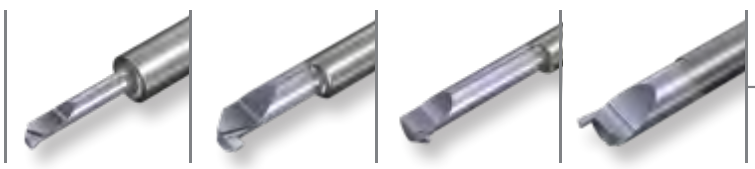
vargus
NEUMO Ehrenberg Group

INTERNAL MACHINING

micrOscope

Precise Turning, Grooving, Threading & Face Grooving



METRIC

GROOVEX
Innovative Grooving & Turning Solutions

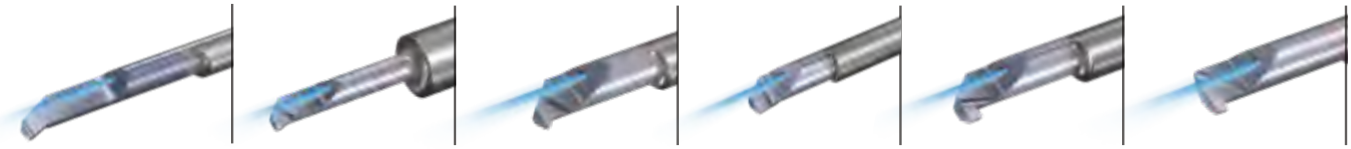
micrOscope

Micro Tools for Small Bores

The **Microscope** line offers new and improved solutions for micro boring, grooving, chamfering and threading in bores as small as 1.0 mm.
The **Microscope** line offers a large and extended range of single-ended inserts and a full range of toolholders with a simple clamping system.

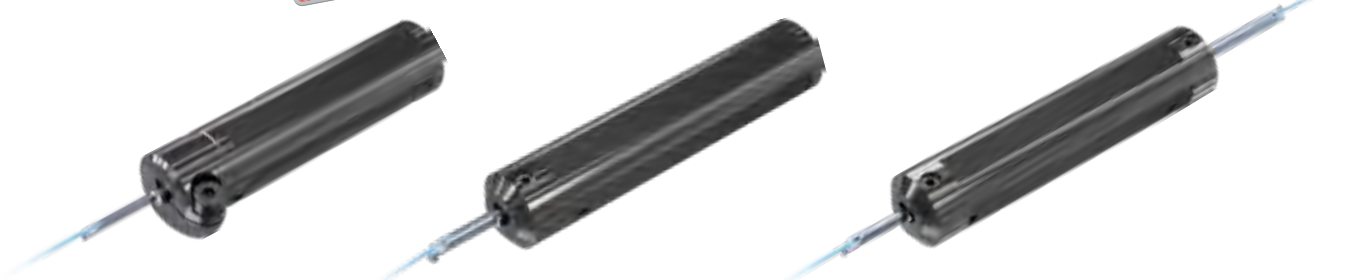
CONTENTS:

Internal Tools with High Pressure Coolant Thru NEW



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

Miniature Toolholders NEW



Shrink Toolholders | Round Toolholders without Shoulder | Double Sided Round Toolholders without Shoulder

Applications

Boring

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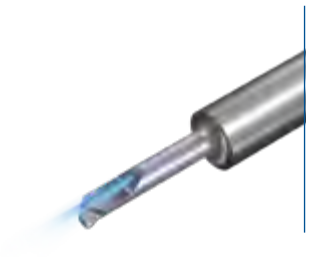
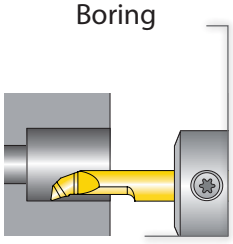
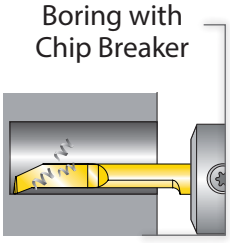


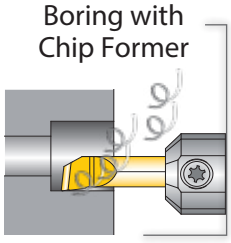
Boring



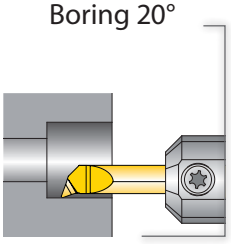
Boring with Chip Breaker



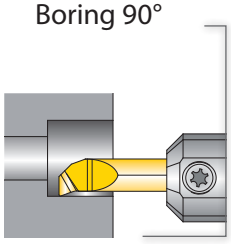
Boring with Chip Former



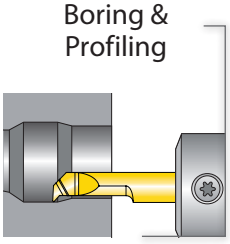
Boring 20°



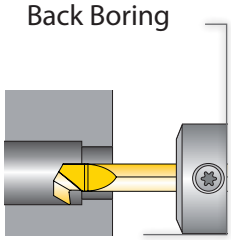
Boring 90°



Boring & Profiling



Back Boring



Chamfering

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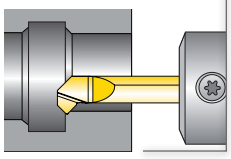
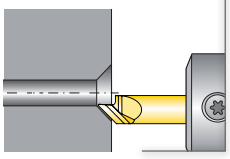
Boring & Chamfering



Face Chamfering



Grooving

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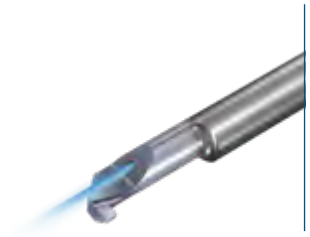
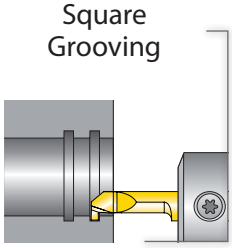
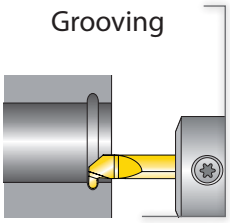


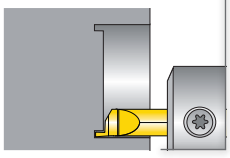
Square Grooving



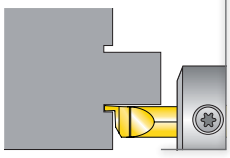
Round Grooving



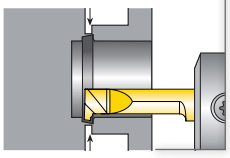
Face Grooving Internal



Face Grooving External



Pre-Part Off



Threading

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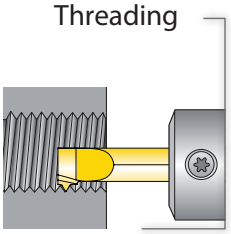
Threading



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	Aluminium Alloys Wrought	Non Aging	60	100-300
	35		Aged	100	100-150
	36	Aluminium Alloys	Cast	75	100-150
	37		Cast & Aged	90	60-100
	38	Aluminium Alloys	Cast Si 13-22%	130	100-150
	39	Copper and Copper Alloys	Brass	90	60-100
	40		Bronze and non leaded Copper	100	60-100
S(M) Heat Resistant Material	19	High Temperature Alloys	Annealed (Iron based)	200	25-45
	20		Aged (Iron based)	280	20-30
	21		Annealed (Nickel or Cobalt based)	250	15-20
	22		Aged (Nickel or Cobalt based)	350	10-15
	23	Titanium Alloys	Pure 99.5 Ti	400Rm	60-100
	24		α+β Alloys	1050Rm	40-50
H(K) Hardened Material	25	Extra Hard Steel	Hardened & Tempered	45-50HRc	20-45
	26			51-55HRc	20-40

Carbide Grade

VBX - TiCN PVD coated
VTX - AlTiN PVD coated

VTX

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

VBX

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

Boring Technical Data

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

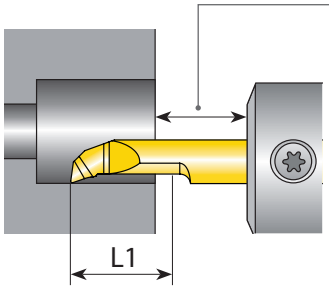
High Alloy Steel, 330 HB, 2100 Kc [N/mm^2]			
D min.	Vmax mm^2	ap max. (mm)	f mm/rev
1 mm - 1.7 mm	0.0012	0.08	0.015
1.8 mm - 2.7mm	0.0017	0.10	0.017
2.8 mm - 3.2 mm	0.0031	0.18	0.017
3.3 mm - 3.7 mm	0.0040	0.22	0.018
3.8 mm - 4.2 mm	0.0050	0.25	0.020
4.3 mm - 5.2 mm	0.0084	0.30	0.028
5.2 mm - 6.2 mm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

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

Machining Recommendation

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

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



Grooving Technical Data

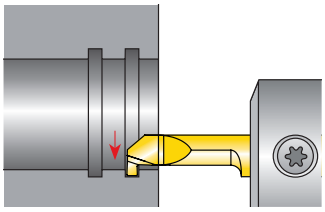
Recommended VBX Cutting Speeds Vc [m/min] and Feed f [mm/rev]

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

Carbide Grade

VBX - TiCN PVD coated
VTX - AlTiN PVD coated

Machining Recommendation



Machine the groove in one motion instead of intervals.

VTX

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

VBX

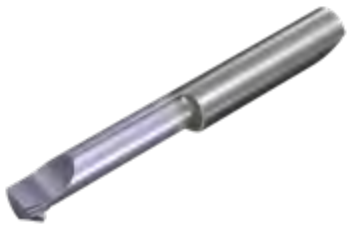
Excellent for all applications and outstanding wear resistance in low-to-medium cutting speeds, combined with good fracture toughness.
TiCN PVD coated.

Threading Technical Data

Recommended VBX Cutting Speeds Vc [m/min]

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

Carbide Grade

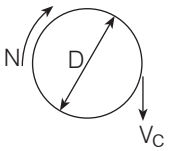


VBX - TiCN PVD coated
VTX - AlTiN PVD coated

Calculation of N [RPM]

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

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



N - Revolution Per Minute [RPM]
V_C - Cutting Speed [m/mm]
D - Workpiece Diameter [mm]

Number of Passes for Threading

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

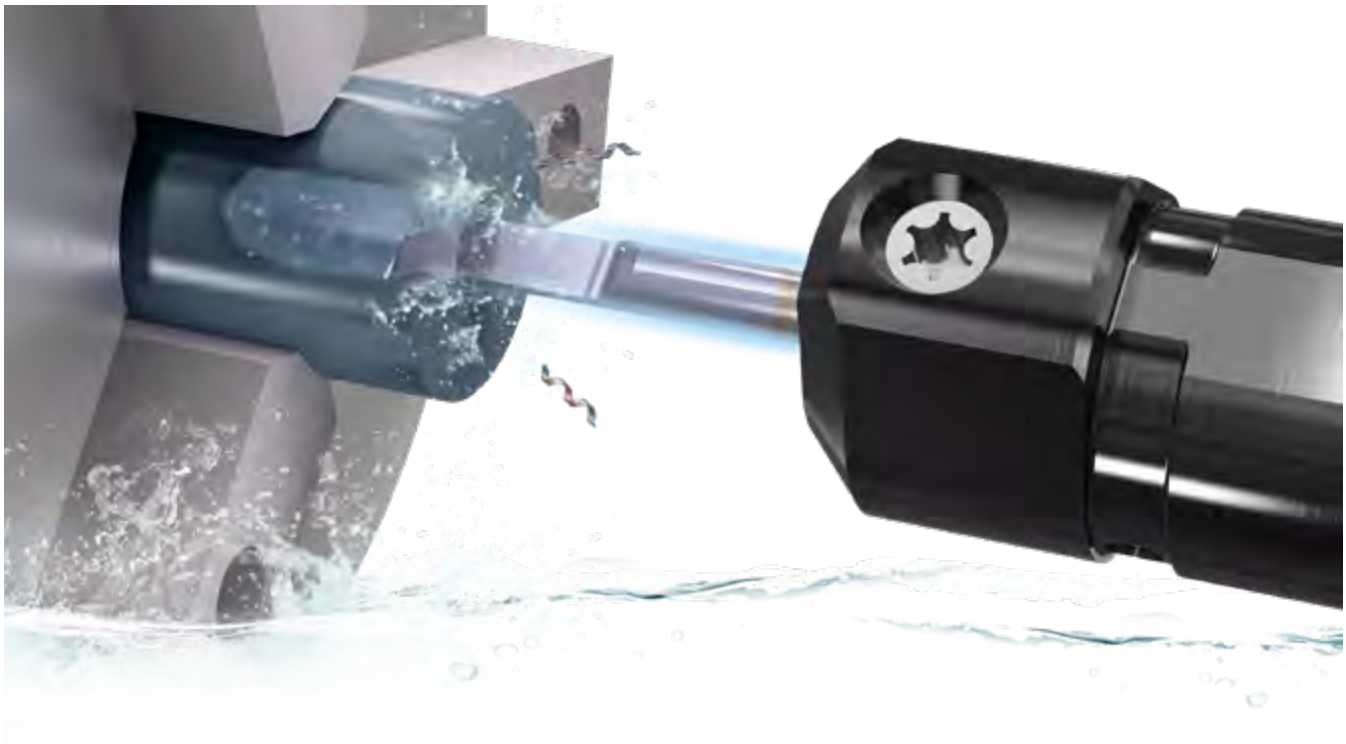
VTX

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

VBX

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

micrOscope Inserts



microscope Insert Ordering Code

Boring:

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

Grooving:

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

Threading:

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

1- Product Line

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

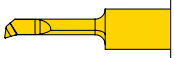
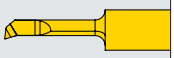
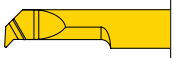
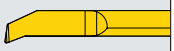
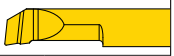
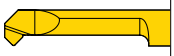
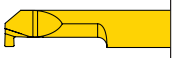
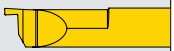
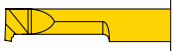
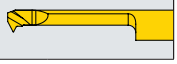
2 - Shank Dia.

4, 5, 6, 7

3 - Min. Bore Dia. (mm)

1.7, 2.2, 3.2…

4 - Application Type

BC	Boring	
BE	Boring with Edge Prep	
B20	Boring 20°	
B90	Boring 90°	
CL	Boring & Profiling	
BCB	Boring with Chip Breaker	
BCF	Boring with Chip Former	
BB	Back Boring	
CH4545	Boring & Chamfering 45°	
CH45	Face Chamfering 45°	
GS	Square Grooving	
GR	Round Grooving	
FG	Face Grooving Internal	
FP	Face Grooving External	
PP	Pre-Part Off	
TH	Threading	

5 - Boring Nose Radius

0.05, 0.1, 0.15, 0.2 (mm)

5 - Grooving Width

079 - 318 (mm)

5 - Threading Pitch

Full Profile - Pitch Range	
mm	TPI
0.5 - 1.5	28-18
Partial Profile - Pitch Range	
mm	TPI
A 0.5 - 1.5	A 48-16
F 0.5 - 1.0	F 48-24

6 - Threading Standard

A60 - Partial Profile 60°
A55 - Partial Profile 55°
ISO - ISO Metric
UN - American UN
NPT - NPT
W - Whitworth for BSW, BSP
TR - Trapez

7 - Maximum Length of Cut (mm)

L10 - 10mm, L15 - 15mm…

8 - RH or LH

R - RH
L - LH

9 - Coolant

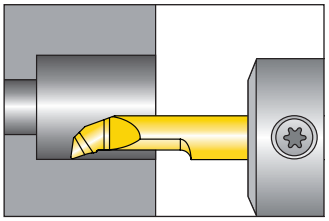
C - Internal Coolant
NONE - Without Coolant

10 - Carbide Grade

VBX, VTX

Boring NEW

Internal



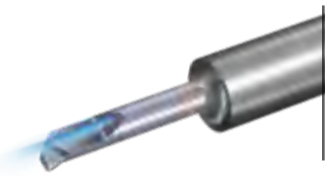


Figure 1: M...

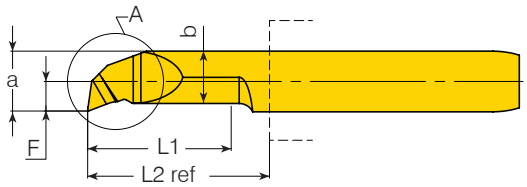
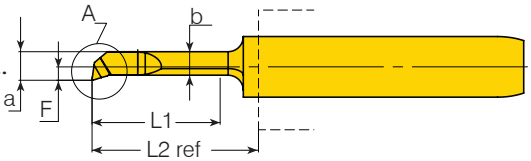
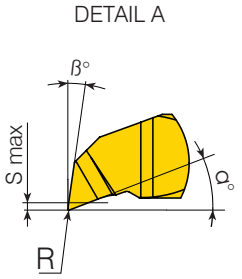


Figure 2: MC...





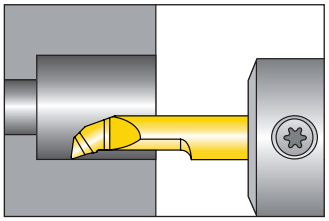
* L2 Ref: Repeatability within +/-0.02

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/L	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/L	6.0	0.05	0.48	0.15	0.96	0.71	16.4		8.8	25.75	•	○
		MC410BCR10L06R/L	6.0	0.1	0.48	0.15	0.96	0.81	17		8.8	25.75	•	○
	1.5	MC415BCR10L09R/L	9.0	0.1	0.74	0.15	1.45	1.22	16		11.5	28.5	•	○
	1.7	MC417BCR05L06R/L	6.0	0.05	0.62		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	0.2	1.43	1.04	16		11.5	28.5	•	○
		MC417BCR10L09R/L	9.0	0.1	0.82		1.63	1.3	16		11.5	28.5	•	○
	1.9	MC419BCR05L6R **	6.0	0.05	0.72		1.62	1.2	16		11.5	28.5	•	○
		MC419BCR05L9R **	9.0	0.05	0.72		1.62	1.2	16		11.5	28.5	•	○
	2.2	MC422BCR05L06R/L	6.0	0.05	0.88		1.88	1.55	17.7		11.5	28.5	•	○
		MC422BCR10L06R/L	6.0	0.1	0.93		1.93	1.55	17.7		11.5	28.5	•	○
		MC422BCR05L09R/L	9.0	0.05	0.88		1.88	1.55	17.7		11.5	28.5	•	○
		MC422BCR10L09R/L	9.0		0.1		2.06	1.76	17.7		11.5	28.5	•	○
		MC422BCR10L14R/L	14.0		1.04		2.04	1.76	17.7		18.2	35.2	•	•
		MC422BER10L14R/L	14.0	0.1	1.04		2.04	1.76	1.77		18.2	35.2	○	•
	2.7	MC427BCR05L10R/L	10.0		0.05		2.47	2.06	17.5		11.5	28.5	•	○
		MC427BCR15L10R/L	10.0		1.19		2.41	2.06	17.5		11.5	28.5	•	○
		MC427BCR15L15R/L	15.0	0.15	0.15	0.2	2.48	2.06	17.5	8	18.2	35.2	•	•
		MC427BER15L15R/L	15.0		0.15		2.48	2.06	17.5		18.2	35.2	○	•
		MC427BCR05L16R/L	16.0	0.05	1.22		2.47	2.06	17.5		18.2	35.2	•	•
		MC427BER05L16R/L	16.0	0.05	1.22		2.47	2.06	17.5		18.2	35.2	○	•
	3.0	MC430BCR05L10R**	10.0	0.05	1.33		2.7	2.25	17.5		11.5	28.7	○	•
		MC430BCR05L16R/L	16.0	0.05	1.33		2.7	2.25	17.5		18.2	35.2	•	○
		MC430BCR15L20R/L	20.0	0.15	1.36		2.7	2.36	17.5		22.8	39.8	•	○
		M430BCR15L20RC**	20.0	0.15	1.36		2.7	2.36	17.5		22.8	39.8	○	•
		MC430BCR05L26R**	26.0	0.05	1.33		2.7	2.25	17.5		28.7	45.7	•	○

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

Internal



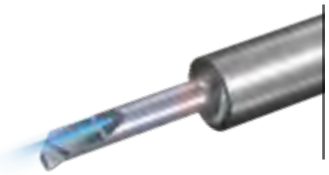


Figure 1: M...

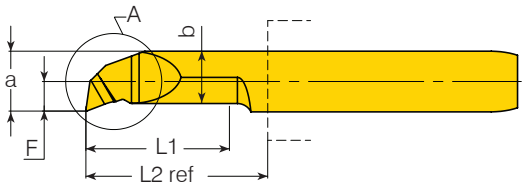
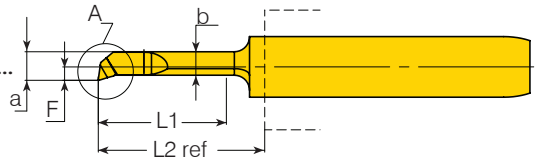
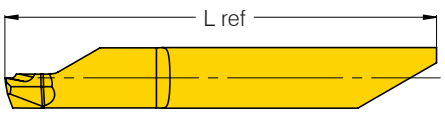
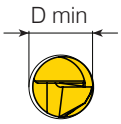


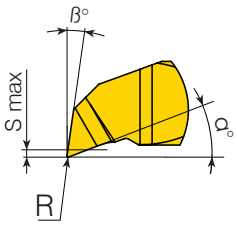
Figure 2: MC...







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	●	○
		M432BCR15L10RC**	10.0	0.15	1.44		2.9	2.5	17.5		11.5	28.5	○	●
		MC432BCR05L16R/L	16.0	0.05	1.43		2.9	2.45	17.5		18.2	35.2	●	●
		MC432BER05L16R/L	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/L	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/L	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/L	20.0	0.15	1.4		2.87	2.45	17.5		22.8	39.8	○	●
		M432BCR15L20RC**	20.0	0.15	1.4		2.87	2.45	17.5		22.8	39.8	○	●
	3.7	MC437BCR05L10R**	10.0	0.05	1.78		3.48	3.05	17.5		11.5	28.5	●	○
		MC437BCR15L10R/L	10.0	0.15	1.74		3.44	3.05	17.5		11.5	28.5	●	○
		MC437BCR15L15R/L	15.0	0.15	1.74		3.44	3.05	17.5		18.2	35.2	●	○
		MC437BCR15L20R/L	20.0	0.15	1.74		3.44	3.05	17.5		22.8	39.8	●	○
		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		11.5	28.5	○	●
		M442BCR05L10R**	10.0	0.05	1.95		3.95	3.45	21		11.5	28.5	●	○
		MS442BCR15L10R/L	10.0	0.15	1.93		3.93	3.13	19		11.5	28.5	●	○
		M442BCR15L10RC**	10.0	0.15	1.93		3.93	3.13	19		11.5	28.5	○	●
		M442BCR05L16R/L	16.0	0.05	1.95		3.95	3.45	21		18.2	35.2	●	○
		M442BCR03L15R**	15.0	0.03	1.98		3.98	3.13	19		18.2	35.2	○	●
		MS442BCR15L16R/L	16.0	0.15	1.93		3.93	3.13	19		18.2	35.2	●	○
		M442BCR05L21R/L	21.0	0.05	1.95		3.95	3.45	21		22.8	39.8	●	○
		MS442BCR15L21R/L	21.0	0.15	1.93		3.93	3.13	19		22.8	39.8	●	○
		M442BCR15L21RC**	21.0	0.15	1.93		3.93	3.13	19		22.8	39.8	○	●
		M442BCR03L25R**	25.0	0.03	1.98		3.98	3.13	19		28.7	45.7	○	●
		M442BCR05L26R/L	26.0	0.05	1.95		3.95	3.45	21		28.7	45.7	●	○
		MS442BCR15L26R/L	26.0	0.15	1.93		3.93	3.13	19		28.7	45.7	●	○
		M442BCR05L30R**	30.0	0.05	1.95		3.95	3.45	21		33.7	50.7	●	○

** LH Tools are available upon request.

● In stock ○ Available upon request

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

Boring (con't)

NEW

Internal

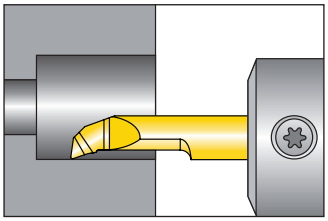
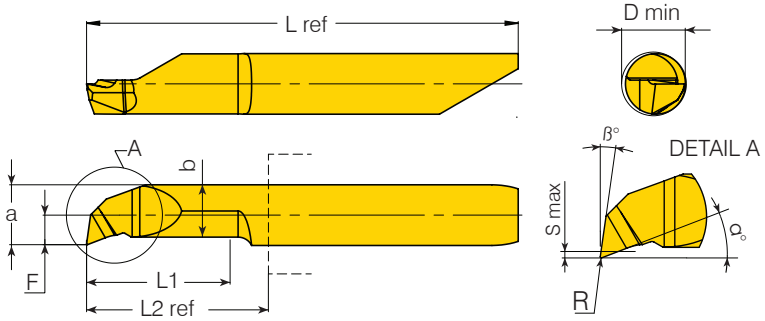


Figure 1: M...



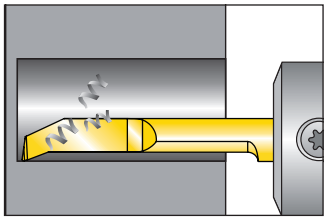
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
5.0	5.2	M552BCR05L10R**	10.0	0.05	2.43	0.5	4.93	4.24	19	8	12.15	35	○	●
		M552BCR20L10RC**	10.0	0.20	2.44		4.94	4.04	21		12.15	35	●	○
		M552BCR20L10R/L	10.0	0.20	2.44		4.94	4.04			12.15	35	●	○
		M552BCR03L15R**	15.0	0.03	2.44		4.94	4.24			18.15	41	○	●
		M552BCR20L16R/L	16.0	0.20	2.44		4.94	4.04			18.15	41	●	○
		M552BCR05L20R**	20.0	0.05	2.43		4.93	4.24			23.15	46	●	○
		M552BCR20L21RC**	21.0	0.20	2.44		4.94	4.04			23.15	46	○	●
		M552BCR20L21R/L	21.0	0.20	2.44		4.94	4.04			23.15	46	●	●
		M552BER20L21R/L	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/L	26.0	0.20	2.44		4.94	4.04			28.15	51	○	●
		M552BCR05L30R**	30.0	0.05	2.42		4.92	4.24			32.15	55	●	○
		M552BCR20L30R/L	30.0	0.20	2.44		4.94	4.04			32.15	55	●	○
		M552BCR20L30RC**	30.0		2.44		4.94	4.04			32.15	55	○	●
		M552BCR20L35R/L	35.0		2.44		4.94	4.04			37.15	60	●	○
		M552BCR20L35RC**	35.0		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/L	21.0	0.20							23.3	47	●	○
		M662BCR20L26R/L	26.0								28.3	52	●	○
		M662BCR20L30R/L	30.0								32.3	56	●	●
		M662BER20L30R/L	30.0								32.3	56	○	●
		M662BCR20L35R/L	35.0								37.3	61	●	●
		M662BER20L35R/L	35.0								37.3	61	○	●
		M662BCR20L40R/L	40.0								42.3	66	●	○
		M662BCR05L30R**	30.0	0.05							32.3	56	○	●
7.0	7.2	M772BCR20L15R**	15.0	0.20	3.44	0.5	6.94	5.74	22	8	16.4	41	●	○
		M772BCR20L25R/L	25.0								26.4	51	●	○
		M772BCR20L30R**	30.0								31.4	56	○	●
		M772BCR20L35R/L	35.0								36.4	61	●	○
		M772BCR20L40R/L	40.0								41.4	66	●	●
		M772BER20L40R/L	40.0								41.4	66	○	●
		M772BCR20L45R/L	45.0								46.4	71	●	●
		M772BER20L45R/L	45.0								46.4	71	○	●
		M772BCR20L50R/L	50.0								51.4	76	●	○

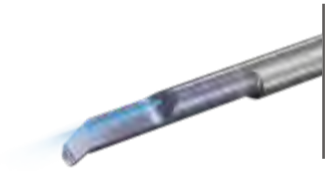
** LH Tools are available upon request.
● In stock ○ Available upon request
Inserts marked with C are available with internal coolant.
Inserts marked with E are available with edge prep.

Boring with Chip Breaker

NEW

Internal





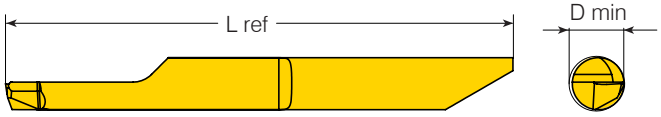


Figure 1: M...

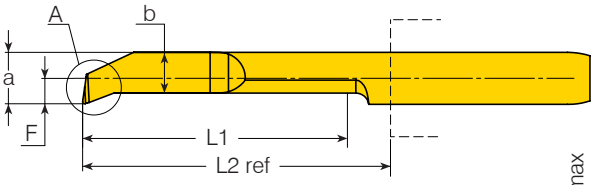
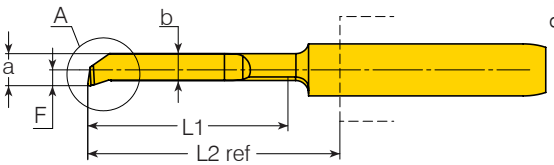
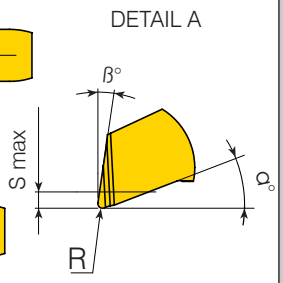


Figure 2: MC...





* L2 Ref: Repeatability within +/-0.02

Right hand shown

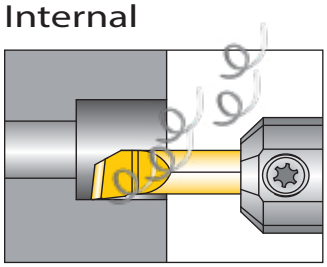
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	2.2	MC422BCBR10L14R	14	0.1	1.04	0.2	2.04	1.76	18	8	18.2	35.2	•	○
	2.7	MC427BCBR15L15R	15	0.15	1.22		2.47	2.06			18.2	35.2	•	○
		MC427BCBR05L15R		0.05	1.22		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	M442BCBR05L15R	15	0.05	1.95	0.3	3.95	3.13	21		18.2	35.2	•	○
		M442BCBR15L15R		0.15	1.95		3.95	3.13			18.2	35.2	•	○
		M442BCBR05L20R	20	0.05	1.95		3.95	3.13			22.8	39.8	•	○
		M442BCBR15L20R		0.15	1.95		3.95	3.13			22.8	39.8	•	○
		M442BCBR15L20RC		0.15	1.95		3.95	3.13			22.8	39.8	○	•
5.0	5.2	M552BCBR20L20R			2.44		4.94	4.04			23.15	46	•	○
		M552BCBR20L25R	25		2.44		4.94	4.04			28.15	51	•	○
		M552BCBR20L25RC	25		2.44		4.94	4.04			28.15	51	○	•
6.0	6.2	M662BCBR20L30R	30	0.2	2.93	0.5	5.93	4.73	22		32.3	56	•	○
		M662BCBR20L35R	35		2.93		5.93	4.73			37.3	61	•	○
7.0	7.2	M772BCBR20L40R	40		3.44		6.94	5.74			41.4	66	•	○
		M772BCBR20L45R	45		3.44		6.94	5.74			46.4	71	•	○

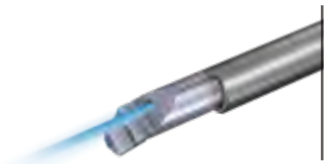
• In stock ○ Available upon request
All tools are available in LH upon request.
Inserts marked with C are available with internal coolant.

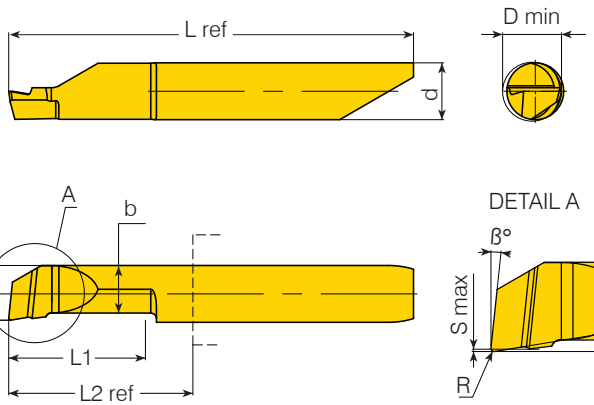
Boring with Chip Former

NEW

Internal







* L2 Ref: Repeatability within +/-0.02

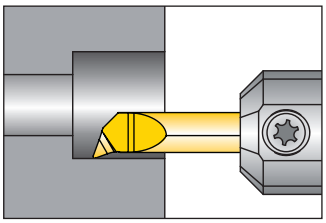
Right hand shown

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	MS442BCFR15L10R/L	10.0	0.15	1.85	0.05	3.85	3.35	9.4	6	11.5	28.5	●	○
		M442BCFR15L10RC	10.0								11.5	28.5	○	●
		MS442BCFR15L15R/L	15.0								18.2	35.2	●	○
		MS442BCFR15L20R/L	20.0								22.8	39.8	●	○
5.0	5.2	M552BCFR20L10R	10.0	0.2	2.35		4.85	4.25			12.15	35	●	○
		M552BCFR20L15R	15.0								18.15	41	●	○
		M552BCFR20L20R/L	20.0								23.15	46	●	○
		M552BCFR20L25R	25.0								28.15	51	●	○
		M552BCFR20L30R	30.0								32.15	55	●	○
6.0	6.2	M662BCFR20L15R	15.0		2.85		5.85	5.1			18.3	42	●	○
		M662BCFR20L20R/L	20.0								23.3	47	●	○
		M662BCFR20L25R	25.0								28.3	52	●	○
		M662BCFR20L30R	30.0								32.3	56	●	○
		M662BCFR20L35R	35.0								37.3	61	●	○
7.0	7.2	M772BCFR20L15R	15.0		3.4		6.9	6.1			16.4	41	●	○
		M772BCFR20L20R	20.0								26.4	51	●	○
		M772BCFR20L25R	25.0								26.4	51	●	○
		M772BCFR20L30R	30.0								36.4	61	●	○
		M772BCFR20L35R/L	35.0								36.4	61	●	○
		M772BCFR20L40R	40.0								41.4	66	●	○

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

Boring 20°

Internal



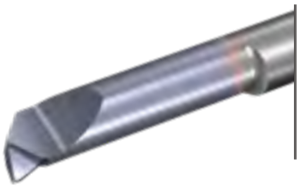


Figure 1: M...

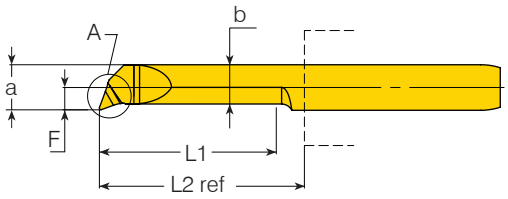
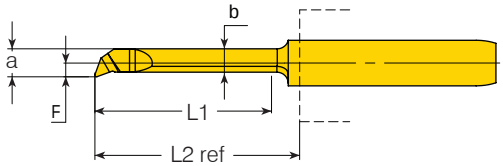
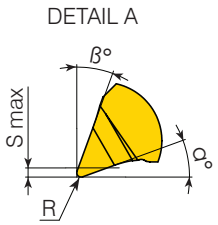


Figure 2: MC...





* L2 Ref: Repeatability within +/-0.02

Right hand shown

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

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

Boring 90°

Internal

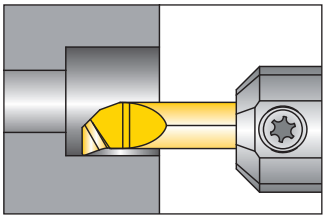


Figure 1: M...

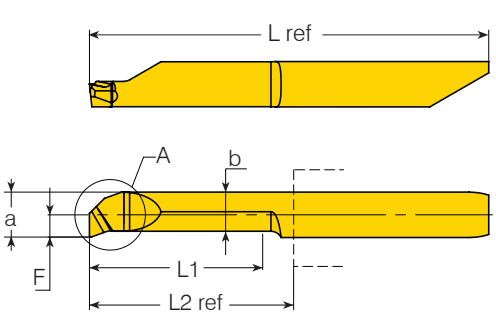
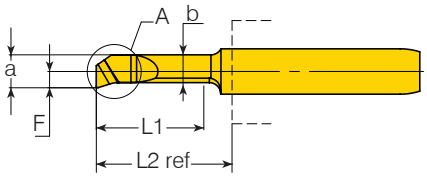
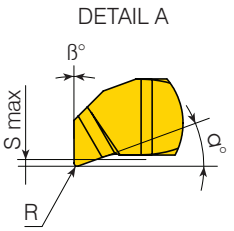


Figure 2: MC...





* L2 Ref: Repeatability within +/-0.02

Right hand shown

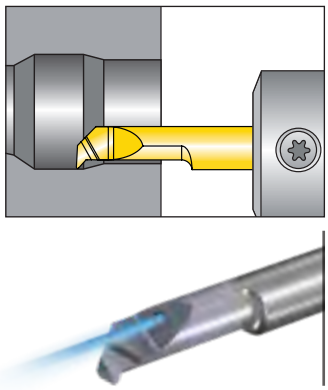
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	3.2	MC432B90R15L10R/L	10.0	0.15	1.43	0.2	2.90	2.45	18	0	11.5	25.8	•	○
	4.2	M442B90R15L16R/L	16.0		1.95	0.3	3.95	3.45	20		18.2	35.2	•	○
5.0	5.2	M552B90R20L10R/L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

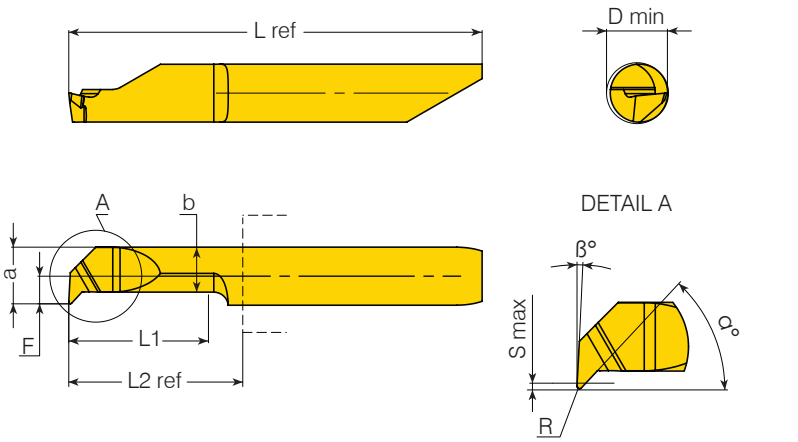
• In stock ○ Available upon request

Boring & Profiling

NEW

Internal





* L2 Ref: Repeatability within +/-0.02

Right hand shown

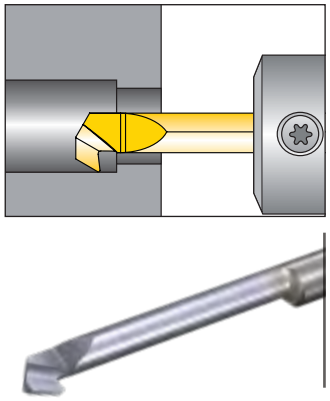
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm										Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L ref	VBX	VTX
4.0	4.2	M442CLR15L10R/L	10	0.15	1.9	0.7	3.9	3.1	47	3	11.5	28.5	●	○
		M442CLR15L10RC	10								11.5	28.5	○	●
		MS442CLR15L16R/L	16								18.2	35.2	●	○
		M442CLR15L21RC	21								18.2	35.2	○	●
		MS442CLR15L21R/L	21								22.8	39.8	●	○
5.0	5.2	M552CLR20L16R/L	16	0.2	2.4	0.95	4.9	3.8	49		18.15	41	●	○
		M552CLR20L25R/L	25								28.15	51	●	○
		M552CLR20L25RC	25								28.15	51	○	●
6.0	6.2	M662CLR20L16R/L	16		2.78	1.75	5.78	3.9			18.3	42	●	○
		M662CLR20L21R/L	21								23.3	47	●	○
		M662CLR20L30R/L	30								32.3	56	●	○

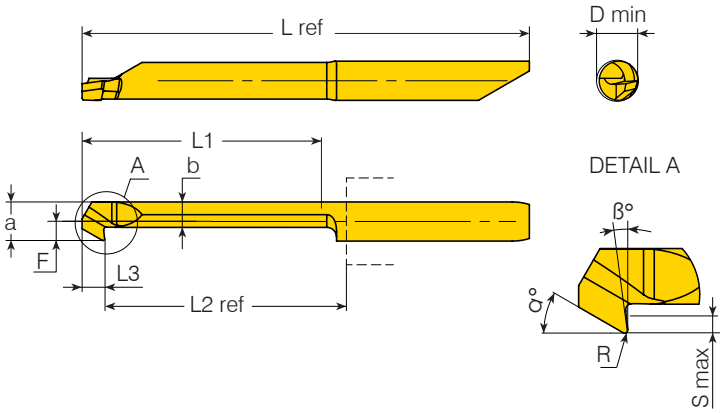
● In stock ○ Available upon request

Inserts marked with C are available with internal coolant.

Back Boring

Internal





* L2 Ref: Repeatability within +/-0.03

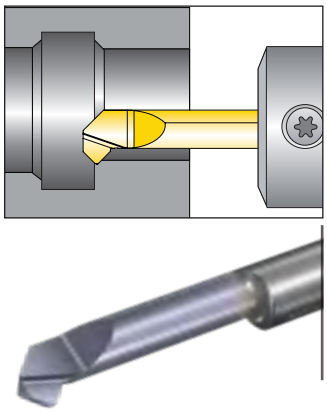
Right hand shown

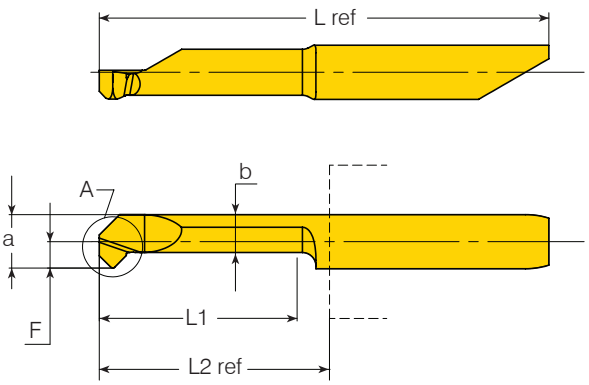
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm											Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	β°	L2 ref*	L3	L ref	VBX	VTX
4.0	4.2	M442BBR15L25R/L	25.0	0.15	1.95	0.8	3.95	2.6	30	6	26.4	2.30	45.7	•	○
5.0	5.2	M552BBR15L30R/L	30.0		2.45	1.0	4.95	3.8		7	29.85		55.0	•	○
6.0	6.2	M662BBR15L30R/L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

• In stock ○ Available upon request

Boring & Chamfering 45°

Internal





* L2 Ref: Repeatability within +/-0.02

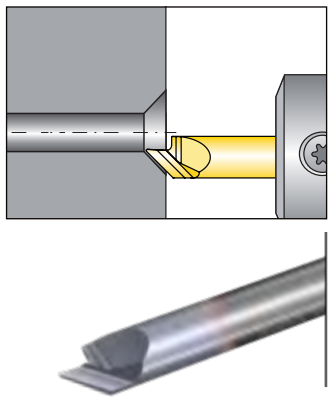
Right hand shown

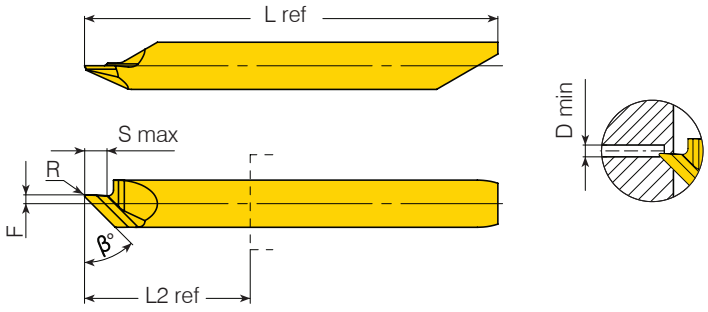
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	L1	R	F	S max	a	b	α°	L2 ref*	L ref	VBX	VTX
4.0	4.2	MS442CH4545L15R/L	15.0	0.2	1.95	0.7	3.95	2.8	45	18.4	35.4	•	○
5.0	5.2	M552CH4545L15R/L	15.0		2.45		4.95	3.7		18.35	41.2	•	○
		M552CH4545L20R/L	20.0							23.35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

• In stock ○ Available upon request

Face Chamfering 45°

Internal





* L2 Ref: Repeatability within +/-0.02

Right hand shown

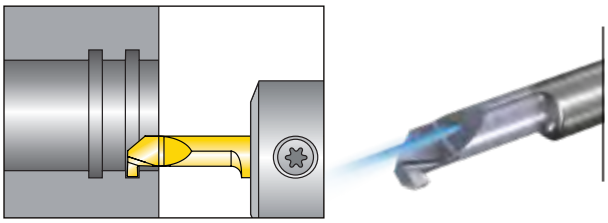
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm						Grades	
d (mm)	D min. (mm)	RH/LH	R	F	S max	β°	L2 ref*	L ref	VBX	VTX
4.0	1.0	M410CH45L15R	0.1	0.75	2.4	45	18.2	35.2	•	○
		M410CH45L15L							•	○

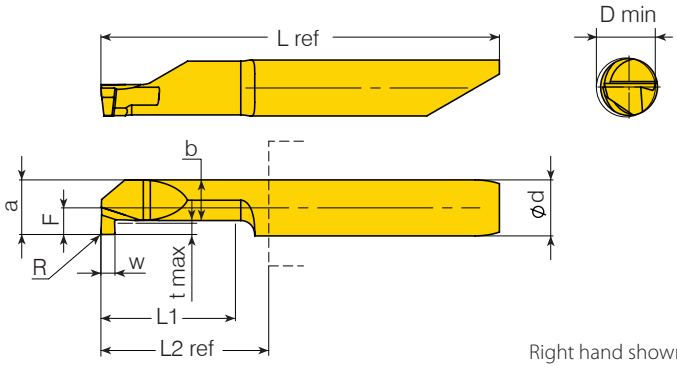
• In stock ○ Available upon request

Square Grooving

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	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
4.0	4.2	MS442GSW079L10R/L	0.79	0.8	10	1.96	0.1	3.96	2.9	11.5	28.5	•	○
		MS442GSW100L10R/L	1.00			1.90		3.90				•	○
		MS442GSW150L10R**	1.50									•	○
		M442GSW150L10RC**	1.50									○	•
		MS442GSW079L15R/L	0.79		15	1.96		3.96		18.2	35.2	•	○
		MS442GSW100L15R/L	1.00			1.90		3.90				•	○
		M442GSW100L15RC**	1.00									○	•
		MS442GSW100L20R/L	1.00		20					22.8	39.8	•	○
		M442GSW100L20RC**	1.00									○	•
		MS442GSW079L25R/L	0.79		25	1.96		3.96		28.7	45.7	•	○
5.0	5.2	M552GSW100L10R/L	1.00	1	10	2.40	0.1	4.90	3.7	12.15	35	•	○
		M552GSW100L10RC**	1.00									○	•
		M552GSW150L10R**	1.50									•	○
		M552GSW200L10R**	2.00									•	○
		M552GSW100L15R/L	1.00		15					18.15	41	•	○
		M552GSW100L15RC**	1.00									○	•
		M552GSW150L15R/L	1.50									•	○
		M552GSW150L15RC	1.50									○	•
		M552GSW200L15R**	2.00									•	○
		M552GSW100L20R/L	1.00		20					23.15	46	•	○
		M552GSW150L20R/L	1.50									•	○
		M552GSW150L20RC**	1.50									○	•
		M552GSW200L20R**	2.00									•	○
6.0	6.2	M662GSW079L10R**	0.79	1.8	10	2.96	0.1	5.96	4.0	12.3	36	•	○
		M662GSW100L10R/L	1.00			2.90		5.90				•	○
		M662GSW117L10R**	1.17			2.96		5.96				•	○
		M662GSW150L10R**	1.50			2.90		5.90				•	○
		M662GSW157L10R**	1.57			2.96		5.96				•	○
		M662GSW198L10R**	1.98									•	○
		M662GSW200L10R/L	2.00			2.90		5.90				•	○
		M662GSW079L15R**	0.79		15	2.96		5.96		18.3	42	•	○
		M662GSW100L15R/L	1.00			2.90		5.90				•	○
		M662GSW117L15R**	1.17			2.96		5.96				•	○
		M662GSW150L15R/L	1.50			2.90		5.90				•	○
		M662GSW157L15R**	1.57			2.96		5.96				•	○
		M662GSW198L15R**	1.98									•	○
		M662GSW200L15R/L	2.00			2.90		5.90				•	○
		M662GSW100L20R/L	1.00		20					23.3	47	•	○

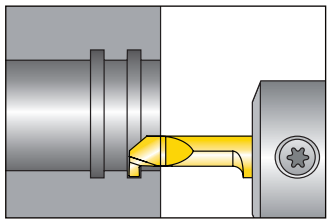
** LH Tools are available upon request.

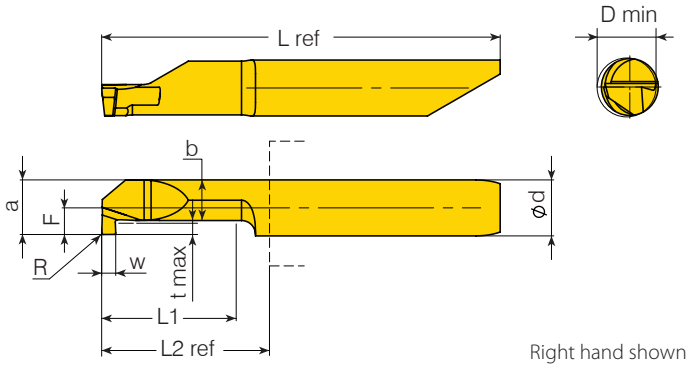
• In stock ○ Available upon request

Inserts marked with C are available with internal coolant.

Square Grooving (con't)

Internal





* L2 Ref: Repeatability within +/-0.02

Right hand shown

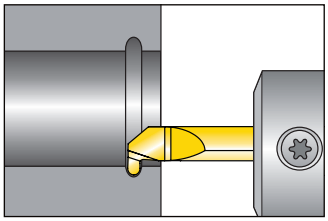
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
6.0	6.2	M662GSW150L20R/L	1.50	1.8	20	2.90	0.1	5.90	4.0	23.3	47	•	○
		M662GSW200L20R/L	2.00									•	○
		M662GSW079L25R**	0.79		25	2.96		5.96		28.3	52	•	○
		M662GSW117L25R**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

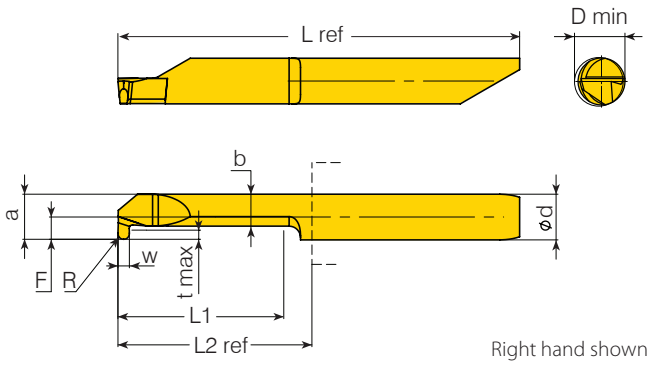
** LH Tools are available upon request.

• 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	0.5	3.95	2.8	18.2	35.2	•	○
5.0	5.2	M552GRR050L20R/L	1.0	1	20	2.45	0.5	4.95	3.7	23.15	46	•	○
		M552GRR075L20R/L	1.5				0.75					•	○
		M552GRR100L20R**	2.0				1					•	○
6.0	6.2	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	M772GRR100L30R**	2.0	2.5	30	3.45	1	6.95	4.1	36.4	61	•	○

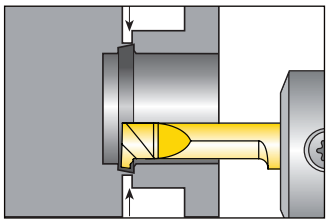
** LH Tools are available upon request.

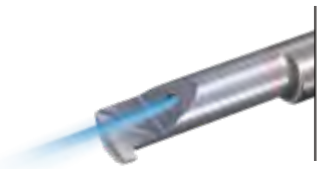
• In stock ○ Available upon request

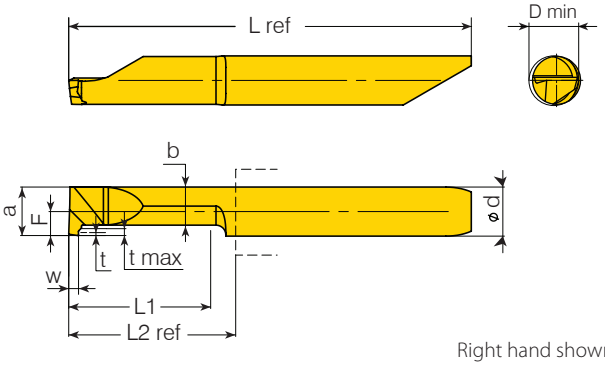
Pre-Part Off

NEW

Internal







* L2 Ref: Repeatability within +/-0.02

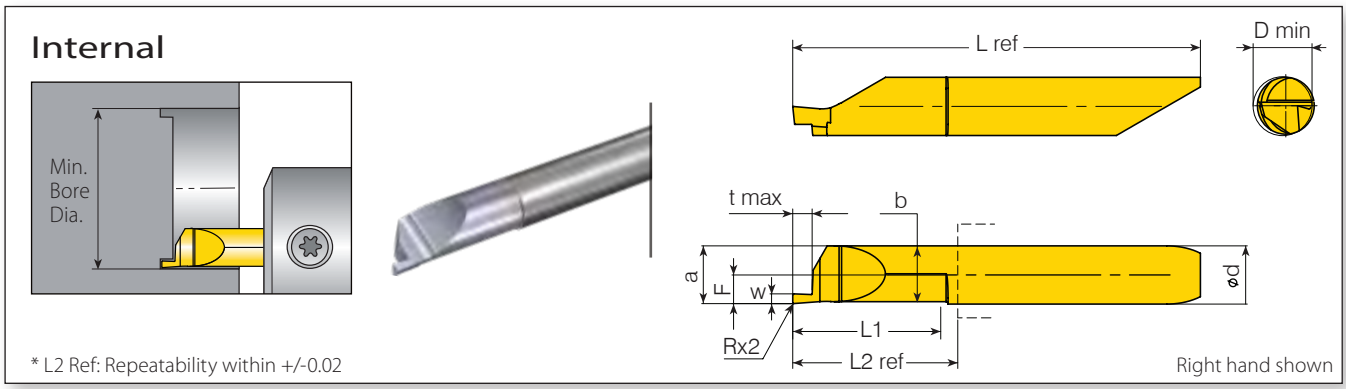
Right hand shown

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

** LH Tools are available upon request.

• In stock ○ Available upon request

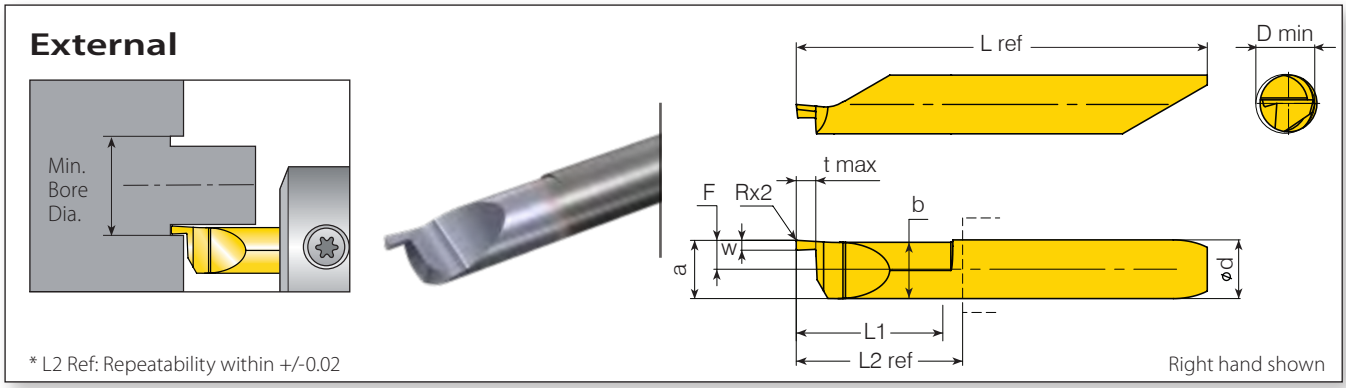
Face Grooving Internal



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

• In stock ○ Available upon request

Face Grooving External

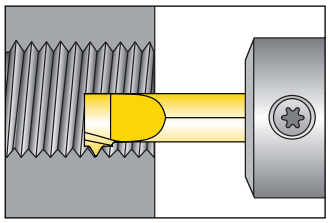


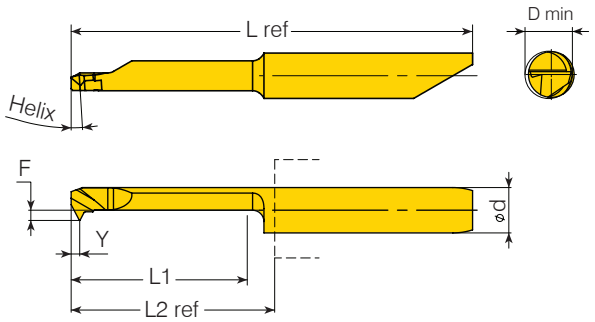
Shank Dia.	Min. Bore Dia.	Ordering Code	Dimensions mm									Grades	
d (mm)	D min. (mm)	RH/LH	W±0.025	t max	L1	F	R	a	b	L2 ref*	L ref	VBX	VTX
6.0	6.2	M662FPW10L15R/L	1.00	2.0	15	2.95	0.10	5.95	5.75	18.3	42	•	○
		M662FPW117L15R/L	1.17				0.15					•	○
		M662FPW15L15R/L	1.50	3.0			0.10					•	○
		M662FPW157L15R/L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

• In stock ○ Available upon request

Threading

Internal



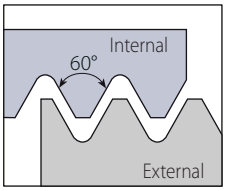


* L2 Ref: Repeatability within +/-0.02

Right hand shown

Partial Profile 60°

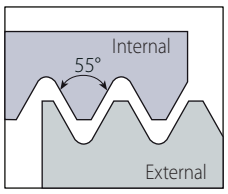
NEW



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

● In stock ○ Available upon request

Partial Profile 55°

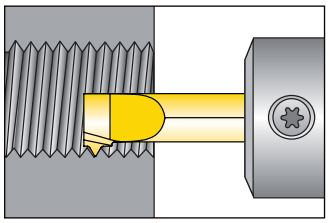


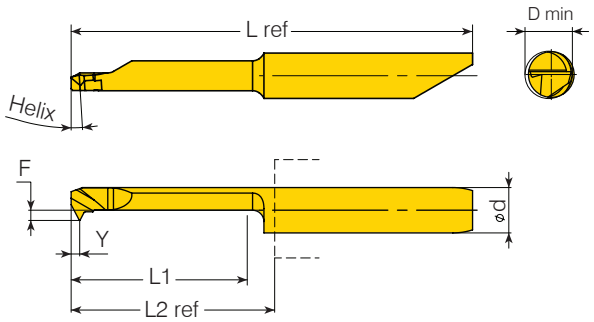
Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch		Dimensions mm						Grades	
d (mm)	D min. (mm)	RH/LH	mm	TPI	Helix	L1	F	Y	L2 ref*	L ref	VBX	VTX
4.0	3.2	MS429THF55L16R/L	0.5-1.0	48-24	3.5	16	0.9	0.75	18.4	35.4	●	○
	4.2	MS439THF55L16R/L	0.5-1.0	48-24			1.9				●	○
6.0	6.2	M659THA55L16R/L	0.5-1.5	48-16			2.9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

● In stock ○ Available upon request

Threading

Internal

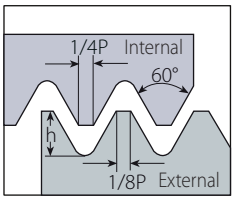




* L2 Ref: Repeatability within +/-0.02

Right hand shown

ISO Metric

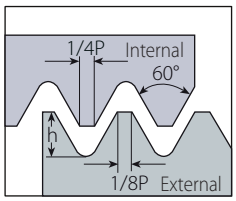


Defined by: R262 (DIN 13)
Tolerance Class: 6g/6H

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

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

American UN



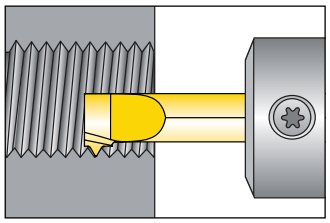
Defined by: ANSI B1.1:74
Tolerance Class: 2A/2B

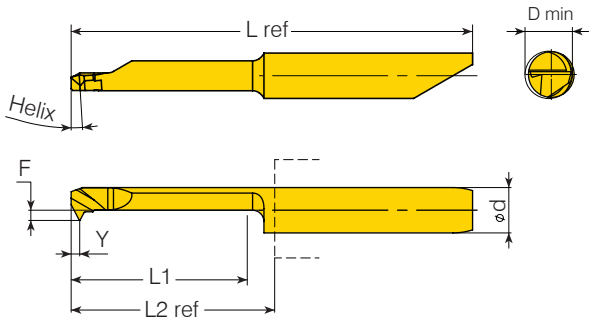
	Shank Dia.	Min. Bore Dia.	Ordering Code	Pitch			Dimensions mm					Grades	
Thread	d (mm)	D min. (mm)	RH/LH	TPI	Helix °	L1	F	Y	h (min)	L2 ref*	L ref	VBX	VTX
No.8-32UNC	4.0	3.3	MS429TH32UNL16R/L	32	3.5	16	0.92	0.6	0.46	18.4	35.4	●	○
No.10-28UNS		3.6	MS429TH28UNL16R/L	28			0.92	0.65	0.52			●	○
1/4"-27UNS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

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

Threading

Internal

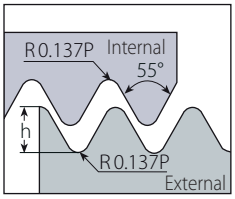




* L2 Ref: Repeatability within +/-0.02

Right hand shown

Whitworth for BSW, BSP

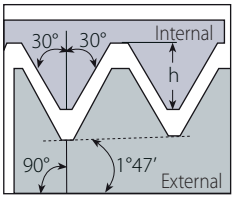


Defined by:
B.S.84:1956, DIN 259, ISO228/1:1982
Tolerance Class:
Medium Class A

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

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

NPT



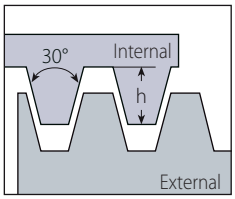
Defined by:
USAS B2.1:1968
Tolerance Class:
Standard NPT

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

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

Trapez

NEW



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

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

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

micrOscope Toolholders

micrOscope Toolholders Ordering Code

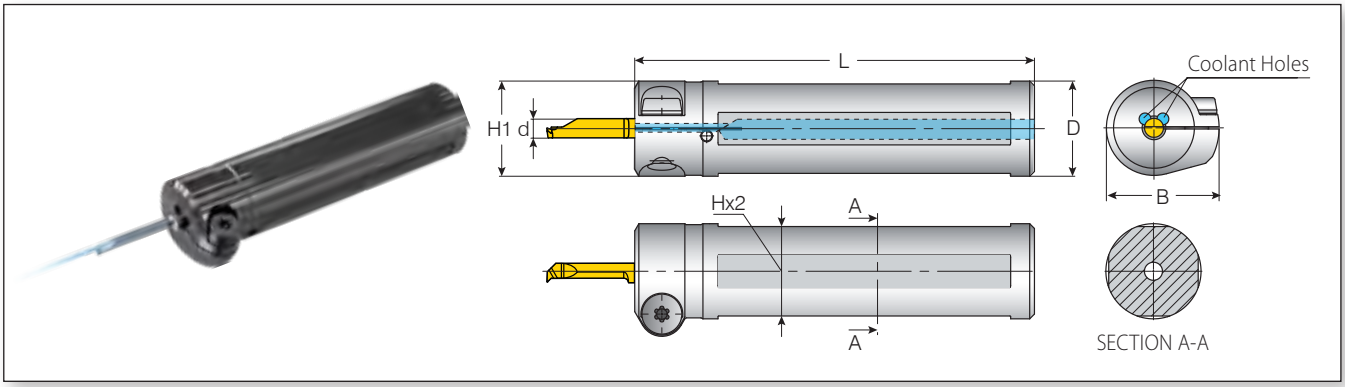
MH	C	R	22	-	4	-	5	-	4F
1	2	3	4		5		6		7

1 - Product Line	2 - Coolant	3 - Round Tools	4 - Shank Size (mm)
MH - Microscope Round Holder **MHS** - Microscope Holder with Square Shank **MHD** - Microscope with Drop Head	**C or D** - Coolant Thru	**R** - Round Bore **S** - Shrink by Screw	10 - 28

5 - Bore Size (mm)	6 - Bore Size (mm) for Double Bore	7 - 4 Flats
4, 5, 6, 7	4, 5, 6, 7	**4F** - Four Flats **None** - Two Flats

Shrink Toolholders

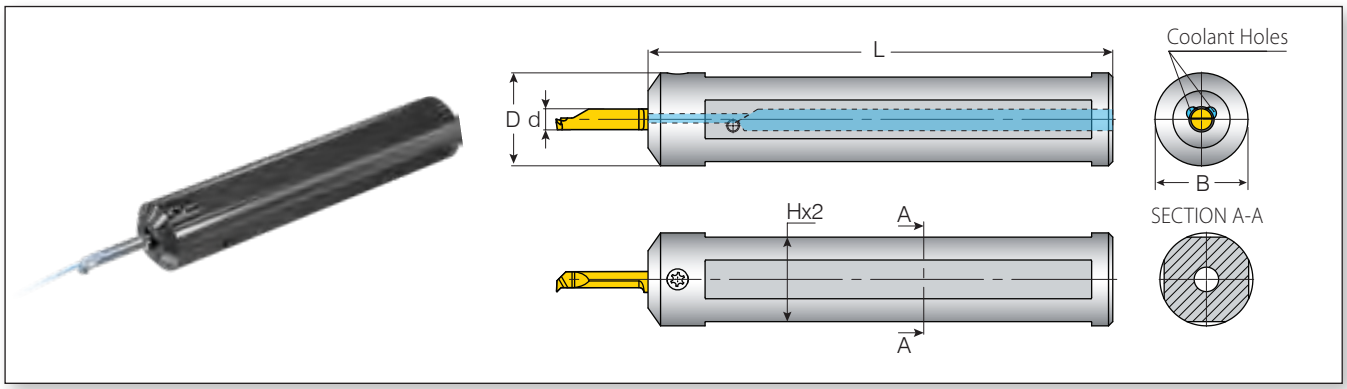
NEW



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*	F15IP*
	MHCS12-4-4F	12.0	19.7	13.8	10.8	70.0		
	MHCS16-4-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-4-4F	20.0	23.7	20.0	18.8	84.0		
	MHCS22-4-4F	22.0	24.7	22.0	20.0	110.0		
5.0	MHCS16-5-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-5-4F	20.0	23.7	20.0	18.8	84.0		
6.0	MHCS12-6-4F	12.0	19.7	13.8	10.8	70.0		
	MHCS16-6-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-6-4F	20.0	23.7	20.0	18.8	84.0		
	MHCS22-6-4F	22.0	24.7	22.0	20.0	110.0		
7.0	MHCS16-7-4F	16.0	21.7	16.0	14.8	75.0		
	MHCS20-7-4F	20.0	23.7	20.0	18.8	84.0		

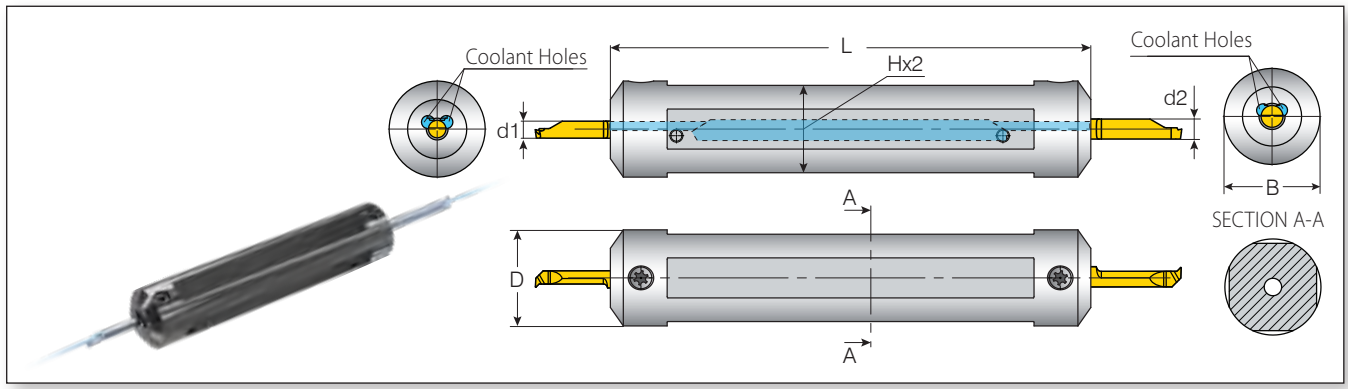
* SM5x10-15IPx2 is a special screw which can be used from both its sides.
For an alternative screw, please use MS5x10 (key: S4).

Round Tools without Shoulder NEW



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		

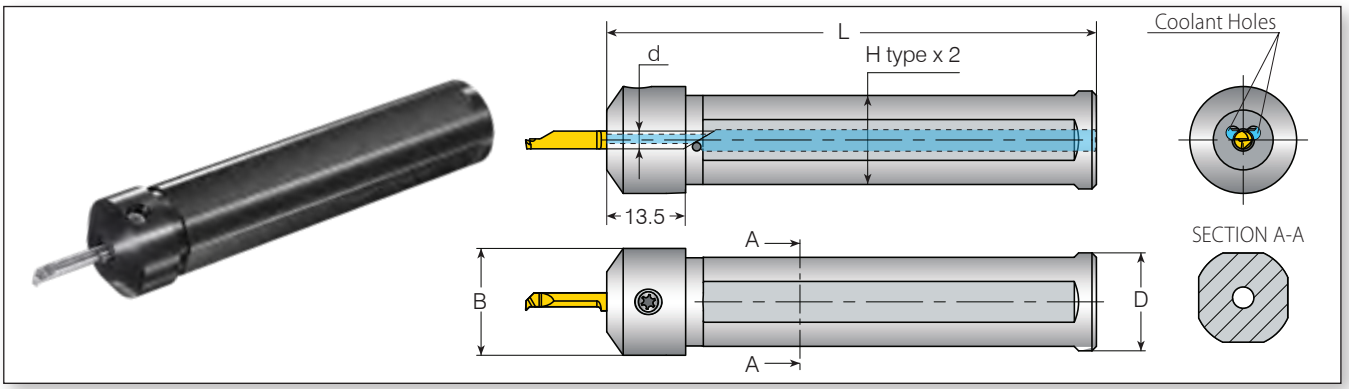
Round Double Sided Toolholders NEW



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		

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

Holder with Round Shank - 4 Flats

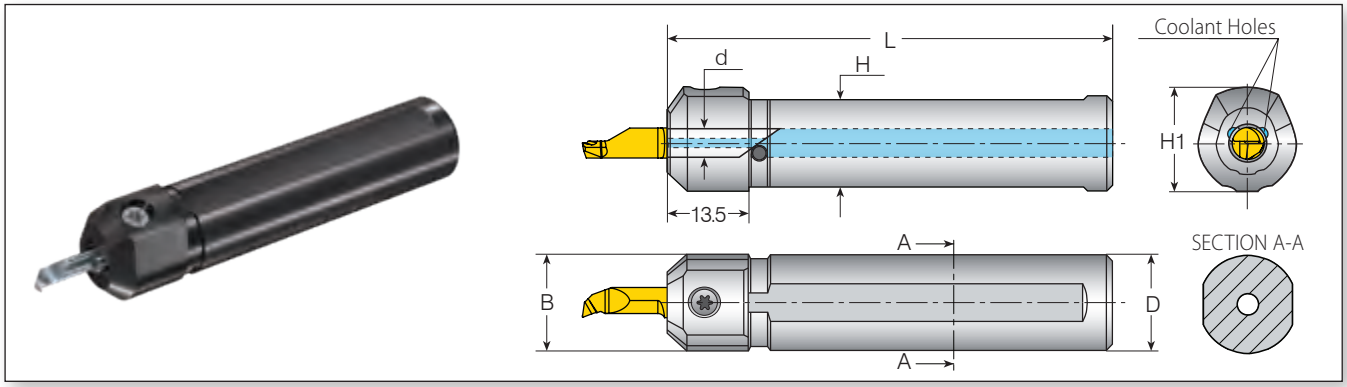


						Spare Parts	
Micro Insert Dia.	Ordering Code	Dimensions mm					
d (mm)		D	B	H	L	Clamping Screw	Key
4.0	MHC20-4-4F	20.0	22.0	18.8	83.5	SL7DT15 or SL7DBT15IP*	KT15 or F15IP*
	MHC22-4-4F	22.0	24.0	20.0	110		
	MHC23-4-4F	23.0	25.0	21.0			
	MHC25-4-4F	25.0	27.0	23.0			
	MHC28-4-4F	28.0	30.0	26.0			
5.0	MHC20-5-4F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

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

Holder with Round Shank - 2 Flats

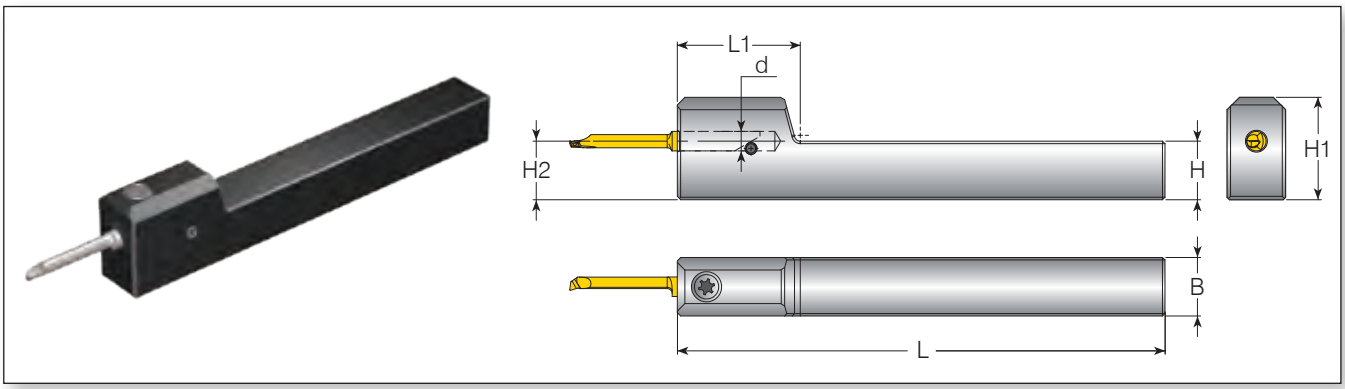
microscope



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	Coolant Holes 84.0		
5.0	MHC 10-5	10.0	14.0	8.8	65.0		
	MHC 12-5	12.0	16.0	10.8	70.0		
	MHC 16-5	16.0	18.6	14.8	75.0		
	MHC 20-5	20.0	22.0	18.8	84.0		
6.0	MHC 12-6	12.0	16.0	10.8	70.0		
	MHC 16-6	16.0	18.6	14.8	75.0		
	MHC 20-6	20.0	22.0	18.8	84.0		
7.0	MHC 16-7	16.0	18.6	14.8	75.0		
	MHC 20-7	20.0	22.0	18.8	84.0		

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

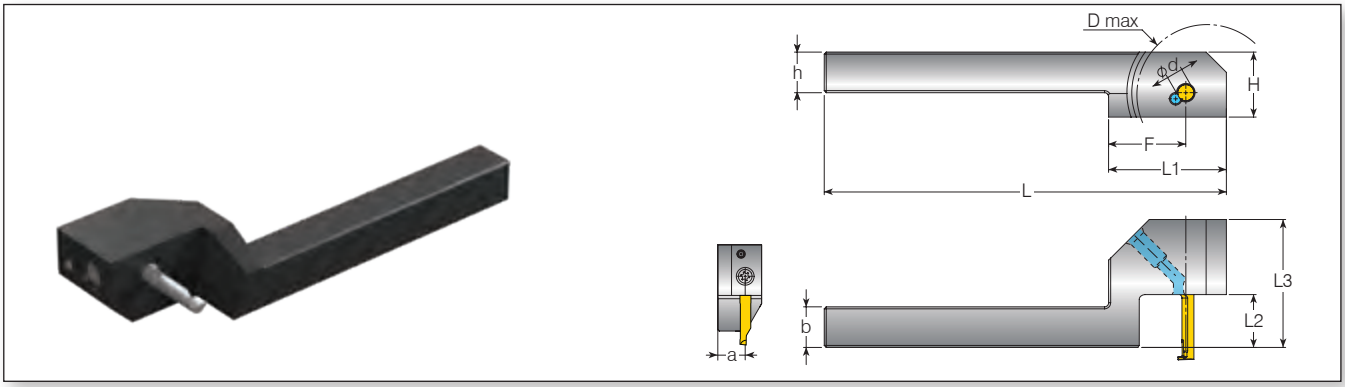
Holder with Square Shank



Micro Insert Dia.	Ordering Code	Dimensions mm				Spare Parts	
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		

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

Holder with Drop Head



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

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

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