



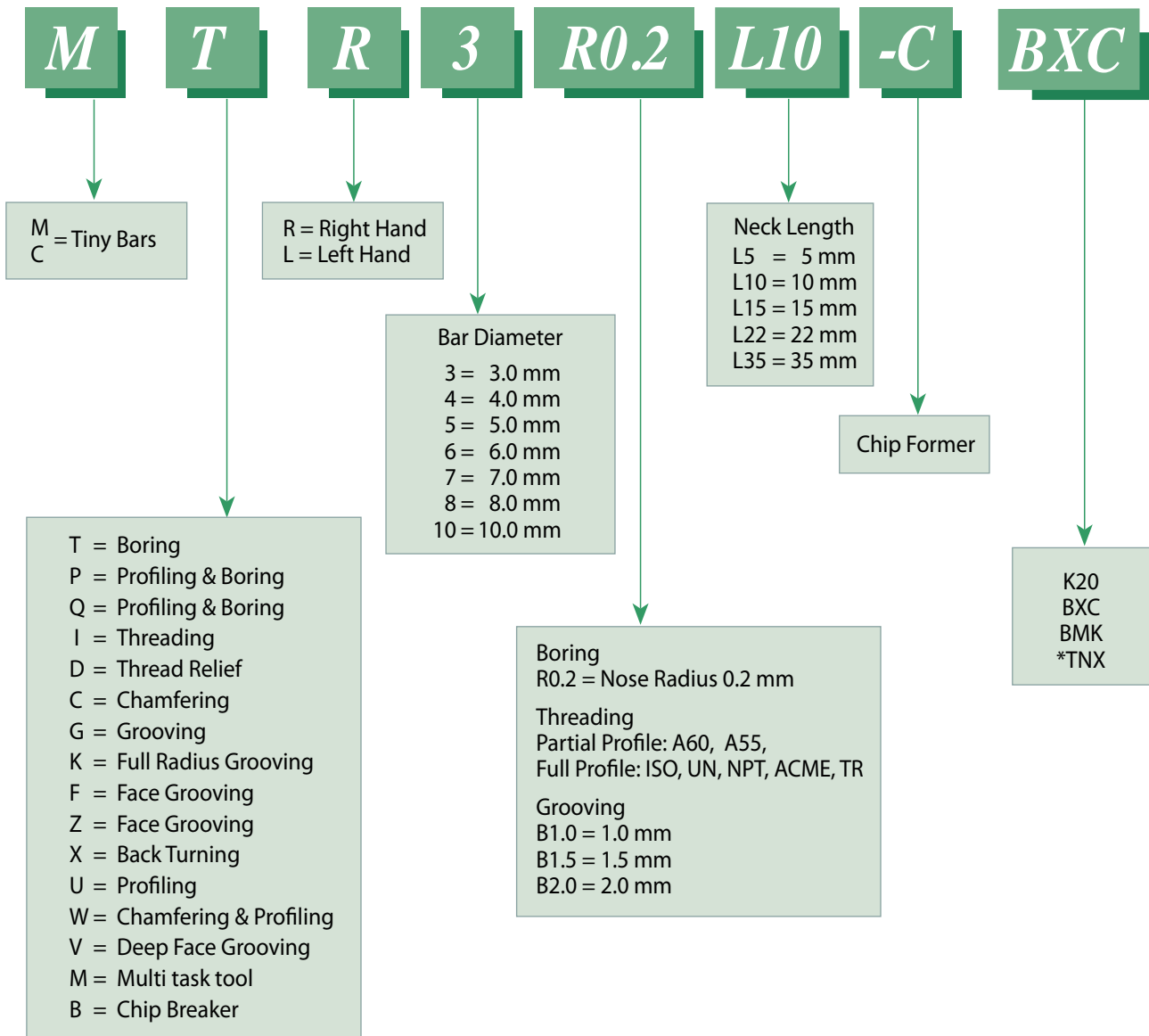
## Solid Carbide tools for working in small bores

These tools are made for the high-tech, medical and small component industry. All tools include through coolant enabling the cooling fluid to reach the cutting edge efficiently, for easy chip removal and smooth cutting operations.

Contents:	Page:	Contents:	Page:
<b>Tiny Bars</b>	2-31	MFR Face Grooving Bars	25
Product Identification	2	MFR Face Grooving Bars with Chip Former	26
MTR Boring Bars	3-4	MFL Face Grooving Bars	27
CBR Profiling and Boring Bars	5	MVR Deep Face Grooving Bars	28
CMR Multi-Task Tiny Bars	6	MZR Face Grooving Bars	29
MXR Back Turning Bars	7	MZL Face Grooving Bars	30
MPR Profiling and Boring Bars	8-9	HK Broaching Tools	31
MUR Profiling, 90° Face Cutting Bars	10	<b>Tiny Toolholders</b>	32-41
MQR Profiling and Boring Bars	11	Product Identification	32
MIR Threading Bars	12-18	Tiny Toolholders	32-33
MDR Thread Relief, Chamfering and Grooving Bars	19	Tiny Toolholders for Star Swiss machines	34
MCR Chamfering and Boring Bars	20	CIM Clamping System	35-38
MWR Chamfering and Profiling Bars	21	Tiny Toolholders Square Shank	39-41
MGR Grooving Bars	22-23	Tiny Tools Kits	42
MKR Full Radius Grooving Bars	24	Technical Section	43-46

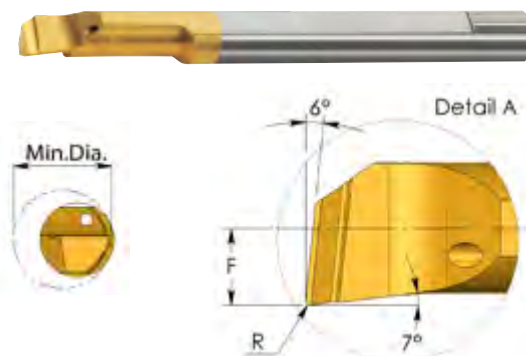
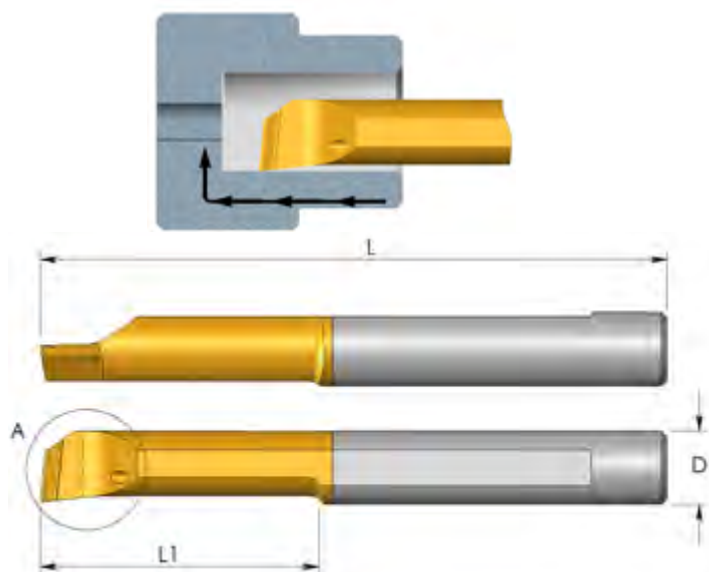
# Product Identification

## Tiny Bars Ordering Codes



\* Available only for CBR bars

## MTR Bars Boring



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

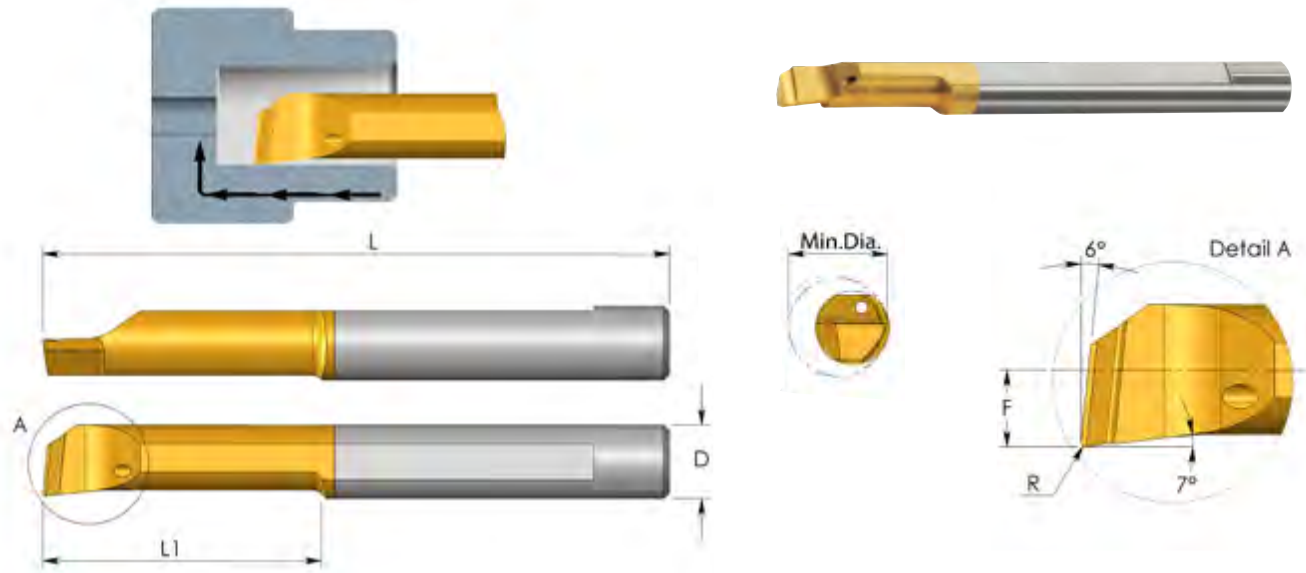
D	Ordering Code	L	L1	R	F	Min. Dia.	Holder
3.0	MTR 1 R0 L6	39	6	0	0.5	1.0	SIM ... H3
	MTR 1 R0.05 L4	39	4	0.05	0.5	1.0	
	MTR 1 R0.05 L6	39	6	0.05	0.5	1.0	
3.0	MTR 1.2 R0 L7	39	7	0	0.6	1.2	SIM ... H3
	MTR 1.2 R0 L9	39	9	0	0.6	1.2	
3.0	MTR 1.5 R0 L6	39	6	0	0.7	1.5	SIM ... H3
	MTR 1.5 R0.1 L6	39	6	0.10	0.7	1.5	
3.0	MTR 2 R0 L10	39	10	0	0.8	2.1	SIM ... H3
	MTR 2 R0.05 L5	39	5	0.05	0.8	2.1	
	MTR 2 R0.05 L10	39	10	0.05	0.8	2.1	
	MTR 2 R0.1 L10	39	10	0.10	0.8	2.1	
	MTR 2 R0.1 L15	39	15	0.10	0.8	2.1	
	MTR 2 R0.15 L5	39	5	0.15	0.8	2.1	
4.0	MTR 2.5 R0 L10	51	10	0	1.0	2.5	SIM ... H4
	MTR 2.5 R0.1 L10	51	10	0.10	1.0	2.5	
	MTR 2.5 R0.1 L15	51	15	0.10	1.0	2.5	
3.0	MTR 3 R0.05 L10	39	10	0.05	1.3	3.1	SIM ... H3
	MTR 3 R0.05 L15	39	15	0.05	1.3	3.1	
	MTR 3 R0.1 L10	39	10	0.10	1.3	3.1	
	MTR 3 R0.1 L15	39	15	0.10	1.3	3.1	
	MTR 3 R0.2 L10	39	10	0.20	1.3	3.1	
	MTR 3 R0.2 L15	39	15	0.20	1.3	3.1	
4.0	MTR 4 R0.05 L15	51	15	0.05	1.7	4.1	SIM ... H4
	MTR 4 R0.05 L22	51	22	0.05	1.7	4.1	
	MTR 4 R0.1 L10	51	10	0.10	1.7	4.1	
	MTR 4 R0.1 L15	51	15	0.10	1.7	4.1	
	MTR 4 R0.1 L22	51	22	0.10	1.7	4.1	
	MTR 4 R0.2 L10	51	10	0.20	1.7	4.1	
	MTR 4 R0.2 L15	51	15	0.20	1.7	4.1	
	MTR 4 R0.2 L22	51	22	0.20	1.7	4.1	
4.0	MTR 4 R0.2 L30	62	30	0.20	1.7	4.1	

For additional holders see page A06-32 to 41

● First choice

○ Alternative

## MTR Bars Boring



D	Ordering Code	L	L1	R	F	Min Dia.	Holder
5.0	MTR 5 R0.05 L15	51	15	0.05	2.1	5.1	SIM ... H5
	MTR 5 R0.1 L15	51	15	0.10	2.1	5.1	
	MTR 5 R0.1 L22	51	22	0.10	2.1	5.1	
	MTR 5 R0.1 L30	76	30	0.10	2.1	5.1	
	MTR 5 R0.2 L10	51	10	0.20	2.1	5.1	
	MTR 5 R0.2 L15	51	15	0.20	2.1	5.1	
	MTR 5 R0.2 L22	51	22	0.20	2.1	5.1	
	MTR 5 R0.2 L30	76	30	0.20	2.1	5.1	
6.0	MTR 5 R0.2 L40	76	40	0.20	2.1	5.1	SIM ... H6
	MTR 6 R0.05 L15	51	15	0.05	2.8	6.1	
	MTR 6 R0.05 L22	51	22	0.05	2.8	6.1	
	MTR 6 R0.1 L15	51	15	0.10	2.8	6.1	
	MTR 6 R0.1 L22	51	22	0.10	2.8	6.1	
	MTR 6 R0.2 L15	51	15	0.20	2.8	6.1	
	MTR 6 R0.2 L22	51	22	0.20	2.8	6.1	
	MTR 6 R0.2 L30	58	30	0.20	2.8	6.1	
7.0	MTR 6 R0.2 L35	76	35	0.20	2.8	6.1	SIM ... H7
	MTR 6 R0.2 L40	76	40	0.20	2.8	6.1	
8.0	MTR 7 R0.2 L22	62	22	0.20	3.3	7.1	SIM ... H8
	MTR 7 R0.2 L30	62	30	0.20	3.3	7.1	
8.0	MTR 8 R0.2 L15	64	15	0.20	3.8	8.1	SIM ... H8
	MTR 8 R0.2 L22	64	22	0.20	3.8	8.1	
10.0	MTR 8 R0.2 L35	76	35	0.20	3.8	8.1	SIM ... H10
	MTR 10 R0.2 L35	73	35	0.20	4.8	10.1	

Order example: MTR 4 R0.2 L15 BXC

For L.H. bars specify MTL instead of MTR

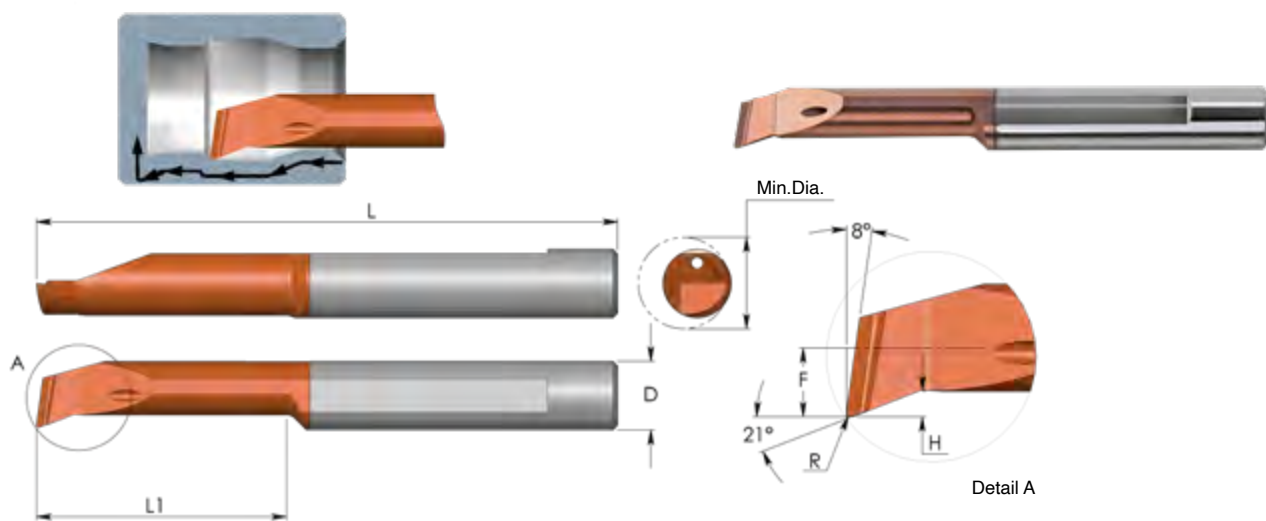
For additional holders see page A06-32 to 41

## CBR Bars Profiling and Boring

With advanced Chip Breaker

Chip evacuation is obtained thanks to advanced Chip Breaker and the internal coolant through the tool, pushing the chips out of the hole.

Excellent solution for machining stainless steels, super alloys and other “difficult” materials that create curly chips around the tool and the application. Can be used also as general purpose for a wide range of materials.



Grade	P	M	K	N	S	H
TNX	●	●	●	●	●	●

D	Ordering Code	L	L1	R	H	F	Min. Dia.	Holder
4.0	<b>CBR 4 R0.2 L10</b>	51	10	0.2	0.4	1.8	4.1	SIM ... H4
	<b>CBR 4 R0.2 L15</b>	51	15	0.2	0.4	1.8	4.1	
5.0	<b>CBR 5 R0.2 L15</b>	51	15	0.2	0.8	2.3	5.1	SIM ... H5
	<b>CBR 5 R0.2 L22</b>	51	22	0.2	0.8	2.3	5.1	
6.0	<b>CBR 6 R0.2 L15</b>	51	15	0.2	1.0	2.8	6.1	SIM ... H6
	<b>CBR 6 R0.2 L22</b>	51	22	0.2	1.0	2.8	6.1	

Order example: CBR 5 R0.2 L15 TNX

For L.H. bars specify **CBL** instead of **CBR**

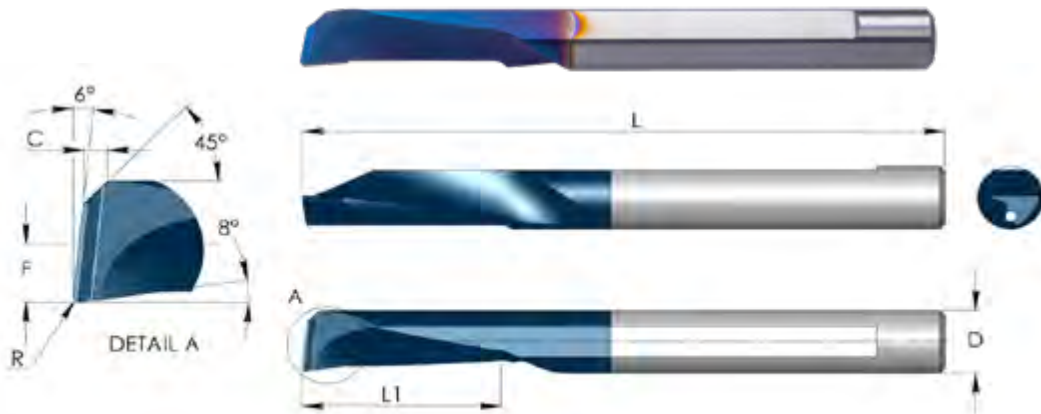
For additional holders see page A06-32 to 41

● First choice

○ Alternative

## CMR Multi-Task Tiny Bars

Multi-Task Tiny Tool CMR for Boring, Turning, Facing and Chamfering with a single tool



Grade	P	M	K	N	S	H
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	R	F	C	Hole Dia.*	Holder
4.0	<b>CMR 4 R0.1 L10</b>	51	10	0.1	1.8	1.1	4.0	SIM...H4
	<b>CMR 4 R0.1 L15</b>	51	15	0.1	1.8	1.1	4.0	
5.0	<b>CMR 5 R0.2 L10</b>	51	10	0.2	2.1	1.3	5.0	SIM...H5
	<b>CMR 5 R0.2 L15</b>	51	15	0.2	2.1	1.3	5.0	
6.0	<b>CMR 6 R0.2 L12</b>	58	12	0.2	2.8	1.5	6.0	SIM...H6
	<b>CMR 6 R0.2 L18</b>	58	18	0.2	2.8	1.5	6.0	

Order example: CMR 6 R0.2 L12 BMK

● First choice    ○ Alternative

For L.H. bars specify CML instead of CMR

\* The minimum diameter the tool can produce from full material

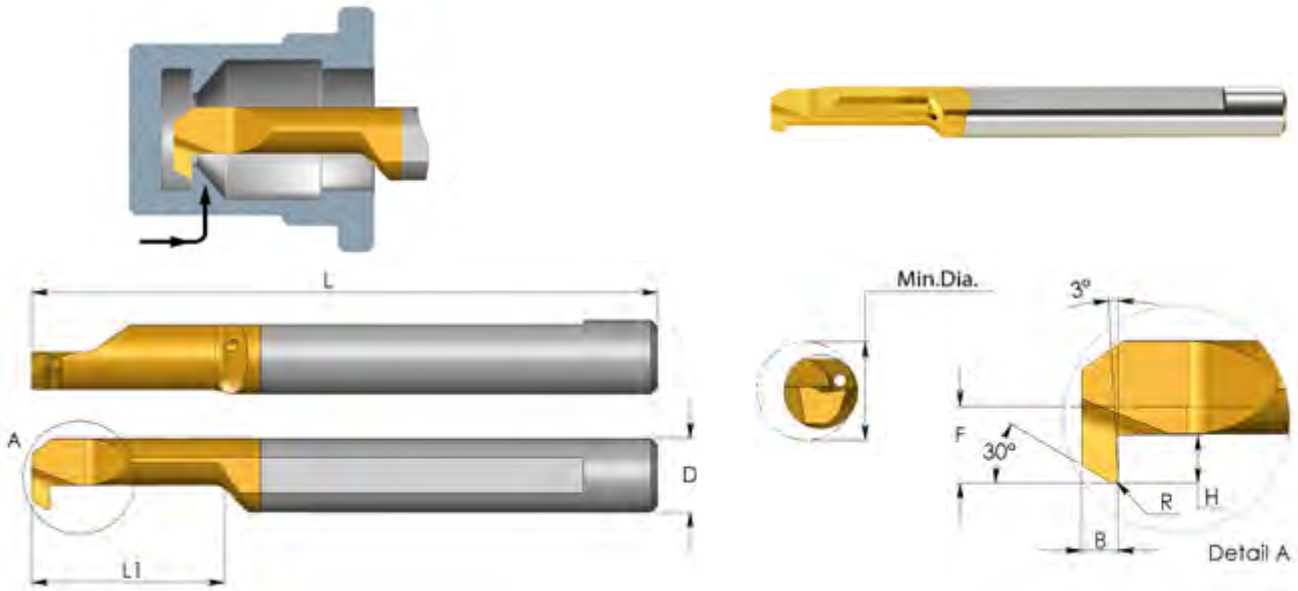
For additional holders see page A06-32 to 41



Demonstration



## MXR Bars Back Turning



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	B	R	H	F	Min. Dia.	Holder
4.0	<b>MXR 4 R0.1 L10</b>	51	10	1.3	0.10	0.5	1.3	3.1	SIM ... H4
4.0	<b>MXR 4 R0.15 L10</b>	51	10	1.3	0.15	0.8	1.7	4.1	SIM ... H4
	<b>MXR 4 R0.15 L15</b>	51	15	1.3	0.15	0.8	1.7	4.1	
5.0	<b>MXR 5 R0.2 L15</b>	51	15	1.5	0.20	1.0	2.3	5.1	SIM ... H5
	<b>MXR 5 R0.2 L22</b>	51	22	1.5	0.20	1.0	2.3	5.1	
6.0	<b>MXR 6 R0.2 L15</b>	51	15	1.5	0.20	1.8	2.8	6.1	SIM ... H6
	<b>MXR 6 R0.2 L22</b>	51	22	1.5	0.20	1.8	2.8	6.1	

Order example: MXR 4 R0.15 L15 BXC

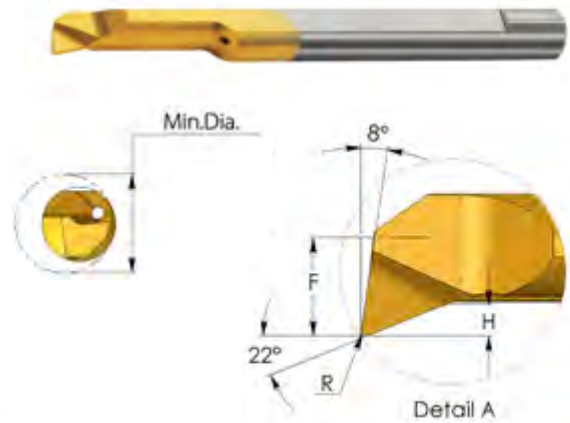
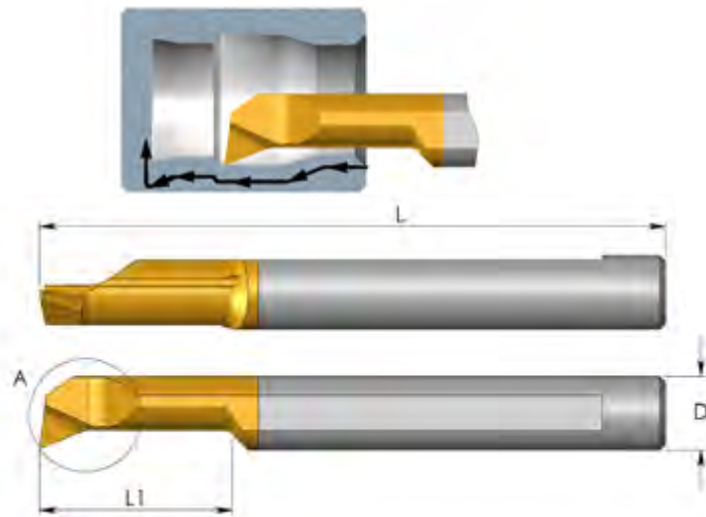
For L.H. bars specify **MXL** instead of **MXR**

For additional holders see page A06-32 to 41

● First choice

○ Alternative

## MPR Bars Profiling and Boring



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	R	H	F	Min. Dia.	Holder
3.0	MPR 1 R0.05 L4	39	4	0.05	0.2	0.5	1.0	SIM ... H3
	MPR 1 R0.05 L8	39	8	0.05	0.2	0.5	1.0	
3.0	MPR 1.2 R0.1 L5	39	5	0.10	0.3	0.6	1.2	SIM ... H3
	MPR 1.2 R0.1 L9	39	9	0.10	0.3	0.6	1.2	
3.0	MPR 1.5 R0.05 L10	39	10	0.05	0.3	0.7	1.5	SIM ... H3
	MPR 1.5 R0.1 L6	39	6	0.10	0.3	0.7	1.5	
	MPR 1.5 R0.1 L10	39	10	0.10	0.3	0.7	1.5	
3.0	MPR 2 R0.05 L10	39	10	0.05	0.5	0.8	2.1	SIM ... H3
	MPR 2 R0.1 L10	39	10	0.10	0.5	0.8	2.1	
	MPR 2 R0.15 L5	39	5	0.15	0.5	0.8	2.1	
	MPR 2 R0.15 L10	39	10	0.15	0.5	0.8	2.1	
4.0	MPR 2.5 R0.1 L10	51	10	0.10	0.6	1.0	2.5	SIM ... H4
	MPR 2.5 R0.1 L15	51	15	0.10	0.6	1.0	2.5	
3.0	MPR 3 R0.05 L10	39	10	0.05	0.7	1.3	3.1	SIM ... H3
	MPR 3 R0.05 L15	39	15	0.05	0.7	1.3	3.1	
	MPR 3 R0.1 L10	39	10	0.10	0.7	1.3	3.1	
	MPR 3 R0.1 L15	39	15	0.10	0.7	1.3	3.1	
	MPR 3 R0.1 L22	47	22	0.10	0.7	1.3	3.1	
	MPR 3 R0.2 L10	39	10	0.20	0.7	1.3	3.1	
	MPR 3 R0.2 L15	39	15	0.20	0.7	1.3	3.1	
MPR 3 R0.2 L22	47	22	0.20	0.7	1.3	3.1		
4.0	MPR 4 R0.1 L10	51	10	0.10	0.8	1.7	4.1	SIM ... H4
	MPR 4 R0.1 L15	51	15	0.10	0.8	1.7	4.1	
	MPR 4 R0.1 L22	51	22	0.10	0.8	1.7	4.1	
	MPR 4 R0.2 L10	51	10	0.20	0.8	1.7	4.1	
	MPR 4 R0.2 L15	51	15	0.20	0.8	1.7	4.1	
	MPR 4 R0.2 L30	62	30	0.20	0.8	1.7	4.1	

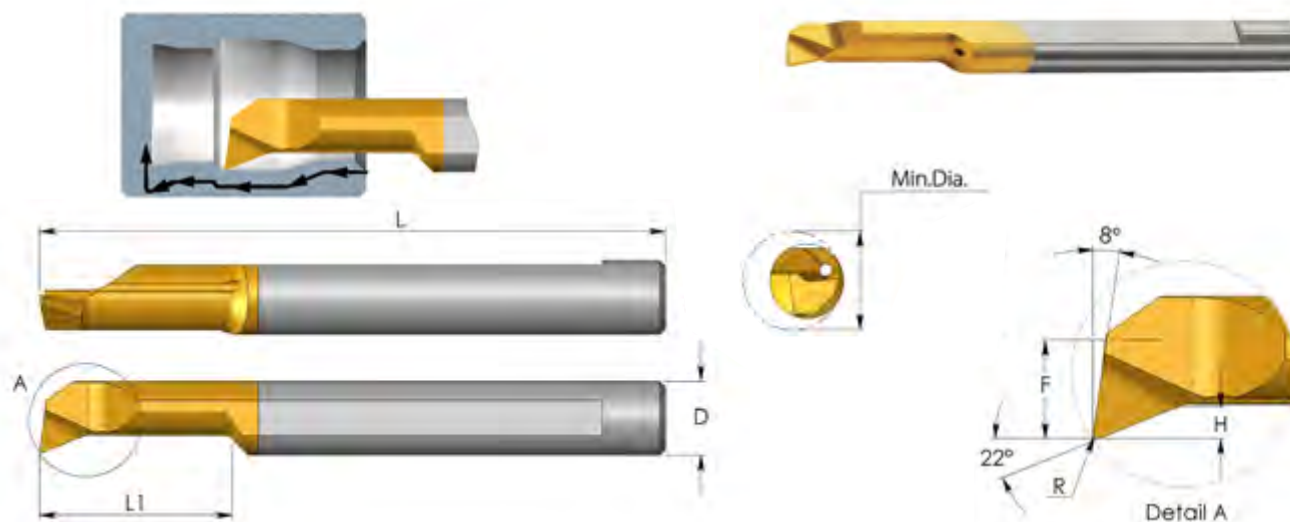
For additional holders see page A06-32 to 41

● First choice

○ Alternative



## MPR Bars Profiling and Boring



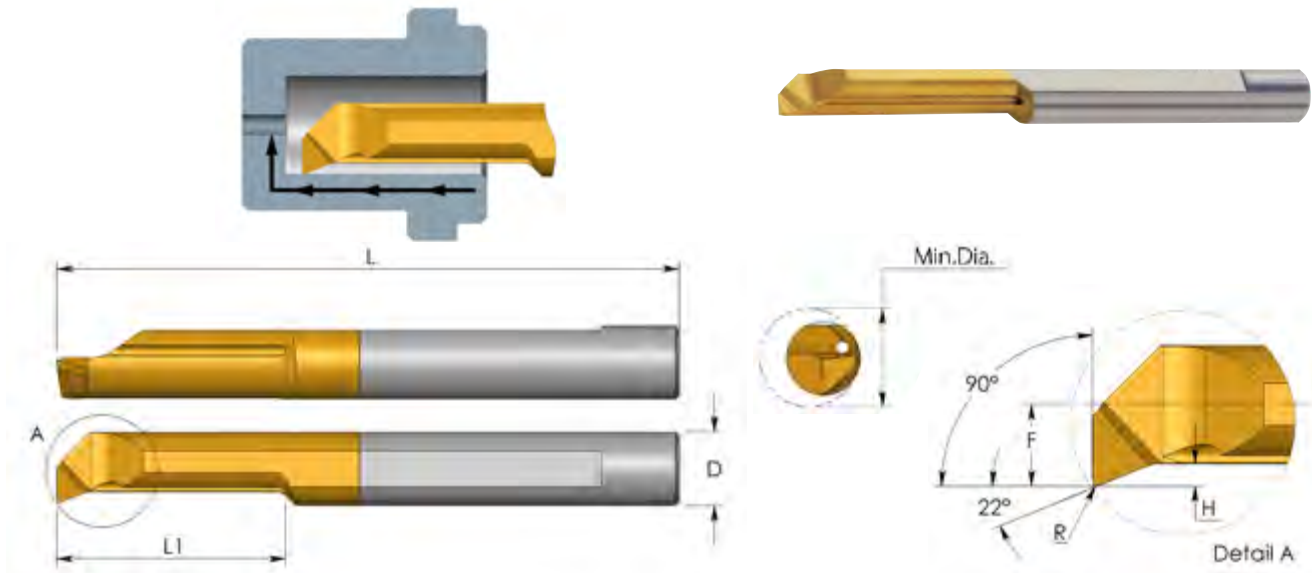
D	Ordering Code	L	L1	R	H	F	Min. Dia.	Holder
5.0	<b>MPR 5 R0.1 L22</b>	51	22	0.10	1.2	2.1	5.1	SIM ... H5
	<b>MPR 5 R0.1 L30</b>	76	30	0.10	1.2	2.1	5.1	
	<b>MPR 5 R0.2 L10</b>	51	10	0.20	1.2	2.1	5.1	
	<b>MPR 5 R0.2 L15</b>	51	15	0.20	1.2	2.1	5.1	
	<b>MPR 5 R0.2 L22</b>	51	22	0.20	1.2	2.1	5.1	
	<b>MPR 5 R0.2 L30</b>	76	30	0.20	1.2	2.1	5.1	
	<b>MPR 5 R0.2 L40</b>	76	40	0.20	0.9	2.1	5.1	
6.0	<b>MPR 6 R0.2 L10</b>	51	10	0.20	1.4	2.8	6.1	SIM ... H6
	<b>MPR 6 R0.2 L15</b>	51	15	0.20	1.4	2.8	6.1	
	<b>MPR 6 R0.2 L22</b>	51	22	0.20	1.4	2.8	6.1	
	<b>MPR 6 R0.2 L30</b>	76	30	0.20	1.4	2.8	6.1	
	<b>MPR 6 R0.2 L40</b>	76	40	0.20	1.0	2.8	6.1	
7.0	<b>MPR 7 R0.2 L22</b>	62	22	0.20	1.5	3.3	7.1	SIM ... H7
	<b>MPR 7 R0.2 L30</b>	62	30	0.20	1.5	3.3	7.1	
	<b>MPR 7 R0.2 L35</b>	62	35	0.20	1.5	3.3	7.1	
8.0	<b>MPR 8 R0.2 L15</b>	64	15	0.20	1.6	3.8	8.1	SIM ... H8
	<b>MPR 8 R0.2 L22</b>	64	22	0.20	1.6	3.8	8.1	
	<b>MPR 8 R0.2 L35</b>	76	35	0.20	1.6	3.8	8.1	
10.0	<b>MPR 10 R0.2 L35</b>	73	35	0.20	2.0	4.8	10.1	SIM ... H10

Order example: MPR 4 R0.2 L15 BXC

For L.H. Bars specify MPL instead of MPR

For additional holders see page A06-32 to 41

## MUR Bars Profiling, 90° Face Cutting



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	R	H	F	Min. Dia.	Holder
3.0	<b>MUR 3 R0.05 L10</b>	39	10	0.05	0.4	1.3	3.1	SIM ... H3
	<b>MUR 3 R0.05 L15</b>	39	15	0.05	0.4	1.3	3.1	
4.0	<b>MUR 4 R0.1 L10</b>	51	10	0.10	0.5	1.7	4.1	SIM ... H4
	<b>MUR 4 R0.1 L15</b>	51	15	0.10	0.5	1.7	4.1	
5.0	<b>MUR 5 R0.15 L15</b>	51	15	0.15	0.7	2.1	5.1	SIM ... H5
	<b>MUR 5 R0.15 L22</b>	51	22	0.15	0.7	2.1	5.1	
6.0	<b>MUR 6 R0.15 L15</b>	51	15	0.15	0.9	2.8	6.1	SIM ... H6
	<b>MUR 6 R0.15 L22</b>	51	22	0.15	0.9	2.8	6.1	
8.0	<b>MUR 8 R0.2 L22</b>	64	22	0.20	1.1	3.8	8.1	SIM ... H8

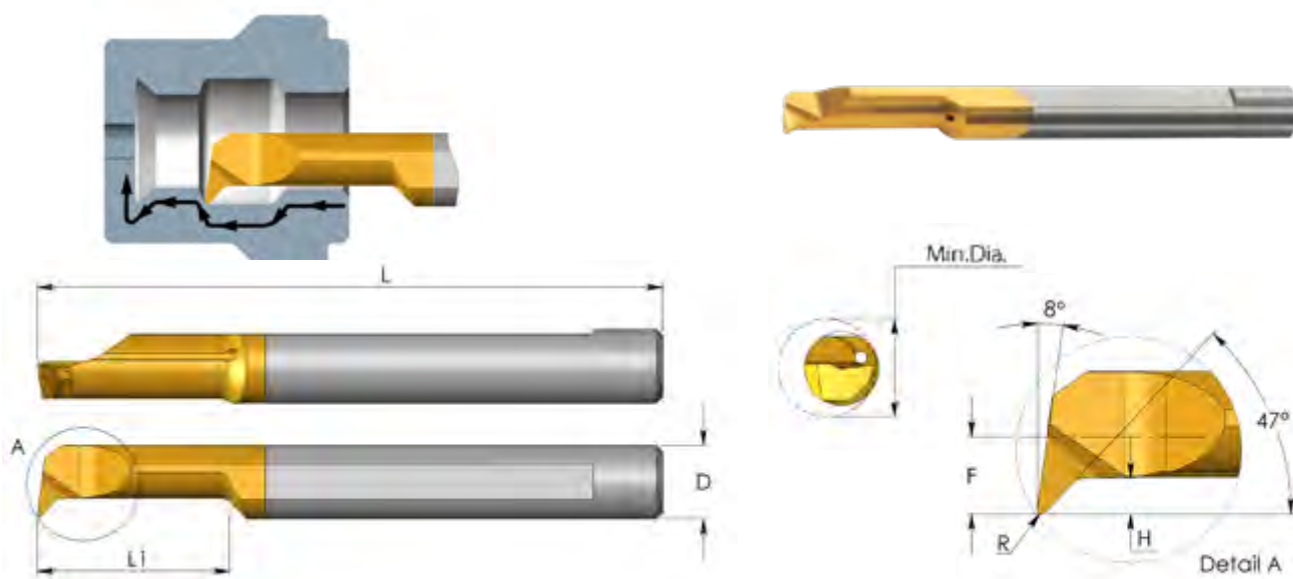
Order example: MUR 5 R0.15 L15 BXC

● First choice    ○ Alternative

For L.H. bars specify MUL instead of MUR

For additional holders see page A06-32 to 41

## MQR Bars Profiling and Boring



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	R	H	F	Min. Dia.	Holder
3.0	<b>MQR 3 R0.1 L10</b>	39	10	0.10	0.6	1.3	3.1	SIM ... H3
	<b>MQR 3 R0.1 L15</b>	39	15	0.10	0.6	1.3	3.1	
4.0	<b>MQR 4 R0.1 L22</b>	51	22	0.10	0.8	1.8	4.1	SIM ... H4
	<b>MQR 4 R0.2 L10</b>	51	10	0.20	0.8	1.8	4.1	
	<b>MQR 4 R0.2 L15</b>	51	15	0.20	0.8	1.8	4.1	
	<b>MQR 4 R0.2 L22</b>	51	22	0.20	0.8	1.8	4.1	
5.0	<b>MQR 5 R0.2 L15</b>	51	15	0.20	1.0	2.3	5.1	SIM ... H5
	<b>MQR 5 R0.2 L22</b>	51	22	0.20	1.0	2.3	5.1	
6.0	<b>MQR 6 R0.2 L15</b>	51	15	0.20	1.4	2.8	6.1	SIM ... H6
	<b>MQR 6 R0.2 L22</b>	51	22	0.20	1.4	2.8	6.1	
	<b>MQR 6 R0.2 L30</b>	58	30	0.20	1.4	2.8	6.1	
8.0	<b>MQR 8 R0.2 L22</b>	64	22	0.20	1.6	3.8	8.1	SIM ... H8
	<b>MQR 8 R0.2 L27</b>	64	27	0.20	2.0	3.8	8.1	

Order example: MQR 5 R0.2 L15 BXC

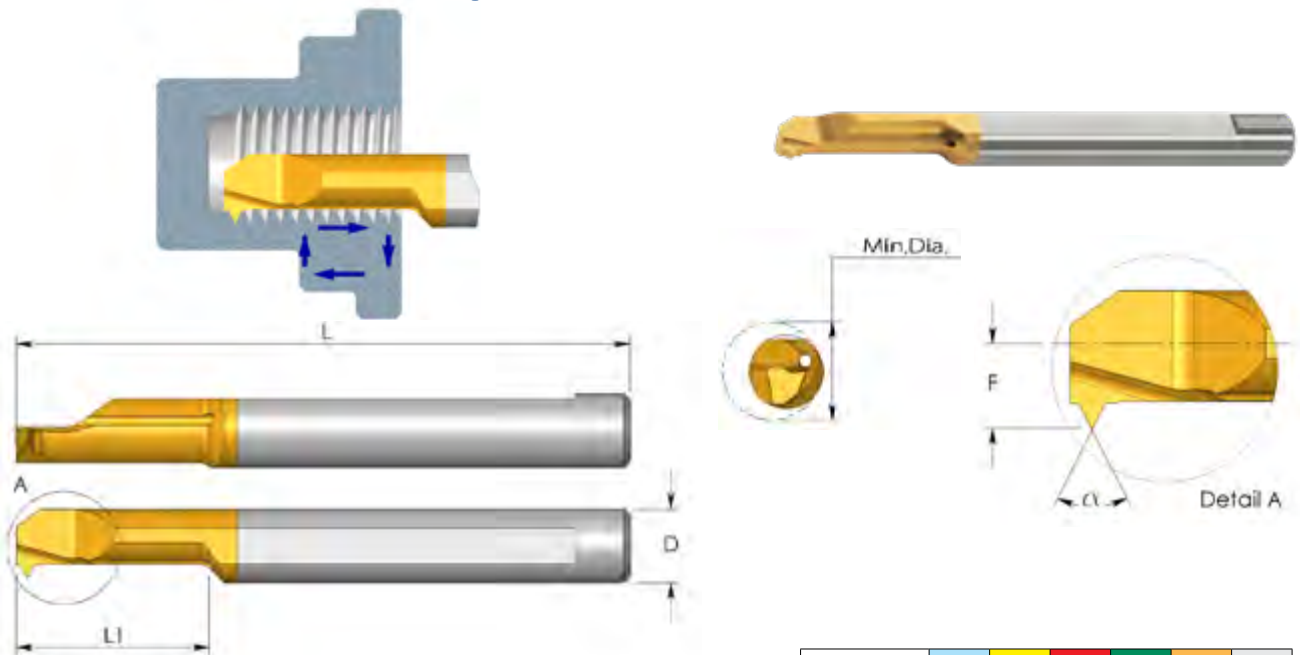
For L.H. bars specify MQL instead of MQR

For additional holders see page A06-32 to 41

● First choice

○ Alternative

## MIR Bars Threading



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

### Partial Profile 55°

D	Ordering Code	Pitch Range		L	L1	α	F	Min. Dia.	Holder
		mm	TPI						
3.0	<b>MIR 3 L15 A55</b>	0.5 - 1.0	48 - 24	39	15	55	1.4	3.2	SIM ... H3
4.0	<b>MIR 4 L15 A55</b>	0.5 - 1.0	48 - 24	51	15	55	1.8	4.1	SIM ... H4
5.0	<b>MIR 5 L15 A55</b>	0.5 - 1.25	48 - 20	51	15	55	2.3	5.1	SIM ... H5
	<b>MIR 5 L22 A55</b>	0.5 - 1.25	48 - 20	51	22	55	2.3	5.1	
6.0	<b>MIR 6 L15 A55</b>	0.5 - 1.5	48 - 16	51	15	55	2.6	6.0	SIM ... H6
	<b>MIR 6 L22 A55</b>	0.5 - 1.5	48 - 16	51	22	55	2.6	6.0	

Order example: MIR 5 L15 A55 BXC

### Partial Profile 60°

D	Ordering Code	Pitch Range		L	L1	α	F	Min. Dia.	Holder
		mm	TPI						
3.0	<b>MIR 1 L5 A60</b>	0.25 - 0.35	100 - 72	39	4.8	60	0.55	1.2	SIM ... H3
	<b>MIR 1.5 L6 A60</b>	0.35 - 0.45	72 - 56	39	6.3	60	0.65	1.4	
3.0	<b>MIR 2 L8 A60</b>	0.45 - 0.7	56 - 32	39	8	60	1.0	2.1	SIM ... H3
3.0	<b>MIR 3 L15 A60</b>	0.7 - 1.0	32 - 24	39	15	60	1.4	3.2	SIM ... H3
4.0	<b>MIR 4 L17 A60</b>	0.35 - 0.45	72 - 56	51	17	60	1.8	4.1	SIM ... H4
	<b>MIR 4 L15 A60</b>	0.8 - 1.0	32 - 24	51	15	60	1.8	4.1	
5.0	<b>MIR 5 L15 A60</b>	1.0 - 1.25	24 - 20	51	15	60	2.3	5.1	SIM ... H5
	<b>MIR 5 L22 A60</b>	1.0 - 1.25	24 - 20	51	22	60	2.3	5.1	
6.0	<b>MIR 6 L15 A60</b>	1.0 - 1.5	24 - 16	51	15	60	2.6	6.0	SIM ... H6
	<b>MIR 6 L22 A60</b>	1.0 - 1.5	24 - 16	51	22	60	2.6	6.0	
8.0	<b>MIR 8 L22 A60</b>	1.0 - 2.0	24 - 13	64	22	60	3.6	8.0	SIM ... H8

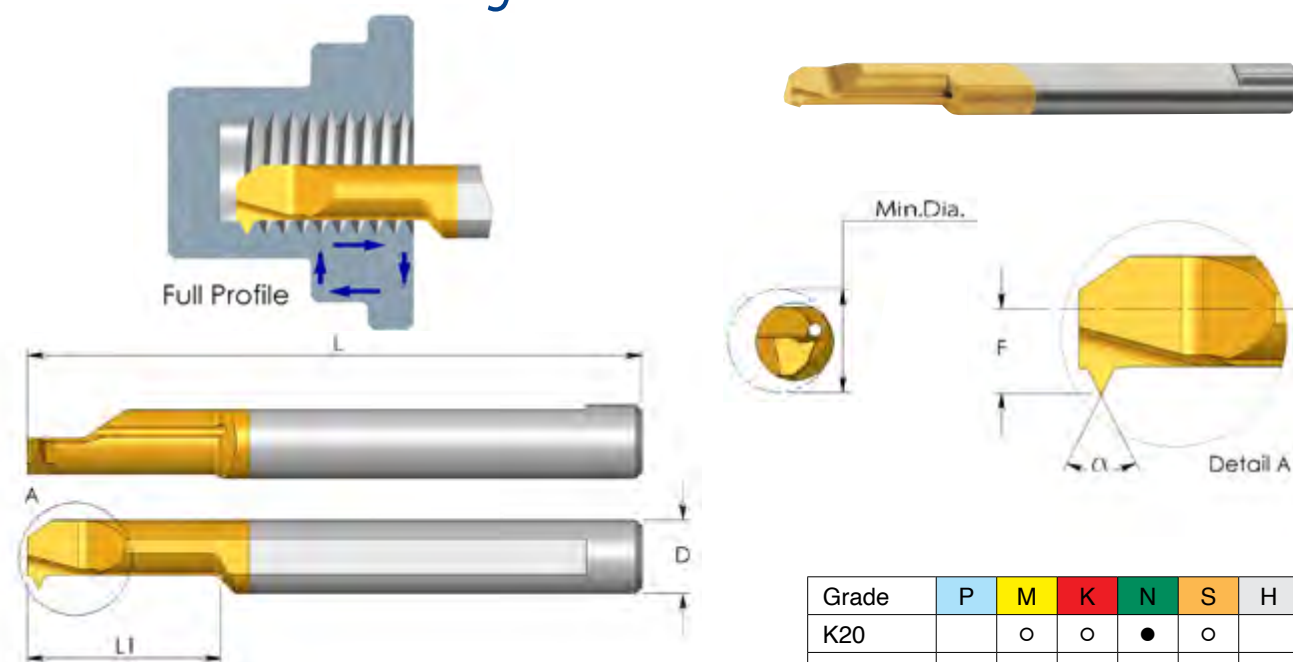
Order example: MIR 5 L15 A60 BXC

For L.H. bars specify MIL instead of MIR

For additional holders see page A06-32 to 41

● First choice    ○ Alternative

## MIR Bars Threading



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

### Full Profile - ISO 60°

D	Ordering Code	Pitch mm	M Coarse	M Fine	L	L1	α	F	Min. Dia.	Holder
3.0	<a href="#">MIR 3 L10 0.5 ISO</a>	0.5	M3	M3.5	39	10	60	1.0	2.4	SIM ... H3
3.0	<a href="#">MIR 3 L15 0.5 ISO</a>	0.5		M4	39	15	60	1.4	3.2	SIM ... H3
	<a href="#">MIR 3 L15 0.7 ISO</a>	0.7	M4		39	15	60	1.4	3.2	
	<a href="#">MIR 3 L15 0.75 ISO</a>	0.75	M4.5		39	15	60	1.4	3.2	
4.0	<a href="#">MIR 4 L15 0.5 ISO</a>	0.5		M5	51	15	60	1.8	4.1	SIM ... H4
	<a href="#">MIR 4 L15 0.75 ISO</a>	0.75		M5	51	15	60	1.8	4.1	
	<a href="#">MIR 4 L15 0.8 ISO</a>	0.8	M5		51	15	60	1.8	4.1	
5.0	<a href="#">MIR 5 L15 1.0 ISO</a>	1.0	M6, M7	M8	51	15	60	2.2	4.9	SIM ... H5
6.0	<a href="#">MIR 6 L22 1.25 ISO</a>	1.25	M8, M9	M10	51	22	60	2.8	6.1	SIM ... H6
	<a href="#">MIR 6 L22 1.5 ISO</a>	1.5	M10, M11		51	22	60	2.8	6.1	

Order example: MIR 5 L15 1.0 ISO BXC

### Full Profile - UN 60°

D	Ordering Code	Pitch TPI	UNC	UNF	UNEF	UNS	L	L1	α	F	Min. Dia.	Holder
3.0	<a href="#">MIR 3 L10 32 UN</a>	32	6				39	10	60	1.0	2.7	SIM...H3
3.0	<a href="#">MIR 3 L15 32 UN</a>	32	8	10			39	15	60	1.4	3.2	SIM...H3
	<a href="#">MIR 3 L15 36 UN</a>	36		8		10	39	15	60	1.4	3.2	
4.0	<a href="#">MIR 4 L15 36 UN</a>	36				12	51	15	60	1.8	4.1	SIM...H4
	<a href="#">MIR 4 L15 32 UN</a>	32			12		51	15	60	1.8	4.1	
5.0	<a href="#">MIR 5 L15 28 UN</a>	28		1/4			51	15	60	2.2	4.9	SIM...H5
	<a href="#">MIR 5 L18 20 UN</a>	20	1/4				51	18	60	2.3	5.0	
6.0	<a href="#">MIR 6 L18 24 UN</a>	24		5/16			51	18	60	2.8	6.5	SIM...H6
	<a href="#">MIR 6 L18 18 UN</a>	18	5/6			3/8	51	18	60	2.8	6.2	

Order example: MIR 4 L15 36 UN BXC

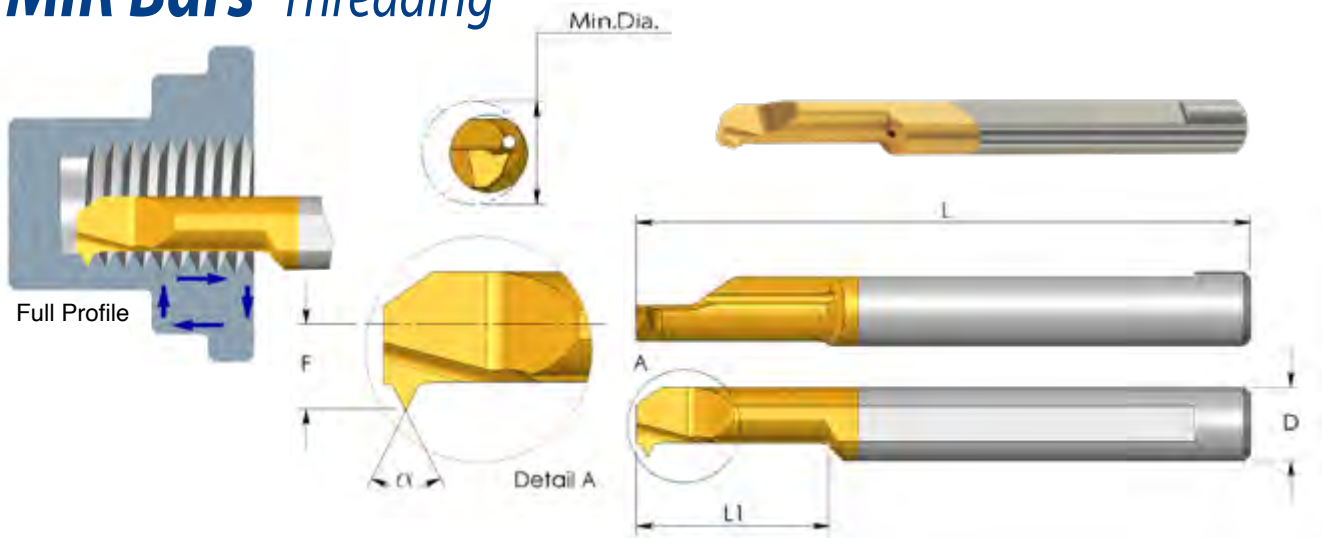
For L.H. bars specify MIL instead of MIR

For additional holders see page A06-32 to 41

● First choice

○ Alternative

## MIR Bars Threading



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

### Full Profile - MJ 60°

D	Ordering Code	Thread Size	L	L1	$\alpha$	F	Min. Dia.	Holder
3.0	<b>MIR 3 L15 0.7 MJ</b>	MJ4x0.7	39	15	60	1.4	3.2	SIM ... H3
4.0	<b>MIR 4 L15 0.8 MJ</b>	MJ5x0.8	51	15	60	1.8	4.1	SIM ... H4
5.0	<b>MIR 5 L15 1.0 MJ</b>	MJ6x1.0	51	15	60	2.2	4.9	SIM ... H5

Order example: MIR 4 L15 0.8 MJ BXC

### Full Profile - UNJ 60°

D mm	Ordering Code	Thread Size	L	L1	$\alpha$	F	Min. Dia.	Holder
3.0	<b>MIR 3 L15 32 UNJ</b>	8-32 UNJC	39	15	60	1.4	3.2	SIM...H3
5.0	<b>MIR 5 L15 28 UNJ</b>	1/4-28 UNJF	51	15	60	2.2	4.9	SIM...H5
	<b>MIR 5 L18 20 UNJ</b>	1/4-20 UNJC	51	18	60	2.3	5.0	SIM...H5

Order example: MIR 3 L15 32 UNJ BXC

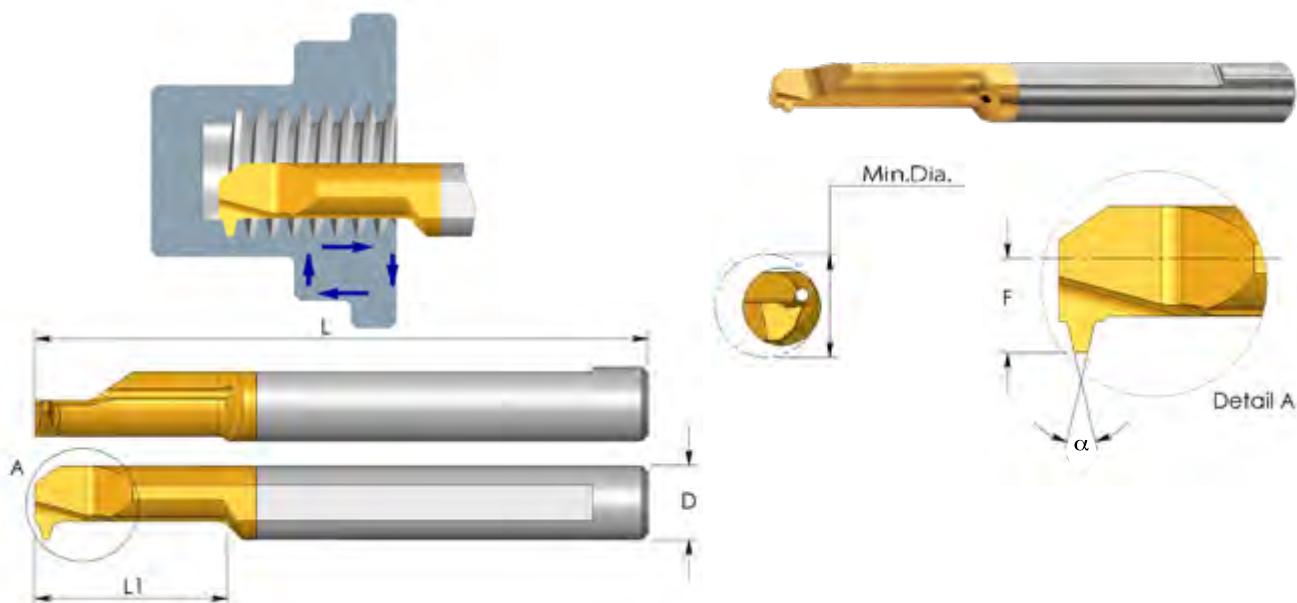
For L.H. bars specify MIL instead of MIR

For additional holders see page A06-32 to 41

● First choice    ○ Alternative



## MIR Bars Threading



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

### Full Profile - G 55° BSP

D	Ordering Code	Thread Size	L	L1	$\alpha$	F	Min. Dia.	Holder
6.0	<b>MIR 6 L17 28 W</b>	1/16-28 BSP	51	17	55	2.8	6.5	SIM ... H6
	<b>MIR 6 L17 19 W</b>	1/4-19 BSP	51	17	55	2.8	7.0	

### Full Profile - Whitworth 55° BSW

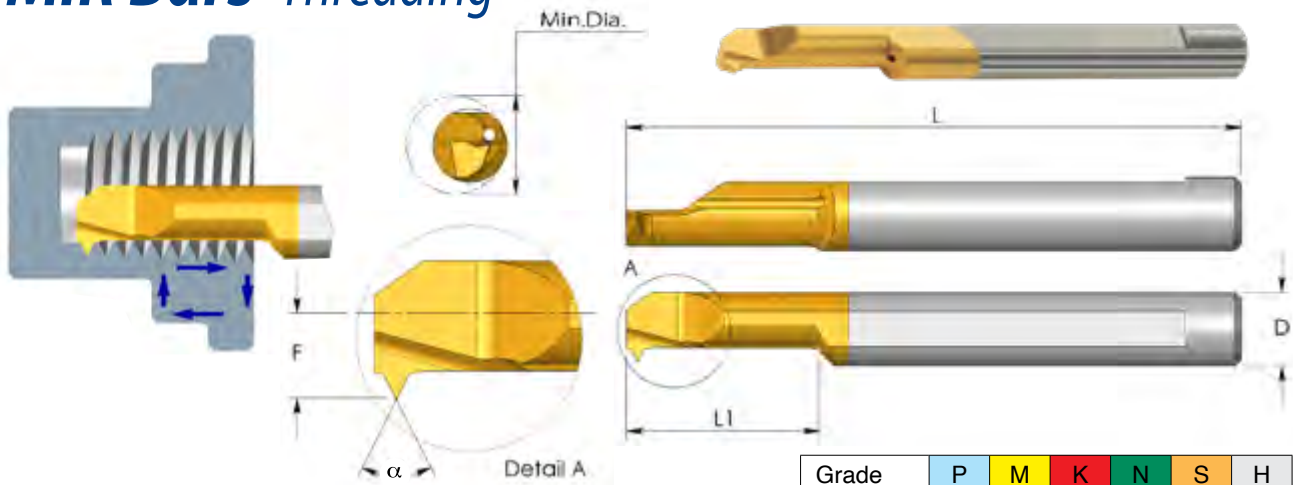
D	Ordering Code	Thread Size	L	L1	$\alpha$	F	Min. Dia.	Holder
5.0	<b>MIR 5 L17 20 W</b>	1/4-20 BSW	51	17	55	2.0	4.7	SIM ... H5

Order example: MIR 6 L17 28 W BMK

For L.H. bars specify MIL instead of MIR

For additional holders see page A06-32 to 41

## MIR Bars Threading

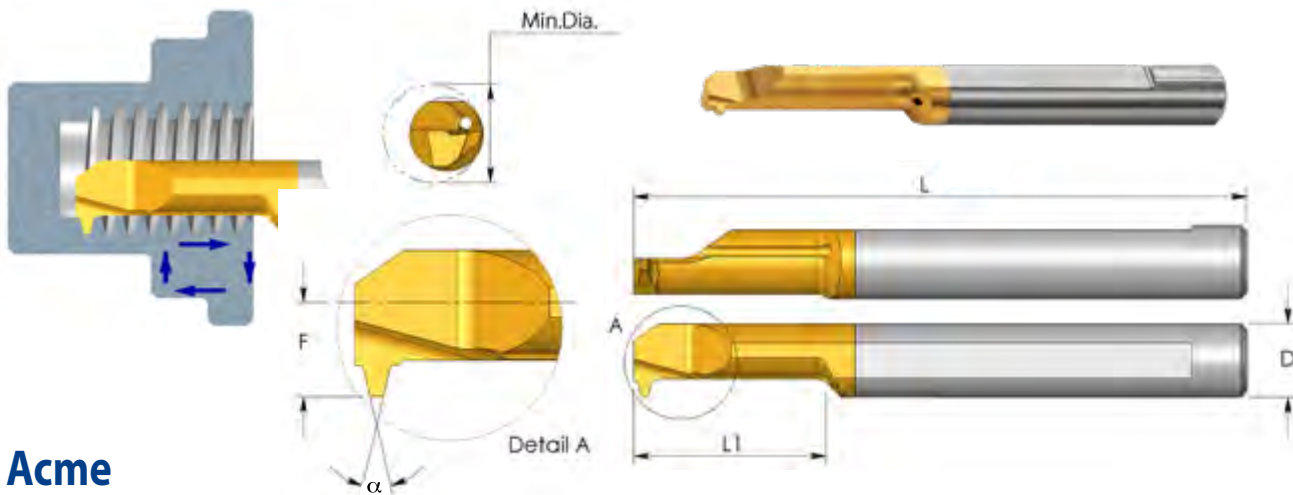


Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

### Full Profile - NPT 60°

D	Ordering Code	Pitch TPI	Thread Size	L	L1	α	F	Min. Dia.	Holder
6.0	<b>MIR 6 L15 27 NPT</b>	27	1/16 x 27 NPT 1/8 x 27 NPT	51	15	60	2.8	5.9	SIM ... H6

Order example: MIR 6 L15 27 NPT BXC



### Acme

D	Ordering Code	Pitch TPI	Thread Size	L	L1	α	F	Min. Dia.	Holder
4.0	<b>MIR 4 L15 16 ACME</b>	16	1/4 x 16	51	15	29	1.8	4.6	SIM ... H4
6.0	<b>MIR 6 L20 14 ACME</b>	14	5/16 x 14	51	20	29	2.8	6.0	SIM ... H6
7.0	<b>MIR 7 L22 12 ACME</b>	12	3/8 x 12 7/16 x 12	62	22	29	3.3	7.2	SIM ... H7
8.0	<b>MIR 8 L30 10 ACME</b>	10	1/2 x 10	76	30	29	3.8	10.0	SIM ... H8
10.0	<b>MIR 10 L35 8 ACME</b>	8	5/8 x 8	73	35	29	4.8	12.5	SIM ... H10
10.0	<b>MIR 10 L45 6 ACME</b>	6	3/4 x 6 7/8 x 6	105	45	29	4.8	14.6	SIM ... H10
10.0	<b>MIR 10 L52 5 ACME</b>	5	1x5	105	52	29	4.8	20.0	SIM ... H10

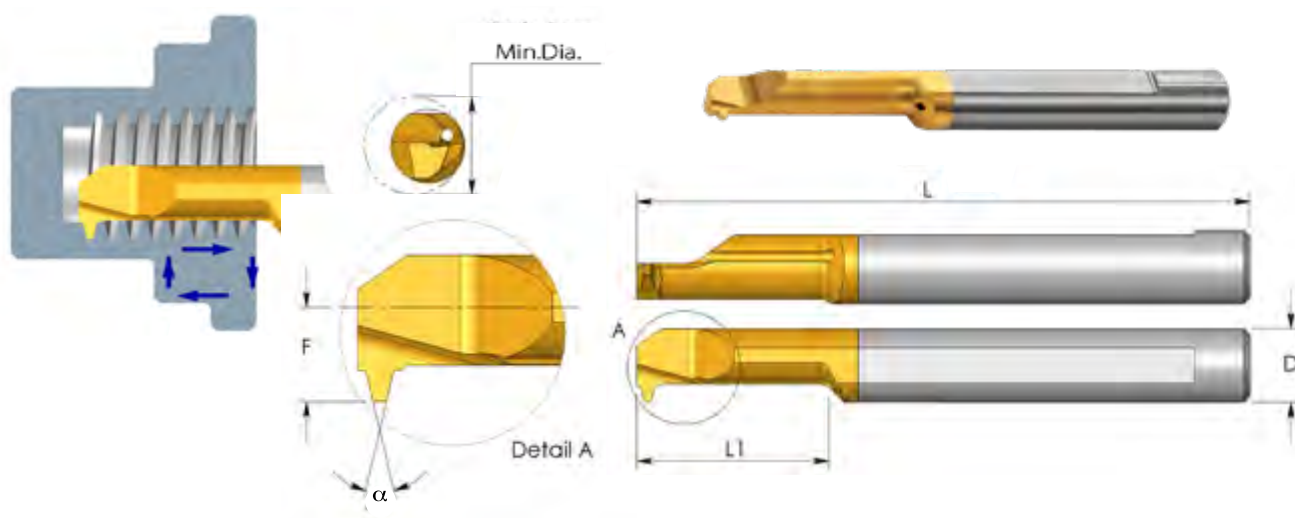
Order example: MIR 6 L 20 14 ACME BXC

For L.H. bars specify MIL instead of MIR

For additional holders see page A06-32 to 41

● First choice    ○ Alternative

## MIR Bars Threading



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

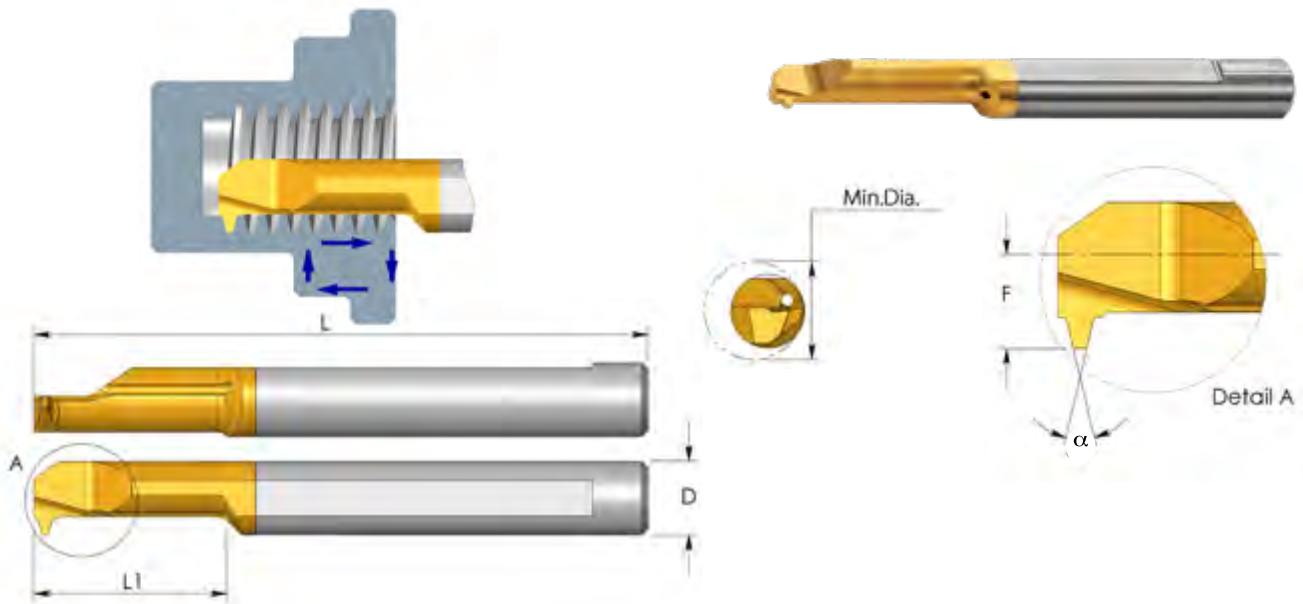
## Stub Acme

D	Ordering Code	Pitch TPI	Thread Size	L	L1	$\alpha$	F	Min. Dia.	Holder
4.0	<b>MIR 4 L15 16 STACME</b>	16	1/4 x 16	51	15	29	1.8	5.2	SIM ... H4
6.0	<b>MIR 6 L20 14 STACME</b>	14	5/16 x 14	51	20	29	2.8	6.6	SIM ... H6
7.0	<b>MIR 7 L22 12 STACME</b>	12	3/8 x 12 7/16 x 12	62	22	29	3.3	8.1	SIM ... H7
8.0	<b>MIR 8 L30 10 STACME</b>	10	1/2 x 10	76	30	29	3.8	11.0	SIM ... H8
10.0	<b>MIR 10 L35 8 STACME</b>	8	5/8 x 8	73	35	29	4.8	13.8	SIM ... H10
10.0	<b>MIR 10 L45 6 STACME</b>	6	3/4 x 6 7/8 x 6	105	45	29	4.8	16.3	SIM ... H10

Order example: MIR 7 L22 12 STACME K20  
For additional holders see page A06-32 to 41

● First choice    ○ Alternative

## MIR Bars Threading



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

### Trapez - DIN 103

D	Ordering Code	Pitch mm	Thread Size	L	L1	$\alpha$	F	Min. Dia.	Holder
6.0	<b>MIR 6 L22 1.5 TR</b>	1.5	TR 8 x 1.5 TR 9 x 1.5 TR10 x 1.5	51	22	30	2.8	6.4	SIM ... H6
7.0	<b>MIR 7 L25 2 TR</b>	2	TR 9 x 2 TR10 x 2 TR11 x 2 TR12 x 2	62	25	30	3.2	6.9	SIM ... H7
10.0	<b>MIR 10 L35 2 TR</b>	2	TR14 x 2 TR16 x 2 TR18 x 2 TR20 x 2	73	35	30	4.8	11.0	SIM ... H10
7.0	<b>MIR 7 L35 3 TR</b>	3	TR11 x 3 TR12 x 3	62	35	30	3.3	7.5	SIM ... H7
10.0	<b>MIR 10 L35 3 TR</b>	3	TR14 x 3 TR22 x 3 TR24 x 3 TR26 x 3 TR28 x 3	73	35	30	4.8	10.5	SIM ... H10
10.0	<b>MIR 10 L45 4 TR</b>	4	TR16 x 4 TR18 x 4 TR20 x 4	105	45	30	4.8	11.5	SIM ... H10
10.0	<b>MIR 10 L55 5 TR</b>	5	TR22 x 5 TR24 x 5 TR28 x 5	105	55	30	4.8	11.0	SIM ... H10

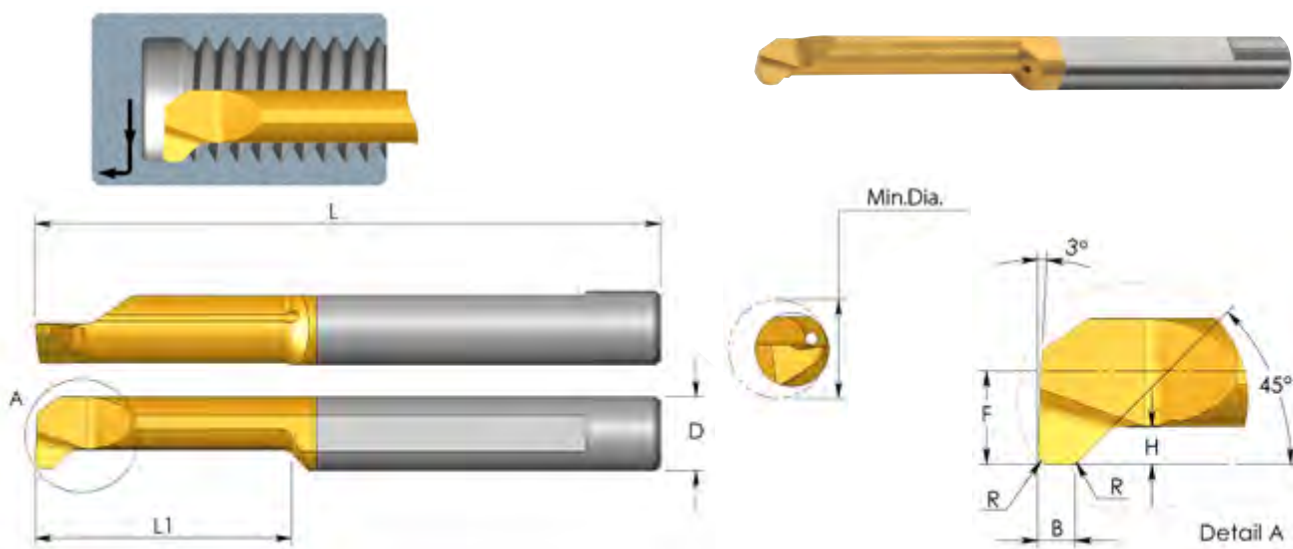
Order example: MIR 10 L35 3 TR BXC

● First choice    ○ Alternative

For L.H. bars specify MIL instead of MIR

For additional holders see page A06-32 to 41

## MDR Bars Thread Relief, Chamfering and Grooving



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	B	R	H	F	Min. Dia.	Holder
4.0	<b>MDR 4 R0.5 L18</b>	51	18	1.5	0.5	0.8	1.8	4.1	SIM ... H4
5.0	<b>MDR 5 R0.5 L24</b>	51	24	1.5	0.5	1.2	2.3	5.1	SIM ... H5
6.0	<b>MDR 6 R0.5 L27</b>	58	27	1.5	0.5	1.4	2.8	6.1	SIM ... H6

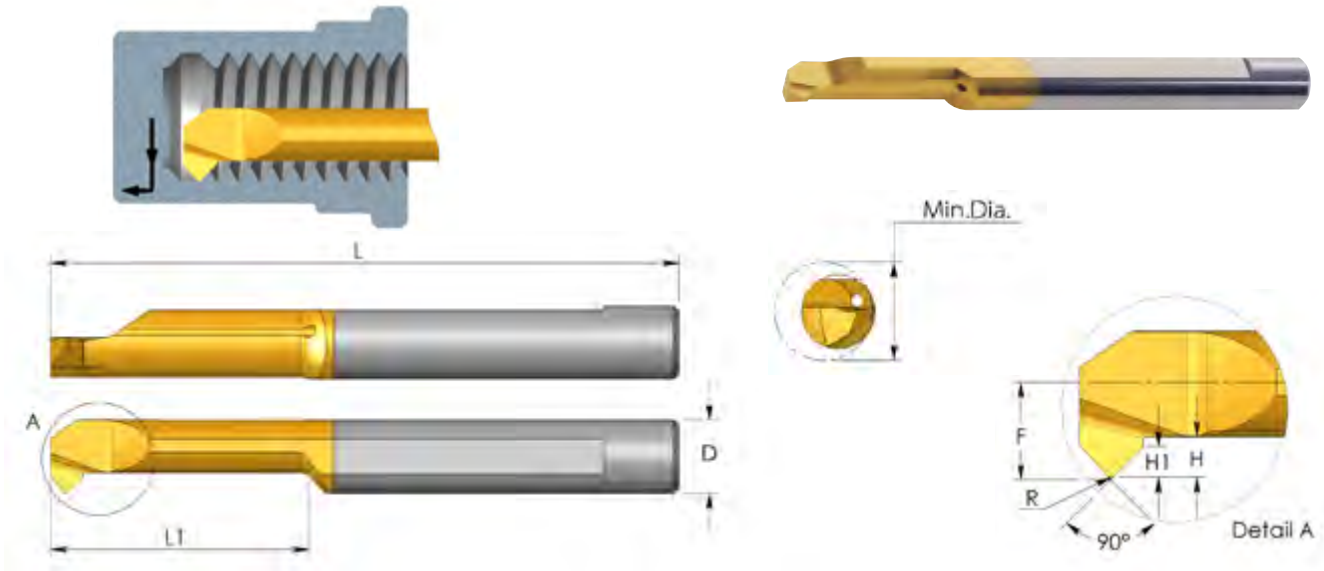
Order example: MDR 5 R0.5 L24 BXC

● First choice    ○ Alternative

For L.H. bars specify MDL instead of MDR

For additional holders see page A06-32 to 41

## MCR Bars Chamfering and Boring



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	R	H	H1	F	Min. Dia.	Holder
3.0	<b>MCR 3 R0.2 L10</b>	39	10	0.2	0.7	0.3	1.3	3.1	SIM ... H3
4.0	<b>MCR 4 R0.2 L15</b>	51	15	0.2	0.8	0.4	1.7	4.1	SIM ... H4
5.0	<b>MCR 5 R0.2 L15</b>	51	15	0.2	1.2	0.7	2.1	5.1	SIM ... H5
6.0	<b>MCR 6 R0.2 L15</b>	51	15	0.2	1.4	0.7	2.8	6.1	SIM ... H6
7.0	<b>MCR 7 R0.2 L20</b>	62	20	0.2	1.5	0.8	3.3	7.1	SIM ... H7

Order example: MCR 4 R0.2 L15 BXC

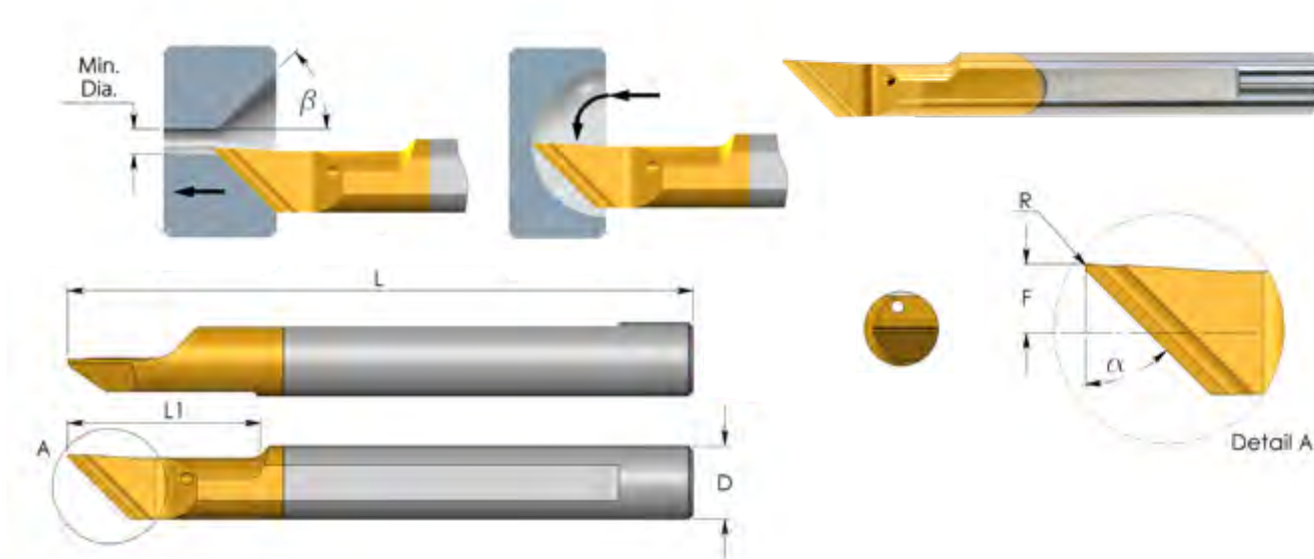
For L.H. bars specify MCL instead of MCR

For additional holders see page A06-32 to 41

● First choice    ○ Alternative



## MWR Bars Chamfering and Profiling



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	R	$\alpha$	$\beta$	F	Min. Dia.	Holder
6.0	<b>MWR 6 R0.2 A90</b>	51	15	0.2	45°	45°	2.3	1.0	SIM ... H6
	<b>MWR 6 R0.2 A60</b>	51	15	0.2	60°	30°	2.3	1.0	
	* <b>MWR 6 R0.4 A90</b>	51	22	0.4	45°	45°	2.3	6.0	
	* <b>MWR 6 R0.4 A60</b>	51	22	0.4	60°	30°	2.3	6.0	

Order example: MWR 6 R0.2 A90 BXC

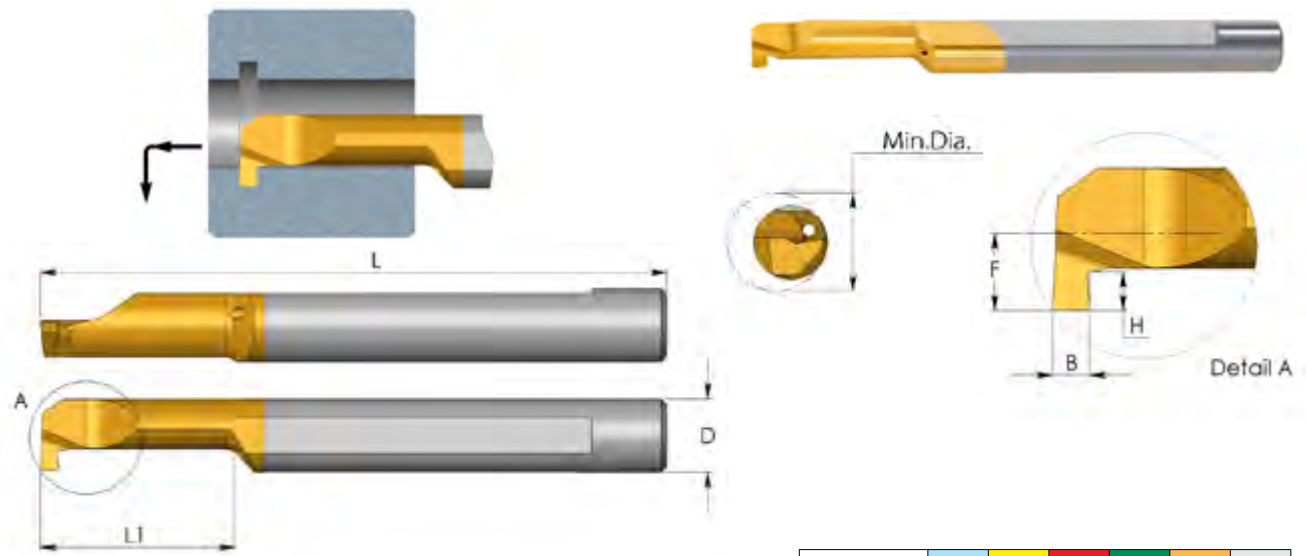
For L.H. bars specify MWL instead of MWR

\*Can be used also for boring

For additional holders see page A06-32 to 41

● First choice    ○ Alternative

## MGR Bars Grooving



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	B		H	F	Min. Dia.	Holder
				mm	in				
4.0	<b>MGR 2 B0.5 L10</b>	51	10	0.5	.020	0.5	0.9	2.1	SIM ... H4
3.0	<b>MGR 3 B0.5 L10</b>	39	10	0.5	.020	0.5	1.3	3.1	SIM ... H3
	<b>MGR 3 B0.7 L10</b>	39	10	0.7	.028	0.6	1.3	3.1	
4.0	<b>MGR 4 B0.5 L10</b>	51	10	0.5	.020	0.5	1.7	4.1	SIM ... H4
	<b>MGR 4 B0.5 L15</b>	51	15	0.5	.028	0.5	1.7	4.1	
	<b>MGR 4 B0.7 L10</b>	51	10	0.7	.028	0.6	1.7	4.1	
	<b>MGR 4 B0.79 L15</b>	51	15	0.79	.031	0.9	1.7	4.1	
	<b>MGR 4 B0.79 L22</b>	51	22	0.79	.031	0.9	1.7	4.1	
	<b>MGR 4 B1.0 L10</b>	51	10	1.0	.039	1.0	1.7	4.1	
	<b>MGR 4 B1.0 L15</b>	51	15	1.0	.039	1.0	1.7	4.1	
	<b>MGR 4 B1.0 L22</b>	51	22	1.0	.039	1.0	1.7	4.1	
	<b>MGR 4 B1.5 L10</b>	51	10	1.5	.059	1.0	1.7	4.1	
	<b>MGR 4 B1.5 L15</b>	51	15	1.5	.059	1.0	1.7	4.1	
5.0	<b>MGR 5 B0.79 L15</b>	51	15	0.79	.031	1.0	2.3	5.1	SIM ... H5
	<b>MGR 5 B0.79 L22</b>	51	22	0.79	.031	1.0	2.3	5.1	
	<b>MGR 5 B1.0 L15</b>	51	15	1.0	.039	1.2	2.3	5.1	
	<b>MGR 5 B1.0 L22</b>	51	22	1.0	.039	1.2	2.3	5.1	
	<b>MGR 5 B1.19 L15</b>	51	15	1.19	.047	1.2	2.3	5.1	
	<b>MGR 5 B1.19 L22</b>	51	22	1.19	.047	1.2	2.3	5.1	
	<b>MGR 5 B1.5 L15</b>	51	15	1.5	.059	1.2	2.3	5.1	
	<b>MGR 5 B1.5 L22</b>	51	22	1.5	.059	1.2	2.3	5.1	
	<b>MGR 5 B1.59 L15</b>	51	15	1.59	.063	1.2	2.3	5.1	
	<b>MGR 5 B1.59 L22</b>	51	22	1.59	.063	1.2	2.3	5.1	
	<b>MGR 5 B2.0 L15</b>	51	15	2.0	.079	1.2	2.3	5.1	
	<b>MGR 5 B2.0 L22</b>	51	22	2.0	.079	1.2	2.3	5.1	

For additional holders see page A06-32 to 41

● First choice      ○ Alternative

## MGR Bars Grooving

D	Ordering Code	L	L1	B		H	F	Min. Dia.	Holder
				mm	in				
6.0	MGR 6 B1.0 L15	51	15	1.0	.039	1.4	2.8	6.1	SIM ... H6
	MGR 6 B1.0 L22	51	22	1.0	.039	1.4	2.8	6.1	
	MGR 6 B1.5 L15	51	15	1.5	.059	1.4	2.8	6.1	
	MGR 6 B1.5 L22	51	22	1.5	.059	1.4	2.8	6.1	
	MGR 6 B2.0 L15	51	15	2.0	.079	1.4	2.8	6.1	
	MGR 6 B2.0 L22	51	22	2.0	.079	1.4	2.8	6.1	
6.0	MGR 6 B0.79 L17	51	17	0.79	.031	1.8	2.8	6.1	SIM ... H6
	MGR 6 B0.79 L23	51	23	0.79	.031	1.8	2.8	6.1	
	MGR 6 B1.0 L17	51	17	1.0	.039	1.8	2.8	6.1	
	MGR 6 B1.19 L17	51	17	1.19	.047	1.8	2.8	6.1	
	MGR 6 B1.19 L23	51	23	1.19	.047	1.8	2.8	6.1	
	MGR 6 B1.5 L17	51	17	1.5	.059	1.8	2.8	6.1	
	MGR 6 B1.5 L23	51	23	1.5	.059	1.8	2.8	6.1	
	MGR 6 B1.59 L17	51	17	1.59	.063	1.8	2.8	6.1	
	MGR 6 B1.59 L23	51	23	1.59	.063	1.8	2.8	6.1	
	MGR 6 B2.0 L17	51	17	2.0	.079	1.8	2.8	6.1	
MGR 6 B2.0 L23	51	23	2.0	.079	1.8	2.8	6.1		
7.0	MGR 7 B1.0 L15	62	15	1.0	.039	2.5	3.3	7.1	SIM ... H7
	MGR 7 B1.0 L22	62	22	1.0	.039	2.5	3.3	7.1	
	MGR 7 B1.0 L30	62	30	1.0	.039	2.5	3.3	7.1	
	MGR 7 B1.19 L22	62	22	1.19	.047	2.5	3.3	7.1	
	MGR 7 B1.19 L30	62	30	1.19	.047	2.5	3.3	7.1	
	MGR 7 B1.5 L15	62	15	1.5	.059	2.5	3.3	7.1	
	MGR 7 B1.5 L22	62	22	1.5	.059	2.5	3.3	7.1	
	MGR 7 B1.5 L30	62	30	1.5	.059	2.5	3.3	7.1	
	MGR 7 B1.59 L22	62	22	1.59	.063	2.5	3.3	7.1	
	MGR 7 B1.59 L30	62	30	1.59	.063	2.5	3.3	7.1	
	MGR 7 B2.0 L15	62	15	2.0	.079	2.5	3.3	7.1	
	MGR 7 B2.0 L22	62	22	2.0	.079	2.5	3.3	7.1	
MGR 7 B2.0 L30	62	30	2.0	.079	2.5	3.3	7.1		
8.0	MGR 8 B1.0 L22	64	22	1.0	.039	1.7	3.8	8.1	SIM ... H8
	MGR 8 B1.5 L22	64	22	1.5	.059	1.7	3.8	8.1	
	MGR 8 B2.0 L15	64	15	2.0	.079	2.6	3.8	8.1	
	MGR 8 B2.0 L22	64	22	2.0	.079	2.6	3.8	8.1	
	MGR 8 B2.38 L15	64	15	2.38	.094	2.6	3.8	8.1	
	MGR 8 B2.38 L22	64	22	2.38	.094	2.6	3.8	8.1	

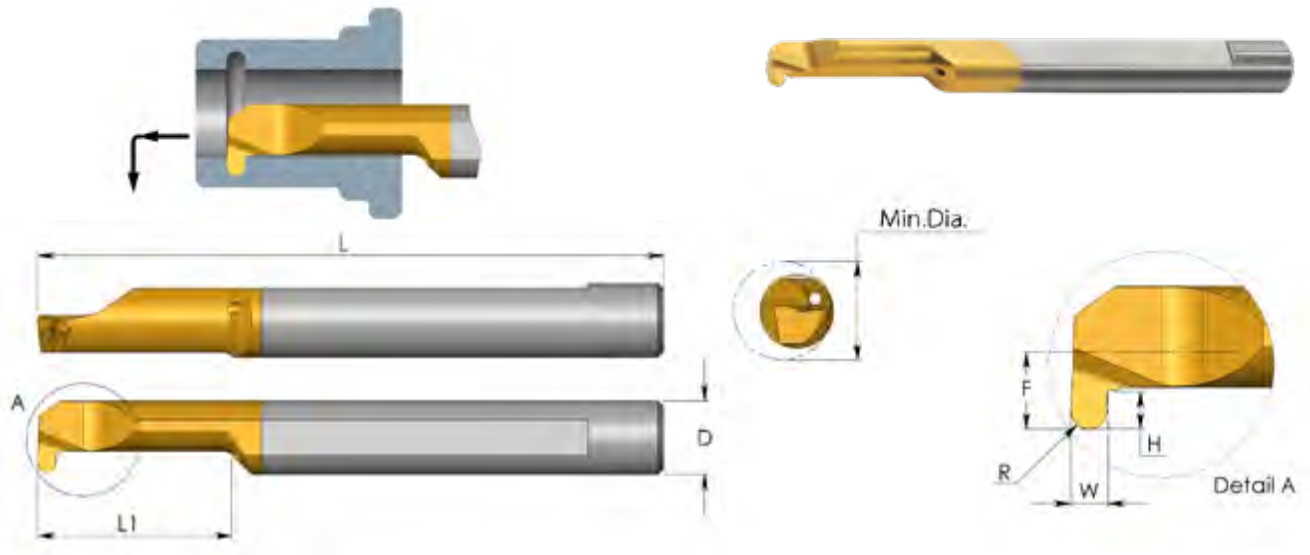
Tolerance: B±0.025 mm/.001"

Order example: MGR 5 B1.5 L15 BXC

For L.H. bars specify MGL instead of MGR

For additional holders see page A06-32 to 41

# MKR Bars Full Radius Grooving



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	R	W	H	F	Min. Dia.	Holder
4.0	<b>MKR 4 R0.5 L10</b>	51	10	0.50	1.0	1.0	1.7	4.1	SIM ... H4
	<b>MKR 4 R0.5 L15</b>	51	15	0.50	1.0	1.0	1.7	4.1	
	<b>MKR 4 R0.75 L10</b>	51	10	0.75	1.5	1.0	1.7	4.1	
5.0	<b>MKR 5 R0.5 L15</b>	51	15	0.50	1.0	1.2	2.3	5.1	SIM ... H5
	<b>MKR 5 R0.75 L15</b>	51	15	0.75	1.5	1.2	2.3	5.1	
	<b>MKR 5 R1.0 L15</b>	51	15	1.00	2.0	1.2	2.3	5.1	
	<b>MKR 5 R1.0 L22</b>	51	22	1.00	2.0	1.2	2.3	5.1	
6.0	<b>MKR 6 R0.5 L15</b>	51	15	0.50	1.0	1.6	2.8	6.1	SIM ... H6
	<b>MKR 6 R0.75 L15</b>	51	15	0.75	1.5	1.6	2.8	6.1	
	<b>MKR 6 R1.0 L15</b>	51	15	1.00	2.0	1.6	2.8	6.1	
	<b>MKR 6 R1.0 L23</b>	51	23	1.00	2.0	1.8	2.8	6.1	
7.0	<b>MKR 7 R0.5 L22</b>	62	22	0.50	1.0	2.5	3.3	7.1	SIM ... H7
	<b>MKR 7 R0.75 L22</b>	62	22	0.75	1.5	2.5	3.3	7.1	
	<b>MKR 7 R1.0 L22</b>	62	22	1.00	2.0	2.5	3.3	7.1	

Tolerance: R±0.025 mm

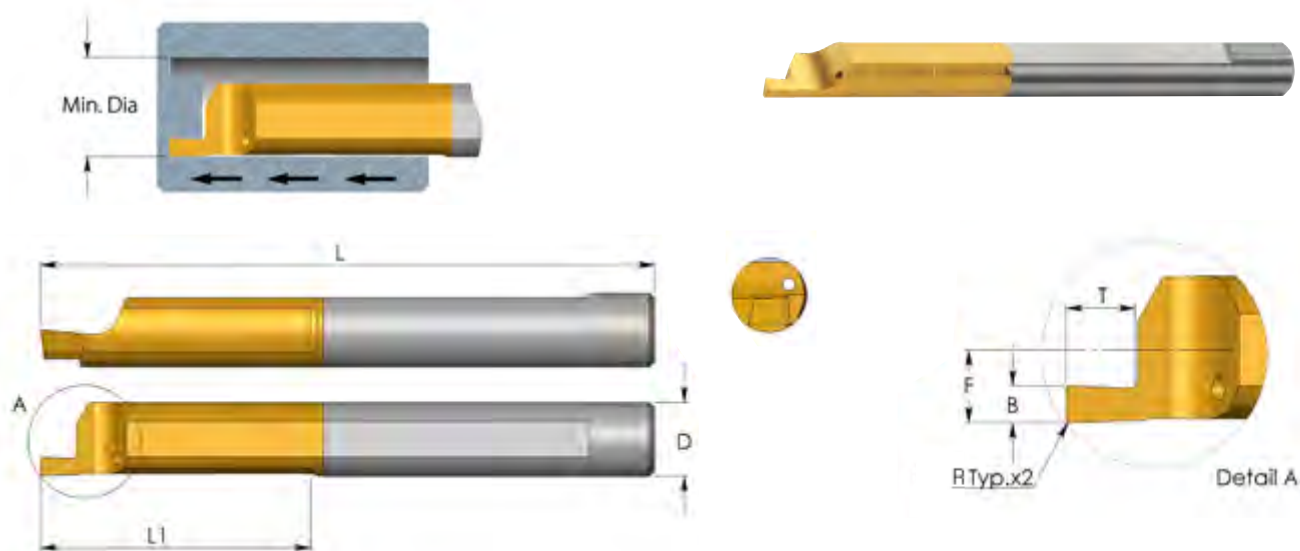
● First choice    ○ Alternative

Order example: MKR 5 R1.0 L15 BXC

For L.H. bars specify MKL instead of MKR

For additional holders see page A06-32 to 41

## MFR Bars Face Grooving



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	R	B	T	F	Min. Dia.	Holder
4.0	<b>MFR 4 B0.5 L15</b>	51	15	0.05	0.5	1.2	1.95	5.0	SIM ... H4
	<b>MFR 4 B0.75 L15</b>	51	15	0.1	0.75	1.2	1.95	5.0	
	<b>MFR 4 B1.0 L15</b>	51	15	0.1	1.0	1.5	1.95	5.0	
	<b>MFR 4 B1.5 L15</b>	51	15	0.1	1.5	2.8	1.95	5.0	
	<b>MFR 4 B1.5 L17</b>	51	17	0.1	1.5	3.5	1.95	5.0	
	<b>MFR 4 B2.0 L17</b>	51	17	0.1	2.0	5.0	1.95	5.0	
5.0	<b>MFR 5 B0.5 L22</b>	51	22	0.05	0.5	1.2	2.45	6.0	SIM ... H5
	<b>MFR 5 B0.75 L22</b>	51	22	0.1	0.75	1.2	2.45	6.0	
	<b>MFR 5 B1.0 L22</b>	51	22	0.1	1.0	1.5	2.45	6.0	
	<b>MFR 5 B1.0 L23</b>	51	23	0.1	1.0	2.5	2.45	6.0	
	<b>MFR 5 B1.5 L22</b>	51	22	0.1	1.5	2.5	2.45	6.0	
	<b>MFR 5 B1.5 L23</b>	51	23	0.1	1.5	3.5	2.45	6.0	
	<b>MFR 5 B2.0 L22</b>	51	22	0.1	2.0	3.8	2.45	6.0	
	<b>MFR 5 B2.0 L23</b>	51	23	0.1	2.0	5.0	2.45	6.0	
6.0	<b>MFR 6 B1.0 L22</b>	51	22	0.1	1.0	1.5	2.95	8.0	SIM ... H6
	<b>MFR 6 B1.5 L22</b>	51	22	0.1	1.5	2.5	2.95	8.0	
	<b>MFR 6 B2.0 L22</b>	51	22	0.1	2.0	3.0	2.95	8.0	
	<b>MFR 6 B2.5 L22</b>	51	22	0.1	2.5	4.8	2.95	8.0	
	<b>MFR 6 B3.0 L30</b>	58	30	0.1	3.0	6.0	2.95	8.0	
8.0	<b>MFR 8 B2.5 L22</b>	64	22	0.1	2.5	3.5	3.95	10.0	SIM ... H8

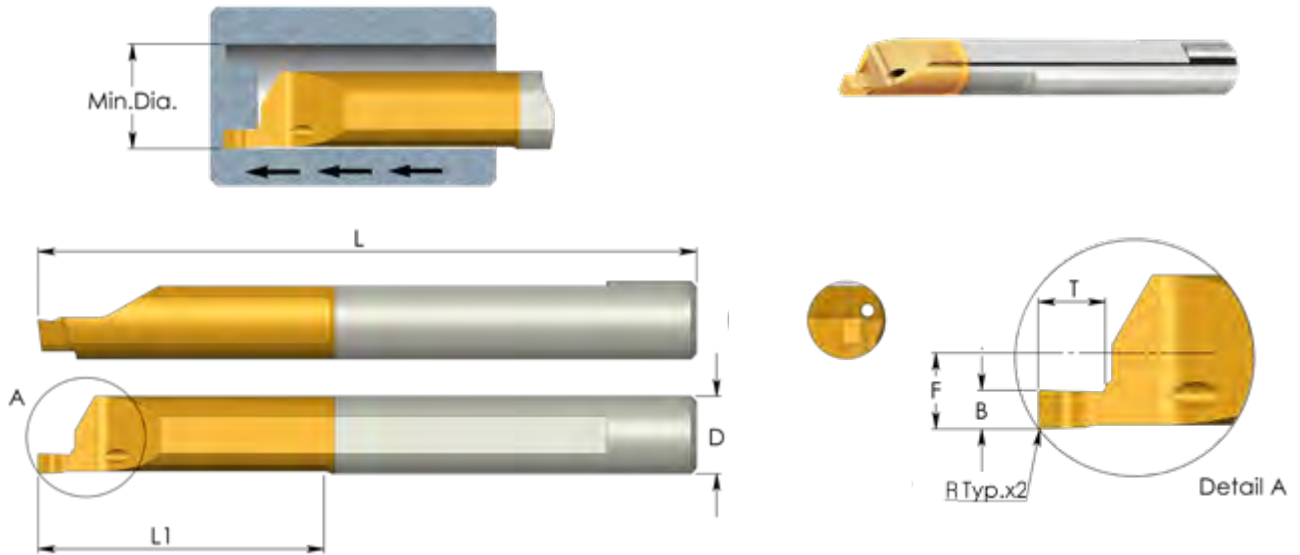
Order example: MFR 5 B1.0 L22 BXC

● First choice

○ Alternative

For additional holders see page A06-32 to 41

## MFR Bars Face Grooving with Chip Former



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	R	B	T	F	Min. Dia.	Holder
4.0	<b>MFR 4 B1.5 L15-C</b>	51	15	0.1	1.5	2.8	1.95	5.0	SIM ... H4
5.0	<b>MFR 5 B1.5 L22-C</b>	51	22	0.1	1.5	2.5	2.45	6.0	SIM ... H5
	<b>MFR 5 B2.0 L22-C</b>	51	22	0.1	2.0	3.8	2.45	6.0	
6.0	<b>MFR 6 B1.5 L22-C</b>	51	22	0.1	1.5	2.5	2.95	8.0	SIM ... H6
	<b>MFR 6 B2.0 L22-C</b>	51	22	0.1	2.0	3.0	2.95	8.0	
	<b>MFR 6 B3.0 L22-C</b>	51	22	0.1	3.0	6.0	2.95	8.0	

Order example: MFR 5 B2.0 L22-C BXC

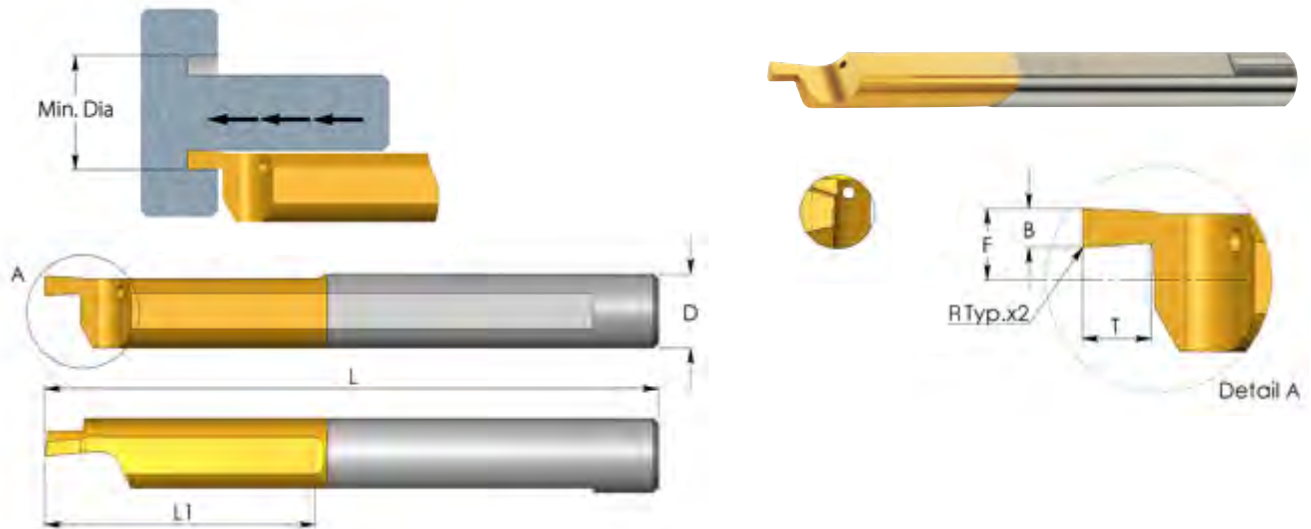
● First choice    ○ Alternative

For L.H. bars specify MFL instead of MFR

For additional holders see page A06-32 to 41



## MFL Bars Face Grooving



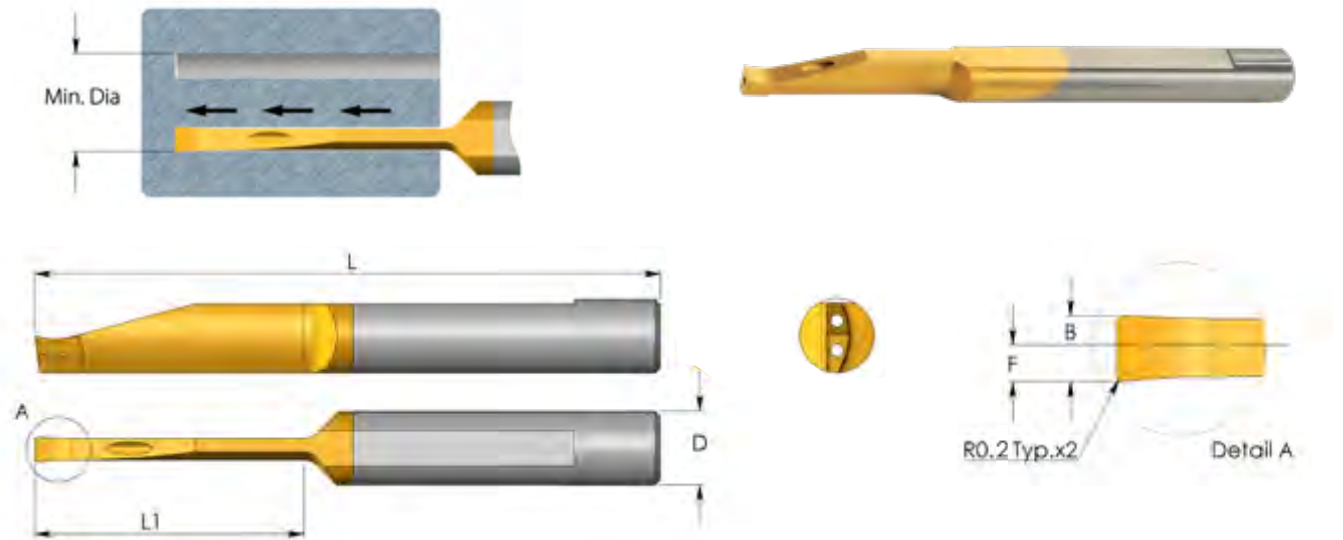
Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	R	B	T	F	Min. Dia.	Holder
4.0	<b>MFL 4 B0.5 L15</b>	51	15	0.05	0.5	1.2	1.75	5.0	SIM ... H4
	<b>MFL 4 B0.75 L15</b>	51	15	0.10	0.75	1.2	1.75	5.0	
	<b>MFL 4 B1.0 L15</b>	51	15	0.10	1.0	1.5	1.75	5.0	
	<b>MFL 4 B1.5 L15</b>	51	15	0.10	1.5	2.8	1.75	5.0	
	<b>MFL 4 B1.5 L17</b>	51	17	0.10	1.5	3.5	1.75	5.0	
	<b>MFL 4 B2.0 L17</b>	51	17	0.10	2.0	5.0	1.75	5.0	
5.0	<b>MFL 5 B0.5 L22</b>	51	22	0.05	0.5	1.2	2.25	6.0	SIM ... H5
	<b>MFL 5 B0.75 L22</b>	51	22	0.10	0.75	1.2	2.25	6.0	
	<b>MFL 5 B1.0 L22</b>	51	22	0.10	1.0	1.5	2.25	6.0	
	<b>MFL 5 B1.0 L23</b>	51	23	0.10	1.0	2.5	2.25	6.0	
	<b>MFL 5 B1.5 L22</b>	51	22	0.10	1.5	2.5	2.25	6.0	
	<b>MFL 5 B1.5 L23</b>	51	23	0.10	1.5	3.5	2.25	6.0	
	<b>MFL 5 B2.0 L22</b>	51	22	0.10	2.0	3.8	2.25	6.0	
	<b>MFL 5 B2.0 L23</b>	51	23	0.10	2.0	5.0	2.25	6.0	
6.0	<b>MFL 6 B1.0 L22</b>	51	22	0.10	1.0	1.5	2.75	8.0	SIM ... H6
	<b>MFL 6 B1.5 L22</b>	51	22	0.10	1.5	2.5	2.75	8.0	
	<b>MFL 6 B2.0 L22</b>	51	22	0.10	2.0	3.0	2.75	8.0	
	<b>MFL 6 B2.5 L22</b>	51	22	0.10	2.5	4.8	2.75	8.0	
	<b>MFL 6 B3.0 L30</b>	58	30	0.10	3.0	6.0	2.75	8.0	
8.0	<b>MFL 8 B2.5 L22</b>	64	22	0.10	2.5	3.5	3.75	10.0	SIM ... H8

Order example: MFL 4 B2.0 L17 BMK  
 For additional holders see page A06-32 to 41

● First choice    ○ Alternative

## MVR Bars Deep Face Grooving - with 2 coolant bores



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	B	F	Min. Dia.	Holder
6.0	<b>MVR 6 B2.0 L10</b>	64	10	2.0	1.1	10.0	SIM ... H6
	<b>MVR 6 B2.0 L15</b>	64	15	2.0	1.1	12.0	
	<b>MVR 6 B2.0 L22</b>	64	22	2.0	1.1	12.0	
	<b>MVR 6 B2.5 L15</b>	64	15	2.5	1.4	10.0	
	<b>MVR 6 B2.5 L22</b>	64	22	2.5	1.4	12.0	
	<b>MVR 6 B3.0 L22</b>	64	22	3.0	1.6	10.0	
8.0	<b>MVR 8 B3.0 L27</b>	64	27	3.0	1.6	15.0	SIM ... H8
	<b>MVR 8 B3.0 L43</b>	80	43	3.0	1.6	15.0	
8.0	<b>MVR 8 B4.0 L43</b>	80	43	4.0	2.1	20.0	SIM ... H8

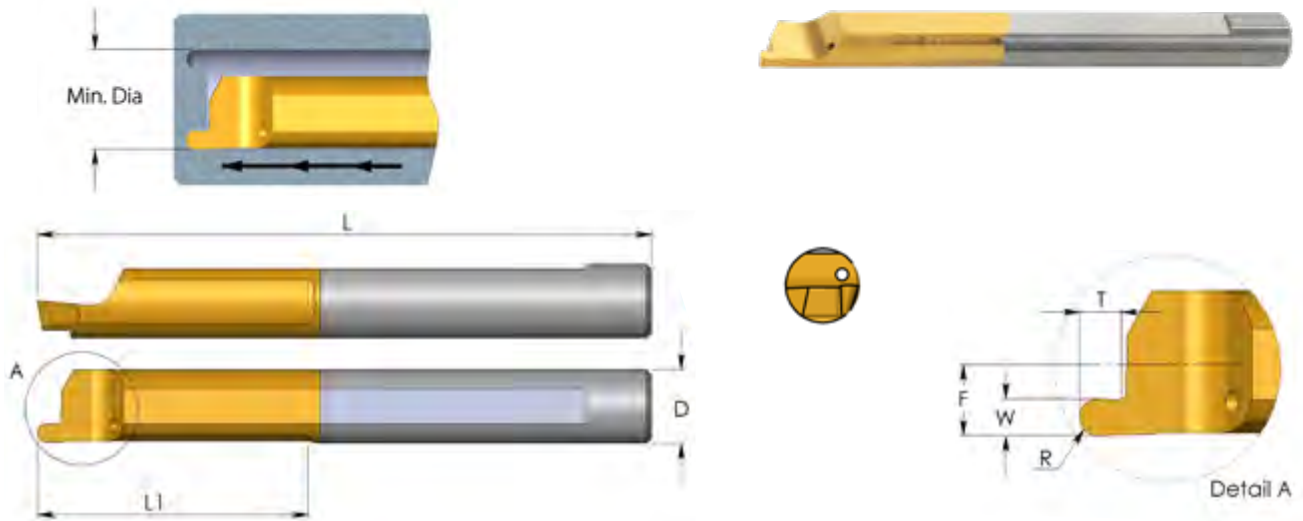
Order example: MVR 6 B2.0 L22 BXC

● First choice    ○ Alternative

For L.H. bars specify MV**L** instead of MVR

For additional holders see page A06-32 to 41

## MZR Bars Face Grooving



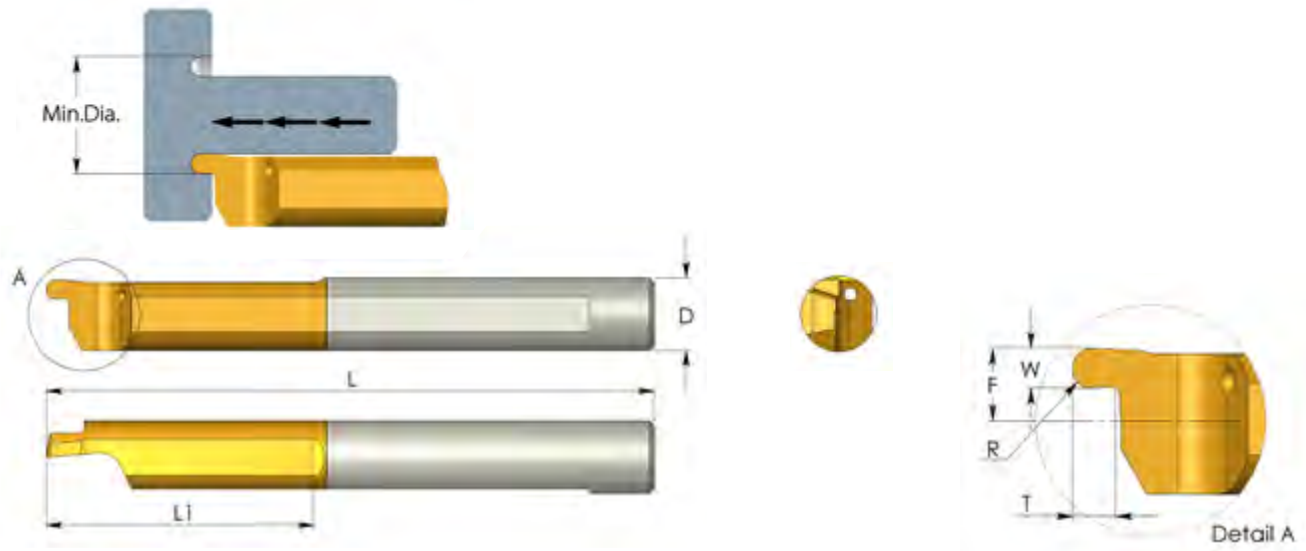
Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	R	W	T	F	Min. Dia.	Holder
4.0	<b>MZR 4 R0.5 L15</b>	51	15	0.50	1.0	1.2	1.95	5.0	SIM ... H4
	<b>MZR 4 R0.75 L15</b>	51	15	0.75	1.5	1.5	1.95	5.0	
5.0	<b>MZR 5 R0.5 L22</b>	51	22	0.50	1.0	1.2	2.45	6.0	SIM ... H5
	<b>MZR 5 R0.75 L22</b>	51	22	0.75	1.5	1.5	2.45	6.0	
	<b>MZR 5 R1.0 L22</b>	51	22	1.00	2.0	2.5	2.45	6.0	
6.0	<b>MZR 6 R0.5 L22</b>	51	22	0.50	1.0	1.2	2.95	8.0	SIM ... H6
	<b>MZR 6 R0.75 L22</b>	51	22	0.75	1.5	1.5	2.95	8.0	
	<b>MZR 6 R1.0 L22</b>	51	22	1.00	2.0	2.5	2.95	8.0	

Order example: MZR 5 R0.5 L22 BXC  
 For additional holders see page A06-32 to 41

● First choice      ○ Alternative

## MZL Bars Face Grooving



Grade	P	M	K	N	S	H
K20		○	○	●	○	
BXC	●	●	●	○	●	●
BMK	●	●	●	○	●	●

D	Ordering Code	L	L1	R	W	T	F	Min. Dia.	Holder
4.0	<b>MZL 4 R0.5 L15</b>	51	15	0.50	1.0	1.2	1.75	5.0	SIM ... H4
	<b>MZL 4 R0.75 L15</b>	51	15	0.75	1.5	1.5	1.75	5.0	
5.0	<b>MZL 5 R0.5 L22</b>	51	22	0.50	1.0	1.2	2.25	6.0	SIM ... H5
	<b>MZL 5 R0.75 L22</b>	51	22	0.75	1.5	1.5	2.25	6.0	
	<b>MZL 5 R1.0 L22</b>	51	22	1.00	2.0	2.5	2.25	6.0	
6.0	<b>MZL 6 R0.5 L22</b>	51	22	0.50	1.0	1.2	2.75	8.0	SIM ... H6
	<b>MZL 6 R0.75 L22</b>	51	22	0.75	1.5	1.5	2.75	8.0	
	<b>MZL 6 R1.0 L22</b>	51	22	1.00	2.0	2.5	2.75	8.0	

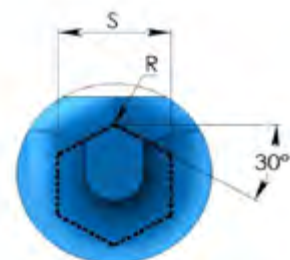
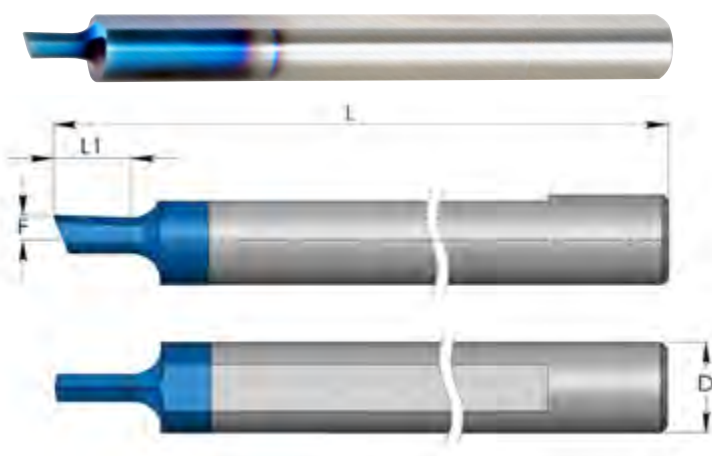
Order example: MZL 5 R0.5 L22 BXC  
 For additional holders see page A06-32 to 41

● First choice    ○ Alternative

## HK Broaching Tools for Hexagon Keys

### Product Identification - Ordering Codes

<b>HK</b>	<b>3</b>	<b>S30</b>	<b>L5</b>	<b>BMK</b>
↓	↓	↓	↓	↓
Hexagon Keys	Min. Bore Dia. 1 = 1.2 - 1.6 mm 2 = 2.2 mm 3 = 2.9 mm 4 = 3.9 mm 5 = 4.9 mm	Socket Size S12 = 1.2 - 1.6 mm S16 = 1.6 - 2.3 mm S23 = 2.3 - 2.9 mm S30 = 3.0 - 4.0 mm S40 = 4.0 - 5.0 mm S50 = 5.0 - 8.0 mm	Maximum Cutting depth L2 = 2.3 - 2.5 mm L4 = 4.0 mm L5 = 5.5 mm L6 = 6.5 mm L9 = 9.5 mm	Grade



Grade	P	M	K	N	S	H
BMK	●	●	●	●	●	

D	S	Ordering Code	L	L1	R	F	Min. Dia.	Holder
4.0	1.2-1.6	<b>HK 1 S12 L2</b>	51	2.3	0.05	0.10	1.2	SIM...H4
	1.6-2.3	<b>HK 1 S16 L2</b>	51	2.5	0.05	0.10	1.6	
5.0	2.3-2.9	<b>HK 2 S23 L4</b>	51	4.0	0.05	1.35	2.2	SIM...H5
	3.0-4.0	<b>HK 3 S30 L5</b>	51	5.5	0.05	1.35	2.9	
	4.0-5.0	<b>HK 4 S40 L6</b>	51	6.5	0.10	1.35	3.9	
7.0	5.0-8.0	<b>HK 5 S50 L9</b>	62	9.5	0.10	1.35	4.9	SIM...H7

S = Socket Size

Order example: HK 1 S12 L2 BMK

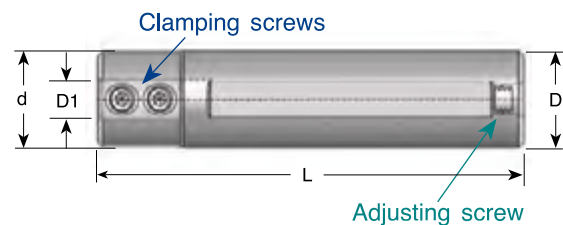
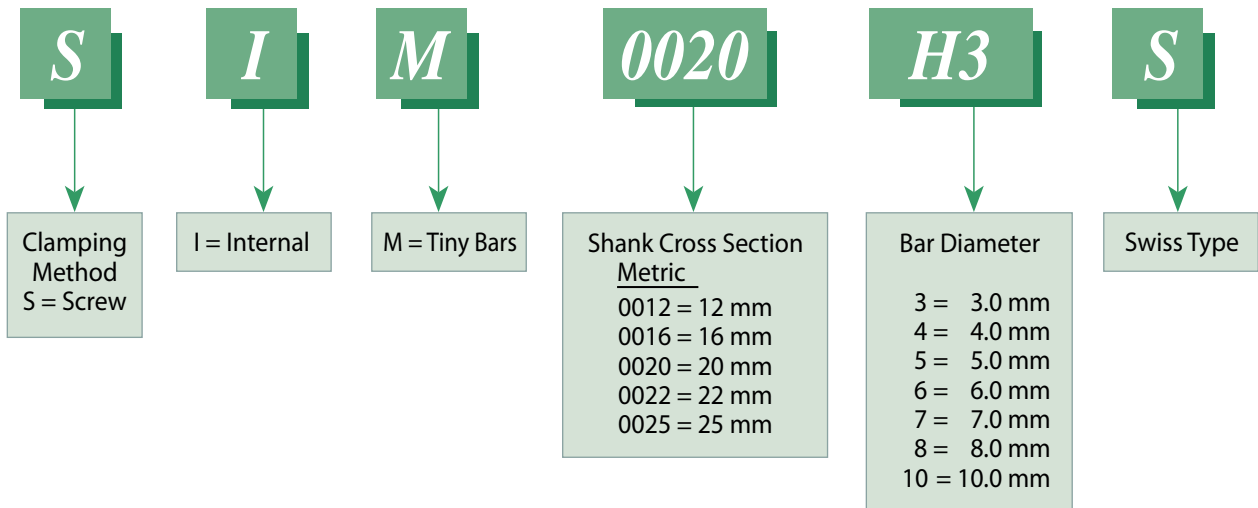
For additional holders see page A06-32 to 41

● First choice

○ Alternative

# Tiny Tools Toolholders

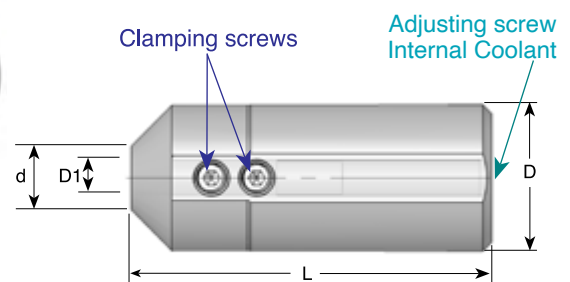
## Product Identification - Ordering Codes



D1	Ordering Code	D	d	L	Key	Clamping Screw	Adjusting Screw
3.0	<b>SIM 0012 H3</b>	12	12	88	K16, K25	S24	S35
	<b>SIM 0016 H3S</b>	16	20	75	K25	S25	S35S
	<b>SIM 0016 H3</b>	16	20	88	K25	S25	S35
	<b>SIM 0020 H3</b>	20	20	88	K25	S25	S35
	<b>SIM 0022 H3</b>	22	22	88	K25	S25	S35
	<b>SIM 0022 H3K</b>	22	22	120	K25	S25	S55
	<b>SIM 0025 H3M</b>	25	25	150	K25	S25	-



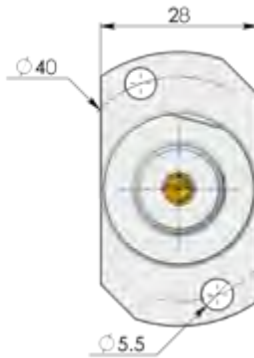
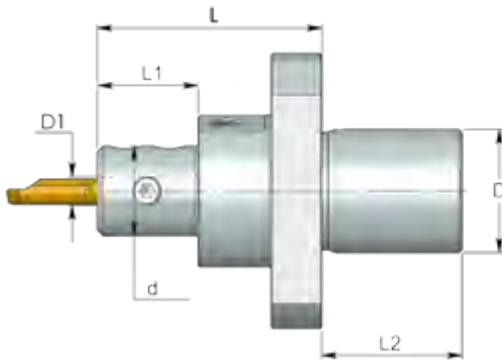
D1	Ordering Code	D	d	L	Key	Clamping Screw	Adjusting Screw
4.0	<b>SIM 0012 H4</b>	12	12	88	K16, K25	S24	S35
	<b>SIM 0016 H4S</b>	16	20	75	K25	S25	S35S
	<b>SIM 0016 H4</b>	16	20	88	K25	S25	S35
	<b>SIM 0020 H4</b>	20	20	88	K25	S25	S35
	<b>SIM 0022 H4</b>	22	22	88	K25	S25	S35
	<b>SIM 0022 H4K</b>	22	22	120	K25	S25	S55
	<b>SIM 0025 H4M</b>	25	25	150	K25	S25	-
5.0	<b>SIM 0012 H5</b>	12	12	88	K16, K25	S24	S35
	<b>SIM 0016 H5S</b>	16	20	75	K25	S25	S35S
	<b>SIM 0016 H5</b>	16	20	88	K25	S25	S35
	<b>SIM 0020 H5</b>	20	20	88	K25	S25	S35
	<b>SIM 0022 H5</b>	22	22	88	K25	S25	S35
	<b>SIM 0022 H5K</b>	22	22	120	K25	S25	S55
	<b>SIM 0025 H5M</b>	25	25	150	K25	S25	-
6.0	<b>SIM 0012 H6</b>	12	14	88	K16, K25	S24	S35
	<b>SIM 0016 H6S</b>	16	20	75	K25	S25	S35S
	<b>SIM 0016 H6</b>	16	20	88	K25	S25	S35
	<b>SIM 0020 H6</b>	20	20	88	K25	S25	S35
	<b>SIM 0022 H6</b>	22	22	88	K25	S25	S35
	<b>SIM 0022 H6K</b>	22	22	120	K25	S25	S55
	<b>SIM 0025 H6M</b>	25	25	150	K25	S25	-
7.0	<b>SIM 0016 H7</b>	16	20	88	K25	S25	S35
	<b>SIM 0020 H7</b>	20	20	88	K25	S25	S35
	<b>SIM 0022 H7</b>	22	22	88	K25	S25	S35
8.0	<b>SIM 0016 H8</b>	16	20	88	K25	S25	S35
	<b>SIM 0020 H8</b>	20	20	88	K25	S25	S35
	<b>SIM 0022 H8</b>	22	22	88	K25	S25	S35
10.0	<b>SIM 0016 H10</b>	16	20	88	K25	S25S	S35
	<b>SIM 0020 H10</b>	20	20	88	K25	S25S	S35
	<b>SIM 0022 H10</b>	22	22	88	K25	S25	S35



D1	Ordering Code	D	d	L	Key	Clamping Screw	Adjusting Screw
3.0	<b>SIM 0025 H3</b>	25	10.8	62	K25	S25	S35M
4.0	<b>SIM 0025 H4</b>	25	10.8	62	K25	S25	S35M
5.0	<b>SIM 0025 H5</b>	25	10.8	62	K25	S25	S35M
6.0	<b>SIM 0025 H6</b>	25	10.8	62	K25	S25	S35M
7.0	<b>SIM 0025 H7</b>	25	10.8	62	K25	S25	S35M
8.0	<b>SIM 0025 H8</b>	25	10.8	62	K25	S25	S35M

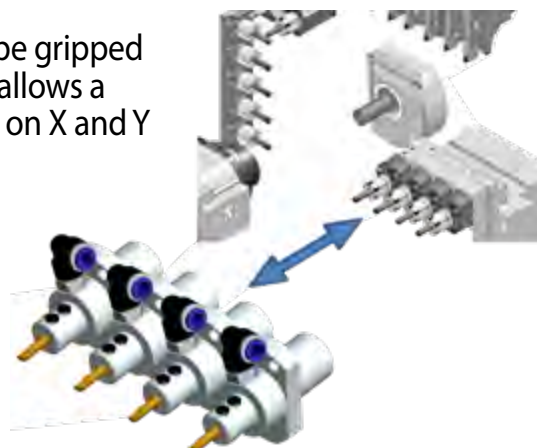
# Tiny Tools Toolholders for Star Swiss machines

Carmex has developed a unique external turning holder for the sub-spindle on CNC Swiss type lathes.



D1	Ordering Code	D	d	L	L1	L2	dp	key	Clamping Screw
3.0	<b>SIM 22S H3</b>	22	16	40	18	25	4/6	K16, K25	S24P
3.0	<b>SIM 22S H3-L</b>	22	16	50	28	25	4/6	K16, K25	S24P
4.0	<b>SIM 22S H4</b>	22	16	40	18	25	4/6	K16, K25	S24P
4.0	<b>SIM 22S H4-L</b>	22	16	50	28	25	4/6	K16, K25	S24P
5.0	<b>SIM 22S H5</b>	22	16	40	18	25	4/6	K16, K25	S24M
5.0	<b>SIM 22S H5-L</b>	22	16	50	28	25	4/6	K16, K25	S24M
6.0	<b>SIM 22S H6</b>	22	16	40	18	25	4/6	K16, K25	S24M
6.0	<b>SIM 22S H6-L</b>	22	16	50	28	25	4/6	K16, K25	S24M
7.0	<b>SIM 22S H7</b>	22	20	40	18	25	4/6	K25	S25
8.0	<b>SIM 22S H8</b>	22	20	40	18	25	4/6	K25	S25
8.0	<b>SIM 22S H8-L</b>	22	20	50	28	25	4/6	K25	S25
10.0	<b>SIM 22S H10</b>	22	20	40	18	25	4/6	K25	S25S
10.0	<b>SIM 22S H10-L</b>	22	20	50	28	25	4/6	K25	S25S

The Tiny tool can be gripped in two directions, allows a turning operation on X and Y axis.



## CIM-Fast Clamping System

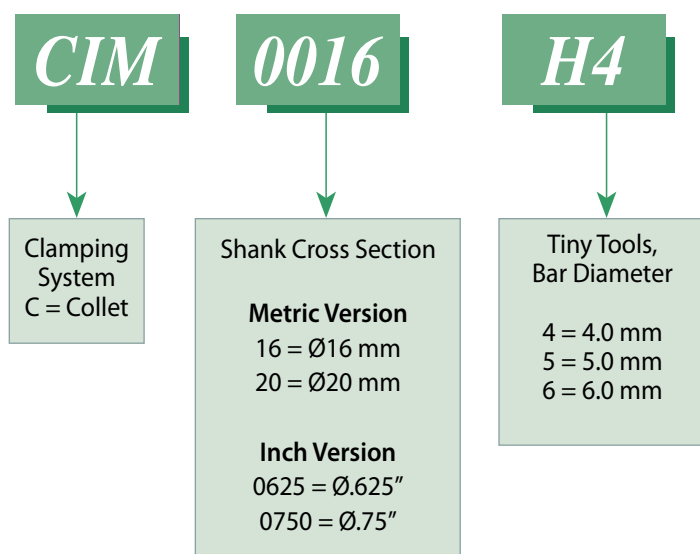


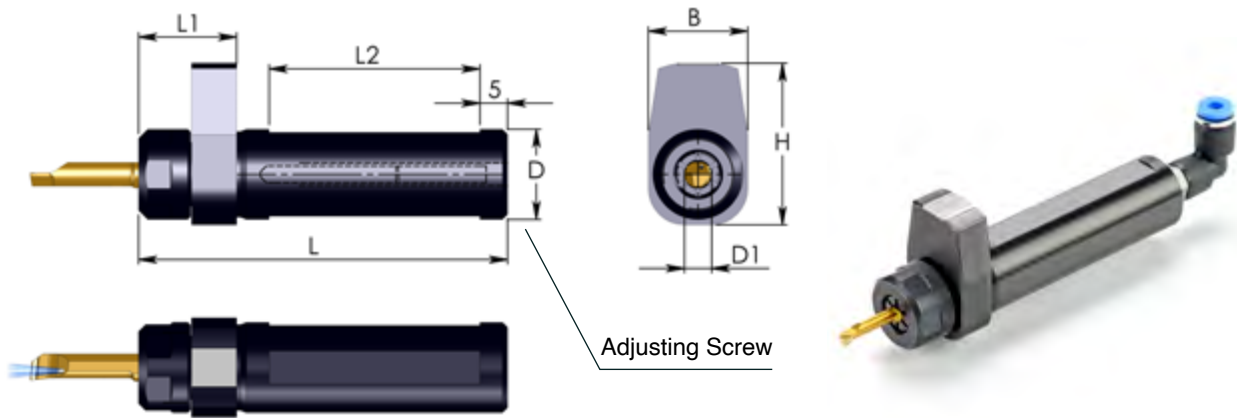
The new innovative **CIM** clamping system provides high precision and repeatability of the Tiny Tools cutting edge, as well as fast and easy tool exchange without removing the holder. The **CIM** system includes an internal tool indexing mechanism which index the tool in the correct orientation, as well as strong and rigid collet clamping for high stability.

- No screws required
- Enable fast and accurate exchange of the Tiny Tool inside the machine without removing the **CIM** holder from the machine, or additional tool setup.
- Holders with three clamping flats on the shank for maximum flexibility.
- Fits standard and special Carmex Tiny Tools
- Internal coolant through the **CIM** holder and the Tiny Tool pointing to the cutting edge.

## Product Identification - Ordering Codes

### **CIM** – Toolholder







## Metric Version

D1	Ordering Code	D	L	L1	L2	B	H
4.0	<a href="#">CIM 0016 H4</a>	16	88	22	58	22	36
	<a href="#">CIM 0020 H4</a>	20	88	22	58	22	36
5.0	<a href="#">CIM 0016 H5</a>	16	88	22	58	22	36
	<a href="#">CIM 0020 H5</a>	20	88	22	58	22	36
6.0	<a href="#">CIM 0016 H6</a>	16	88	22	58	22	36
	<a href="#">CIM 0020 H6</a>	20	88	22	58	22	36

## Inch Version

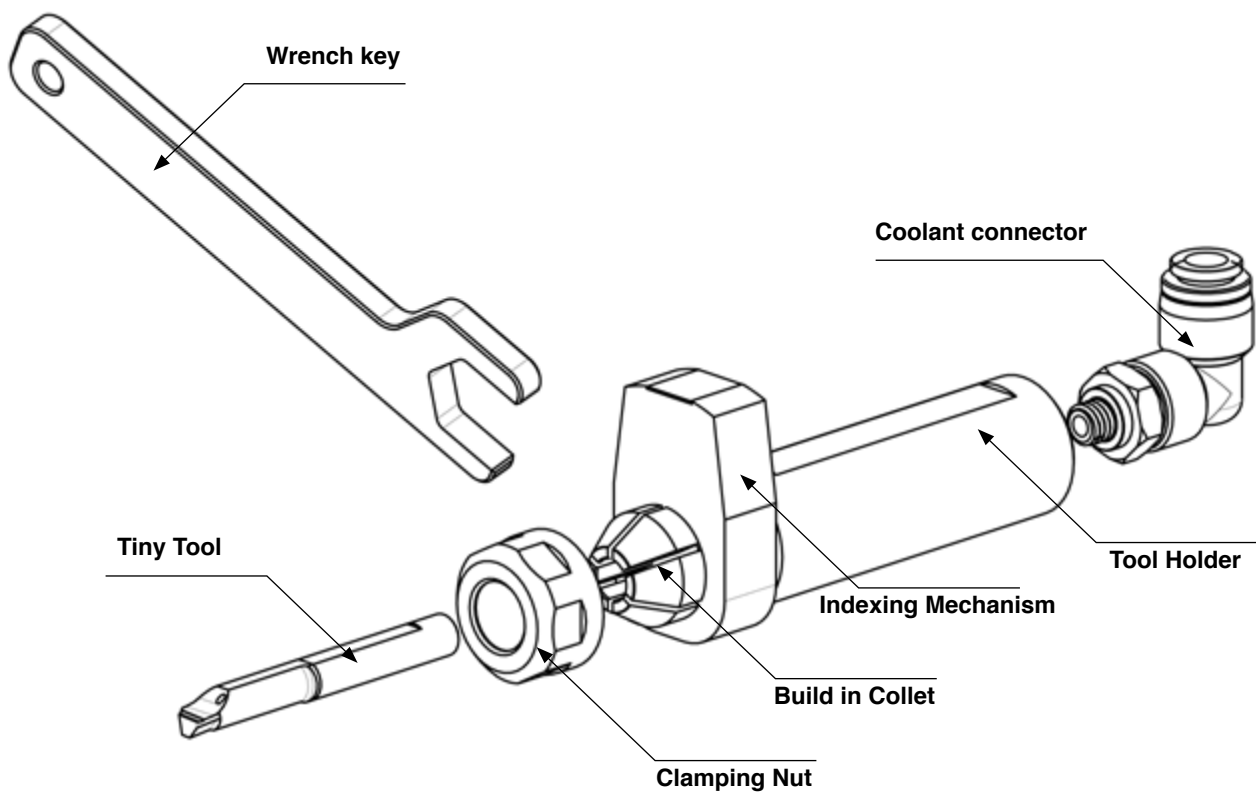
D1 mm	Ordering Code	D"	L"	L1"	L2"	B"	H"
4.0	<a href="#">CIM 0625 H4</a>	5/8	3.5	.87	2.3	.87	1.4
	<a href="#">CIM 0750 H4</a>	3/4	3.5	.87	2.3	.87	1.4
5.0	<a href="#">CIM 0625 H5</a>	5/8	3.5	.87	2.3	.87	1.4
	<a href="#">CIM 0750 H5</a>	3/4	3.5	.87	2.3	.87	1.4
6.0	<a href="#">CIM 0625 H6</a>	5/8	3.5	.87	2.3	.87	1.4
	<a href="#">CIM 0750 H6</a>	3/4	3.5	.87	2.3	.87	1.4

## Spare parts

Clamping nut	Wrench key	Adjusting screw	Adjusting screw key	Coolant supply connector
				
CN19	WK19	S35	K25	P-M6-4

\* P-M6-6 also available

## **CIM** – clamping system details



## General instructions for use

The CIM toolholder system is designed for a fast and simple way of achieving correct indexing of Tiny Tools inside the machine.

Following is a recommended procedure for the first use:

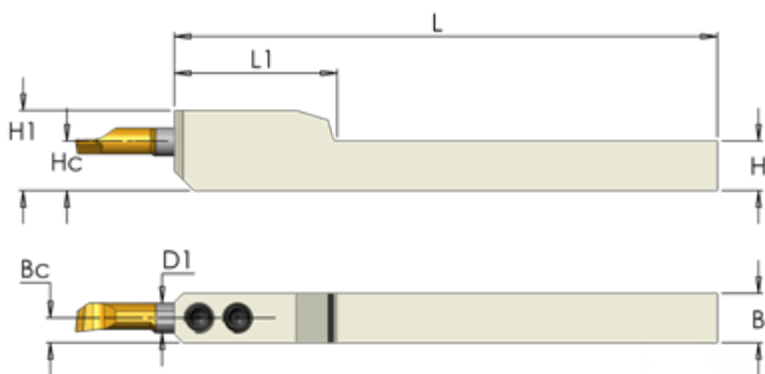
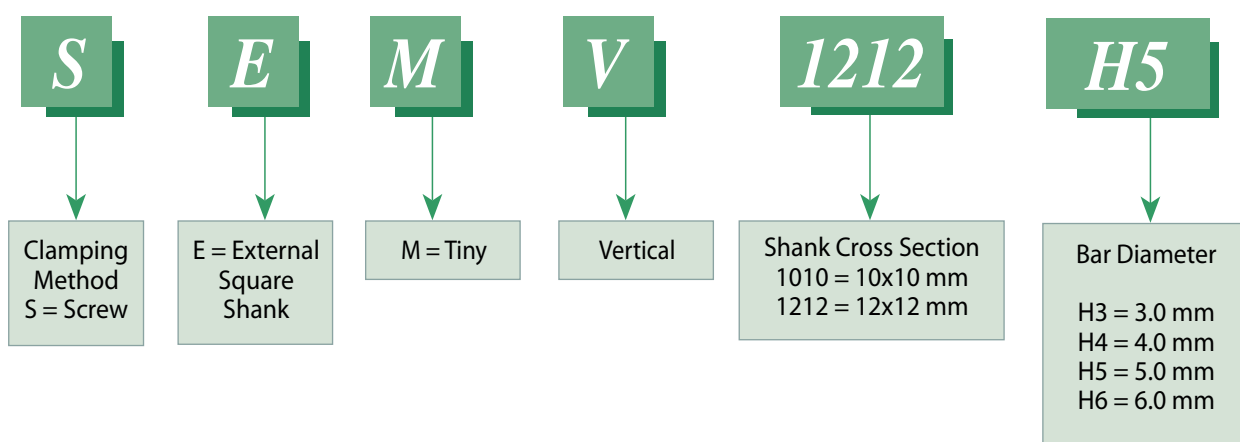
1. Adjust the rear stopper screw according the tool required over-hang.  
Insert the Tiny Tool into the collet and push it gently until it passes the internal indexing mechanism.  
Adjust the rear stopper screw according the required overhang (do not set the final tool orientation).  
That procedure should be done only once and outside the machine.
2. Remove the Tiny Tool from the CIM toolholder and mount the holder on the machine.  
Clamp it well and it is ready to use. At that point the clamping nut should be screwed on the toolholder collet by hand and remain open.
3. Insert the Tiny Tool into the CIM collet and push it inside gently until you will hear a click.  
Rotate the tool by hand clock wise and counter clock wise until you hear a click and the indexing mechanism set the tool to center.
4. Close the nut by the wrench key.

In that point the tool is ready to use.

For a tool replacement, open the collet with the wrench key, replace the tool, close the collet and continue working.

## Tiny Tools Toolholders - Square Shank for internal machining

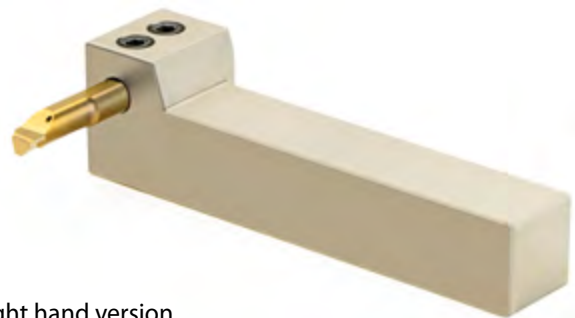
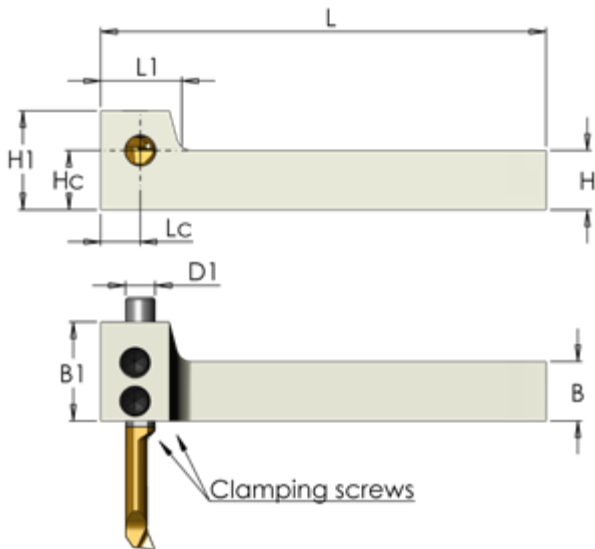
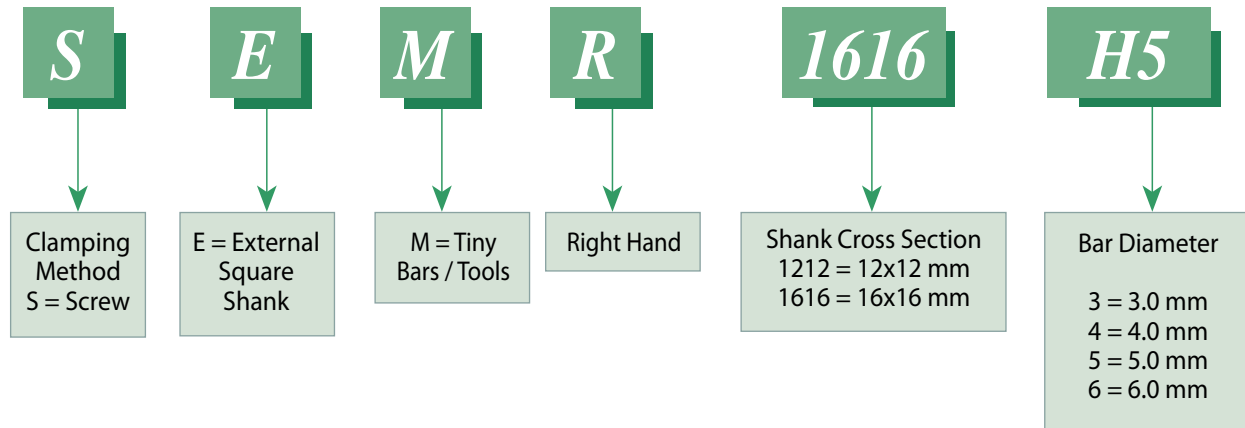
### Product Identification - Ordering Codes



D1	Ordering Code	H	B	L1	L	Hc	Bc	H1	Key	Clamping Screw
3.0	<b>SEMV 1010 H3</b>	10	10	24	110	10	5	14.7	K16	S24
	<b>SEMV 1212 H3</b>	12	12	24	110	12	6	16.7	K16	S24
4.0	<b>SEMV 1010 H4</b>	10	10	36	110	10	5	15.2	K16	S24
	<b>SEMV 1212 H4</b>	12	12	36	110	12	6	17.2	K16	S24
5.0	<b>SEMV 1010 H5</b>	10	10	36	110	10	5	15.7	K16	S24
	<b>SEMV 1212 H5</b>	12	12	36	110	12	6	17.7	K16	S24
6.0	<b>SEMV 1010 H6</b>	10	10	33	110	10	5	16.2	K16	S24
	<b>SEMV 1212 H6</b>	12	12	33	110	12	6	18.2	K16	S24



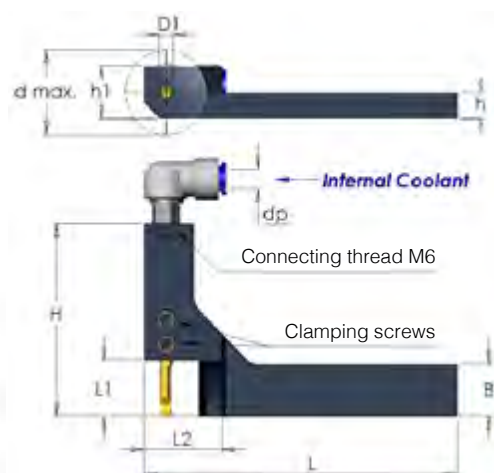
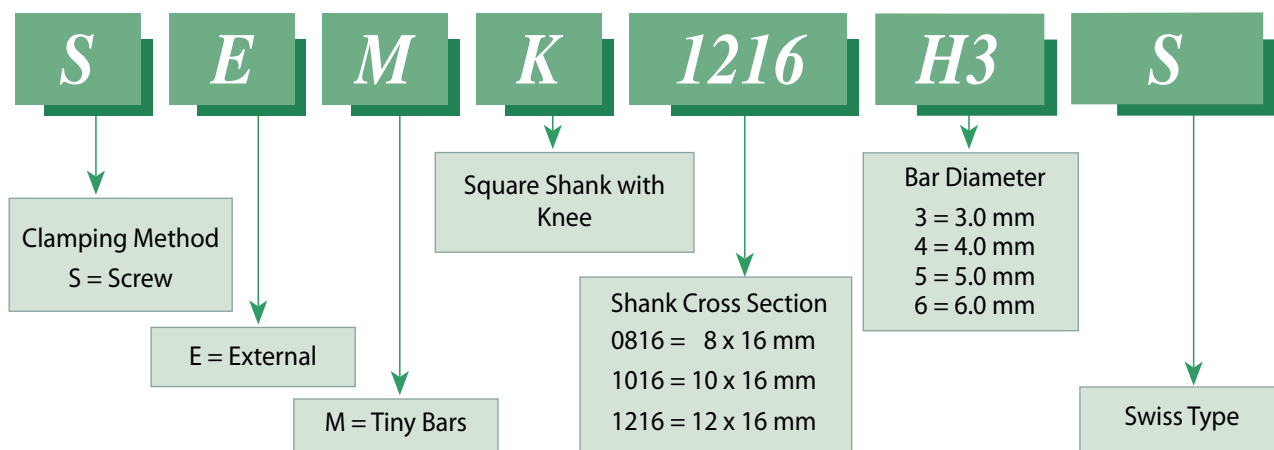
# Product Identification - Ordering Codes



Right hand version

D1	Ordering Code	H	B	B1	L	L1	Hc	Lc	H1	Key	Clamping Screw
3.0	<b>SEM R 1212 H3</b>	12	12	20	88	16	12	7	20	K25	S25
	<b>SEM R 1616 H3</b>	16	16	24	120	16	16	7	24	K25	S25
4.0	<b>SEM R 1212 H4</b>	12	12	20	88	16	12	7	20	K25	S25
	<b>SEM R 1616 H4</b>	16	16	24	120	16	16	7	24	K25	S25
5.0	<b>SEM R 1212 H5</b>	12	12	20	88	16	12	7	20	K25	S25
	<b>SEM R 1616 H5</b>	16	16	24	120	16	16	7	24	K25	S25
6.0	<b>SEM R 1212 H6</b>	12	12	20	88	16	12	7	20	K25	S25S
	<b>SEM R 1616 H6</b>	16	16	24	120	16	16	7	24	K25	S25S

## Product Identification - Ordering Codes

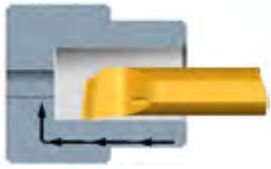


D1	Ordering Code	B	L	L1	L2	H	h	h1	d max.	*dp	Key	Clamping Screw
3.0	<b>SEMK 0816 H3S</b>	16	100	17	25	46	8	16	26	4/6	K25	S25
	<b>SEMK 1016 H3S</b>	16	100	17	25	46	10	18	26	4/6	K25	
	<b>SEMK 1216 H3S</b>	16	100	17	25	46	12	20	26	4/6	K25	
4.0	<b>SEMK 0816 H4S</b>	16	100	17	25	58	8	16	26	4/6	K25	S25
	<b>SEMK 1016 H4S</b>	16	100	17	25	58	10	18	26	4/6	K25	
	<b>SEMK 1216 H4S</b>	16	100	17	25	58	12	20	26	4/6	K25	
5.0	<b>SEMK 0816 H5S</b>	16	100	17	25	58	8	16	26	4/6	K25	S25
	<b>SEMK 1016 H5S</b>	16	100	17	25	58	10	18	26	4/6	K25	
	<b>SEMK 1216 H5S</b>	16	100	17	25	58	12	20	26	4/6	K25	
6.0	<b>SEMK 0816 H6S</b>	16	100	17	25	58	8	16	26	4/6	K25	S25
	<b>SEMK 1016 H6S</b>	16	100	17	25	58	10	18	26	4/6	K25	
	<b>SEMK 1216 H6S</b>	16	100	17	25	58	12	20	26	4/6	K25	

\* Optional

## Tiny Tools Kits

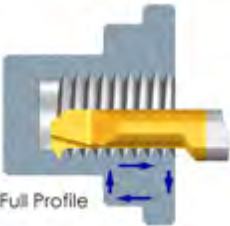
Boring



Profiling & Boring



Threading



Chamfering & Boring



Grooving



Face Grooving



<b>KT4-20</b>	<b>KT5-20</b>	
MTR 4 R0.2 L10	MTR 5 R0.2 L15	Boring
MPR 4 R0.2 L10	MPR 5 R0.2 L15	Profiling
MIR 4 L15 A60	MIR 5 L15 A60	Threading
MCR4 R0.2 L15	MCR 5 R0.2 L15	Chamfering
MGR4 B1.5 L10	MGR 5 B1.5 L15	Grooving
MFR 4 B1.0 L15	MFR 5 B1.0 L22	Face Grooving
SIM 0020 H4	SIM 0020 H5	Holder
K25	K25	Key

Order example: KT4-20

Also available are kits with a 16 mm or 22 mm shank diameter bar holder.  
Order example: KT4-16

## Technical Section

### Carbide Grades:

#### BXC (P30 - P50, K25 - K40)

PVD TiN coated grade for low cutting speed.  
Works well with a wide range of stainless steels.

#### BMK (K10 - K20)

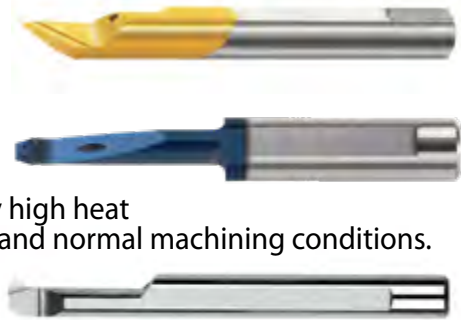
Sub-micron grade with advanced PVD triple coating. Extremely high heat resistant and smooth cutting operation, for high performance, and normal machining conditions. General purpose for all materials.

#### K20 (K10 - K30)

Uncoated Carbide grade for non ferrous metals, aluminum and cast iron.

#### TNX

New advanced carbide grade **TNX** for higher feeds and high performance, at medium to high cutting speed. Extra fine grain size with high hardness and toughness combined with triple layer reddish coating, provides high edge stability and better chip flow. Available only for CBR bars.



### Cutting speed for Tiny Tools

ISO Standard	Material		Condition	Cutting Speed m/min			
				BXC	BMK	K20	TNX
<b>P</b>	Non-Alloy steel and cast steel, free cutting steel	<%0.25C	Annealed	25 - 70	30 - 80		36 - 80
		≥%0.25C	Annealed				
		< %0.55C	Quenched and tempered				
		≥%0.55C	Annealed				
	Low alloy steel and cast steel (less than %5 alloying elements)		Annealed	20 - 40	25 - 50		30 - 50
			Quenched and tempered				
High alloy steel, cast steel, and tool steel		Annealed	20 - 40	25 - 50		30 - 50	
		Quenched and tempered					
<b>M</b>	Stainless steel and cast steel		Ferritic/martensitic	25 - 40	30 - 60		36 - 60
			Martensitic				
			Austenitic				
<b>K</b>	Cast iron nodular (GGG)		Ferritic/pearlitic	25 - 60	30 - 80		36 - 80
			Pearlitic				
	Grey cast iron (GG)		Ferritic	30 - 70	30 - 80		36 - 80
			Pearlitic				
Malleable cast iron		Ferritic	20 - 40	20 - 50		24 - 50	
		Pearlitic					
<b>N</b>	Aluminum-wrought alloy		Not cureable	50 - 100	60 - 120	30 - 50	72 - 120
			Cured				
	Aluminum- cast, alloyed		≤%12 Si	40 - 80	50 - 90	20 - 40	60 - 90
			>%12 Si				
	Copper alloys		>%1 Pb	30 - 60	30 - 70	20 - 40	36 - 70
			Free cutting				
Brass							
Non metallic		Electrolytic copper	40 - 80		20 - 40		
		Duroplastics, fiber plastics					
		Hard rubber					
<b>S</b>	High temp. alloys, Super alloys	Fe based	Annealed	15 - 30	15 - 40		18 - 40
			Cured				
		Ni or Co based	Annealed				
			Cured				
Titanium, Titanium alloys		Cast	10 - 30	10 - 30		12 - 30	
		Alpha+beta alloys cured					
<b>H</b>	Hardened steel		Hardened 45-50 HRc	10 - 30	14 - 40		18 - 40
			Hardened 51-55 HRc				
			Hardened 56-62 HRc				
	Chilled cast iron		Cast	10 - 30	10 - 30		12 - 30
Cast iron		Hardened	10 - 20	10 - 20		12 - 20	

**Recommended Feed Rate: 0.01 - 0.03 mm/rev**

For CMR Tiny Tools see page A06-45

## Threading Passes

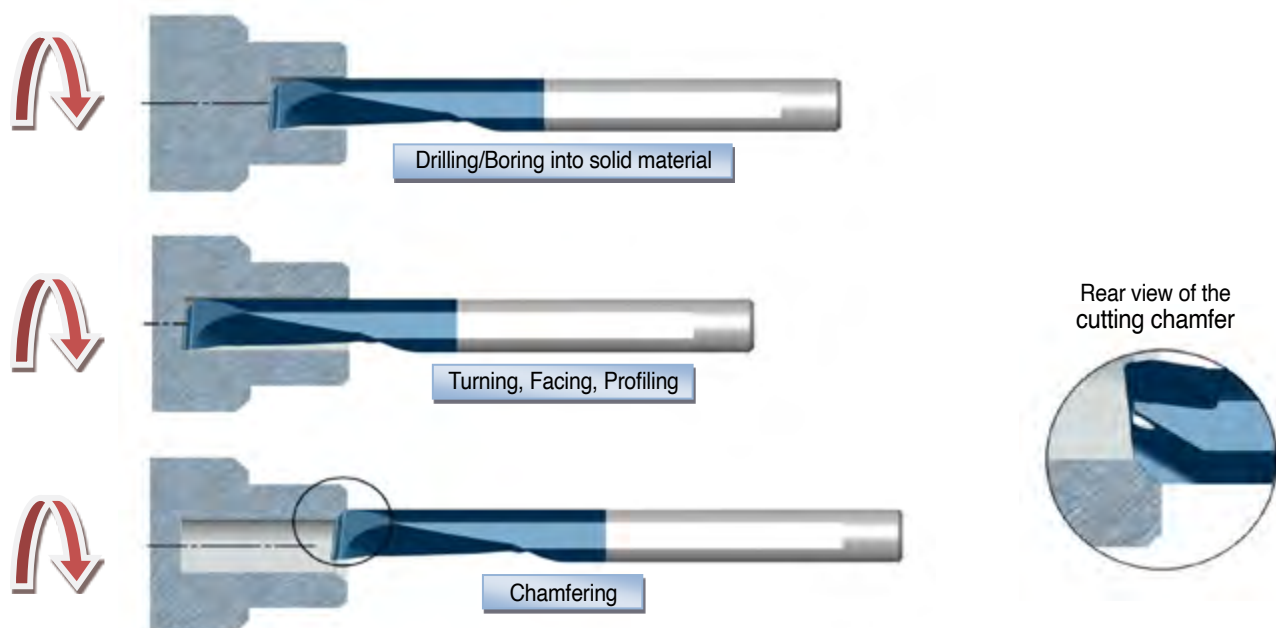
Pitch:	mm TPI	0.5 48	0.7 36	0.8 32	1.0 24	1.25 20	1.5 16	2-5 14-5
Number of Passes		6 - 12	7 - 14	7 - 16	8 - 18	8 - 20	10 - 22	20 - 38

## CMR Carmex Multi-Task Tiny Tools

- Carmex is introducing a new and innovative Multi-Task Tiny Tool **CMR** for Boring, Turning, Facing and Chamfering with a single tool.
- The unique design enables machining of the material without the need for a pilot hole.
- The new tool shortens the machining cycle time and the number of tools required - providing **High Productivity**.
- Effective through coolant hole with a spiral flute, evacuates the chips out of the hole uninterruptedly.
- Unique chip breaker and flute design.
- To use with standard SIM toolholders on Swiss Type or CNC lathe machines.
- Available in **BMK** Grade only.

## Working Method

- The tool penetrates the work piece and produces the hole compliant with the minimum diameter the tool allows.
- The tool can penetrate the material in one pass or several passes depending on the work piece material, coolant pressure, machine power etc.
- The hole can be enlarged by multi radial passes.



The tool is equipped with an additional cutting edge, which is located across the main front edge. This allows production of an additional 45° chamfer on the work piece without the need to stop the spindle or processing operation.

## CMR General Recommendations

### Coolant fluid

Dry machining should not be performed under any circumstances. It is necessary to use an internal coolant in all applications. Oil or Emulsion lubricants are recommended for best performance. In the event of low coolant pressure, adding an external coolant can improve the tool operation.

The cooling stream is designed to provide three benefits:

1. Cooling the cutting edge of the tool, and the contact area.
2. Pushing the chip away from the tool quickly, thereby reducing wear of the edge.
3. Helping to break the chip into smaller pieces and evacuating them from the cutting area.

## Cutting Data

ISO Standard	Material	Cutting Speed m/min
<b>P</b>	Low and Medium Carbon Steels <0.55%C	20 - 75
	High Carbon Steels ≥0.55%C	20 - 75
	Alloy Steels, Treated Steels	20 - 60
<b>M</b>	Stainless Steels - Free Cutting	20 - 60
	Stainless Steels - Austenitic	20 - 50
	Cast Steels	20 - 70
<b>K</b>	Cast Iron	20 - 90
<b>N</b>	Aluminum ≤12%Si, Copper	40 - 150
	Aluminum >12% Si	20 - 100
	Synthetics, Duroplastics, Thermoplastics	40 - 150
<b>S</b>	Nickel Alloys, Titanium Alloys	15 - 60
<b>H</b>	Hardened Steels	60 - 70

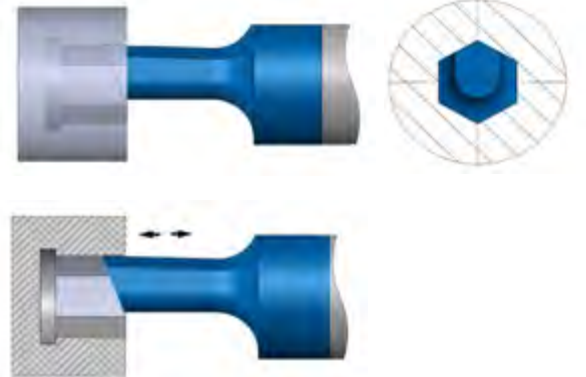
**Recommended Feed Rate: 0.01 - 0.03 mm/rev**

## HK Broaching Tools for Hexagon Keys

The HK broaching system have been developed to machine internal keyways inside blind or through holes, using CNC machines.

### Working Demo

- To use with Carmex standard SIM Bar Holders
- The holder can be located directly in the turret or the machine spindle
- Holder with rear clamping screw for full support during operation
- Available in **BMK** Grade only.



## Cutting Data

Material Tensile Strength (N/mm <sup>2</sup> )	Feed rate (mm/min)	In-feed per stroke (mm)
400-650	7000-9000	0.06-0.09
700-850	5000-6500	0.04-0.07
900-1000	4000-5500	0.03-0.05
1100-1200	3000-4500	0.02-0.04

The cutting data above is an initial recommendation and depends on the machine condition, workpiece profile and the application clamping

- A relief groove is highly recommended, if not possible a gradual volume decrease should be made at the end of the broaching groove
- The HK tool must be positioned outside of the hole/groove before each stroke
- After setup and first stroke, we recommend to observe the tool and the application to make sure no collision occurred