Member IMC Group Tungaloy INDUSTRY 4.0

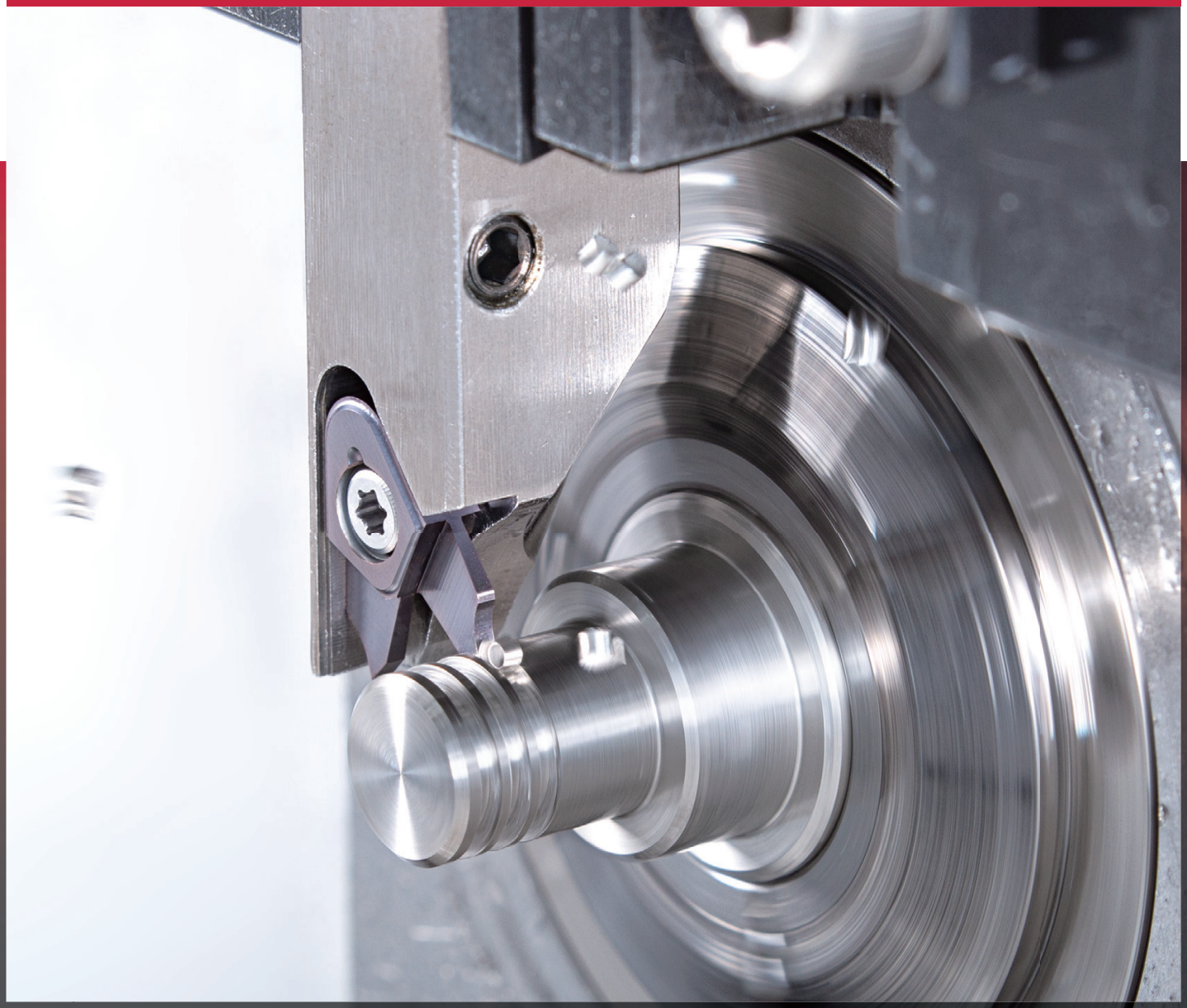
GrooveLine

Grooving and Threading Tools for CNC automatic lathes

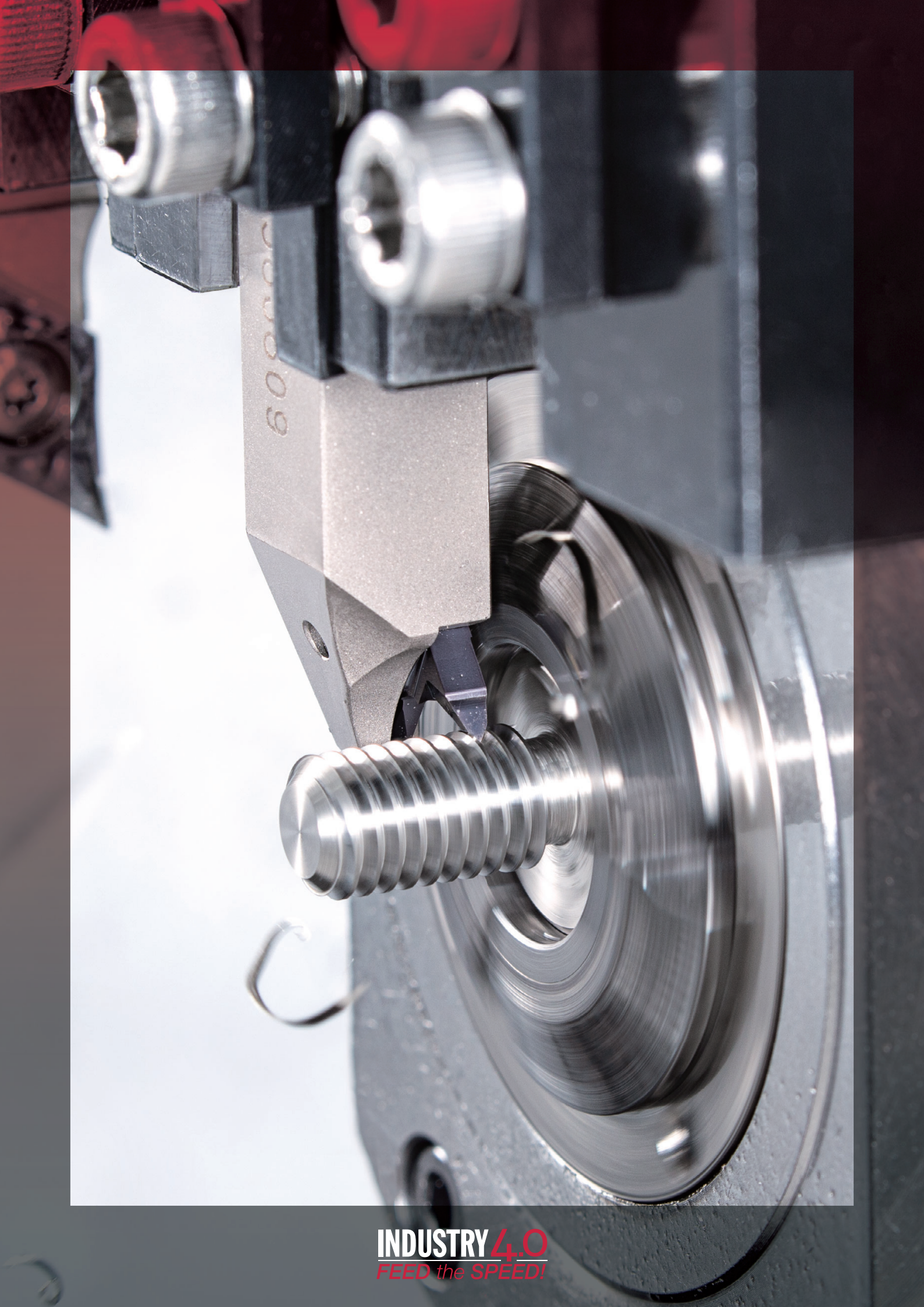
MINI V LOCK GROOVE

Tungaloy Report No. 557-US

High precision grooving and threading tool series for CNC automatic lathes



TUNGALOY ADDFORCE ACCELERATED LINES



INDUSTRY 4.0
FEED the SPEED!

TUNGALOY

ADDFORCE GROOVE

ACCELERATED PARTING AND GROOVING

MINI VLOCK GROOVE

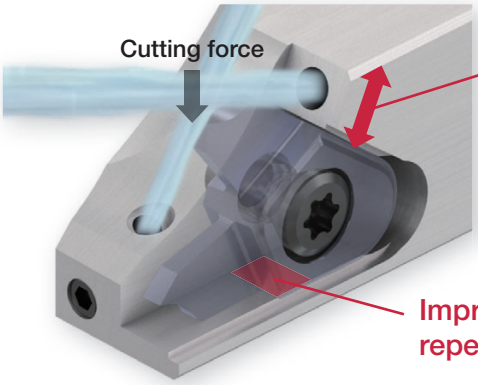
Toolholders with new insert clamping system for extra tool rigidity

Perfect for grooving and threading bar stocks of 0.472" (12 mm) or smaller diameters

MINIV LOCK GROOVE

Grooving and threading tools for CNC automatic lathes with unique insert clamping system for extra tool rigidity

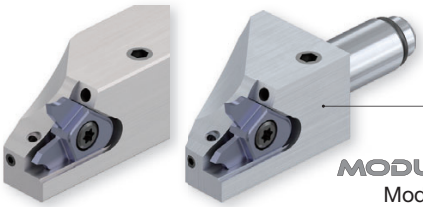
- V-shaped insert pocket retains the insert securely, enabling high precision machining
- Available in 06 (3/8") and 08 (1/2") square shanks
- High-pressure through coolant directed to the rake and back faces of the cutting edge for smooth machining process and prolonged tool life
- Same inserts for right-hand and left-hand toolholders



A thick support restricts the insert movements during machining.

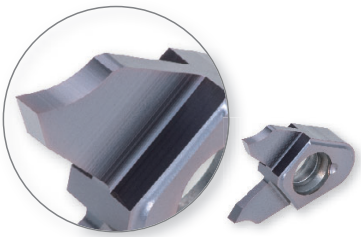
Improves the cutting edge repeatability

06 (3/8")



08 (1/2")

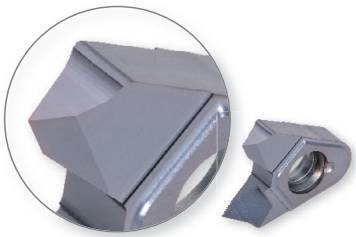
MODUMINI TURN
Modular head



For grooving

2-corner insert

CW = 0.013" - 0.039"



For threading

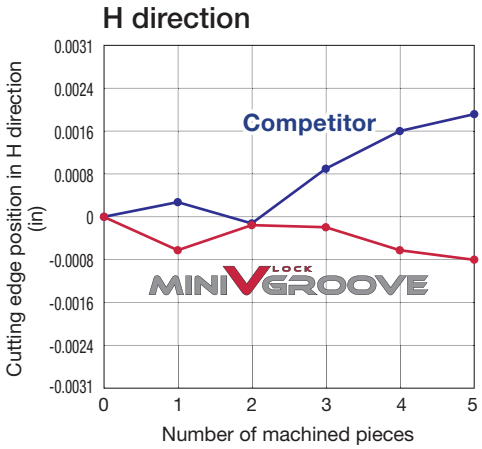
2-corner insert

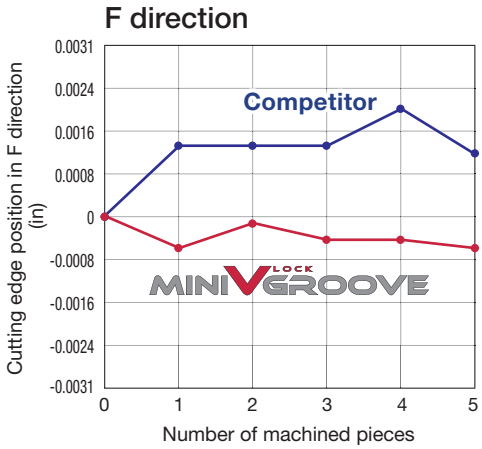
TPI: 64 - 12
(Pitch: 0.4 - 2 mm)
Cutting edge angle: 55°, 60°

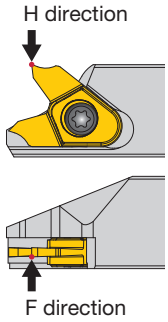
Slim shank design eliminates interference with neighboring tools

CUTTING PERFORMANCE

■ Tool rigidity



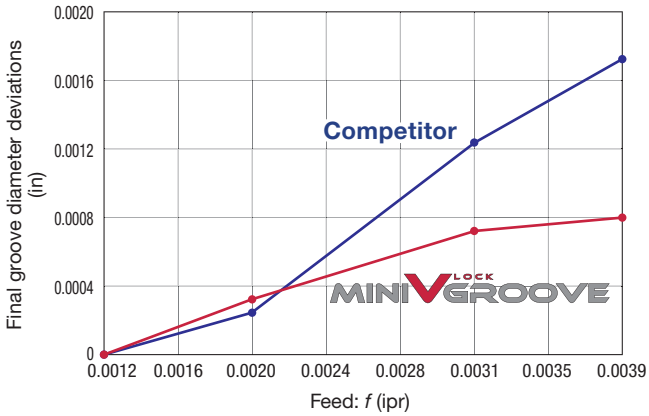




Process: Measure #1 → machining → Measure #2

Displacement of cutting edge position: Difference between Measure #1 & #2

■ Deviations of final groove diameters

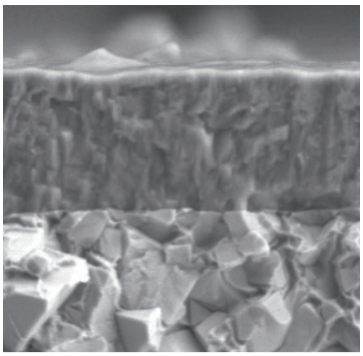


M

Toolholder	: SVER06-10
Insert	: VGP10-100F-005 SH725
Workpiece material	: 304
Barstock diameter	: ø0.472”
Cutting speed	: *Vc* = 262 sfm
Groove width	: CW = 0.039"
Coolant	: Oil

GRADE

SH725



PVD coated grade SH725

(Ti,Al)N coating combined with a tough carbide substrate dedicated for small parts machining offers excellent coating adhesion and edge sharpness.

Excellent resistance to wear and chip welding

Smooth coating surface of the cutting edge prevents coating from peeling off, while its incredible wear resistance provides longer tool life than existing grades.

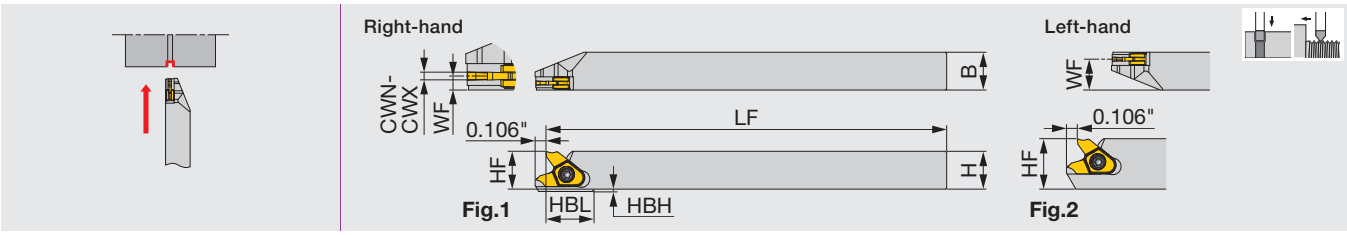
High resistance to plastic deformation

Tough carbide substrate offers stable and longer tool life.

TOOLHOLDERS

SVER/L

External grooving and threading toolholder



Inch	CWN	CWX	H	B	LF	HF	WF (1)	HBL	HBH	Insert	Torque	Fig.
SVER/L06-10	0.020	0.039	0.375	0.375	4.750	0.375	0.070/0.304	0.472	0.024	VG*10...	0.96	1
SVER/L08-10	0.020	0.039	0.500	0.500	4.750	0.500	0.070/0.430	-	-	VG*10...	0.96	2

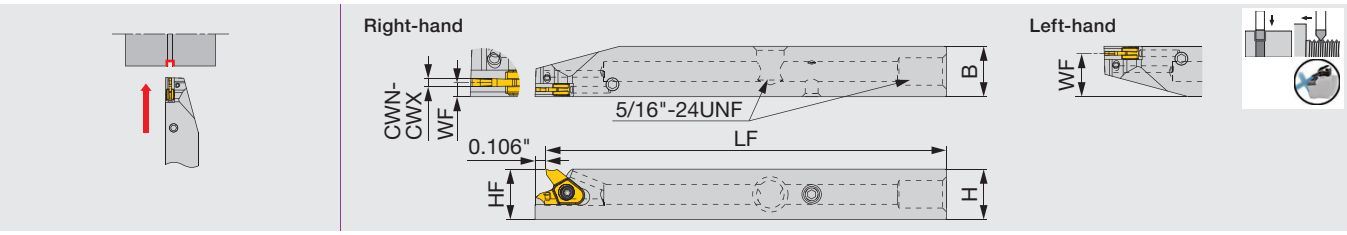
Torque: Recommended clamping torque: lbs·ft
(1) "WF" indicates the distance from the reference position to the center of the cutting edge width. The first value before "/" indicates the WF for the right-hand holder and the second value after "/" for the left-hand holder.

SPARE PARTS

Designation	Clamping screw	Wrench
SVER06/08...	CSTB-2.5L054DL	T-7F
SVEL06/08...	CSTB-2.5L054DR	T-7F

SVER/L-CHP

External grooving and threading toolholder, with high pressure coolant capability



Inch	CWN	CWX	H	B	LF	HF	WF (1)	Insert	Torque
SVER/L08-10-CHP	0.020	0.039	0.500	0.500	4.750	0.500	0.070/0.430	VG*10...	0.96

Compatible to the direct internal coolant supply system without the use of external coolant hose.
Torque: Recommended clamping torque: lbs·ft
(1) "WF" indicates the distance from the reference position to the center of the cutting edge width. The first value before "/" indicates the WF for the right-hand holder and the second value after "/" for the left-hand holder.

SPARE PARTS

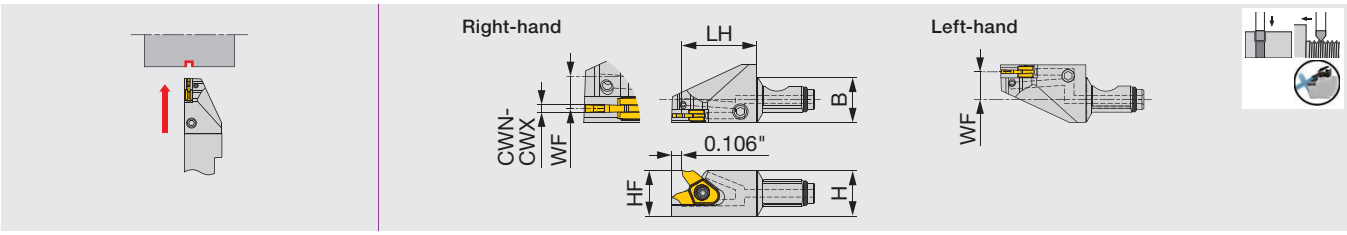
Designation	Clamping screw	Wrench 1	Coolant plug	Wrench 2	DirectJet plug	Wrench 3
SVER08...	CSTB-2.5L054DL	T-7F	SR5/16UNFTL360	P-4	SSHM4-6-TB	P-2
SVEL08...	CSTB-2.5L054DR	T-7F	SR5/16UNFTL360	P-4	SSHM4-6-TB	P-2

MODULAR HEAD

QC12-SVER/L-CHP

MODUMTURN

Modular head for external grooving and threading, with high pressure coolant capability



Inch	CWN	CWX	H	B	LH	HF	WF (1)	Insert	Torque
QC12-SVER/L10-CHP	0.020	0.039	0.472	0.472	0.768	0.472	0.165/0.283	VG*10...	0.96

Metric	CWN	CWX	H	B	LH	HF	WF (1)	Insert	Torque*
QC12-SVER/L10-CHP	0.5	1	12	12	19.5	12	4.19/7.19	VG*10...	1.3

Torque: Recommended clamping torque: lbs·ft (*N·m)
(1) "WF" indicates the distance from the reference position to the center of the cutting edge width. The first value before "/" indicates the WF for the right-hand holder and the second value after "/" for the left-hand holder.

SPARE PARTS

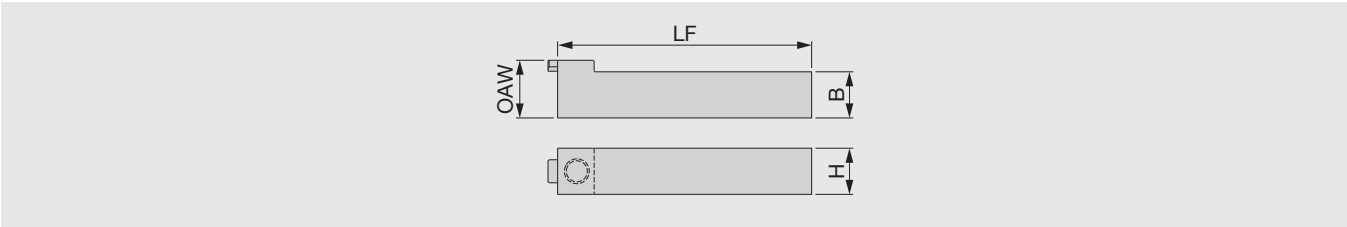
Designation	Clamping screw	Wrench	O-ring
QC12-SVER...	CSTB-2.5L054DL	T-7F	ORSS-0454.5X1.0NBR70
QC12-SVEL...	CSTB-2.5L054DR	T-7F	ORSS-0454.5X1.0NBR70

SHANKS

QC-08 and QC-1212

MODUMTURN

Shank for Interchangeable Heads (All metric heads are compatible with the inch shanks)



Inch	H	B	LF	OAW	Torque
QC-08F	0.500	0.500	2.560	0.590	2.21
QC-08X	0.500	0.500	3.940	0.590	2.21

Metric	H	B	LF	OAW	Torque*
QC-1212F	12	12	65	15	3
QC-1212X	12	12	100	15	3

Torque: Recommended clamping torque: lbs·ft (*N·m)

SPARE PARTS

Designation	Clamping screw	Wrench
QC-08*, QC-1212*	SRM6X0.5-26977	P-3

MODUMTURN
For more information

QC-08-CHP and QC-1212-CHP

MODUMINITURN

Shank for modular heads, with high pressure coolant capability

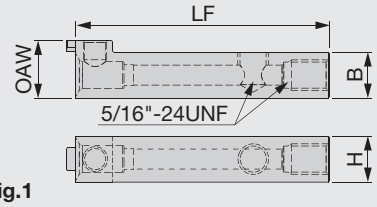


Fig.1

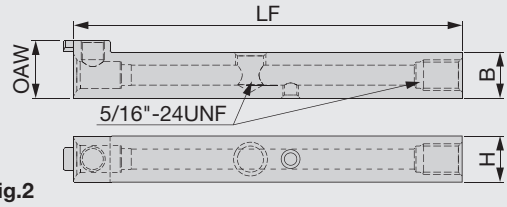


Fig.2

Inch	H	B	LF	OAW	Torque	Fig.
QC-08F-CHP	0.500	0.500	2.560	0.590	2.21	1
QC-08X-CHP (1)	0.500	0.500	3.940	0.590	2.21	2

Metric	H	B	LF	OAW	Torque*	Fig.
QC-1212F-CHP	12	12	65	15	3	1
QC-1212X-CHP (1)	12	12	100	15	3	2

(1) Compatible to the direct internal coolant supply system without the use of external coolant hose.
Through-coolant shank
Torque: Recommended clamping torque: lbs·ft (*N·m)

SPARE PARTS

Designation	Clamping screw	Wrench	Coolant plug	Wrench	DirectJet plug	Wrench
QC-08F-CHP, QC-1212F-CHP	SRM6X0.5-26977	P-3	SR5/16UNFTL360	P-4	-	-
QC-08X-CHP, QC-1212X-CHP	SRM6X0.5-26977	P-3	SR5/16UNFTL360	P-4	SSHM4-6-TB	P-2

Q12 heads fit both the metric QC-1212 and the inch QC08 shanks

QC-08-F10-CHP and QC-1216-F15-CHP

MODUMINITURN

Stepped-head shank for modular heads, with high pressure coolant capability

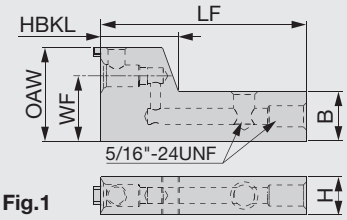


Fig.1

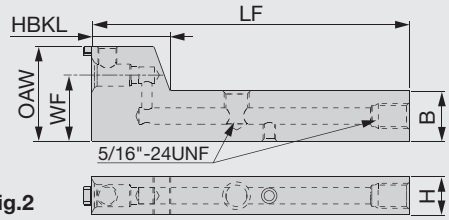


Fig.2

Inch	H	B	LF	WF	HBKL	OAW	Torque	Fig.
QC-08F-F10-CHP	0.500	0.625	2.560	0.861	0.980	1.220	2.21	1
QC-08X-F10-CHP (1)	0.500	0.625	3.940	0.861	0.980	1.220	2.21	2

Metric	H	B	LF	WF	HBKL	OAW	Torque*	Fig.
QC-1216F-F15-CHP	12	16	65	21	25	30	3	1
QC-1216X-F15-CHP (1)	12	16	100	21	25	30	3	2

(1) Compatible to the direct internal coolant supply system without the use of external coolant hose.
QC12 heads only can be mounted on these shanks.
Torque: Recommended clamping torque: lbs·ft (*N·m)

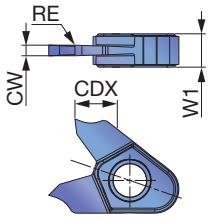
SPARE PARTS

Designation	Clamping screw	Wrench	Coolant plug	Wrench	DirectJet plug	Wrench
QC-08F-F10-CHP, QC-1216F-F15-CHP	SRM6X0.5-26977	P-3	SR5/16UNFTL360	P-4	-	-
QC-08X-F10-CHP, QC-1216X-F15-CHP	SRM6X0.5-26977	P-3	SR5/16UNFTL360	P-4	SSHM4-6-TB	P-2

QC12 heads fit both the metric QC-1216 and the inch QC-08 shanks.

INSERTS

VGP10 (For grooving / sharp edge)



P	Steel	★
M	Stainless	★
K	Cast iron	
N	Non-ferrous	★
S	Superalloys	★
H	Hard materials	

★ : First choice

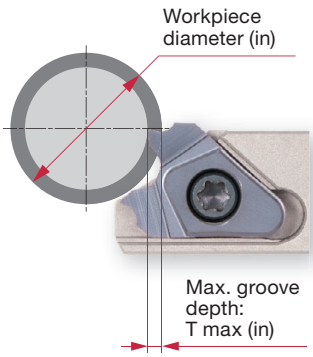
Designation	CW±0.025 (mm)	CW±0.001 (in)	RE (in)	Coated SH725	CDX* (in)	CUTDIA (in)	W1 (in)
VGP10-050F-000	0.5	0.020	0	●	0.098	0.197	0.124
VGP10-050F-005	0.5	0.020	0.002	●	0.098	0.197	0.124
VGP10-075F-000	0.75	0.030	0	●	0.118	0.236	0.124
VGP10-075F-005	0.75	0.030	0.002	●	0.118	0.236	0.124
VGP10-100F-000	1	0.039	0	●	0.157	0.315	0.124
VGP10-100F-005	1	0.039	0.002	●	0.157	0.315	0.124

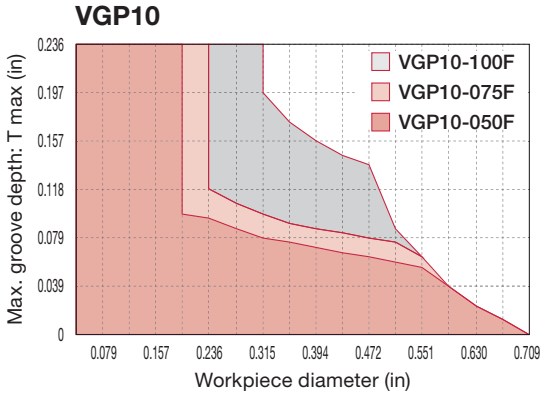
*Max grooving depth varies depending on workpiece diameters.
See below for details.

● : Line up

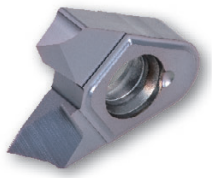
Note: Max grooving depths vs workpiece diameters

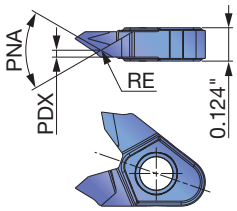
To avoid tool interference with the workpiece, max grooving depths (T max) for the insert used may be smaller than the CDX values listed above depending on the workpiece diameter.





VGT10 (For threading / sharp edge)





P	Steel	★
M	Stainless	★
K	Cast iron	
N	Non-ferrous	★
S	Superalloys	★
H	Hard materials	

★ : First choice

Designation	RE (in)	Coated	Pitch (mm)	TPI	PDX (in)	PNA
		SH725				
VGT10F-60A-005	0.002	●	0.4 - 1	64 - 25	0.026	60°
VGT10F-60A-010	0.004	●	1 - 2	25 - 12	0.038	60°
VGT10F-55A-005	0.002	●	0.6 - 1.5	40 - 16	0.033	55°

● : Line up

STANDARD CUTTING CONDITIONS

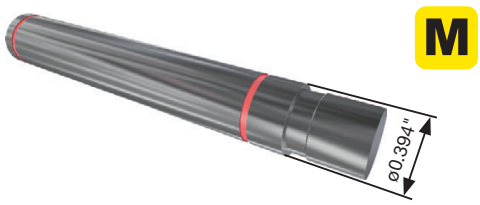
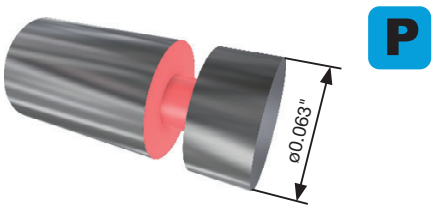
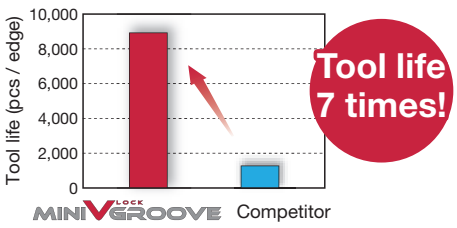
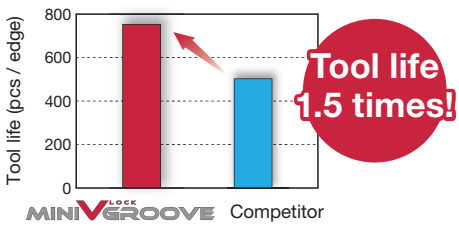
Grooving

ISO	Workpiece materials	Grade	Cutting speed *Vc* (sfm)	Feed *f* (ipr)
P	Low carbon steels 1015, 1020, etc.	SH725	164 - 492	0.0002 - 0.004
	Carbon steels, Alloy steels 1055, 4140, etc.	SH725	164 - 492	0.0002 - 0.004
	Free cutting steels SUH22, SUH23, etc.	SH725	164 - 492	0.0002 - 0.004
M	Stainless steels 304, etc.	SH725	164 - 328	0.0002 - 0.004
N	Aluminum alloys 5056, 6061, etc.	SH725	492 - 722	0.0002 - 0.004
	Copper alloy C2600, C280C, etc.	SH725	328 - 656	0.0002 - 0.004
S	Titanium alloys Ti-6Al-4V, etc.	SH725	98 - 262	0.0002 - 0.004
	Superalloys Inconel718, etc.	SH725	98 - 262	0.0002 - 0.004

Threading

ISO	Workpiece materials	Grade	Cutting speed *Vc* (sfm)	Pitch (mm)	TPI
P	Low carbon steels 1015, 1020, etc.	SH725	164 - 492	0.4 - 2	64 - 12
	Carbon steels, Alloy steels 1055, 4140, etc.	SH725	164 - 492	0.4 - 2	64 - 12
	Free cutting steels SUH22, SUH23, etc.	SH725	164 - 492	0.4 - 2	64 - 12
M	Stainless steels 304, etc.	SH725	164 - 328	0.4 - 2	64 - 12
N	Aluminum alloys 5056, 6061, etc.	SH725	492 - 722	0.4 - 2	64 - 12
	Copper alloy C2600, C280C, etc.	SH725	328 - 656	0.4 - 2	64 - 12
S	Titanium alloys Ti-6Al-4V, etc.	SH725	98 - 262	0.4 - 2	64 - 12
	Superalloys Inconel718, etc.	SH725	98 - 262	0.4 - 2	64 - 12

PRACTICAL EXAMPLES

	Workpiece type	Pin	Sensor part
	Toolholder	SVER06-10	SVER06-10
	Insert	VGP10-100F-000	VGP10-050F-000
	Grade	SH725	SH725
	Workpiece material	304	Tool steel
	Workpiece material		
Cutting conditions	Cutting speed: *Vc* (sfm)	197	164
Cutting conditions	Feed : *f* (ipr)	0.0008	0.0004
Cutting conditions	Groove width : CW (in)	0.039	0.020
Cutting conditions	Groove depth : in	0.008	0.020
Cutting conditions	Machining	External grooving	External grooving
Cutting conditions	Coolant	Oil	Oil
	Results	 **MiniV-LockGroove** provided excellent surface quality thanks to its high edge repeatability and a large rake angle, extending tool life by 7 times.	 **MiniV-LockGroove** provided superior part quality thanks to its light cutting geometry and secure insert clamping, extending tool life by 1.5 times.

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