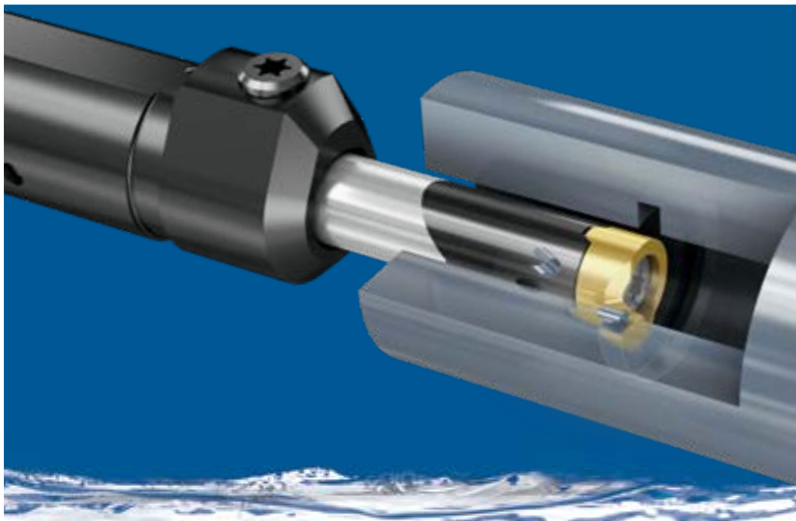
vargus
NEUMO Ehrenberg Group







GROOVEX

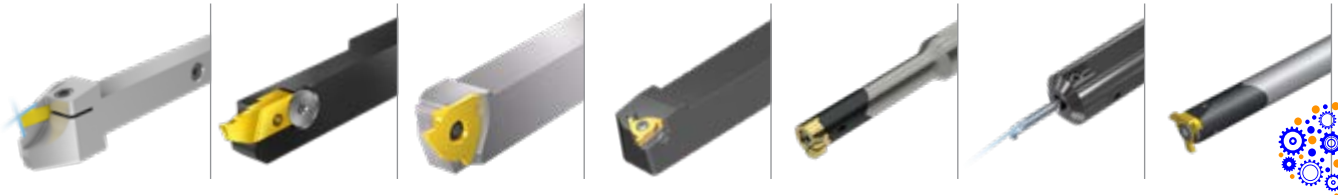
Innovative Grooving & Turning Solutions

EXTERNAL GROOVE TURNING

INTERNAL GROOVE TURNING

GROOVE MILLING

MAIN CATALOG | METRIC



ТОВ «СМАРТТЕК ІНЖИНІРИНГ», т. +380-50-396-90-96, info@smarttec.com.ua, https://www.smarttec.com.ua

СМАРТТЕК
РОЗУМНІ ТЕХНОЛОГІЇ

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 GROOVE TURNING:

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

ST-Cut – Precise tools for external machining on Swiss type machines for a broad range of applications.

GrooVical – Precise Grooving & Turning for shallow grooves, with accurate grounded notch.

Laydown Grooving – Standard laydown grooving inserts for general use in internal and external grooving applications.

INTERNAL GROOVE TURNING:

micrOscope – Micromachining Solutions for Boring, Grooving & Threading in Bores smaller than 1.0mm.

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

GROOVE MILLING:

GM Solid – Solid carbide groove milling tools for miniature and small bores.

GM Slot – Indexable groove milling tools for Grooving and Chamfering applications.

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 and Medical Industries.

SHAVIV Leading Deburring Solutions , manufactures world leading hand-deburring solutions for metal, plastic and wood.


EGMO
Neumo Ehrenberg Group
vargus

GROOVEX
Innovative Grooving & Turning Solutions

EXTERNAL GROOVE TURNING

Semi Finishing

VG-Cut
Complete Range of Turning Solutions

Finishing

ST-Cut
Precise Tools for Small Parts Machining

GrooVical
Precise Grooving & Turning Applications

Laydown Grooving

For Shallow Grooves

INTERNAL GROOVE TURNING

Semi Finishing

VG-Cut

Complete Range of Turning Solutions

Finishing

GrooVical

Precise Grooving & Turning Applications

Laydown Grooving

For Shallow Grooves

Mini-V

Precise Turning, Grooving, Threading & Face Grooving

micrOscope

Mini Tools for Small & Medium Bores

Inserts

Toolholders

Groove Turning Accessories

GROOVE MILLING

GM Solid

Solid Carbide Groove Milling Tools

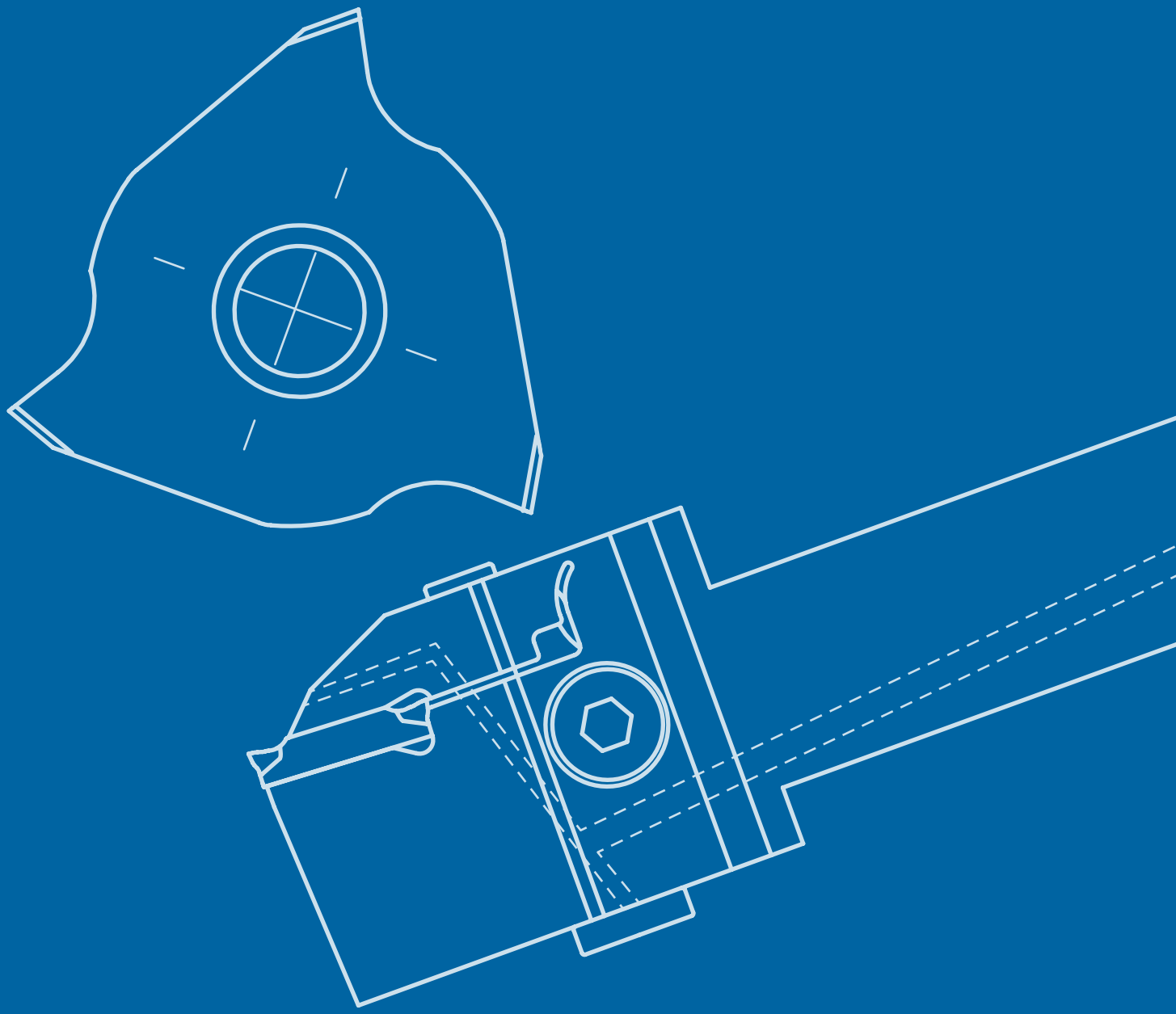
GM Solid Tools

GM Slot

Square Grooving, Round Grooving and Chamfering

Inserts

Toolholders



EXTERNAL GROOVE TURNING

Semi Finishing

Finishing

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СМАРТТЕК
РОЗУМНІ ТЕХНОЛОГІЇ

EXTERNAL GROOVE TURNING | **SEMI FINISHING**

VG-Cut

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

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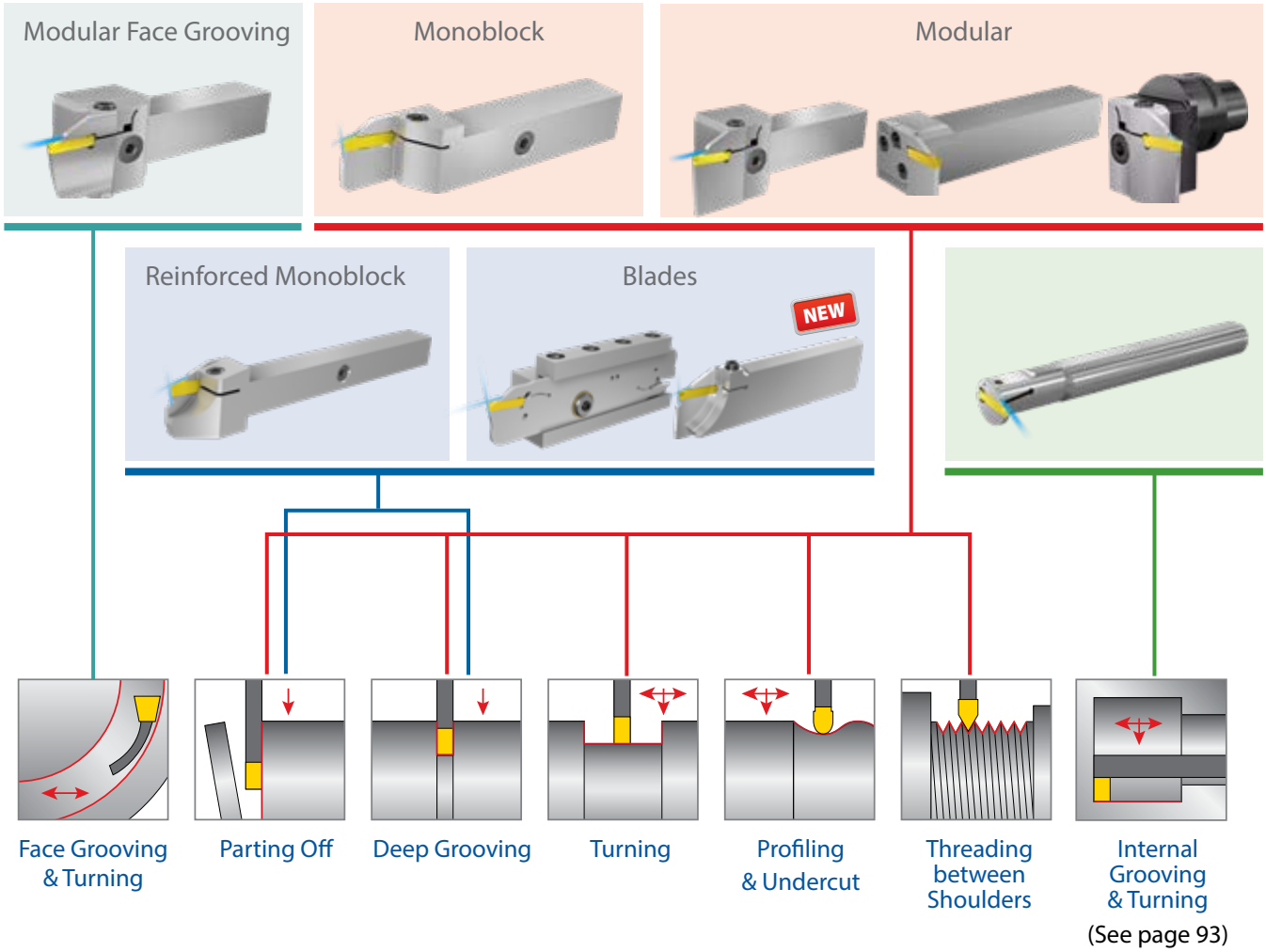
СМАРТТЕК
РОЗУМНІ ТЕХНОЛОГІЇ

VG-Cut | Complete Range of Turning Solutions

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

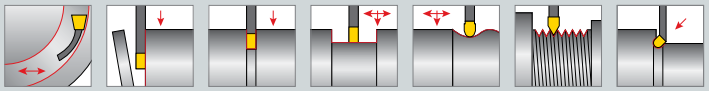
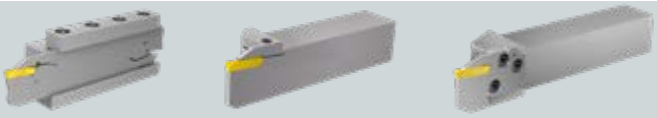
VG-Cut tools provide a wider range of applications and options within the same insert pocket of Deep Grooving, Parting Off, Turning, Profiling, Boring, Face Grooving and Threading. VG-Cut inserts also offer a variety of chip formers and carbide grades, making the **VG-Cut** program a distinctly versatile system. **VG-Cut** inserts are designed with a unique multifunctional and diverse geometry, **starting at 1.5mm**, 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.

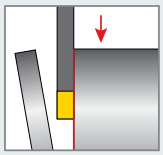
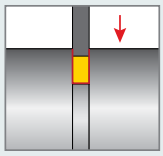


(See page 93)

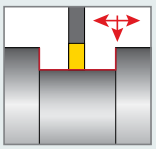
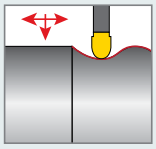
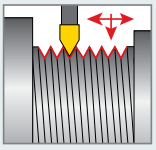
Insert, Tool and Cutting Data Selection Guide

A	Identify the Application		
B	Identify the Designated Workpiece 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

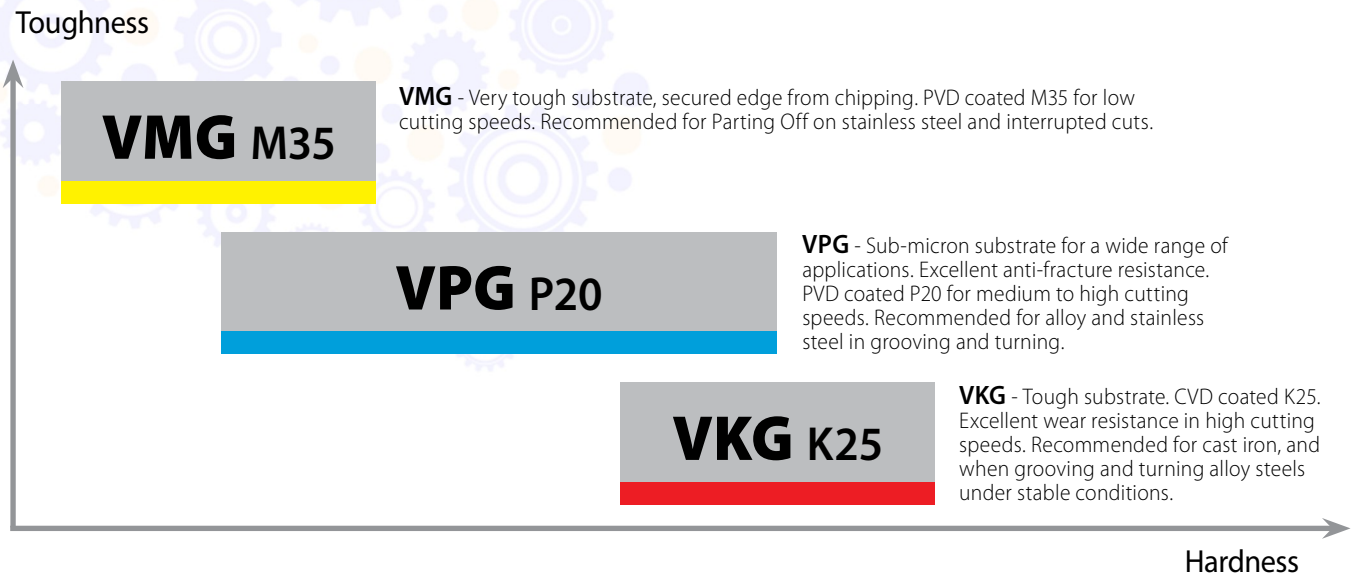
Application	Material Group	Standard Conditions	Extreme Conditions
 Parting Off	**P** Alloy Steel; **H** Hardened Material; **K** Cast Iron	 **GT** Recommended choice for machining alloy and stainless steel. Positive rake chip former leads to low cutting forces during cutting. A multifunctional chip former 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

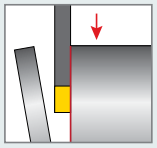
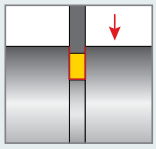
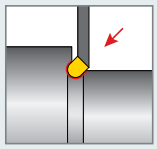
Application	Standard Conditions
 Turning	 **GT** Recommended choice for machining alloy and stainless steel. Positive rake chip former leads to low cutting forces during cutting, with multifunctional chip former for parting off, grooving and turning.
 Profiling	 **GR** Recommended choice for grooving,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

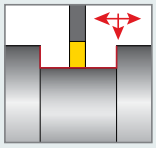
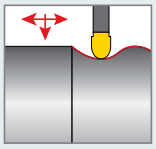
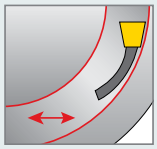
Designated Carbide Grade for Desired Application

Toughness vs. Hardness



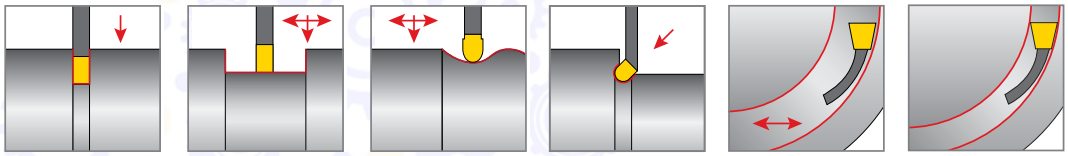
Recommended Carbide Grade for Designated Application

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

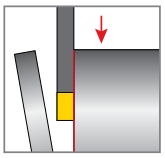
Technical Data

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	Aluminum Alloys Wrought	Non Aging	60	150-300		
	35		Aged	100	150-250		
	36	Aluminum Alloys	Cast	75	150-300		
	37		Cast & Aged	90	150-300		
	38	Aluminum 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

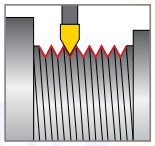


For Parting Off, improved chip forming and chip evacuation; **reduce speed by ≈ 30%.**

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%.**

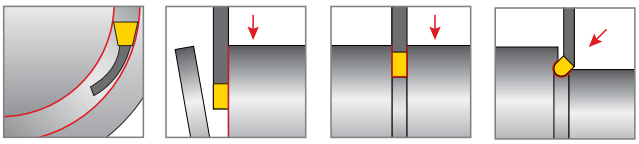
Technical Data

Recommended Cutting Speeds Vc [m/min] for Threading

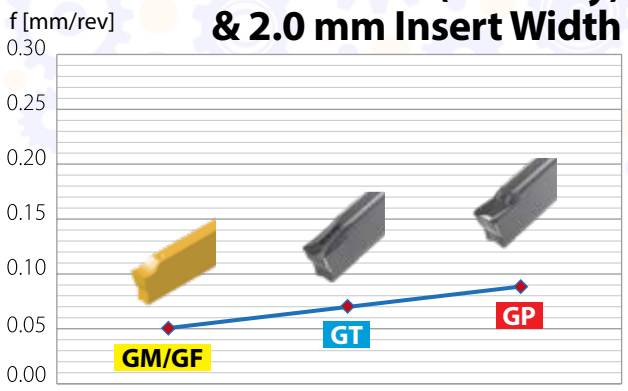


Material Group	Vargus No.	Material		Hardness Brinell HB	Carbide Grade VPG PVD P20
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	120-260
	2		Medium Carbon (C=0.25-0.55%)	150	90-220
	3		High Carbon (C=0.55-0.85%)	170	90-220
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	180	90-220
	5		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	Aluminum Alloys Wrought	Non Aging	60	200-450
	35		Aged	100	200-350
	36	Aluminum Alloys	Cast	75	200-450
	37		Cast & Aged	90	200-450
	38	Aluminum 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

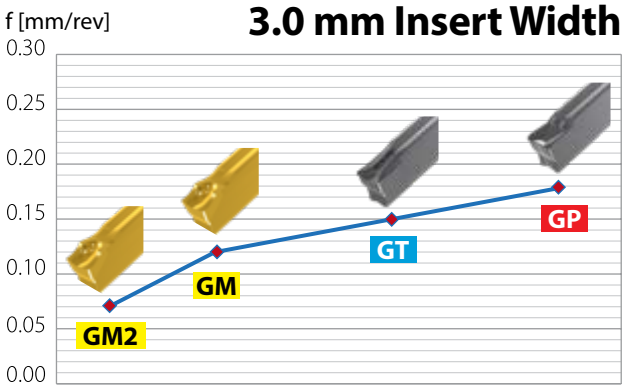


1.5 mm (GM Only) & 2.0 mm Insert Width



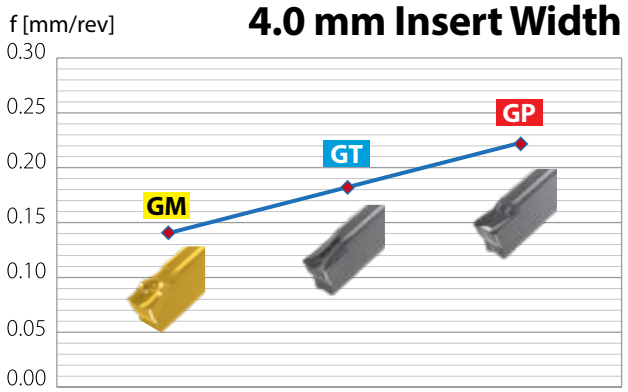
Chip Former	GM/GF	GT	GP
f [mm/rev]	0.06	0.08	0.10

3.0 mm Insert Width



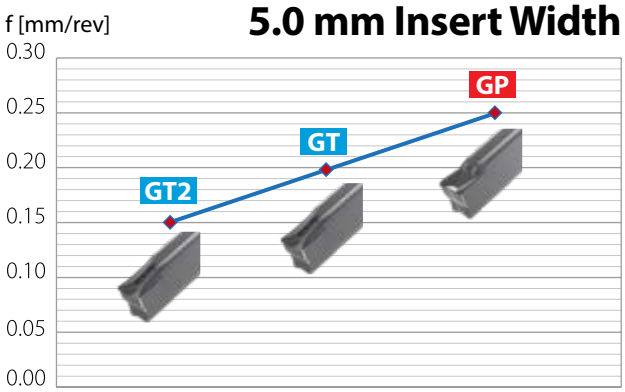
Chip Former	GM2	GM	GT	GP
f [mm/rev]	0.07	0.12	0.15	0.18

4.0 mm Insert Width



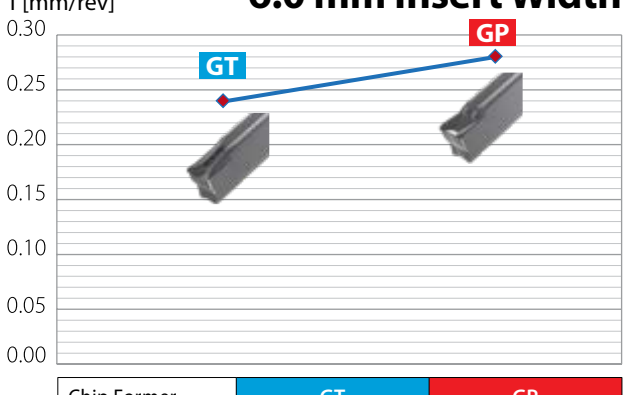
Chip Former	GM	GT	GP
f [mm/rev]	0.14	0.18	0.22

5.0 mm Insert Width



Chip Former	GT2	GT	GP
f [mm/rev]	0.15	0.20	0.25

6.0 mm Insert Width



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

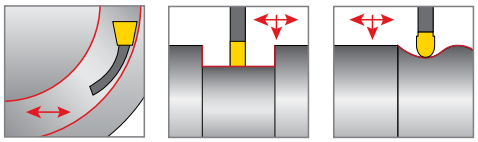
Correct chip forming is essential for chip evacuation. Low feed rates with sufficient chip evacuation improve process stability and tool life.
Feed rate should be increased only when improved evacuation is needed to prevent wall scratching or chip entanglement.

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

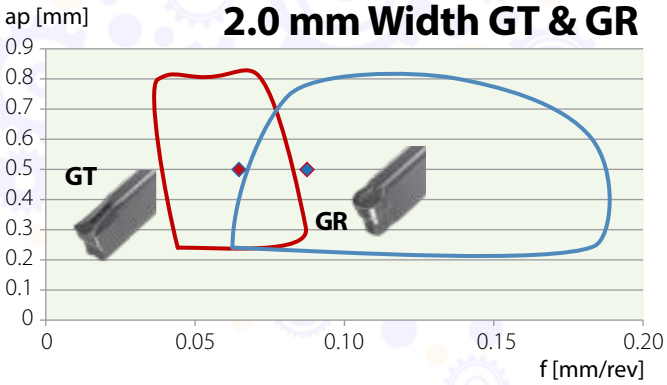
For Parting Off, it is recommended to reduce feed rate by 50% as the insert approaches rotation center. Reduce feed when the insert approaches approx. 3.0 mm diameter.

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



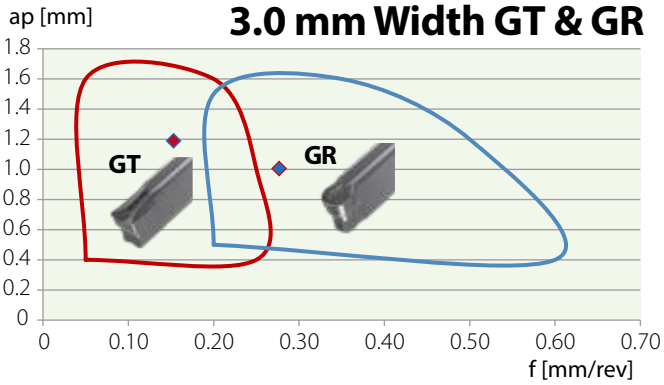
2.0 mm Width GT & GR



Recommended Starting Point:

	GT 2.0 mm	GR 2.0 mm
ap [mm]	0.50	0.50
f [mm/rev]	0.06	0.08

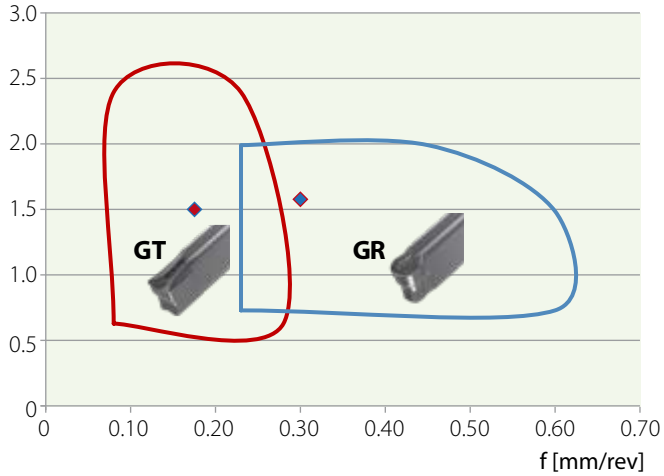
3.0 mm Width GT & GR



Recommended Starting Point:

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

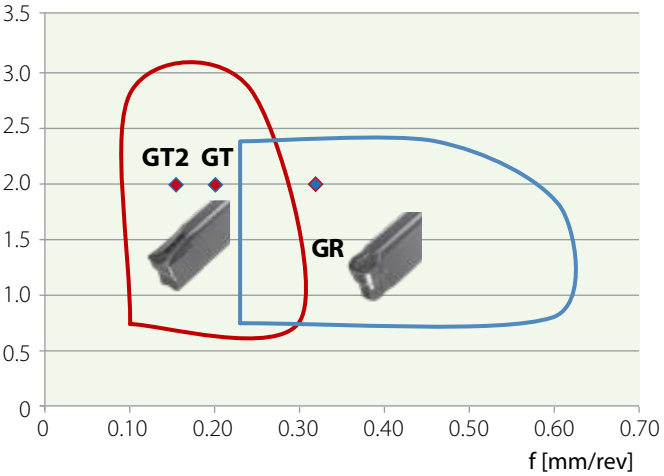
4.0 mm Width GT & GR



Recommended Starting Point:

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

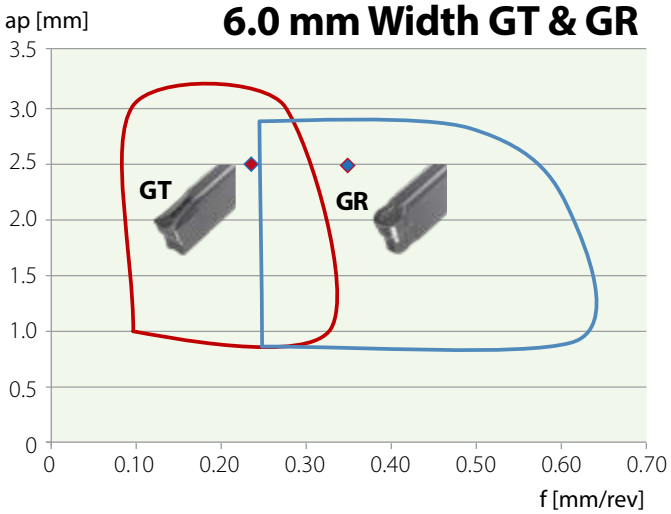
5.0 mm Width GT & GR



Recommended Starting Point:

	GT2 5.0 mm	GT 5.0 mm	GR 5.0 mm
ap [mm]	2.00	2.00	2.00
f [mm/rev]	0.15	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:

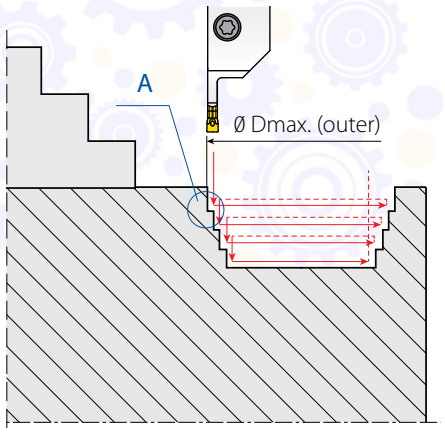


Figure A

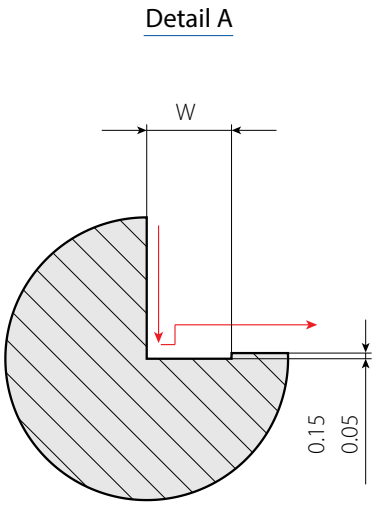


Figure B

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 an average grooving depth 0.2-0.45mm 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:

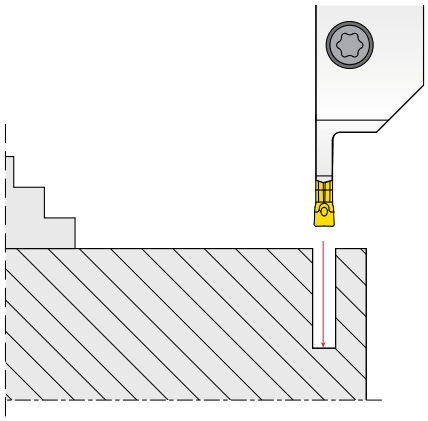


Figure A

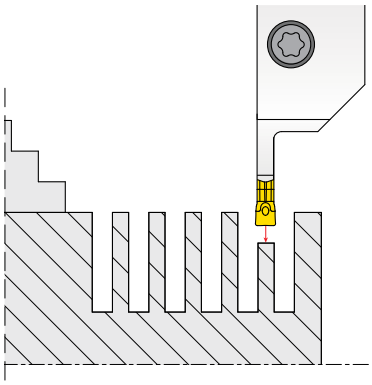


Figure B

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:

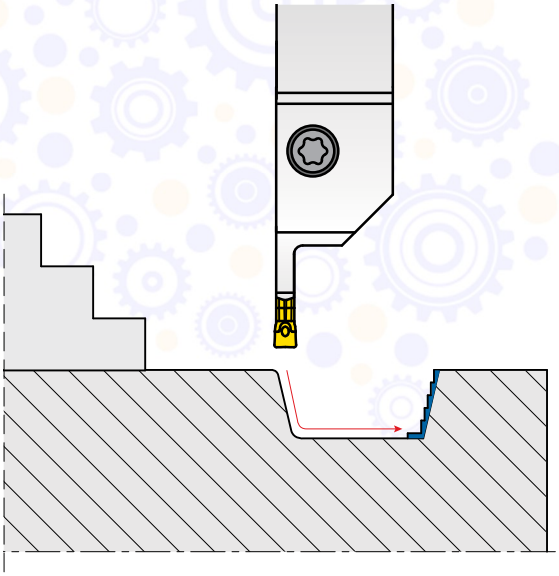


Figure A

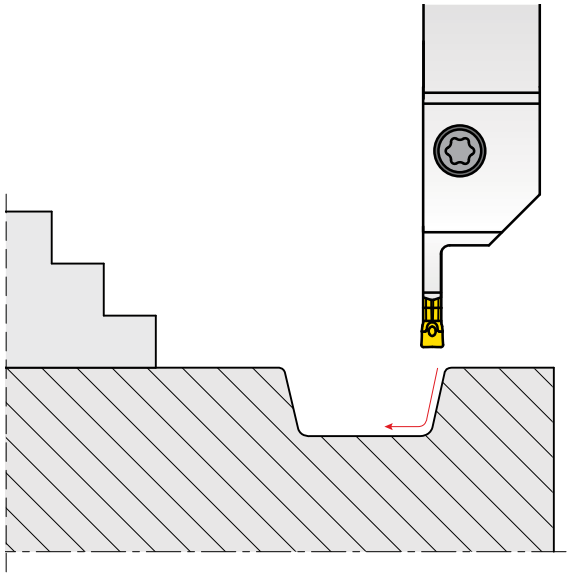


Figure B

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:

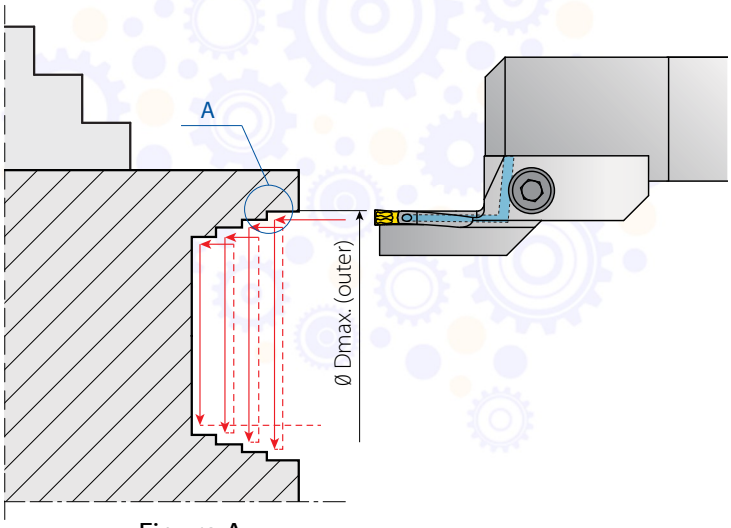


Figure A

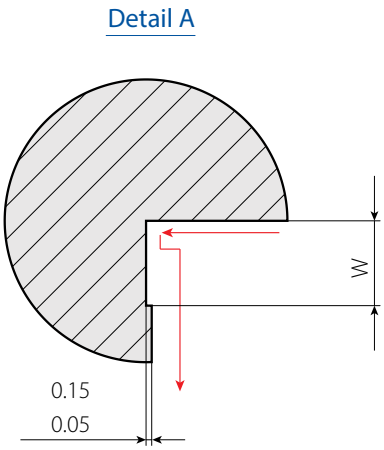


Figure B

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 0.10 mm.
4. Repeat the above cycle (1, 2 & 3), each time deeper into the workpiece, with average grooving depth of 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:

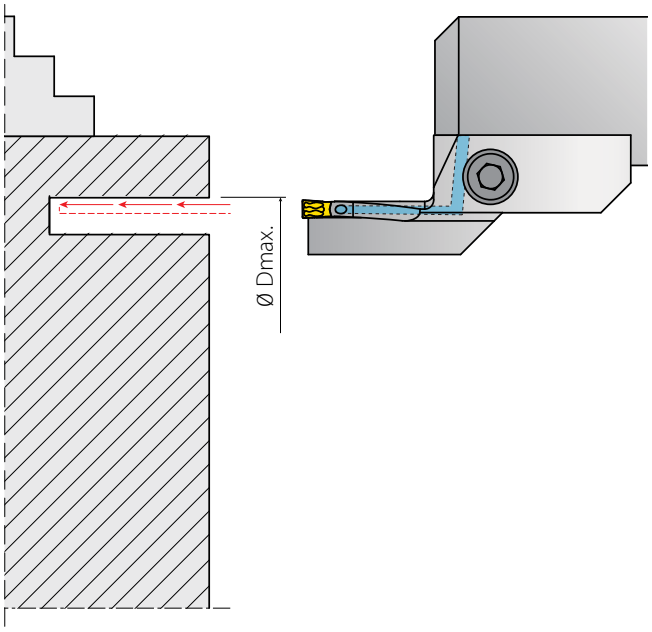


Figure A

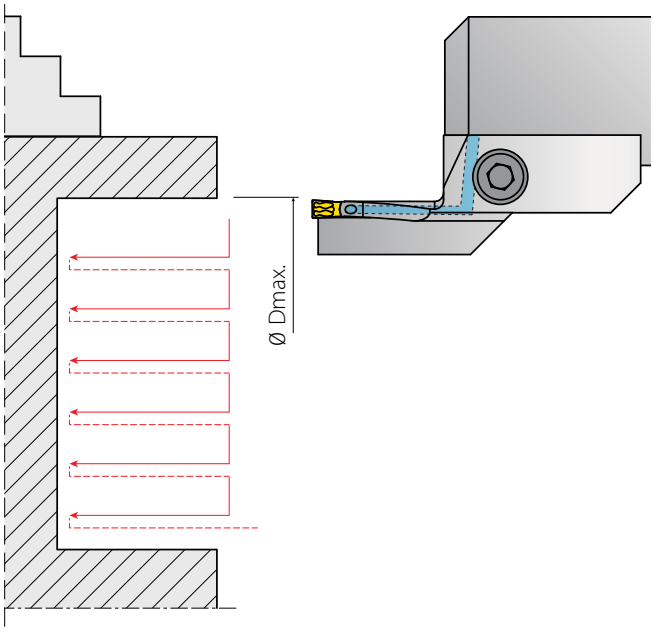


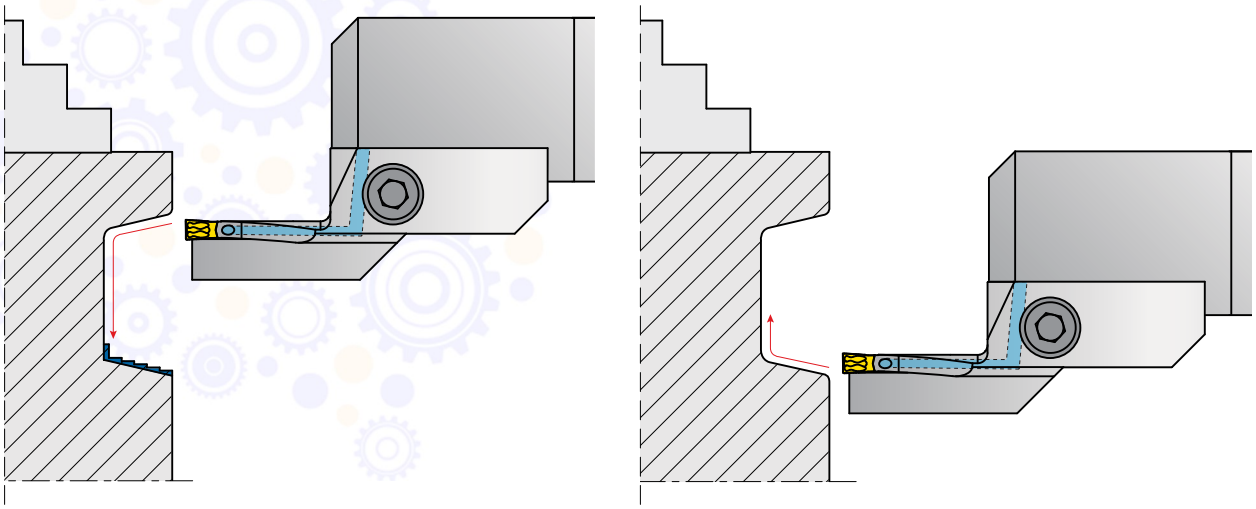
Figure B

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.

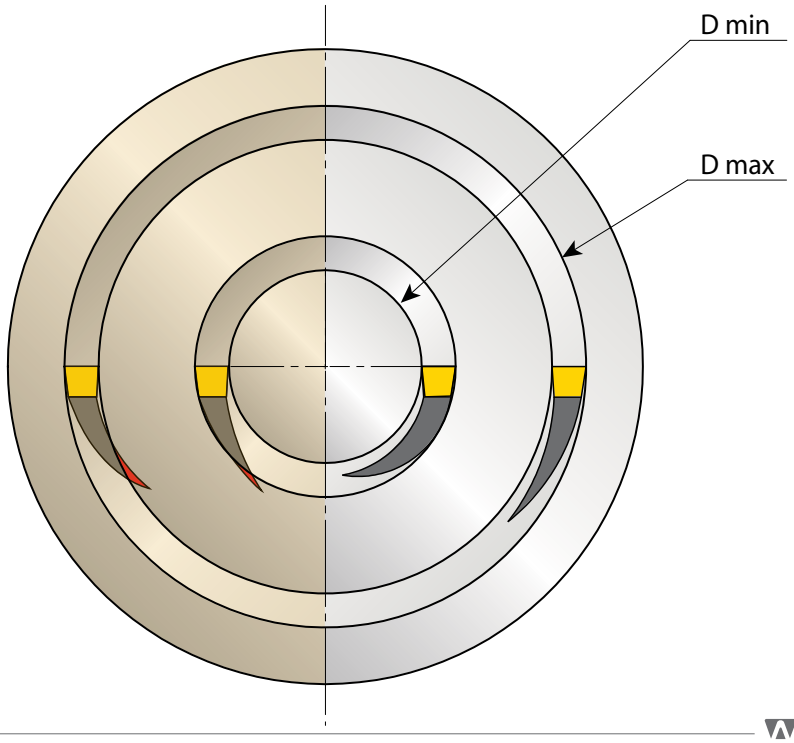
Selecting the Correct Face Grooving Module

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

D max

D min

Wrong Support **Correct Support**



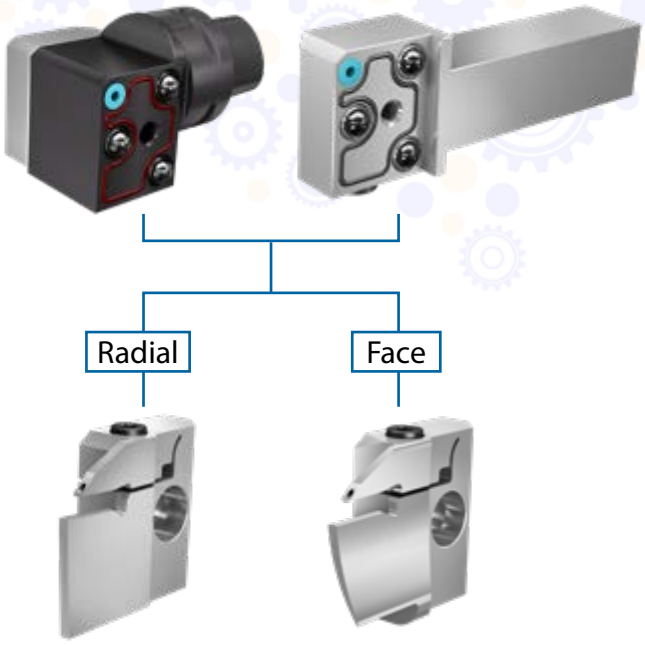
User Guide for Modular System

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

*** High pressure coolant system shown**

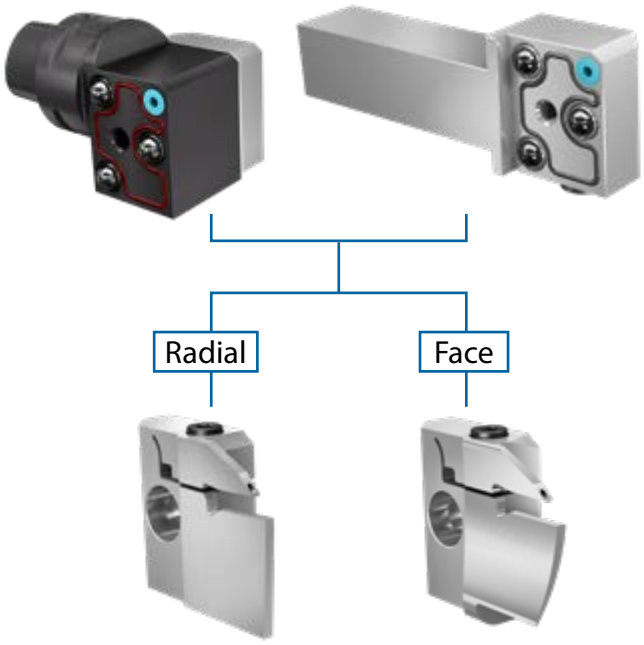
Parallel Right Tools

Right Body



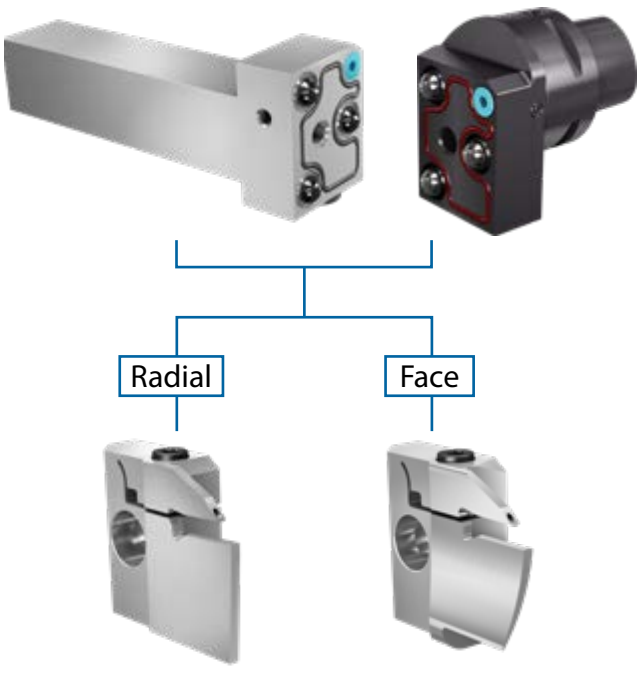
Parallel Left Tools

Left Body



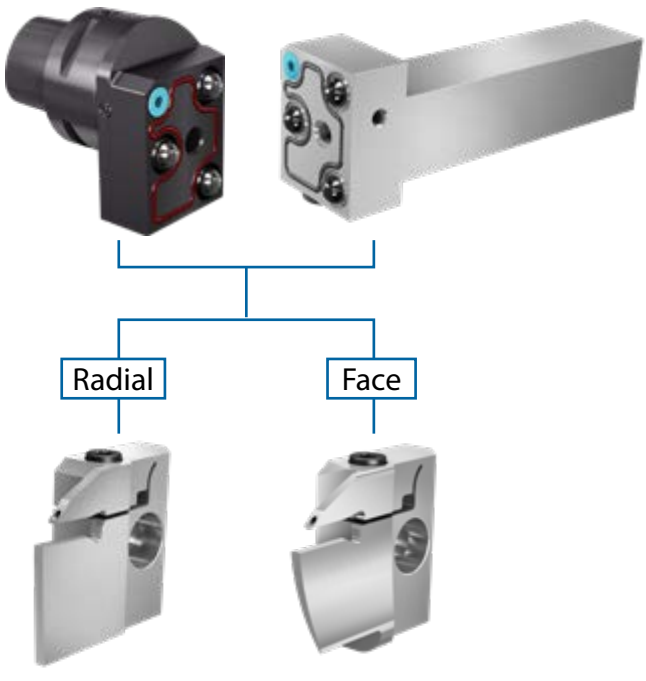
90° Right Tools

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 38 VG-Cut / GrooVical Modular Bodies See page 43 VG-Cut / GrooVical V-Cap Bodies See page 44
	Angled Fitting G1_8x6P	013-00947	
	Straight Fitting G1_8x6P	013-00942	
	Plug G1/8"P	013-00948	VG-Cut Blade Holders See page 38
	Plug DIN 916 GALV M6x8P	013-00940	
	Coolant Sleeve	013-00946	VG-Cut / GrooVical Modular Bodies See page 43 VG-Cut / GrooVical V-Cap Bodies See page 44
	O-RING Body Seal	013-00944	

VG-Cut Inserts

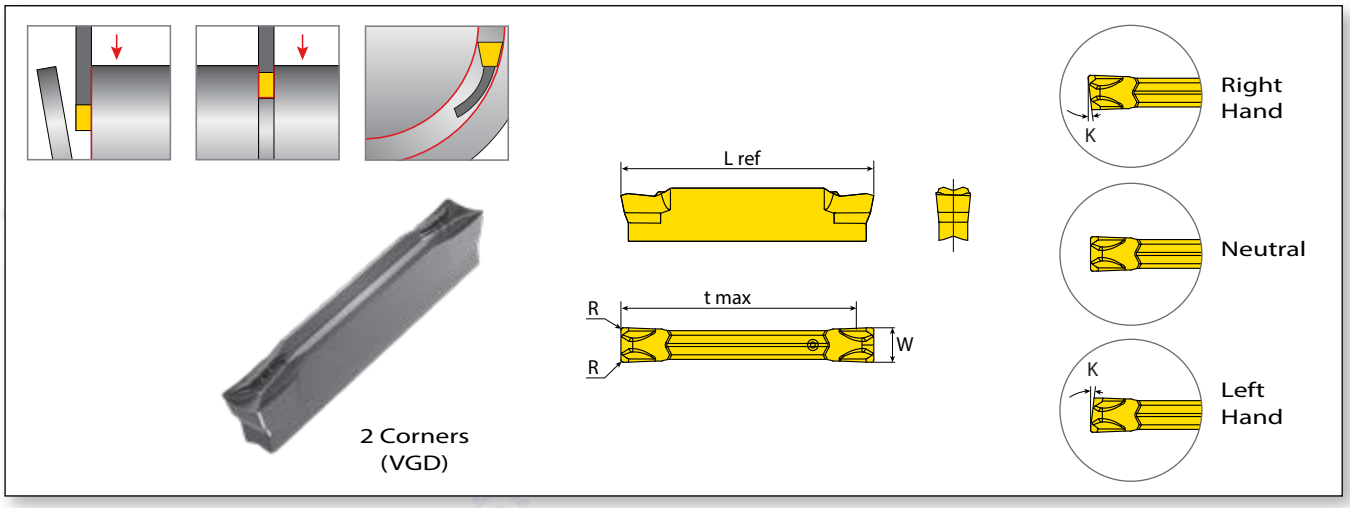
VG-Cut Inserts - Ordering Code System

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 - VG-Cut	D - Double S - Single	1.5, 2.0, 3.0, 4.0, 5.0, 6.0 mm	0.20 mm Threading Standard

5 – RH or LH (for Parting Off)	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, GT2, GR RS - Close to right shoulder LS - Close to left shoulder	VPG, VMG, VKG

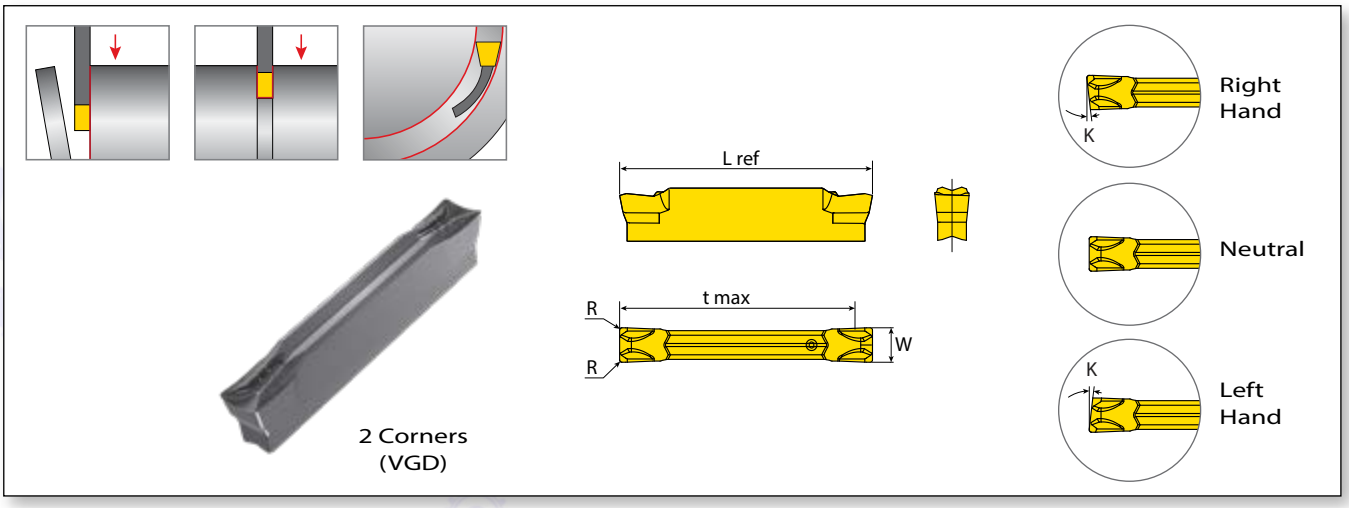
Parting Off & Deep Grooving - Double Sided Inserts
1.5 - 6.0 mm Width



		Pocket Size	Ordering Code	Dimensions mm					Feed Range (mm/rev)	Grade		
				W$^{\pm 0.04}$	R	t max	K°	L ref		VPG	VMG	VKG
Positive cutting edge, for small parts, thin wall pipes & soft materials	GF	2	VGD2.00-015-6R-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-GF	2.00	0.20	20.0	0.0	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	1.5	VGD1.50-012-GM	1.50	0.12	20.0	0.0	22.0	0.03 - 0.10	•	•	-
		1.5	VGD1.50-003-15R-GM	1.50	0.03	20.0	15.0	22.0	0.03 - 0.06	○	•	-
		1.5	VGD1.50-003-15L-GM	1.50	0.03	20.0	15.0	22.0	0.03 - 0.06	○	•	-
		2	VGD2.00-015-GM	2.00	0.15	20.0	0.0	22.0	0.03 - 0.10	•	○	○
		3	VGD3.00-015-GM	3.00	0.15	20.0	0.0	22.0	0.06 - 0.16	•	○	•
		3	VGD3.00-030-GM	3.00	0.30	20.0	0.0	22.0	0.08 - 0.22	•	•	•
		3	VGD3.00-020-6R-GM	3.00	0.20	20.0	6.0	22.0	0.05 - 0.16	•	•	○
		3	VGD3.00-020-6L-GM	3.00	0.20	20.0	6.0	22.0	0.05 - 0.16	•	•	○
		3	VGD3.00-018-15R-GM	3.00	0.18	20.0	15.0	22.0	0.04 - 0.12	○	•	○
		3	VGD3.00-018-15L-GM	3.00	0.18	20.0	15.0	22.0	0.04 - 0.12	○	•	○
		3	VGD3.00-030-GM2	3.00	0.30	20.0	0.0	22.0	0.04 - 0.12	○	•	○
		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	•	○	•
		5	VGD5.00-080-GT2	5.00	0.80	23.0	0.0	2.50	0.06 - 0.22	•	○	○
		6	VGD6.00-040-GT	6.00	0.40	23.0	0.0	25.0	0.10 - 0.25	•	○	•
		6	VGD6.00-080-GT	6.00	0.80	23.0	0.0	25.0	0.10 - 0.28	•	○	○
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	•	○	•
		5	VGD5.00-250-GR	5.00	2.50	20.0	0.0	25.0	0.06 - 0.20	•	○	○
		6	VGD6.00-300-GR	6.00	3.00	20.0	0.0	25.0	0.06 - 0.20	•	○	•

• In stock ○ Available upon request

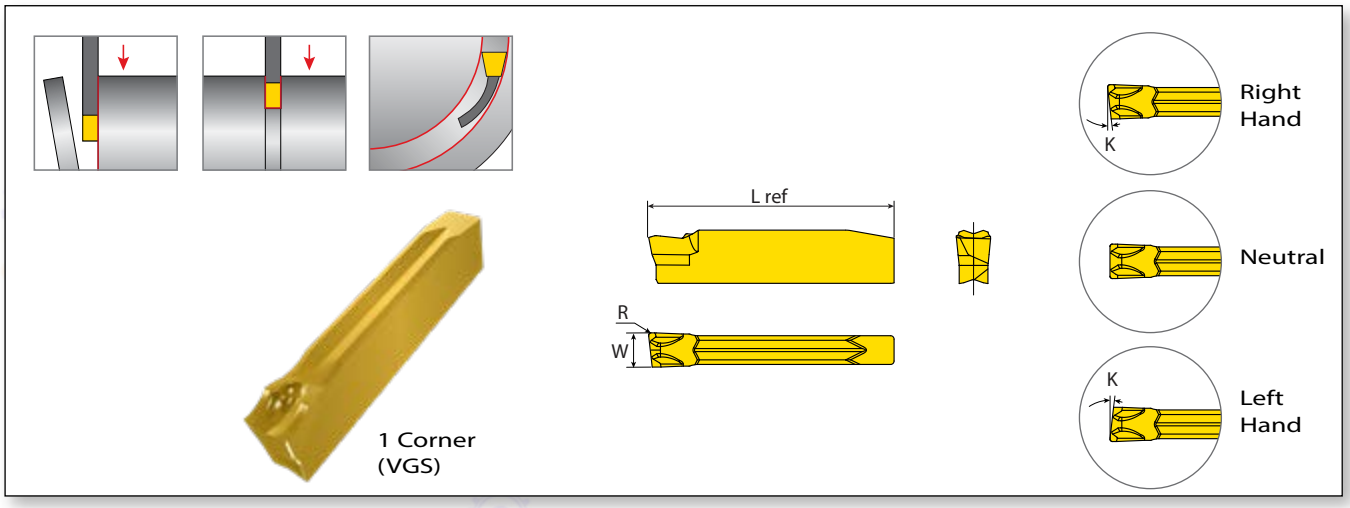
Parting Off & Deep Grooving - Double Sided Inserts (con't)
2.0 - 6.0 mm Width



		Pocket Size	Ordering Code	Dimensions mm					Feed Range (mm/rev)	Grade		
				W±0.04	R	t max	K°	L ref		VPG	VMG	VKG
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	VGD2.00-015-6R-GP	2.00	0.15	20.0	6.0	22.0	0.04 - 0.12	○	•	○
		2	VGD2.00-015-6L-GP	2.00	0.15	20.0	6.0	22.0	0.04 - 0.12	○	•	○
		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

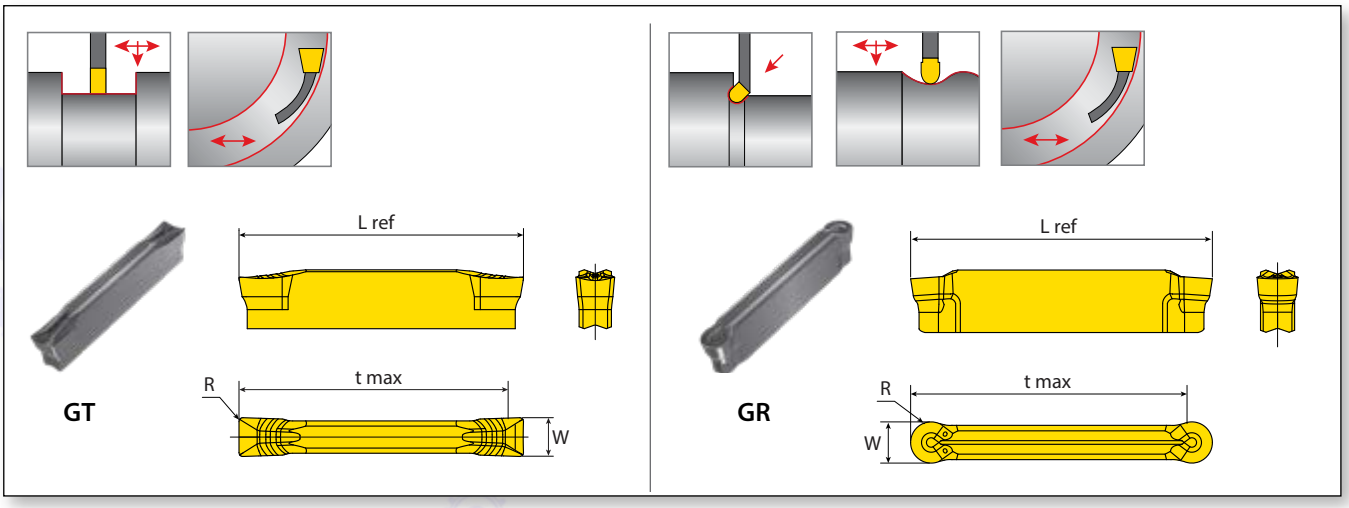
Parting Off & Deep Grooving - Single Sided Inserts
2.0 - 4.0 mm Width



		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

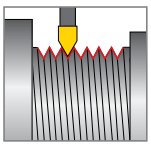
Turning & Profiling
2.0 - 6.0 mm Width



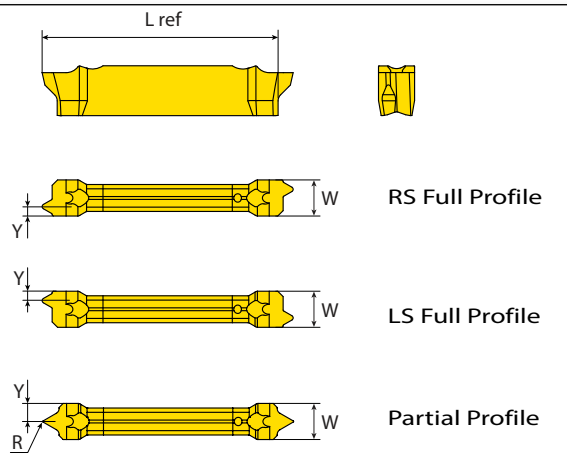
		Pocket Size	Ordering Code	Dimensions mm					Feed Range (mm/rev)	Grade		
				W±0.04	R	t max	K°	L ref		VPG	VMG	VKG
Positive rake chip former with multifunctional chip control. Low cutting forces during cutting.	GT	2	VGD2.00-020-GT	2.00	0.20	20.0	0.0	22.0	0.03 - 0.12	•	○	•
		3	VGD3.00-030-GT	3.00	0.30	20.0	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	•	○	•
		5	VGD5.00-080-GT2	5.00	0.80	23.0	0.0	2.50	0.06 - 0.22	•	○	○
		6	VGD6.00-040-GT	6.00	0.40	23.0	0.0	25.0	0.10 - 0.25	•	○	•
		6	VGD6.00-080-GT	6.00	0.80	23.0	0.0	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	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	•	○	•
		5	VGD5.00-250-GR	5.00	2.50	20.0	0.0	25.0	0.06 - 0.20	•	○	○
		6	VGD6.00-300-GR	6.00	3.00	20.0	0.0	25.0	0.06 - 0.20	•	○	•

• In stock ○ Available upon request

Threading
3.0 mm Width

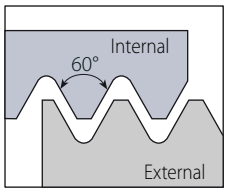


RS/LS Varied range of threading standards for machining between shoulders and close to spindle.



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

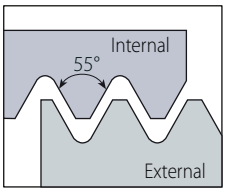
Partial Profile 60°



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

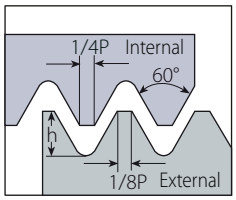
Partial Profile 55°



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

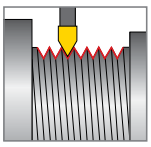


Defined by: R262 (DIN 13)
Tolerance class: 6g

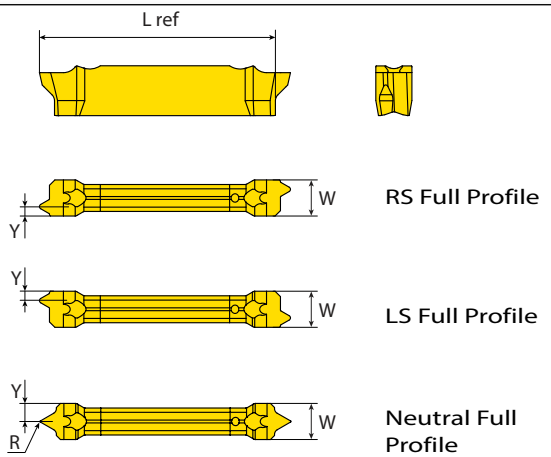
Pocket Size	Ordering Code	Dimensions mm					No. of Passes	Helix	Grade	Min. Thread Diameter
		W ref	Pitch mm	h min	Y	L ref		Deg	VPG	
3	VGD3.0ISO0.4RH-LS	3.00	0.40	0.25	0.37	21.9	3 - 7	4°	•	M2x0.4
3	VGD3.0ISO0.50RH-RS/LS		0.50	0.31	0.53		5 - 7	2.5°	•	M3x0.5
3	VGD3.0ISO0.70RH-RS/LS		0.70	0.43	0.64		5 - 8		•	M4x0.7 Coarse
3	VGD3.0ISO0.75RH-RS/LS		0.75	0.46	0.64		5 - 8		•	M5x0.75
3	VGD3.0ISO0.75LH-LS		0.75	0.46	0.64		5 - 8		•	M5x0.75
3	VGD3.0ISO0.80RH-RS/LS		0.80	0.49	0.64		5 - 8		•	M5x0.8 Coarse
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)

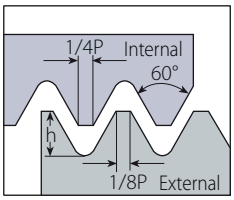


RS/LS Varied range of threading standards for machining between shoulders and close to spindle.



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

American UN

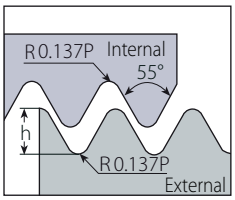


Defined by: ANSI B1.1:74
Tolerance class: 2A

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	VGD3.0UN80RH-RS/LS	3.00	80	0.18	0.35	21.9	3 - 5	4°	•	No.0-80UNF
3	VGD3.0UN72RH-LS		72	0.22	0.38		3 - 5		•	No.1-72UNF
3	VGD3.0UN56RH-RS/LS		56	0.28	0.40		3 - 6		•	No.2-56UNC
3	VGD3.0UN40RH-RS/LS		40	0.39	0.60		3 - 7		•	No.4-40UNC
3	VGD3.0UN32RH-RS/LS		18	0.87	0.93		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	VGD3.0UN18LH-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/LS		14	1.11	1.09		8 - 14		•	7/16"-14UNC
3	VGD3.0UN12RH-RS/LS		12	1.30	1.30		8 - 14		•	9/16"-14UNC

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

Whitworth

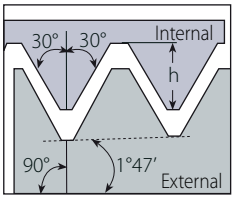


Defined by: B.S.84:1956, DIN 259, ISO228/1:1982
Tolerance class: Medium class A

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	VGD3.0W36RH-LS	3.00	36	0.86	0.95	21.9	5 - 8	2.5°	•	
3	VGD3.0W32RH-LS		32	1.16	1.15		5 - 8		•	
3	VGD3.0W26RH-LS		26	1.48	1.68		5 - 8		•	
3	VGD3.0W19RH-RS/LS		19	0.45	0.60		7 - 12		•	1/2"-19BSW
3	VGD3.0W14RH-RS/LS		14	0.51	0.60		8 - 14		•	1/2"-14BSW
3	VGD3.0W11RH/LH		11	0.63	0.75		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/LH		11.5	1.64	1.60		9 - 15		•	1"-11.5NPT
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 System

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
WS - Reinforced blade with screw clamping

3 – For External Holders
Shank Size

4 – Pocket Size
1.5, 2, 3, 4, 5, 6

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

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

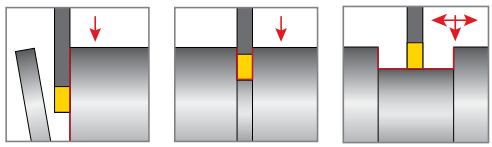
9 – RH or LH
R - RH
L - LH
None - Neutral

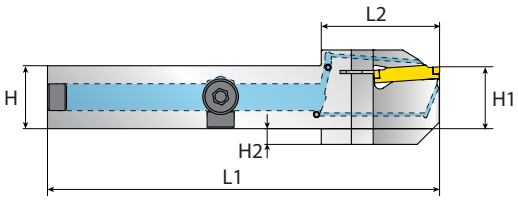
10 – PH
PH - Reinforced blade structure

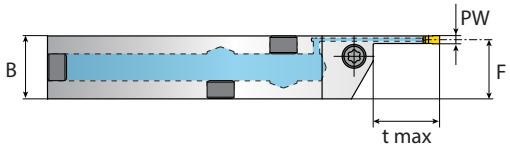
11 – Coolant
C - Coolant

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

External Monoblock Tools with High Pressure Coolant Thru Grooving, Parting Off, Turning & Threading





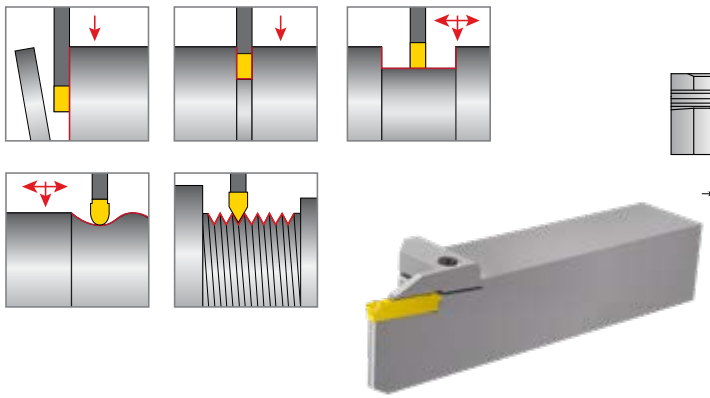


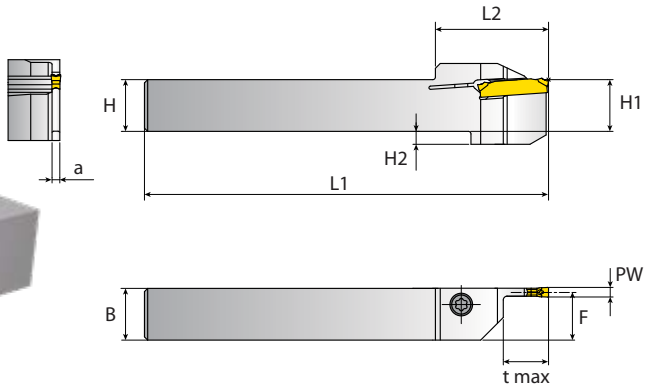
* Right hand shown

Ordering Code		Dimensions mm							Spare Parts	
RH/LH	PW	t max	HXB	H1	F	L1	L2	a	Cylindrical Screw*	Key
VGER/L2020-3T12C	3	12	20x20	20	18.8	124.6	28.5	2.4	SM5x20-T25	K6T
VGER/L2020-3T21C		21	20x20	20	18.8	124.6	37.6	2.4		
VGER/L2525-3T12C		12	25x25	25	23.8	124.6	30.6	2.4		
VGER/L2525-3T21C		21	25x25	25	23.8	124.6	37.6	2.4		
VGER/L2525-4T21C	4	21	25x25	25	23.3	124.6	37.6	2.4		

* Recommended Tightening torque: PW3 - 4.5 Nm, PW4 - 5Nm

External Monoblock Tools
Grooving, Parting Off, Turning & Threading





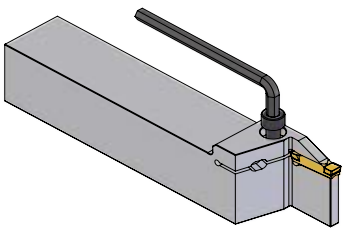
* Right hand shown

Ordering Code			Dimensions mm							Spare Parts		
RH/LH	PW	t max	HXB	H1	H2	F	L1	L2	a	Cylindrical Screw*	Key	Key
VGER/L1616-2NT12	2	12	16x16	16	4	15.1	125	35	1.8	SM4x16-T20	K4TF	-
VGER/L2020-2NT12		12	20x20	20	-	19.1	125	35	1.8			
VGER/L2525-2NT08		8	25x25	25	-	24.1	125	35	1.8			
VGER/L1212-3NT08	3	8	12x12	12	4	10.75	125	35	2.5	SM3.5X14-T15	-	KT-15
VGER/L1212-3NT12		12	12x12	12	4	10.75	125	35	2.5			
VGER/L1616-3NT12		12	16x16	16	4	14.75	125	35	2.5	SM4x16-T20		K6T
VGER/L1616-3NT21		21	16x16	16	4	14.75	125	35	2.5			
VGER/L2020-3NT08		8	20x20	20	-	18.75	125	35	2.5	SM5x20-T25		
VGER/L2020-3NT12		12	20x20	20	-	18.75	125	35	2.5			
VGER/L2020-3NT21		21	20x20	20	-	18.75	125	35	2.5			
VGER/L2525-3NT08		8	25x25	25	-	23.75	125	35	2.5			
VGER/L2525-3NT12		12	25x25	25	-	23.75	125	35	2.5			
VGER/L2525-3NT21		21	25x25	25	-	23.75	125	35	2.5			
VGER/L1616-4NT21	4	21	16x16	16	4	14.3	125	35	3.4	SM4x16-T20		
VGER/L2020-4NT12		12	20x20	20	-	18.3	125	35	3.4	SM5x20-T25		
VGER/L2020-4NT21		21	20x20	20	-	18.3	125	35	3.4			
VGER/L2525-4NT08		8	25x25	25	-	23.3	125	35	3.4			
VGER/L2525-4NT12		12	25x25	25	-	23.3	125	35	3.4			
VGER/L2525-4NT21		21	25x25	25	-	23.3	125	35	3.4			
VGER/L3232-4NT21		21	32x32	32	-	30.3	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	-			

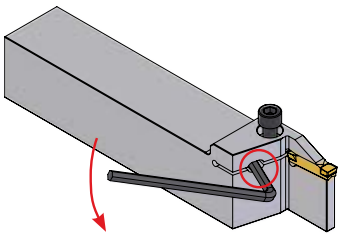
* Tightening Torque: PW2 - 3Nm, PW3/4/5/6 - 5Nm

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

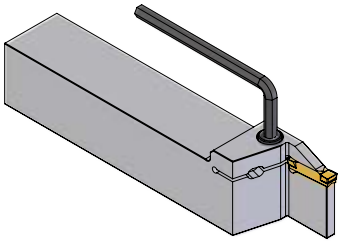
1 Unlock the top screw using the key provided.



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.



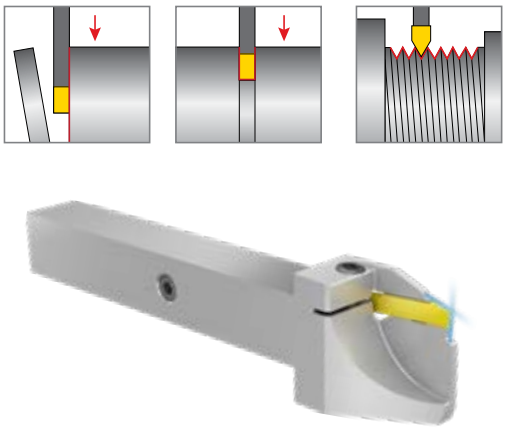
3 Now remove the key from the pocket and secure the insert by firmly locking the top screw.

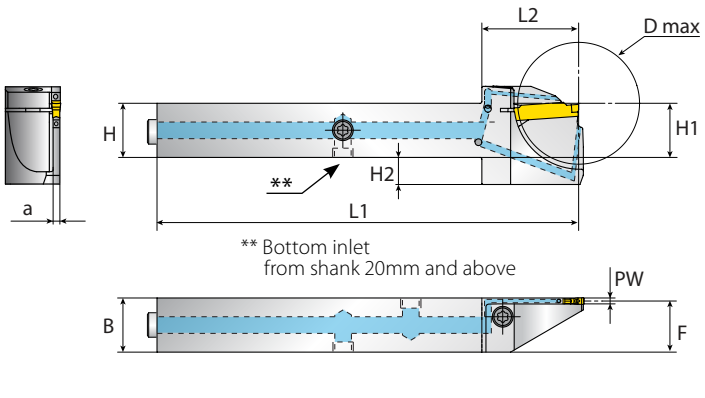


| Tools should not be clamped without an insert inside the pocket.

Reinforced Monoblock Tools with High Pressure Coolant Thru Grooving, Parting Off & Threading

NEW





* Right hand shown

Ordering Code	Dimensions mm									Spare Parts		
RH/LH	PW	D max	HXB	H1	F	L1	L2	a	H2	Cylindrical Screw*	Key	Plug Screw x2
VGER/L1010-1.5T10-PHC	1.5	20	10x10	10	9.35	110	24.6	1.3	7	SM4x14 T15	KT-15	Plug M6x6
VGER/L1212-1.5T10-PHC		20	12x12	12	11.35	125	22.6		5			
VGER/L1616-1.5T10-PHC		20	16x16	16	15.35	125	22.6		2			
VGER/L1010-2T10PHC	2	20	10x10	10	9.1	109.6	26	1.8	7			Plug M6x6
VGER/L1212-2T12PHC		24	12x12	12	11.1	124.6	24		6			
VGER/L1616-2T12PHC		24	16x16	16	15.1	124.6	24		2			
VGER/L1616-2T18PHC		36	16x16	16	15.1	124.6	30		8			
VGER/L2020-2T18PHC		36	20x20	20	19.1	124.6	30		4			Plug G1/8"
VGER/L1212-3T12PHC	3	24	12x12	12	10.8	124.6	24	2.4	6			
VGER/L1616-3T12PHC		24	16x16	16	14.8	124.6	24		2			
VGER/L2020-3T21PHC		42	20x20	20	18.8	124.6	32		7			
VGER/L2525-3T21PHC		42	25x25	25	23.8	124.6	32		2			

* Recommended Tightening Torque: 1.5, 2.0 mm width - 4 Nm max | 3.0 mm width - 5 Nm max.

Standard Key K3TF is supplied with tool. A torque meter can be ordered separately for greater tightening accuracy.

The following VARGUS accessories for use with HPC can be ordered separately:

1. Tube Connector 25-6P (x1)
2. Fittings (x2): Angled Fitting M6x6P or Straight Fitting M6x6P

For more information see page 21.

Reinforced Monoblock Tools
Grooving, Parting Off & Threading

NEW

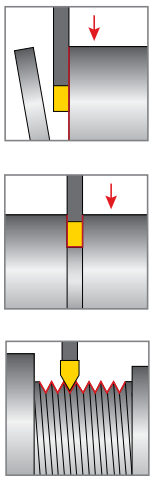


Figure 1

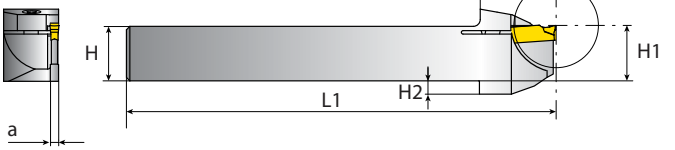
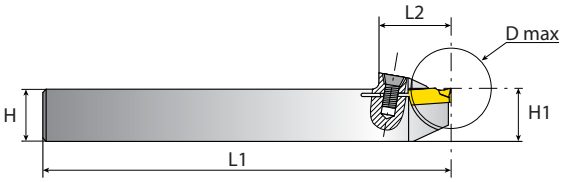


Figure 2



* Right hand shown

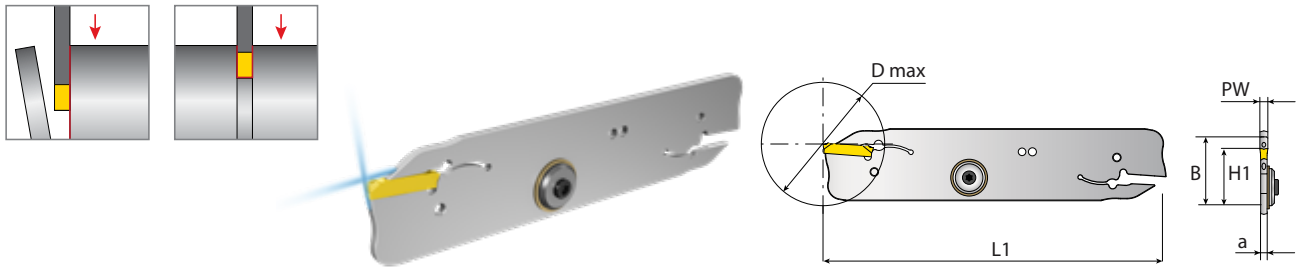
Ordering Code		Dimensions mm								Spare Parts		
RH/LH	PW	D max	HXB	H1	H2	F	L1	L2	a	Cylindrical Screw*	Key	Key
VGER/L1010-1.5T6.5-PH	1.5	13	10x10	10	4	9.35	125	22	1.3	SCM4x14-T15	K3TF	-
VGER/L1010-1.5T10-PH		20	10x10	10	4	9.35	125	22	1.3			
VGER/L1212-1.5T6.5-PH		13	12x12	12	-	11.35	125	22	1.3			
VGER/L1212-1.5T10-PH		20	12x12	12	-	11.35	125	22	1.3			
VGER/L1616-1.5T10-PH		20	16x16	16	-	15.35	125	22	1.3			
VGER/L1010-2T12PH	2	24	10x10	10	4	9.1	125	22	1.8	SCM4x14-T15	K3TF	-
VGER/L1212-2T08PH		16	12x12	12	-	11.1	125	22	1.8			
VGER/L1212-2T12PH		24	12x12	12	-	11.3	125	22	1.4			
VGER/L1616-2T12PH		24	16x16	16	-	15.3	125	22	1.4			
VGER/L1616-2T21PH		1.65	16x16	16	-	15.3	125	30	1.4			
VGER/L2020-2T12PH		24	20x20	20	-	19.3	125	22	1.4			
VGER/L2020-2T21PH		1.65	20x20	20	-	19.3	125	30	1.4			
VGER/L2525-2T21PH		42	25x25	25	-	24.3	125	30	1.4			
VGER/L1616-3T12PH	3	24	16x16	16	-	14.8	125	22	2.4	SCM4x14-T15	-	KT-15
VGER/L1616-3T21PH		42	16x16	16	-	18.8	125	30	2.4			
VGER/L2020-3T12PH		24	20x20	20	-	18.8	125	22	2.4			
VGER/L2020-3T21PH		42	20x20	20	-	18.8	125	30	2.4			
VGER/L2525-3T12PH		24	25x25	25	-	23.8	125	22	2.4			
VGER/L2525-3T21PH		42	25x25	25	-	23.8	125	30	2.4			

*Tightening Torque: 1.5, 2.0 mm width - **Cannot Exceed** 3 Nm max | 3.0 mm width - 5 Nm max.

Standard Key K3TF is supplied with tool. A torque meter can be ordered separately for greater tightening accuracy.

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

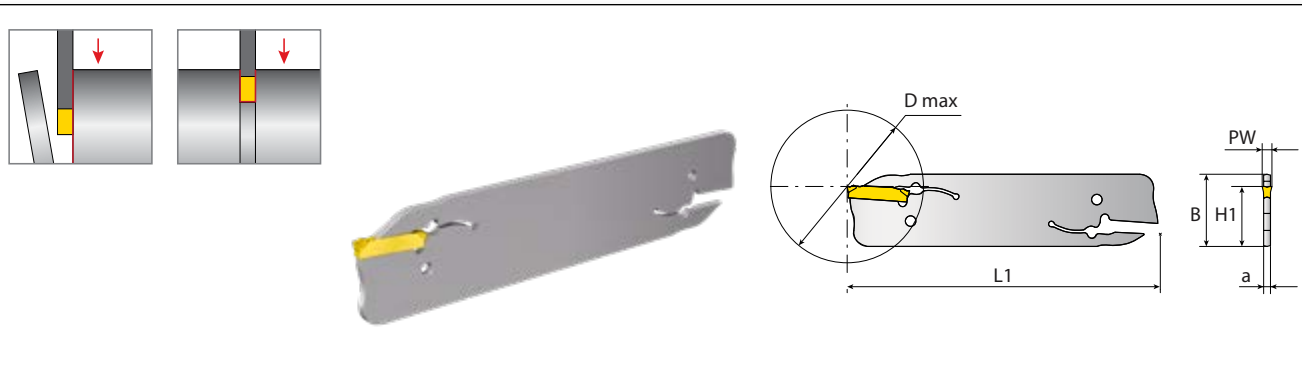
Blades with High Pressure Coolant Thru Grooving, Parting Off



Ordering Code	Dimensions mm						Spare Parts		
	B	PW	D max*	H1	L1	a	Key**	Sealing Cap Key***	Sealing Cap
VGP26-3DC	26	3	70	21.4	110	2.5	VP-3	Key WS-15IP	WS-15IP
VGP32-3DC	32	3	100	24.8	150	2.5	VP-3	Key WS-15IP	WS-15IP
VGP32-4DC	32	4	100	24.8	150	3.4	VP-4	Key WS-15IP	WS-15IP

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.

Blades Grooving & Parting Off

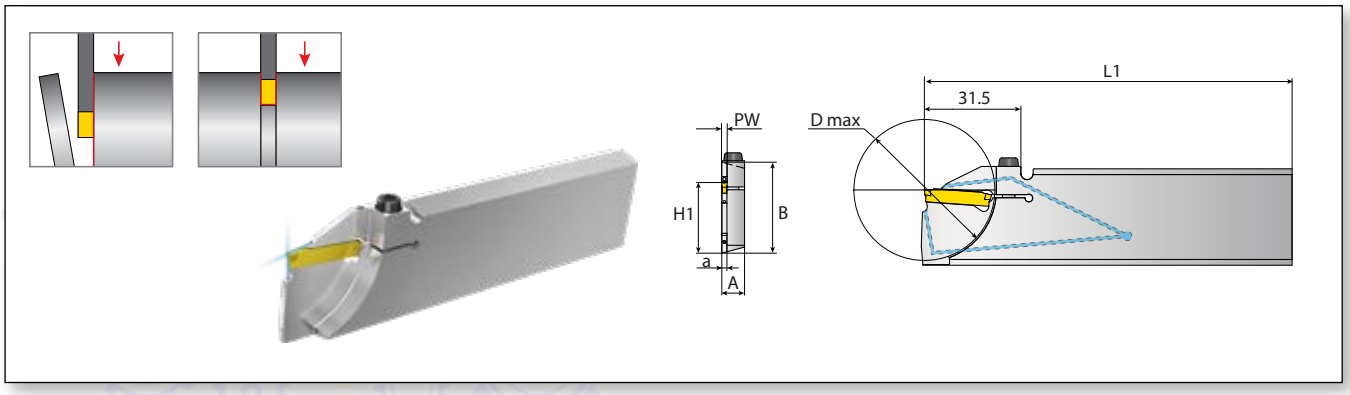


Ordering Code	Dimensions mm						Spare Parts
	B	PW	D max*	H1	L1	a	Key**
VGP26-2D	26	2	50	21.4	110	1.8	VP-3
VGP32-2D	32	2	50	24.8	150	1.8	
VGP26-3D	26	3	70	21.4	110	2.5	
VGP32-3D	32	3	100	24.8	150	2.5	
VGP35-3S	35	3	100	33.5	150	2.5	
VGP32-4D	32	4	100	24.8	150	3.4	VP-4
VGP32-5D	32	5	100	24.8	150	4.0	VP-G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

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

Reinforced Blades (Screw Clamping) with HPC Grooving, Parting Off

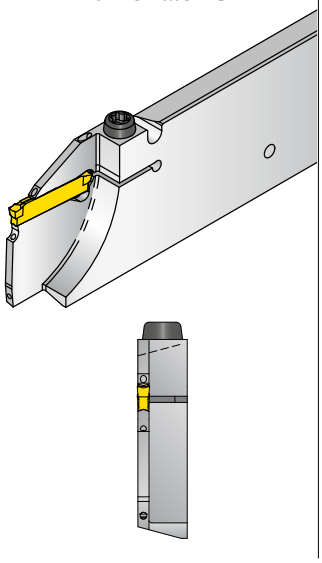
NEW



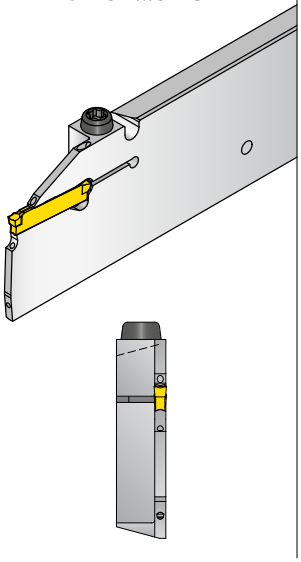
Ordering Code	Dimensions mm							Spare Parts	
									
RH/LH	B	PW	D max*	H1	L1	A	a	Screw**	Key
VGWSR 26-2SRC	26	2	46	21.4	110	8	1.8	SM4.0x16-T20	K6T
VGWSR 26-2SLC	26	2	46	21.4	110	8	1.8		
VGWSL 26-2SLC	26	2	46	21.4	110	8	1.8		
VGWSL 26-2SRC	26	2	46	21.4	110	8	1.8		
VGWSR 32-2SRC	32	2	46	24.8	120	8	1.8		
VGWSR 32-2SLC	32	2	46	24.8	120	8	1.8		
VGWSL 32-2SLC	32	2	46	24.8	120	8	1.8		
VGWSL 32-2SRC	32	2	46	24.8	120	8	1.8		
VGWSR 26-3SRC	26	3	46	21.4	110	8	2.4		
VGWSR 26-3SLC	26	3	46	21.4	110	8	2.4		
VGWSL 26-3SLC	26	3	46	21.4	110	8	2.4		
VGWSL 26-3SRC	26	3	46	21.4	110	8	2.4		
VGWSR 32-3SRC	32	3	46	24.8	120	8	2.4		
VGWSR 32-3SLC	32	3	46	24.8	120	8	2.4		
VGWSL 32-3SLC	32	3	46	24.8	120	8	2.4		
VGWSL 32-3SRC	32	3	46	24.8	120	8	2.4		

* D max figures presented are for single sided insert (VGS).
** Recommended tightening torque: PW2 - 3Nm, PW3 - 4.5Nm.

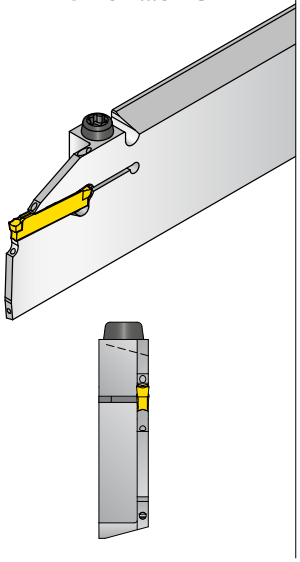
VGWSL...SLC



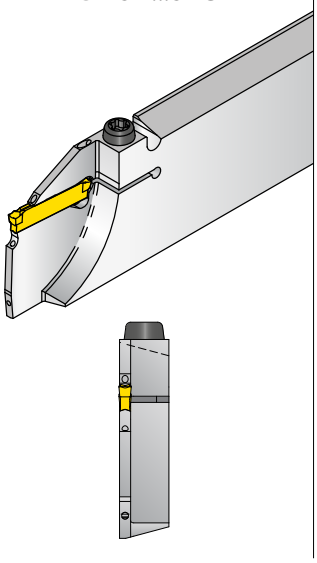
VGWSL...SRC



VGWSR...SRC

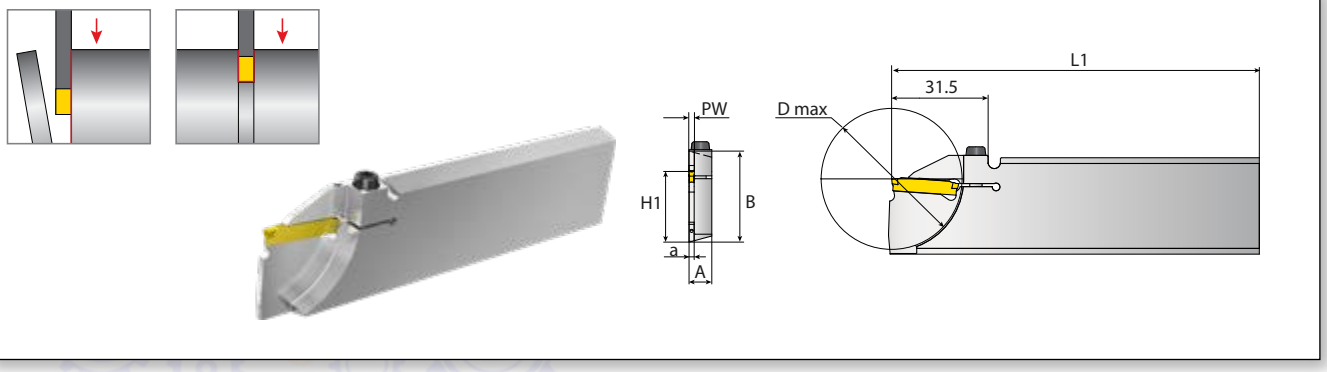


VGWSR...SLC



Reinforced Blades (Screw Clamping) Grooving, Parting Off

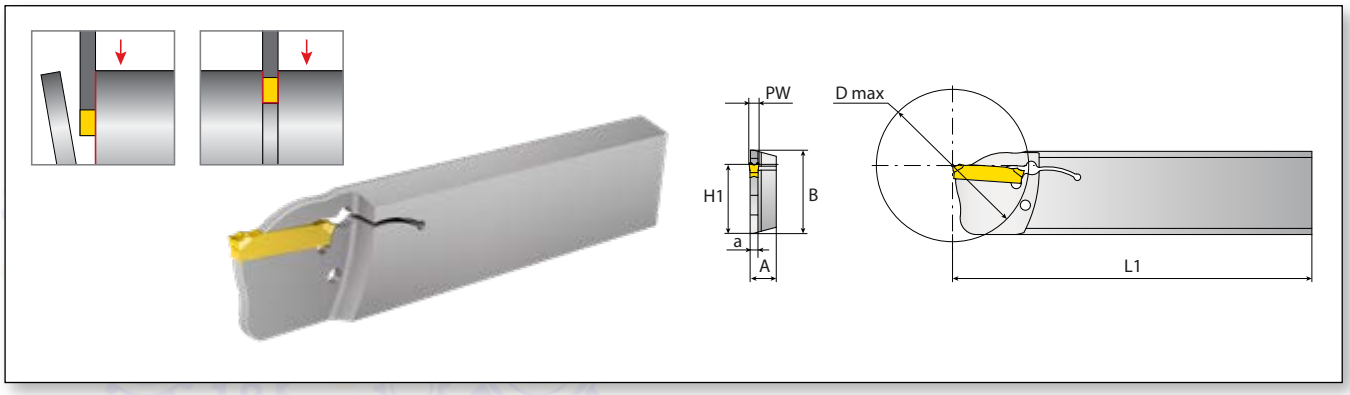
NEW



Ordering Code	Dimensions mm							Spare Parts	
RH/LH	B	PW	D max*	H1	L1	A	a	Screw**	Key
VGWSR 26-2SR	26	2	46	21.4	110	8	1.8	SM4.0x16-T20	K6T
VGWSR 26-2SL	26	2	46	21.4	110	8	1.8		
VGWSL 26-2SL	26	2	46	21.4	110	8	1.8		
VGWSL 26-2SR	26	2	46	21.4	110	8	1.8		
VGWSR 32-2SR	32	2	46	24.8	120	8	1.8		
VGWSR 32-2SL	32	2	46	24.8	120	8	1.8		
VGWSL 32-2SL	32	2	46	24.8	120	8	1.8		
VGWSL 32-2SR	32	2	46	24.8	120	8	1.8		
VGWSR 26-3SR	26	3	46	21.4	110	8	2.4		
VGWSR 26-3SL	26	3	46	21.4	110	8	2.4		
VGWSL 26-3SL	26	3	46	21.4	110	8	2.4		
VGWSL 26-3SR	26	3	46	21.4	110	8	2.4		
VGWSR 32-3SR	32	3	46	24.8	120	8	2.4		
VGWSR 32-3SL	32	3	46	24.8	120	8	2.4		
VGWSL 32-3SL	32	3	46	24.8	120	8	2.4		
VGWSL 32-3SR	32	3	46	24.8	120	8	2.4		

* D max figures presented are for single sided insert (VGS).
** Recommended tightening torque: PW2 - 3Nm, PW3 - 4.5Nm.

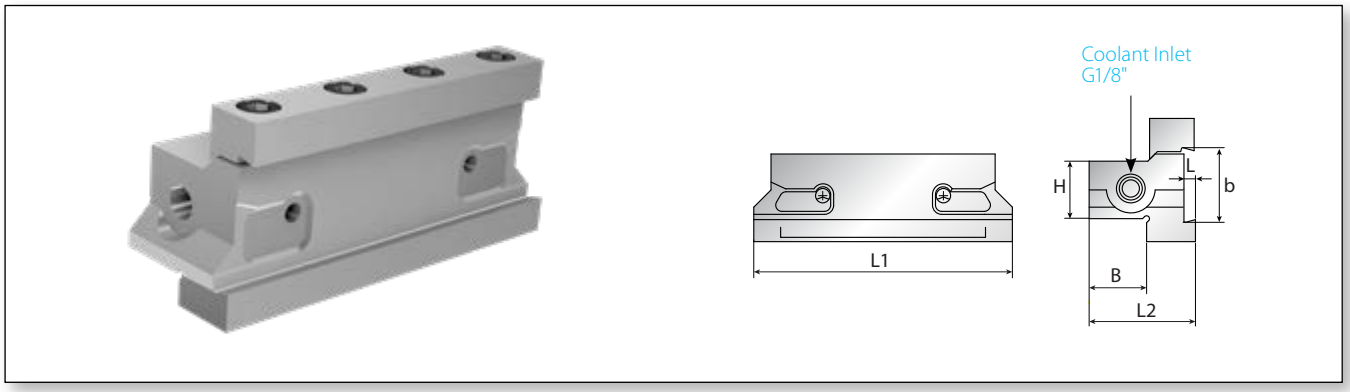
Reinforced Blades
Grooving, Parting Off



Ordering Code	Dimensions mm							Spare Parts
RH/LH	B	PW	D max*	H1	L1	A	a	Key**
VGWR/L26-2S	26	2	65	21.4	110	8.0	1.8	VP-3
VGWR/L32-2S	32	2	65	24.7	110	8.0	1.8	
VGWR/L26-3S	26	3	65	21.4	110	8.0	2.5	
VGWR/L32-3S	32	3	65	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		

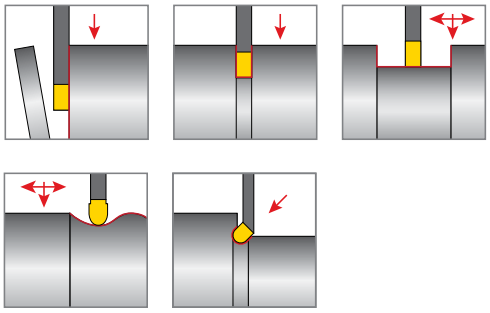
* Tightening Torque: 10 Nm max

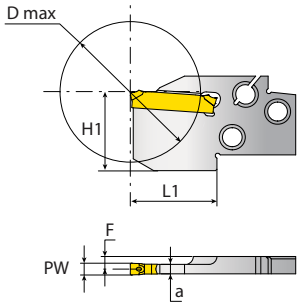
Necessary Parts When Using Blades with High Pressure Coolant Thru:

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

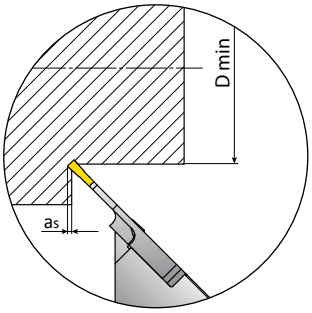
Radial (0°-90°) Module Limitations

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

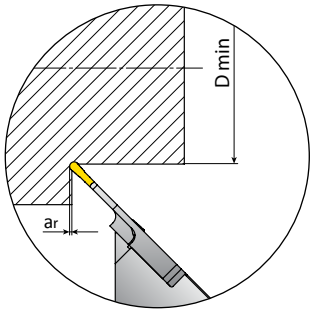
45° (Undercut) Module Limitations

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		

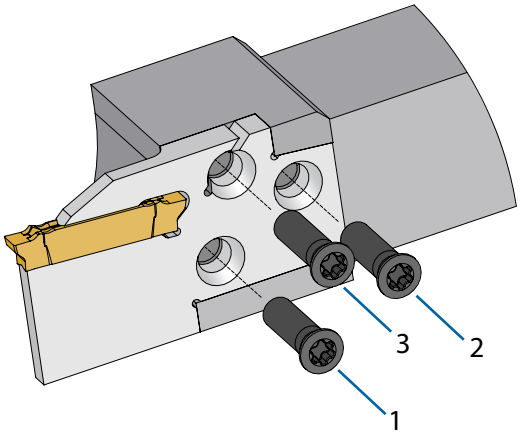
Square Groove



Round Groove

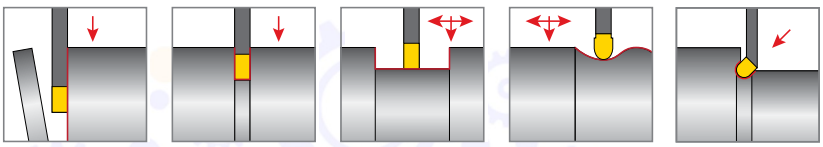


Mounting and Replacing Modules:

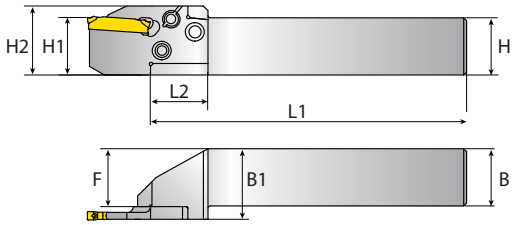


1. Clamp the module using screws 1, 2 and 3.
2. Clamp module to body with screw no. 1, followed by screw no. 2.
3. Finally, clamp the insert to the holder using screw no. 3.

Modular Bodies for Grooving, Parting Off & Turning



Parallel Square Bodies

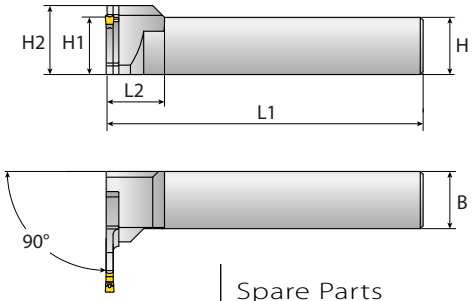


* Right hand shown

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



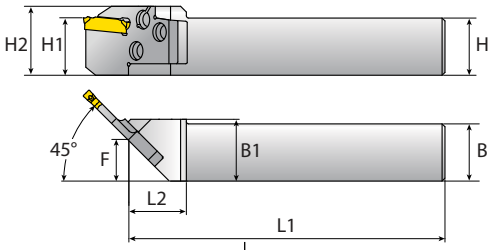
* Right hand shown

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

45° Square Bodies



* Left hand shown

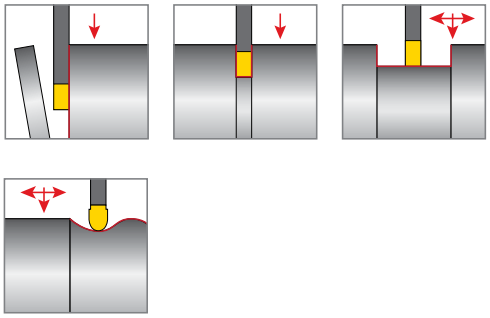
Spare Parts

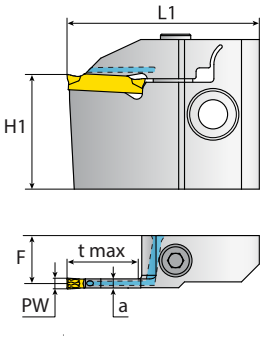
Ordering Code	Dimensions mm							Spare Parts	
RH/LH	H/H1	B	B1	H2	L1	L2	F	Conical Screw*	Key
VBMR/L2020-45	20	20.0	21.5	24	110	20	14.5	SM4x10.5 T15 SM4x14 T15	KT-15
VBMR/L2525-45	25	25.0	26.0	30	140	25	18	SM5x13.5 T20 SM5x18 T20	K6T

For 45º 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





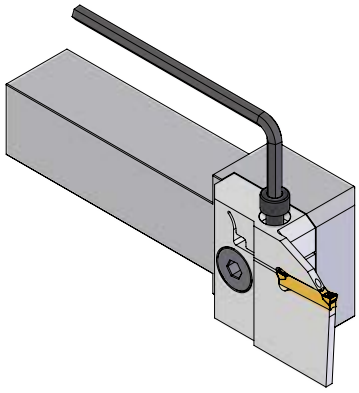
*Right hand shown

Ordering Code			Dimensions mm				Spare Parts	
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		

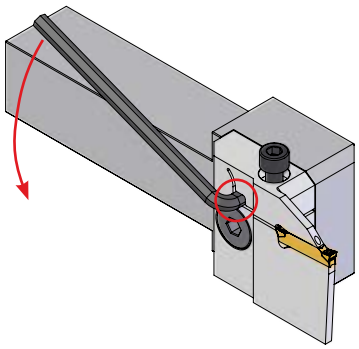
* Tightening Torque: PW 2 mm - 4 Nm max; PW 3, 4, 5, 6 mm - 7 Nm max.
** T max figures presented for single sided inserts (VGS).

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

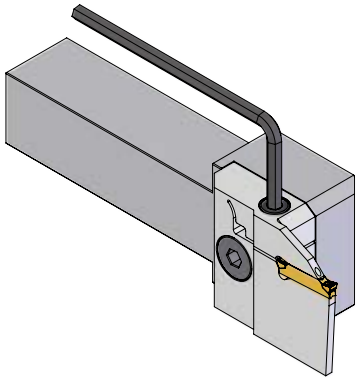
1 Unlock the top screw using the key provided.



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.

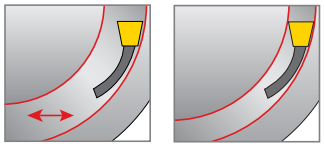


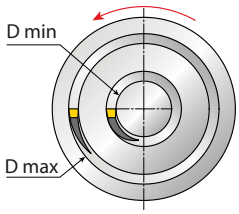
3 Now remove the key from the pocket and secure the insert by firmly locking the top screw.



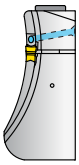
| Tools should not be clamped without an insert inside the pocket.

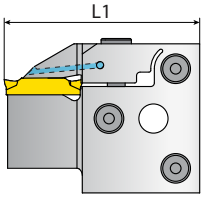
Face Grooving Modules with High Pressure Coolant Thru

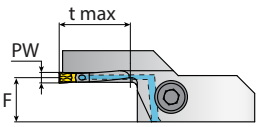




Workpiece rotation for Face Grooving:
- Clockwise for left-hand application
- Counter-clockwise for right-hand application







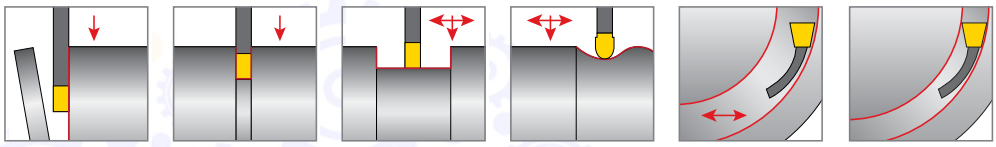
* Right hand shown

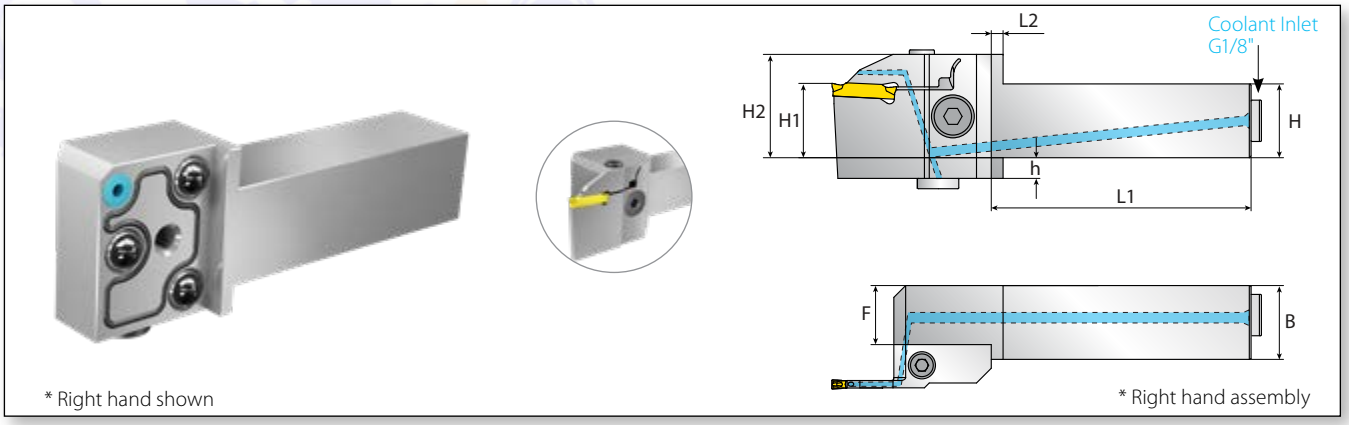
Ordering Code	Dimensions mm						Spare Parts	
RH/LH	PW	t max	D min	D max	F	L1	Screw*	Key
VGFR/L-2530-T10-3C	3	10	23.50	32.00	12.5	45	SM5x16	K4H
VGFR/L-3038-T10-3C			28.60	40.40				
VGFR/L-3848-T10-3C			36.60	50.40				
VGFR/L-4860-T10-3C			46.60	62.80				
VGFR/L-6075-T10-3C			58.70	78.20				
VGFR/L-75100-T10-3C			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.

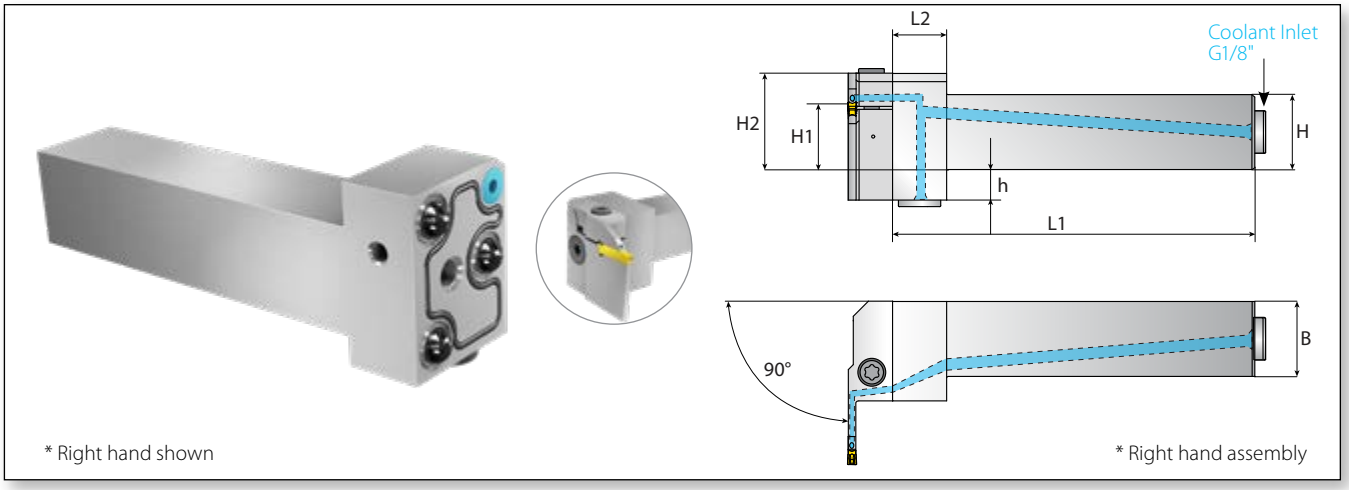
Modular Bodies with High Pressure Coolant for Grooving, Face Grooving, Parting Off and Turning





Parallel Square Bodies with HPC

Ordering Code	Dimensions mm							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					



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					

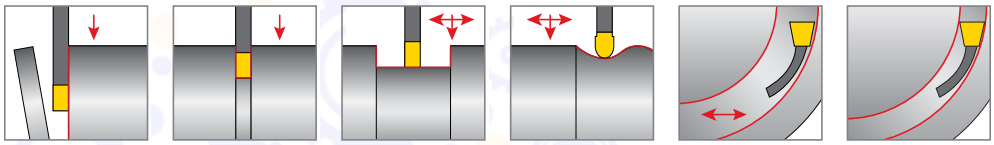
* Tightening Torque: 26 NM max.

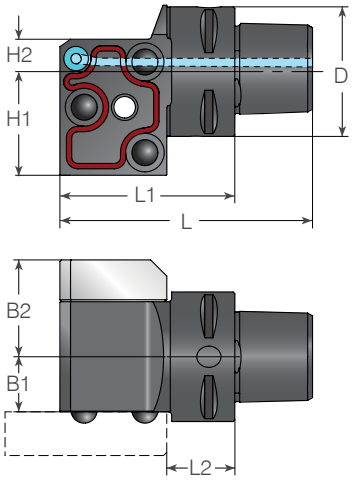
Necessary Parts When Using Modules with High Pressure Coolant Thru:

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 see page 21.**

Modular V-CAP Holders with HPC

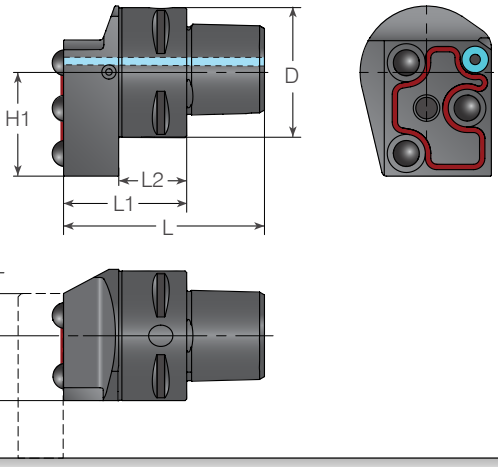




* RH+LH holder with Modular Cover. RH shown.

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						



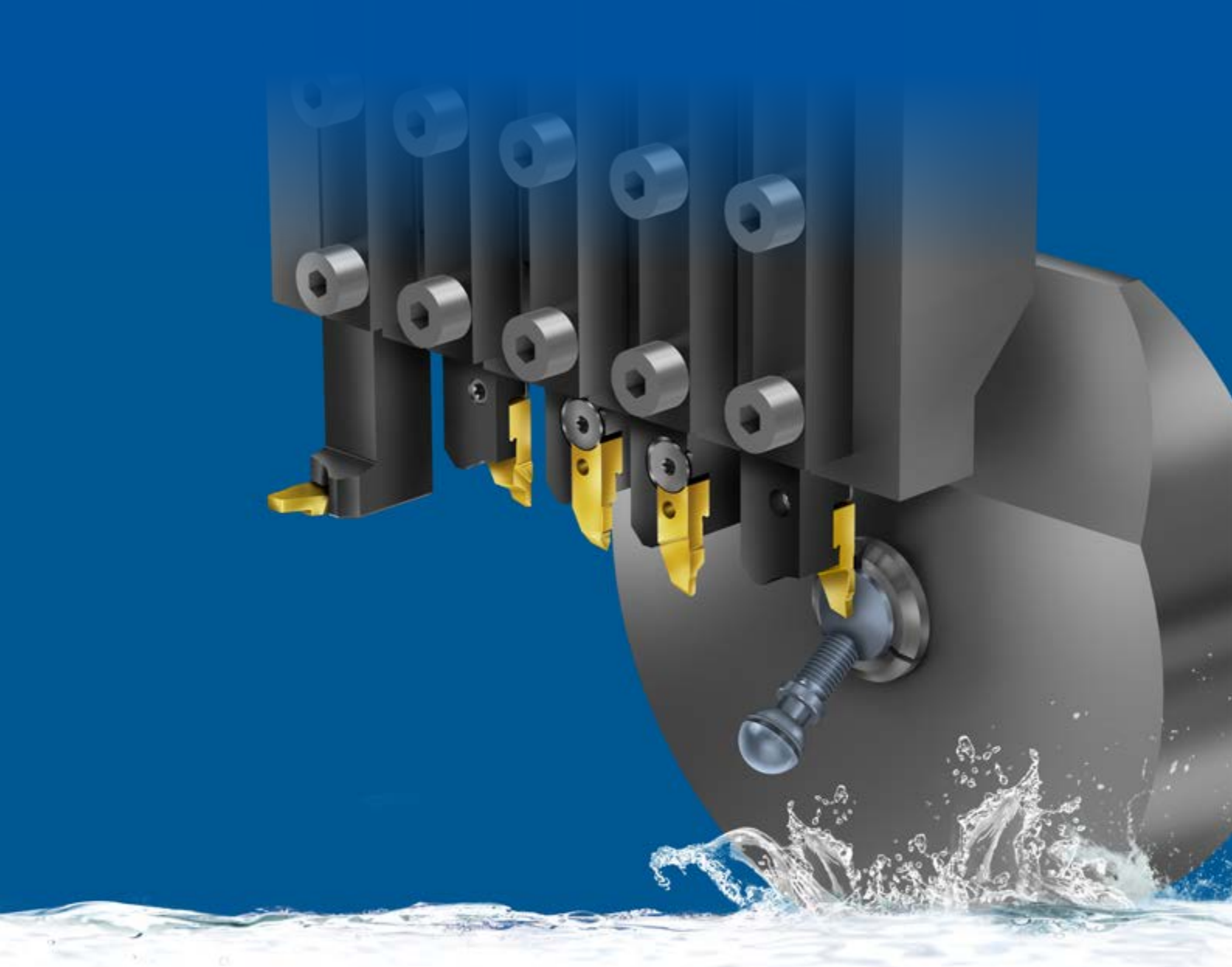
* Right hand shown

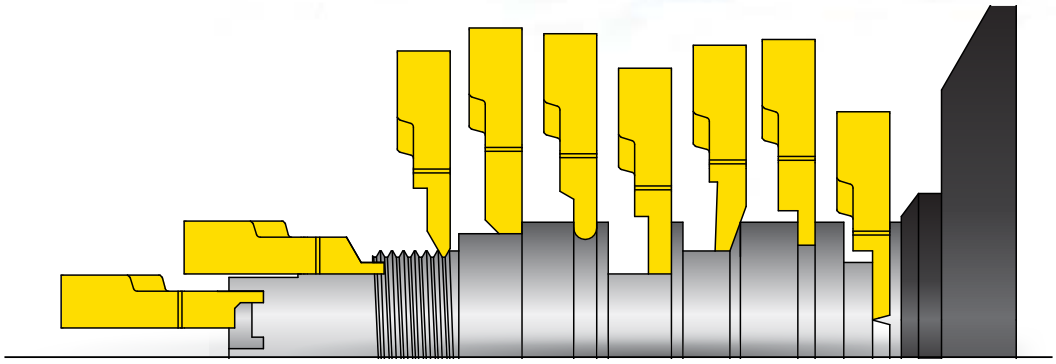
90° V-CAP Bodies with HPC

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 GROOVE TURNING | **FINISHING**

ST-Cut

Precise Tools for Small Parts Machining

ТОВ «СМАРТТЕК ІНЖИНІРИНГ», т. +380-50-396-90-96, info@smarttec.com.ua, https://www.smarttec.com.ua

СМАРТТЕК
РОЗУМНІ ТЕХНОЛОГІЇ

ST-Cut

Precise Tools for Small Parts Machining

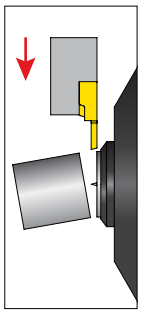
Vargus is pleased to introduce the New ST-Cut, an innovative solution for machining small parts on Swiss type machines.

Features and Benefits:

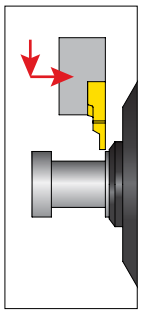
- Unique insert replacement system
- Quick and easy change of insert inside the machine from both sides of the tool
- High repeatability of the cutting edge on all axes
- 17.0mm maximum parting off diameter, with up to 3.0mm notch width
- Excellent rigidity
- Insert edge treatment for increased tool life

ST-Cut Applications

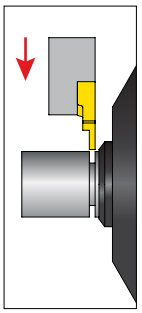
Parting Off



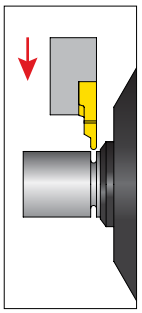
Groove & Turn



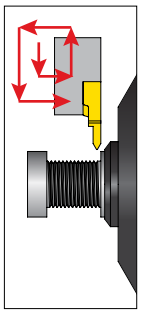
Square Grooving



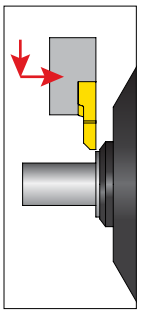
Round Grooving



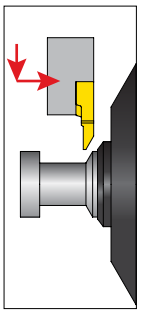
Threading



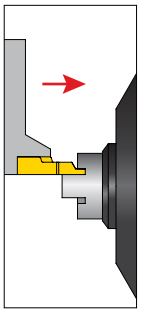
Front Turning



Back Turning



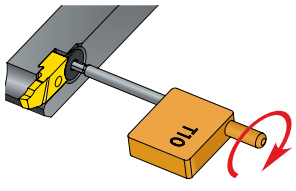
Face Grooving



Custom-made according to customer's application

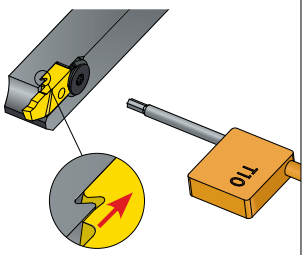
ST-Cut Unique Clamping System

1 Loosen the screw by turning it clockwise about 3-4 turns (for RH tools)*

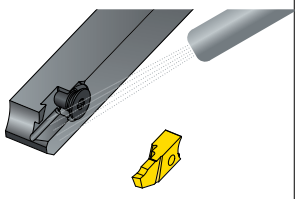


* Counterclockwise for LH tools

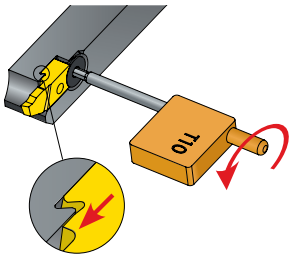
2 Push the insert back slightly and remove the insert in a circular motion



3 Thoroughly clean the insert pocket

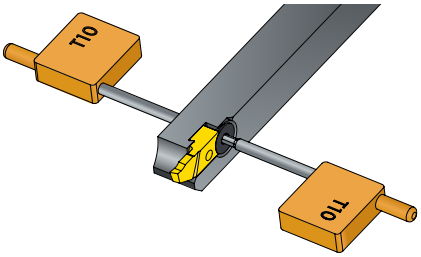


4 Tighten the screw by turning it counterclockwise (for RH tools)*



* Clockwise for LH tools

Double-sided screws for maximum accessibility on the machine



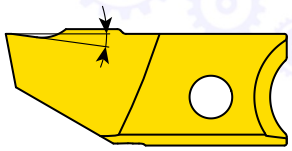
ST-Cut Technical Data

Geo-Rake Angle

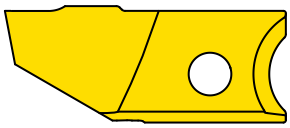
The maximum diameter for parting off is 17.0mm, and up to 3.0mm notch width.
The insert corner can pass the center of rotation up to 0.2mm maximum.

Rake Angle

8° / 17°



0°



Positive Rake Angle Chip Former

Recommended for specific applications, depending on the type of application and workpiece material.
Relatively sharp edge, designed for less build-up on the insert cutting edge.
Highly recommended for Gummy materials such Stainless Steel and Titanium.

Vargus also offers custom-made rake angles for defined applications.

0° Rake Angle Chip Former

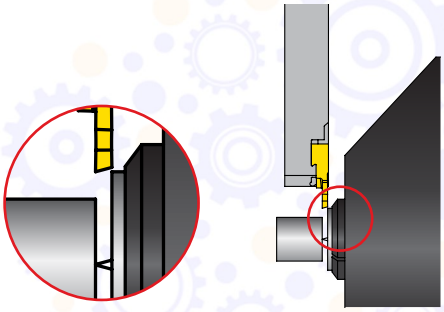
Insert geometry designed for general use applications.
Relatively dull edge, which creates fewer fractures.
Recommended for High Alloy Steels and hard abrasive materials.

Grades

ST-Cut inserts are offered in two different grades: **VPG** and **VS020**.
VPG is PVD coated, for medium and high speeds.
VS020 is uncoated to ensure a sharper cutting edge, crucial for very small parts when the cutting speeds are relatively low and light cutting is required.

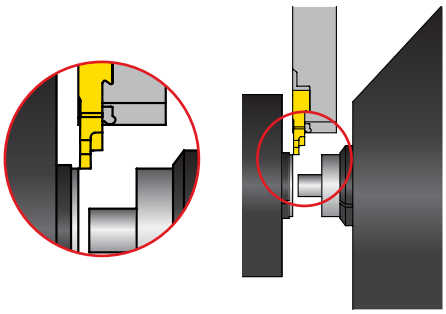
Grade	Application	Sample
VPG	Sub-micron substrate for a wide range of applications. Excellent anti-fracture resistance. AlTiN PVD coated P20, for medium to high cutting speeds. Excellent for alloy steel, stainless steel, and Titanium.	
VS020	Uncoated Sub-micron substrate for a wide range of applications. Excellent anti-fracture resistance. Recommended for medium to low cutting speeds. Excellent for alloy steel, stainless steel, and Titanium.	

Cutting Recommendations and Tool Types



When parting off small diameter parts, without the support of the sub spindle, it is recommended to use an ST-Cut Parting Off insert with a lead angle, thereby eliminating the center boss (See Figure 1).

Figure 1:
Parting Off Close to Main Spindle - STER…-85 RH tool with RH insert/RH lead angle



When a sub spindle is used, which is the recommended method when parting off small parts, a neutral insert with a tougher notch is recommended to avoid scratches and burrs on the sides of the workpiece (See Figure 2).

Figure 2:
Parting Off Close to Sub Spindle - STEL…-85 LH tool with LH insert

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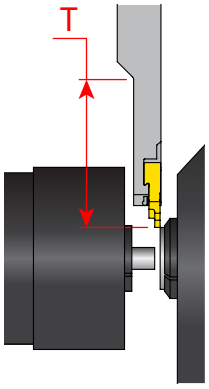


Figure 3:
Parting Off Close to Main Spindle – STESR…-85 RH tool with RH insert (LH tool also available)

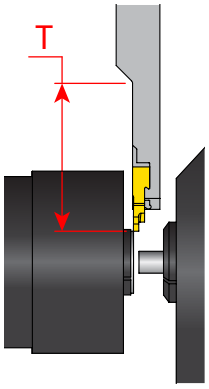
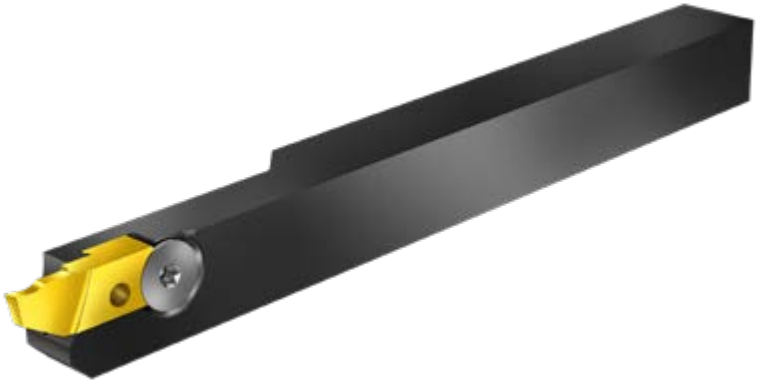


Figure 4:
Parting Off Close to Sub Spindle – STESRS…-85 RH tool with LH insert

The ST-Cut tool offering includes "Stepped Tools" – STESR/L and STESRS – for short part lengths, where both the main and the sub-spindles are used.
The maximum length exceeding the center of the workpiece is 0.20mm (See Figures 3 and 4).



ST-Cut Recommended Cutting Speeds

In bar-feeder machines (Swiss Type, Slide Machines, etc.), turn speed limitations of the bar feeder often dictate the actual cutting speed.
The recommended cutting speeds in the table below should be used if the machine can achieve such speeds.
ST-Cut tools are also designed to work at much lower speeds, and up to 40% faster if needed, depending on the material properties, such as hardness and tensile strength.

Material Group	Vargus No.	Material		Vc [m/min]		
				Turning	Parting Off	Threading
P Steel	1	**Unalloyed Steel** Low Carbon Steel		150	110	150
	2					
	3					
	4	**Low Alloy Steel** Alloy Steel < 750 Rm [N/mm²]		100	75	100
	5					
	6					
	7	**High Alloy Steel** Alloy Steel > 750 Rm [N/mm²]		75	55	75
	8					
	9					
M Stainless Steel	11	**Stainless Steel** Stainless Steel		65	50	65
	12					
N(K) Non-Ferrous Metals	34	**Aluminum Alloys** Aluminum Si > 12%		500	380	200
	35					
	36					
	37					
	39	**Copper and Copper Alloys** Brass, Bronze		350	250	150
	40					
S(M) Heat Resistant Material	19	**High Temperature Alloys and Titanium Alloys**	Titanium < 600 Rm [N/mm²]	60	40	50
	20					
	21					
	22		Titanium > 900 Rm [N/mm²]	35	30	35
	23					
	24					

ST-Cut Nominal Feeds and Depth of Cut

The cutting conditions for Parting Off and Turning applications in the table below are recommended starting points, which may be increased by up to 30%, depending on material properties, such as hardness and tensile strength.

Material Group	Vargus No.	Material		Cutting Width (mm)	Parting Off	Turning	
					Feed (mm/rev)	Depth of Cut (mm)	Feed (mm/rev)
P Steel	1	**Unalloyed Steel** Low Carbon Steel		0.5 - 1.0	0.04	0.05 -1.2	0.06
	2			1.2 - 1.8	0.08	1.2 - 2.5	0.12
	3			2.0 - 3.0	0.12	2.5 - 4.0	0.18
	4	**Low Alloy Steel** Alloy Steel < 750 Rm [N/mm²]		0.5 - 1.0	0.03	0.05 - 1.2	0.04
	5			1.2 - 1.8	0.06	1.2 - 2.5	0.08
	6			2.0 - 3.0	0.10	2.5 - 4.0	0.14
	7	**High Alloy Steel** Alloy Steel > 750 Rm [N/mm²]		0.5 - 1.0	0.02	0.05 - 1.2	0.03
	8			1.2 - 1.8	0.05	1.2 - 2.5	0.08
	9			2.0 - 3.0	0.08	2.5 - 4.0	0.12
M Stainless Steel	11	**Stainless Steel**		0.5 - 1.0	0.025	0.04 - 0.08	0.04
	12			1.2 - 1.8	0.035	0.08 - 1.5	0.05
				2.0 - 3.0	0.06	1.5 - 3.0	0.08
N(K) Non-Ferrous Metals	34	**Aluminum Alloys** Aluminum Si > 12%		0.5 - 1.0	0.06	0.05 - 1.2	0.08
	35			1.2 - 1.8	0.12	1.2 - 2.5	0.18
	36			2.0 - 3.0	0.18	2.5 - 4.0	0.25
	37	**Copper and Copper Alloys** Brass, Bronze		0.5 - 1.0	0.06	0.05 - 1.2	0.08
	39			1.2 - 1.8	0.12	1.2 - 2.5	0.18
	40			2.0 - 3.0	0.18	2.5 - 4.0	0.25
S(M) Heat Resistant Material	19	**High Temperature Alloys and Titanium Alloys**	Titanium < 600 Rm [N/mm²]	0.5 - 1.0	0.02	0.04 - 0.08	0.03
	20			1.2 - 1.8	0.04	0.08 - 1.5	0.06
	21			2.0 - 3.0	0.06	1.5 - 3.0	0.10
	22		Titanium > 900 Rm [N/mm²]	0.5 - 1.0	0.01	0.04 - 0.08	0.02
	23			1.2 - 1.8	0.025	0.08 - 1.5	0.04
	24			2.0 - 3.0	0.04	1.5 - 3.0	0.08

ST-Cut Inserts

ST-Cut Inserts - Ordering Code System

ST	85	R	P	0	-	0.7		35	00	-	00	R	E	
1	2	3	4	5		6	7	8	9		10	11	12	13

1- Line Name
ST - ST Cut

2 - Max. Radial Depth
85 - 8.5mm

3 - RH or LH
R - Right Hand
L - Left Hand

4 - Application
P - Parting Off
T - Groove Turn
S - Square Grooving
R - Round Grooving
TH - Threading
FT - Front Turning
BT - Back Turning
FG - Face Grooving Internal
FP - Face Grooving External

5 - Rake Angle
0 - 0°
6 - 6°
10 - 10°
12 - 12°
15 - 15°
17 - 17°

6 - Grooving Width
0.5 - 3.0mm

6 - Corner Radius for Round Grooving Inserts
0.2 - 1.5mm

7 - Thread Standard and Pitch (Threading)
60 - Partial 60°
55 - Partial 55°

8 - t max
15 - 1.5mm
35 - 3.5mm
50 - 5.0mm
55 - 5.5mm
70 - 7.0mm
85 - 8.5mm

9 - Corner Radius
00 - 0.0mm
0.05 - 0.05mm

10 - Approach Angle (for Parting Off)
00 - 0°
06 - 6°
15 - 15°

11 - Corner Lead Direction (Parting Off)
R - Right Hand Direction
L - Left Hand Direction
None - Neutral Direction

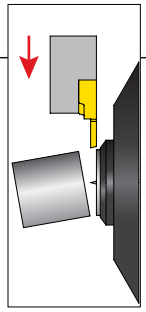
11 - Helix Side (Threading)
RH - Right Hand Helix
LH - Left Hand Helix

12 - Special Insert Structure
E - Treated Cutting Edge
W - Wiper
C - Chamfer
CW - Chamfer & Wiper
RW - Radius & Wiper

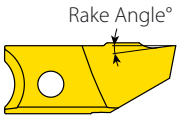
12 - Threading
R - Close to Right Shoulder
L - Close to Left Shoulder
None - Neutral

13 - Grade
VPG
VS020

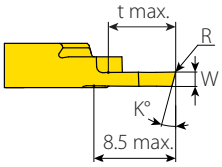
Parting Off



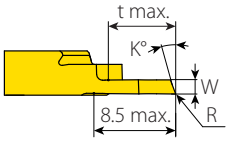
LH Insert



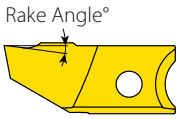
LH Insert
LH K-Direction



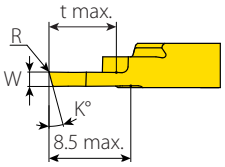
LH Insert
RH K-Direction



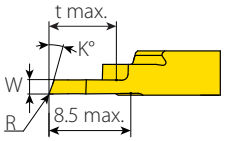
RH Insert



RH Insert
RH K-Direction



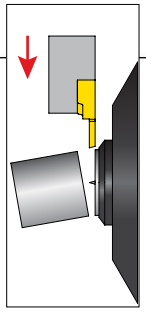
RH Insert
LH K-Direction



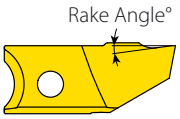
Ordering Code	Dimensions mm						Special Structure	Grade	
	W	R	t max	K°	K° - Direction	Rake Angle		VS020	VPG
ST85RP0-0.515-00-15R	0.50	0	1.50	15	R	0	-	○	●
ST85LP0-0.515-00-15L	0.50	0	1.50	15	L	0	-	○	●
ST85RP0-0.735-00-06RE	0.70	0	3.50	6	R	0	E	○	●
ST85LP0-0.735-00-06LE	0.70	0	3.50	6	L	0	E	○	●
ST85RP0-1.050-00-06RE	1.00	0	5.00	6	R	0	E	○	●
ST85LP0-1.050-00-06LE	1.00	0	5.00	6	L	0	E	○	●
ST85RP0-1.550-00-15RE	1.50	0	5.00	15	R	0	E	○	●
ST85LP0-1.550-00-15LE	1.50	0	5.00	15	L	0	E	○	●
ST85RP0-1.570-0.05-15RE	1.50	0.05	7.00	15	R	0	E	○	●
ST85LP0-1.570-0.05-15LE	1.50	0.05	7.00	15	L	0	E	○	●
ST85RP0-2.085-00-15RE	2.00	0	8.50	15	R	0	E	○	●
ST85LP0-2.085-00-15LE	2.00	0	8.50	15	L	0	E	○	●
ST85RP0-2.085-0.05-15RE	2.00	0.05	8.50	15	R	0	E	○	●
ST85LP0-2.085-0.05-15LE	2.00	0.05	8.50	15	L	0	E	○	●
ST85RP8-0.735-00-15RE	0.70	0	3.50	15	R	8	E	○	●
ST85LP8-0.735-00-15LE	0.70	0	3.50	15	L	8	E	○	●
ST85RP8-1.050-00-15RE	1.00	0	5.00	15	R	8	E	○	●
ST85LP8-1.050-00-15LE	1.00	0	5.00	15	L	8	E	○	●
ST85RP8-0.735-00-15R	0.70	0	3.50	15	R	8	-	○	●
ST85LP8-0.735-00-15L	0.70	0	3.50	15	L	8	-	○	●
ST85RP8-1.050-00-15R	1.00	0	5.00	15	R	8	-	○	●
ST85LP8-1.050-00-15L	1.00	0	5.00	15	L	8	-	○	●
ST85RP8-1.570-00-15RE	1.50	0	7.00	15	R	8	E	○	●
ST85LP8-1.570-00-15LE	1.50	0	7.00	15	L	8	E	○	●
ST85RP8-1.570-0.05-15RE	1.50	0.05	7.00	15	R	8	E	○	●
ST85RP8-1.570-0.05-15LE	1.50	0.05	7.00	15	L	8	E	○	●
ST85RP8-2.085-00-15RE	2.00	0	8.50	15	R	8	E	○	●
ST85LP8-2.085-00-15LE	2.00	0	8.50	15	L	8	E	○	●
ST85RP8-2.085-0.05-15RE	2.00	0.05	8.50	15	R	8	E	○	●
ST85LP8-2.085-0.05-15LE	2.00	0.05	8.50	15	L	8	E	○	●

● In stock ○ Available upon request

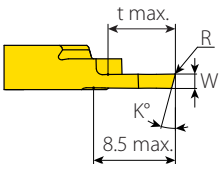
Parting Off



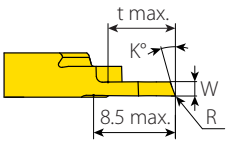
LH Insert



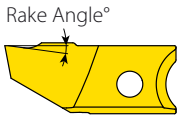
LH Insert
LH K-Direction



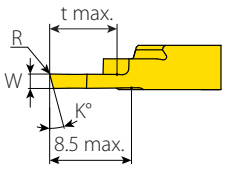
LH Insert
RH K-Direction



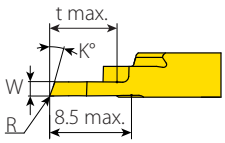
RH Insert



RH Insert
RH K-Direction

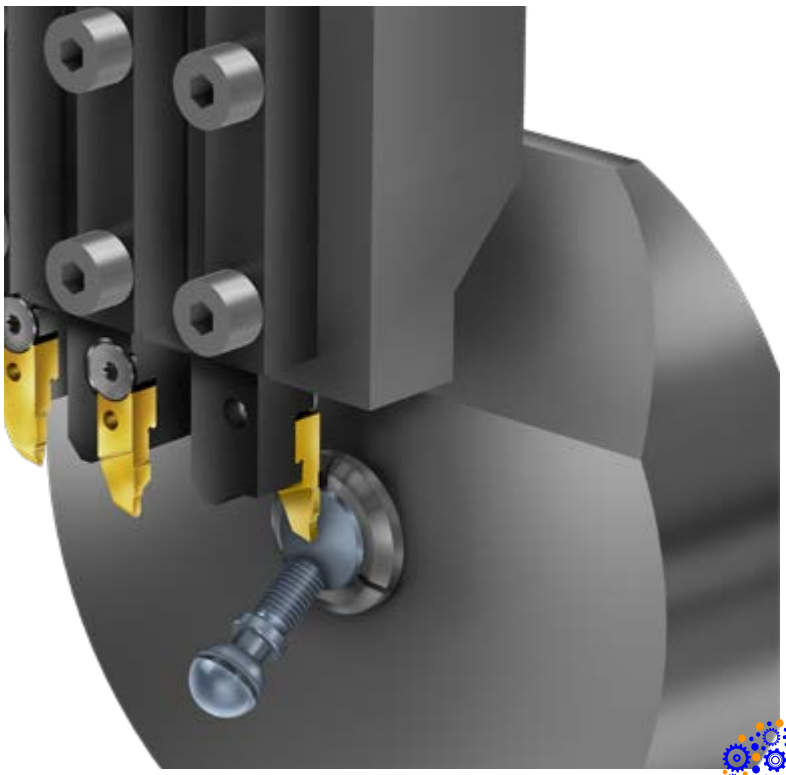


RH Insert
LH K-Direction

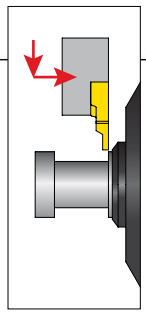


Ordering Code	Dimensions mm						Special Structure	Grade	
	W	R	t max	K°	K° - Direction	Rake Angle		VS020	VPG
ST85RP17-0.735-00-15RE	0.70	0	3.50	15	R	17	E	○	●
ST85LP17-0.735-00-15LE	0.70	0	3.50	15	L	17	E	○	●
ST85RP17-1.050-00-15RE	1.00	0	5.00	15	R	17	E	○	●
ST85LP17-1.050-00-15LE	1.00	0	5.00	15	L	17	E	○	●
ST85RP17-1.570-00-15RE	1.50	0	7.00	15	R	17	E	○	●
ST85LP17-1.570-00-15LE	1.50	0	7.00	15	L	17	E	○	●
ST85RP17-1.570-0.05-15RE	1.50	0.05	7.00	15	R	17	E	○	●
ST85RP17-1.570-0.05-15LE	1.50	0.05	7.00	15	L	17	E	○	●
ST85RP17-2.085-00-15RE	2.00	0	8.50	15	R	17	E	○	●
ST85LP17-2.085-00-15LE	2.00	0	8.50	15	L	17	E	○	●
ST85RP17-2.085-0.05-15RE	2.00	0.05	8.50	15	R	17	E	○	●
ST85LP17-2.085-0.05-15LE	2.00	0.05	8.50	15	L	17	E	○	●

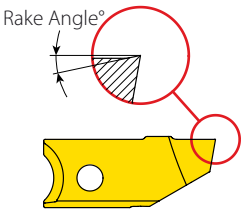
● In stock ○ Available upon request

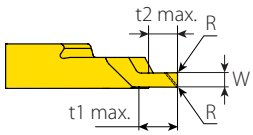


Groove & Turn

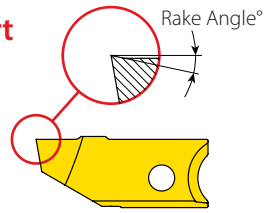


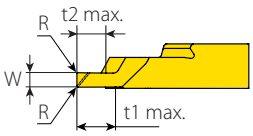
LH Insert





RH Insert





Groove & Turn Right Hand Inserts

Ordering Code	Dimensions mm					Special Structure	Grade	
	W	R	t1 max	t2 max	Rake Angle		VS020	VPG
ST85RT12-0.515-0.03E	0.50	0.03	4.00	1.50	12	E	○	•
ST85RT12-1.025-00E	1.00	0.00	4.00	2.50	12	E	○	•
ST85RT12-1.025-0.05E	1.00	0.05	4.00	2.50	12	E	○	•
ST85RT12-1.530-00E	1.50	0.00	4.00	3.00	12	E	○	•
ST85RT12-1.530-0.08E	1.50	0.08	4.00	3.00	12	E	○	•
ST85RT12-2.040-0.08E	2.00	0.08	6.50	4.00	12	E	○	•
ST85RT12-2.560-0.10E	2.50	0.10	6.50	6.00	12	E	○	•
ST85RT12-3.065-0.20E	3.00	0.20	6.50	6.50	12	E	○	•

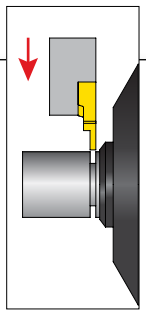
• In stock ○ Available upon request

Groove & Turn Left Hand Inserts

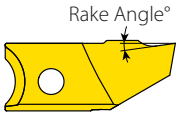
Ordering Code	Dimensions mm					Special Structure	Grade	
	W	R	t1 max	t2 max	Rake Angle		VS020	VPG
ST85LT12-0.515-0.03E	0.50	0.03	4.00	1.50	12	E	○	•
ST85LT12-1.025-00E	1.00	0.00	4.00	2.50	12	E	○	•
ST85LT12-1.025-0.05E	1.00	0.05	4.00	2.50	12	E	○	•
ST85LT12-1.530-00E	1.50	0.00	4.00	3.00	12	E	○	•
ST85LT12-1.530-0.08E	1.50	0.08	4.00	3.00	12	E	○	•
ST85LT12-2.040-0.08E	2.00	0.08	6.50	4.00	12	E	○	•
ST85LT12-2.560-0.10E	2.50	0.10	6.50	6.00	12	E	○	•
ST85LT12-3.065-0.20E	3.00	0.20	6.50	6.50	12	E	○	•

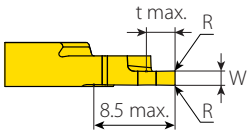
• In stock ○ Available upon request

Square Grooving

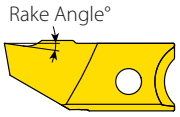


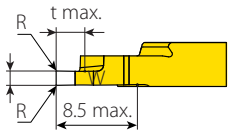
LH Insert





RH Insert





Square Grooving Right Hand Inserts

Ordering Code	Dimensions mm				Special Structure	Grade	
	W	R	t max	Rake Angle		VS020	VPG
ST85RS0-0.820-00E	0.80	0.00	2.00	0	E	○	●
ST85RS8-0.820-00E	0.80	0.00	2.00	8	E	○	●
ST85RS0-1.025-00E	1.00	0.00	2.50	0	E	○	●
ST85RS8-1.025-00E	1.00	0.00	2.50	8	E	○	●
ST85RS8-1.025-0.05E	1.00	0.05	2.50	8	E	○	●
ST85RS0-1.230-00E	1.20	0.00	3.00	0	E	○	●
ST85RS8-1.230-00E	1.20	0.00	3.00	8	E	○	●
ST85RS0-1.530-00E	1.50	0.00	3.00	0	E	○	●
ST85RS8-1.530-00E	1.50	0.00	3.00	8	E	○	●
ST85RS8-1.530-0.05E	1.50	0.05	3.00	8	E	○	●
ST85RS0-1.840-00E	1.80	0.00	4.00	0	E	○	●
ST85RS0-2.040-00E	2.00	0.00	4.00	0	E	○	●
ST85RS0-2.560-00E	2.50	0.00	6.00	0	E	○	●
ST85RS0-3.065-00E	3.00	0.00	6.50	0	E	○	●

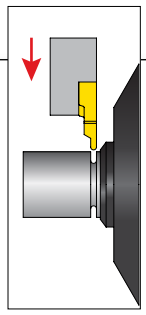
● In stock ○ Available upon request

Square Grooving Left Hand Inserts

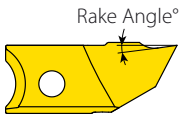
Ordering Code	Dimensions mm				Special Structure	Grade	
	W	R	t max	Rake Angle		VS020	VPG
ST85LS0-0.820-00E	0.80	0.00	2.00	0	E	○	●
ST85LS8-0.820-00E	0.80	0.00	2.00	8	E	○	●
ST85LS0-1.025-00E	1.00	0.00	2.50	0	E	○	●
ST85LS8-1.025-00E	1.00	0.00	2.50	8	E	○	●
ST85LS8-1.025-0.05E	1.00	0.05	2.50	8	E	○	●
ST85LS0-1.230-00E	1.20	0.00	3.00	0	E	○	●
ST85LS8-1.230-00E	1.20	0.00	3.00	8	E	○	●
ST85LS0-1.530-00E	1.50	0.00	3.00	0	E	○	●
ST85LS8-1.530-00E	1.50	0.00	3.00	8	E	○	●
ST85LS8-1.530-0.05E	1.50	0.05	3.00	8	E	○	●
ST85LS0-1.840-00E	1.80	0.00	4.00	0	E	○	●
ST85LS0-2.040-00E	2.00	0.00	4.00	0	E	○	●
ST85LS0-2.560-00E	2.50	0.00	6.00	0	E	○	●
ST85LS0-3.065-00E	3.00	0.00	6.50	0	E	○	●

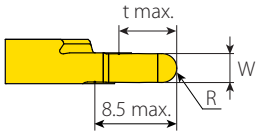
● In stock ○ Available upon request

Round Grooving

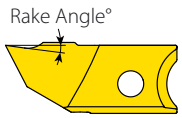


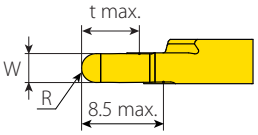
LH Insert





RH Insert





Round Grooving Right Hand Inserts

Ordering Code	Dimensions mm				Special Structure	Grade	
	W	R	t max	Rake Angle		VS020	VPG
ST85RR0-0.215E	0.40	0.20	1.50	0	E	○	●
ST85RR0-0.520E	1.00	0.50	2.00	0	E	○	●
ST85RR0-0.7530E	1.50	0.75	3.00	0	E	○	●
ST85RR0-1.040E	2.00	1.00	4.00	0	E	○	●
ST85RR8-1.040E	2.00	1.00	4.00	8	E	○	●
ST85RR0-1.2550E	2.50	1.25	5.00	0	E	○	●
ST85RR0-1.560E	3.00	1.50	6.00	0	E	○	●
ST85RR8-1.560E	3.00	1.50	6.00	8	E	○	●

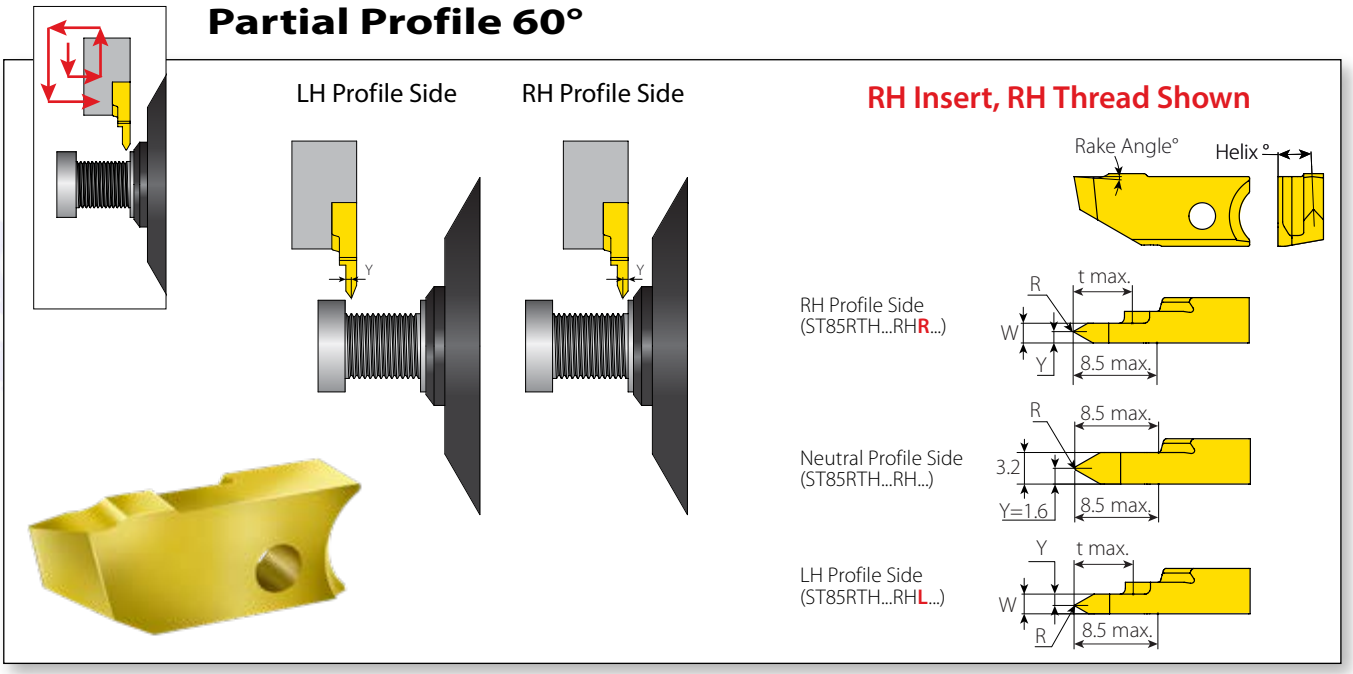
● In stock ○ Available upon request

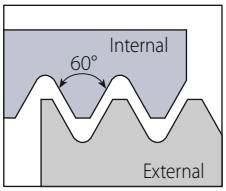
Round Grooving Left Hand Inserts

Ordering Code	Dimensions mm				Special Structure	Grade	
	W	R	t max	Rake Angle		VS020	VPG
ST85LR0-0.215E	0.40	0.20	1.50	0	E	○	●
ST85LR0-0.520E	1.00	0.50	2.00	0	E	○	●
ST85LR0-0.7530E	1.50	0.75	3.00	0	E	○	●
ST85LR0-1.040E	2.00	1.00	4.00	0	E	○	●
ST85LR8-1.040E	2.00	1.00	4.00	8	E	○	●
ST85LR0-1.2550E	2.50	1.25	5.00	0	E	○	●
ST85LR0-1.560E	3.00	1.50	6.00	0	E	○	●
ST85LR8-1.560E	3.00	1.50	6.00	8	E	○	●

● In stock ○ Available upon request

Partial Profile 60°





Partial Profile 60° Right Hand Inserts

Ordering Code	Dimensions mm				Pitch						Grade	
	W	R	t max	Y	mm / TPI	No. of Passes	Rake Angle	Helix °	Thread Direction	Profile Side	VS020	VPG
ST85RTH4AA60RHR	1.00	0.00	2.50	0.15	0.075 - 0.25/508-100	3-4	4	6	RH	R	○	●
ST85RTH4AA60RHL	1.00	0.00	2.50	0.15	0.075 - 0.25/508-100	3-4	4	6	RH	L	○	●
ST85RTH4AB60RHR	1.50	0.02	4.50	0.30	0.25 - 0.5/80-46	4-6	4	4	RH	R	○	●
ST85RTH4AB60RHL	1.50	0.02	4.50	0.30	0.25 - 0.5/80-46	4-6	4	4	RH	L	○	●
ST85RTH4A60RHR	2.00	0.05	6.5	0.85	0.5 - 1.5/46-16	4-10	4	2.5	RH	R	○	●
ST85RTH4A60RHL	2.00	0.05	6.5	0.85	0.5 - 1.5/46-16	4-10	4	2.5	RH	L	○	●
ST85RTH4G60RH	3.20	0.20	8.5	1.60	1.75 - 3.0/14-8	5-14	4	1.5	RH	N	○	●

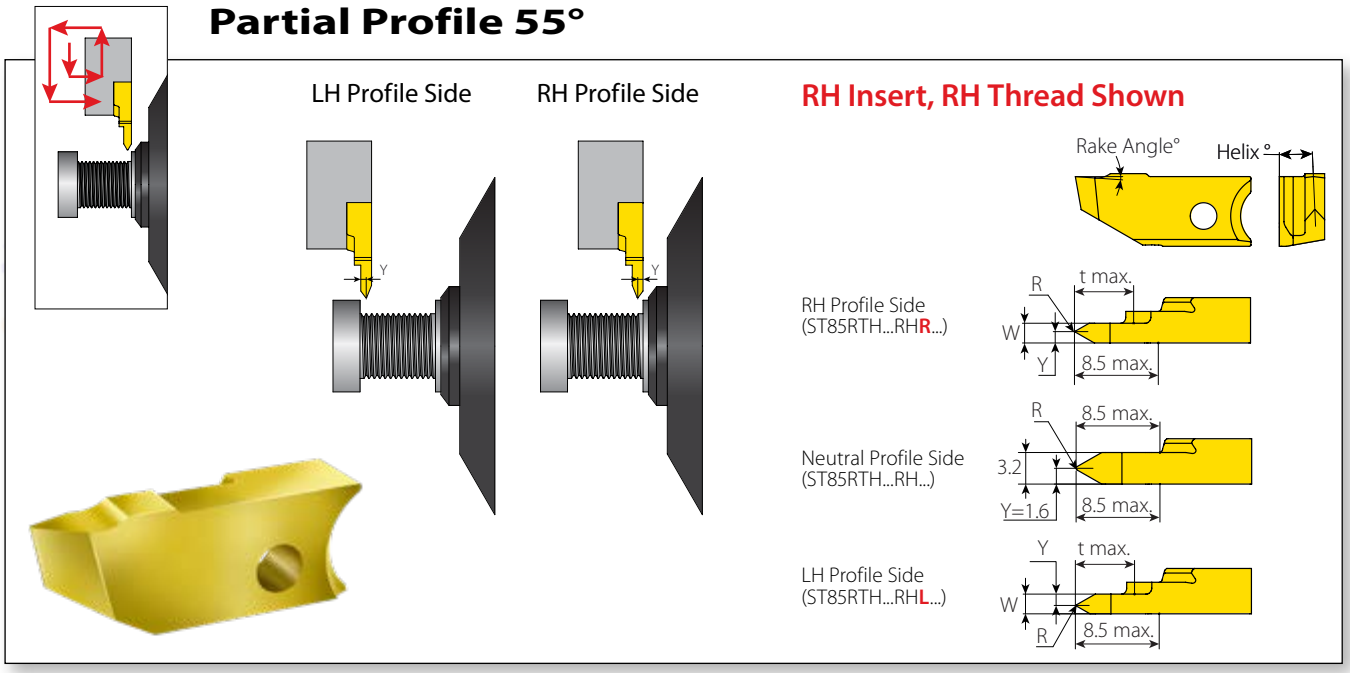
● In stock ○ Available upon request

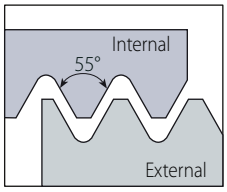
Partial Profile 60° Left Hand Inserts

Ordering Code	Dimensions mm				Pitch						Grade	
	W	R	t max	Y	mm / TPI	No. of Passes	Rake Angle	Helix °	Thread Direction	Profile Side	VS020	VPG
ST85LTH4AA60RHR	1.00	0.00	2.50	0.15	0.075 - 0.25/508-100	3-4	4	6	RH	R	○	●
ST85LTH4AA60RHL	1.00	0.00	2.50	0.15	0.075 - 0.25/508-100	3-4	4	6	RH	L	○	●
ST85LTH4AB60RHR	1.50	0.02	4.50	0.30	0.25 - 0.5/80-46	4-6	4	4	RH	R	○	●
ST85LTH4AB60RHL	1.50	0.02	4.50	0.30	0.25 - 0.5/80-46	4-6	4	4	RH	L	○	●
ST85LTH4A60RHR	2.00	0.05	6.5	0.85	0.5 - 1.5/46-16	4-10	4	2.5	RH	R	○	●
ST85LTH4A60RHL	2.00	0.05	6.5	0.85	0.5 - 1.5/46-16	4-10	4	2.5	RH	L	○	●
ST85LTH4G60RH	3.20	0.20	8.5	1.60	1.75 - 3.0/14-8	5-14	4	1.5	RH	N	○	●

● In stock ○ Available upon request

Partial Profile 55°





Partial Profile 55° Right Hand Inserts

Ordering Code	Dimensions mm				Pitch						Grade	
	W	R	t max	Y	mm / TPI	No. of Passes	Rake Angle	Helix °	Thread Direction	Profile Side	VS020	VPG
ST85RTH4A55RHR	2.00	0.06	6.50	0.85	0.5 - 1.5/46-16	4-10	4	2.5	RH	R	○	●
ST85RTH4A55RHL	2.00	0.06	6.50	0.85	0.5 - 1.5/46-16	4-10	4	2.5	RH	L	○	●
ST85RTH4G55RH	3.20	0.25	8.50	1.60	1.75 - 3.0/14-8	5-14	4	1.5	RH	N	○	●

● In stock ○ Available upon request

Partial Profile 55° Left Hand Inserts

Ordering Code	Dimensions mm				Pitch						Grade	
	W	R	t max	Y	mm / TPI	No. of Passes	Rake Angle	Helix °	Thread Direction	Profile Side	VS020	VPG
ST85LTH4A55RHR	2.00	0.06	6.50	0.85	0.5 - 1.5/46-16	4-10	4	2.5	RH	R	○	●
ST85LTH4A55RHL	2.00	0.06	6.50	0.85	0.5 - 1.5/46-16	4-10	4	2.5	RH	L	○	●
ST85LTH4G55RH	3.20	0.25	8.50	1.60	1.75 - 3.0/14-8	5-14	4	1.5	RH	N	○	●

● In stock ○ Available upon request

ST-Cut External Tools

ST-Cut Tools - Ordering Code System

ST	E		SR	810		85	T30	
1	2	3	4	5	-	6	7	8

1- Line Name	2 - Type	3 - Approach Angle	4 - RH or LH
ST - ST Cut	E - Square Shank R - Round Shank	None - 0° 90 - 90° 45 - 45°	R - RH Tool L - LH Tool SR - RH Stepped Shank, Sub spindle relief. See figure 1 SL - LH Stepped Shank, Main spindle relief SRS - RH Stepped Shank. Insert close to Sub spindle (left side). See figure 2 SLS - LH Stepped Shank. Close to Main spindle (right side)

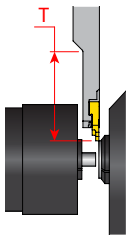


Figure 1
SR Tool - RH tool with RH insert

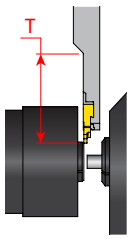


Figure 2
SRS Tool - RH tool with LH insert

5 - Shank Size / Diameter	6 - Max Radial Depth	7 - Radial Depth Depth (Stepped Toolholders)	8 - Coolant
0810 - 8x10mm 1010 - 10x10mm 1212 - 12x12mm 1616 - 16x16mm 2020 - 20x20mm 10 - Ø10mm	85 - Max Radial Depth 8.5mm	None - Non Stepped Shank T30 - Limit Depth of Step 30mm T40 - Limit Depth of Step 40mm	None - No coolant C - Coolant

Torque Limiting Accessories (Sold Separately):

Torque Limiting Handles

	Ordering Code	Item Number	Range
	VTRF	013-01038	0.6 Nm to 3.0 Nm

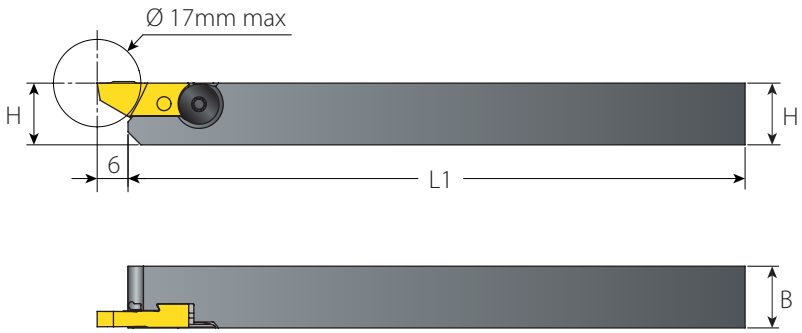
Torque Limiting Adapters

	Ordering Code	Item Number	Torque Max (Nm)
	D02-12 -3.0Nm	013-01084	3.0

Torque Limiting Bits

	Ordering Code	Item Number	Bit Type
	BIT25-TX10	013-01094	Torx

Square Shank Tools



* Right hand shown

Square Shank Right Hand Tools

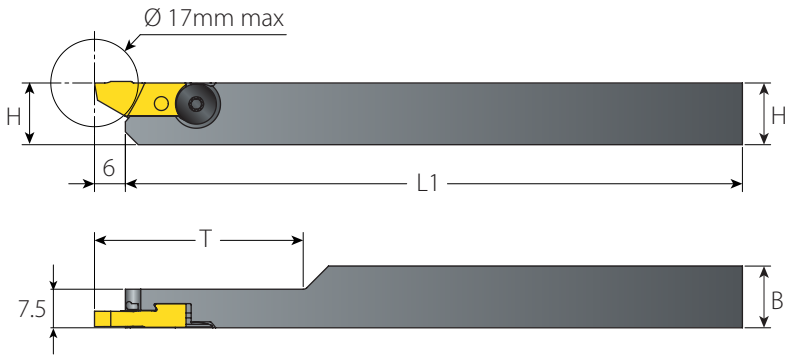
Insert Size	Ordering Code	Dimensions mm		Spare Parts		
		HxB	L1	Screw	Key	Torque Limiting Adapter*
85	STER0810-85	8x10	110	SM5x0.8x9-T10 LH Torque Limit: 3.0Nm	K3T	D02-12-3.0Nm
	STER1010-85	10x10	110			
	STER1212-85	12x12	120			
	STER1616-85	16x16	120			
	STER2020-85	20x20	120			

Square Shank Left Hand Tools

Insert Size	Ordering Code	Dimensions mm		Spare Parts		
		HxB	L1	Screw	Key	Torque Limiting Adapter*
85	STEL0810-85	8x10	110	SM5x0.8x9-T10 Torque Limit: 3.0Nm	K3T	D02-12-3.0Nm
	STEL1010-85	10x10	110			
	STEL1212-85	12x12	120			
	STEL1616-85	16x16	120			
	STEL2020-85	20x20	120			

* Item sold separately. See page 59 for more details.

Stepped Square Shank Tools



* Right hand shown

Stepped Square Shank Right Hand Tools (STESR)

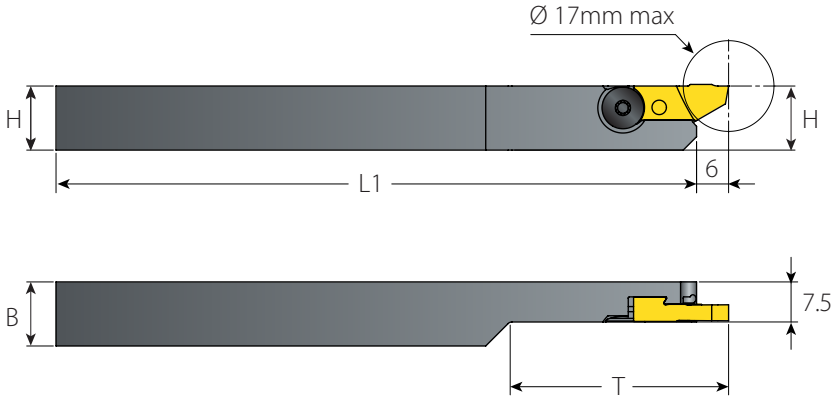
Spare Parts

Insert Size	Ordering Code	Dimensions mm			Screw	Key	Torque Limiting Adapter*
		HxB	L1	T			
85	STESR0810-85T30	08x10	110	30	SM5x0.5x7-T10 LH Torque Limit: 3.0Nm	K3T	D02-12-3.0Nm
	STESR1010-85T30	10x10	110	30			
	STESR1212-85T40	12x12	120	40			
	STESR1616-85T40	16x16	120	40			

Stepped Square Shank Left Hand Tools (STESL)

Spare Parts

Insert Size	Ordering Code	Dimensions mm			Screw	Key	Torque Limiting Adapter*
		HxB	L1	T			
85	STESL0810-85T30	08x10	110	30	SM5x0.5x7-T10 Torque Limit: 3.0Nm	K3T	D02-12-3.0Nm
	STESL1010-85T30	10x10	110	30			
	STESL1212-85T40	12x12	120	40			
	STESL1616-85T40	16x16	120	40			



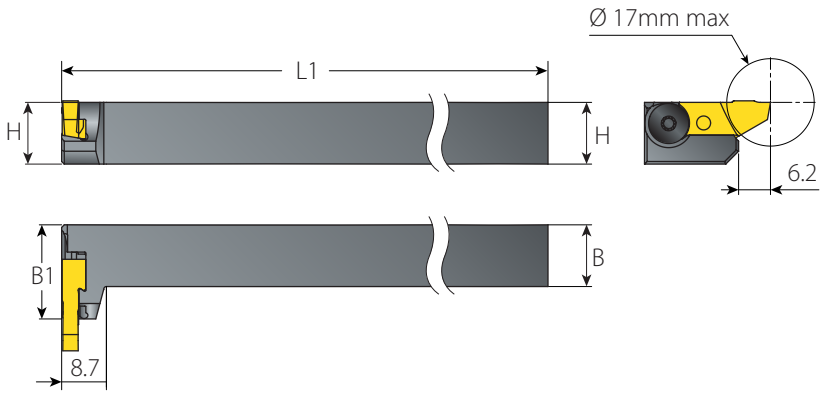
Stepped Square Shank Right Hand Tools (STESRS) **

Spare Parts

Insert Size	Ordering Code	Dimensions mm			Screw	Key	Torque Limiting Adapter*
		HxB	L1	T			
85	STESRS1010-85T30	10x10	110	30	SM5x0.5x7-T10 Torque Limit: 3.0Nm	K3T	D02-12-3.0Nm
	STESRS1212-85T40	12x12	120	40			
	STESRS1616-85T40	16x16	120	40			

* Item sold separately. See page 59 for more details.
** STESRS...-85T... - RH tool with LH Inserts. See page 48.

Square Shank 90° Tools



* Right hand shown

Square Shank 90° Right Hand Tools **

Insert Size	Ordering Code	Dimensions mm		
		HxB	L1	B1
85	STE90R1010-85	10x10	110	18.3
	STE90R1212-85	12x12	120	18.3

Spare Parts

		
Screw	Key	Torque Limiting Adapter*
SM5x0.8x9-T10 Torque Limit: 3.0Nm	K3T	D02-12-3.0Nm

* Item sold separately. See page 59 for more details.

** STE90R...-85. - RH tool with LH Inserts

EXTERNAL MACHINING | **FINISHING**

GrooVical

Precise Grooving & Turning Applications

ТОВ «СМАРТТЕК ІНЖИНІРИНГ», т. +380-50-396-90-96, info@smarttec.com.ua, https://www.smarttec.com.ua

СМАРТТЕК
РОЗУМНІ ТЕХНОЛОГІЇ

GrooVical

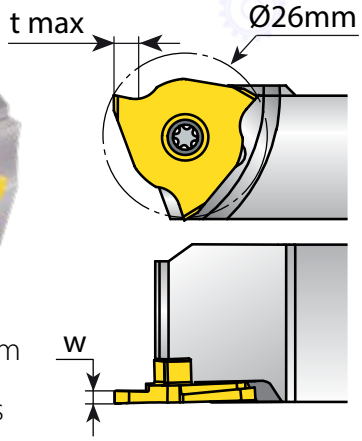
Precise Grooving & Turning Applications

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.

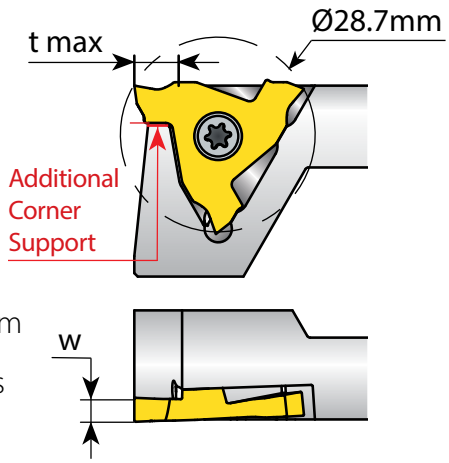
GVN26



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

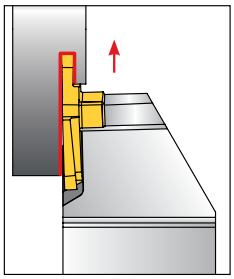
W = Groove Widths from 2-6.35mm

Modular Holders with High Pressure Coolant (HPC)

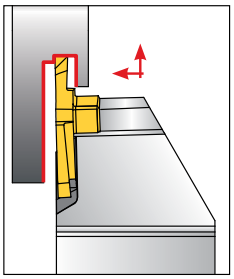
- Quick change modules for **GrooVical** GVN26 and GVN29 inserts for precise grooving, turning and parting off
- High pressure coolant up to 100 bar
- Modules are suitable for parallel and 90° modular square bodies and the **NEW** GROOVEX polygon shaped V-CAP holders (C4, C5, C6)
- Groovex V-Cap holders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

For more information see page 79.

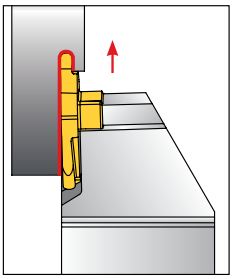
Applications:



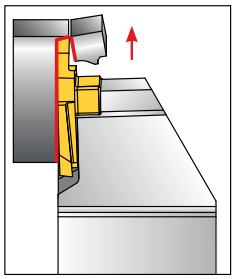
Square Grooving



Square Turning & Grooving



Round Grooving



Perting Off

Groovical Technical Data

Recommended Grades and Cutting Data

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [m/min] Coated VKX	Vc [m/min] Coated VN020
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	Aluminum Alloys Wrought	Non Aging	60	-	500-1200
	35		Aged	100	-	200-600
	36	Aluminum Alloys	Cast	75	-	500-1000
	37		Cast & Aged	90	-	300-600
	38	Aluminum Alloys	Cast Si 13-22%	130	-	300-400
	39	Copper and Copper Alloys	Brass	90	-	300-500
	40		Bronze And Non Leaded Copper	100	-	300-400
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.

VN020 NEW

Uncoated grade specially designed for Aluminum and Copper alloys. The high positive rake geometry and the sharp cutting edge of these inserts produce low forces while machining.

Recommended Feed Rate for Grooving & Turning Finishing Operations

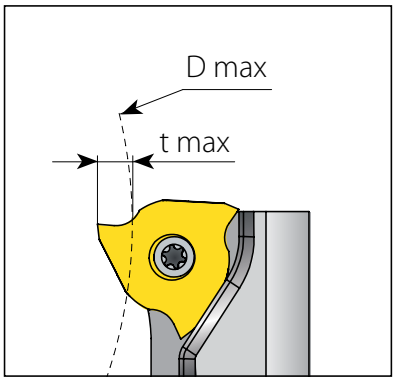
	High Alloy Steel, 330 HB, 2100 Kc [N/mm²]		**Austenitic Stainless Steel**, 200 HB,2600 Kc [N/mm²]	
Insert Width (mm)	Depth ap = Insert Width x variable	Average f mm/rev	Depth ap = Insert Width x variable	Average f mm/rev
0.4 mm - 0.9 mm	0.55	0.04	0.35	0.02
1.0mm - 1.5mm	0.55	0.07	0.35	0.04
1.6 mm -2.0 mm	0.60	0.11	0.40	0.07
2.1 mm - 2.5 mm	0.60	0.14	0.40	0.09
2.6 mm - 3.0 mm	0.60	0.17	0.40	0.11
3.1 mm - 4.0mm	0.60	0.21	0.40	0.14
4.1 mm - 5.5 mm	0.60	0.28	0.40	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

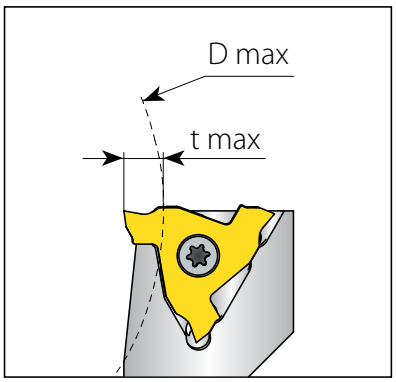
GVN26 External - Depth of Groove in Relation to Workpiece Dia.

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

GrooVical Inserts - Ordering Code System

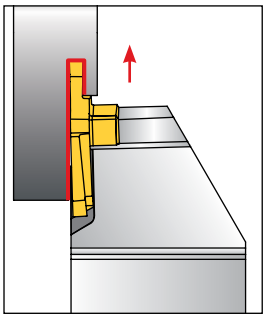
GVN	26	R	P	0.5	-	0.05	-	15	R	VKX
1	2	3	4	5		6		7	8	9

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

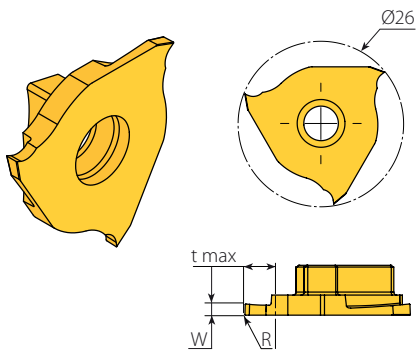
6 - Corner Radius
0.0 - 1mm

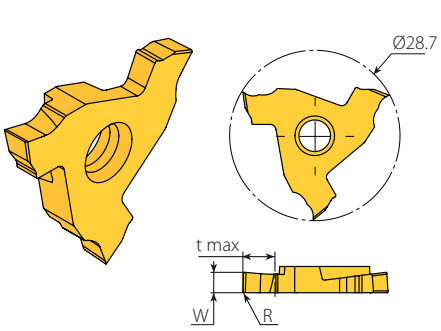
7 - Approach Angle	8 - Cutting Side	9 - Carbide Grade
6 - 6 Deg. 15 - 15 Deg.	R - Right corner leading L - Left corner leading None - Neutral	VTX, VKX, VN020

Close to Shoulder Super Positive Rake Grooving (SP)



Right hand shown

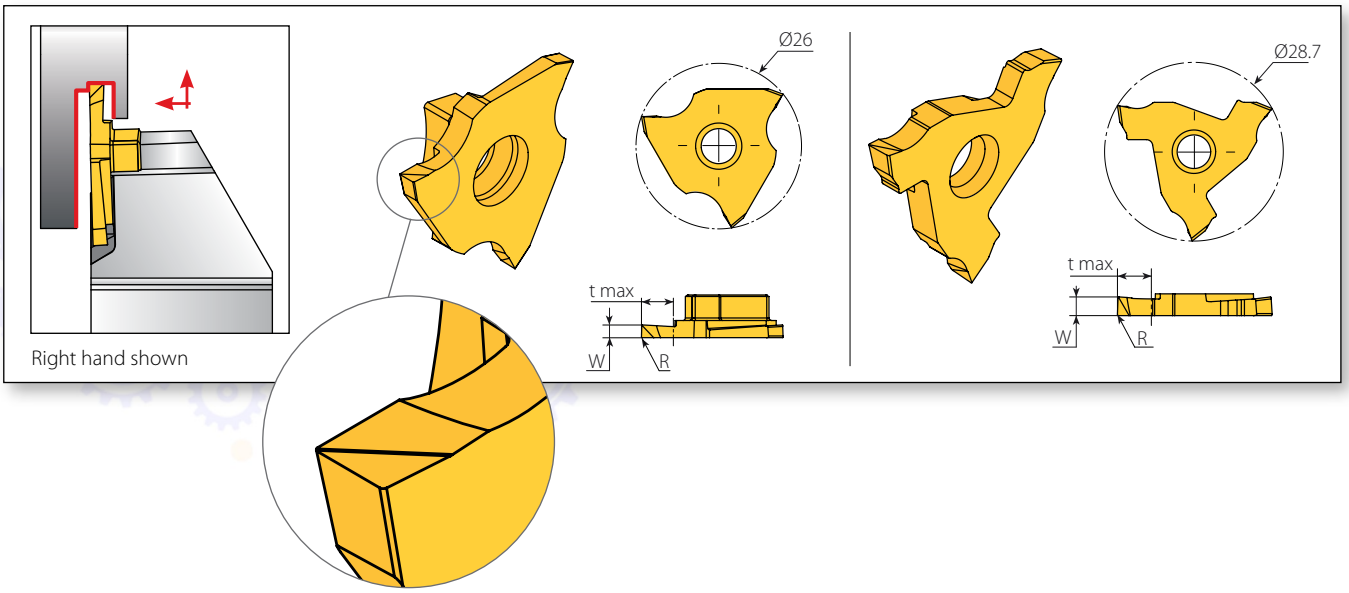




Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W±0.02	R±0.03	t max	VN020 NEW	VTX	
26	GVN26R/LSP1.0-0.08	1.0	0.08	2.25	•	•	GVNE...-26, GVNE90...-26
	GVN26R/LSP1.5-0.08	1.5	0.08	3.00	•	•	
	GVN26R/LSP2.0-0.1	2.0	0.10	3.75	•	•	
	GVN26R/LSP2.5-0.15	2.5	0.15	3.75	•	•	
29	GVN29R/LSP3.0-0.2	3.0	0.20	4.90	○	•	GVNE...-29-1, GVNE90...-29-2, GVNI...-29

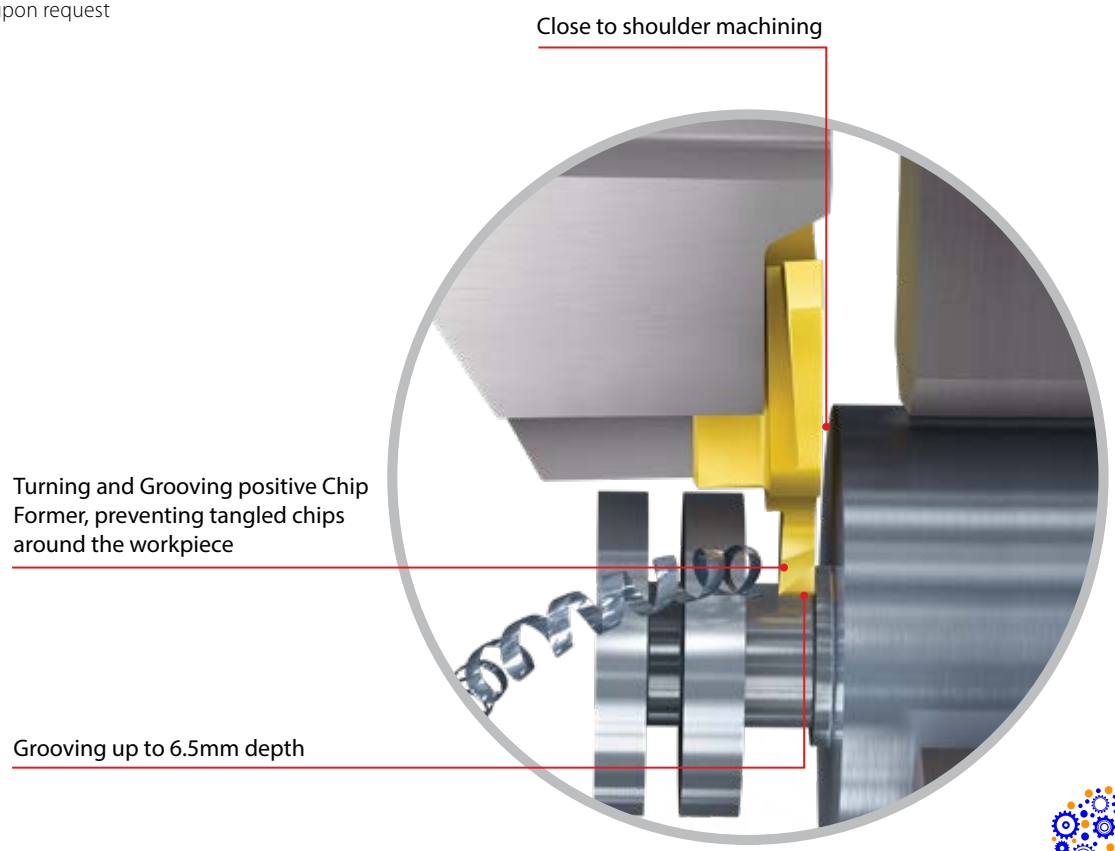
• In stock ○ Available upon request

Close to Shoulder Square Turning & Grooving Chip Former

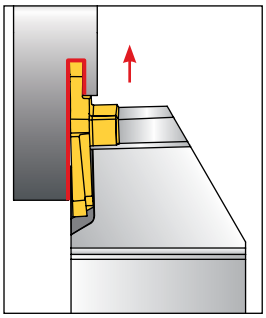


Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W±0.02	R±0.03	t max	VKX	VTX	
26	GVN26R/LT1.0-0.06	1.0	0.06	3.0	○	•	GVNE...-26, GVNE90...-26
	GVN26R/LT1.0-0.08	1.0	0.08	3.0	○	•	
	GVN26RT1.0-0.12	1.0	0.12	1.5	○	•	
	GVN26RT1.4-0.05	1.4	0.05	2.0	○	•	
	GVN26R/LT1.5-0.08	1.5	0.08	4.0	○	•	
	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

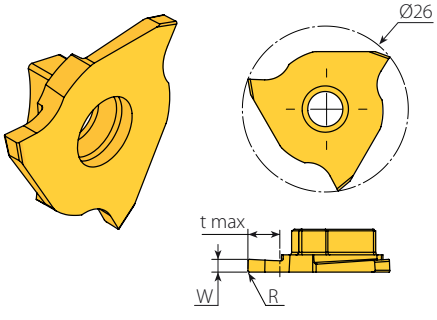
• In stock ○ Available upon request

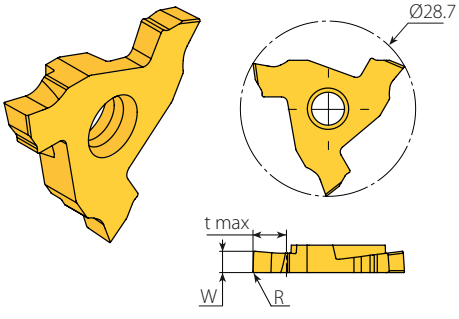


Close to Shoulder Square Grooving



Right hand shown





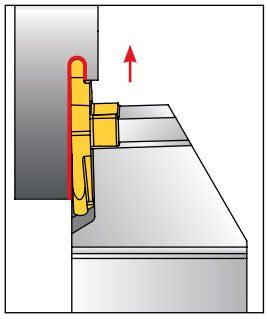
Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W$^{\pm 0.02}$	R$^{\pm 0.03}$	t max	**VKX**	**VTX**	
	GVN26R/LS0.5-0.12	0.50	0.12	1.0	○	●	
	GVN26R/LS0.57-00	0.57	0.00	1.0	●	●	
	GVN26R/LS0.77-00	0.77	0.00	1.6	○	●	
	GVN26R/LS0.79-00	0.79	0.00	1.6	●	○	
	GVN26R/LS0.79-0.2	0.79	0.20	1.6	●	●	
	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)

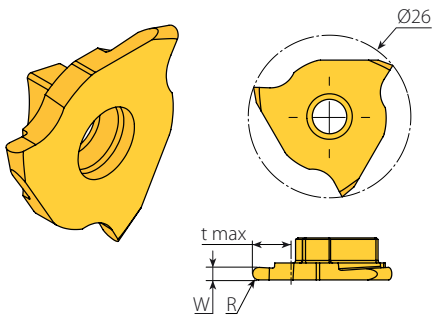
Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W$^{\pm 0.02}$	R$^{\pm 0.03}$	t max	**VKX**	**VTX**	
29	GVN29R/LS2.38-0.1	2.38	0.10	6.5	•	○	GVNE...-29-1, GVNE90...-29-1, GVNI...-29
	GVN29R/LS2.5-0.1	2.50	0.10	6.5	•	○	
	GVN29RS2.5-0.2	2.50	0.20	6.5	○	•	
	GVN29R/LS2.7-0.1	2.70	0.10	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	•	•	

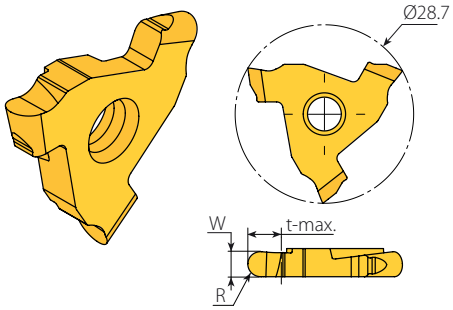
• In stock ○ Available upon request

Close to Shoulder Round Grooving



Right hand shown

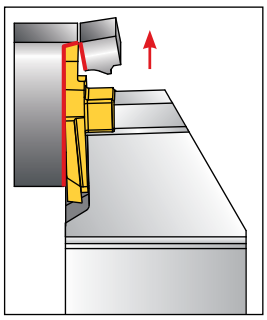




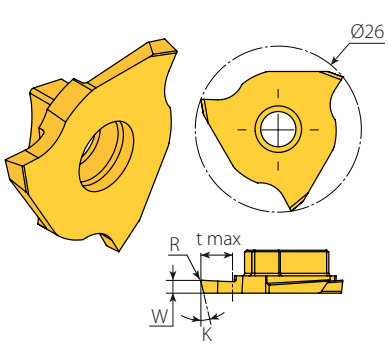
Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W$^{\pm 0.02}$	R$^{\pm 0.03}$	t max	**VKX**	**VTX**	
26	GVN26R/LR0.5-0.25	0.50	0.25	1.0	•	○	GVNE...-26, GVNE90...-26
	GVN26R/LR0.79-0.39	0.79	0.39	1.6	•	○	
	GVN26R/LR1.0-0.5	1.00	0.50	2.0	•	○	
	GVN26RR1.2-0.6	1.20	0.60	2.0	•	•	
	GVN26LR1.2-0.6	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

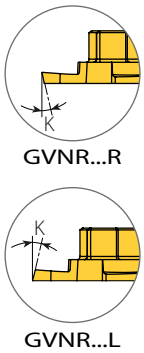
• In stock ○ Available upon request

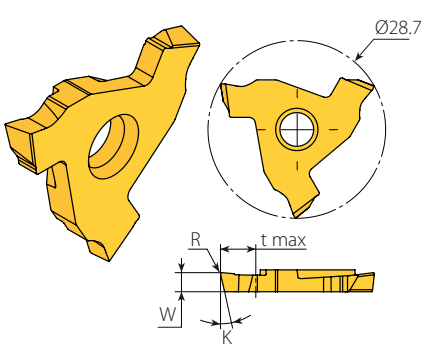
Close to Shoulder Parting Off



Right hand shown (R...R)



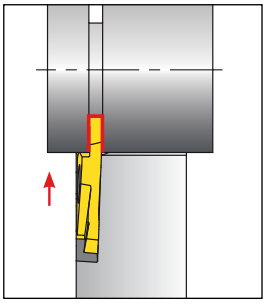




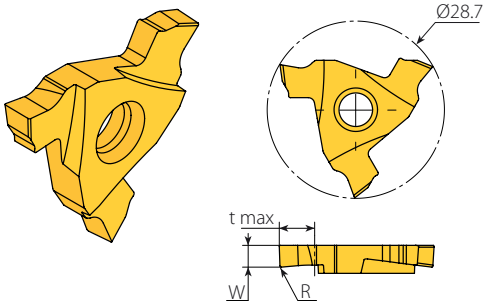
Insert Size	Ordering Code	Dimensions mm				Grade		Toolholder
IC	RH/LH	W±0.02	R±0.03	t max	K°	VKX	VTX	
26	GVN26RP0.5-0.05-06R	0.5	0.05	1.0	6	•	○	GVNE...-26, GVNE90...-26
	GVN26RP0.5-0.05-06L	0.5	0.05	1.0	6	•	○	
	GVN26LP0.5-0.05-06R	0.5	0.05	1.0	6	•	○	
	GVN26LP0.5-0.05-06L	0.5	0.05	1.0	6	•	○	
	GVN26RP0.5-0.05-15R	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)



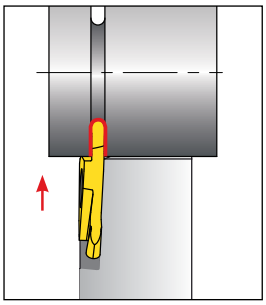
Right hand shown



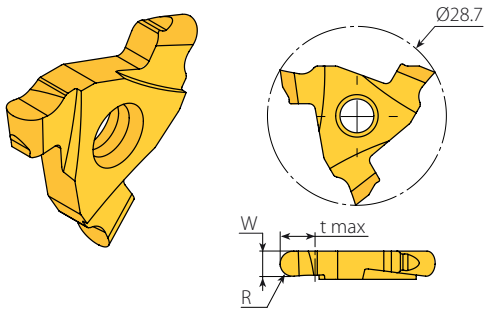
Insert Size	Ordering Code	Dimensions mm			Grade		Toolholder
IC	RH/LH	W$^{\pm 0.02}$	R$^{\pm 0.03}$	t max	VKX	VTX	
29	GV29R/LS2.38-0.1	2.38	0.10	6.5	•	•	GVE...-29-1, GVE90...-2901, GVI...-29
	GV29R/LS2.5-0.1	2.50	0.10	6.5	•	•	
	GV29R/LS2.7-0.1	2.70	0.10	6.5	•	•	
	GV29R/LS3.0-0.2	3.00	0.20	6.5	•	•	
	GV29RS3.0-0.4	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$^{\pm 0.02}$	R$^{\pm 0.03}$	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 Shank Tools

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)

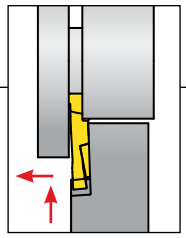
Square Bodies

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

V-CAP Bodies

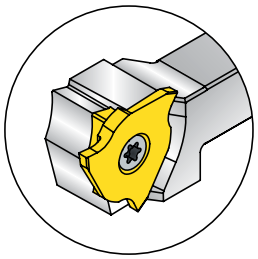
VBM	R	C5	-	90	-	C
1	2	3		4		5

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

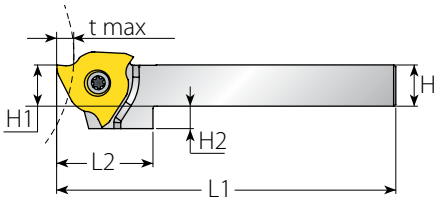


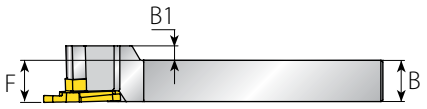
Right hand shown

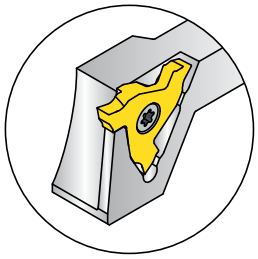
Close to Shoulder External Tools



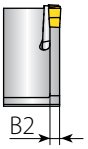
GVN26

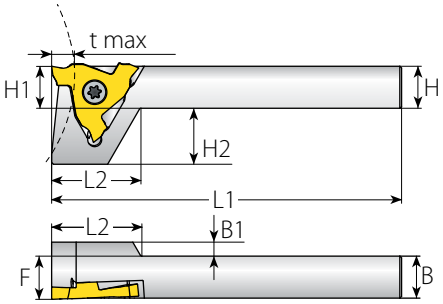






GVN29



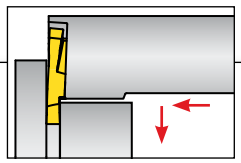


Spare Parts

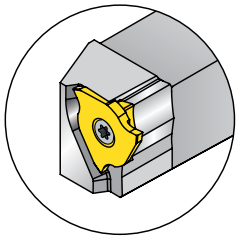
Insert Size	Ordering Code	Dimensions mm										
	RH/LH	H=B	L1	H1	L2	H2	F	B1	B2	t max/D max	Insert Screw*	Torx Key
26	GVNER/L10-26	10	125	10	28.0	8.5	10.2	6.2	-	See page 66	SGM5	L20IP
	GVNER/L12-26	12	125	12	28.0	6.5	12.2	4.2				
	GVNER/L16-26	16	125	16	28.0	2.5	16.2	-				
	GVNER/L20-26	20	125	20	28.0	-	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

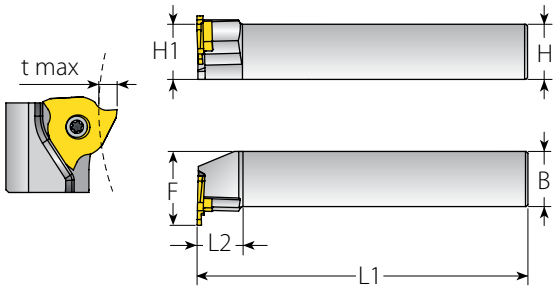
Close to Shoulder External Tools 90°

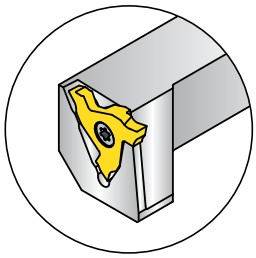


Right hand shown

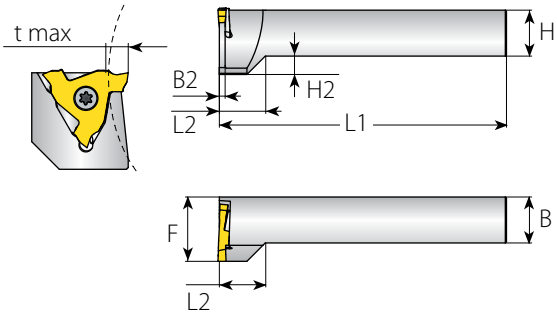


GVN26





GVN29

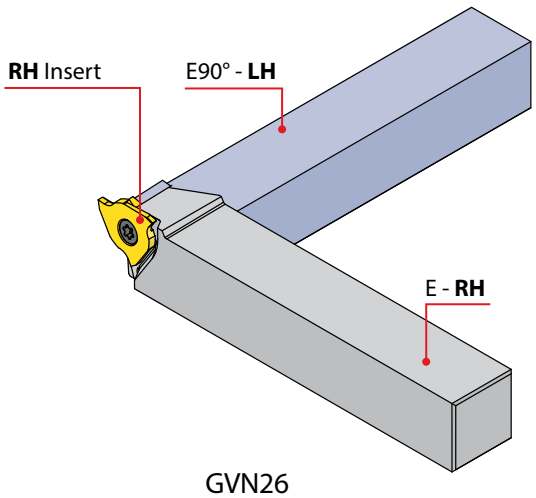


Spare Parts

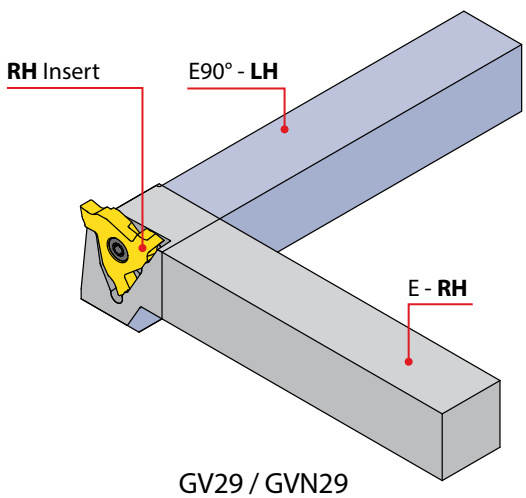
Insert Size	Ordering Code	Dimensions mm									
	RH/LH	H=B	L1	H1	L2	B2	H2	F	t max/D max	Insert Screw*	Torx Key
26	GVNE90R/L20-26	20	125	20	20.0	-	-	28.5	See page 66	SGM5	L20IP
	GVNE90R/L25-26	25	150	25	20.0	-	-	33.5			
29	GVNE90R/L20-29-1	20	125	20	20.2	1.75	8	28.0			
	GVNE90R/L20-29-2	20	125	20	20.2	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)

Square Bodies

Parallel 90°

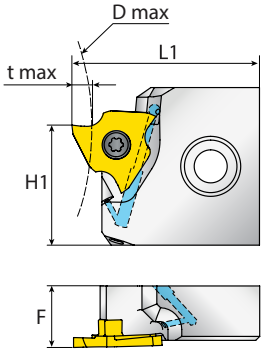
V-CAP Holders

Parallel 90°

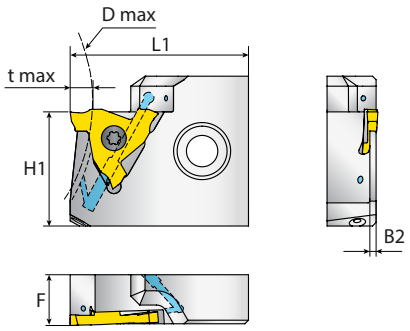
GrooVical Modules

GVN26

GVN29



GVN26



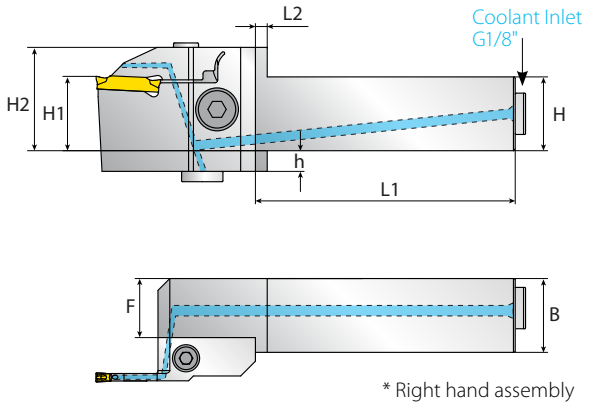
GVN29

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 66	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

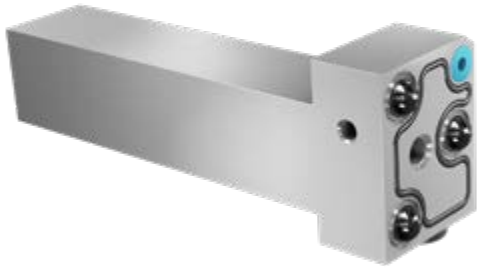


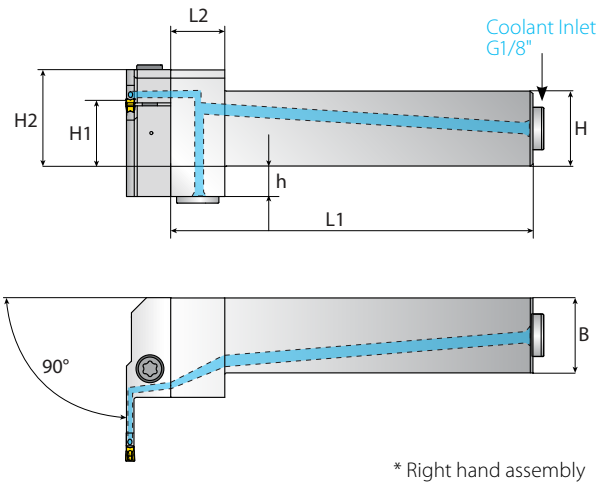
* Right hand shown

* 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.

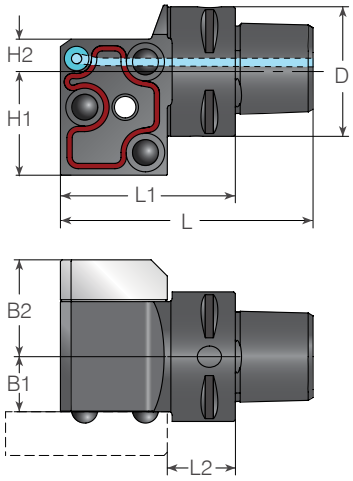
Necessary Parts When Using Modules with High Pressure Coolant Thru:

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

RH+LH holder with Modular Cover. RH shown.

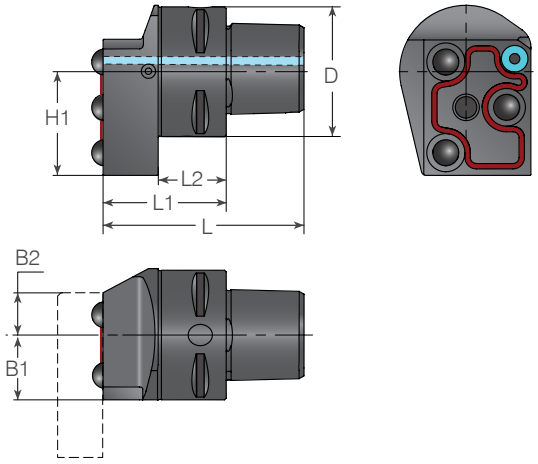


Parallel V-CAP Bodies with HPC

Spare Parts

Ordering Code	Dimensions mm							Spare Parts				
RH+LH	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

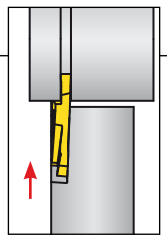
Spare Parts

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					

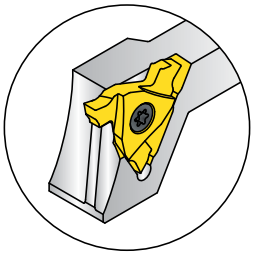
V-CAP holders are according to ISO 26623.

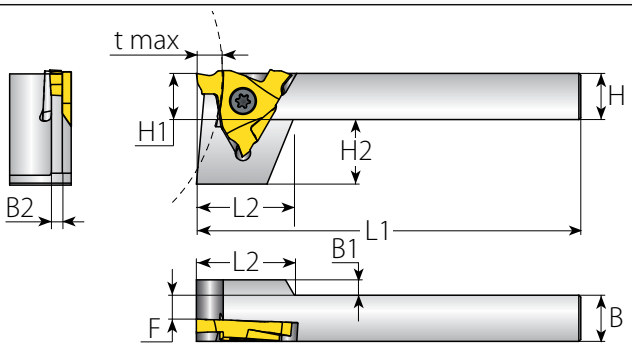
* Tightening Torque: 26 Nm max.

External Tools (GV29)



Right hand shown

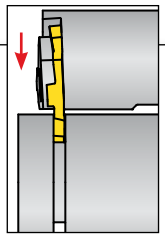




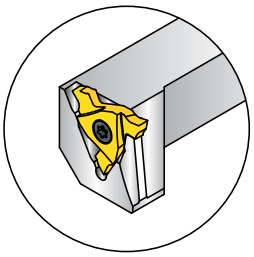
Insert Size	Ordering Code	Dimensions mm									Spare Parts	
	RH/LH	H=B	L1	H1	L2	H2	F	B1	B2	t max/D max	Insert Screw*	Torx Key
29	GVER/L12-29-1	12	100	12	25.5	16	7.2	4	1.75	See page 66	SGM5	L20IP
	GVER/L12-29-2	12	100	12	25.5	16	6.2	4	2.75			
	GVER/L16-29-1	16	125	16	23.2	12	11.2	-	1.75			
	GVER/L16-29-2	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			

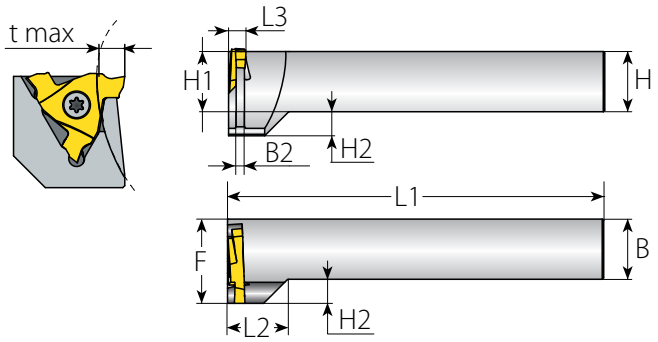
* Tightening Torque 4.5 Nm

External Toolholders 90° (GV29)



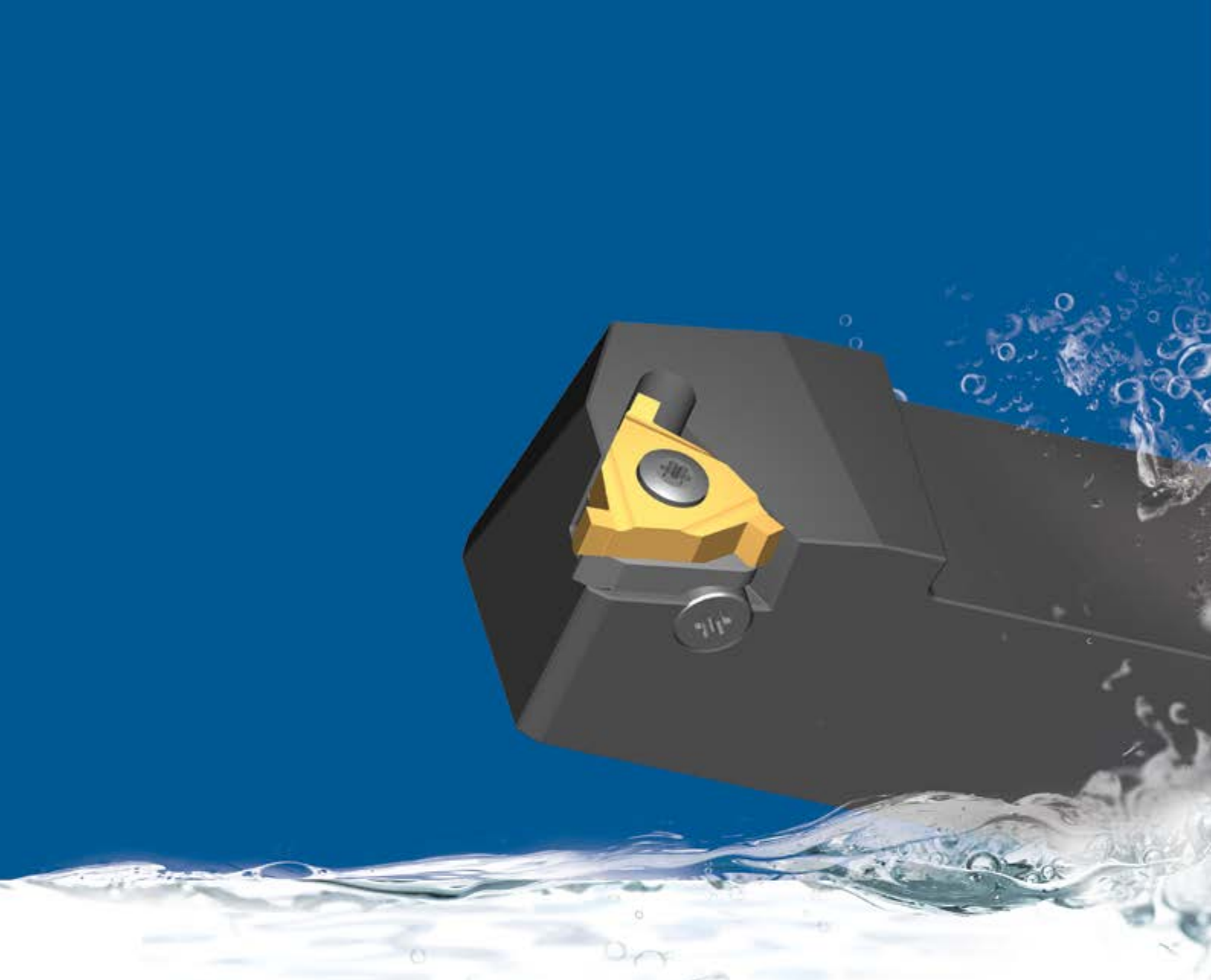
Right hand shown





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 66	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



EXTERNAL GROOVE TURNING | **FINISHING**

Laydown Grooving

For Shallow Grooves

Technical Data

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

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [m/min] Coated VTX	Vc [m/min] Coated VKX	Feed [mm/rev]
P Steel	1	Unalloyed steel	Low carbon (C=0.1-0.25%)	125	140-200	140-200	0.3
	2		Medium carbon (C=0.25-0.55%)	150	120-180	120-180	0.15
	3		High Carbon (C=0.55-0.85%)	170	110-180	110-180	0.05
	4	Low alloy steel (alloying elements ≤ 5%)	Non hardened	180	100-155	100-155	0.25
	5		Hardened	275	90-145	90-145	0.1
	6		Hardened	350	80-135	80-135	0.05
	7	High alloy steel (alloying elements >5%)	Annealed	200	70-115	65-115	0.2
	8		Hardened	325	50-100	50-100	0.05
	9	Cast steel	Low alloy (alloying elements <5%)	200	30-50	30-50	0.2
	10		High alloy (alloying elements >5%)	225	20-40	25-40	0.05
M Stainless Steel	11	Stainless steel Ferritic	Non hardened	200	70-120	80-120	0.2
	12		Hardened	330	60-95	55-95	0.05
	13	Stainless steel Austenitic	Austenitic	180	70-100	60-100	0.2
	14		Super Austenitic	200	40-90	50-90	0.05
	15	Stainless steel Cast Ferritic	Non hardened	200	80-110	60-80	0.2
	16		Hardened	330	65-110	45-65	0.05
	17	Cast austenitic	Austenitic	200	85-100	50-70	0.2
	18		Hardened	330	60-100	40-60	0.05
K Cast Iron	28	Malleable Cast iron	Ferritic (short chips)	130	70-120	60-80	0.2
	29		Pearlitic (long chips)	230	70-120	60-80	0.15
	30	Grey cast iron	Low tensile strength	180	70-120	60-80	0.2
	31		High tensile strength	260	60-100	40-70	0.1
	32	Nodular SG iron	Ferritic	160	50-80	60-80	0.2
	33		Pearlitic	260	60-90	70-90	0.1
N(K) Non-Ferrous Metals	34	Aluminum alloys Wrought	Non aging	60	100-240	80-240	0.4
	35		Aged	100	80-170	100-170	0.1
	36	Aluminum alloys	Cast	75	100-150	100-150	0.25
	37		Cast & aged	90	80-120	60-100	0.15
	38	Aluminum alloys	Cast Si 13-22%	130	100-150	100-150	0.15
	39	Copper and copper alloys	Brass	90	80-200	80-200	0.2
	40		Bronze and non leaded copper	100	80-200	80-200	0.15
S(M) Heat Resistant Material	19	High temperature alloys	Annealed (Iron based)	200	45-60	25-45	0.2
	20		Aged (Iron based)	280	35-50	20-30	0.05
	21		Annealed (Nickel or Cobalt based)	250	20-30	15-20	0.05
	22		Aged (Nickel or Cobalt based)	350	15-25	10-15	0.05
	23	Titanium alloys	Pure 99.5 Ti	400Rm	140-170	60-100	0.1
	24		α+β alloys	1050Rm	50-70	40-50	0.05
H(K) Hardned Material	25	Extra hard steel	Hardened & tempered	45-50HRc	45-60	20-40	0.02
	26			51-55HRc	40-50	20-35	0.02

Grades and Their Application

Grade	Application Type	Sample
VTX	General use carbide grade. A tough sub-micron substrate with TiAlN coating. Provides good fracture toughness and excellent wear resistance.	
VKX	Superior general purpose grade, excellent in steels and stainless steels, recommended for rigid cutting conditions TiN coated.	

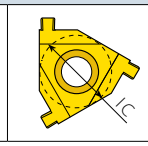
Laydown Grooving Inserts

Laydown Grooving Inserts - Ordering Code System

3	E	R	1.1	C	D471	-	0.35	VTX
1	2	3	4	5	6		7	8

1- Insert Size

3 - IC3/8"
5 - IC5/8"



2 - Type of Insert

E - External

3 - RH / LH Insert

R - Right Hand Insert
L - Left Hand Insert

4 - Groove Std. Width

0.8 - 2.15 (mm)

5 - Profile Style

C - Full Profile

6 - Groove Standard

DIN 471 Partial
DIN 471
DIN 7993 Partial
DIN 7993
DIN 76 ST, DIN 76 SH
CIR - CIRCLIP

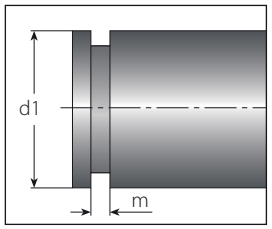
7 - Groove Depth

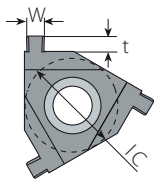
0.33 - 2.0 (mm)

8 - Carbide Grade

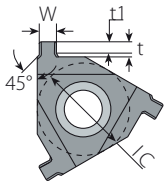
VTX
VKX

DIN 471 Retaining Ring Grooves for Shafts





Standard (Partial Profile)



Standard (Full Profile)

Standard (Partial Profile)

Insert Size	Ordering Code	Groove Std.	Dimensions mm		Grade		Anvil	Holder
IC	RH	m (H13)	W	t	VKX	VTX		
3/8″	3ER1.1D471-1.3	1.10	1.19	1.3	•	•	YE3M-1.5N	AL..-3
	3ER1.3D471-1.5	1.30	1.39	1.5	•	•		
	3ER1.6D471-1.85	1.60	1.69	1.8	•	•		
	3ER1.85D471-2.0	1.85	1.94	2.0	•	•		

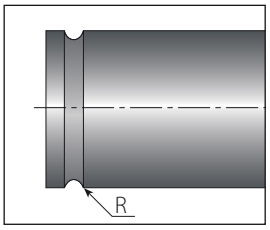
Range of profiles also available on IC 1/4″, 1/2″ and 5/8″, inserts on request.
• In stock ∘ Available upon request

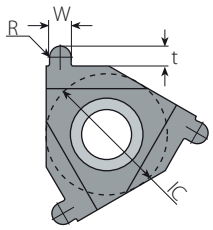
Standard (Full Profile)

Insert Size	Ordering Code	Groove Std.		Dimensions mm			Grade		Anvil	Holder
IC	RH	m(H13)	d1	W	t1	t	VKX	VTX		
3/8″	3ER1.1CD471-0.35	1.10	15	1.19	0.33	0.35	•	•	YE3M-1.5N	AL..-3
	3ER1.1CD471-0.4	1.10	16-17	1.19	0.36	0.40	•	•		
	3ER1.3CD471-0.5	1.30	18-22	1.39	0.44	0.50	•	•		
	3ER1.3CD471-0.55	1.30	24-26	1.39	0.45	0.55	•	•		
	3ER1.6CD471-0.7	1.60	28-30	1.69	0.60	0.70	•	•		
	3ER1.6D471-0.85	1.60	32-34	1.69	0.75	0.85	•	•		
	3ER1.6CD471-1.0	1.60	35	1.69	0.85	1.00	•	•		
	3ER1.85CD471-1.0	1.85	36-38	1.94	0.85	1.00	•	•		
	3ER1.85CD471-1.25	1.85	40-48	1.94	1.10	1.25	•	•		
	3ER2.15CD471-1.5	2.15	50-63	2.24	1.35	1.50	•	•		

Range of profiles also available on IC 1/4″, 1/2″ and 5/8″, inserts on request.
• In stock ∘ Available upon request

DIN 7993 Snap Ring Grooves





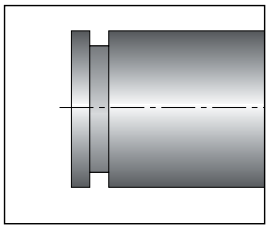
Standard
(Partial Profile)

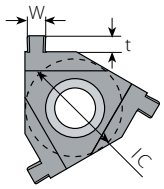
Standard (Partial Profile for Shafts)

Insert Size	Ordering Code	Dimensions mm			Grade		Anvil	Holder
IC	RH	R	W	t	VKX	VTX		
3/8"	3ER0.4D7993-0.6	0.40	0.80	0.60	•	•	YE3M-1.5N	AL..-3
	3ER0.6D7993-0.8	0.60	1.20	0.80	•	•		
	3ER0.9D7993-1.1	0.90	1.80	1.10	•	•		
	3ER1.0D7993-1.2	1.00	2.00	1.20	•	•		

Range of profiles also available on IC 1/4", 1/2" and 5/8", inserts on request.
• In stock ∘ Available upon request

CIRCLIP Inch Standard





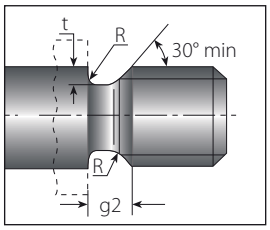
Standard
(Partial Profile)

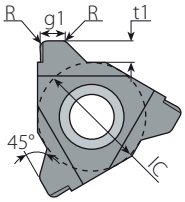
Standard (Partial Profile)

Insert Size	Ordering Code	Dimensions Inch		Grade		Anvil	Holder
IC	RH	W	t	VKX	VTX		
3/8"	3ER.031CIRC-.05	.031	.050	•	○	YE3M-1.5N	AL..-3
	3ER.041CIRC-.07	.041	.070	•	○		
	3ER.047CIRC-.07	.047	.080	•	○		
	3ER.058CIRC-.08	.058	.080	•	○		
	3ER.062CIRC-.08	.062	.080	•	○		
	3ER.072CIRC-.08	.072	.080	•	○		
	3ER.078CIRC-.08	.078	.080	•	○		

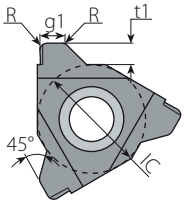
Range of profiles also available on IC 1/4", 1/2" and 5/8", inserts on request.
• In stock ∘ Available upon request

DIN 76 Thread Undercuts (For ISO Metric Threads in Accordance with DIN 13)





Normal - Type A



Short - Type B

Standard (Normal - Type A)

Insert Size	Ordering Code	Pitch	Dimensions mm					Grade		Anvil	Holder
IC	RH	mm	R	g1	g2	t	t1	VKX	VTX		
3/8″	3ER0.50D76ST-0.40	0.50	0.2	1.10	1.50	0.40	2.50	•	○	YE3M-1.5N	AL..-3
	3ER0.60D76ST-0.50	0.60	0.4	1.30	1.80	0.50	2.40	•	○		
	3ER0.70D76ST-0.55	0.70	0.4	1.55	2.10	0.55	2.20	•	○		
	3ER0.80-D76ST-0.65	0.80	0.4	1.75	2.40	0.65	2.10	•	•		
	3ER1.00-D76ST-0.80	1.00	0.6	2.20	3.00	0.80	1.90	•	•		
5/8″	5ER1.25D76ST-1.0	1.25	0.6	2.80	3.80	1.00	3.60	○	•	YE5M-1.5N	AL..-5
	5ER1.50D76ST-1.15	1.50	0.8	3.35	4.50	1.15	3.30	•	•		
	5ER1.75D76ST-1.30	1.75	1.0	4.00	5.30	1.30	3.00	•	○		
	5ER2.0D76ST-1.50	2.00	1.0	4.50	6.00	1.50	2.70	•	○		

• In stock ○ Available upon request

Standard (Short - Type B)

Insert Size	Ordering Code	Pitch	Dimensions mm					Grade		Anvil	Holder
IC	RH	mm	R	g1	g2	t	t1	VKX	VTX		
3/8″	3ER1.00-D76SH-0.80	1.00	0.6	1.20	2.00	0.80	2.50	•	•	YE3M-1.5N	AL..-3
	3ER1.25-D76SH-1.00	1.25	0.6	1.50	2.50	1.00	2.30	•	•		
	3ER1.50-D76SH-1.15	1.50	0.8	1.85	3.00	1.15	2.10	•	•		
	3ER1.75-D76SH-1.30	1.75	1.0	2.20	3.50	1.30	1.90	•	•		
5/8″	5ER2.00D76SH-1.50	2.00	1.0	2.50	4.00	1.50	3.80	•	○	YE5M-1.5N	AL..-5
	5ER2.50D76SH-1.80	2.50	1.2	3.20	5.00	1.80	3.50	•	○		
	5ER3.00-D76SH-2.20	3.00	1.6	3.80	6.00	2.20	3.10	•	○		

Range of profiles also available on IC 1/4″ and 1/2″ inserts on request.

• In stock ○ Available upon request

Laydown Grooving Holders

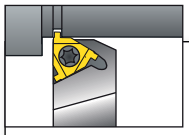
Laydown Grooving Holders - Ordering Code System

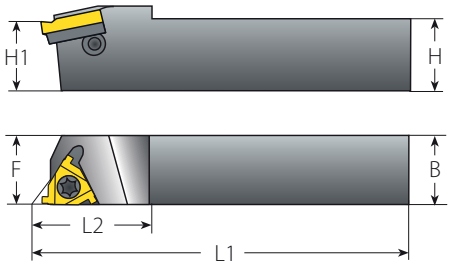
External Toolholders

A	L	32	-	4	
1	2	3		4	5

1- Anvil	2 - Holder Style	3 - Shank Square [mm]	4 - Insert Size	5 - RH/LH Holder
A - Anvil required **N** - No Anvil required	**L** - External	8, 10, 12, 16, 20, 25, 32, 40, 50, 60	**3** - IC3/8" **5** - IC5/8"	**None** - Right Hand **LH** - Left Hand

External Toolholders

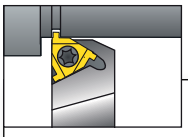




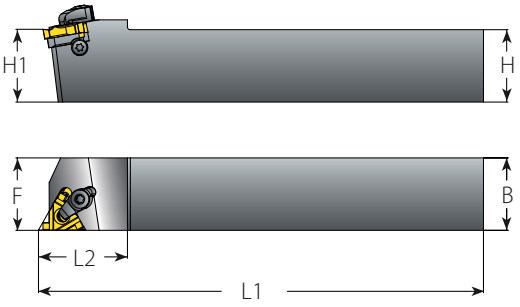
Standard

Insert Size	Ordering Code	Dimensions mm				Spare Parts			
									 *
IC	RH	H=H1=B	F	L1	L2	Insert Screw	Anvil Screw	Torx Key	Anvil RH
1/4"	NL8-2	8	11	136.4	17.5	SN2T	-	K2T	-
	NL10-2	10	11	70.0	17.5				
	NL12-2	12	12	80.0	17.5				
3/8"	AL3/8-3	9.52	16	63.6	20.5	SA3T	SY3T	K3T	YE3M-1.5N
	AL12-3	12	16	100.0	22.0				
	AL16-3	16	16	82.3	20.5				
	AL20-3	20	20	128.6	30.0				
	AL25-3	25	25	153.6	30.0				
	AL32-3	32	32	173.6	30.0				
1/2"	AL25-4	25	25	155.7	36.0	SA4T	SY4T	K4T	YE4M-1.5N
	AL32-4	32	32	175.7	36.0				
	AL40-4	40	40	205.7	36.0				
5/8"	AL25-5	25	32	151.6	35.0	SA5T	SY5T	K5T	YE5M-1.5N
	AL32-5	32	32	176.6	40.0				
	AL40-5	40	40	206.6	40.0				
	AL50-5	50	50	256.6	40.0				

* The toolholders are supplied with standard anvils. For Grooving, please use the anvils indicated in the table above. For ordering code see page 83.



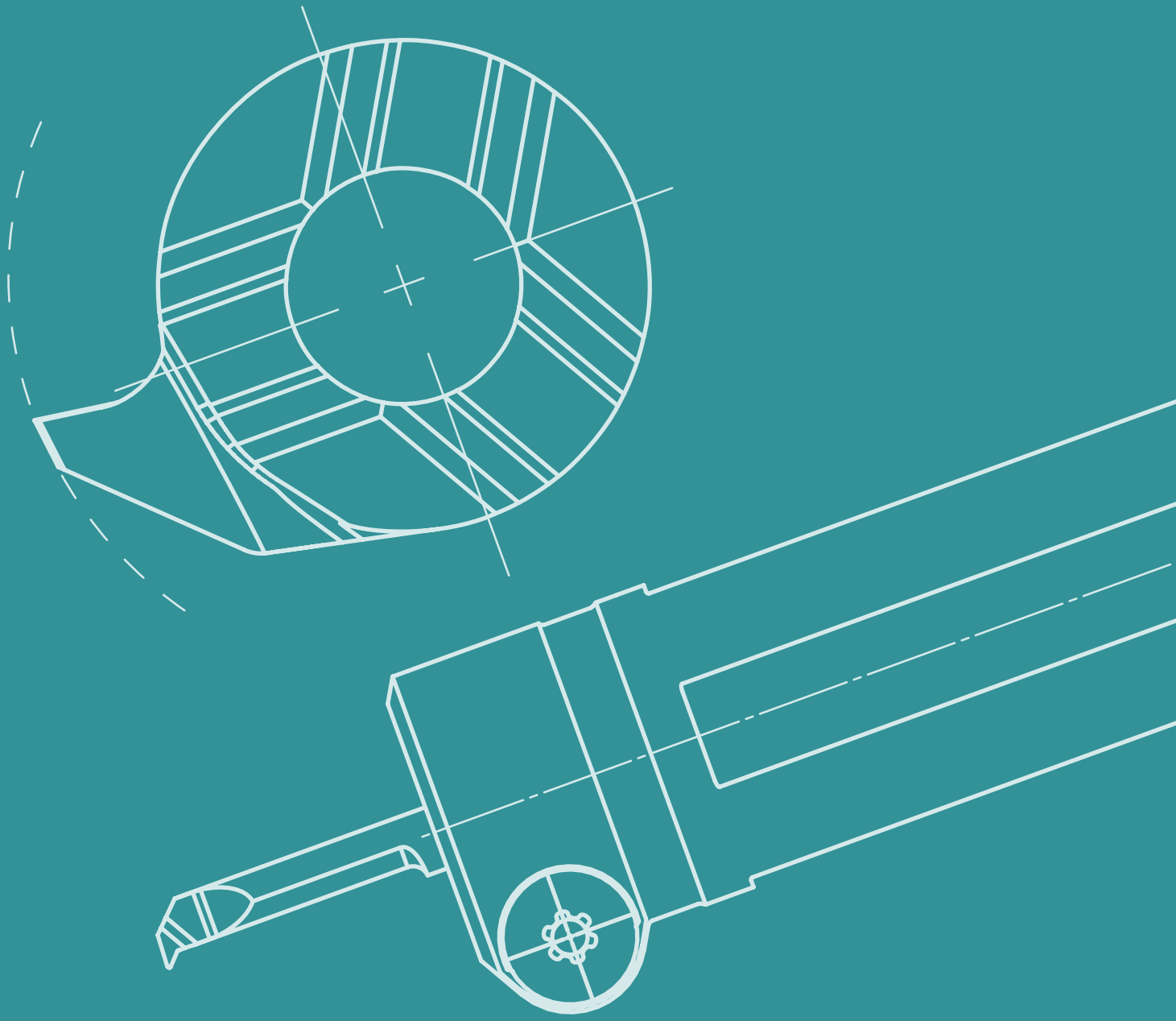
External Toolholders



Standard with Clamp
(Dual System, Screw or Clamp)

Insert Size	Ordering Code	Dimensions mm				Spare Parts				
IC	RH/LH	H=H1=B	F	L1	L2	Insert Screw	Anvil Screw	Clamp	Torx Key	Anvil LH
3/8"	AL16-3C	16	16	100.0	20.5	SA3T	SY3T	C3	K3CT	YE3M-1.5N
	AL20-3C	20	20	128.6	30					
	AL25-3C	25	25	153.6	30					
	AL32-3C	32	32	173.6	30					
1/2"	AL25-4C	25	25	155.7	36	SA4T	SY4T	C4	K4T	YE4M-1.5N
	AL32-4C	32	32	175.7	36					
	AL40-4C	40	40	205.7	36					
5/8"	AL25-5C	25	32	151.6	35	SA5T	SY5T	C5	K5T	YE5M-1.5N
	AL32-5C	32	32	176.6	40					
	AL40-5C	40	40	206.6	40					
	AL50-5C	50	50	256.6	40					

* The toolholders are supplied with standard anvils. For Grooving, please use the anvils indicated in the table above. For ordering code see page 83.



INTERNAL GROOVE TURNING

ТОВ «СМАРТТЕК ІНЖИНІРИНГ», т. +380-50-396-90-96, info@smarttec.com.ua, https://www.smarttec.com.ua

СМАРТТЕК
РОЗУМНІ ТЕХНОЛОГІЇ

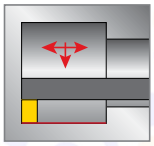
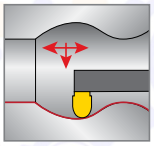
INTERNAL MACHINING | **SEMI FINISHING**

VG-Cut

Internal Grooving & Turning Applications

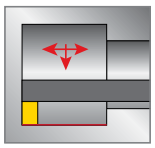
Tech Guide

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	Aluminum Alloys Wrought	Non Aging	60	150-300		
	35		Aged	100	150-250		
	36	Aluminum Alloys	Cast	75	150-300		
	37		Cast & Aged	90	150-300		
	38	Aluminum 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

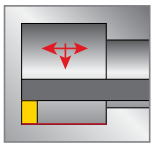
Vc [m/min] for Boring



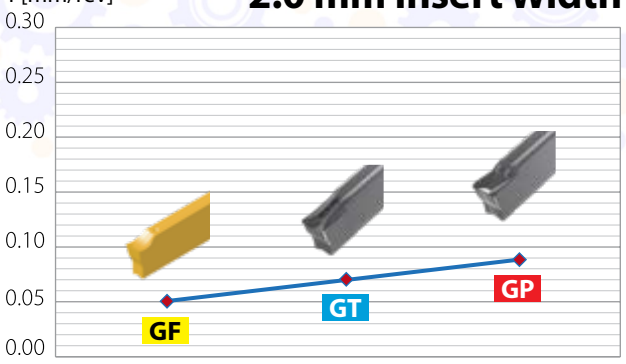
Reduce speed by ≈ 30% for improved chip forming and evacuation.

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

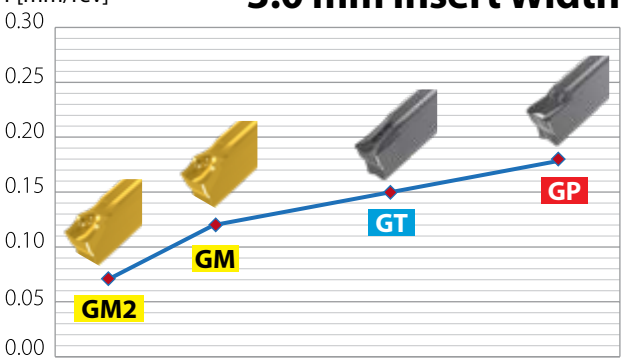


2.0 mm Insert Width



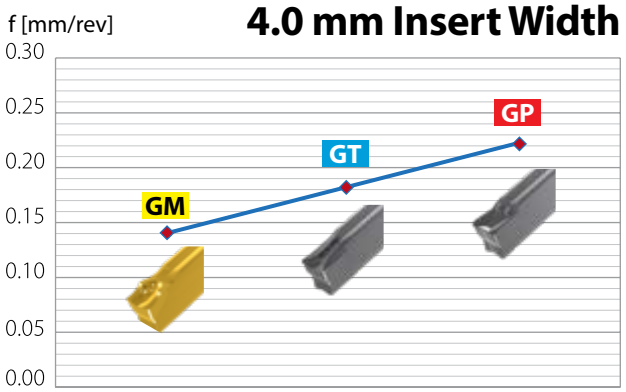
Chip Former	GF	GT	GP
f [mm/rev]	0.06	0.08	0.10

3.0 mm Insert Width



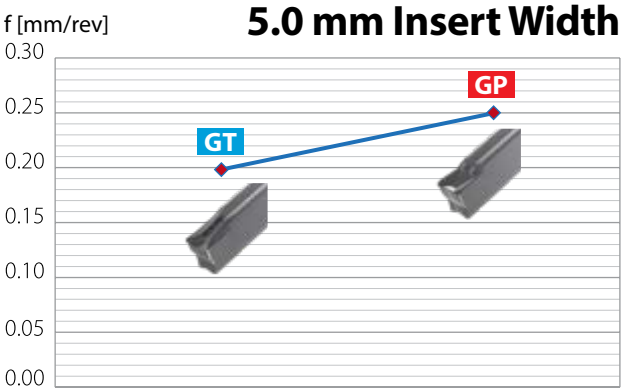
Chip Former	GM2	GM	GT	GP
f [mm/rev]	0.07	0.12	0.15	0.18

4.0 mm Insert Width



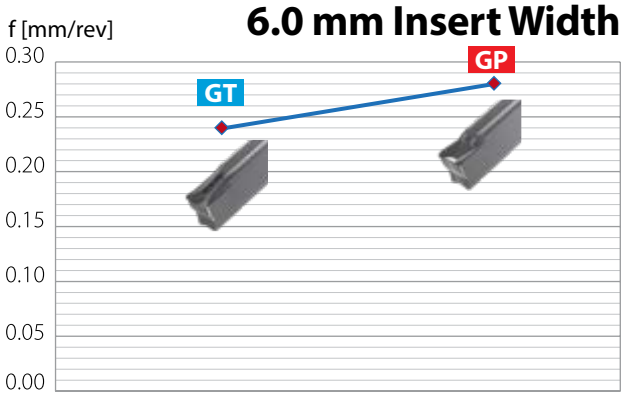
Chip Former	GM	GT	GP
f [mm/rev]	0.14	0.18	0.22

5.0 mm Insert Width



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

6.0 mm Insert Width

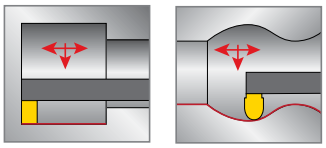


Chip Former	GT	GP
f [mm/rev]	0.24	0.28

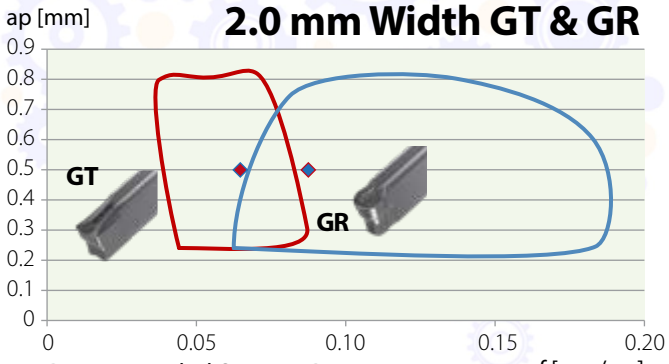
For better chip evacuation in Grooving, creating short chips is preferable. It is therefore recommended to work in short intervals (pecking), at a maximum grooving depth of twice the insert width. Taking into consideration the workpiece material and groove diameter, it is recommended to begin the first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



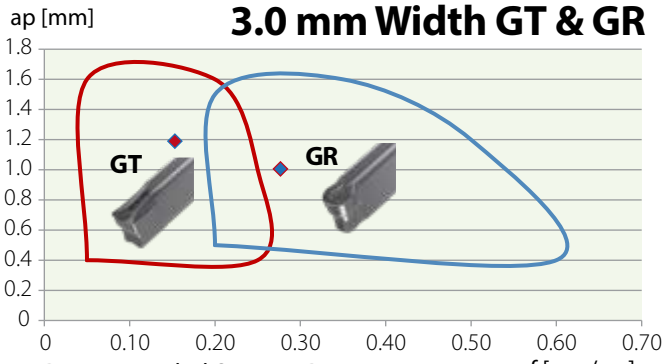
2.0 mm Width GT & GR



Recommended Starting Point:

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

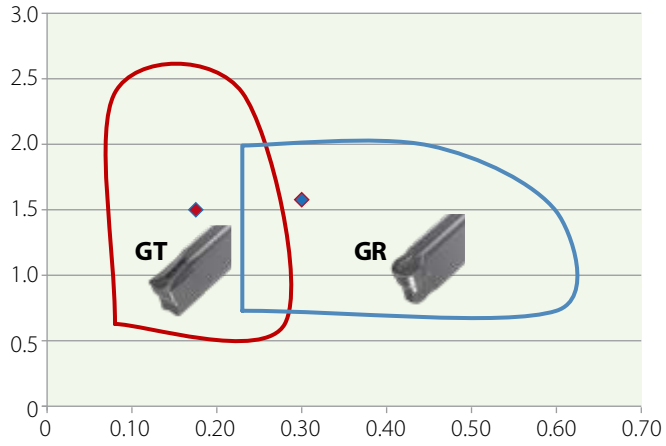
3.0 mm Width GT & GR



Recommended Starting Point:

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

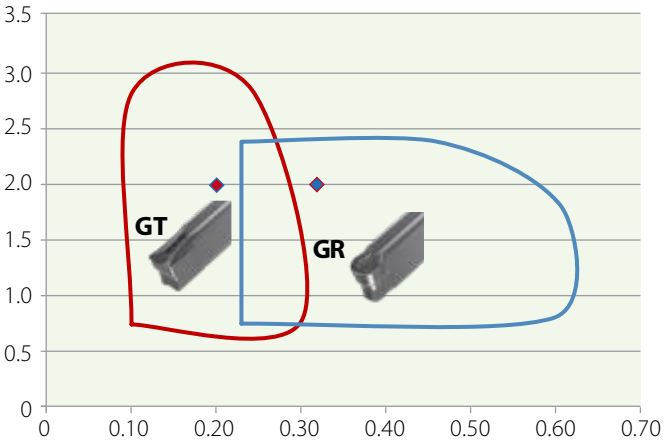
4.0 mm Width GT & GR



Recommended Starting Point:

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

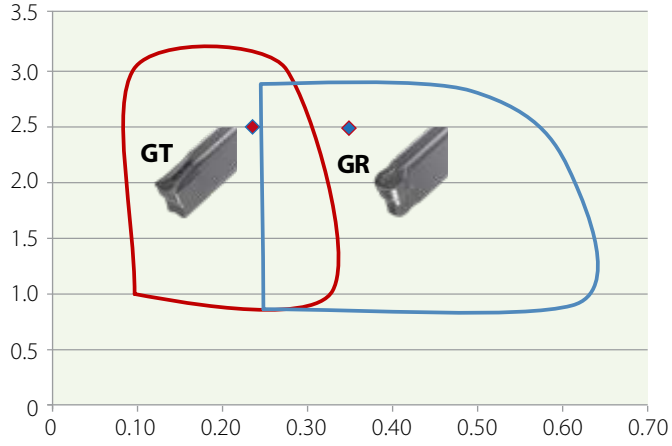
5.0 mm Width GT & GR



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 System

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

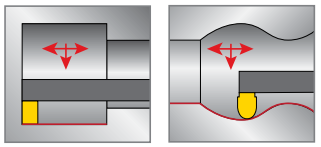
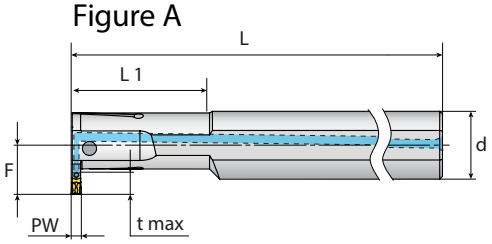


Figure A



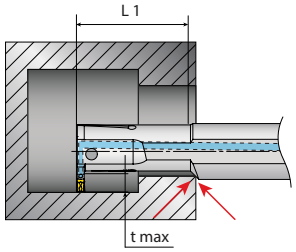
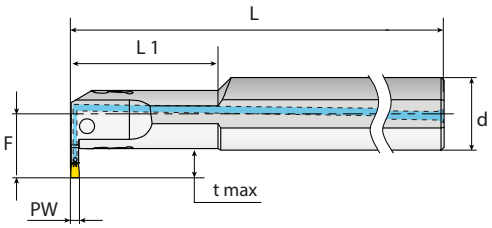
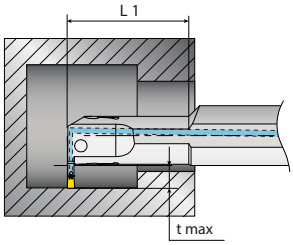


Figure B NEW





*Right hand shown

Figure A

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

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	Aluminum Alloys Wrought	Non Aging	60	100-240
	35		Aged	100	80-170
	36	Aluminum Alloys	Cast	75	100-150
	37		Cast & Aged	90	80-120
	38	Aluminum 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

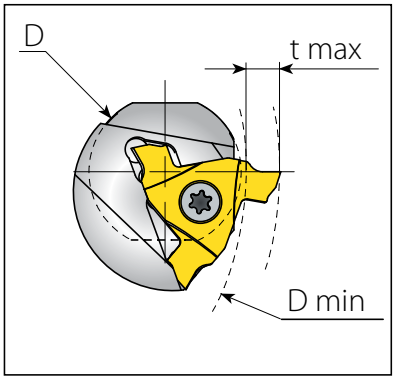
	High Alloy Steel, 330 HB, 2100 Kc [N/mm²]		**Austenitic Stainless Steel**, 200 HB, 2600 Kc [N/mm²]	
Insert Width (mm)	Depth ap = Insert Width x variable	Average f mm/rev	Depth ap = Insert Width x variable	Average f mm/rev
0.4 mm - 0.9 mm	0.055	0.04	0.035	0.02
1.0mm - 1.5mm	0.055	0.07	0.035	0.04
1.6 mm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



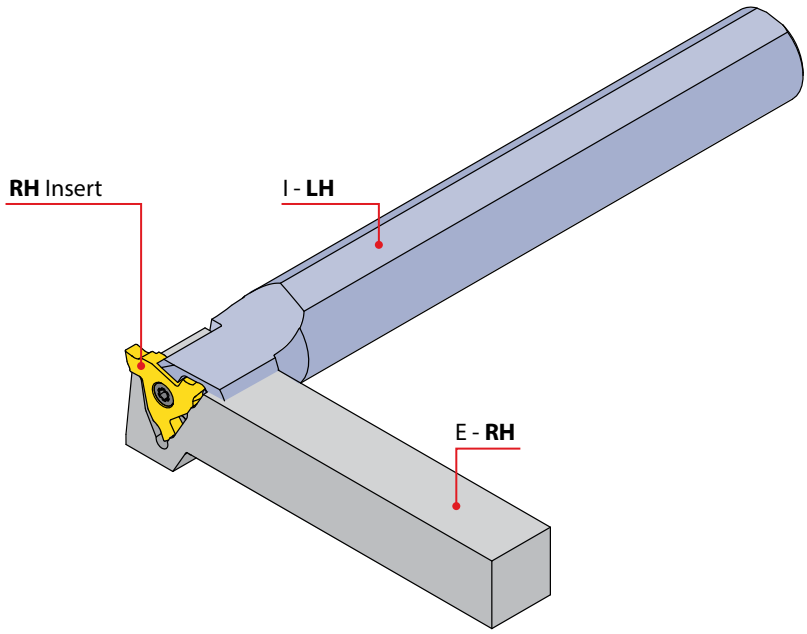
GrooVical Holders

GrooVical Holders - Ordering Code System

GVN	I	R	25	-	29
1	2	3	4		5

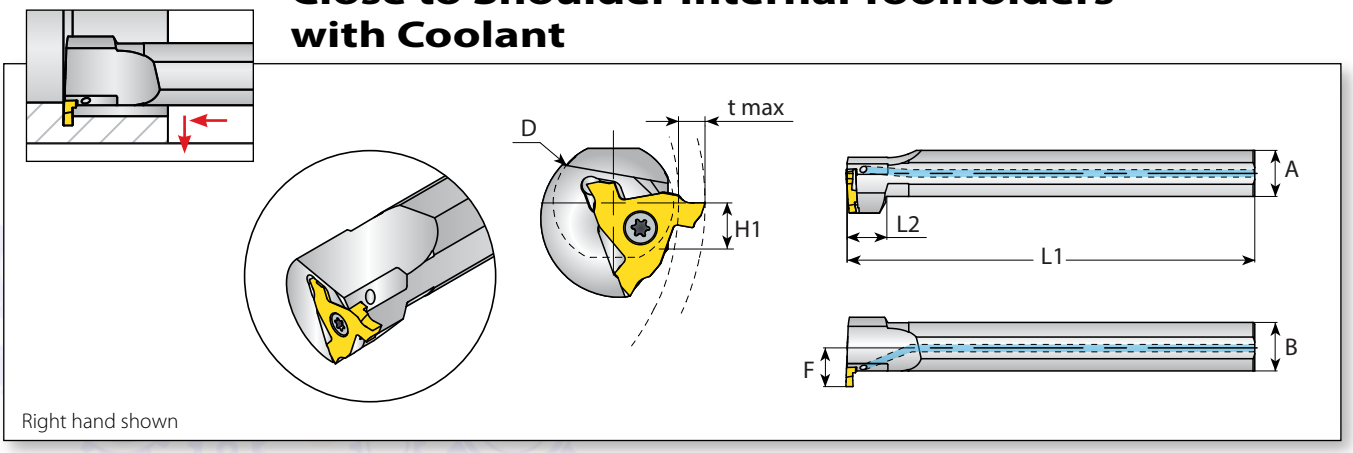
1- Insert Type	2 - Type	3 - RH or LH	4 - Shank Size	5 - Insert Size
GVN - Groovical Close to Shoulder **GV** - Groovical Neutral	**I** - Internal	**R** - RH **L** - LH	25, 32 mm	29

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



GV29 / GVN29

Close to Shoulder Internal Toolholders with Coolant



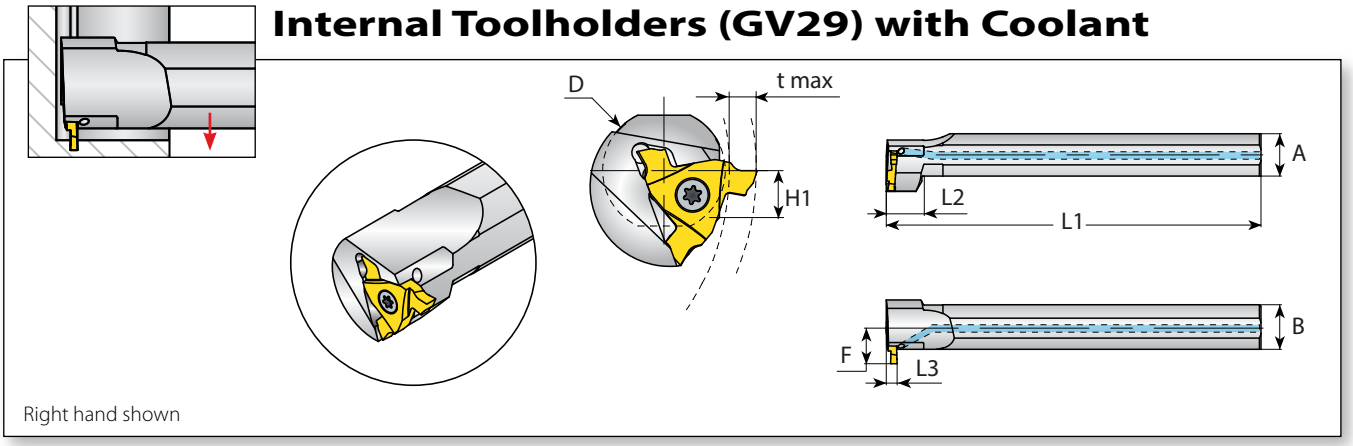
Right hand shown

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 101	SGM5	L20IP
	GVNIR/L32-29	32	250	19	29.0	30.5	14.5	22.2			

For suitable GVN29 inserts, please see pages 68-72.

* Tightening Torque 4.5 Nm.

Internal Toolholders (GV29) with Coolant

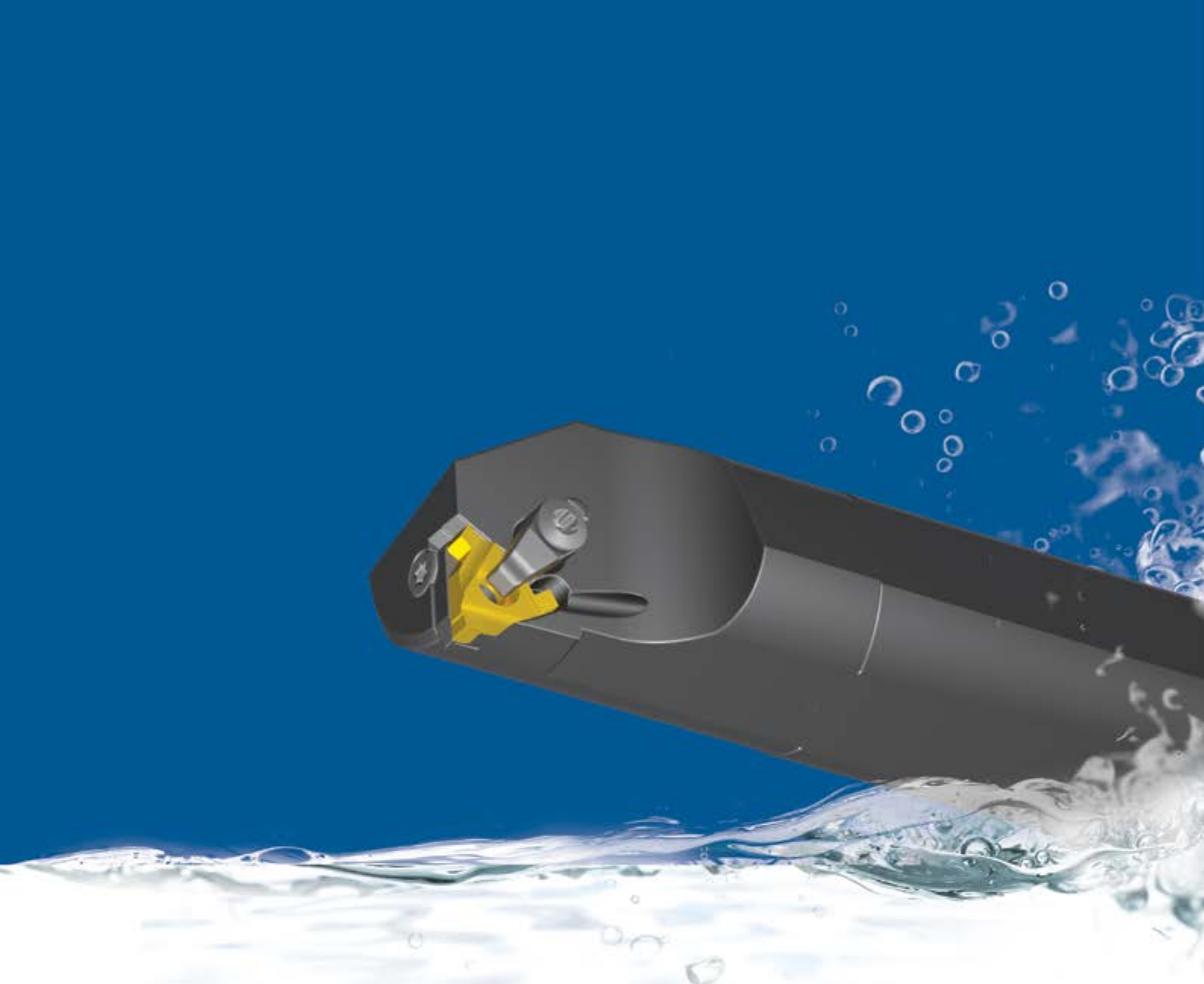


Right hand shown

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 101	SGM5	L20IP
	GVIR32-29	32	250	19	5.8	29.0	30.5	14.5	22.2			

For suitable GV29 inserts, please see page 73.

* Tightening Torque 4.5 Nm.



INTERNAL GROOVE TURNING | **FINISHING**

Laydown Grooving

For Shallow Grooves

ТОВ «СМАРТТЕК ІНЖИНІРИНГ», т. +380-50-396-90-96, info@smarttec.com.ua, https://www.smarttec.com.ua

СМАРТТЕК
РОЗУМНІ ТЕХНОЛОГІЇ

Technical Data

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

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [m/min] Coated VTX	Vc [m/min] Coated VKX	Feed [mm/rev]
P Steel	1	Unalloyed steel	Low carbon (C=0.1-0.25%)	125	140-200	140-200	0.3
	2		Medium carbon (C=0.25-0.55%)	150	120-180	120-180	0.15
	3		High Carbon (C=0.55-0.85%)	170	110-180	110-180	0.05
	4	Low alloy steel (alloying elements ≤ 5%)	Non hardened	180	100-155	100-155	0.25
	5		Hardened	275	90-145	90-145	0.1
	6		Hardened	350	80-135	80-135	0.05
	7	High alloy steel (alloying elements >5%)	Annealed	200	70-115	65-115	0.2
	8		Hardened	325	50-100	50-100	0.05
	9	Cast steel	Low alloy (alloying elements <5%)	200	30-50	30-50	0.2
	10		High alloy (alloying elements >5%)	225	20-40	25-40	0.05
M Stainless Steel	11	Stainless steel Ferritic	Non hardened	200	70-120	80-120	0.2
	12		Hardened	330	60-95	55-95	0.05
	13	Stainless steel Austenitic	Austenitic	180	70-100	60-100	0.2
	14		Super Austenitic	200	40-90	50-90	0.05
	15	Stainless steel Cast Ferritic	Non hardened	200	80-110	60-80	0.2
	16		Hardened	330	65-110	45-65	0.05
	17	Cast austenitic	Austenitic	200	85-100	50-70	0.2
	18		Hardened	330	60-100	40-60	0.05
K Cast Iron	28	Malleable Cast iron	Ferritic (short chips)	130	70-120	60-80	0.2
	29		Pearlitic (long chips)	230	70-120	60-80	0.15
	30	Grey cast iron	Low tensile strength	180	70-120	60-80	0.2
	31		High tensile strength	260	60-100	40-70	0.1
	32	Nodular SG iron	Ferritic	160	50-80	60-80	0.2
	33		Pearlitic	260	60-90	70-90	0.1
N(K) Non-Ferrous Metals	34	Aluminum alloys Wrought	Non aging	60	100-240	80-240	0.4
	35		Aged	100	80-170	100-170	0.1
	36	Aluminum alloys	Cast	75	100-150	100-150	0.25
	37		Cast & aged	90	80-120	60-100	0.15
	38	Aluminum alloys	Cast Si 13-22%	130	100-150	100-150	0.15
	39	Copper and copper alloys	Brass	90	80-200	80-200	0.2
	40		Bronze and non leaded copper	100	80-200	80-200	0.15
S(M) Heat Resistant Material	19	High temperature alloys	Annealed (Iron based)	200	45-60	25-45	0.2
	20		Aged (Iron based)	280	35-50	20-30	0.05
	21		Annealed (Nickel or Cobalt based)	250	20-30	15-20	0.05
	22		Aged (Nickel or Cobalt based)	350	15-25	10-15	0.05
	23	Titanium alloys	Pure 99.5 Ti	400Rm	140-170	60-100	0.1
	24		α+β alloys	1050Rm	50-70	40-50	0.05
H(K) Hardned Material	25	Extra hard steel	Hardened & tempered	45-50HRc	45-60	20-40	0.02
	26			51-55HRc	40-50	20-35	0.02

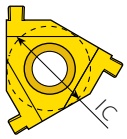
Grades and Their Application

Grade	Application Type	Sample
VTX	General use carbide grade. A tough sub-micron substrate with TiAlN coating. Provides good fracture toughness and excellent wear resistance.	
VKX	Superior general purpose grade, excellent in steels and stainless steels, recommended for rigid cutting conditions TiN coated.	

Laydown Grooving Internal Inserts

Laydown Grooving Inserts - Ordering Code System

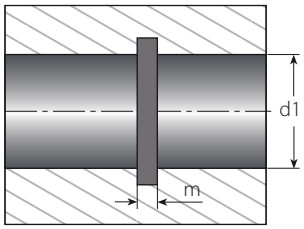
3	I	R	1.1	C	D472	-	0.50	VTX
1	2	3	4	5	6		7	8

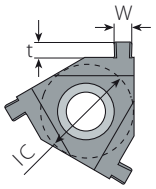
1- Insert Size	2 - Type of Insert	3 - RH / LH Insert
3 - IC3/8" 	I - Internal	R - Right Hand Insert L - Left Hand Insert

4 - Groove Std. Width	5 - Profile Style	6 - Groove Standard	7 - Groove Depth	8 - Carbide Grade
0.8 - 2.15 (mm)	C - Full Profile	DIN 472 Partial DIN 472 DIN 7993 Partial DIN 7993 DIN 76 ST, DIN 76 SH CIR - CIRCLIP	0.33 - 2.0 (mm)	VTX VKX

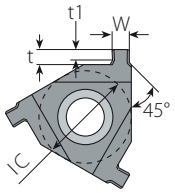
DIN 472 Retaining Ring Grooves for Bores

Internal





Standard
(Partial Profile)



Standard
(Full Profile)

Standard (Partial Profile)

Insert Size	Ordering Code	Groove Std.	Dimensions mm		Grade		Anvil	Holder
IC	RH	m (H13)	W	t	**VKX**	**VTX**		
3/8"	3IR1.1D472-1.3	1.10	1.19	1.30	•	•	YI3M-1.5N	AVR..-3 NVR - 3
	3IR1.3D472-1.5	1.30	1.39	1.50	•	•		
	3IR1.6D472-1.8	1.60	1.69	1.80	•	•		
	3IR1.85D472-2.0	1.85	1.94	2.00	•	•		

Range of profiles also available on IC 1/4", 1/2" and 5/8", inserts on request.
• In stock ∘ Available upon request

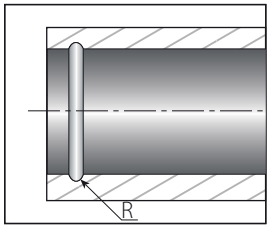
Standard (Full Profile)

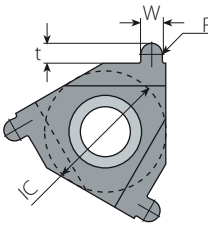
Insert Size	Ordering Code	Groove Std.	Dimensions mm				Grade		Anvil	Holder
IC	RH	m (H13)	d1	W	t1	t	**VKX**	**VTX**		
3/8"	3IR1.1CD472-0.50	1.10	18-22	1.19	0.36	0.50	•	•	YI3M-1.5N	AVR..-3 NVR - 3
	3IR1.3CD472-0.60	1.30	24-26	1.39	0.44	0.60	•	•		
	3IR1.3CD472-0.70	1.30	28-30	1.39	0.60	0.70	•	•		
	3IR1.3CD472-0.85	1.30	31-34	1.39	0.75	0.85	•	•		
	3IR1.6CD472-0.85	1.60	34	1.69	0.75	0.85	•	•		
	3IR1.6CD472-1.00	1.60	35-38	1.69	0.85	1.00	•	•		
	3IR1.85CD472-1.25	1.85	40-48	1.94	1.10	1.25	•	•		
	3IR2.15CD472-1.50	2.15	50-63	2.24	1.35	1.50	•	•		

Range of profiles also available on IC 1/4", 1/2" and 5/8", inserts on request.
• In stock ∘ Available upon request

DIN 7993 Snap Ring Grooves

Internal





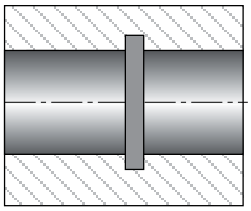
Standard
(Partial Profile)

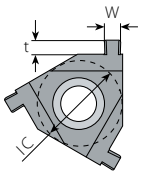
Standard (Partial Profile for Bores)

Insert Size	Ordering Code	Dimensions mm			Grade		Anvil	Holder
IC	RH	R	W	t	VKX	VTX		
3/8"	3IR0.6D7993-0.8	0.60	1.20	0.80	•	•	YI3M-1.5N	AVR..-3 NVR - 3
	3IR0.9D7993-1.1	0.90	1.80	1.10	•	•		
	3IR1.0D7993-1.2	1.00	2.00	1.20	•	•		

Range of profiles also available on IC 1/4", 1/2" and 5/8" inserts on request.
• In stock ∘ Available upon request

CIRCLIP Inch Standard





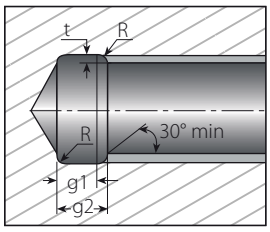
Standard
(Partial Profile)

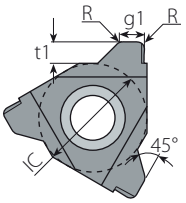
Standard (Partial Profile)

Insert Size	Ordering Code	Dimensions mm		Grade		Anvil	Holder
IC	RH	W	t	**VKX**	**VTX**		
3/8″	3IR.031CIRC-.05	.031	.05	•	•	YI3M-1.5N	AVR..-3* NVR - 3
	3IR.041CIRC-.07	.041	.07	•	•		
	3IR.047CIRC-.07	.047	.07	•	•		
	3IR.058CIRC-.08	.058	.08	•	•		
	3IR.062CIRC-.08	.062	.08	•	•		
	3IR.072CIRC-.08	.072	.08	•	•		
	3IR.078CIRC-.08	.078	.08	•	•		

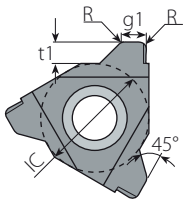
Range of profiles also available on IC 1/4″, 1/2″ and 5/8″, inserts on request.
• In stock ∘ Available upon request

DIN 76 Thread Undercuts (For ISO Metric Threads in Accordance with DIN 13)





Normal - Type C



Short - Type D

Standard (Normal - Type C)

Insert Size	Ordering Code	Pitch	Dimensions mm					Grade		Anvil	Holder
IC	RH	mm	R	g1	g2	t	t1	VKX	VTX		
3/8"	3IR0.50D76ST-0.40	0.50	0.2	1.10	1.50	0.40	2.50	•	○	Y13M-1.5N	AVR...- 3 NVR...- 3
	3IR0.60D76ST-0.50	0.60	0.4	1.30	1.80	0.50	2.40	•	○		
	3IR0.70D76ST-0.55	0.70	0.4	1.55	2.10	0.55	2.20	•	○		
	3IR0.80D76ST-0.65	0.80	0.4	1.75	2.40	0.65	2.10	•	○		
	3IR1.00D76ST-0.80	1.00	0.6	2.20	3.00	0.80	1.90	•	○		

Range of profiles also available on IC 1/4", 1/2" and 5/8" inserts on request.
• In stock ○ Available upon request

Standard (Short - Type D)

Insert Size	Ordering Code	Pitch	Dimensions mm					Grade		Anvil	Holder
IC	RH	mm	R	g1	g2	t	t1	VKX	VTX		
3/8"	3IR1.00D76SH-0.80	1.00	0.6	1.20	2.00	0.80	2.50	•	•	Y13M-1.5N	AVR...- 3 NVR...- 3
	3IR1.25D76SH-1.0	1.25	0.6	1.50	2.50	1.00	2.30	•	•		
	3IR1.50D76SH-1.15	1.50	0.8	1.85	3.00	1.15	2.10	•	•		
	3IR1.75D76SH-1.30	1.75	1.0	2.20	3.50	1.30	1.90	•	•		

Range of profiles also available on IC 1/4", 1/2" and 5/8" inserts on request.
• In stock ○ Available upon request

Laydown Grooving Internal Holders

Laydown Grooving Holders - Ordering Code System

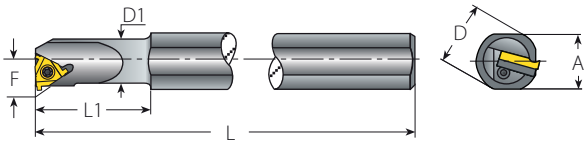
Internal Holders

C	A	VR	C	20	-	3		
1	2	3	4	5		7	8	9

1- Shank Type	2 - Anvil	3 - Tool Type	4 - Cooling	5 - Shank Front Dia
B - Anti Vibration System C - Carbide Shank	A - Anvil required N - No Anvil required	VR - Internal Round shank	C - With Coolant Channel	10, 10D, 12, 13, 16 16D, 20, 25, 25D, 32, 40, 50

7- Insert Size	8- Clamping	9 - RH/LH Holder
3 - IC3/8"	C - With Clamp	None - Right Hand LH - Left Hand

Internal Toolholders

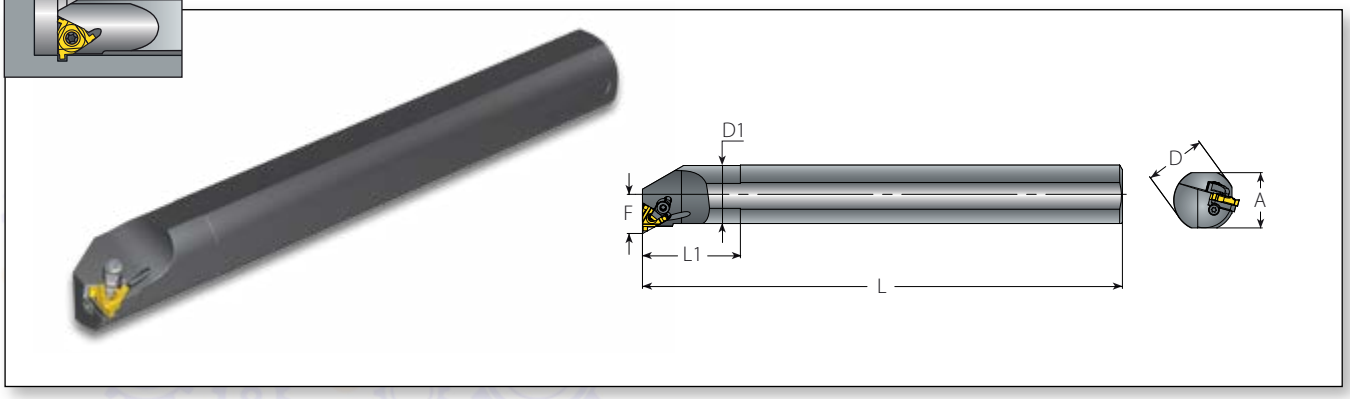


Standard

Insert Size	Ordering Code	Dimensions mm						Min Bore Dia.	Spare Parts			
												*
IC	RH	A	L	L1	D	D1	F	mm	Insert Screw	Anvil Screw	Torx Key	Anvil RH
1/4″	NVR10D-2	18.0	100	25	10	10.0	7.3	13	SN2T	-	K2T	-
	NVR10-2	18.0	180	25	20	10.0	7.3	13				
	NVR13-2	18.0	180	32	20	13.0	8.9	16				
3/8″	NVR13-3	18.0	180	32	20	12.7	10.3	17	SN3T	-	K3T	-
	NVR16-3	18.0	180	40	20	16.0	11.5	20				
	NVR16D-3	15.2	150	32	16	16.0	11.3	20				
	AVR20-3	18.0	180	40	20	20.0	13.4	24	SA3T	SY3T	K3T	YI3M-1.5N
	AVR25-3	29.0	250	60	32	25.0	16.3	29				
	AVR25D-3	22.6	200	45	25	24.6	16.1	29				
	AVR32-3	29.0	250	60	32	32.0	19.6	36				
	AVR40-3	36.0	300	60	40	40.0	23.8	44				
1/2″	NVR20-4	18.0	180	50	20	20.0	15.6	27	SN4T	-	K4T	-
	AVR25-4	29.0	250	60	32	25.0	17.4	32	SA4T	SY4T	K4T	YI4M-1.5N
	AVR25D-4	22.6	200	45	25	24.6	17.2	32				
	AVR32-4	29.0	250	60	32	32.0	21.5	39				
	AVR40-4	36.0	300	60	40	40.0	25.8	47				
5/8″	AVR32-5	29.0	250	60	32	32.0	22.4	40	SN5T	SY5T	K5T	YI5M-1.5N
	AVR40-5	36.0	300	60	40	40.0	26.4	48	SA5T	SY5T	K5T	YI5M-1.5N
	AVR50-5	45.0	350	75	50	50.0	31.4	58				
	AVR60-5	54.0	400	75	60	60.0	36.4	69				

* The toolholders are supplied with standard anvils. For Grooving, please use the anvils indicated in the table above.
Holders with coolant channel available as standard. For ordering code see page 112.

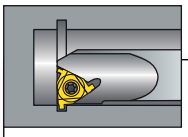
Internal Toolholders



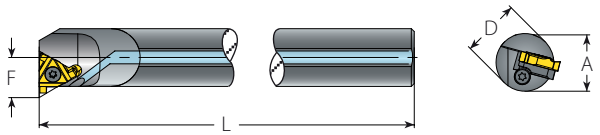
Standard with Clamp
(Dual System, Screw or Clamp)

Insert Size	Ordering Code	Dimensions mm						Min Bore Dia.	Spare Parts				
IC	RH/LH	A	L	L1	D	D1	F	mm	Insert Screw	Anvil Screw	Clamp	Torx Key	Anvil RH
3/8″	AVR20-3C	18.0	180	50	20	20.0	13.4	24	SA3T	SY3T	C3	K3CT	YI3M-1.5N
	AVR25-3C	28.0	250	60	32	25.0	16.3	29					
	AVR25D-3C	22.6	200	45	25	24.6	16.1	29					
	AVR32-3C	29.0	250	60	32	32.0	19.6	36					
	AVR40-3C	36.0	300	60	40	40.0	23.8	44					
1/2″	AVR25-4C	29.0	250	60	32	25.0	17.4	32	SA4T	SY4T	C4	K4T	YI4M-1.5N
	AVR25D-4C	22.6	200	45	25	24.6	17.2	32					
	AVR32-4C	29.0	250	60	32	32.0	21.5	39					
	AVR40-4C	36.0	300	60	40	40.0	25.8	47					
5/8″	AVR32-5C	29.0	250	60	32	32.0	22.4	40	SN5T	SY5T	C5	K5T	YI5M-1.5N
	AVR40-5C	36.0	300	60	40	40.0	26.4	48	SA5T	SY5T	C5	K5T	YI5M-1.5N
	AVR50-5C	45.0	350	75	50	50.0	31.4	58					
	AVR60-5C	54.0	400	75	60	60.0	36.4	69					

* The toolholders are supplied with standard anvils. For Grooving, please use the anvils indicated in the table above.
Holders with coolant channel available as standard. For ordering code see page 112.



Internal Toolholders

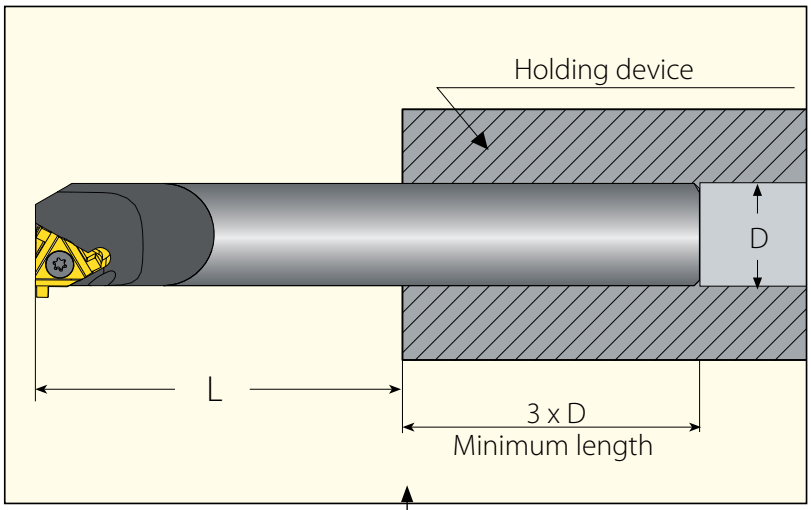


Standard with Carbide Shank

Insert Size	Ordering Code					Min Bore Dia.	Spare Parts			
IC	RH/LH	D	A	F	L	mm	Insert Screw	Anvil Screw	Torx Key	Anvil RH
1/4″	CNVRC10-2	10	9.5	7.3	150	13	SN2T	-	K2T	-
	CNVRC12-2	12	11.7	8.3	180	15				
3/8″	CNVRC16-3	16	15.6	11.5	200	20	SN3T	-	K3T	-
	CAVRC20-3	20	19.5	13.4	250	24	SA3T	SY3T	K3T	YI3M-1.5N
1/2″	CNVRC20-4	20	19.5	13.8	250	25	SN4T	-	K4T	-

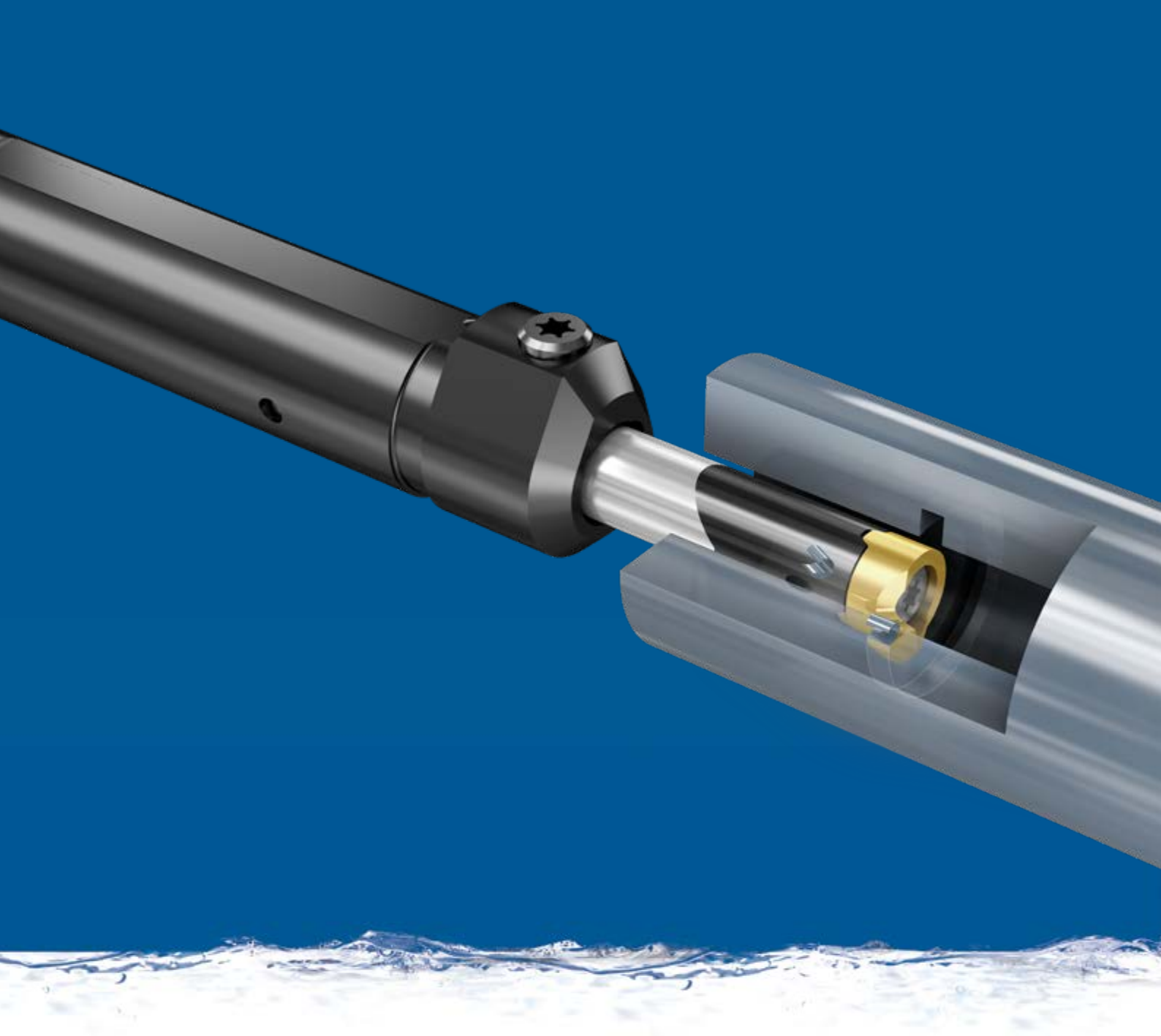
* **The toolholders are supplied with standard anvils. For Grooving, please use the anvils indicated in the table above.**
The above Toolholders have coolant channel as standard.

Carbide Shank toolholders should be used when extra accuracy is required or when the bar length to bar diameter ratio exceeds 3:1.



The overhang to bar diameter ratio should be as small as possible to eliminate the chance of chatter (vibration).

The minimum length inside a holding device should be 3 times the diameter of the bar shank.



INTERNAL GROOVE TURNING | **FINISHING**

Mini-V

Precise Turning, Grooving, Threading & Face Grooving

ТОВ «СМАРТТЕК ІНЖИНІРИНГ», т. +380-50-396-90-96, info@smarttec.com.ua, https://www.smarttec.com.ua

СМАРТТЕК
РОЗУМНІ ТЕХНОЛОГІЇ

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.

Mini-VE Sizes 08 & 11

NEW

New Geometry for Inserts and Holders for Improved Performance and Better Chip Evacuation

Features and Benefits:

- Better chip evacuation
- Improved performance
- Available for boring, grooving, and threading inserts
- New Mini-VE 08 & 11 left-hand inserts available as standard
- New Mini-VE tools feature two flat areas for versatile mounting of the tool
- Mini-VE VE08 & VE11 inserts can be mounted on both VE & V tools
- RH and LH inserts can be mounted on the same tool

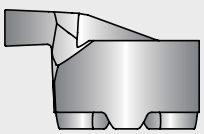
Ordering Code:

- New Mini-VE inserts and holders are marked with "E"
  Insert example: VE08020BCR VTX
  Holder example: CVE08-1221

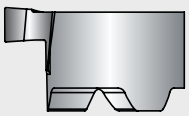
Availability:

- Mini V inserts and tools available while supplies last

New Geometry
VE08 and VE11 inserts



Previous Geometry
V08 and V11 inserts

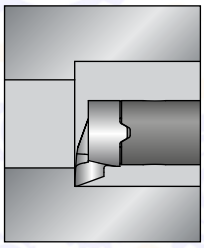


Applications

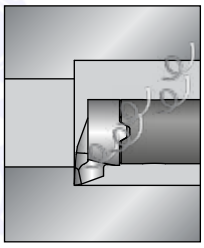
BORING

Pages 123 - 125

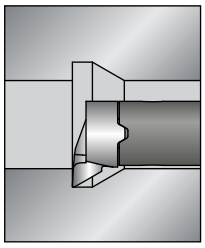
Boring



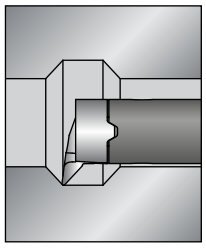
Boring with Chip Former



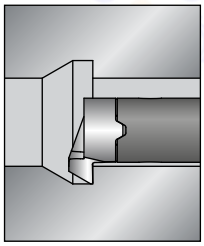
Boring & Profiling 30°



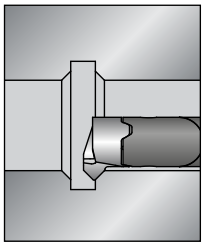
Boring & Profiling 45°



Back Boring



Boring & Chamfering



GROOVING

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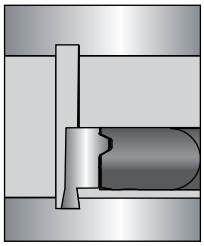
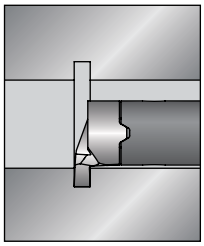
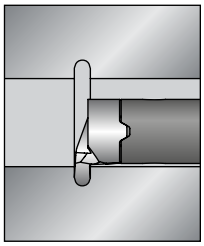
Square Grooving D472



Square Grooving



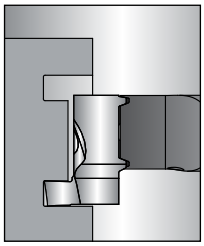
Round Grooving



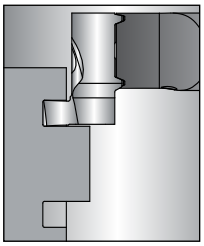
FACE GROOVING

Pages 130 - 131

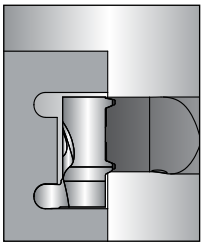
Square Face Grooving Internal



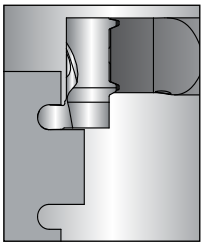
Square Face Grooving External



Round Face Grooving Internal



Round Face Grooving External



THREADING

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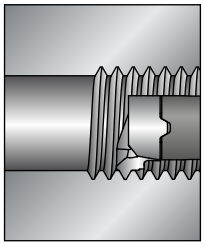
Threading



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	Aluminum 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	Aluminum alloys	Cast	75	40-120	40-400	0.50-0.90
	37		Cast & aged	90	40-120	40-200	0.40-0.60
	38	Aluminum 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

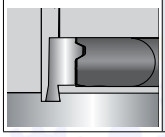
VTX

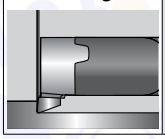
Excellent for Boring applications in medium-to-high cutting speeds and in dry conditions.
Multi-layered AlTiN PVD coated, general purpose grade for prevention of peeling and chipping.
***** For **VTX Grade**, increase speed by 20%.

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			28				43							
	NPTF														
V11	ISO														
	UN	13	19		25	16			19	22	24				
	W														
	BSPT						19								
V14	ISO														
	UN	7	10		13	16			19	22	24	32	38		
	W														
V16	ISO														
	UN	7	10		13	16			19	22	24	32	38		
	W														

Option of constant depth chip

	Pitch mm	0.5	0.75		1	1.25			1.5	1.75	2	2.5	3	3.5	4
	Pitch TPI	48	32	27	24	20	19	18	16	14	12	10	8	7	6
Insert Style	Standard	Passes (same)													
V08	ISO														
	UN	11-24	17-35		23-48	18-28			21-34	25-40					
	W														
	NPT			25-53				40-83							
	NPTF														
	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
VE - Mini-V Improved Geometry Inserts (sizes 08 & 11)
V - Mini-V Inserts (sizes 14 & 16)

2 - Insert Size
08, 11, 14, 16

3 - Type of Application
BC - Boring
BCF - Boring with Chip Former
CL - Boring & Profiling
BB - Back Boring
CH45 - Boring & Profiling 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
VTX
VBX

Grooving Inserts

V	08	GS	W120	T 100	R	VBX
1	2	3	4	5	6	7

1- Line Name
VE - Mini-V Improved Geometry Inserts (sizes 08 & 11)
V - Mini-V Inserts (sizes 14 & 16)

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
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
VTX
VBX

Threading Inserts

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

1- Line Name
VE - Mini-V Improved Geometry Inserts (sizes 08 & 11)
V - Mini-V Inserts (sizes 14 & 16)

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

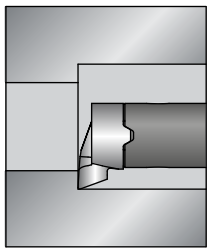
	TPI		mm
H	48-32	H	0.5-.75
I	24-20	I	1.0-1.25
J	16-14	J	1.5-1.75
G	14-8	G	1.75-3.0
AG	48-8	AG	0.5-3.0

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

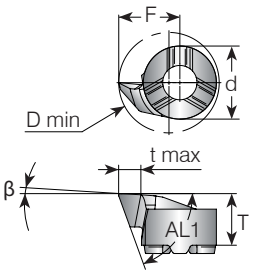
6 - RH or LH
R - RH
L - LH

7 - Carbide Grade
VBX
VTX

Boring

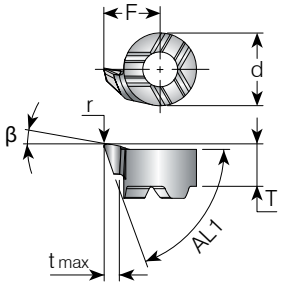


VE08 & VE11*



* VE11 is shown

V14 & V16



VE08 & VE11 | Mini-VE

Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grade
	RH/LH	r	d	T	t max	AL1	β	F	mm	VTX
VE08	VE08020BCR/L	0.2	6.0	4.45	1.3	70°	8°	4.65	7.8	•
VE11	VE11020BCR/L	0.2	8.0	5.65	2.3	70°	3°	6.7	11.0	•

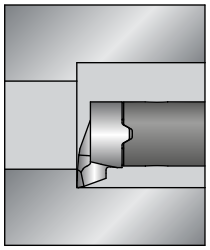
• In stock ○ Available upon request

V14 & V16

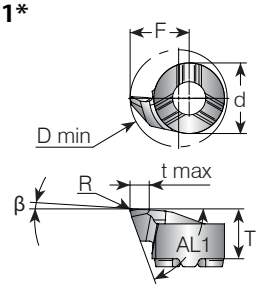
Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grades	
	RH	r	d	T	t max	AL1	β	F	mm	VBX	VTX
V14	V14BC R	0.2	9	5.6	4.0	69.8°	8°	8.7	13.8	•	•
V16	V16BC R	0.2	11	5.6	4.3	69.8°	5.5°	9.7	15.5	•	•

• In stock ○ Available upon request

Boring with Chip Former



VE08 & VE11*



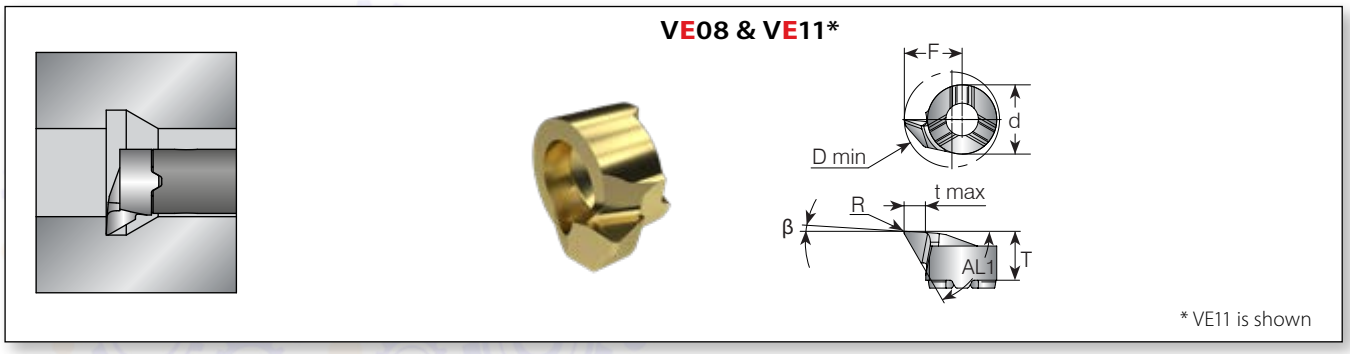
* VE11 is shown

VE08 & VE11 | Mini-VE

Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grade
	RH/LH	r	d	T	t max	AL1	β	F	mm	VTX
VE08	VE08020BCFR/L	0.2	6.0	4.45	1.3	70°	8°	4.65	7.8	•
VE11	VE11020BCFR/L	0.2	8.0	5.65	2.3	70°	3°	6.7	11.0	•

• In stock ○ Available upon request

Boring & Profiling 30°

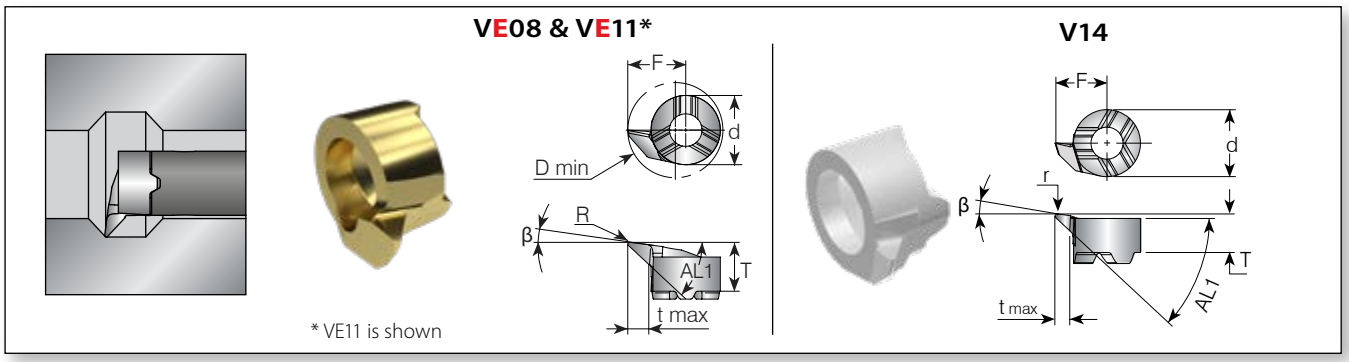


VE08 & VE11 | Mini-VE

Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grade
	RH/LH	r	d	T	t max	AL1	β	F	mm	VTX
VE08	VE08020P30R/L	0.2	6.0	4.45	1.3	58°	8°	4.65	7.8	•
VE11	VE11020P30R/L	0.2	8.0	5.65	2.3	58°	3°	6.70	11.0	•

• In stock ∘ Available upon request

Boring & Profiling 45°



VE08 & VE11 | Mini-VE

Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grade
	RH/LH	r	d	T	t max	AL1	β	F	mm	VTX
VE08	VE08020P47R/L	0.2	6.0	4.45	1.3	43°	5.5°	4.65	7.8	•
VE11	VE11020P47R/L	0.2	8.0	5.65	2.3	43°	7°	6.70	11.0	•

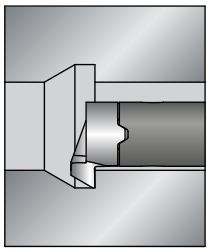
• In stock ∘ Available upon request

V14 & V16

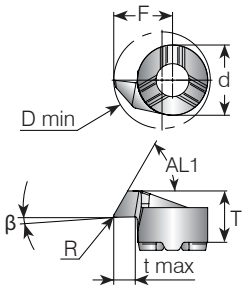
Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grades	
	RH	r	d	T	t max	AL1	β	F	mm	VBX	VTX
V14	V14CL R	0.2	9	5.6	4.0	43°	6°	8.7	13.7	•	•
V16	V16CL R	0.2	11	5.6	4.3	43°	6°	10.2	15.8	•	•

• In stock ∘ Available upon request

Back Boring

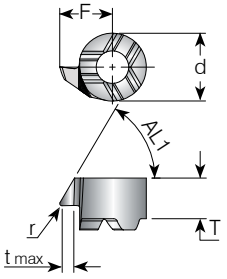


VE08 & VE11*



* VE11 is shown

V14



VE08 & VE11 | Mini-VE

Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grade
	RH/LH	r	d	T	t max	AL1	β	F	mm	VTX
VE08	VE08020BBR/L	0.2	6	4.6	1.2	60°	4.65	4.65	7.8	•
VE11	VE11020BBR/L	0.2	8	5.85	2.2	60°	6.7	6.70	11.0	•

• In stock ◦ Available upon request

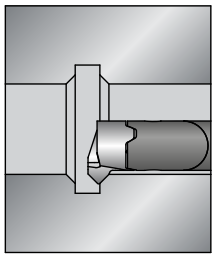
V14

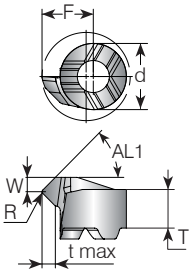
Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	r	d	T	t max	AL1	F	mm	VBX	VTX
V14	V14BB R	0.2	9	5.6	3.5	59.5°	8.70	13.8	•	•

• In stock ◦ Available upon request

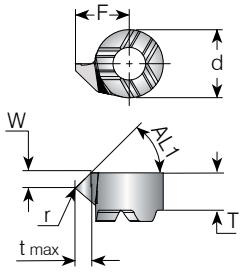
Boring & Chamfering 45°

VE08





V14



VE08 | Mini-VE

Insert Style	Ordering Code	Dimensions mm								Min. Bore Dia.	Grade
	RH/LH	r	d	W$^{+0.03}$	T	t max	AL1	F		mm	VTX
VE08	VE08020CH45R/L	0.2	6	1.3	4.6	1.2	45°	4.65		7.8	•

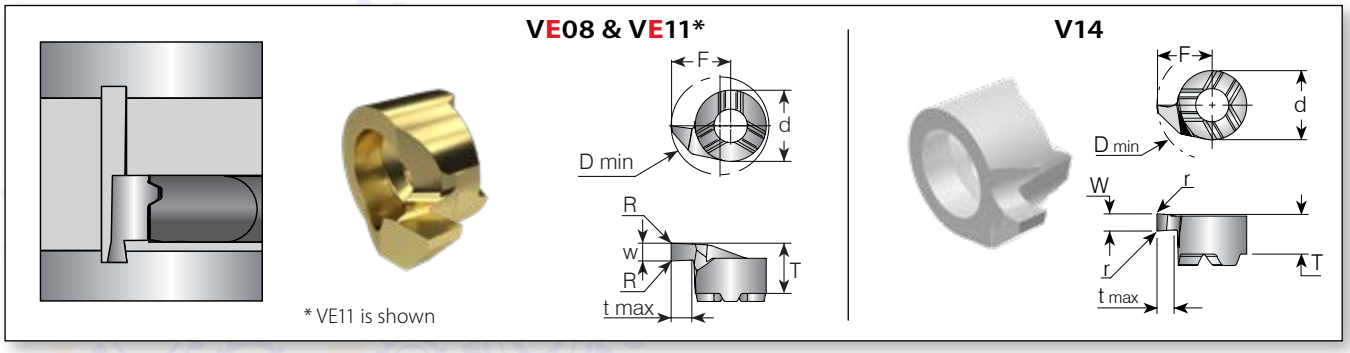
• In stock ◦ Available upon request

V14

Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grades	
	RH	r	d	W$^{+0.03}$	T	t max	AL1	F	mm	VBX	VTX
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



VE08 & VE11 | Mini-VE

Insert Style	Ordering Code	Width of Circlip		Dimensions mm					Min. Bore Dia.	Grade
	RH/LH	mm	W+0.03	d	t max	T	F	r	D min	VTX
VE08	VE0800GSW070T100R/L	0.7	0.73	6	1.0	4.4	4.8	0	8	○
	VE0800GSW080T100R/L	0.8	0.83							●
	VE0800GSW090T100R/L	0.9	0.93							○
	VE0800GSW110T100R/L	1.1	1.20							○
	VE0800GSW130T100R/L	1.3	1.40							○
	VE0800GSW160T100R/L	1.6	1.70							○
VE11	VE1100GSW070T120R/L	0.7	0.73	8	1.2	5.7	6.7	0	11	○
	VE1100GSW080T130R/L	0.8	0.83		1.3					●
	VE1100GSW090T150R/L	0.9	0.93		1.5					○
	VE1100GSW110T220R/L	1.1	1.20		2.2					○
	VE1100GSW130T220R/L	1.3	1.40		2.2					○
	VE1100GSW160T220R/L	1.6	1.70		2.2					○

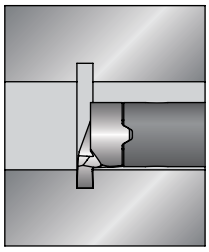
● In stock ○ Available upon request

V14

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
V14	V14D472 W130T400 R	1.3	1.40	9	4.3	5.6	9	0	14	●	●
	V14D472 W160T400 R	1.6	1.70							●	●

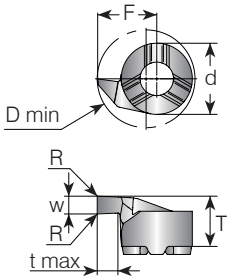
● In stock ○ Available upon request

Square Grooving - 0.05 mm Corner Radius

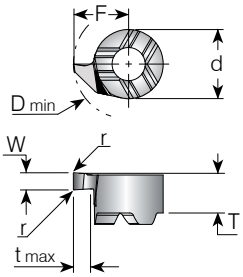


* VE11 is shown

VE08 & VE11*



V14 & V16



VE08 & VE11 | Mini-VE

Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grade
	RH/LH	d	W$^{+0.03}$	t max	T	F	r	D min		VTX
VE08	VE08005GS W078T100R/L	6	0.78	1.0	4.4	4.8	0.05	8		○
	VE08005GS W086T100R/L		0.86							○
	VE08005GS W100T100R/L		1.00							●
	VE08005GS W117T100R/L		1.17							○
	VE08005GS W150T100R/L		1.50							●
	VE08005GS W157T100R/L		1.57							○
	VE08005GS W198T100R/L		1.98							○
	VE08005GS W200T100R/L		2.00							●
VE11	VE11005GS W100T230R/L	8	1	2.3	5.7	6.7	0.05	11		●
	VE11005GS W117T230R/L		1.17							○
	VE11005GS W120T230R/L		1.2							○
	VE11005GS W142T230R/L		1.42							○
	VE11005GS W150T230R/L		1.5							●
	VE11005GS W157T230R/L		1.57							○
	VE11005GS W198T230R/L		1.98							○
	VE11005GS W200T230R/L		2							●
	VE11005GS W238T230R/L		2.38							○
	VE11005GS W250T230R/L		2.5							○
	VE11005GS W318T230R/L		3.18							○

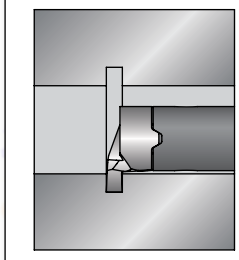
● In stock ○ Available upon request

V14 & V16

Insert Style	Ordering Code	Dimensions mm							Min. Bore Dia.	Grades	
	RH	d	W$^{+0.03}$	t max	T	F	r	D min		VBX	VTX
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							●	●

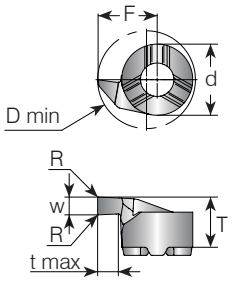
● In stock ○ Available upon request

Square Grooving

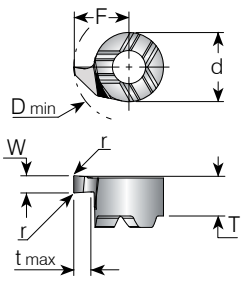


* VE11 is shown

VE08 & VE11*



V14 & V16



VE08 & VE11 | Mini-VE

Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grade
	RH/LH	d	W$^{+0.03}$	t max	T	F	r	D min	VTX
VE08	VE08020GS W150T100R/L	6	1.50	1.00	4.4	4.8	0.20	8	•
	VE08064GS W186T146R/L		1.86	1.46			0.64		○
	VE08020GS W198T100R/L		1.98	1.00			0.20		○
VE11	VE11020GS W070T180R/L	8	0.70	1.80	5.7	6.7	0.20	11	○
	VE11020GS W117T230R/L		1.17	2.30			0.20		○
	VE11020GS W200T230R/L		2.00	2.30			0.20		○

• In stock ○ Available upon request

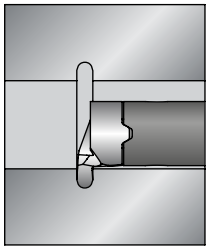
V14 & V16

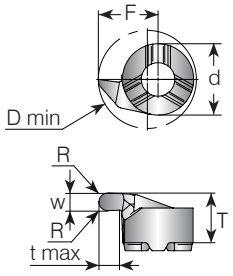
Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	W$^{+0.03}$	t max	T	F	r	D min	VBX	VTX
V14	V14GSR W078T400 R	9	0.78	4.0	5.6	9.0	0.2	14	•	•
	V14GSR W117T400 R		1.17						•	•
	V14GSR W150T400 R		1.50						•	•
	V14GSR W157T400 R		1.57						•	•
	V14GSR W198T400 R		1.98						•	•
	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

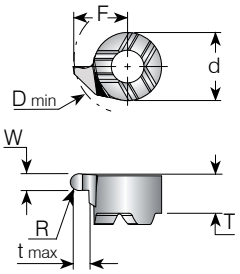
VE08 & VE11*





* VE11 is shown

V14



VE08 & VE11 | Mini-VE

Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grade
	RH/LH	d	$W^{+0.03}$	t max	T	F	r	D min	VTX
VE08	VE08040GR W080T100R/L	6	0.800	1.0	4.4	4.8	0.400	8	•
	VE08060GR W120T100R/L		1.200				0.600		○
	VE08080GR W160T100R/L		1.600				0.800		○
	VE08090GR W180T100R/L		1.800				0.900		○
	VE08100GR W200T100R/L		2.000				1.000		•
VE11	VE11028GR W057T200R/L	8	0.577	2.0	5.7	6.7	0.287	11	○
	VE11030GR W060T170R/L		0.600	1.7			0.300		○
	VE11040GR W080T230R/L		0.800	2.3			0.400		•
	VE11060GR W120T230R/L		1.200	2.3			0.600		○
	VE11078GR W157T230R/L		1.570	2.3			0.785		○
	VE11100GR W200T230R/L		2.000	2.3			1.000		•
	VE11120GR W240T230R/L		2.400	2.3			1.200		○

• In stock ○ Available upon request

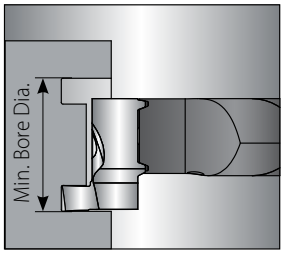
V14

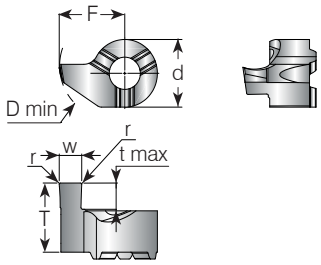
Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	$W^{+0.03}$	t max	T	F	r	D min	VBX	VTX
V14	V14D7993 W120T400 R	9	1.20	4.0	5.6	9.0	0.6	14	•	•
	V14D7993 W157T400 R		1.57				0.785		•	•
	V14D7993 W180T400 R		1.80				0.9		•	•
	V14D7993 W200T400 R		2.00				1.0		•	•
	V14D7993 W220T400 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





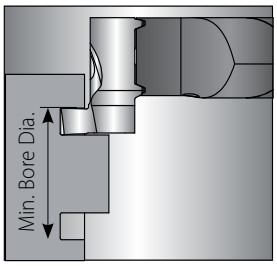
V14

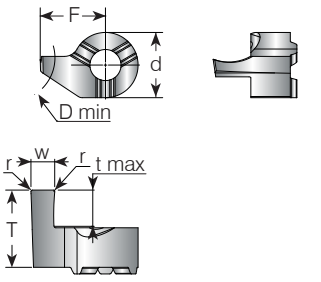
Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	W$^{+0.03}$	t max	T	F	r	D min	VBX	VTX
V14	V14FGW100T150 R	9	1.00	1.5	7.7	9	0.2	14	•	○
	V14FGW150T250 R		1.50	2.5	8.7				•	○
	V14FGW200T300 R		2.00	3.0	9.2				•	○
	V14FGW200T500 R		2.00	5.0	10.7				•	○
	V14FGW250T300 R		2.50	3.0	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





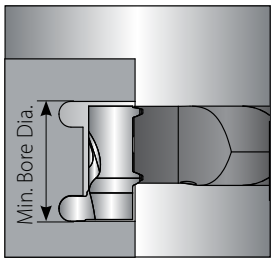
V14

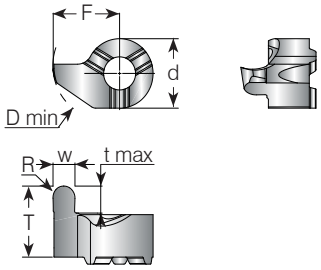
Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	W$^{+0.03}$	t max	T	F	r	D min	VBX	VTX
V14	V14FEGW100T150 R	9	1.00	1.5	7.3	9	0.2	12	•	○
	V14FEGW150T250 R		1.50	2.5	8.3				•	○
	V14FEGW200T300 R		2.00	3.0	8.8				•	○
	V14FEGW200T500 R		2.00	5.0	10.7				•	○
	V14FEGW250T300 R		2.50	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





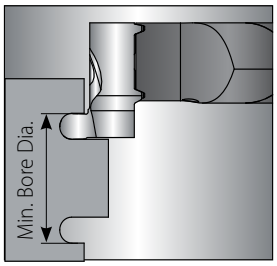
V14

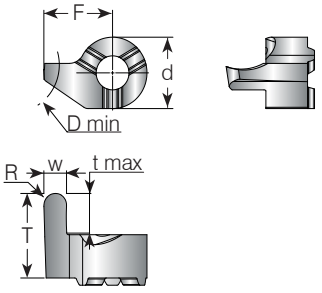
Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	W$^{+0.03}$	t max	T	F	r	D min	VBX	VTX
V14	V14FGR050T150 R	9	1.00	1.5	7.7	9	0.5	14	•	○
	V14FGR100T300 R		2.00	3	9.2		1.0		•	○
	V14FGR150T300 R		3.00	3	9.2		1.5		•	○

• In stock ○ Available upon request

Round Face Grooving

External



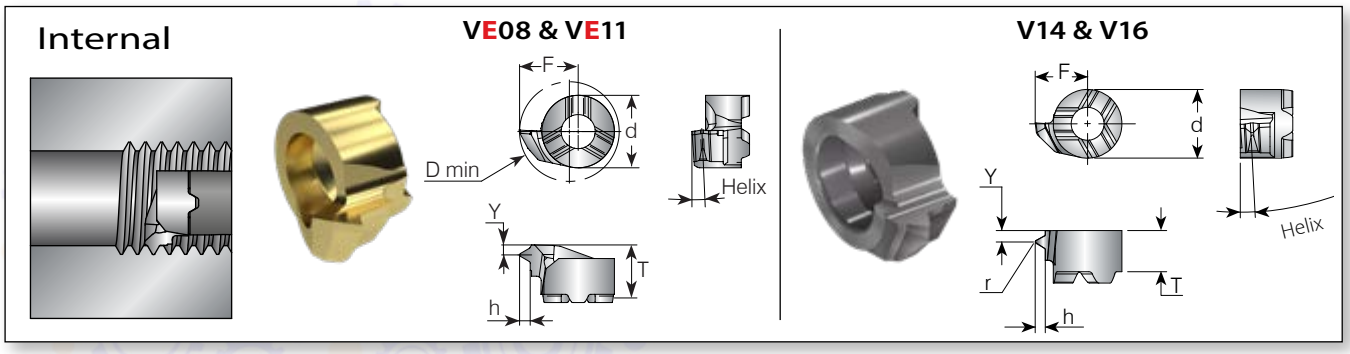


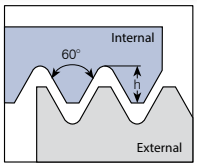
V14

Insert Style	Ordering Code	Dimensions mm						Min. Bore Dia.	Grades	
	RH	d	W$^{+0.03}$	t max	T	F	r	D min	VBX	VTX
V14	V14FEGR100T500 R	9	2.00	5	10.7	9	1.00	12	•	○
	V14FEGR125T500 R		2.50				1.25		•	○

• In stock ○ Available upon request

Threading





Partial Profile 60° | Mini-VE

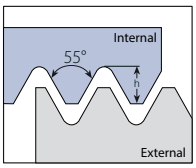
Insert Style	Pitch		Ordering Code	Dimensions mm						Helix	Grade
	TPI	mm	RH/LH	d	T	F	Y	r	h max	Deg.	VTX
VE08	48-32	0.5-0.75	VE08TH H60R/L	6	4.6	4.20	0.5	0.025	0.49	1.5	○
	24-20	1.0-1.25	VE08TH I60R/L			4.46	0.8	0.095	0.74	2.5	○
	16-14	1.5-1.75	VE08TH J60R/L			4.76	0.9	0.137	1.04	3	○
VE11	48-32	0.5-0.75	VE11TH H60R/L	8	5.8	5.80	0.5	0.025	0.49	1.5	○
	24-20	1.0-1.25	VE11TH I60R/L			6.06	0.8	0.095	0.74	1.5	○
	16-14	1.5-1.75	VE11TH J60R/L			5.61	0.9	0.137	1.04	3	○

● In stock ○ Available upon request

Partial Profile 60° - V14 & V16

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 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



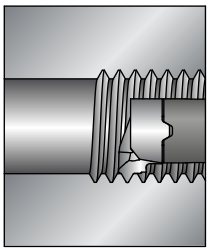
Partial Profile 55°

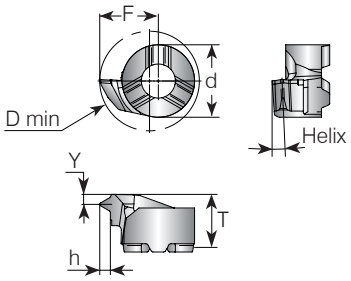
Insert Style	Pitch		Ordering Code	Dimensions mm						Helix	Grades	
	TPI	mm	RH	d	T	F	Y	r	h max	Deg.	VBX	VTX
V14	48-16	0.5-1.5	V14TH A55 R	9	5.7	9	0.9	0.05	1.71	1.5	●	●
	14-8	1.75-3.0	V14TH G55 R				1.7	0.21	2.700		●	●
	48-8	0.5-3.0	V14TH AG55 R				1.7	0.07	2.700		●	●
V16	48-16	0.5-1.5	V16TH A55 R	11	5.7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

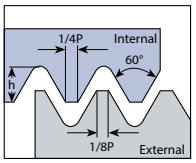
Threading

Internal





* VE11 is shown

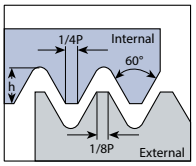


ISO Metric | Mini-VE

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

Min Thread	Insert Style	Ordering Code		Dimensions mm					Helix	Grade
		mm	RH/LH	d	T	F	Y	h min	Deg.	VTX
M8x.5	VE08	0.50	VE08TH .50ISOR/L	6	4.6	3.86	0.35	0.29	1.0	○
M8.5x.75		0.75	VE08TH .75ISOR/L			4.19	0.50	0.43	1.5	○
M9x1.0		1.00	VE08TH 1.00ISOR/L			4.29	0.50	0.58	2.0	○
M10x1.25		1.25	VE08TH 1.25ISOR/L			4.44	0.80	0.72	2.5	○
M10x1.5		1.50	VE08TH 1.50ISOR/L			4.58	0.90	0.87	3.0	○
M12x1.75		1.75	VE08TH 1.75ISOR/L			4.80	0.90	1.01	3.0	○
M14x2.0	VE11	2.00	VE11TH 2.00ISOR/L	8	5.85	6.47	1.10	1.15	2.5	○

• In stock ○ Available upon request

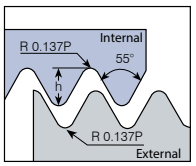


American UN | Mini-VE

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

Min Thread	Insert Style	Ordering Code		Dimensions mm					Helix	Grade
		TPI	RH/LH	d	T	F	Y	h min	Deg.	VTX
3/8"-32UNEF	VE08	32	VE08TH 32UNR/L	6	4.6	4.21	0.50	0.46	1.5	○
3/8"-28UN		28	VE08TH 28UNR/L			4.28	0.50	0.52	2	○
3/8"-24UNF		24	VE08TH 24UNR/L			4.32	0.65	0.61	2	○
3/8"-20UN		20	VE08TH 20UNR/L			4.45	0.80	0.73	2.5	○
3/8"-18UNS		18	VE08TH 18UNR/L			4.53	0.85	0.81	2.5	○
3/8"-16UNC		16	VE08TH 16UNR/L			4.33	0.95	0.92	2.5	○
7/16"-14UNC		14	VE08TH 14UNR/L			4.78	1.10	1.05	3	○
9/16"-12UNC	VE11	12	VE11TH 12UNR/L	8	5.85	6.44	1.24	1.22	2.5	○

• In stock ○ Available upon request



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

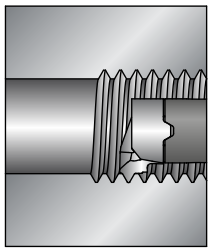
Whitworth - BSW, BSP, BSF, BSB | Mini-VE

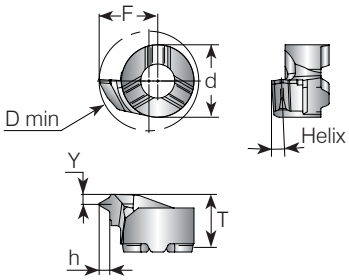
Min Thread	Insert Style	Ordering Code		Dimensions mm					Helix	Grade
		TPI	RH/LH	d	T	F	Y	h min	Deg.	VTX
1/2"x19W	VE11	19	VE11TH 19WR/L	8	5.85	6.18	0.85	0.86	2	○

• In stock ○ Available upon request

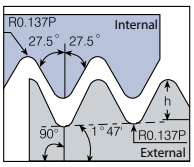
Threading

Internal





* VE11 is shown

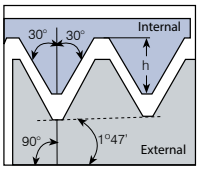


BSPT | Mini-VE - New Geometry

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

Min Thread	Insert Style	Ordering Code		Dimensions mm					Helix	
		TPI	RH/LH	d	T	F	Y	h min	Deg.	VTX
1/4"-19BSPT	VE11	19	VE11TH 19BSPTR/L	8	5.65	6.18	0.85	0.86	2	○

• In stock ○ Available upon request

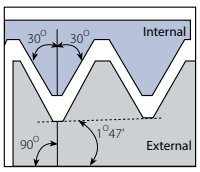


NPT | Mini-VE - New Geometry

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

Min Thread	Insert Style	Ordering Code		Dimensions mm					Helix	Grade
		TPI	RH/LH	d	T	F	Y	h min	Deg.	VTX
1/8"-27NPT	VE08	27	VE08TH 27NPTR/L	6	4.6	4.35	0.6	0.64	2	○
1/4"-18NPT		18	VE08TH 18NPTR/L			4.80	0.9	1.00	2	○

• In stock ○ Available upon request

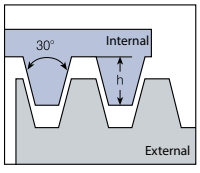


NPTF

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 | Mini-VE - New Geometry

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

Min Thread	Insert Style	Ordering Code		Dimensions mm					Helix	Grade
		mm	RH/LH	d	T	F	Y	h min	Deg.	VTX
TR10x2.0	VE08	2	VE08TH 2.0TRR/L	6	4.6	4.79	0.90	1.25	3.5	○
TR11x3.0		3	VE08TH 3.0TRR/L			4.95	1.18	1.75	5	○
TR16x4.0	VE11	4	VE11TH 4.0TRR/L	8	5.85	6.53	1.60	2.25	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
C - Carbide Shank **None** - Steel Shank	**VE** - Mini-V Improved Toolholders (sizes 08 & 11) **V** - Mini-V Toolholders (sizes 14 & 16)	08, 11, 14, 16	6, 8, 12, 16

5 - Tool Overhang	6 - RH or LH
12, 21, 29, 30, 42, 50, 56, 64, 80	**None** - RH **L** - LH

Mini-V Sleeves

MH	C	16	-	6
1	2	3		4

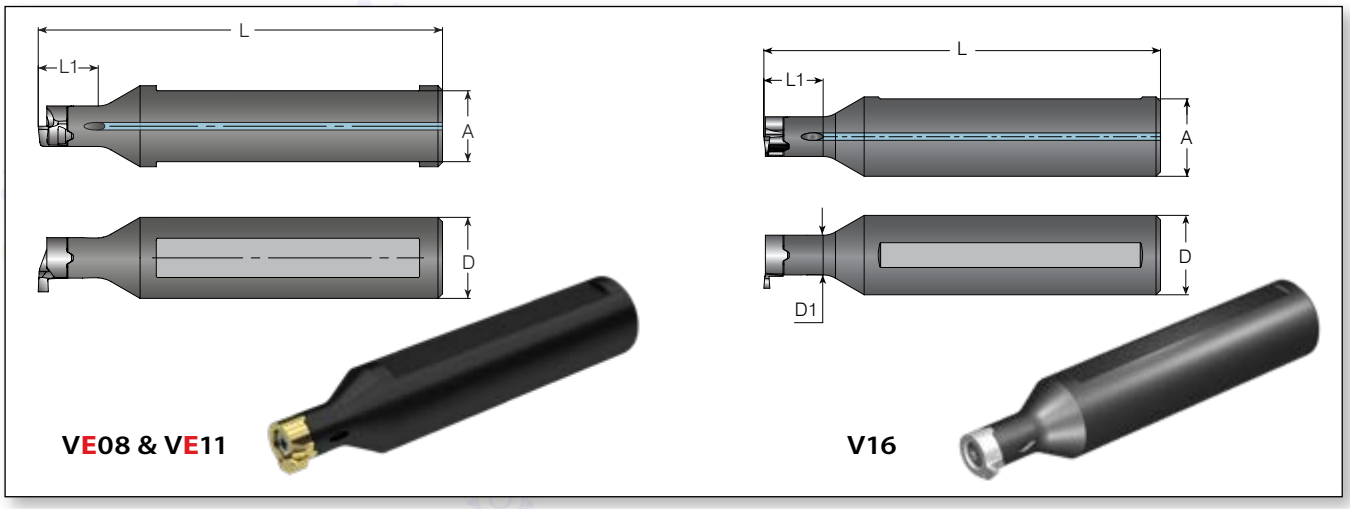
V-CAP Sleeve

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



Alloy Steel Shank | Mini-VE - New Geometry

Spare Parts

Insert Style	Ordering Code	Dimensions mm					Spare Parts	
		A	L	L1	D	D1	Screw*	Key
VE08	VE08-1612	14.6	80	12	16	6	SNV08	K2T
VE11	VE11-1612	14.6	80	12	16	8	SNV11	K3T

* Tightening Torque: 1.6 Nm.

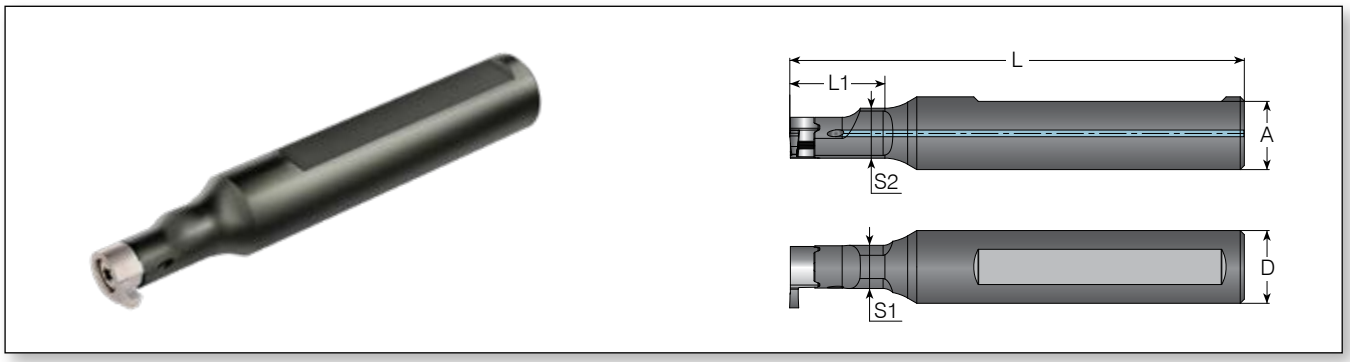
Alloy Steel Shank - V16

Spare Parts

Insert Style	Ordering Code	Dimensions mm					Spare Parts	
	Holder RH	A	L	L1	D	D1	Screw*	Key
V16	V16-1622	15	100	22	16	11	SNV16	K4T

* Tightening Torque: 5.0 Nm max.

Reinforced Alloy Steel Shank



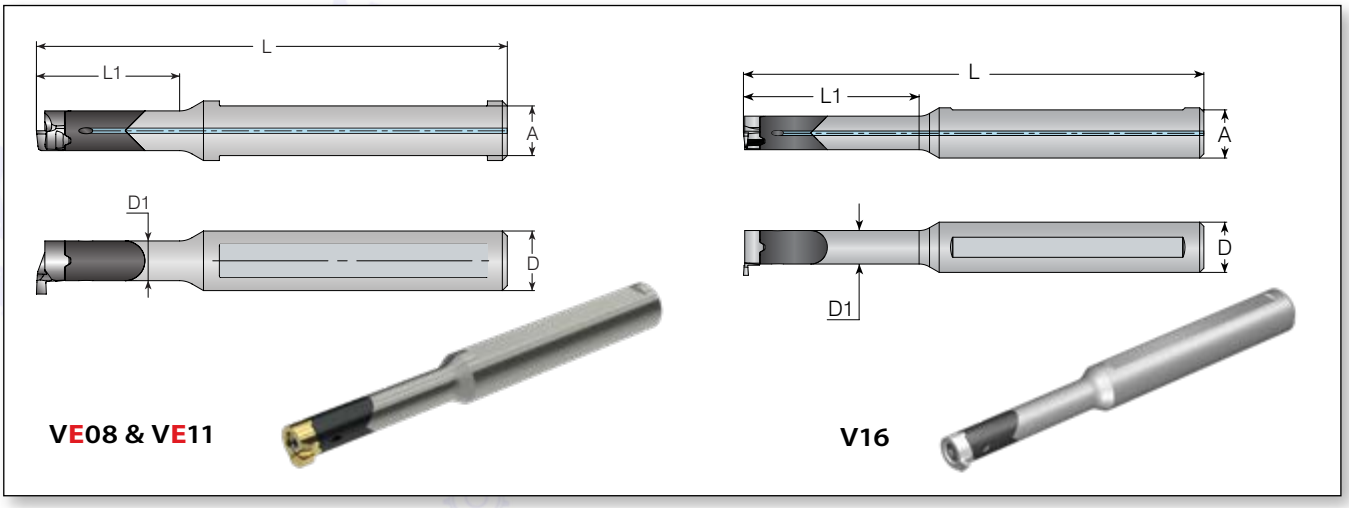
Reinforced Alloy Steel Shank - V14

Spare Parts

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

* Tightening Torque: 2.8 Nm max.

Carbide Shank



Carbide Shank | Mini-VE - New Geometry

Spare Parts

Insert Style		Dimensions mm					Spare Parts	
		A	L	L1	D	D1	Screw*	Key
VE08	CVE08-1221	10.0	80.5	21	12	6	SNV08	K2T
	CVE08-1230		90.5	30				
	CVE08-1242		100	42				
	CVE08-1250		115	50				
VE11	CVE11-1229	10.0	95	29	12	8 *	SNV11	K3T
	CVE11-1242		110	42				
	CVE11-1256		120	56				
	CVE11-1264		130	64				

* Tightening Torque: VE08 - 1.6 Nm | VE11 - 2.2 Nm.

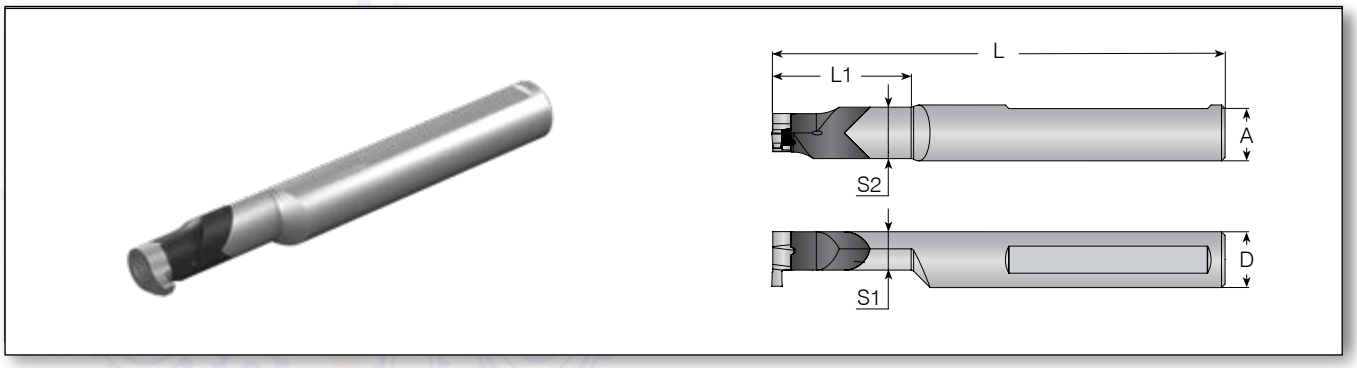
Carbide Shank - V16

Spare Parts

Insert Style		Dimensions mm					Spare Parts	
	Holder RH	A	L	L1	D	D1	Screw	Key
V16	CV16-1240	11.0	130	40	12	11	SNV16	K4T
	CV16-1256		130	56				
	CV16-1280		150	80				

* Tightening Torque: 5.0 Nm max.

Reinforced Carbide Shank

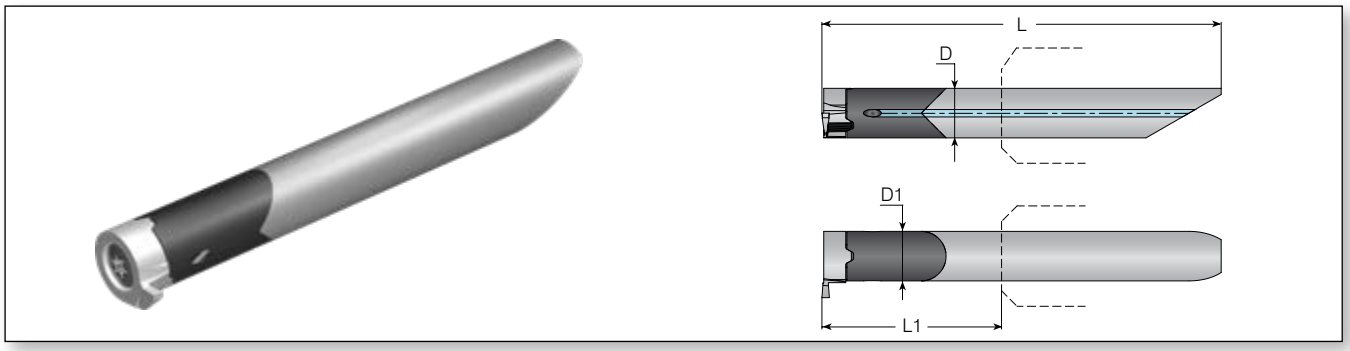


Reinforced Carbide Shank - V14 & V16

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

* Tightening Torque: V14 - 2.8 Nm max. | V16 - 5.0 Nm max.
** For boring, chamfering and face grooving only.

Carbide Shank for Sleeves



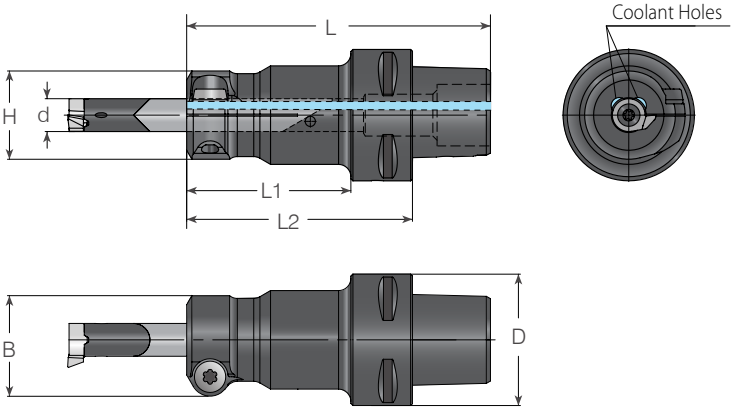
Carbide Shank for Sleeves - V08 & V11

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

* Tightening Torque: V08 - 0.65 Nm max. | V11 - 2.0 Nm max.
** For boring and chamfering only.

V-CAP Holders for Carbide Shank Sleeve Clamping

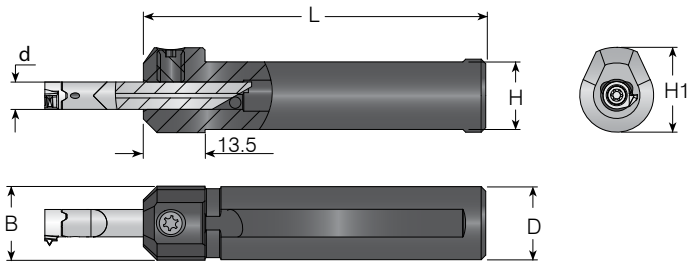
NEW



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 GROOVE TURNING | **FINISHING**

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Precise Turning, Grooving, Threading & Face Grooving

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СМАРТТЕК
РОЗУМНІ ТЕХНОЛОГІЇ

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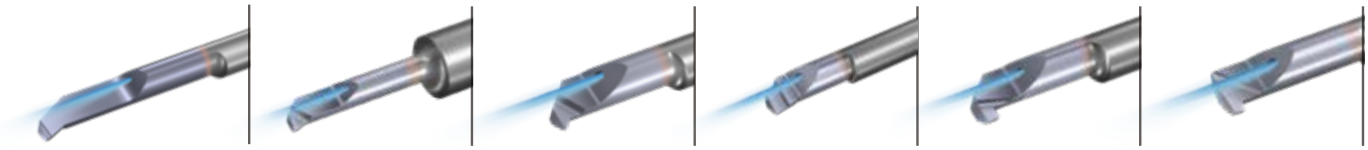
Micro Tools for Small Bores

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

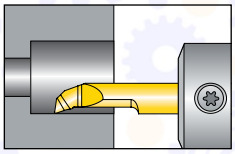
V-Cap Holder with Shrink Clamping | Shrink Toolholders | Round Toolholders without Shoulder | Double Sided Round Toolholders without Shoulder

Applications

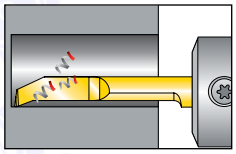
BORING

Pages 150 - 161

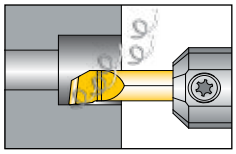
Boring



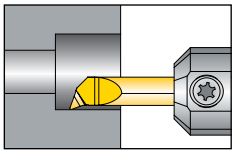
Boring with Chip Breaker



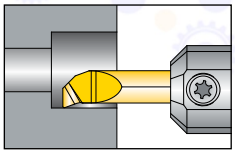
Boring with Chip Former



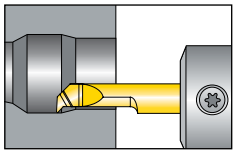
Boring 20°



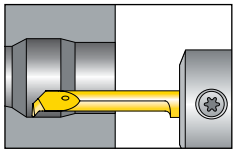
Boring 90°



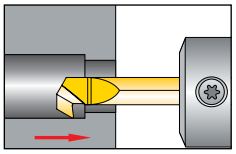
Boring & Profiling (CL)



Boring & Profiling with Chip Breaker (CBL)



Back Boring



CHAMFERING

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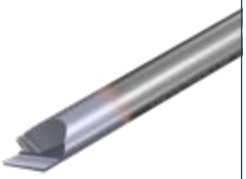
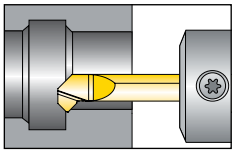
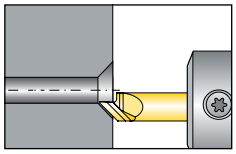


Boring & Chamfering



Face Chamfering



GROOVING

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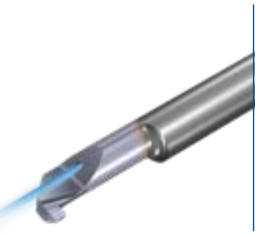
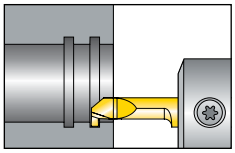
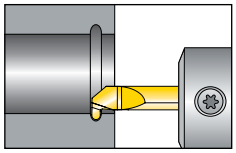


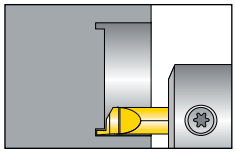
Square Grooving



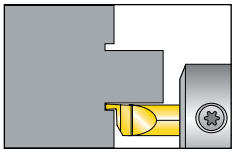
Round Grooving



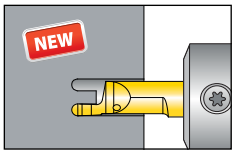
Face Grooving Internal



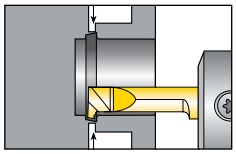
Face Grooving External



Round Face Grooving Internal



Pre-Part Off



THREADING

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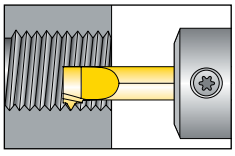
Threading



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	Aluminum Alloys Wrought	Non Aging	60	100-300
	35		Aged	100	100-150
	36	Aluminum Alloys	Cast	75	100-150
	37		Cast & Aged	90	60-100
	38	Aluminum 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]

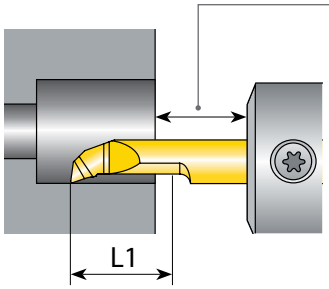
High Alloy Steel, 330 HB, 2100 Kc [N/mm^2]			
D min.	Vmax mm^2	ap max. (mm)	f mm/rev
1 mm - 1.7 mm	0.0012	0.08	0.015
1.8 mm - 2.7mm	0.0017	0.10	0.017
2.8 mm - 3.2 mm	0.0031	0.18	0.017
3.3 mm - 3.7 mm	0.0040	0.22	0.018
3.8 mm - 4.2 mm	0.0050	0.25	0.020
4.3 mm - 5.2 mm	0.0084	0.30	0.028
5.2 mm - 6.2 mm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

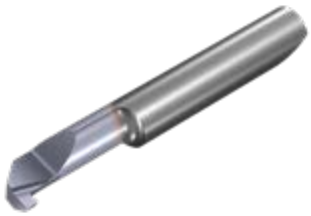


Grooving Technical Data

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

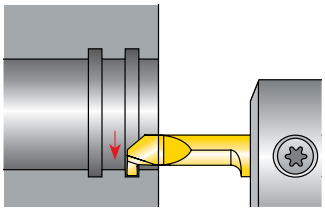
Material Group	Vargus No.	Material		Hardness Brinell HB	Vc[m/min] (Coated)	Feed f [mm/rev]
P Steel	1	Unalloyed Steel	Low Carbon (C=0.1-0.25%)	125	50-120	0.05
	2		Medium Carbon (C=0.25-0.55%)	150	40-100	0.05
	3		High Carbon (C=0.55-0.85%)	170	30-80	0.05
	4	Low Alloy Steel (alloying elements≤5%)	Non Hardened	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	Aluminum Alloys Wrought	Non Aging	60	100-300	0.04
	35		Aged	100	100-150	0.04
	36	Aluminum Alloys	Cast	75	100-150	0.04
	37		Cast & Aged	90	60-100	0.04
	38	Aluminum 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

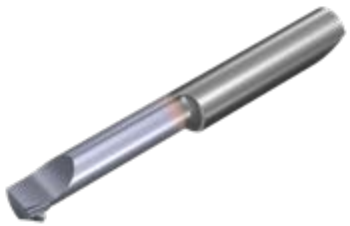
Excellent for all applications and outstanding wear resistance in low-to-medium cutting speeds, combined with good fracture toughness.
TiCN PVD coated.

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	Aluminum Alloys Wrought	Non Aging	60	80-240
	35		Aged	100	100-170
	36	Aluminum Alloys	Cast	75	100-150
	37		Cast & Aged	90	60-100
	38	Aluminum 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

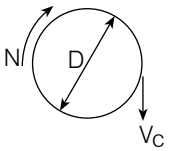


VBX - TiCN PVD coated
VTX - AlTiN PVD coated

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 Inserts - Ordering Code System

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 / MN- Microscope
MC - Microscope central location of cutting tip

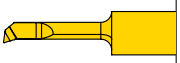
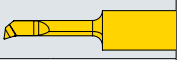
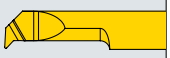
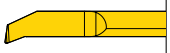
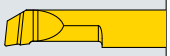
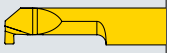
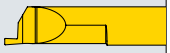
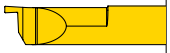
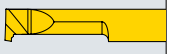
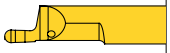
2 - Shank Dia.

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	
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	
RFG	Round Face Grooving Internal	
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

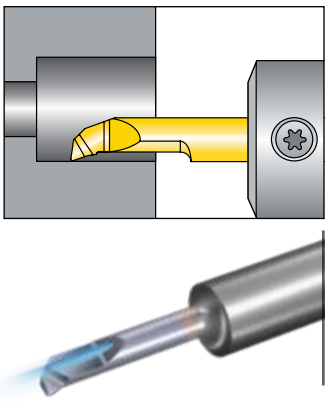
C - Internal Coolant
NONE - Without Coolant

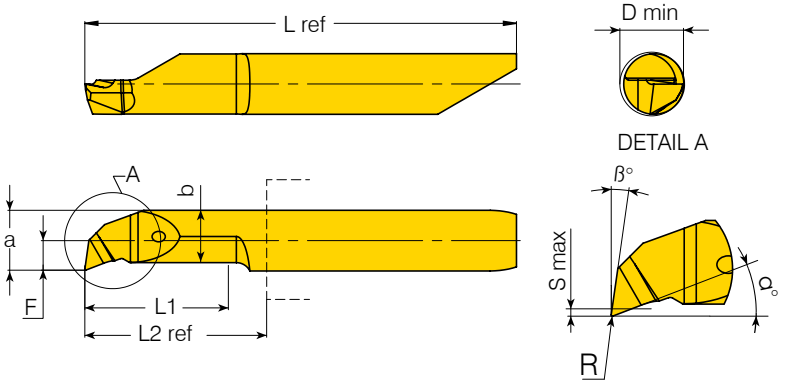
10 - Carbide Grade

VBX, VTX

Boring with High Pressure Coolant

Internal





* L2 Ref: Repeatability within +/-0.02

Right hand shown

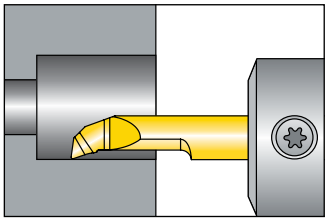
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	3.0	M430BCR15L20RC**	20.0	0.15	1.36	0.2	2.7	2.36	17.5	8	22.8	39.8	○	•
	3.2	M432BCR15L10RC**	10.0	0.15	1.44	0.2	2.9	2.5	17.5	8	11.5	28.5	○	•
		M432BCR15L20RC**	20.0	0.15	1.4		2.87	2.45			22.8	39.8	○	•
	4.0	M440BCR20L10RC	10.0	0.20	1.90	0.25	3.74	3.35	17.5	8	11.5	28.5	○	•
	4.2	M442BCR15L10RC**	10.0	0.15	1.93	0.3	3.93	3.13	19	8	11.5	28.5	○	•
		M442BCR20L10RC**	10.0	0.20	1.98		3.98	3.13			11.5	28.5	○	•
		M442BCR15L21RC**	21.0	0.15	1.93		3.93	3.13			22.8	39.8	○	•
5.0	5.2	M552BCR20L10RC**	10.0	0.20	2.44	0.5	4.94	4.04	21	8	12.15	35	•	○
		M552BCR20L15RC	15.0	0.20	2.44		4.94	4.24			18.15	41	○	•
		M552BCR20L21RC**	21.0	0.20	2.44		4.94	4.04			23.15	46	○	•
		M552BCR20L30RC**	30.0	0.20	2.44		4.94	4.04			32.15	55	○	•
		M552BCR20L35RC**	35.0	0.20	2.44		4.94	4.04			37.15	60	○	•

** LH Tools are available upon request.

• In stock ○ Available upon request

Boring

Internal



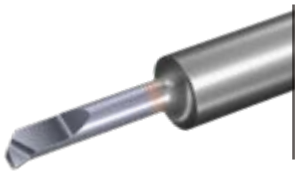


Figure 1: M...

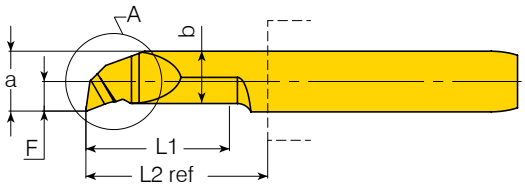
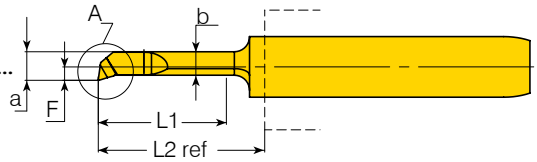
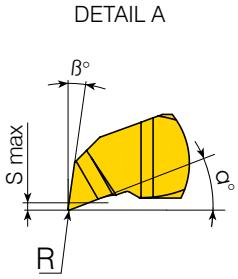


Figure 2: MC...





* 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	1.0	MC410BCR05L04R	4.0	0.05	0.48	0.1	0.96	0.71	16.4	8	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		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	8	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	0.2	1.88	1.55	17.7	8	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	0.05		2.47	2.06	17.5		11.5	28.5	•	○
		MC427BCR15L10R/L	10.0	0.15	1.19		2.41	2.06	17.5		11.5	28.5	•	○
		MC427BCR15L15R/L	15.0		1.23		2.48	2.06	17.5		18.2	35.2	•	•
		MC427BER15L15R**	15.0		1.23		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	•	○
		MC430BCR05L26R/L	26.0	0.05	1.33		2.7	2.25	17.5		28.7	45.7	•	○

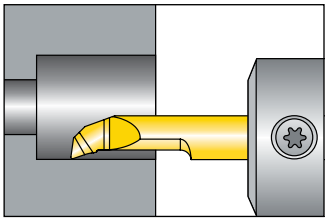
** LH Tools are available upon request.

• In stock ○ Available upon request

Inserts marked with E are available with edge prep.

Boring (con't)

Internal



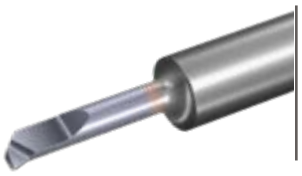


Figure 1: M...

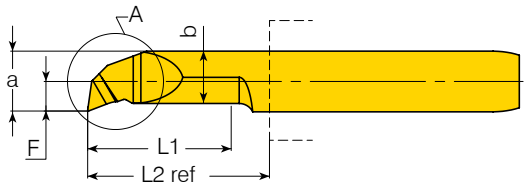
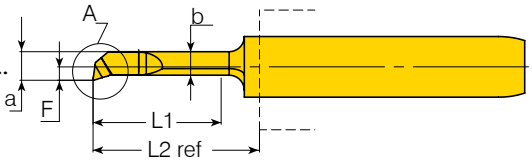
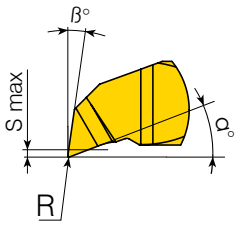


Figure 2: MC...



DETAIL A



* L2 Ref: Repeatability within +/-0.02

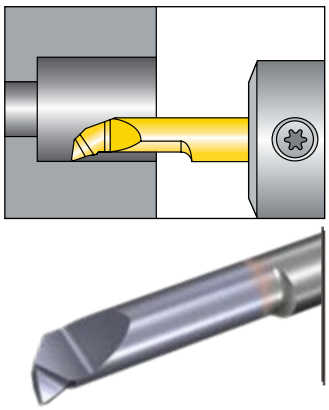
Right hand shown

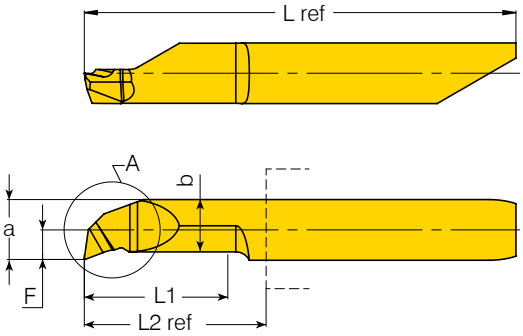
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	3.2	MC432BCR05L10R/L	10.0	0.05	1.43	0.2	2.9	2.45	17.5	8	11.5	28.5	•	○
		MC432BCR15L10R/L	10.0	0.15	1.44		2.9	2.5	17.5		11.5	28.5	•	○
		MC432BCR05L16R/L	16.0	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	•	•
		MC432BER15L16R**	16.0	0.15	1.44		2.87	2.5	17.5		18.2	35.2	○	•
		MC432BCR05L20R/L	20.0	0.05	1.43		2.9	2.45	17.5		22.8	39.8	•	•
		MC432BER05L20R**	20.0	0.05	1.43		2.9	2.45	17.5		22.8	39.8	○	•
		MC432BCR15L20R/L	20.0	0.15	1.4		2.87	2.45	17.5		22.8	39.8	•	•
		MC432BER15L20R**	20.0	0.15	1.4		2.87	2.45	17.5		22.8	39.8	○	•
		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	0.2	3.48	3.05	17.5	8	11.5	28.5	•	○
		MC437BCR15L10R/L	10.0	0.15	1.74		3.44	3.05	17.5		11.5	28.5	•	○
		MC437BCR15L15R	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	○	•
	4.2	M442BCR03L10R**	10.0	0.03	1.98	0.3	3.98	3.13	19	8	11.5	28.5	○	•
		M442BCR05L10R**	10.0	0.05	1.95		3.95	3.45	21		11.5	28.5	•	○
		MS442BCR15L10R	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	•	○
		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	○	•
		M442BCR03L25R**	25.0	0.03	1.98		3.98	3.13	19		28.7	45.7	○	•
		M442BCR05L26R/L	26.0	0.05	1.95		3.95	3.45	21		28.7	45.7	•	○
		MS442BCR15L26R/L	26.0	0.15	1.93		3.93	3.13	19		28.7	45.7	•	○
		M442BCR05L30R**	30.0	0.05	1.95		3.95	3.45	21		33.7	50.7	•	○

** LH Tools are available upon request. | • In stock ○ Available upon request | Inserts marked with E are available with edge prep.

Boring (con't)

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
5.0	5.2	M552BCR05L10R**	10.0	0.05	2.43	0.5	4.93	4.24	21	8	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	○	•
		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	•	○
		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	•	○
		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	•	○
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	•	○

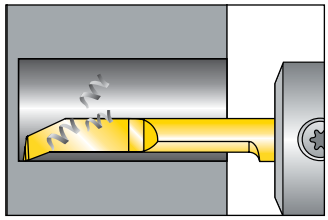
** LH Tools are available upon request.

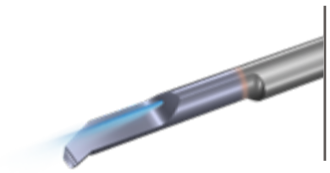
• In stock ○ Available upon request

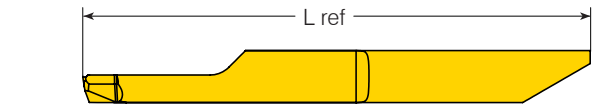
Inserts marked with E are available with edge prep.

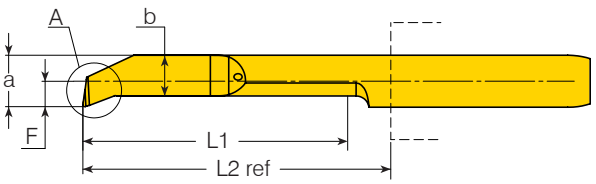
Boring with Chip Breaker and HPC

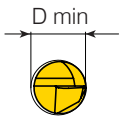
Internal



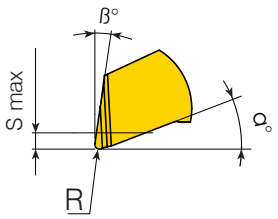








DETAIL A



* L2 Ref: Repeatability within +/-0.02

Right hand shown

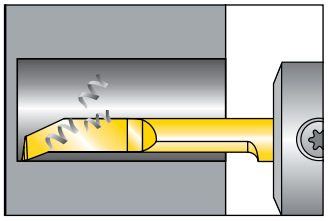
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	4.2	M442BCBR15L20RC	20	0.15	1.95	0.3	3.95	3.13			22.8	39.8	○	●
5.0	5.2	M552BCBR20L15RC	15		2.44		4.94	4.04	21	8	18.15	41	○	●
		M552BCBR20L25RC	25	0.2	2.44	0.5	4.94	4.04			28.15	51	○	●
6.0	6.2	M662BCBR20L30RC	30		2.93		5.93	4.73	22		32.3	56	○	●

● In stock ○ Available upon request

All tools are available in LH upon request.

Boring with Chip Breaker

Internal



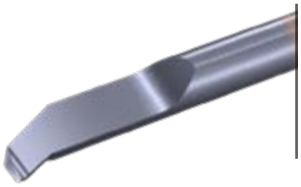


Figure 1: M...

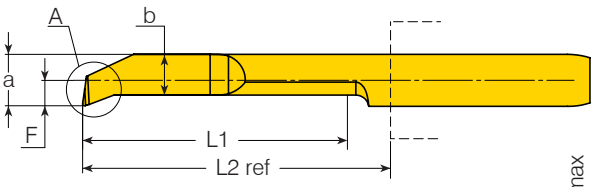
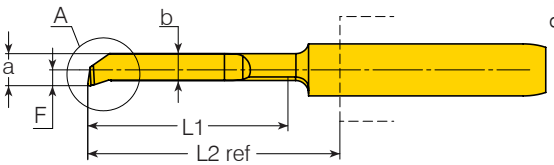
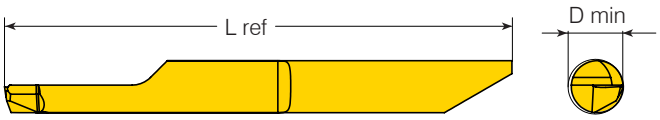
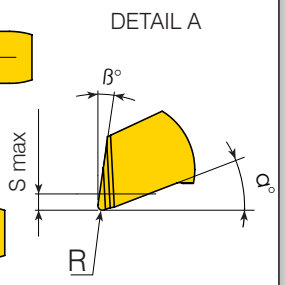


Figure 2: MC...







* L2 Ref: Repeatability within +/-0.02

Right hand shown

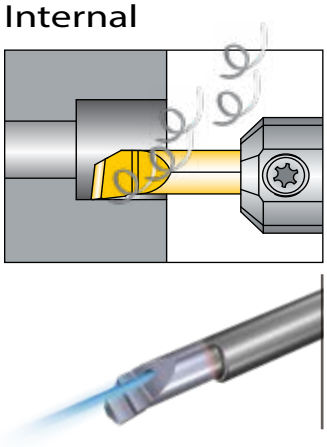
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	2.2	MC422BCBR10L14R	14	0.1	1.04	0.2	2.04	1.76	18	8	18.2	35.2	•	○
	2.7	MC427BCBR15L15R	15	0.15	1.22		2.47	2.06			18.2	35.2	•	○
		MC427BCBR05L15R		0.05	1.22		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		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	0.3	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	•	○
5.0	5.2	M552BCBR20L20R	20	0.2	2.44	0.5	4.94	4.04			23.15	46	•	•
		M552BCBR20L25R	25		2.44		4.94	4.04			28.15	51	•	○
6.0	6.2	M662BCBR20L30R	30		2.93		5.93	4.73	22		32.3	56	•	○
		M662BCBR20L35R	35		2.93		5.93	4.73			37.3	61	•	○
7.0	7.2	M772BCBR20L40R	40		3.44		6.94	5.74			41.4	66	•	○
		M772BCBR20L45R	45		3.44		6.94	5.74			46.4	71	•	○

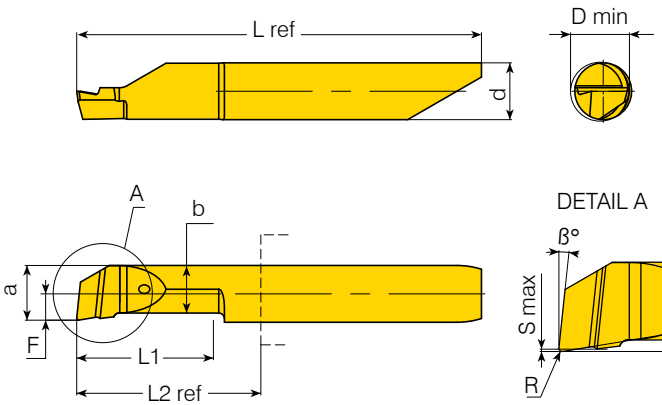
• In stock ○ Available upon request

All tools are available in LH upon request.

Boring with Chip Former and HPC

Internal





* L2 Ref: Repeatability within +/-0.02

Right hand shown

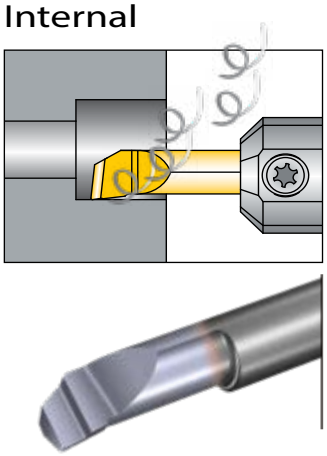
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	4.2	M442BCFR15L10RC	10.0	0.15	1.85	0.05	3.85	3.35	7.5	6	11.50	28.5	○	●

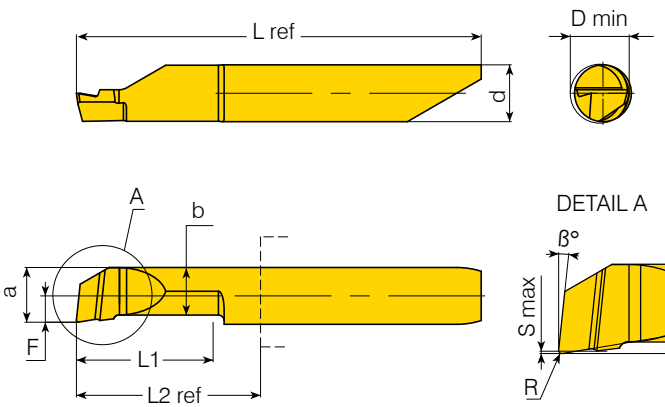
● In stock ○ Available upon request

All tools are available in LH upon request.

Boring with Chip Former

Internal





* L2 Ref: Repeatability within +/-0.02

Right hand shown

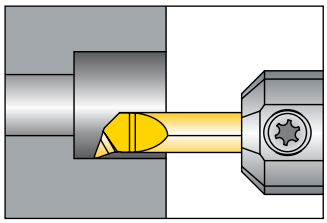
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	4.2	MS442BCFR15L10R	10.0	0.15	1.85	0.05	3.85	3.35	9.47	6	11.50	28.5	•	•
		MS442BCFR15L10L	10.0	0.15							11.50	28.5	•	○
		M442BCFR20L10R	10.0	0.20							11.50	28.5	○	•
		MS442BCFR15L15R	15.0	0.15							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	0.2	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								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.

Boring 20°

Internal



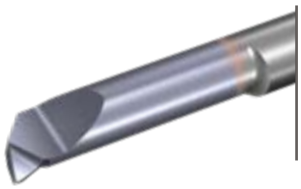


Figure 1: M...

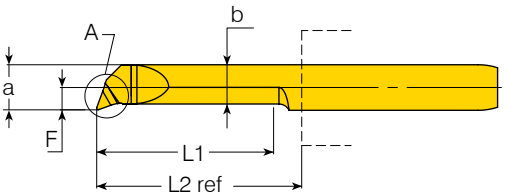
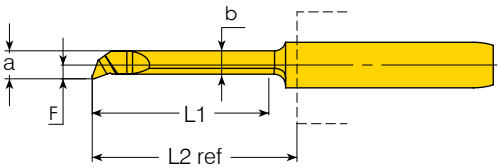
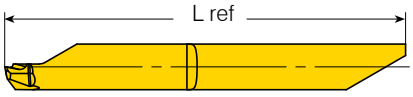
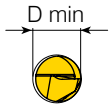


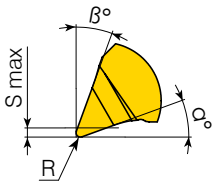
Figure 2: MC...







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	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

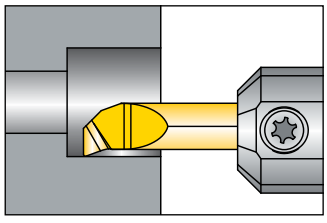


Figure 1: M...

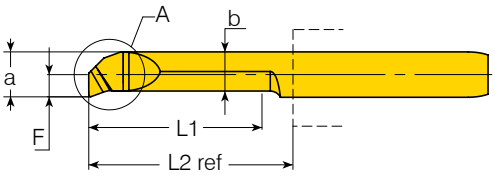
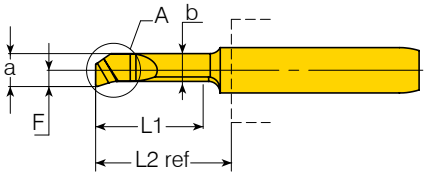
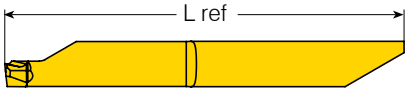
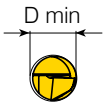


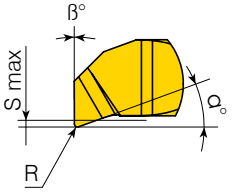
Figure 2: MC...







DETAIL A



* L2 Ref: Repeatability within +/-0.02

Right hand shown

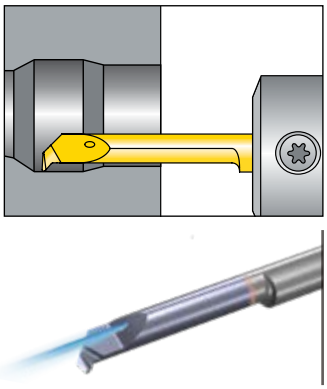
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	3.2	MC432B90R15L10R	10.0	0.15	1.43	0.2	2.90	2.45	18	0	11.5	25.8	•	○
		MC432B90R15L10L	10.0		1.43	0.2	2.90	2.45	18		11.5	25.8	•	•
	4.2	M442B90R15L16R/L	16.0		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	•	○

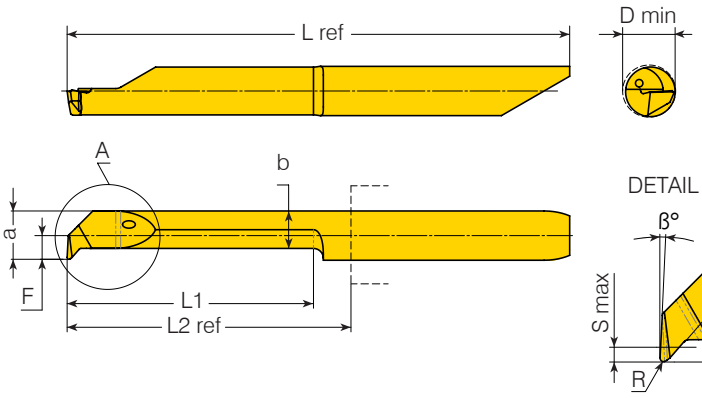
• In stock ○ Available upon request

Boring & Profiling with Chip Breaker & High Pressure Coolant (CBLF)

NEW

Internal





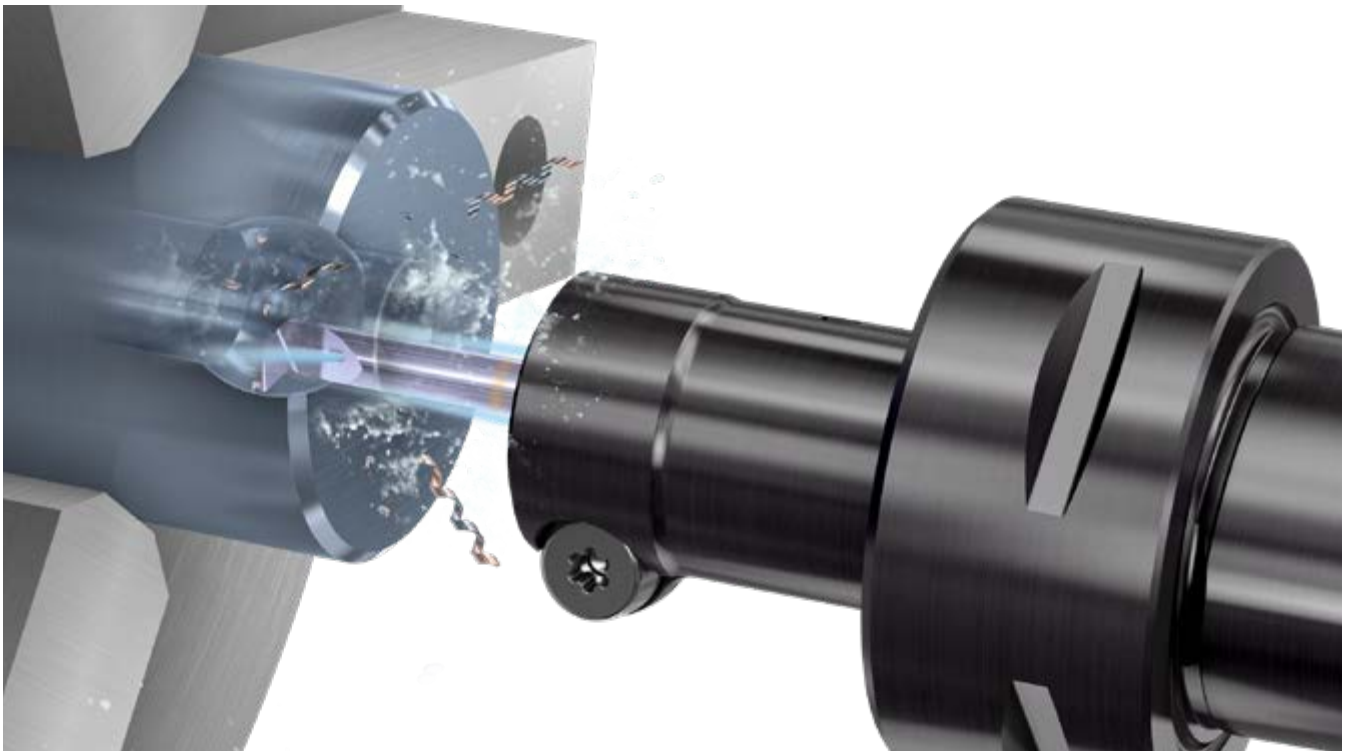
* L2 Ref: Repeatability within +/-0.02

Right hand shown

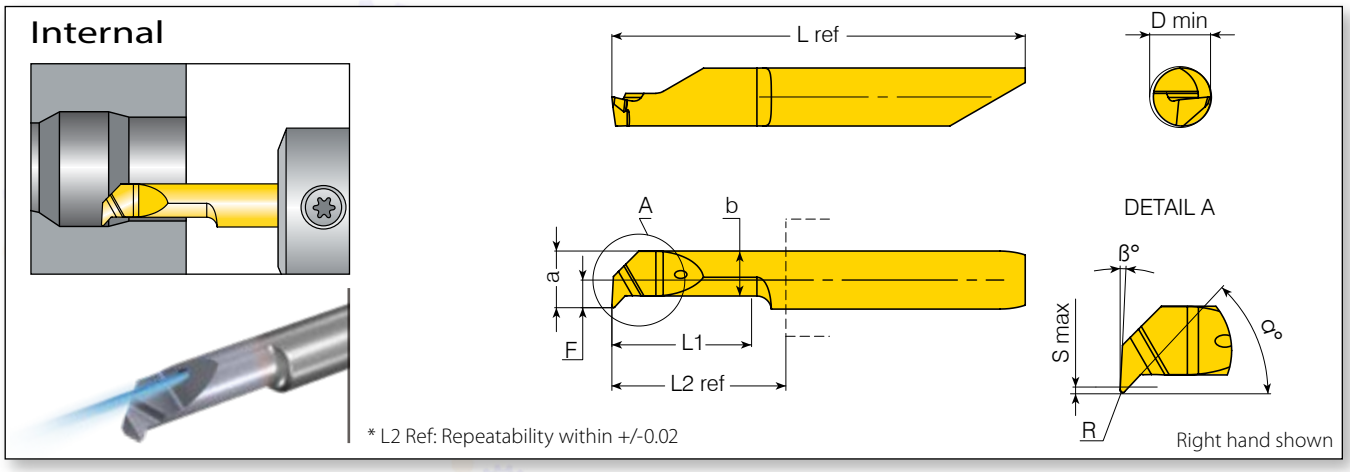
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	4.2	M442CBLFR15 L10R/LC	10	0.15	1.9	0.7	3.9	3.1	47	3	11.5	28.5	○	●
		M442CBLFR15L16R/LC	16								18.2	35.2	○	●
		M442CBLFR15L21R/LC	21								22.8	39.8	○	●
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.



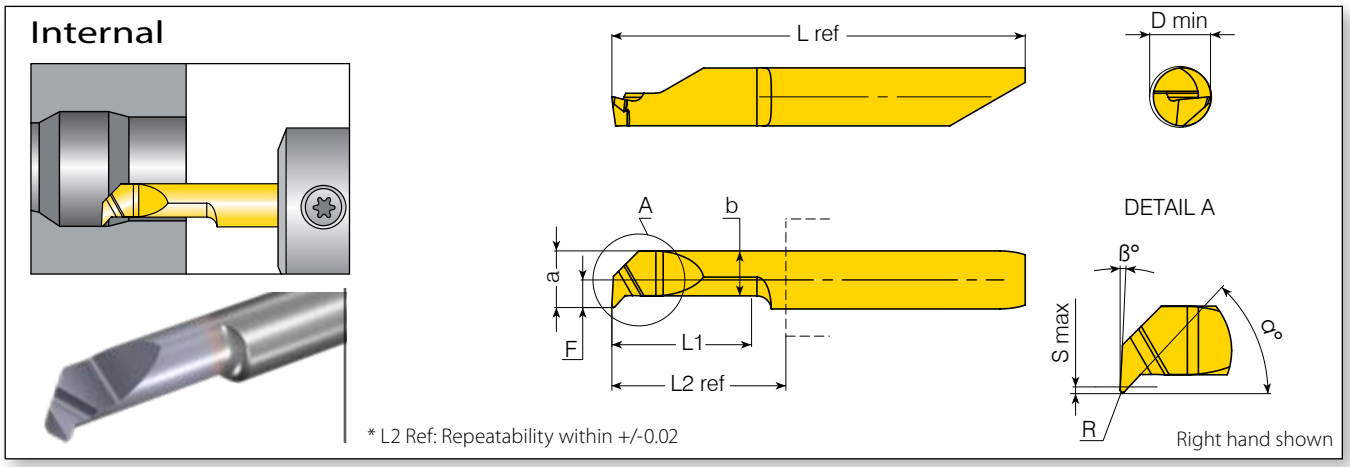
Boring & Profiling (CL) with High Pressure Coolant



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	M442CLR15L10RC	10	0.15	1.9	0.7	3.9	3.1	47	3	11.5	28.5	○	●
		M442CLR15L21RC	21								18.2	35.2	○	●
5.0	5.2	M552CLR20L25RC	25	0.2	2.4	0.95	4.9	3.8	49		28.15	51	○	●

● In stock ○ Available upon request

Boring & Profiling (CL)

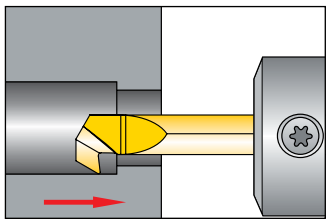


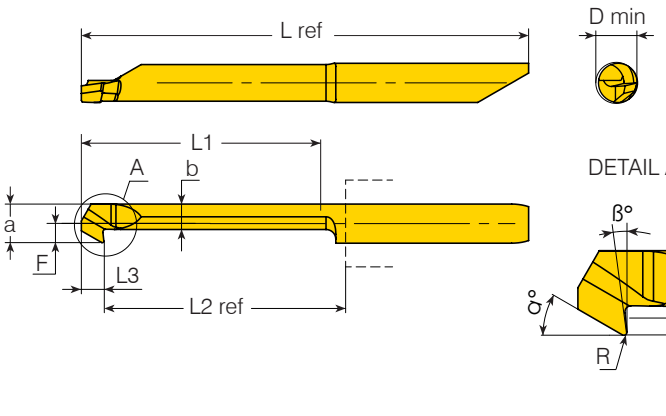
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	4.2	MS442CLR10L10R	10	0.10	1.9	0.7	3.9	3.1	47	3	11.5	28.5	●	○
		MS442CLR15L10R	10	0.15							11.5	28.5	●	●
		MS442CLR15L10L	10								11.5	28.5	●	○
		MS442CLR15L16R/L	16								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	2.4	0.95	4.9	3.8			18.15	41	●	●
		M552CLR20L16L	16								18.15	41	●	○
		M552CLR20L25R	25								28.15	51	●	●
		M552CLR20L25RL	25								28.15	51	●	○
6.0	6.2	M662CLR10L16R	16	0.1	2.78	1.75	5.78	3.9	49		18.3	42	○	●
		M662CLR20L16R	16	0.2	2.78	1.75	5.78	3.9			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

Back Boring

Internal





* L2 Ref: Repeatability within +/-0.03

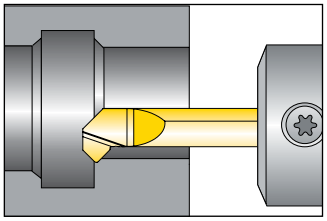
Right hand shown

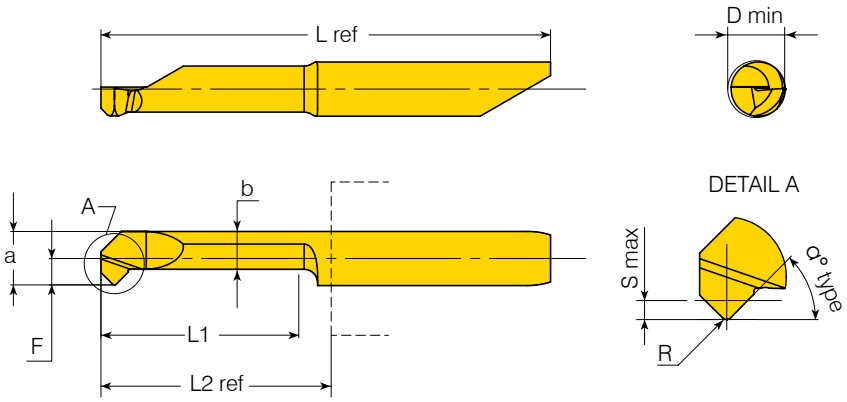
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm											Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L3	L ref	VBX	VTX
4.0	4.2	M442BBR15L25R/L	25.0	0.15	1.95	0.8	3.95	2.6	30	6	26.4	2.30	45.7	•	○
5.0	5.2	M552BBR15L30R/L	30.0		2.45	1.0	4.95	3.8		7	29.85		55.0	•	○
6.0	6.2	M662BBR15L30R/L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

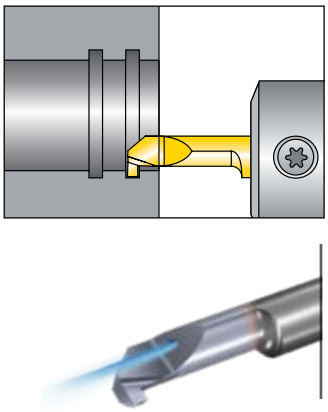
Right hand shown

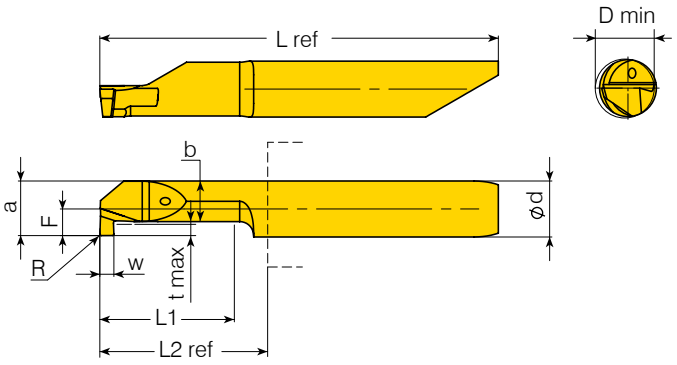
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	L2 ref*	L ref	VBX	VTX
4.0	4.2	MS442CH4545L15R/L	15.0	0.2	1.95	0.7	3.95	2.8	45	18.4	35.4	•	○
5.0	5.2	M552CH4545L15R/L	15.0		2.45		4.95	3.7		18.35	41.2	•	○
		M552CH4545L20R/L	20.0							23.35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

Square Grooving with High Pressure Coolant

Internal





* L2 Ref: Repeatability within +/-0.02

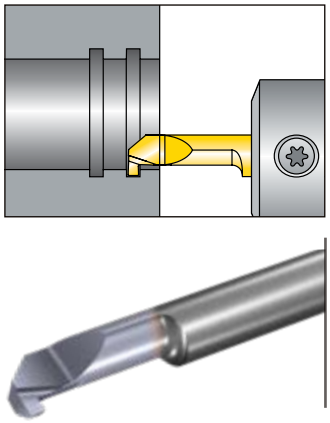
Right hand shown

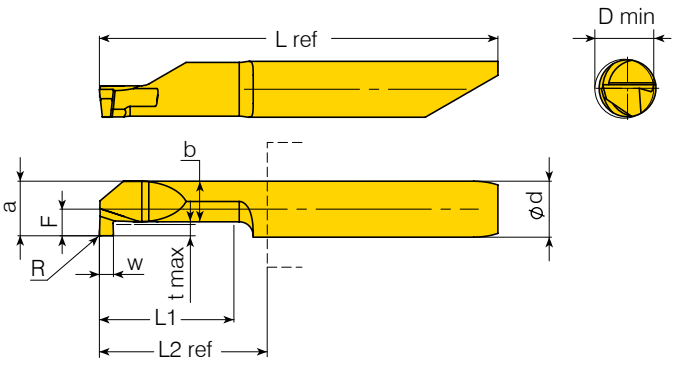
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
4.0	4.2	M442GSW100L10RC**	1.00	0.8	10	1.90	0.1	3.90	2.9	11.5	28.5	○	●
		M442GSW100L15RC**	1.00	0.8	15	1.90	0.1	3.90	2.9	18.2	35.2	○	●
		M442GSW100L20RC**	1.00	0.8	20	1.90	0.1	3.90	2.9	22.8	39.8	○	●
5.0	5.2	M552GSW100L10RC**	1.00	1	10	2.40	0.1	4.90	3.7	12.15	35	○	●
		M552GSW100L15RC**	1.00	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	○	●
		M552GSW150L20RC**	1.50	1	20	2.40	0.1	4.90	3.7	23.15	46	○	●

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

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	●	○
		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	●	○
		MS442GSW100L20R/L	1.00		20		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	●	○
		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	●	○
		M552GSW150L15R/L	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	●	○
		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

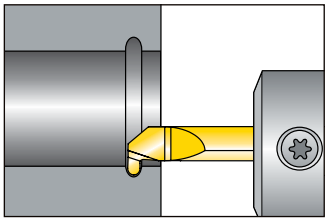
Square Grooving (con't)

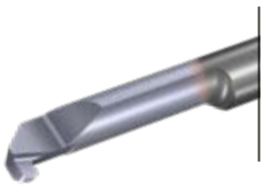
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
6.0	6.2	M662GSW117L15R**	1.17	1.8	15	2.96	0.1	5.96	4.0	18.3	42	●	○
		M662GSW150L15R/L	1.50			2.90		5.90				●	○
		M662GSW157L15R**	1.57			2.96		5.96				●	○
		M662GSW198L15R**	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		20	2.90		5.90	4.0	23.3	47	●	○
		M662GSW200L20R	2.00						4.0			●	●
		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	7.2	M762GSW250L15R	2.50	2.5	15	3.40	0.1	6.90	4.1	18.3	42	○	●
		M772GSW079L10R**	0.79		10	3.46		6.96		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									●	○

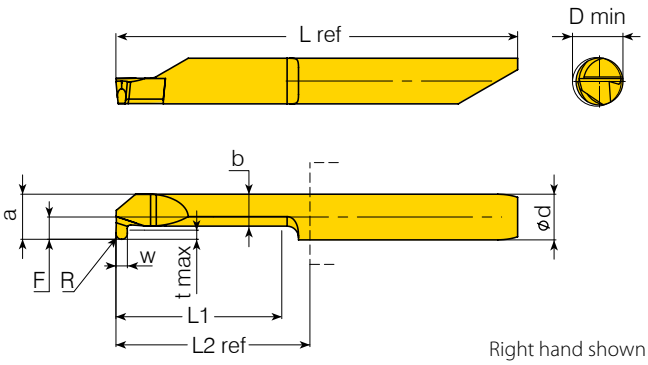
** LH Tools are available upon request.
● In stock ○ Available upon request

Round Grooving

Internal







* L2 Ref: Repeatability within +/-0.02

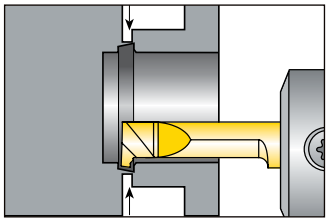
Right hand shown

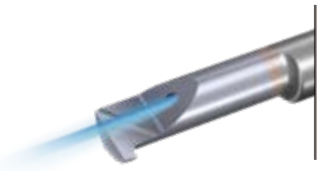
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
4.0	4.2	MS442GRR050L15R/L	1.0	0.8	15	1.95		3.95	2.8	18.2	35.2	●	○
5.0	5.2	M552GRR050L20R**	1.0	1	20	2.45	0.5	4.95	3.7	23.15	46	●	●
		M552GRR050L20L	1.0									●	○
		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 **	1.0	2.5	30	3.45	0.5	6.95	4.15	36.4	51	○	●
		M772GRR100L30R**	2.0	2.5	30	3.45	1	6.95	4.1	36.4	61	●	○

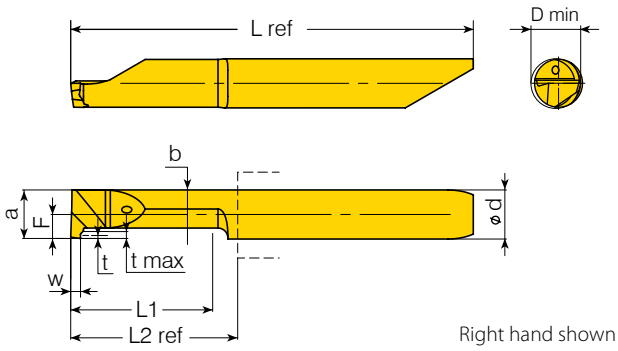
** LH Tools are available upon request.
● In stock ○ Available upon request

Pre-Part Off

Internal







* L2 Ref: Repeatability within +/-0.02

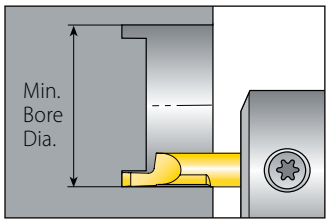
Right hand shown

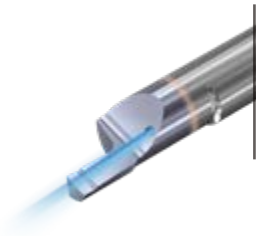
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	t	a	b	L2 ref*	L ref	VBX	VTX
5.0	5.2	M552PPW100L15R/L	1.0	0.7	15	2.44	0.3	4.94	3.88	18.15	41	●	○
		M552PPW100L20R/L			20					23.15	46	●	○
		M552PPW100L20RC**			20					23.15	46	○	●
		M552PPW100L25R/L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

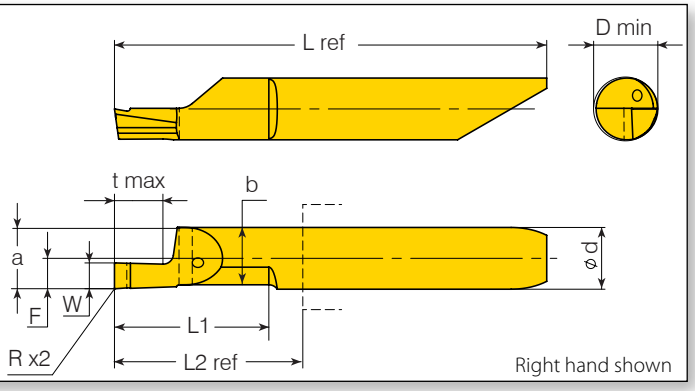
** LH Tools are available upon request.
● In stock ○ Available upon request

Face Grooving with High Pressure Coolant

Internal







* L2 Ref: Repeatability within +/-0.02

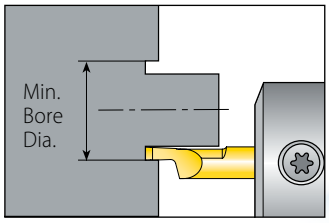
Right hand shown

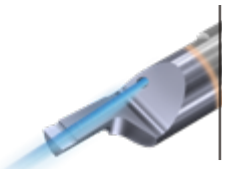
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
6.0	8.0	M680FGW10L15R/LC	1.00	2.0	15	2.8	0.10	5.8	5.55	18.3	42.0	○	●
		M680FGW117L15R/LC	1.17				0.15					○	●
		M680FGW15L15R/LC	1.50	3.0			0.10					○	●
		M680FGW157L15R/LC	1.57				0.15					○	●
		M680FGW198L15R/LC	1.98	4.0			0.15					○	●
		M680FGW20L15R/LC	2.00				0.10					○	●
		M680FGW239L15R/LC	2.39	5.0			0.15					○	●
		M680FGW25L15R/LC	2.50				0.10					○	●
		M680FGW30L15R/LC	3.00	6.0			0.10					○	●
		M680FGW318L15R/LC	3.18				0.15					○	●

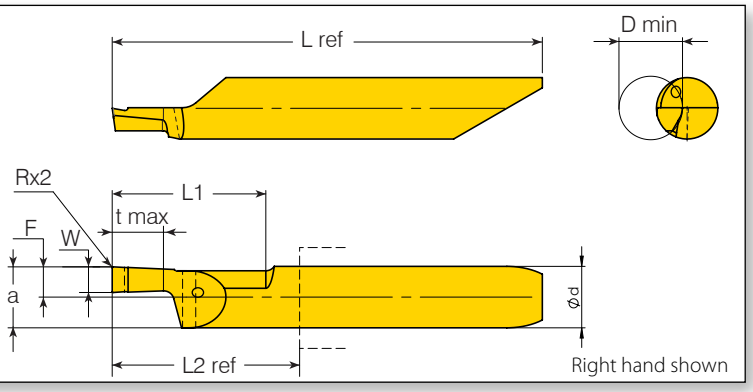
● In stock ○ Available upon request

Face Grooving with High Pressure Coolant

External







* L2 Ref: Repeatability within +/-0.02

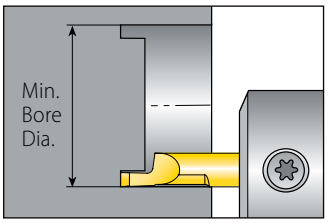
Right hand shown

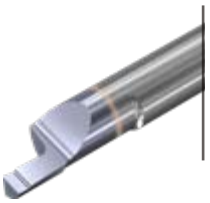
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
6.0	8.0	M680FPW10L15R/LC	1.00	2.0	15	2.8	0.10	5.8	5.55	18.3	42.0	○	●
		M680FPW117L15R/LC	1.17				0.15					○	●
		M680FPW15L15R/LC	1.50	3.0			0.10					○	●
		M680FPW157L15R/LC	1.57				0.15					○	●
		M680FPW198L15R/LC	1.98	4.0			0.15					○	●
		M680FPW20L15R/LC	2.00				0.10					○	●
		M680FPW239L15R/LC	2.39	5.0			0.15					○	●
		M680FPW25L15R/LC	2.50				0.10					○	●
		M680FPW30L15R/LC	3.00	6.0			0.10					○	●
		M680FPW318L15R/LC	3.18				0.15					○	●

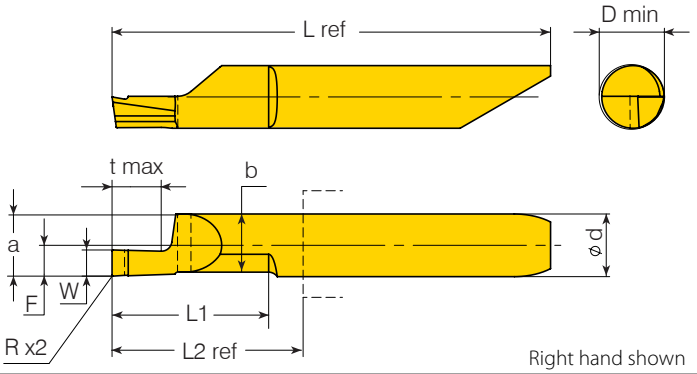
● In stock ○ Available upon request

Face Grooving

Internal







* L2 Ref: Repeatability within +/-0.02

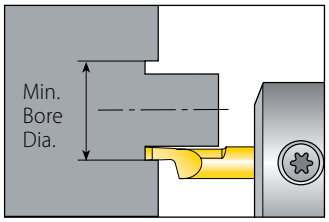
Right hand shown

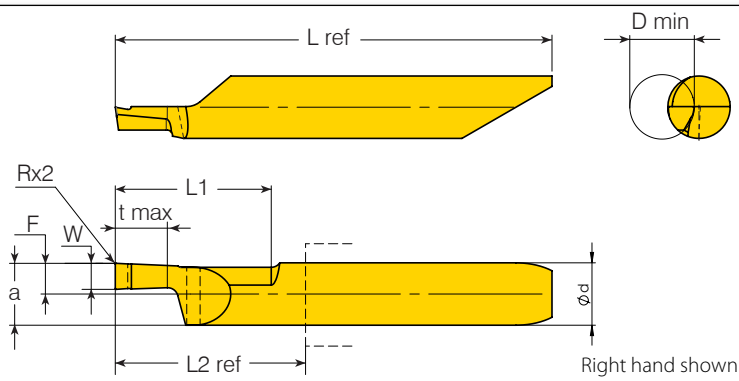
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
6.0	6.2	MN662FGW10L15R/L	1.00	2.0	15	2.95	0.10	5.95	5.57	18.3	42.0	○	●
		MN662FGW117L15R/L	1.17				0.15					○	●
		MN662FGW15L15R/L	1.50	3.0			0.10					○	●
		MN662FGW157L15R/L	1.57				0.15					○	●
		MN662FGW198L15R/L	1.98	4.0			0.15					○	●
		MN662FGW20L15R/L	2.00				0.10					○	●
		MN662FGW239L15R/L	2.39	5.0			0.15					○	●
		MN662FGW25L15R/L	2.50				0.10					○	●
		MN662FGW30L15R/L	3.00	6.0			0.10					○	●
	6.6	MN666FGW318L15R/L	3.18				0.15					○	●

● In stock ○ Available upon request

Face Grooving

External





* L2 Ref: Repeatability within +/-0.02

Right hand shown

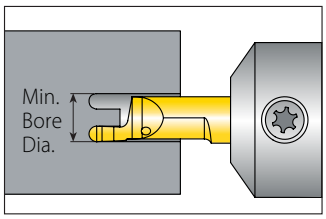
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
6.0	6.2	MN662FPW10L15R/L	1.00	2.0	15	2.95	0.10	5.95	5.57	18.3	42.0	○	●
		MN662FPW117L15R/L	1.17				0.15					○	●
		MN662FPW15L15R/L	1.50	3.0			0.10					○	●
		MN662FPW157L15R/L	1.57				0.15					○	●
		MN662FPW198L15R/L	1.98	4.0			0.15					○	●
		MN662FPW20L15R/L	2.00				0.10					○	●
		MN662FPW239L15R/L	2.39	5.0			0.15					○	●
		MN662FPW25L15R/L	2.50				0.10					○	●
		MN662FPW30L15R/L	3.00	6.0			0.10					○	●
	6.6	MN666FPW318L15R/L	3.18				0.15					○	●

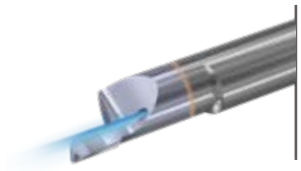
● In stock ○ Available upon request

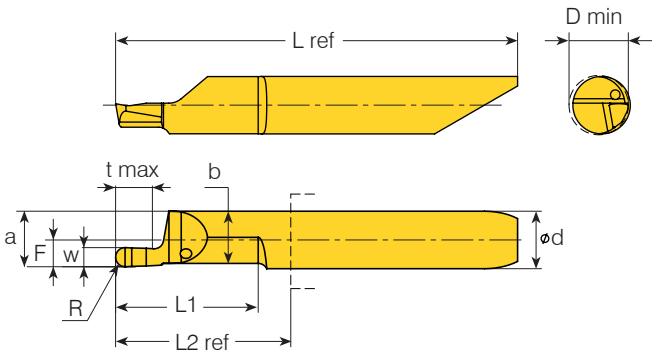
Round Face Grooving with High Pressure Coolant

NEW

Internal







* L2 Ref: Repeatability within +/-0.02

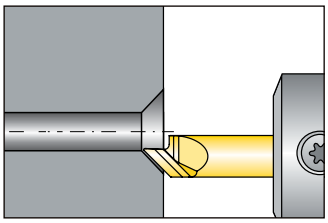
Right hand shown

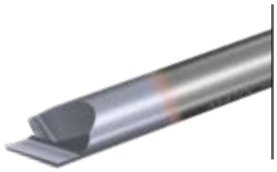
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min.	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
6.0	6.2	M662FGR050L15R/LC	1	2	15	2.8	0.5	5.8	5.55	18.3	42	○	●
		M662FGR080L15R/LC	1.6	3			0.8		5.45			○	●
		M662FGR100L15R/LC	2	4			1					○	●
		M662FGR125L15R/LC	2.5	5			1.25					○	●
		M662FGR150L15R/LC	3	6			1.5					○	●

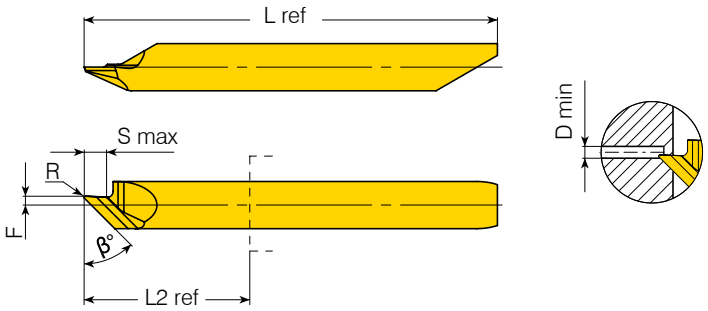
● In stock ○ Available upon request

Face Chamfering 45°

Internal







* L2 Ref: Repeatability within +/-0.02

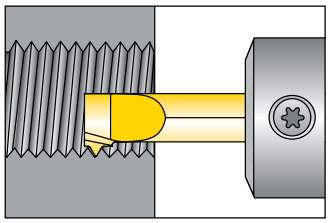
Right hand shown

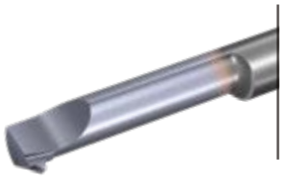
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm						Grades	
d (mm)	D min. (mm)	RH/LH	R	F	S max	β°	L2 ref*	L ref	VBX	VTX
4.0	1.0	M410CH45L15R	0.1	0.75	2.4	45	18.2	35.2	●	○
		M410CH45L15L							●	○

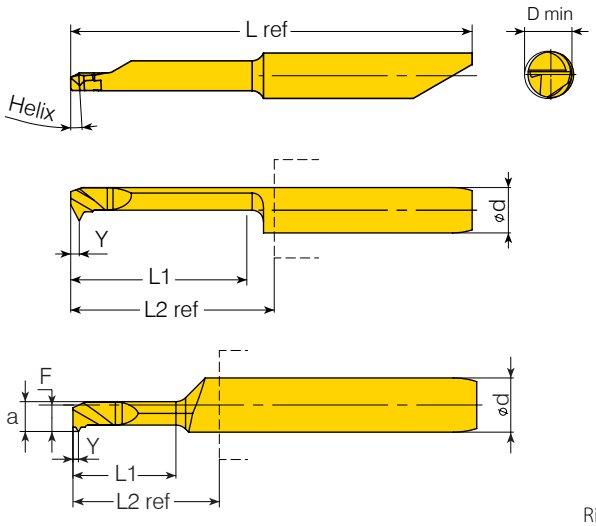
● In stock ○ Available upon request

Threading

Internal



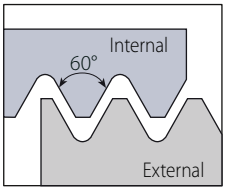




* L2 Ref: Repeatability within +/-0.02

Right hand shown

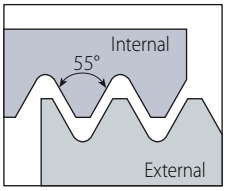
Partial Profile 60°



	Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch		Dimensions mm								Grades	
Thread	d (mm)	D min. (mm)	RH/LH	mm	TPI	L1	a	F	Y	h (min)	L2 ref*	L ref	Helix °	VBX	VTX
M1-M2x0.25	4.0	0.73	M407TH0.25P60L02R	0.25		2.5	0.65	1.95	0.14	0.29	13.0	29.8	4.9	○	●
M1.6-M3x0.35		1.22	M412TH0.35P60L04R	0.35		4	1.10		0.18	0.29			3.8	○	●
M2x0.4		1.57	M416TH0.40P60L05R	0.4		5	1.45		0.2	0.41			4.2	○	●
M2.2-M2.5x0.45		1.71	M417TH0.45P60L06R	0.45		6	1.54		0.22	0.46			4.0	○	●
-	4.0	3.2	MS429THF60L16R	0.5-1.0	48-24	16	2.90	0.9	0.9	-	18.4	35.4	3.5	●	○
		3.2	MS429THF60L16L	0.5-1.0	48-24	16	2.90	0.9						○	●
		4.2	MS439THF60L16R	0.5-1.0	48-24	16	3.89	1.9						●	○
		4.2	MS439THF60L16L	0.5-1.0	48-24	16	3.89	1.9						○	●
	6.0	6.2	M659THA60L06R	0.5-1.5	48-16	6	5.89	2.9			8.5	36.2		○	●
		6.2	M659THA60L16R	0.5-1.5	48-16	16	5.89	2.9			18.5	42.2		●	●
		6.2	M659THA60L16L	0.5-1.5	48-16	16	5.89							●	○

● In stock ○ Available upon request

Partial Profile 55°

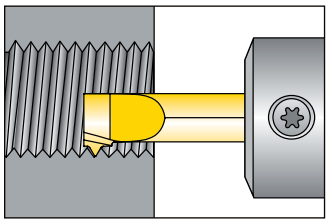


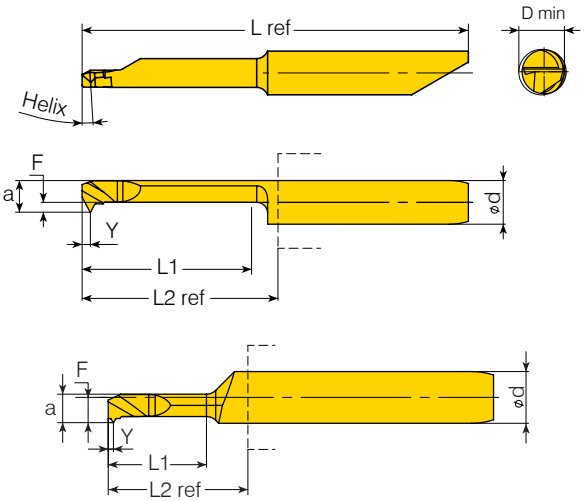
Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch		Dimensions mm							Grades	
d (mm)	D min. (mm)	RH/LH	mm	TPI	Helix	L1	a	F	Y	L2 ref*	L ref	VBX	VTX
4.0	3.2	MS429THF55L16R/L	0.5-1.0	48-24	3.5	16	2.90	0.9	0.75	18.4	35.4	●	○
	4.2	MS439THF55L16R/L	0.5-1.0	48-24			3.90	1.9				●	○
6.0	6.2	M659THA55L16R/L	0.5-1.5	48-16			5.89	2.9	0.9	18.5	42.2	●	○

● In stock ○ Available upon request

Threading

Internal

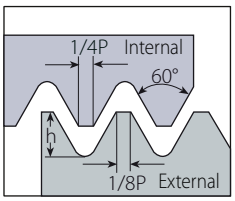




* L2 Ref: Repeatability within +/-0.02

Right hand shown

ISO Metric

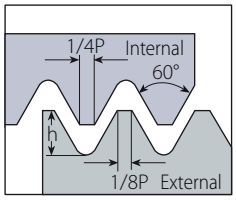


Defined by: R262 (DIN 13)
Tolerance Class: 6g/6H

	Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch		Dimensions mm							Grades	
Thread	d (mm)	D min. (mm)	RH/LH	mm	Helix °	L1	a	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	3.95	1.95	0.40	0.29	13.0	29.8	○	●
M4x0.7		3.24	M432TH0.70ISOL10R	0.70	3.6	10.2	3.95	1.95	0.60	0.41			○	●
M4x0.5		3.4	MS429TH0.50ISOL16R/L	0.50	3.5	16	2.90	0.9	0.4	0.29	18.4	35.4	●	○
M5x0.5		4.4	MS439TH0.50ISOL16R/L	0.50			3.90	1.9	0.4	0.29			●	○
M4x0.7		3.2	MS429TH0.70ISOL16R/L	0.70			2.90	0.9	0.6	0.41			●	○
M4.5-M6x0.75		3.1	M429TH0.75ISOL16R	0.75			2.90	1.9	0.6	0.44			○	●
M5x0.8		4.0	MS429TH0.80ISOL16R/L	0.80			2.90	0.9	0.6	0.46			●	○
M6x1.0		4.8	MS439TH1.00ISOL16R/L	1.00			3.90	1.9	0.7	0.58			●	○
M5.5x0.5	5.0	4.9	M542TH0.50ISOL16R/L	0.50			4.20	1.7	0.4	0.29	18.35	41.2	●	○
M5.5x0.75		4.6	M542TH0.75ISOL16R/L	0.75			4.20	1.7	0.6	0.43			●	○
M7x1.0		5.8	M549TH1.00ISOL16R/L	1.00			4.90	2.4	0.7	0.58			●	○
M6x0.5	6.0	5.4	M649TH0.50ISOL16R/L	0.50			4.90	1.9	0.4	0.29	18.5	42.2	●	○
M6.5x0.75		5.6	M649TH0.75ISOL16R/L	0.75			4.90	1.9	0.6	0.43			●	○
M7.5x1.0		6.3	M659TH1.00ISOL16R/L	1.00			5.90	2.9	0.7	0.58			●	○
M8x1.25		6.5	M659TH1.25ISOL16R/L	1.25			5.90	2.9	0.9	0.72			●	○
M10x1.5		8.3	M659TH1.50ISOL16R/L	1.50	3.0		5.90	2.9	1.0	0.87			●	○

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

American UN

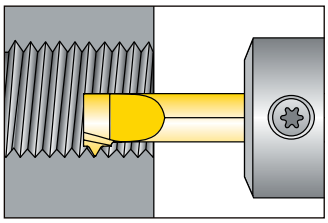


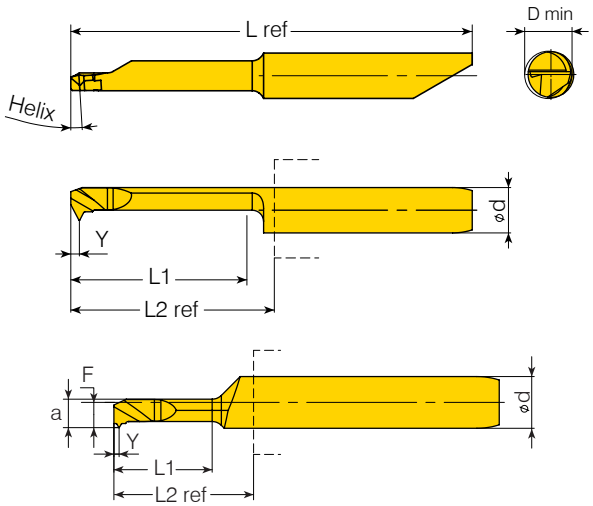
	Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch	Dimensions mm								Grades	
Thread	d (mm)	D min. (mm)	RH/LH	TPI	Helix °	L1	a	F	Y	h (min)	L2 ref*	L ref	VBX	VTX
No.8-32UNC	4.0	3.3	MS429TH32UNL16R/L	32	3.5	16	5.90	0.92	0.6	0.46	18.4	35.4	●	○
No.10-28UNS		3.6	MS429TH28UNL16R/L	28			2.90	0.92	0.65	0.52			●	○
1/4"-27UNS	5.0	5.3	M549TH27UNL16R**	27			4.90	2.4	0.75	0.54	18.35	41.2	●	○
1/4"-24UNS		5.1	M542TH24UNL16R**	24			4.20	1.7	0.75	0.61			●	○
1/4"-20UNC		4.6	M542TH20UNL16R**	20			4.20	1.7	0.9	0.73			●	○
5/16"-18UNC	6.0	6.3	M659TH18UNL16R**	18			5.90	2.9	1.05	0.81	18.5	42.2	●	○
3/8"-16UNC		7.7	M659TH16UNL16R**	16			5.90	2.9	1	0.92			●	○

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

Threading

Internal

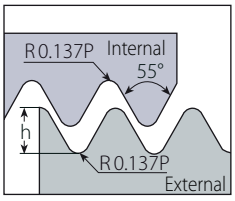




* L2 Ref: Repeatability within +/-0.02

Right hand shown

Whitworth for BSW, BSP

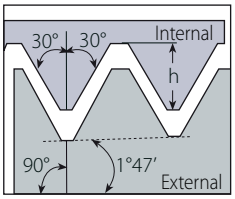


Defined by:
B.S.84:1956, DIN 259, ISO228/1:1982
Tolerance Class:
Medium Class A

	Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch	Dimensions mm								Grades	
Thread	d (mm)	D min. (mm)	RH/LH	TPI	Helix °	L1	a	F	Y	h (min)	L2 ref*	L ref	VBX	VTX
1/16"-28BSP	6.0	6.5	M659TH28WL16R**	28	3.5	16	5.90	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

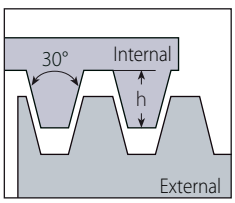


Defined by:
USAS B2.1:1968
Tolerance Class:
Standard NPT

	Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch	Dimensions mm								Grades	
Thread	d (mm)	D min. (mm)	RH/LH	TPI	Helix °	L1	a	F	Y	h (min)	L2 ref*	L ref	VBX	VTX
1/16"-27NPT	6.0	6.1	M659TH27NPTL16R**	27	3.5	16	5.90	2.9	0.75	0.66	18.5	42.2	•	○
1/4"-18NPT		10.7	M659TH18NPTL16R/L	18					1	1.01			•	○
1/2"-14NPT		17.0	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	a	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	5.90	2.95	1.1	0.9	23	46.7	○	•
TR9-TR12x2.0		6.2	M662TH2.0TRL20R	2.0	4		5.95	2.95	1.3	1.25			○	•
TR10-TR14x2.0	7.0	7.2	M772TH2.0TRL20R	2.0	3.4		6.95	3.45					○	•
TR11-TR16x3.0		7.2	M772TH3.0TRL20R	3.0	4.75		6.95	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 System

Holders

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

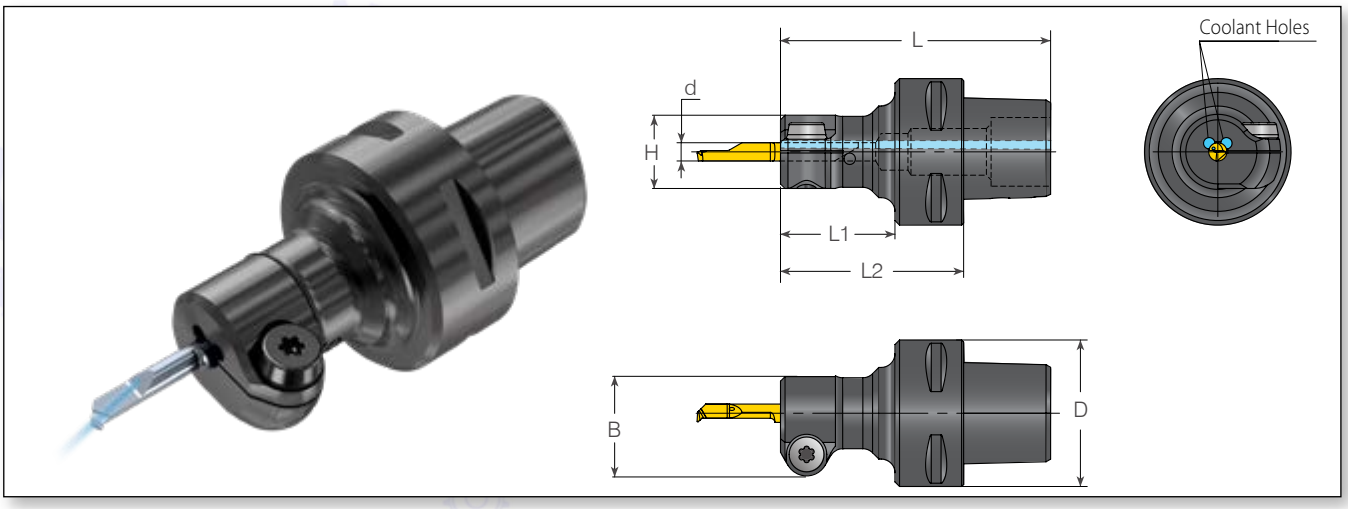
V-CAP Holders

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 Toolholder **MHS** - Microscope Square Shank Toolholder **MHD** - Microscope with Drop Head Toolholder	**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

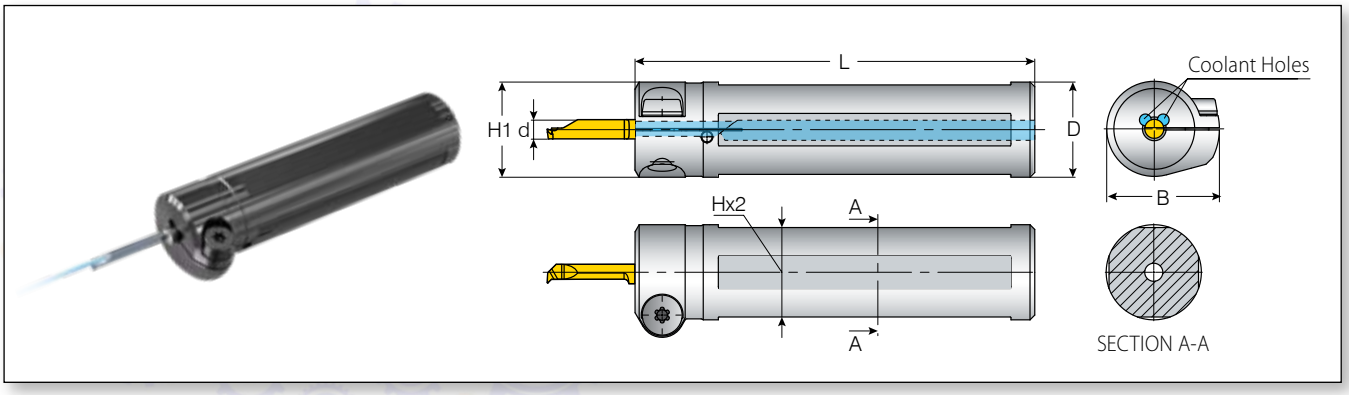


								Spare Parts	
Micro Insert Dia.	Ordering Code	Dimensions mm							
d (mm)		D	B	H	L1	L2	L	Shrink Screw*	Key
4.0	MHCS-4-C3	32.0	21.7	16.0	25.0	40.0	59.0	SM5X10-15IPX2**	L15IP / LX15IP
	MHCS-4-C4	40.0	21.7	16.0	25.0	45.0	69.0		
5.0	MHCS-5-C3	32.0	23.7	20.0	30.0	45.0	64.0		
	MHCS-5-C4	40.0	23.7	20.0	30.0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

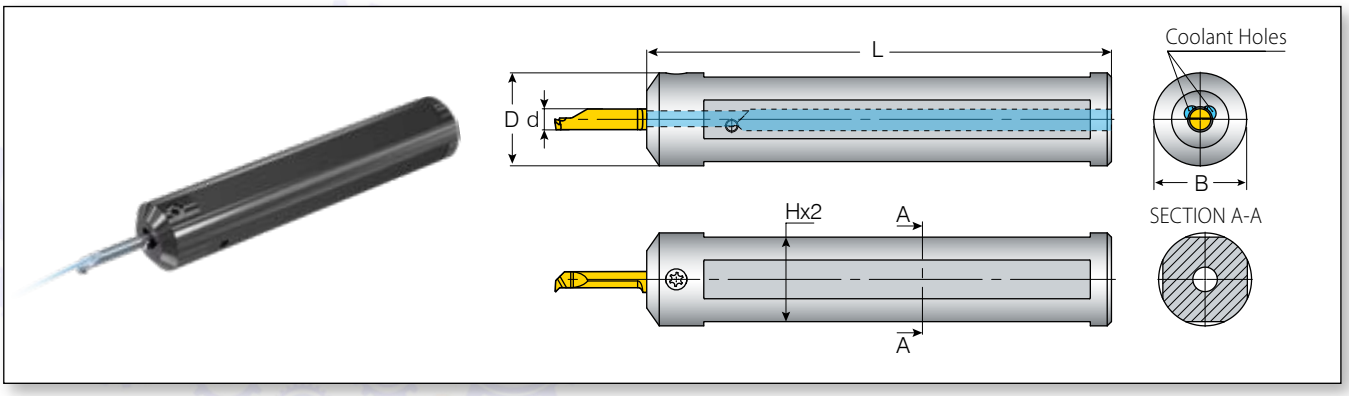


Micro Insert Dia.	Ordering Code	Dimensions mm					Spare Parts	
d (mm)		D	B	H1	H	L	Shrink Screw*	Key
4.0	MHCS10-4-4F	10.0	19.7	13.3	8.8	65.0	SM5X10-15IPX2**	L15IP / LX15IP
	MHCS12-4-4F	12.0	19.7	13.8	10.8	70.0		
	MHCS16-4-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-4-4F	20.0	23.7	20.0	18.8	84.0		
	MHCS22-4-4F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

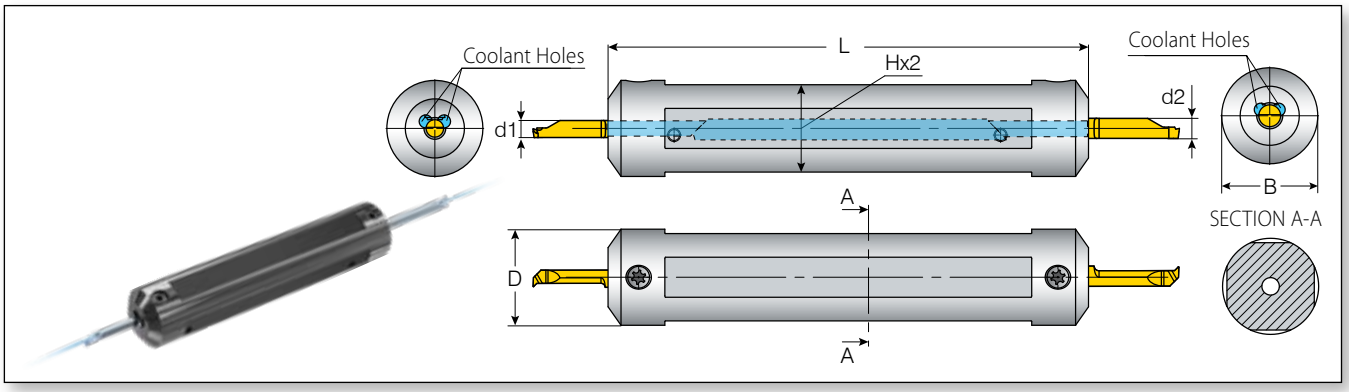
Round Toolholders without Shoulder



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

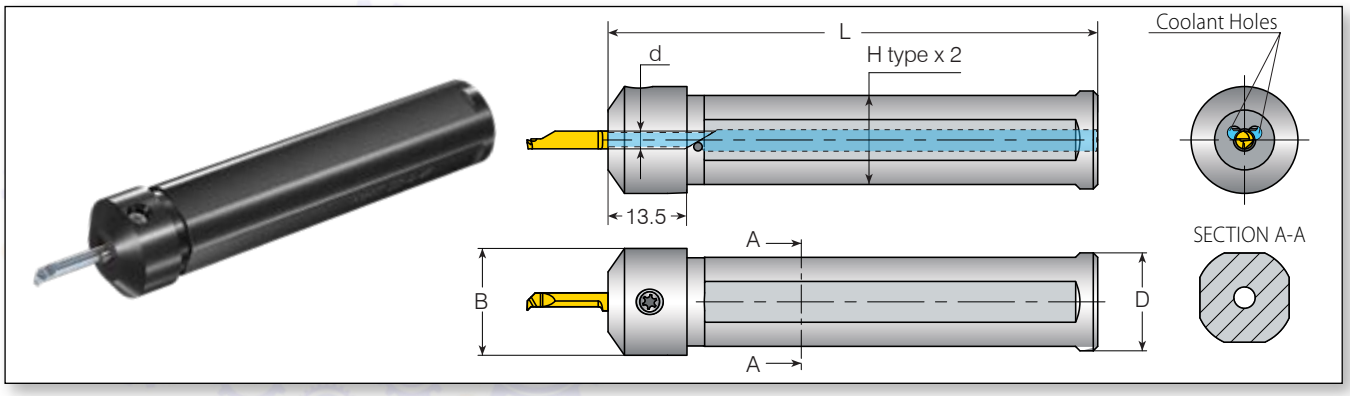


Micro Insert Dia.	Ordering Code	Dimensions mm			Spare Parts	
d1 - d2 (mm)		B=D	H	L	Clamping Screw*	Key
4.0 - 5.0	MHCR075-4-5-4F**	19.05	17.8	83.5	SLDBT15IP	F15IP
	MHCR20-4-5-4F**	20	18.8	83.5		
	MHCR22-4-5-4F	22	20.0	110.0		
	MHCR25-4-5-4F	25	23.0	110.0		
6.0 - 7.0	MHCR20-6-7-4F**	20	18.8	83.5		
	MHCR25-6-7-4F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

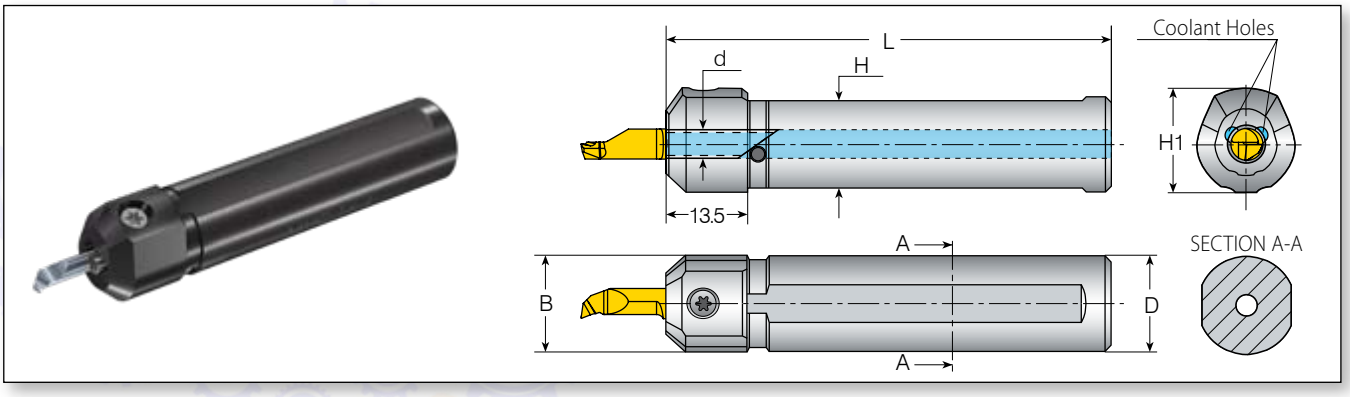


Micro Insert Dia.	Ordering Code	Dimensions mm				Spare Parts	
d (mm)		D	B	H	L	Clamping Screw*	Key
4.0	MHC20-4-4F	20.0	22.0	18.8	83.5	SL7DT15 or SL7DBT15IP**	KT15 or F15IP**
	MHC22-4-4F	22.0	24.0	20.0	110		
	MHC23-4-4F	23.0	25.0	21.0			
	MHC25-4-4F	25.0	27.0	23.0			
	MHC28-4-4F	28.0	30.0	26.0			
5.0	MHC20-5-4F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

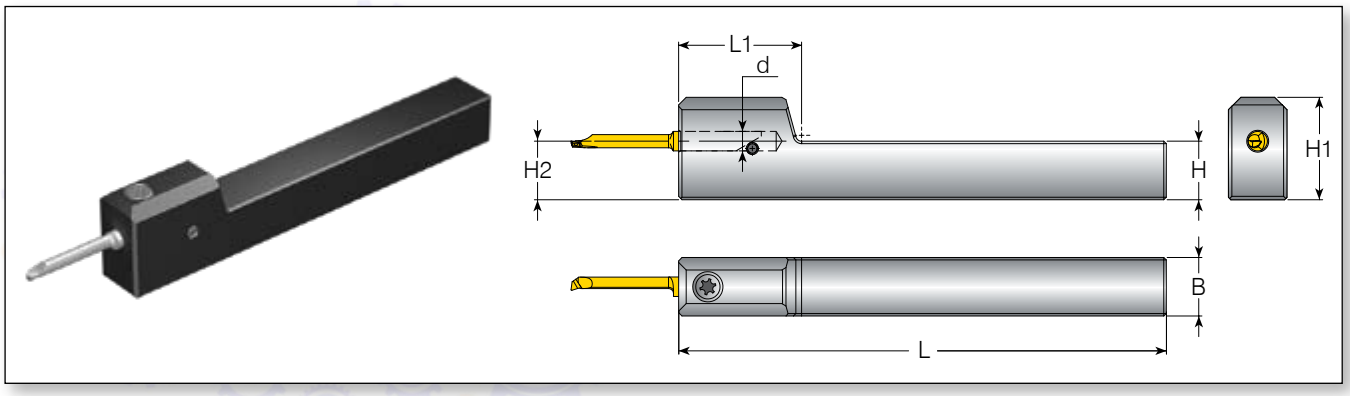


Micro Insert Dia.	Ordering Code	Dimensions mm				Spare Parts	
d (mm)		D=B	H1	H	L	Clamping Screw*	Key
4.0	MHC 10-4	10.0	14.0	8.8	65.0	SL7DT15 or SL7DBT15IP**	KT15 or F15IP**
	MHC 12-4	12.0	16.0	10.8	70.0		
	MHC 16-4	16.0	17.6	14.8	75.0		
	MHC 20-4	20.0	22.0	18.8	84.0		
5.0	MHC 10-5	10.0	14.0	8.8	65.0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

Square Shank Toolholders

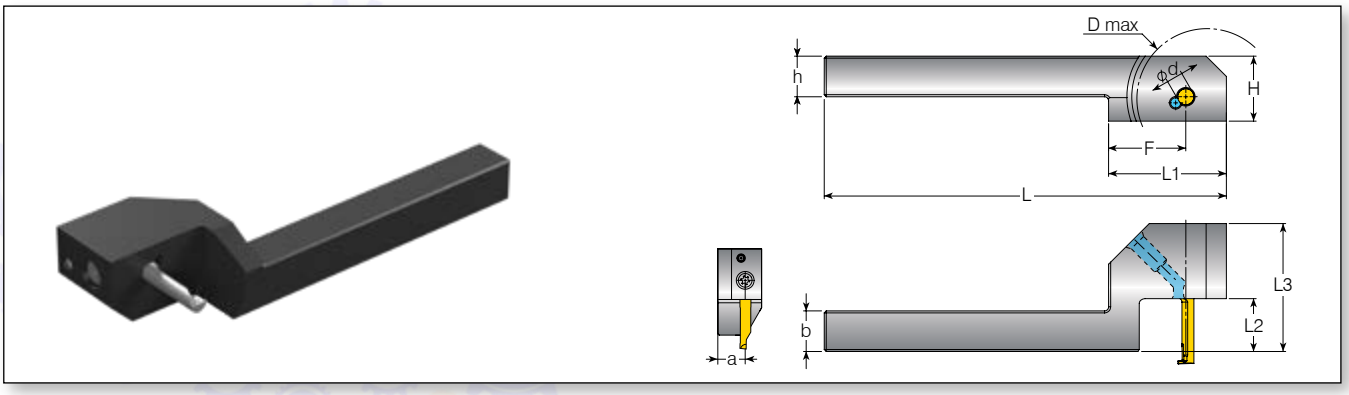


Micro Insert Dia.	Ordering Code	Dimensions mm				Spare Parts	
							
d (mm)		H=H2=B	H1	L	L1	Clamping Screw*	Key
4.0	MHS 1010-4	10.0	19.0	100.0	25.0	SL7DT15 or SL7DBT15IP**	KT15 or F15IP**
5.0	MHS 1010-5	10.0	19.5	100.0	25.0		
4.0	MHS 1212-4	12.0	21.0	100.0	25.0		
5.0	MHS 1212-5	12.0	21.5	100.0	27.0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

Drop Head Toolholders



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.

Groove Turning Accessories

Torque Limiters for Secure Clamping

Torque Limiting Handles

Ordering Code	Item Number	Range
VTRF 	013-01038	0.6 Nm to 3.0 Nm
VTRJ 	013-01039	2.0 Nm to 7.0 Nm

Torque Limiting Adapters

	Ordering Code	Item Number	Torque Max (Nm)
	TSD-12-0.6Nm	013-01082	0.6
	TSD-12-2.0Nm	013-01083	2.0
	TSD-12-3Nm	013-01037	3.0
	D02-12-3.0Nm	013-01084	3.0
	TSD-12-4.5Nm	013-01044	4.5
	TSD-12-5Nm	013-01045	5.0
	TSD-20-7Nm	013-01046	7.0

Torque Limiting Bits

	Ordering Code	Item Number	Bit Type
	BIT25-H4.0	013-01041	Hexagon
	BIT25-H5.0	013-01086	
	BIT25-TX8	013-01085	Torx
	BIT25-TX10	013-01094	
	BIT25-TX15	013-01042	
	BIT25-TX20	013-01043	
	BIT25-TX25	013-01093	
	BIT25-15IP	013-01036	Torx Plus
	BIT25-20IP	013-01040	

Torque Limiters Appendix

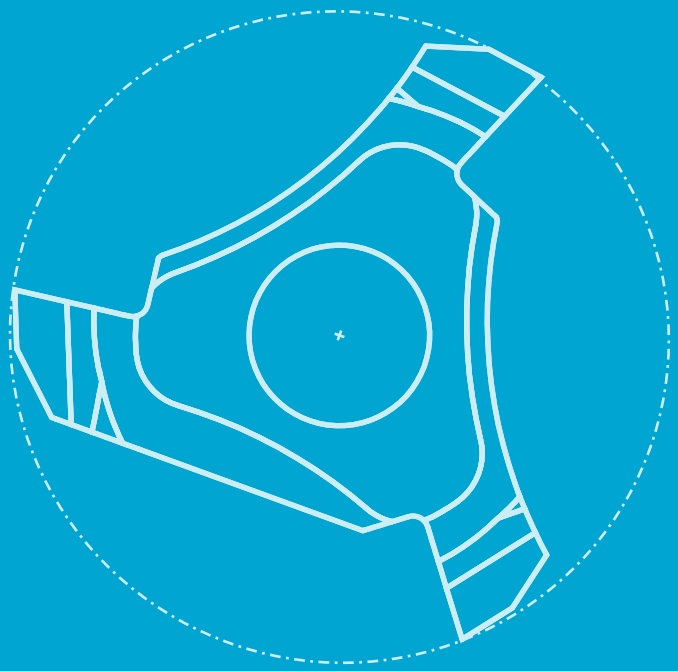
Selecting the Correct Adapter and Bit:

Use the following table to choose the correct adapter and bit based on the appropriate Groovex product family and the designated screw.

In cases where different screws are used within the same product family, locate the appropriate screw in the Groovex Main Catalog.

Product Group	Product Family		Screw	Nm Max	Adapter	Bit
VG-Cut	Monoblock Holders	Insert Width: 2.0 mm	SM4x16-T20	3.0	TSD-12-3Nm	BIT25-TX20
		Insert Width: 3.0 mm	SM3.5x14-T15	5.0	TSD-12-5Nm	
		Insert Width: 3.0 mm	SM4x16-T20	5.0	TSD-12-5Nm	
		Insert Width: 3.0 & 4.0 mm	SM4x18-T20	5.0	TSD-12-5Nm	
		Insert Width: 3.0 & 4.0 mm (VGER/L…N & VGER/L…C)	SM5x20-T25	5.0	TSD-12-5Nm	BIT25-TX25
		Insert Width: 5.0 & 6.0 mm	SM4x18-T20	7.0	TSD-12-7Nm	BIT25-TX20
	Reinforced Monoblock Holders (PH)	Insert Width: 1.5 & 2.0 mm	SM4x14-T15	3.0	TSD-12-3Nm	BIT25-TX15
		Insert Width: 3.0		5.0	TSD-12-5Nm	
	Reinforced Monoblock Holders with High Pressure Coolant (HPC)	Insert Width: 1.5 & 2.0 mm		4.0	-	BIT25-TX15
		Insert Width: 3.0		5.0	TSD-12-5Nm	
	Modular System		SM4x14-T15	5.0	TSD-12-5Nm	BIT25-TX15
			SM4X10.5-T15	5.0	TSD-12-5Nm	
			SM5x13.5-T20	5.0	TSD-12-5Nm	BIT25-TX20
			SM5x18-T20	5.0	TSD-12-5Nm	
	Modular System with High Pressure Coolant	Insert Width: 2.0 mm	SM5x16	3.0	TSD-12-3Nm	BIT25-TX25
		Insert Width: 3.0 & 4.0 mm	SM5x16	5.0	TSD-12-5Nm	
		Insert Width: 5.0 & 6.0 mm	SM5x16	7.0	TSD-20-7Nm	
	Internal Holders	Insert Width: 2.0 mm	SM5x12	3.0	TSD-12-3Nm	BIT25-TX25
			SM5x14	3.0		
			SM5x16	3.0	TSD-12-3Nm	
		Insert Width: 3.0 & 4.0 mm	SM5x12	5.0	TSD-12-5Nm	
			SM5x14	5.0	TSD-12-5Nm	
			SM5x16	5.0	TSD-12-5Nm	
		Insert Width: 4.0 & 5.0 mm	SM5x18	5.0		
		Insert Width: 5.0 mm	SM5x20	5.0		
		Insert Width: 6.0 mm	SM5x25	5.0		
ST-Cut		Inserts ST85….	SM5x0.5x7-T10	3.0	D02-12-3.0Nm*	BIT25-TX10
			SM5x0.8x9-T10			
			SM5x0.5x7-T10 LH			
			SM5x0.8x9-T10 LH			
GrooVical			SGM5	4.5	TSD-12-4.5Nm	BIT25-20IP
Mini-V			SNV08	0.6	TSD-12-0.6Nm	BIT25-TX8
			SNV11	2.0	TSD-12-2.0Nm	BIT25-TX10
			SNV14	3.0	TSD-12-3Nm	BIT25-TX15
			SNV16	5.0	TSD-12-5Nm	BIT25-TX20
microscope			SL7DT15	5.0	TSD-12-5Nm	BIT25-TX15
			SLDBT15IP	5.0	TSD-20-5Nm	
			SM5x10-15IPX2	7.0	TSD-20-7Nm	

* CW/CCW Torque direction



GROOVE MILLING

GROOVE MILLING

GM Solid

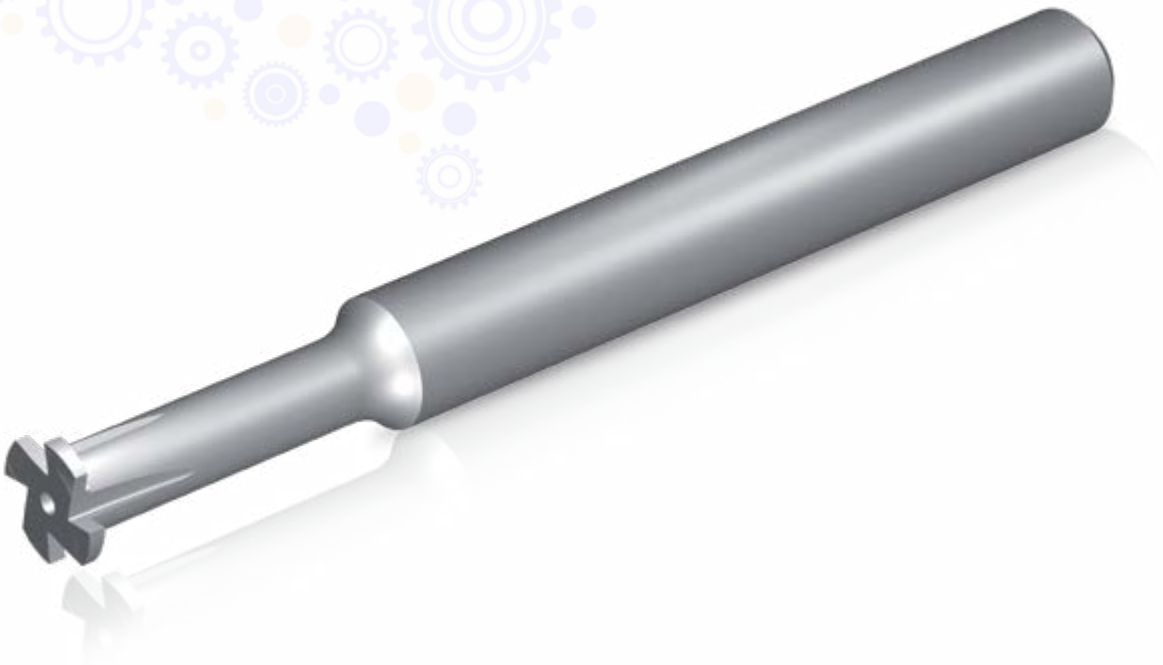
Solid Carbide Groove Milling Tools for Miniature and Small Bores

ТОВ «СМАРТТЕК ІНЖИНІРИНГ», т. +380-50-396-90-96, info@smarttec.com.ua, https://www.smarttec.com.ua

СМАРТТЕК
РОЗУМНІ ТЕХНОЛОГІЇ

GM Solid

Solid Carbide Groove Milling Tools for Miniature and Small Bores



Ø3.0 - 10.00 mm

- Min. bore diameter 6mm
- 4 flutes
- Width of groove 0.7-2.0 mm
- Depth of groove max 1.5mm

GM Solid Groove Milling Technical Data

Recommended Grades, Cutting Speeds Vc [m/min], Feed f [mm/ tooth]

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [m/min]	Feed f[mm/tooth]
					VTH	f
P Steel	1	Unalloyed steel	Low carbon (C=.1-.25 %)	125	100-210	0.07-0.2
	2		Medium carbon (C=.25-.55 %)	150	100-180	0.07-0.2
	3		High Carbon (C=.55-.85 %)	170	100-170	0.07-0.2
	4	Low alloy steel (alloying elements ≤5%)	Non hardened	180	60-90	0.07-0.2
	5		Hardened	275	80-150	0.07-0.2
	6		Hardened	350	70-140	0.07-0.2
	7	High alloy steel (alloying elements >5%)	Annealed	200	60-130	0.07-0.2
	8		Hardened	325	70-110	0.07-0.2
	9	Cast steel	Low alloy (alloying elements <5%)	200	100-170	0.07-0.2
	10		High alloy (alloying elements >5%)	225	70-120	0.07-0.2
M Stainless Steel	11	Stainless steel Ferritic	Non hardened	200	100-170	0.07-0.2
	12		Hardened	330	100-170	0.05-0.15
	13	Stainless steel Austenitic	Austenitic	180	70-140	0.07-0.2
	14		Super Austenitic	200	70-140	0.07-0.2
	15	Stainless steel Cast Ferritic	Non hardened	200	70-140	0.1-0.2
	16		Hardened	330	70-140	0.07-0.2
	17	Stainless steel Cast austenitic	Austenitic	200	70-120	0.07-0.2
	18		Hardened	330	70-120	0.07-0.2
K Cast Iron	28	Malleable Cast iron	Ferritic (short chips)	130	60-130	0.1-0.22
	29		Pearlitic (long chips)	230	60-120	0.07-0.2
	30	Grey cast iron	Low tensile strength	180	60-130	0.07-0.2
	31		High tensile strength	260	60-100	0.07-0.2
	32	Nodular SG iron	Ferritic	160	60-125	0.07-0.2
	33		Pearlitic	260	50-90	0.07-0.2
N(K) Non-Ferrous Metals	34	Aluminum alloys Wrought	non aging	60	100-250	0.1-0.25
	35		Aged	100	100-180	0.1-0.25
	36	Aluminum alloys	Cast	75	150-400	0.1-0.25
	37		Cast & aged	90	150-280	0.1-0.25
	38	Aluminum alloys	Cast Si 13-22%	130	80-150	0.1-0.25
	39	Copper and copper alloys	Brass	90	120-210	0.1-0.25
	40		Bronze and non leaded copper	100	120-210	0.07-0.22
S(M) Heat Resistant Material	23	Titanium alloys	Pure 99.5 Ti	400Rm	70-140	0.07-0.13
	24		α+ß alloys	1050Rm	20-50	0.07-0.13

Grades and Their Application

Grade	Application Type	Sample
VTH	A general-purpose, heavy duty groove milling grade TiCN coated for high resistance to wear	

GM Solid Tools

GM Solid Tools - Ordering Code System

Square Grooving

G	S	4	C	070	6	8	L15	R00	VTH
1	2	3	4	5	6	7	8	9	10

1 - Product Line	2 - Type	3 - Number of Flutes	4 - Cooling	5 - Groove Width (inch)	6 - Shank Diameter
G - Grooving	Solid	4 - Four flutes 6 - Six flutes	C - Cooling None - Without Cooling	070 - 0.7 mm 080 - 0.8 mm 090 - 0.9 mm 100 - 1.0 mm 150 - 1.5 mm 200 - 2.0 mm	06 - 6 mm 08 - 8 mm 10 - 10 mm

7 - Groove Depth	8 - Overhang Length	9 - Radius Groove Width Length	10 - Carbide Grade Width Length
08 - 0.8 mm 12 -1.2 mm 15 -1.5 mm	L15 - 15 mm L25 - 25 mm L35 - 35 mm	R00 - None	VTH

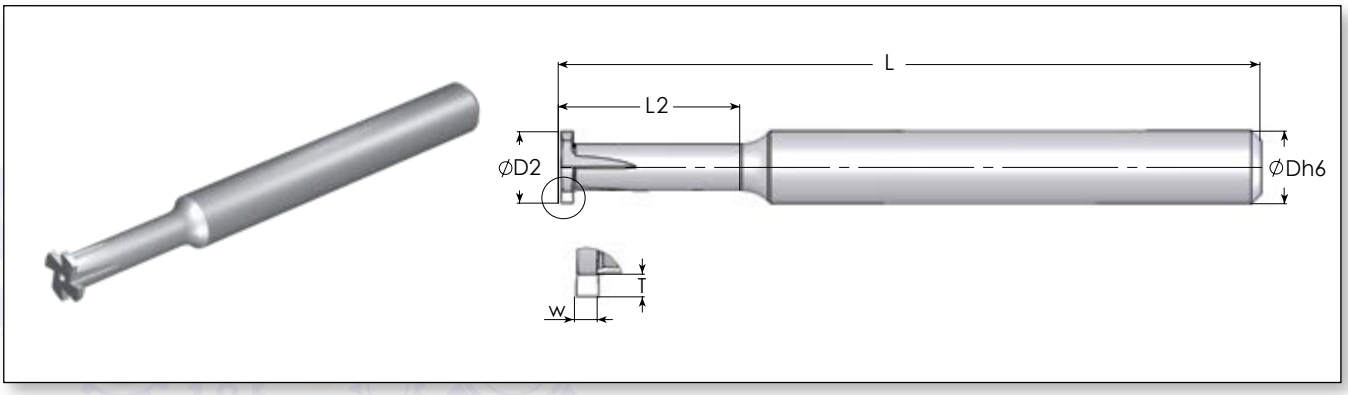
Chamfering

G	M	4	CH	90	060	06	L15	VTH
1	2	3	4	5	6	7	8	9

1 - Product Line	2 - Type	3 - Number of Flutes	4 - Profile	5 - Angle of Chamfering	6 - Shank Diameter
G - Grooving	Milling	4 - Four flutes	CH - Chamfering	90	030 - 3 mm 040 - 4 mm 050 - 5 mm 060 - 6 mm 080 - 8 mm

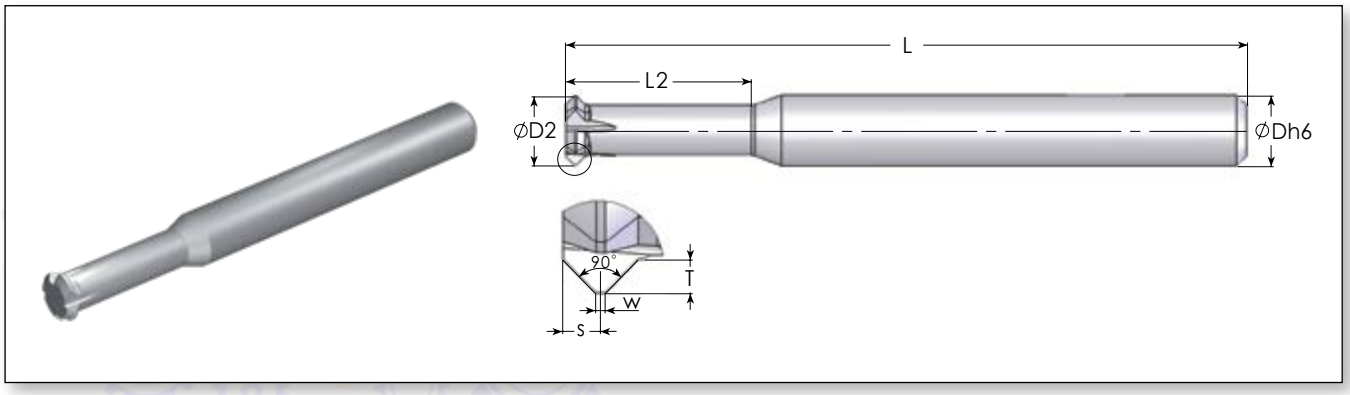
7 - Max. Chamfer Size	8 - Overhang Length	9 - Carbide Grade
06 - 0.6 mm 12 - 1.2 mm	L15 - 15 mm L25 - 25 mm L35 - 35 mm	VTH

Square Grooving



Size	Ordering Code	W +/-0.03mm	T max	D2	Dh6	L2	L	No. of Flutes
6.0mm	GS4C0700608-L15R00VTH	0.7	0.8	5.9	6.0	15.0	58	4
	GS4C0800608-L15R00VTH	0.8						
	GS4C0900608-L15R00VTH	0.9						
	GS4C1000608-L15R00VTH	1.0						
	GS4C1500608-L15R00VTH	1.5						
8.0mm	GS4C0700812-L25R00VTH	0.7	1.2	7.9	8.0	25.0	68	
	GS4C0800812-L25R00VTH	0.8						
	GS4C0900812-L25R00VTH	0.9						
	GS4C1000812-L25R00VTH	1.0						
	GS4C1500812-L25R00VTH	1.5						
	GS4C2000812-L25R00VTH	2.0						
10.0mm	GS6C0701015-L35R00VTH	0.7	1.5	9.9	10.0	35.0	78	6
	GS6C0801015-L35R00VTH	0.8						
	GS6C0901015-L35R00VTH	0.9						
	GS6C1001015-L35R00VTH	1.0						
	GS6C1501015-L35R00VTH	1.5						
	GS6C2001015-L35R00VTH	2.0						

Chamfering



Depth of Cut	Ordering Code							
T max mm		W	D2	Dh6	L2	L	S	No. of Flutes
0.6	GM3CH90 03006-L12 VTH	0.2	2.90	3	12.0	39	0.7	3
0.8	GM3CH90 04008-L10 VTH		3.90	4	10.0	51	0.9	
1.1	GM4CH90 05011-L12 VTH		4.95	5	12.5	51	1.2	4
0.6	GM4CH90 06006-L15 VTH		5.90	6	15.0	58	0.8	
	GM4CH90 06006-L25 VTH				25.0	68		
1.2	GM4CH90 08012-L25 VTH		7.90	8	25.0	68	1.4	
	GM4CH90 08012-L35 VTH				35.0	78		

GROOVE MILLING

GM Slot

Square Grooving, Round Grooving and Chamfering

ТОВ «СМАРТТЕК ІНЖИНІРИНГ», т. +380-50-396-90-96, info@smarttec.com.ua, https://www.smarttec.com.ua

СМАРТТЕК
РОЗУМНІ ТЕХНОЛОГІЇ

GM Slot

Groove Milling Tools with 3 corner indexable inserts for internal and external grooving, threading and chamfering applications

For Small and Medium Bore Diameters

- Min. bore diameter 12.7mm
- 3 flutes
- Width of groove 0.74 - 5.25mm
- Depth of groove max 3.25mm

GM Slot Groove Milling Technical Data

Recommended Grades, Cutting Speeds Vc [m/min], Feed f [mm/tooth]

Material Group	Vargus No.	Material		Hardness Brinell HB	Vc [m/min]	Feed f [mm/tooth]
P Steel	1	Unalloyed steel	Low carbon (C=.1-.25 %)	125	80-160	0.07-0.3
	2		Medium carbon (C=.25-.55 %)	150	80-150	0.07-0.3
	3		High Carbon (C=.55-.85 %)	170	80150	0.07-0.3
	4	Low alloy steel (alloying elements ≤5%)	Non hardened	180	80-160	0.07-0.3
	5		Hardened	275	80-150	0.07-0.3
	6		Hardened	350	80-140	0.07-0.25
	7	High alloy steel (alloying elements >5%)	Annealed	200	60-100	0.07-0.3
	8		Hardened	325	50-80	0.07-0.25
	9	Cast steel	Low alloy (alloying elements <5%)	200	80-160	0.07-0.25
	10		High alloy (alloying elements >5%)	225	60-120	0.07-0.25
M Stainless Steel	11	Stainless steel Ferritic	Non hardened	200	70-130	0.07-0.3
	12		Hardened	330	60-110	0.04-0.25
	13	Stainless steel Austenitic	Austenitic	180	70-130	0.07-0.3
	14		Super Austenitic	200	60-120	0.07-0.25
	15	Stainless steel Cast Ferritic	Non hardened	200	80-140	0.07-0.3
	16		Hardened	330	60-100	0.07-0.25
	17	Stainless steel Cast austenitic	Austenitic	200	80-140	0.07-0.3
	18		Hardened	330	60-100	0.07-0.25
K Cast Iron	28	Malleable Cast iron	Ferritic (short chips)	130	50-70	0.07-0.3
	29		Pearlitic (long chips)	230	80-140	0.07-0.25
	30	Grey cast iron	Low tensile strength	180	80-140	0.07-0.3
	31		High tensile strength	260	60-110	0.07-0.25
	32	Nodular SG iron	Ferritic	160	60-100	0.07-0.3
	33		Pearlitic	260	60-100	0.07-0.3
N(K) Non-Ferrous Metals	34	Aluminum alloys Wrought	Non aging	60	80-300	0.07-0.3
	35		Aged	100	100-250	0.07-0.3
	36	Aluminum alloys	Cast	75	100-200	0.07-0.3
	37		Cast & aged	90	100-220	0.07-0.3
	38	Aluminum alloys	Cast Si 13-22%	130	80-300	0.07-0.25
	39	Copper and copper alloys	Brass	90	80-300	0.07-0.3
	40		Bronze and non leaded copper	100	100-200	0.07-0.25
S(M) Heat Resistant Material	23	Titanium alloys	Pure 99.5 Ti	400Rm	40-80	0.07-0.13
	24		α+ß alloys	1050Rm	65-164	.0028-.0051

Grades and Their Application

Grade	Application Type	Sample
VBX	TiCN coated carbide grade. Excellent grade for steels and general use.	
VTX	TiAlN coated carbide grade. Ideal for Stainless Steels.	

GM Slot Inserts

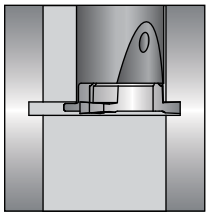
GM Slot Inserts - Ordering Code System

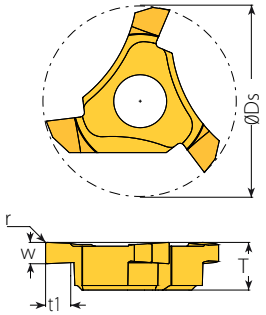
7	V	GS	1.21	-	1.50	GM	3	VBX
1	2	3	4		5	6	7	8

1 - Insert Size	2 - Insert Style	3 - Type of Application	4 - Groove Width	5 - Groove Depth (mm)
7 - I.C. 6.8 mm	**V** - Style	**GS** - Square Grooving	0.74 - 5.15 mm	1.50 mm
9 - I.C. 8.5 mm		**GSR** - Square Grooving with R		2.50 mm
11 - I.C. 10.7 mm		**GR** - Round Grooving		3.25 mm
		CH - Chamfering		

6 - System	7 - Cutting Edge Number	8 - Carbide Grade
GM - Groove Milling	3	VBX
		VTX

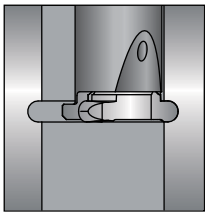
Square Grooving

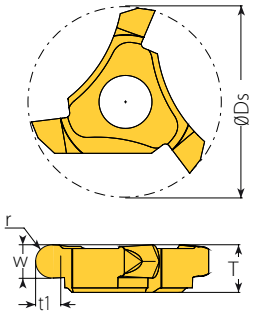




Insert Size	Ordering Code	Dimensions mm					Grade		Toolholder
	RH	W	Width of Circlip	t1	Ds	T	VBX	VTX	
7V	7VGS0.74-1.50GM3	0.74	0.70	1.50	12.7	3.15	•	•	CGMC8C13-40-7-3 CCGMC9C13-45-7-3 GMC20W13-25-7-3
	7VGS0.84-1.50GM3	0.84	0.80				•	•	
	7VGS0.94-1.50GM3	0.94	0.90				•	•	
	7VGS1.21-1.50GM3	1.21	1.10				•	•	
	7VGSR1.41-1.50GM3	1.41	1.30				•	•	
	7VGSR1.50-1.50GM3	1.50	-				•	•	
	7VGSR1.57-1.50GM3	1.57	1.50				•	•	
	7VGSR1.71-1.50GM3	1.71	1.60				•	•	
	7VGSR2.00-1.50GM3	2.00	-				•	•	
	7VGSR2.39-1.50GM3	2.39	2.30				•	•	
	7VGSR2.50-1.50GM3	2.50	-				•	•	
9V	9VGS1.17-2.50GM3	1.17	1.10	2.50	16.7	4.45	•	•	CGMC7/16C17-45-9-3 CGMC11.5C17-50-9-3 GMC20W17-35-9-3
	9VGS1.41-2.50GM3	1.41	1.30				•	•	
	9VGSR1.50-2.50GM3	1.50	-				•	•	
	9VGSR1.57-2.50GM3	1.57	1.50				•	•	
	9VGSR1.71-2.50GM3	1.71	1.60				•	•	
	9VGSR2.00-2.50GM3	2.00	-				•	•	
	9VGSR2.39-2.50GM3	2.39	2.30				•	•	
	9VGSR2.50-2.50GM3	2.50	-				•	•	
	9VGSR3.00-2.50GM3	3.00	-				•	•	
	9VGSR3.18-2.50GM3	3.18	3.10				•	•	
11V	11VGS1.17-3.25GM3	1.17	1.10	3.25	21.7	5.75	•	•	CGMC14C22-60-11-3 CGMC15C22-65-11-3 GMC25W22-45-11-3
	11VGS1.30-3.25GM3	1.30	-				•	•	
	11VGS1.42-3.25GM3	1.42	1.30				•	•	
	11VGSR1.50-3.25GM3	1.50	-				•	•	
	11VGSR1.55-3.25GM3	1.55	1.45				•	•	
	11VGSR1.57-3.25GM3	1.57	1.50				•	•	
	11VGSR1.71-3.25GM3	1.71	1.60				•	•	
	11VGSR1.85-3.25GM3	1.85	1.75				•	○	
	11VGSR2.00-3.25GM3	2.00	-				•	•	
	11VGSR2.39-3.25GM3	2.39	2.30				•	•	
	11VGSR2.50-3.25GM3	2.50	-				•	•	
	11VGSR3.00-3.25GM3	3.00	-				•	•	
	11VGSR3.18-3.25GM3	3.18	3.10				•	•	
	11VGSR4.00-3.25GM3	4.00	-				•	•	
	11VGSR4.75-3.25GM3	4.75	-				•	•	
	11VGSR5.26-3.25GM3	5.26	5.15				•	•	

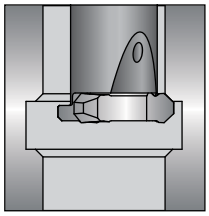
Round Grooving

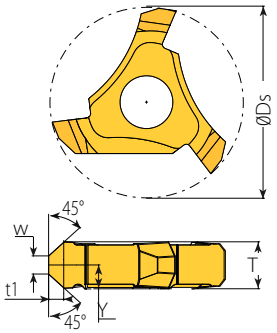




Insert Size	Ordering Code	Dimensions mm					Grade		Toolholder
	RH	W	t1	r	Ds	T	VBX	VTX	
7V	7VGR1.10-1.50GM3	2.20	1.50	1.1	12.70	3.15	•	•	CGMC 8C13-40-7-3 CCGMC 9C13-45-7-3 GMC 20W13-25-7-3
9V	9VGR1.10-2.50GM3	2.20	2.50	1.1	16.70	4.45	•	•	CGMC 11.5C17-50-9-3 CGMC 7/16C17-45-9-3 GMC 075W066-118-9-3
11V	11VGR1.00-3.25GM3	2.00	3.25	1.0	21.70	5.75	•	•	CGMC 15C22-65-11-3 CGMC 5/8C22-60-11-3 GMC 100W085-175-11-3
	11VGR1.10-3.25GM3	2.20		1.1			•	•	
	11VGR1.50-3.25GM3	3.00		1.5			•	•	

Chamfering





Insert Size	Ordering Code	Dimensions mm					Grade		Toolholder
	RH	W	t1	Ds	T	Y	VBX	VTX	
7V	7VCH1.20-1.50GM3	1.20	1.50	12.70	3.15	1.60	•	•	CGMC 9C13-45-7-3 CGMC 5/16C13-40-7-3 GMC 075W050-100-7-3"
9V	9VCH1.40-2.50GM3	1.40	2.50	16.70	4.45	2.23	•	•	CGMC 11.5C17-50-9-3 CGMC 7/16C17-45-9-3 GMC 075W066-118-9-3
11V	11VCH1.60-3.25GM3	1.60	3.25	21.70	5.75	2.88	•	•	CGMC 15C22-65-11-3 CGMC 5/8C22-60-11-3 GMC 100W085-175-11-3

GM Slot Toolholders

GM Slot Holders - Ordering Code System

Holders Ordering Code System

C	GM	9	C	13	-	45	-	7	-	3
1	2	3	4	5		6		7		8

1 - Holder Type
C- Carbide Shank
None - Steel Shank

2 - System
GM - Groove Milling

3 - Shank Dia.
8 - 25.4 mm

4 - Shank Style
C - Cylindrical
W - Weldon

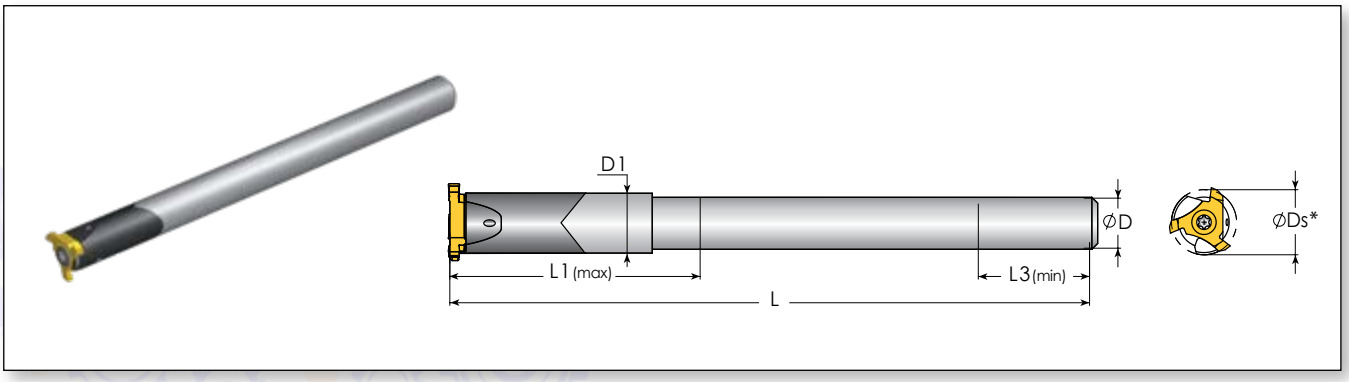
5 - Min Cutting Dia.
13 - 13.0mm
17 - 17.0mm
22 - 22.0mm

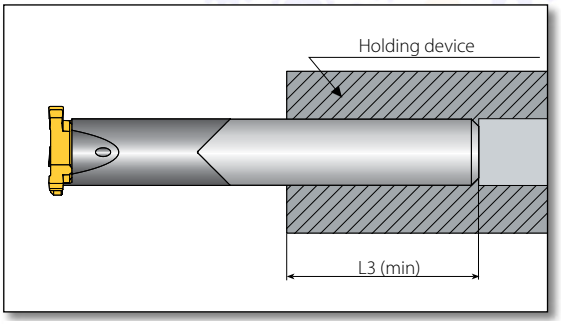
6 - Tool Overhang
25 - 25.0mm
30 - 30.0mm
40 - 40.0mm
45 - 45.0mm
50 - 50.0mm
60 - 60.0mm
65 - 65.0mm

7 - Insert Size
7 - I.C. 6.8mm
9 - I.C. 8.5mm
11 - I.C. 10.7mm

8 - Number of Flutes
3

Carbide Cylindrical Shanks





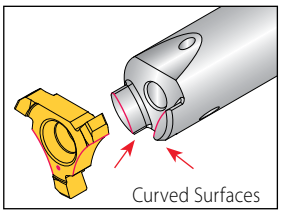
Insert Size	Ordering Code	Dimensions mm					Spare Parts				
		L	L1	L3 (min)	D	D1	Screw	Size	Key/Blade	Handle	Size
7V	CGMC9C13-45-7-3	115	45	20	9.0	9.0	SN2T8-M1	M3.0x.5x9	K2T	-	Torx T8
	CGMC5/16C13-40-7-3		40	18	8.0						
9V	CGMC11.5C17-50-9-3	125	50	25	11.5	11.5	SN3T15-M2	M4x.7x13.5	Blade T15-1/4	Smart Handle 1/4X2	Torx T15
	CGMC7/16C17-45-9-3		45	25	11.0						
11V	CGMC15C22-65-11-3	135	65	32	22.0	15.0	SN4T20-M3	M5x.8x15.5	Blade T20-1/4	Smart Handle 1/4X2	Torx T20
	CGMC5/8C22-65-11-3		65	34	16.0						

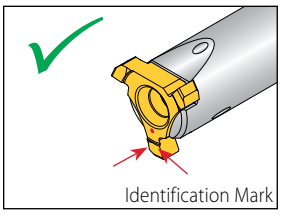
* øDs according to insert.

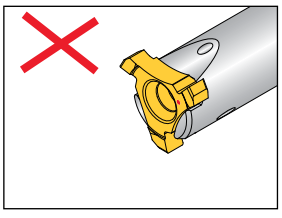
For Correct Clamping:

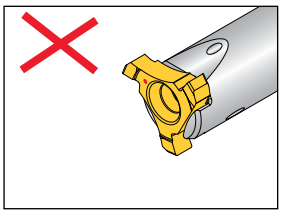
9V

11V



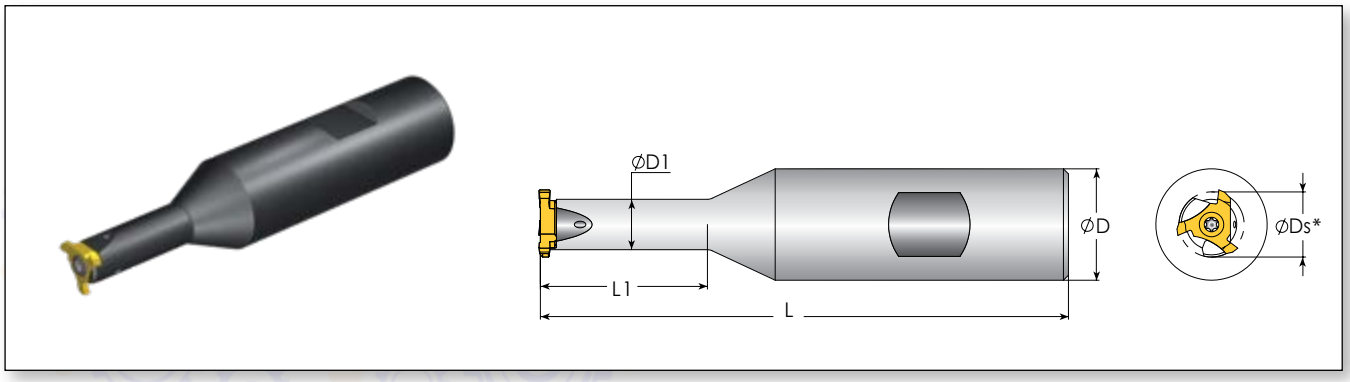






Always mount insert with the identification mark between the two curved surfaces on the toolholder

Weldon Shanks



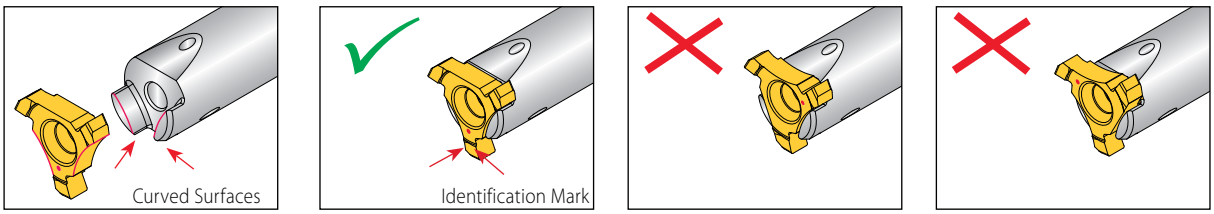
Insert Size	Ordering Code	Dimensions mm				Spare Parts				
		L	L1	D	D1	Screw	Size	Key/Blade	Handle	Size
7V	GMC 20W13-25-7-3	95.0	25.0	20.0	9.0	SN2T8-M1	M3.0x0.5x9	K2T	-	Torx T8
9V	GMC 20W17-30-9-3	100.0	30.0	20.0	11.5	SN3T15-M2	M4x0.7x13.5	Blade T15-1/4	Smart Handle 1/4X2	Torx T15
11V	GMC 25W22-45-11-3	115.0	45.0	25.0	15.0	SN4T20-M3	M5x0.8x15.5	Blade T20-1/4	Smart Handle 1/4X2	Torx T20

* øDs according to insert.

For Correct Clamping:

9V

11V



Always mount insert with the identification mark between the two curved surfaces on the toolholder

THREADING IS VARDEX

Advanced Threading Solutions

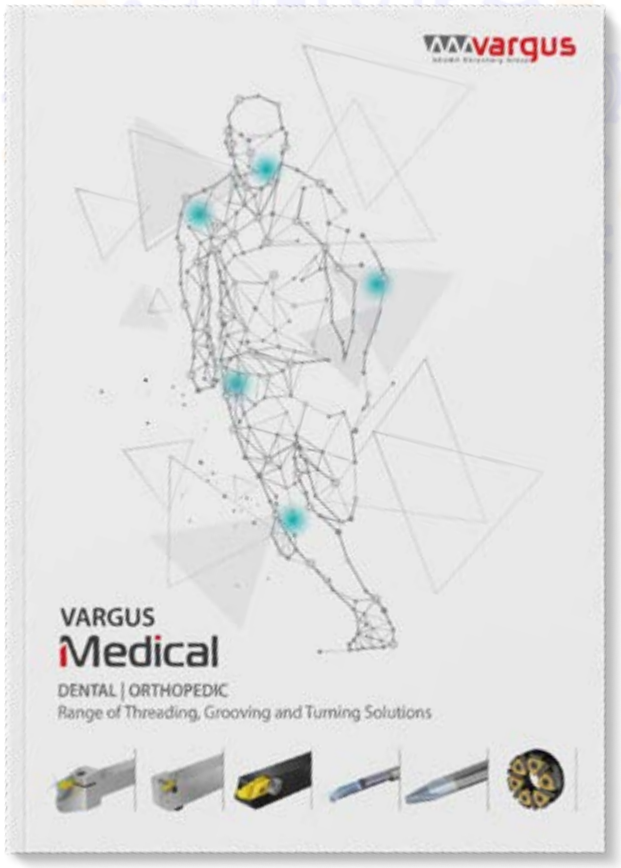
VARDEX is the company's prominent product line for Thread Turning, Thread Milling, and Gear Milling Solutions.

Thread Turning: The VARDEX TT tools offer an extensive collection of pitches and standards in different grades, IC ranges and types of insert styles, as well as customized solutions for the oil and gas industry.

Thread Milling: The VARDEX TM line provides a wide range of applications and solutions in multi-tooth, single-tooth point for deep holes, and solid carbide tools.

Gear Milling: The VARDEX Gear Milling line is a revolutionary concept for gear, rack and spline applications, offered in indexable inserts and solid carbide tools.

VARGUS GENius™: VARGUS' industry-leading Thread Turning and Thread Milling solutions are seamlessly complimented by the VARGUS GENius™ software – The most powerful tool selector, cutting data and CNC program generating software available.



VARGUS Medical

Introducing

VARGUS Solutions for the Medical Industry

In keeping with the demands for mass production and special tooling for the medical industry, VARGUS provides an encompassing range of solutions for the precise and detailed applications commonly used world-wide in this rapidly growing industry.
Whether it be the manufacturing of miniature dental implants, bone screws, bone plates, tulip heads, or other exact medical components, VARDEX and GROOVEX precision tools provide you with the excellent VARGUS quality so well known in the metal-cutting industry. Tailor-made tools are available on request with the added advantage of the VARGUS expertise and knowledge of more than 60 years.

Applications:

- Parting Off
- Turning
- Grooving
- Thread Turning
- Thread Milling
- Thread Whirling
- Boring
- Broaching

The Finishing Touch

SHAVIV
Leading Deburring Solutions

SHAVIV hand deburring tools offer a range of cost-effective and efficient solutions to companies across all industry sectors that need to remove burrs from different materials. The tools are renowned for providing "the finishing touch" in a host of applications, such as hole edges, straight edges, flat surfaces, keyways and corners.

Die & Mold | Electrical | Plastic | Automotive | Metal | Plumbing | Aviation | DIY

Metal | Aluminum | Copper | Cast Iron | Plastic | Wood

Introducing the SHAVIV GENius™

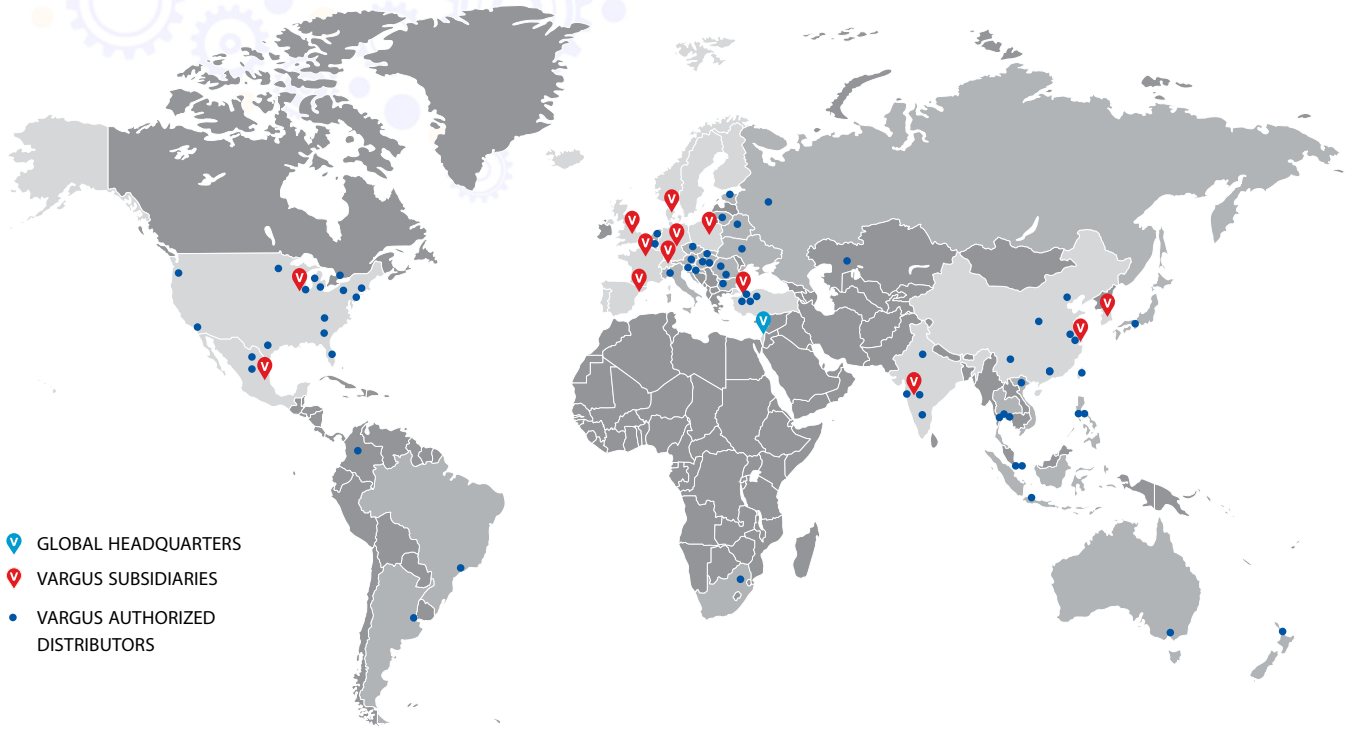
The world's first tool selector for hand deburring applications.

Get the right tool for any deburring, deflashing, countersinking or chamfering job in just 4 simple steps!
Visit www.SHAVIV-GENius.com

Notes

VARGUS Worldwide

With a network of 13 international companies and hundreds 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 innovative products and solutions of the highest quality and excellent value, and is renowned for its technical expertise and uncompromising service.



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GROOVEX

Innovative Grooving & Turning Solutions

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