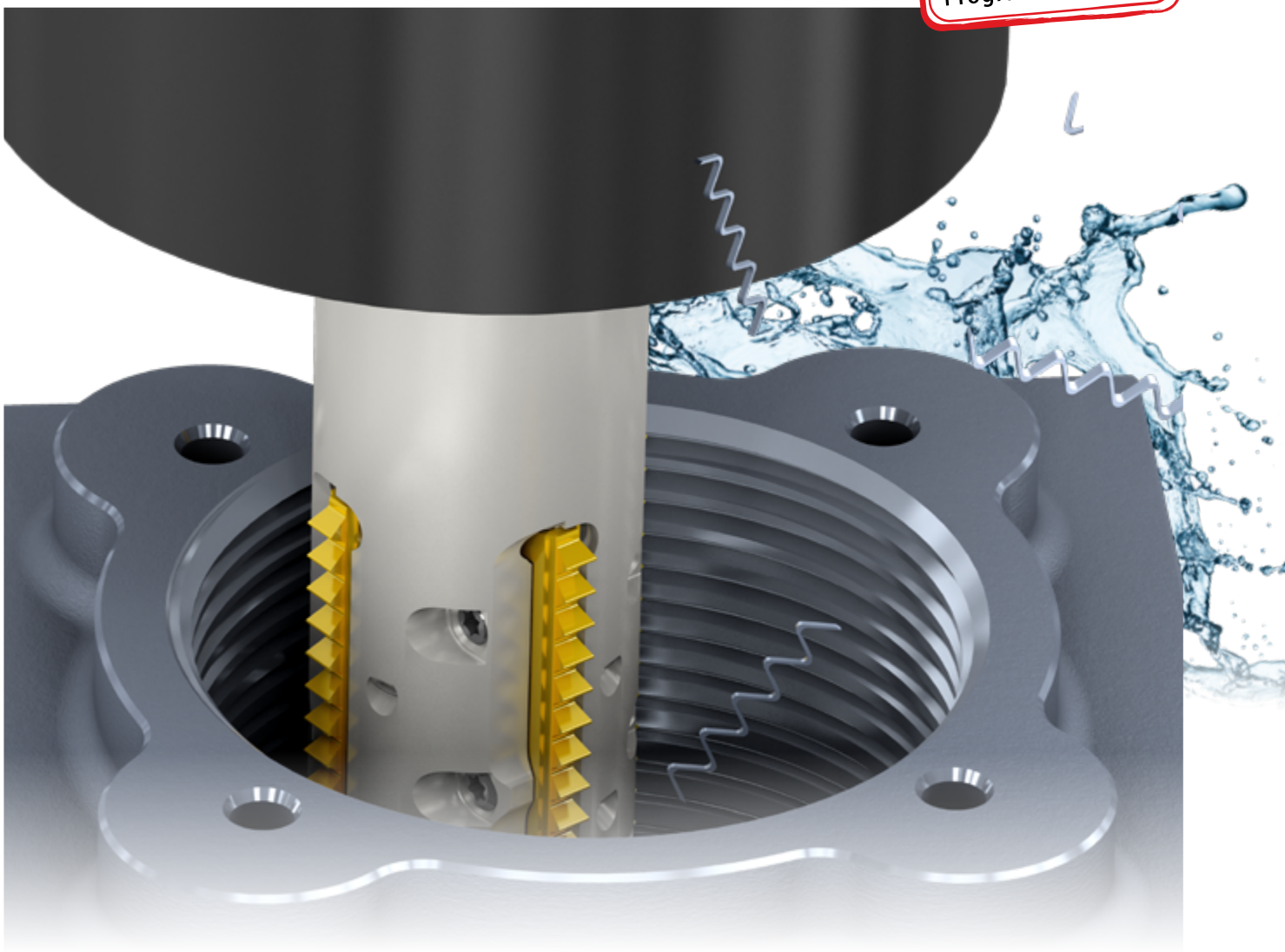

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VARGUS GENius™ | Tool Selector and CNC Program Generator

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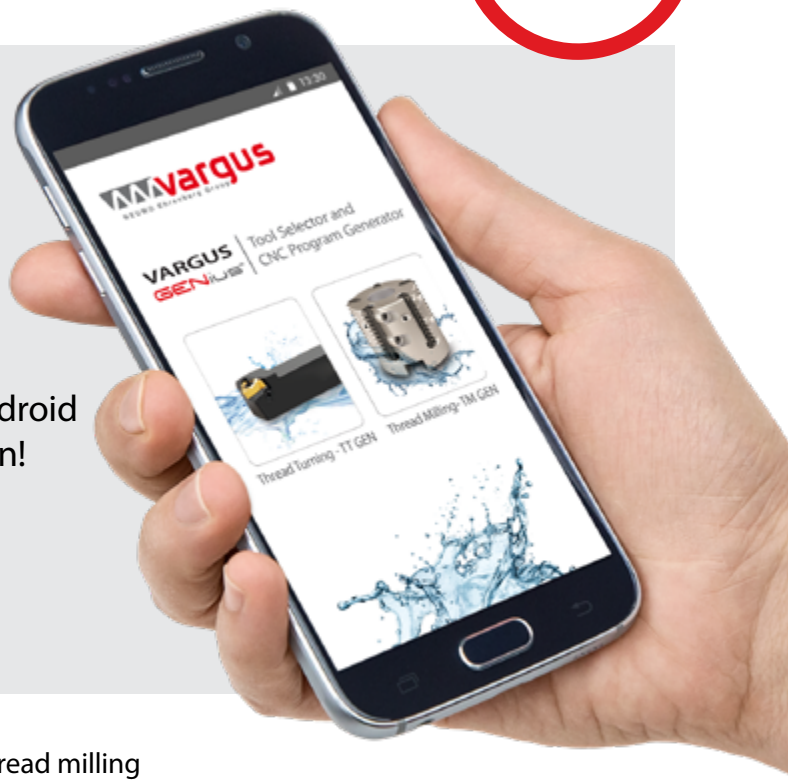

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