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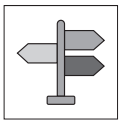
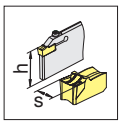
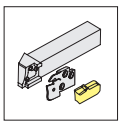
	Catalogue guidelines	C3-C4
	Designation system	C5-C7
	System overview	C8-C37
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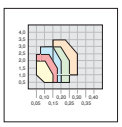
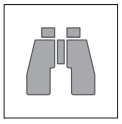
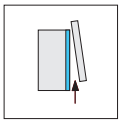
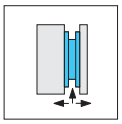
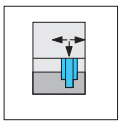
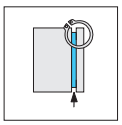
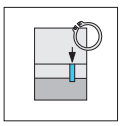
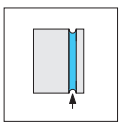
	Application	C47-C62

Application

	Overview	C63-C64
	Part-off	C65-C73
	Grooving and turning, external	C74-C80
	Grooving and turning, internal	C81-C86
	Circlip grooves, external machining	C87-C104
	Circlip grooves, internal machining	C87-C104
	Radius grooves, external machining	C105-C120

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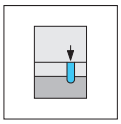
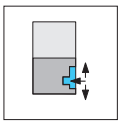
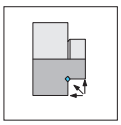
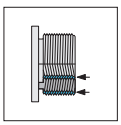
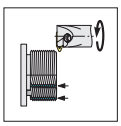
	Radius grooves, internal machining	C105-C120
	Axial grooving	C121-C130
	External recessing	C131-C134
	Threading (turning)	C135-C143
	Threading (milling)	C145-C147

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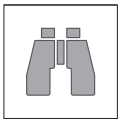
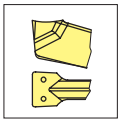
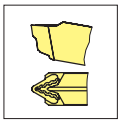
	Overview	C150
	Parting and grooving inserts	C151-C159
	Threading inserts	C160-C163

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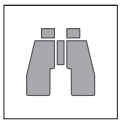
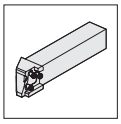
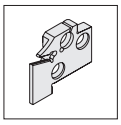
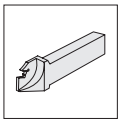
	Overview	C165-C167
	Tool holders	C168-C175
	External modules	C176-C187
	Monoblock tool holders	C188-C197

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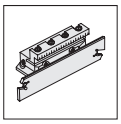
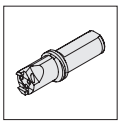
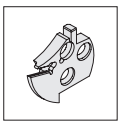
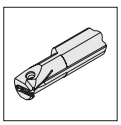
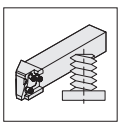
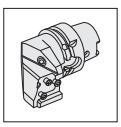
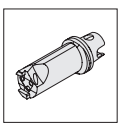
	Blade, clamping block	C198-C206
	Boring bars	C207-C209
	Internal modules	C210-C214
	Monoblock boring bars	C215-C217
	Monoblock tools and modules for threading	C218-C222
	HSK-T tool holders	C171-C172
	UTS tool holders	C173-C174

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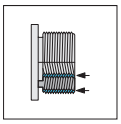	Threading (turning, milling)	C247-C260
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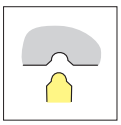
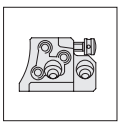
	GX special tools	C266
	Possible applications MSS adapters	C267-C268
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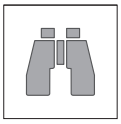	Overview	C224
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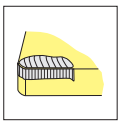	Types of wear, corrective measures	C233-C234
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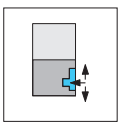
	Possible applications - axial grooving	C241-C246

Catalogue guidelines

Make the right choice in just a few steps

1

Tool selection in the section on applications

1 Choose the requested application in the overview

2 Choose the requested tooling system

2

Choose the suitable type and size of adapter

3

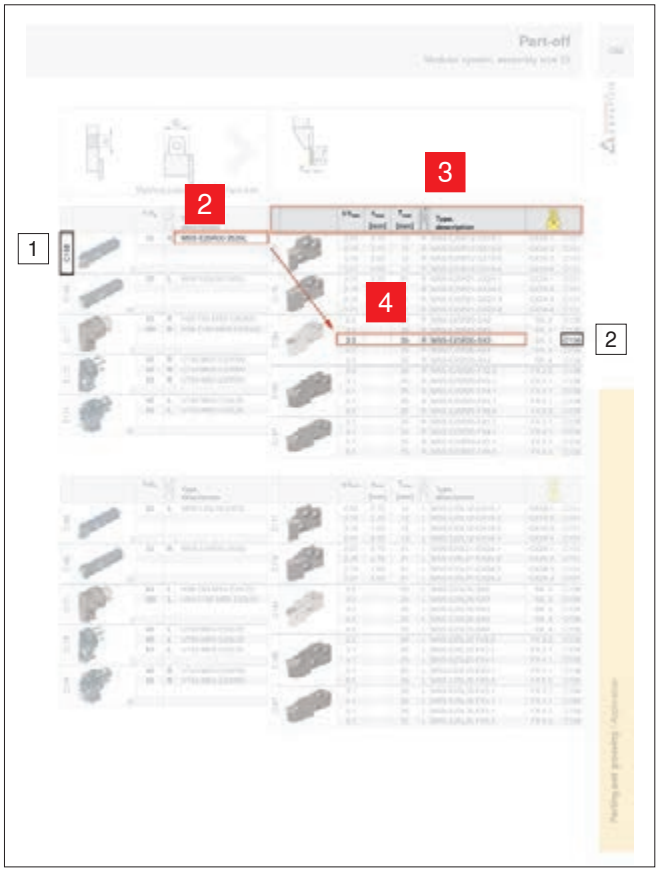
All suitable modules are shown on the right

4

The tool or module can be chosen according to the required parting and grooving depth or width

1 Detailed information on the requested tool

2 Information on the suitable inserts



5

Selection of the insert

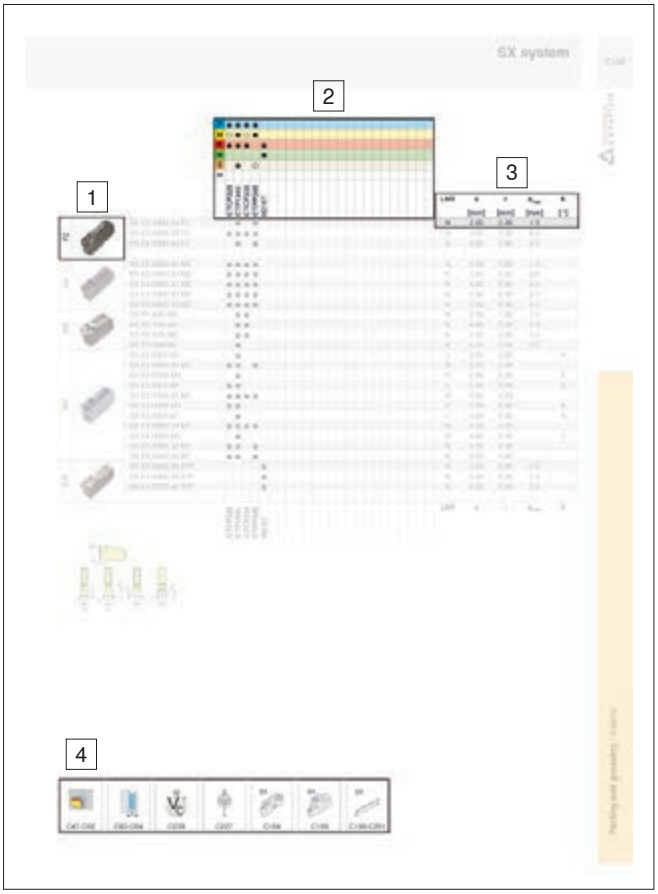
After defining the tooling system the insert is chosen including chip groove and cutting material

1 Chip grooves

2 Possible cutting materials

3 The main dimensions

4 Reference regarding further information



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Selection of the tool

The product page shows the range of tools/modules with the main dimensions and information on the insert types

1 Possible applications

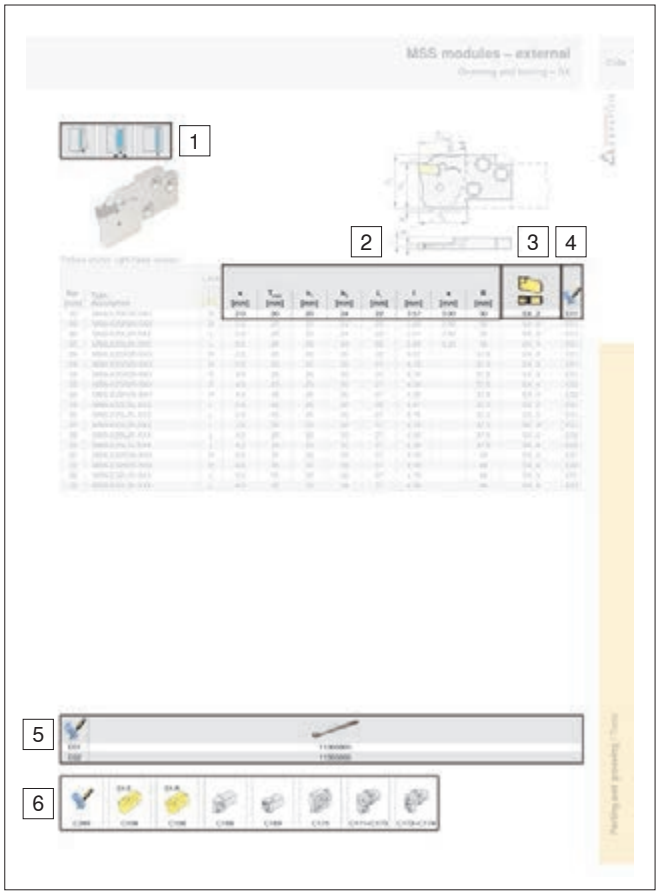
2 The main dimensions

3 Insert reference

4 Spare parts

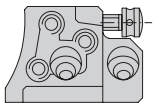
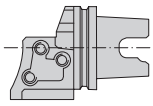
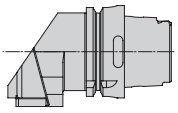
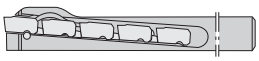
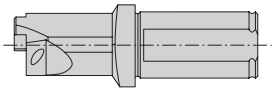
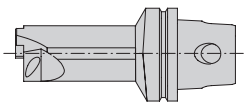
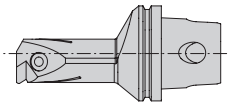
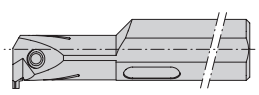
5 Spare parts overview

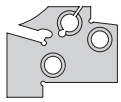
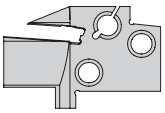
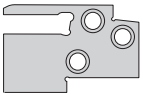
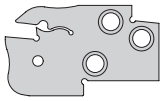
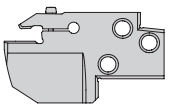
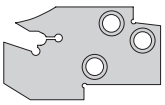
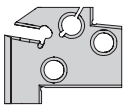
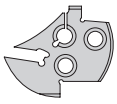
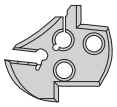
6 Reference regarding further information



CERATIZIT designation system

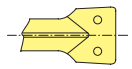
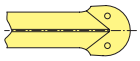
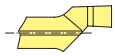
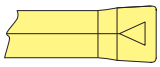
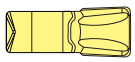
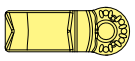
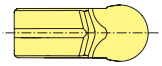
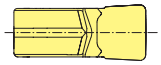
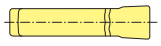
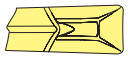
Tool holders

	UTS / HSK-T system	Assembly size (system)	MSS system	E = external / I = internal	Assembly size	Hand	Approach angle	Parting and grooving depth	Shank section, type	Shank length	Insert system
			MSS	E	25	R	00		2525	L	
			MSS	E	25	R	00		AD		
	UT	40	MSS	E	25	R	00				
	HSK	T63	MSS	E	32	L	90				
				E	16	R	00	21	1616	K	GX24-1
			MC		05	R			1010	K	
				E	12	R	00	21			TC16
			MSS	I	25	R	90	1.5D			
	UT	40	MSS	I	32	R	90	2D			
	UT	40	MSS	I	32	R	90	2D			TC16
				I	12	R	90	2.5D			GX09

	MSS system	E = external / I = internal	Assembly size	Hand	Max. parting and grooving depth	Insert system	Insert size	Width class	Axial diameter range D_{min} - D_{max}
	MSS	E	25	R	12	GX	16	2	
	MSS	E	25	R	15	GX	24	3	A70-100
	MSS	E	25	R	10	AX	10		
	MSS	E	25	R	25	SX	3		
	MSS	E	32	N	45	LX			
	MSS	E	25	R	20	FX	3.1		
	MSS	E	25	R		TC	16	2	
	MSS	I	25	R	06	GX	09	1	
	MSS	I	32	R		TC	16	2	

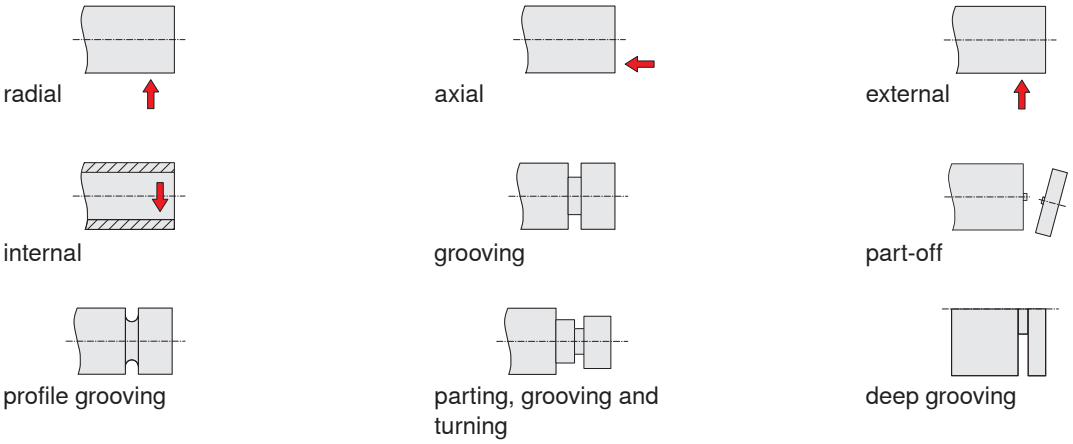
CERATIZIT designation system

Inserts

	Insert system	Insert size	Number of cutting edges	Width class	Insert shape, application	Cutting width, pitch	Hand / thread standard	Corner radius, angle		Chip groove code
	GX	16		2	E	3.00	N	0.30		Code
	GX	16		2	R	1.50	N			Code
	GX	16		2	S	1.00	R			
	AX	10			E	3.00	N	0.30	20	Code
	SX				E	2.00	N	0.20		Code
	SX				R	1.50	N			Code
	LX				E	8.00	N	0.80		Code
	LX				R	4.00	N			Code
	FX					3.10	N	0.20		Code
	MC	05	5			1.00	N	0.10		Code
	TC	16		1	E	1.50	ISO			Code

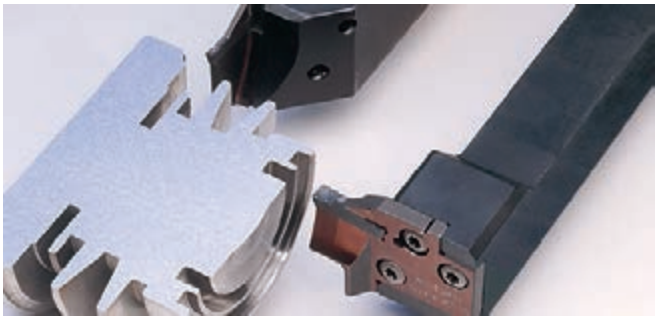
Diverse range of applications

Parting and grooving covers a diverse range of applications and demands, advanced technology and intelligent tool design.



Advanced technology

- Chip formation
- Chip evacuation
- Parallel - flat parting and grooving surface
- Surface finish
- Formation of burrs when parting off tubes
- Formation of pips in part-off operations
- v_c = 0 in the centre
- Entire main cutting edge applied



Intelligent tool design

- Narrow, long overhang
- Insert clamping
- Rigidity
- Resistant against breakage
- Easy handling
- Economy

The modular system

MSS - the modular parting, grooving and threading system

In order to be able to meet all demands, up-to-date tools have a modular structure.

System features

- Separate shank and tool holder
- Same interface for all parting, grooving and threading applications
- Stable, precise connection
- Extendable through new ‘modules’
- Easy handling
- Clamping features optimised for the various applications

Flexibility

- Adaptable to machining task
- One system only for all parting, grooving and threading operations
- Particularly well-suited for semi-standard tools

Simplicity

- Quick module change in case of tool breakage, short downtime

Precision

- High accuracy and repeatability when changing the module
- Reduced set-up time
- High-quality work pieces

Economy

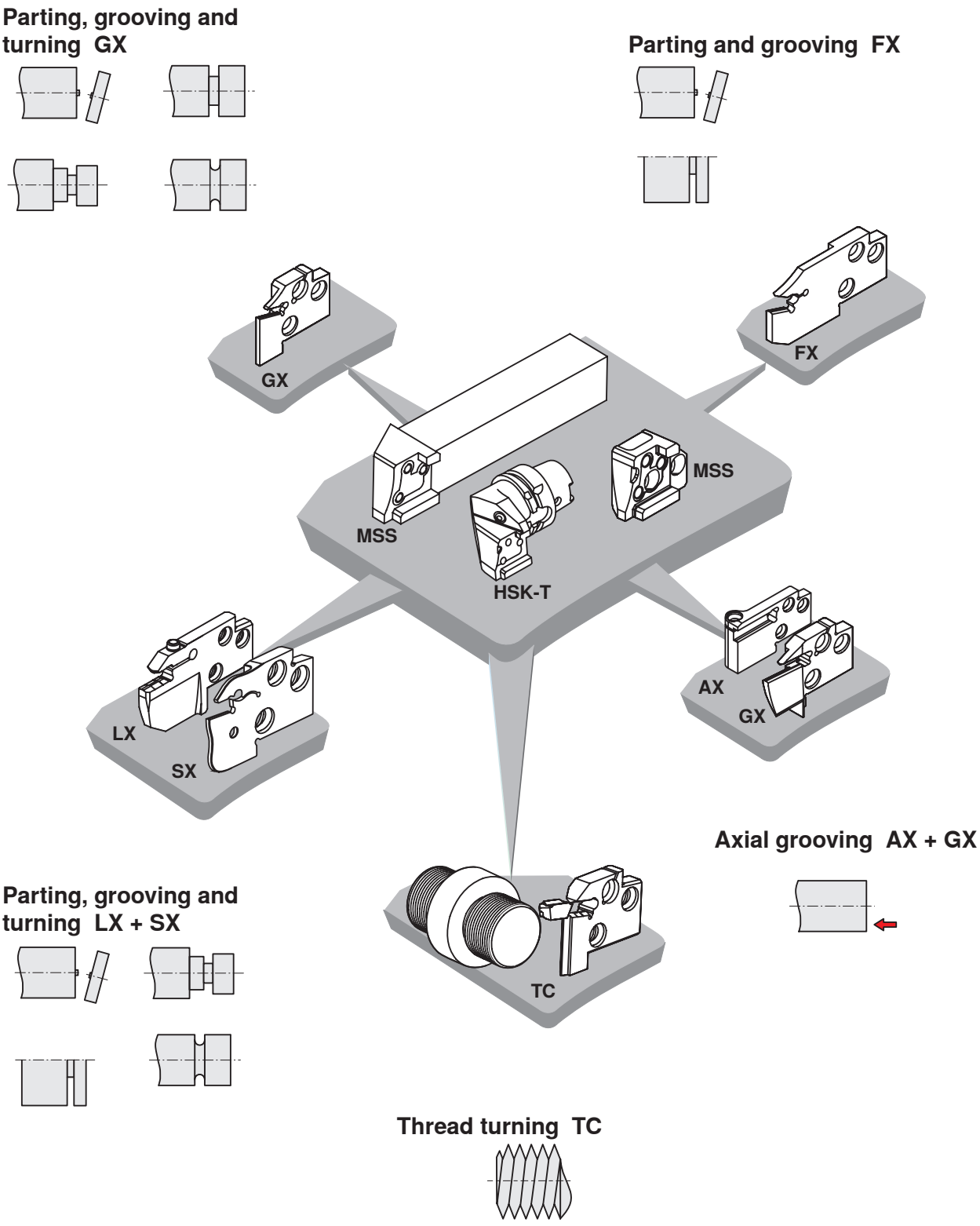
- Low stock inventory provides a large variety of combination possibilities
- In case of tool breakage only change module

Stability

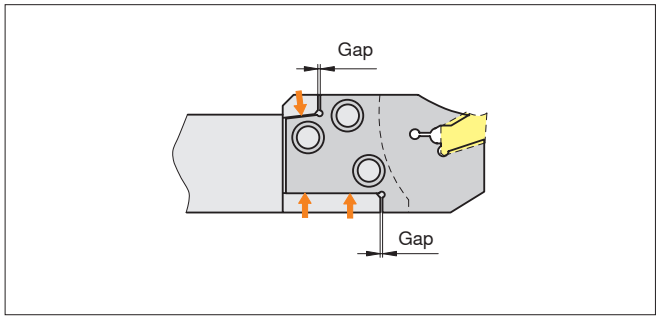
- Application security
- Parting, grooving and longitudinal turning possible

Completeness

- Components for all work pieces and materials


Parting, grooving and turning GX
Parting and grooving FX
GX
FX
MSS
MSS
HSK-T
LX
SX
AX
GX
Axial grooving AX + GX
Parting, grooving and turning LX + SX
TC
Thread turning TC

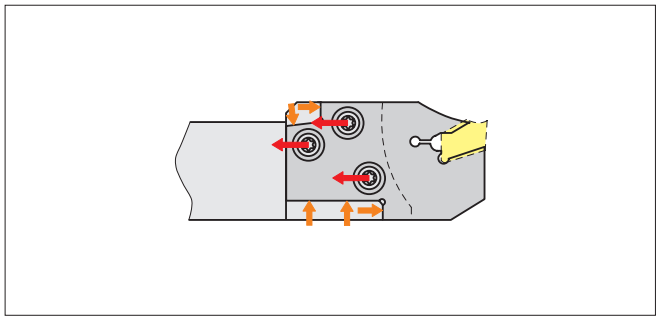
The interface



The strong connection

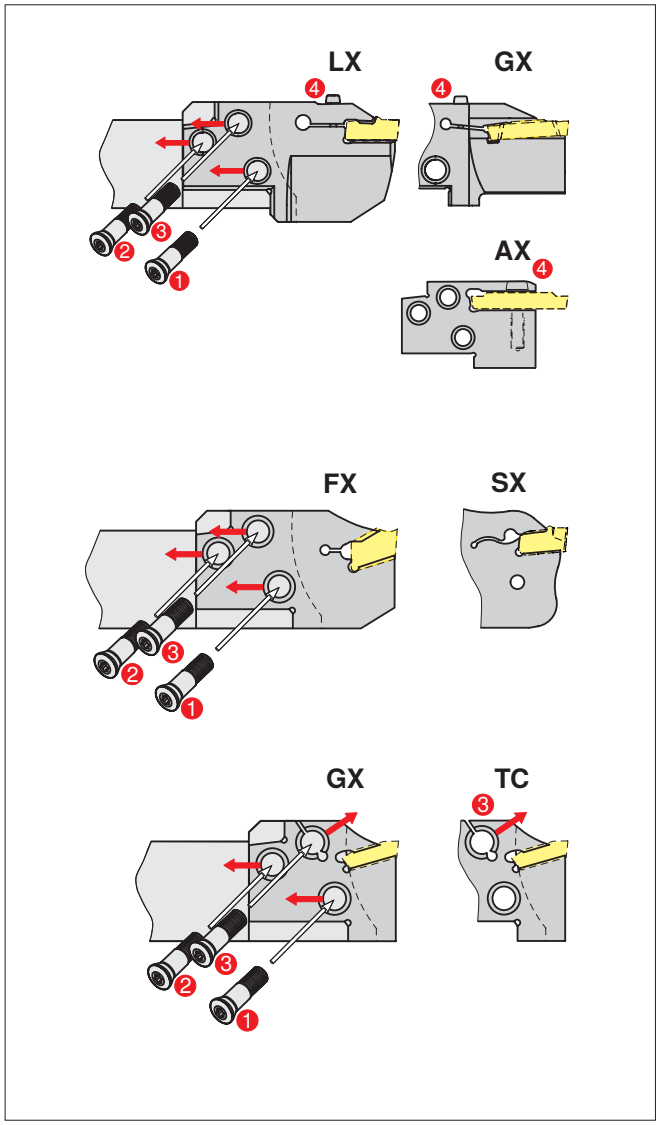
Unclamped module

- Gap between module and location face for axial clamping



Clamped module

- Axial clamping with location face
- Connection without clearance, therefore highest stability



Clamping features
LX / GX / AX
Active insert clamping

Screws 1, 2 and 3 are used to clamp the module. The insert is self-clamping. The insert is clamped through the elastic deformation of the module through the additional screw 4.

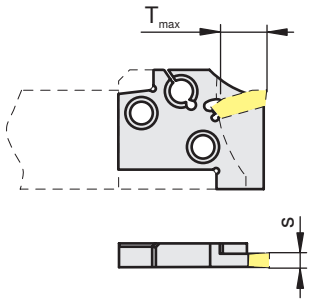
FX / SX
Self-clamping inserts

Screws 1, 2 and 3 are used to clamp the module. The insert is self-clamping.

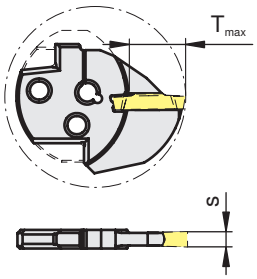
GX / TC
Active insert clamping

Screws 1, 2 and 3 are used to clamp the module. **Important:** clamp the module with screw 1, then screw 2. Afterwards the insert is clamped by means of screw 3.

GX external



GX internal



Parting, grooving, longitudinal turning, axial grooving

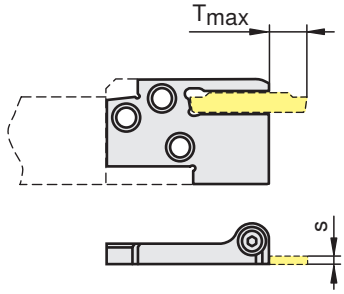
T_{max} = 7 - 21 mm
s = 2,0 - 8,0 mm

Circlip grooves
T_{max} = 0,75 - 4,0 mm
s = 0,6 - 5,25 mm

O-ring grooves
T_{max} = 1,78 - 2,58 mm
s = 1,6 - 2,4 mm

T_{max} = 4 - 19 mm
s = 2,0 - 6,0 mm

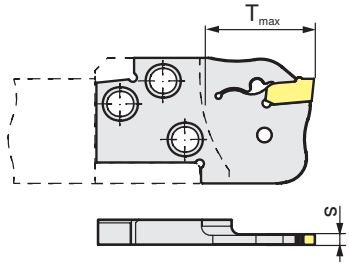
AX



Axial grooving

T_{max} = 5 - 15 mm
s = 3 mm

SX



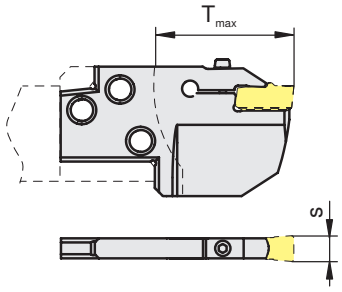
Parting, grooving, longitudinal turning

T_{max} = 20 - 35 mm
s = 2 - 4 mm

The modules

Systems LX / FX / TC

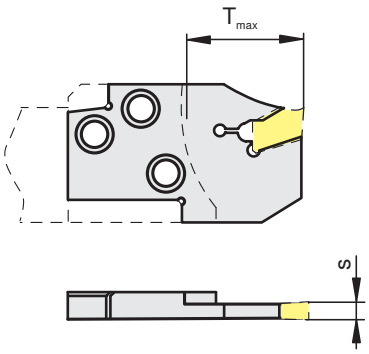
LX



Parting, grooving, longitudinal turning, axial grooving

T_{max} = 25 - 45 mm
s = 8,0 - 10,0 mm

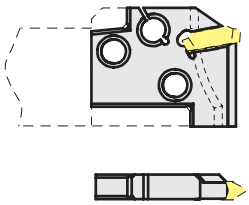
FX



Parting, grooving

T_{max} 20 = 45 mm
s = 2,2 - 6,5 mm

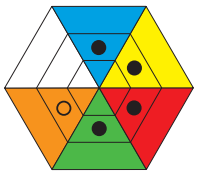
TC



Thread turning and milling

Pitch
ISO 0,5 - 5,0 mm
BSW 28 - 5 TPI

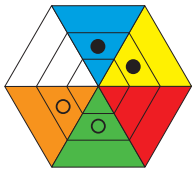
Parting, grooving, longitudinal turning, axial grooving



GX

Insert size	s	r	s	r	
09	0,6-3,25	0,8-1,2	2,0-3,5	1,0-1,2	Upon request
16	0,6-5,25	0,8-1,2	2,0-6,0	1,5-3,0	
24			2,0-6,0	1,5-3,0	

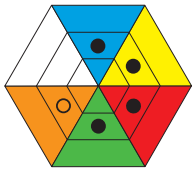
Axial grooving



AX

s
3,0

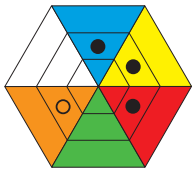
Parting, grooving, longitudinal turning



SX

R	s N	s L	s R
1,5-3,0	2,0-6,0	2,0-4,0	2,0-4,0

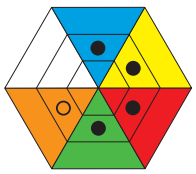
Parting, grooving, longitudinal turning, axial grooving



LX

r	s
4,0	8,0-10,0

Parting and grooving



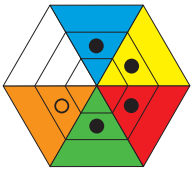
FX

s N	s L	s R
2,2-9,7	2,2-6,5	2,2-5,1

The inserts

Systems GX / AX / SX / LX / FX / TC

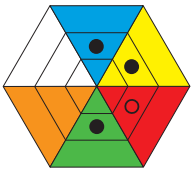
Parting, grooving, longitudinal turning



MC

S N	S L	S R
1,0-2,5	1,0-2,5	1,0-2,5

Thread turning and milling



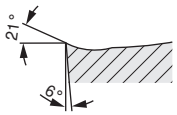
TC

Full and partial profile external, internal ISO 60°	**Full and partial profile external, internal BSW 55°**
Pitch 0.5 - 5.0 mm	**48 - 5 TPI**

- According to the respective application either precision ground or sintered
- Optimised geometries for all important materials
- Security through ideal combination of substrate and coating
- All inserts for aluminium machining are microfinished

-F2

- Very positive geometry
- Ground cutting edge
- Small feed rates
- Low cutting forces
- First choice for stainless materials



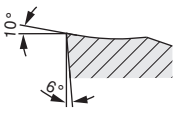
f [mm]

0,05 - 0,15

Machining conditions		
CTCP325	**CTP1340**	**CTPP345**
CTP1340	**CTP1340 CTPP345**	**CTPP345**
CTCP325	CTP1340	
CTP1340	CTP1340	CTPP345

-EN

- Very positive geometry
- Small to medium feed rates
- Low cutting forces
- Universal application
- First choice for axial grooving



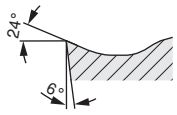
f [mm]

0,05 - 0,17

Machining conditions		
CTCP325	**CTCP335 CTP1340**	**CTP1340**
CTCP335	CTCP335 CTP1340	CTP1340
CTCP325	**CTCP335 CTP1340**	**CTP1340**
CTP1340	CTP1340	CTP1340

-EN (GX24)

- Very positive geometry
- Small to medium feed rates
- Low cutting forces
- Universal application
- First choice for axial grooving



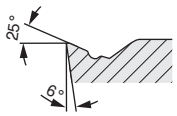
f [mm]

0,05 - 0,17

Machining conditions		
CTCP325	**CTCP335 CTP1340**	**CTPP345**
CTP1340	CTP1340 CTPP345	CTPP345
CTCP325	**CTCP335 CTP1340**	**CTP1340**
CTP1340	CTP1340	CTPP345

-M40

- Stable geometry
- Medium feed rates
- Universal application
- Good chip control



f [mm]

0,075 - 0,20

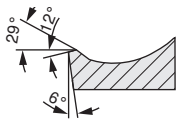
Machining conditions		
CTCP325	**CTP1340**	**CTPP345**
CTP1340	CTP1340 CTPP345	CTPP345
CTCP325	**CTCP325 CTP1340**	**CTP1340**
CTP1340	CTP1340	CTPP345

Geometries for the GX-E system

Parting, grooving and turning

-M1

- Very stable cutting edge
- Medium to high feed rates
- For interrupted cut
- For materials with higher tensile strength
- First choice for part-off operations



f [mm]

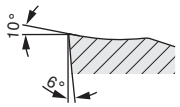
0,10 - 0,20

Machining conditions

CTCP325	**CTP1340**	**CTPP345**
CTP1340	CTP1340 CTPP345	CTPP345
CTCP325	**CTCP325** **CTP1340**	**CTP1340**
CTP1340	CTP1340	CTPP345

-27P

- Highly positive geometry
- Insert with ground periphery
- Sharp cutting edge
- Reduced tendency to adhesion
- First choice for non-ferrous metals



f [mm]

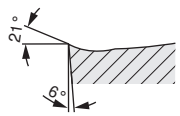
0,05 - 0,25

Machining conditions

H216T	**H216T**	**H216T**

-27P (GX24)

- Highly positive geometry
- Insert with ground periphery
- Sharp cutting edge
- Reduced tendency to adhesion
- First choice for non-ferrous metals



f [mm]

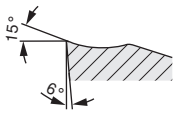
0,05 - 0,25

Machining conditions

H216T	**H216T**	**H216T**

-ER/-EL

- Positive geometry
- Ground cutting edge
- Small feed rates
- Low cutting forces
- Radius and O-ring grooves



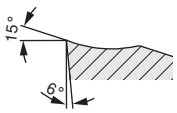
f [mm]

0,05 - 0,15

Machining conditions		
CTCP325	**CTCP325**	
CTCP325	CTCP325	
CTCP325	**CTCP325**	

-EN

- Positive geometry
- Ground cutting edge
- Small to medium feed rates
- Low cutting forces
- Radius grooves, profiling



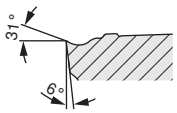
f [mm]

0,05 - 0,20

Machining conditions		
CTCP325	**CTCP325 CTP1340**	**CTP1340**
CTP1340	**CTP1340**	**CTP1340**
CTCP325	**CTCP325 CTP1340**	**CTP1340**
CTP1340	CTP1340	

-M3

- Positive geometry
- Medium to high feed rates
- High surface quality
- Radius grooves, profiling



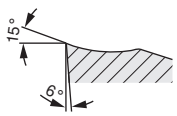
f [mm]

0,07 - 0,20

Machining conditions		
CTCP325	**CTCP325 CTCP335**	**CTCP335**
CTCP335	CTCP335	
CTCP325	**CTCP325 CTCP335**	**CTCP335**

-27P

- Highly positive geometry
- With ground periphery
- Sharp cutting edges
- Reduced tendency to adhesion
- First choice for non-ferrous metals



f [mm]

0,05 - 0,30

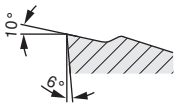
Machining conditions		
H216T	**H216T**	**H216T**

Geometries for GX-S system

Circlip grooves

-ER/-EL

- Positive geometry
- Ground cutting edges
- Small feed rates
- Small corner radii
- Circlip grooves



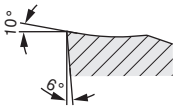
f [mm]

0,025 - 0,125

Machining conditions		
CTP1340	**CTP1340**	
CTP1340	**CTP1340**	
CTP1340	CTP1340	
CTP1340	CTP1340	
CTP1340	CTP1340	

-EN

- Positive geometry
- Ground cutting edges
- Small feed rates
- Small corner radii
- Circlip grooves



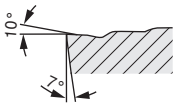
f [mm]

0,025 - 0,125

Machining conditions		
CTP1340	**CTP1340**	
CTP1340	**CTP1340**	
CTP1340	CTP1340	
CTP1340	CTP1340	
CTP1340	CTP1340	

-F50

- Positive geometry
- Ground cutting edges
- Small feed rates
- Small cutting forces
- For axial grooving



f [mm]

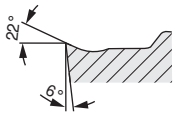
0,025 - 0,125

Machining conditions		
CTP1340	**CTP1340**	
CTP1340	**CTP1340**	
CTP1340	CTP1340	
CTP1340	CTP1340	
CTP1340	CTP1340	

Geometries for SX system

-F2

- Very positive geometry
- Ground cutting edges
- Small feed rates
- Low cutting forces
- First choice for stainless materials



f [mm]

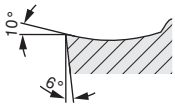
0,05 - 0,15

Machining conditions

CTP1340	**CTP1340**	**CTPP345**
CTP1340	**CTP1340 CTPP345**	**CTPP345**
CTP1340	CTP1340	
CTP1340	CTP1340 CTPP345	

-M2

- Stable geometry
- Medium feed rates
- Universal application
- Good chip control



f [mm]

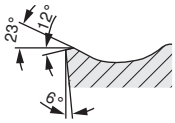
0,075 - 0,20

Machining conditions

CTCP325	**CTCP335 CTP1340**	**CTPP345**
CTCP335	CTP1340	CTPP345
CTCP325	**CTCP325**	**CTCP335**
CTP1340	CTP1340	CTPP345

-M1

- Very stable cutting edges
- Medium to high feed rates
- For interrupted cut
- Materials with higher tensile strength
- First choice for part-off operations



f [mm]

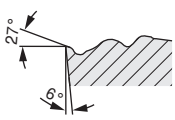
0,10 - 0,20

Machining conditions

CTCP325	**CTCP335 CTP1340**	**CTPP345**
CTCP335	CTP1340	CTPP345
CTCP325	**CTCP325**	**CTCP335**
CTP1340	CTP1340	CTPP345

-M3

- Stable geometry
- Medium to high feed rates
- High surface quality
- Radius grooves, profiling



f [mm]

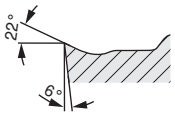
0,05 - 0,20

Machining conditions

CTCP335	**CTCP335 CTP1340**	**CTP1340**
CTCP335	**CTCP335 CTP1340**	**CTP1340**
CTCP335	CTCP335 CTP1340	CTP1340
CTP1340	CTP1340	CTP1340

-27P

- Highly positive geometry
- With ground periphery
- Sharp cutting edges
- Reduced tendency to adhesion
- First choice for non-ferrous metals

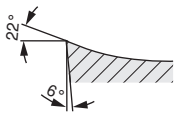


f [mm]	Machining conditions		
	H216T	H216T	H216T
0,05 - 0,25			

Geometries for LX system

-M2

- Stable geometry
- Medium feed rates
- Universal application
- Good chip control



f [mm]

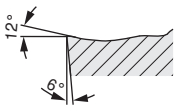
0,20 - 0,50

Machining conditions

CTCP325	**CTCP335 CTP1340**	**CTP1340**
CTCP335	CTP1340	CTP1340
CTCP325	**CTCP325**	**CTCP335**
CTP1340	CTP1340	CTP1340

-M3

- Stable geometry
- Medium to high feed rates
- High surface quality
- Radius grooves, profiling



f [mm]

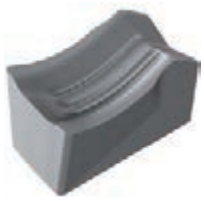
0,15 - 0,35

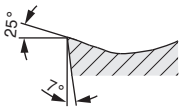
Machining conditions

CTCP325	**CTCP335 CTP1340**	**CTP1340**
CTCP335	**CTCP335 CTP1340**	**CTP1340**
CTCP325	CTCP335 CTP1340	CTP1340
CTP1340	CTP1340	CTP1340

-F1

- Very positive geometry
- Small to medium feed rates
- Low cutting forces
- Good chip control
- Reduced built-up edge





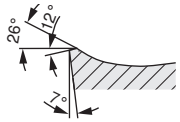
f [mm]

0,05 - 0,15

Machining conditions		
CTCP325	**CTP1340**	**CTPP345**
CTP1340	**CTP1340 CTPP345**	**CTPP345**
CTCP325	CTCP325 CTP1340	
CTP1340	CTP1340 CTPP345	CTPP345

-M1

- Very stable cutting edges
- Medium to high feed rates
- For interrupted cut
- For materials with higher tensile strength
- First choice for part-off operations



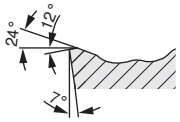
f [mm]

0,08 - 0,20

Machining conditions		
CTCP325	**CTCP335 CTP1340**	**CTPP345**
CTCP335	CTP1340	CTPP345
CTCP325	**CTCP325**	**CTCP335**
CTP1340	CTP1340	CTPP345

-R2

- Very stable cutting edges
- High feed rates
- Good chip control



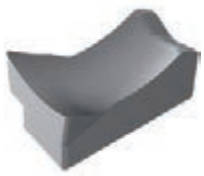
f [mm]

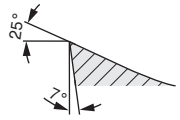
0,10 - 0,27

Machining conditions		
CTCP325	**CTP1340**	**CTPP345**
CTP1340	CTP1340 CTPP345	CTPP345
CTCP325	**CTCP325 CTP1340**	
CTP1340	CTP1340 CTPP345	CTPP345

-27P

- Highly positive geometry
- With ground periphery
- Sharp cutting edges
- Reduced tendency to adhesion
- First choice for non-ferrous metals





f [mm]

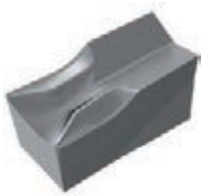
0,03 - 0,13

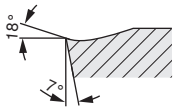
Machining conditions		
H216T	**H216T**	**H216T**

Geometries for MaxiClick system

-F2

- Very positive geometry
- Ground cutting edges
- Small feed rates
- Low cutting forces
- First choice for stainless materials





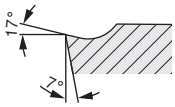
f [mm]

0,05 - 0,10

Machining conditions		
CTP1340	**CTP1340**	**CTP1340**
CTP1340	**CTP1340**	**CTP1340**
CTP1340	CTP1340	
CTP1340	CTP1340	CTP1340
CTP1340	CTP1340	

-F3

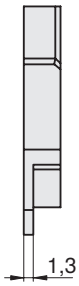
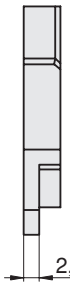
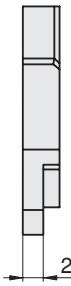
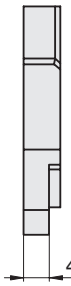
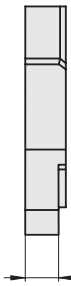
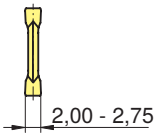
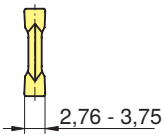
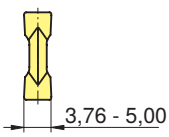
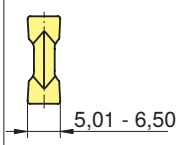
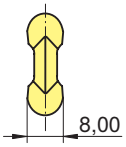
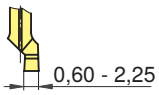
- Very positive geometry
- Ground cutting edges
- Small feed rates
- Low cutting forces
- Reduced formation of pips and burrs



f [mm]

0,02 - 0,06

Machining conditions		
CTP1340	CTP1340	
CTP1340	CTP1340	
CTP1340	CTP1340	
CTP1340	CTP1340	

Width classes	1	2	3	4	5
Parting and grooving modules					
Parting and grooving inserts					
Inserts for circlip grooves					

Module designation

MSS-E20R12-GX16- **2**

1

Insert designation

GX16- **2** E3.00N0.30

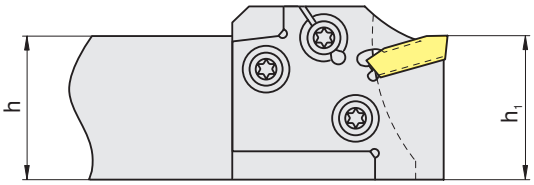
1

1 **Width class** [1)]

The parting and grooving widths of the MSS system are divided into width classes. Every width class represents a certain range of cutting widths.

[1)] Ideally the module and the insert have the same width class. This combination results in the best possible application security.

The assembly size



The assembly size is determined by the shank dimensions of the MSS tool holders.
In this manner the correct tool holder can be assigned to the correct module size and vice versa.
The following tables will give you an overview of the width classes and insert sizes for the available assembly sizes.

Tool designation

MSS- **E25** R00-2525L
[1]

Module designation

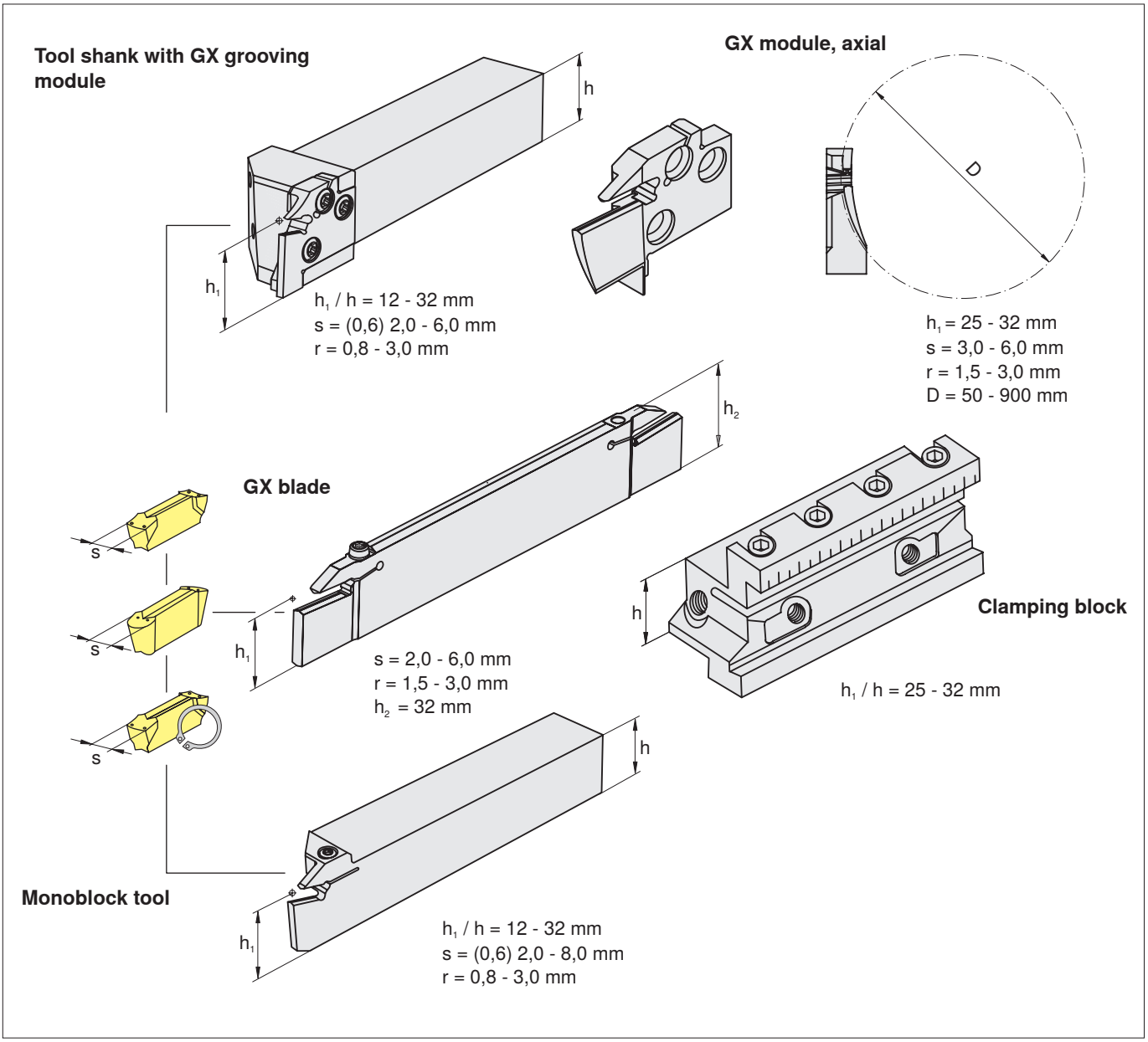
MSS- **E25** R25-GX16-2
[1]

[1] **Assembly size (h)**

Assembly size (h)	GX							
	External machining				Internal machining			
	Width class							
	1	2	3	4	1	2	3	4
10								
12								
16								
20								
25								
32								
40								

Assembly size (h)	GX Insert size					
	09		16		24	
10						
12						
16						
20						
25						
32						
40						

The GX system features a double-ended insert with numerous application possibilities. It is mostly applied for radial grooving and turning. Thanks to special modules the system can easily be adapted for axial and circlip grooving. For GX inserts a range of modules and boring bars for internal grooving is available.



System characteristics

- Double-ended insert
- Ground and directly pressed inserts

Benefits

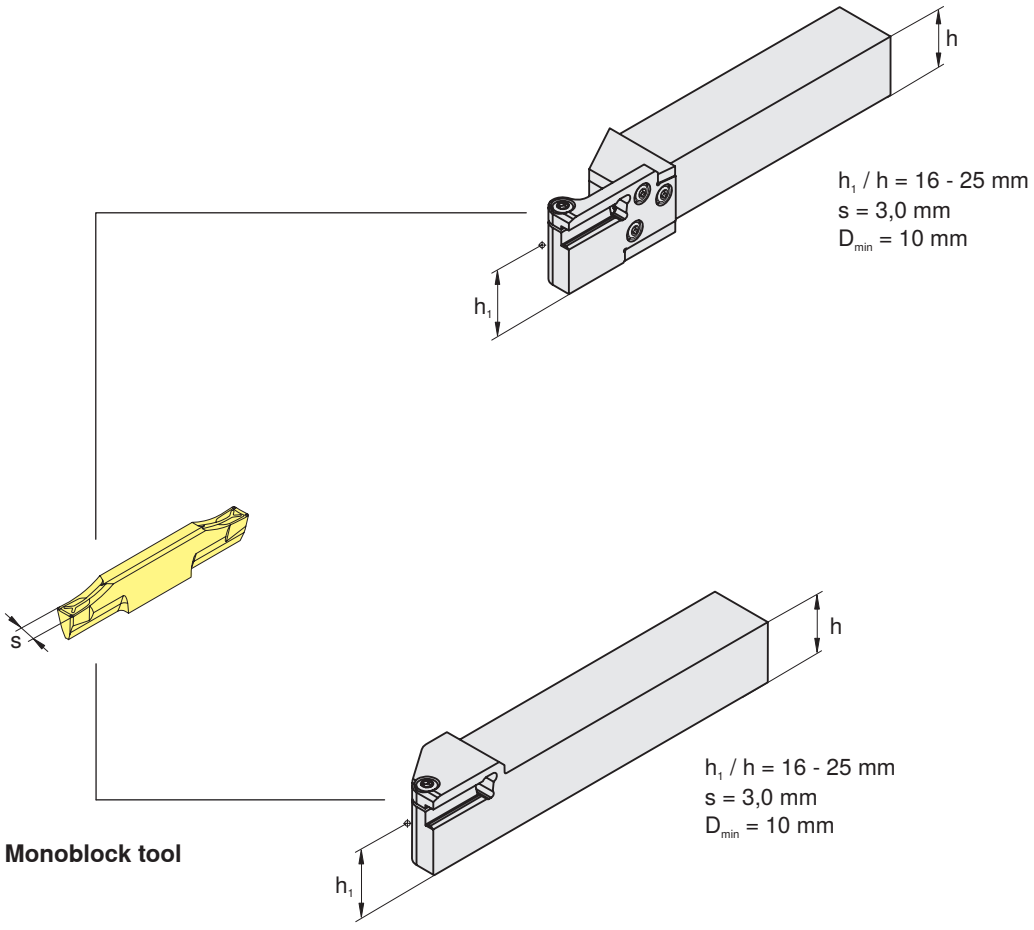
- Good economy
- Optimum solution for all situations

System overview

AX system

The AX system is for axial grooving with small diameters. A special characteristic of the design is that the insert needs no support in the cutting area.

Tool shank with AX parting and grooving module



Monoblock tool

System characteristics

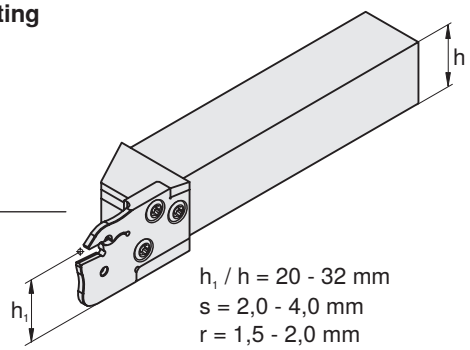
- Neutral insert
- Monoblock and modular tools

Benefits

- May be applied in left-hand and right-hand tools
- Optimum solution in terms of costs for every application

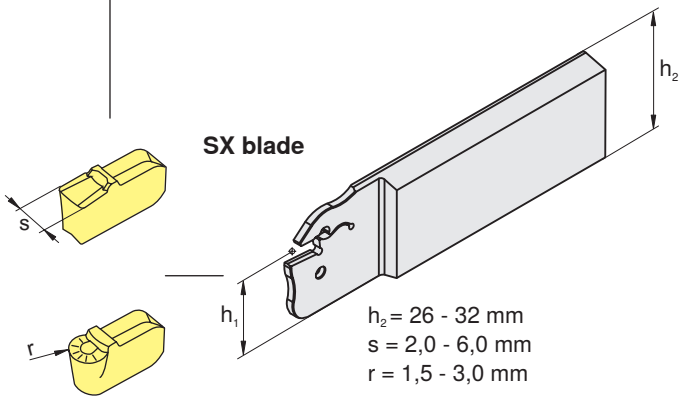
In the SX system the insert is self-clamping and fixed with maximum clamping force in the insert seat. Precise cutting edge positioning and easy handling are guaranteed.

Tool shank with SX parting and grooving module

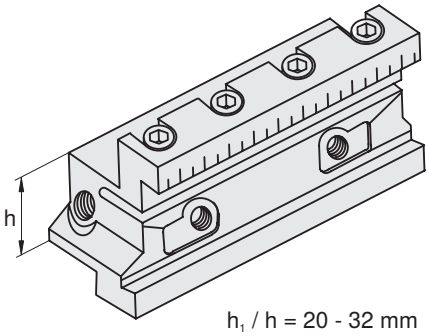


h_1 / h = 20 - 32 mm
s = 2,0 - 4,0 mm
r = 1,5 - 2,0 mm

SX blade

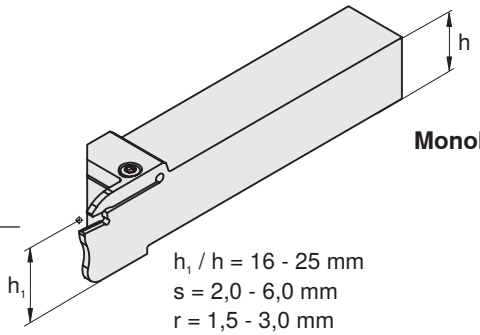


h_2 = 26 - 32 mm
s = 2,0 - 6,0 mm
r = 1,5 - 3,0 mm



h_1 / h = 20 - 32 mm

Clamping block



Monoblock tool

h_1 / h = 16 - 25 mm
s = 2,0 - 6,0 mm
r = 1,5 - 3,0 mm

System characteristics

- Active clamping
- Insert seat with fixed stop
- Easy handling
- FEM optimised tool

Benefits

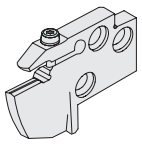
- Inserts will not pull out of the cutting blade
- Exact positioning of the cutting edge
- Quick insert change
- Maximum stability also when longitudinal turning

System overview

LX system

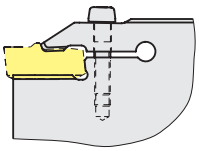
The LX system is characterised by high strength and stability.
It is most suitable for the production of wide and deep grooves
as well as for parting off large bar diameters.

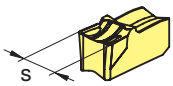
Parting and grooving module LX



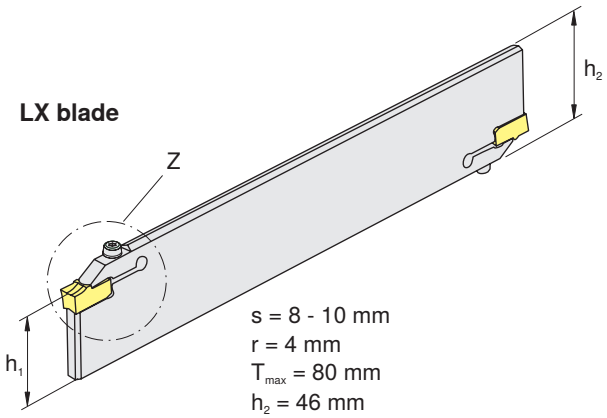
s = 8 - 10 mm
r = 4 mm
T_{max} = 25 / 32 / 45 mm

Detail Z
Active insert clamping



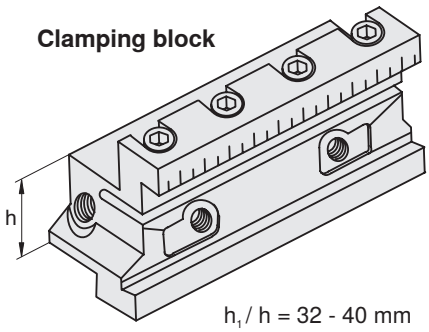


LX blade



s = 8 - 10 mm
r = 4 mm
T_{max} = 80 mm
h_2 = 46 mm

Clamping block



h_1 / h = 32 - 40 mm

Application of LX modules

- Part-off
- Grooving and turning
- Axial grooving with D > 500 mm
- Internal grooving and turning with D > 200 mm

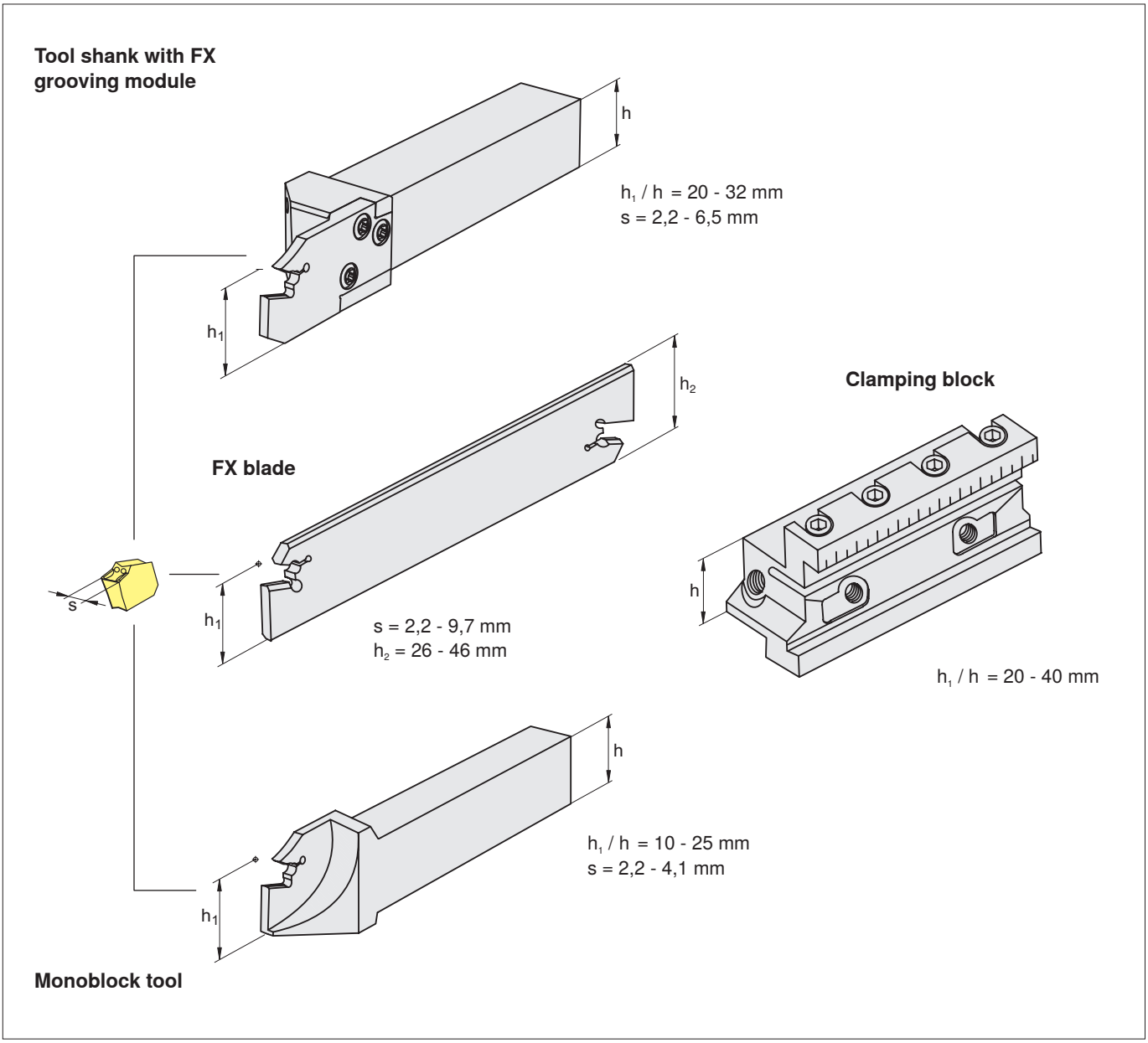
System characteristics

- Robust construction
- Active insert clamping
- Insert with full radius

Benefits

- Application security, high strength and stability
- Well-suited for copy turning

The FX system is characterised by a self-clamping single blade insert for deep grooving of large diameters. FX is directly integrated in the MSS system by means of the respective modules. Additionally the tried and tested block/blade solutions and monoblock tools are available.



System characteristics

- Self-clamping insert
- Adjustable blade
- Single-blade insert, directly pressed

Benefits

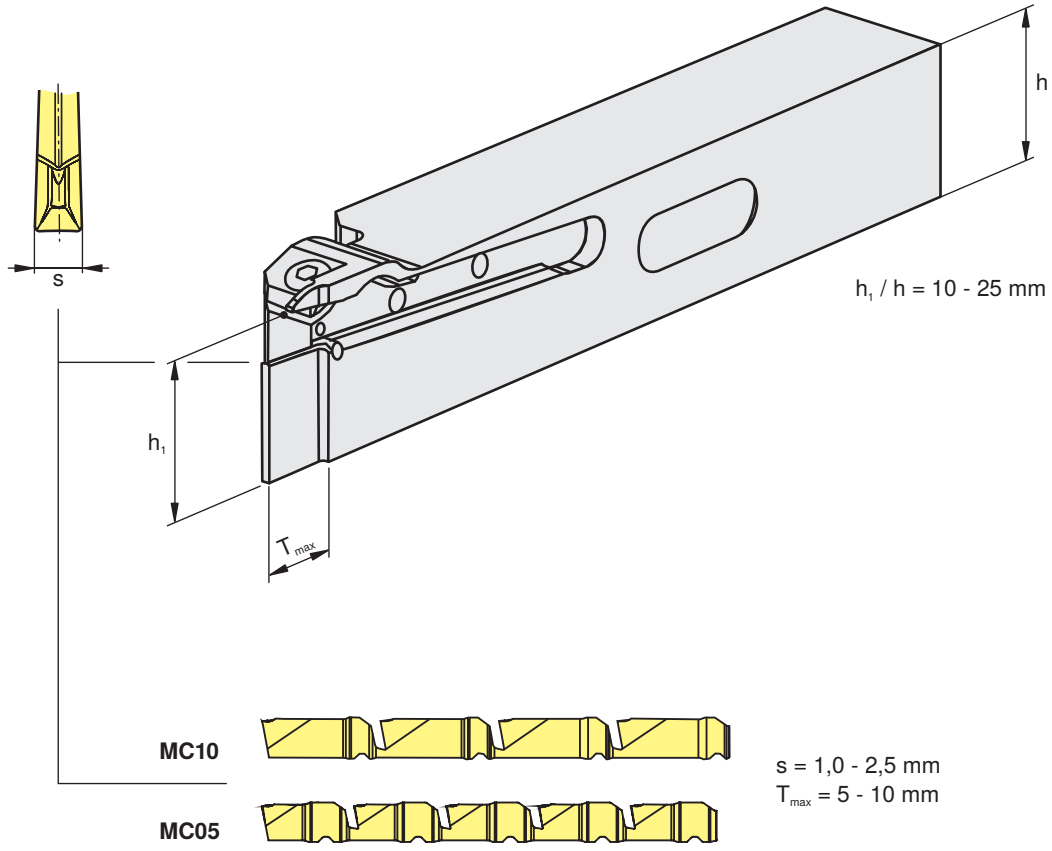
- Easy handling, no clamping parts
- Parting and grooving depth, overhang optimally adjustable
- Economic for deep parting and grooving

System overview

MaxiClick system

MaxiClick is characterised by a cutting insert consisting of 4 or 5 cutting elements. The worn cutting edge is broken off towards the side, like a snap-off knife.

Monoblock tool



System characteristics

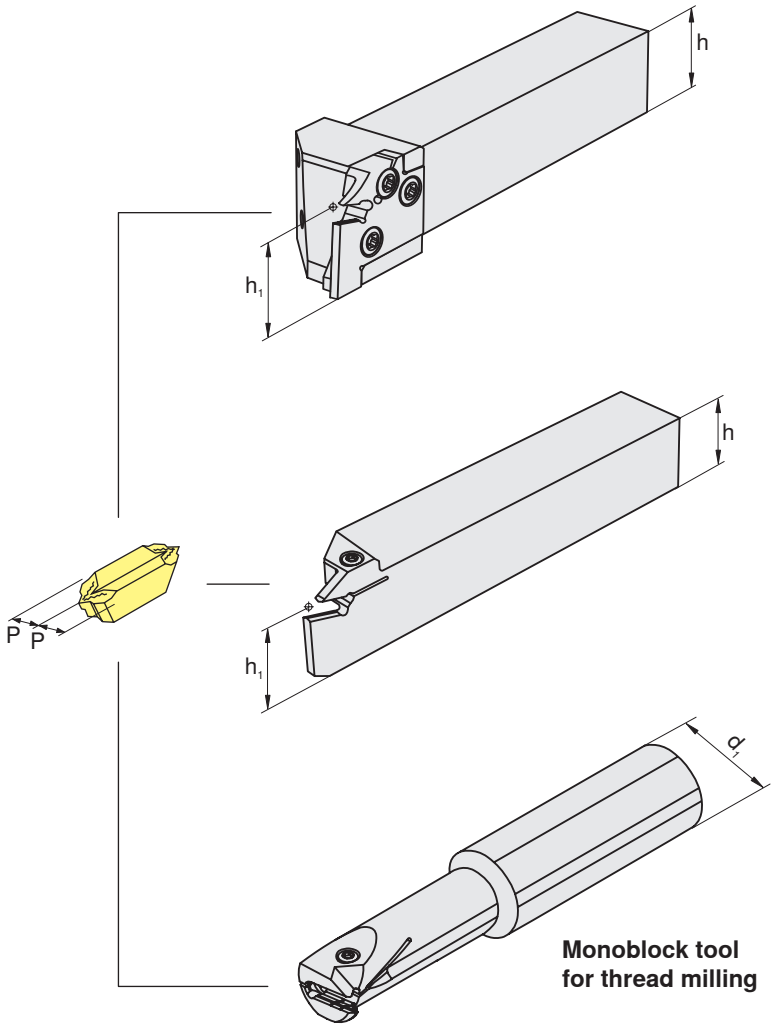
- Extremely narrow part-off and grooving widths are possible
- Excellent surface quality can be achieved
- Multiple part-off operations are possible

Benefits

- Less material wastage
- No additional finishing work necessary
- Reduction of machining costs

With system TC the same insert can be used to produce threads by turning or milling. TC offers numerous advantages which are of decisive importance for many threading applications.

Tool shank with TC threading module



h_1 / h = 20 - 25 mm

Pitch
P = .5 - 5.0 mm
P = 48 - 5 TPI

Monoblock tool

h_1 / h = 12 mm

Pitch
P = .5 - 3.0 mm
P = 48 - 8 TPI

Monoblock tool for thread milling

d_1 = 25 - 32 mm

Pitch
P = .5 - 5.0 mm
P = 48 - 5 TPI

System characteristics

- Turning and milling with the same insert
- Neutral configuration of insert

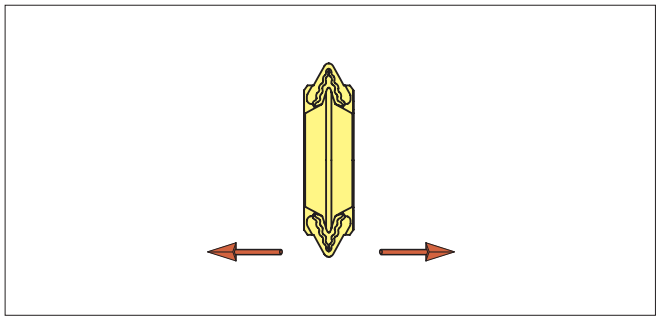
Benefits

- Flexibility, reduced variety and costs
- Right-hand and left-hand threads possible using one insert only
- Reduced storage

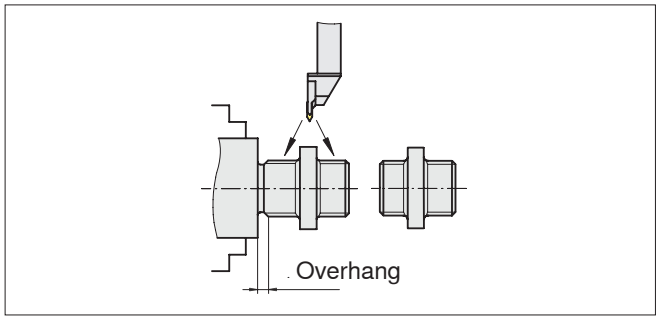
TC system – thread turning

System TC for thread turning is an integrated part of the MSS system. Compared to traditional systems TC offers a series of advantages which are of decisive importance for many threading applications.

System TC

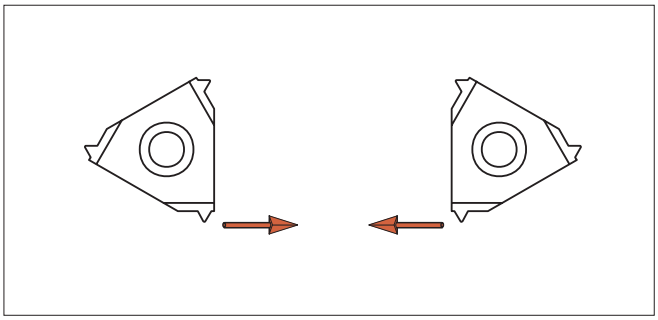


- Neutral configuration of insert makes operation in both directions possible
- Only one threading insert per pitch for partial profile and Whitworth thread; only two threading inserts (internal - external) per pitch for ISO threads
- Reduced storage
- Good chip formation through chip groove with rake angle +10°

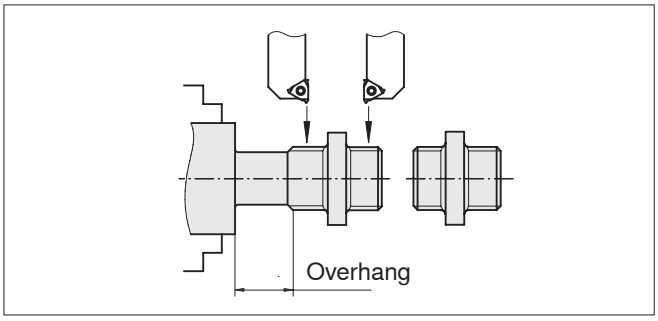


Enhanced economic efficiency through
- reduced machining time
- fewer tool changes
- improved stability, small overhang
- material saving
- thread turning between shoulders possible
- fewer tools and inserts

Conventional system

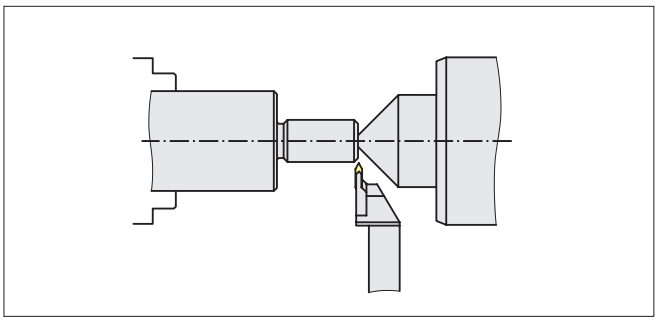


- Right-hand and left-hand version of insert, therefore operation only in one direction
- For every pitch 4 threading inserts are necessary (right- and left-hand, internal - external)



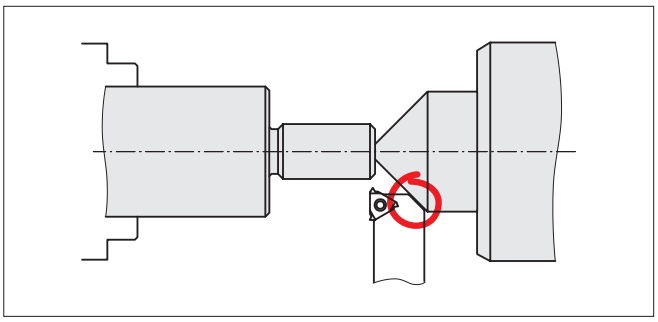
- for this machining method 2 tools are necessary
- additional loss of stability and material caused by large overhangs

System TC

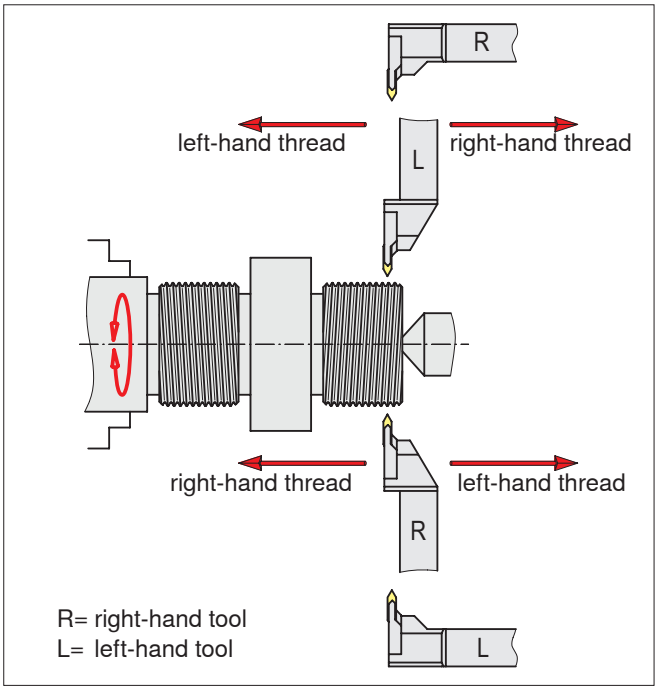


○ Easy access to work piece therefore use of tailstock also possible with small thread diameters

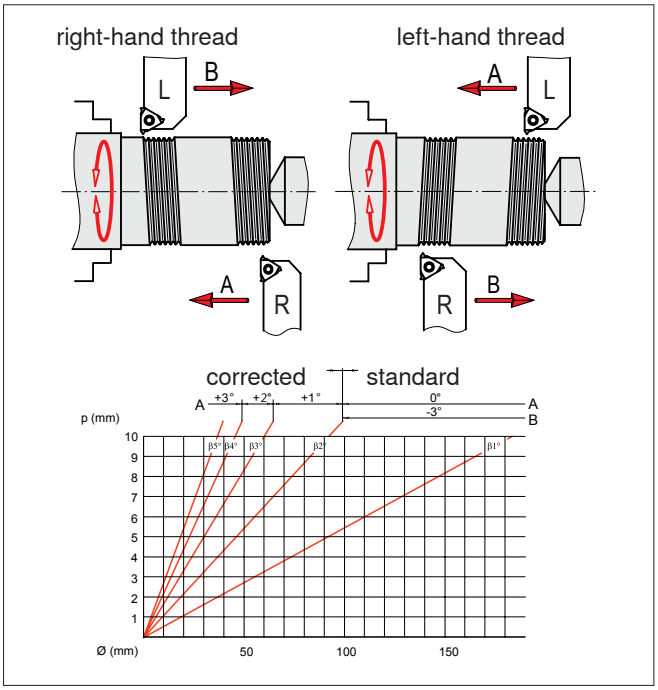
Conventional system



○ Difficult component access
○ Danger of collision



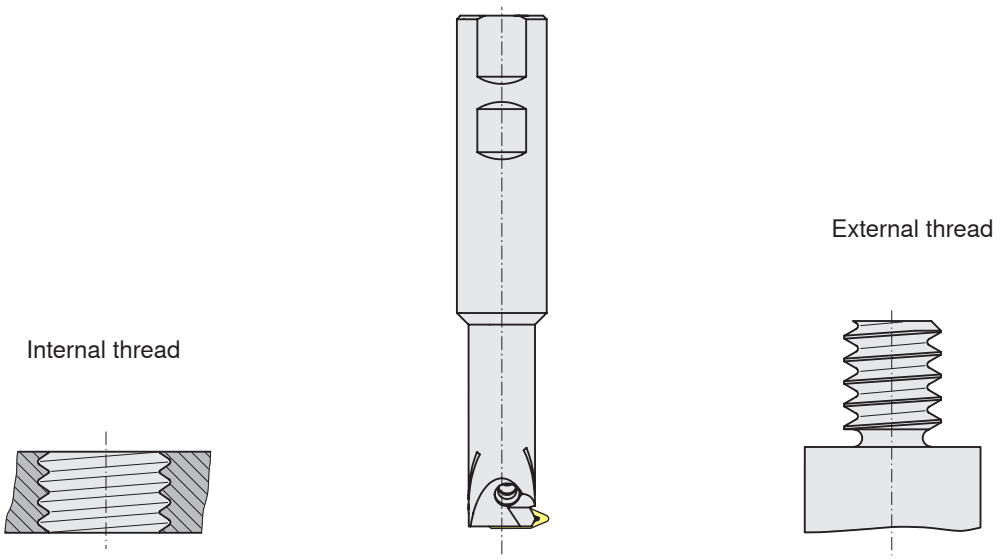
○ Easy to apply as the tools can be used in both directions without correcting the helix angle



○ Correction of helix angle necessary, therefore high degree of application know-how required
○ Can only be operated in one direction

TC system – thread milling

For thread milling and turning the same inserts are applied. With special tool shanks, which are characterised by compact and modular construction, **external as well as internal threads** can be produced on all up-to-date machining centres.

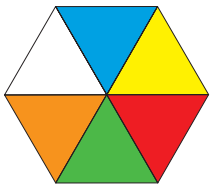


System characteristics

- Turning and milling with the same insert
- Single-tooth thread milling
- Thread is cut in one pass

Benefits

- Flexibility, reduced variety and costs
- Low machining forces, large overhang possible, high cutting data (v_c and f), easy programming
- No interruptions or steps in the thread



Material

Based on VDI 3323 CERATIZIT's MasterGuide divides materials into six main groups (P, M, K, N, S, H). Each is given a colour, according to the system partly adopted in ISO 513.

P Steel

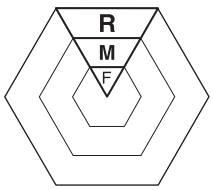
M Stainless steel

K Cast iron

N Non-ferrous metals and non-metals

S Heat-resistant alloys, titanium

H Hard materials



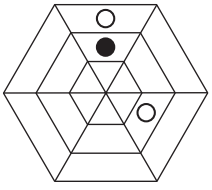
Machining application type

Each coloured segment is divided into three sections, and each section indicates the relevant machining application type:

R = rough machining

M = medium machining

F = fine machining



● **Main application**
o **Extended application**

Application

The ideal application area for each insert is indicated by a black circle. Extended applications are indicated by an open circle. The CERATIZIT MasterGuide provides you with an easily understandable structure for choosing a product and enables you to reduce grade and geometry inventory.

CERATIZIT designation system

Cutting materials

C T C P 3 3 5

1 2 3 4 5

1 Manufacturer: CERATIZIT

2 Cutting material

W Uncoated carbide
C CVD coated carbide
P PVD coated carbide
T Uncoated cermet
E Coated cermet
N Uncoated silicon nitride
M Coated silicon nitride
S Mixed ceramic
K Whisker ceramic
I Sialon
D PCD
B CBN
L CBN coated
H Sintered HSS

3 Main application (material) Variant 1: number

1 Steel
2 Stainless steel
3 Cast iron
4 Light and non ferrous metals, non metals
5 Heat resistant alloys, titanium
6 Hard materials
7 Universal grade for a variety of applications

Main application (material) Variant 2: ISO letter

P Steel
M Stainless steel
K Cast iron
N Light and non ferrous metals, non metals
S Heat resistant alloys, titanium
H Hard materials
X Universal grade for a variety of applications

4 Main application (machining method)

1 Turning
2 Milling
3 Parting and grooving
4 Drilling
5 Threading
6 Others
7 Universal grade for a variety of applications

5 ISO 513 Application range

For example:
05
10
15
25
35 ISO P35
.
.
.

Carbide

HW Uncoated carbide, consisting mainly of tungsten carbide (WC)
HT[1)] Uncoated carbide, consisting mainly of titanium carbide (TiC) or titanium nitride (TiN) or both
HC Carbides as above, but coated

Ceramic

CA Oxide ceramic, consisting mainly of aluminium oxide (Al_2O_3)
CM Mixed ceramic, based on aluminium oxide (Al_2O_3), but with different oxide components
CN Nitride ceramic, consisting mainly of silicon nitride (Si_3N_4)
CC Ceramics as above, but uncoated

Diamond

DP[2)] Polycryistalline diamond

Boron nitride

BL[2)] Polycrystalline cubic boron nitride with a low CBN content (40% - 65%)
BH[2)] Polycrystalline cubic boron nitride with a high CBN content (70% - 95%)
BC[2)] Polycrystalline cubic boron nitride with coating

[1)] These carbides are also called ‘cermets’.

[2)] Polycrystalline diamond and polycrystalline boron nitride are also called ultra-hard cutting materials.

Grade overview

Parting and grooving

Grade designation	Standard designation ISO	Standard designation ANSI	*Type of cutting material	Application range 01 05 10 15 20 25 30 35 40 45 50	P Steel	M Stainless	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Hard materials
CTCP325 COLORSTAR™	HC-P25	C6	C		●					
	HC-K30	C1	C				●			
	HC-M20	-	C			○				
CTP1340 SILVERSTAR™	HC-P30	C6	P		●					
	HC-M25	-	P			●				
	HC-K30	C1	P				●			
	HC-S30	-	P						●	
CTCP335 COLORSTAR™	HC-P35	C6	C		●					
	HC-K35	C1	C				●			
	HC-M30	-	C			○				
CTPP345 SILVERSTAR™	HC-P45	C5	P		●					
	HC-M40	-	P			●				
	HC-S40	-	P						○	
H216T	HW-N15	C3	W					●		
	HW-K15	C3	W				●			

01 05 10 15 20 25 30 35 40 45 50

● Main application

○ Extended application

** to be discontinued

Grade designation	Standard designation		*Type of cutting material	Application range	P	M	K	N	S	H
	ISO	ANSI		01 05 10 15 20 25 30 35 40 45 50	Steel	Stainless	Cast iron	Non-ferrous metals	Heat-resistant	Hard materials
GM213	HC-P20	C7	C		●					
	HC-M15	-	C			●				
	HC-K25	C2	C				●			
GM240	HC-P35	C6	C		●					
	HC-M25	-	C			●				
H216T	HW-N15	C3	W					●		
	HW-K15	C3	W				●			

01 05 10 15 20 25 30 35 40 45 50

● Main application

○ Extended application

Grade description

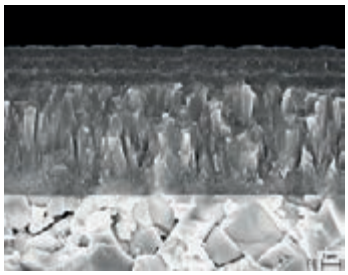
Parting and grooving

CTCP325

COLORSTAR™

HC-P25 | HC-K30 | HC-M20

● ● ○



Specification:
Composition: Co 7.0%; mixed carbide 8.1%; WC balance | Grain size: 1-2 µm | Hardness: HV_{30} 1450 | Coating specification: CVD Ti(C,N) + Al_2O_3 multi-layer

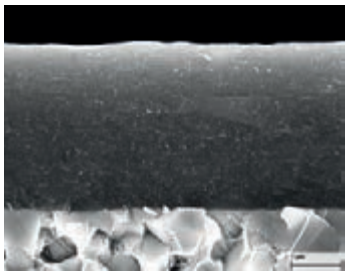
Recommended application:
The wear-resistant solution for steel and cast iron machining with high cutting speeds.

CTP1340

SILVERSTAR™

HC-P30 | HC-M25 | HC-K30 | HC-S30

● ● ● ●



Specification:
Composition: Co 9.0%; mixed carbides 2.0%; WC balance | Grain size: 0.7-1 µm | Hardness: HV_{30} 1590 | Coating specification: PVD TiAlN

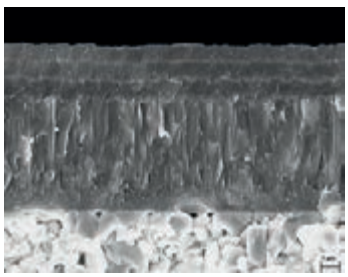
Recommended application:
The universal high-performance grade for steel, austenitic steel, cast iron and heat-resistant alloys.

CTCP335

COLORSTAR™

HC-P35 | HC-K35 | HC-M30

● ● ○



Specification:
Composition: Co 10.5%; mixed carbides 2.0%; WC balance | Grain size: 1 µm | Hardness: HV_{30} 1400 | Coating specification: CVD TiCN-Al_2O_3 multi-layer

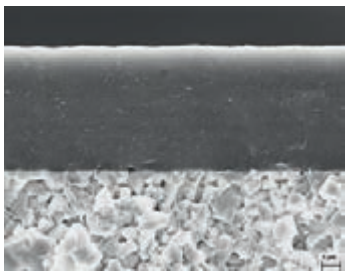
Reommended application:
The reliable choice for the machining of steel and cast iron.

CTPP345

SILVERSTAR™

HC-P45 | HC-M40 | HC-S40

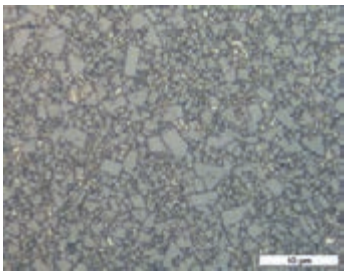
● ● ○



Specification:
Composition: Co 12.5%; mixed carbides 2.0%; WC balance | Grain size: 1-1.5 µm | Hardness: HV_{30} 1380 | Coating specification: PVD TiAlTaN

Recommended application:
The reliable solution for steel and austenitic steels under unstable conditions.

H216T	HW-N15 | HW-K15	● ●



Specification:
Composition: Co 6.0%; WC balance | Grain size: 1 μm | Hardness: HV_{30} 1630

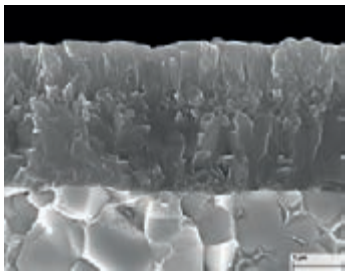
Recommended application:
The uncoated carbide grade for the machining of aluminium and other non-ferrous metals.

Grade description

Threading

GM213

HC-P20 | HC-M15 | HC-K25



Specification:
Composition: Co 6.0%; WC balance | Grain size: 1 µm | Hardness: HV_{30} 1630 | Coating specification: CVD TiCN-TiN

Recommended application:
The wear-resistant thread-turning grade for high cutting speeds.

GM240

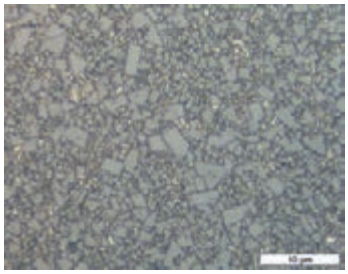
HC-P35 | HC-M25

Specification:
Composition: Co 10.0%; mixed carbides 0.6%; WC balance | Grain size: 0.7 µm | Hardness: HV_{30} 1590 | Coating specification: CVD TiCN-Al_2O_3 multi-layer

Recommended application:
The tough thread-turning grade for universal application.

H216T

HW-N15 | HW-K15



Specification:
Composition: Co 6.0%; WC balance | Grain size: 1 µm | Hardness: HV_{30} 1630

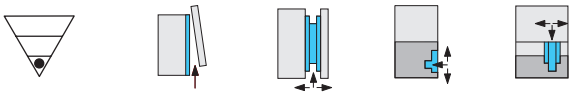
Recommended application:
The uncoated carbide grade for the machining of aluminium and other non-ferrous metals.

CERATIZIT
CERATIZIT

The easy way to success

Recommended application

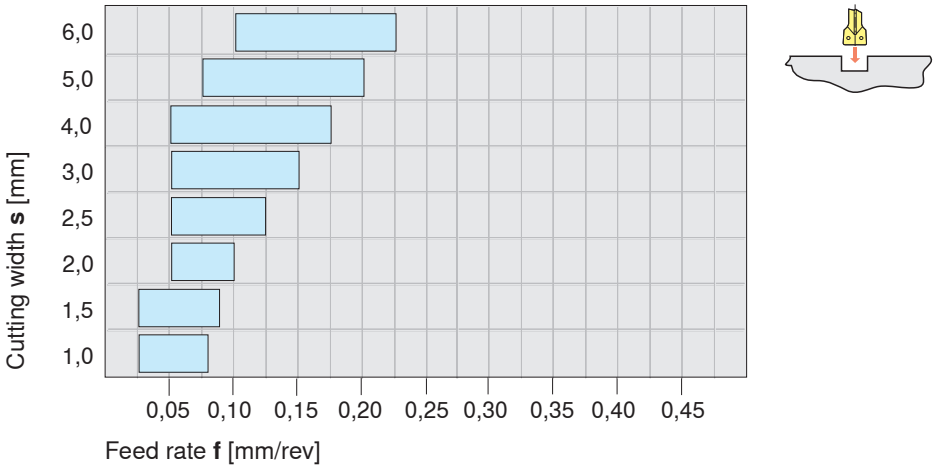
Application



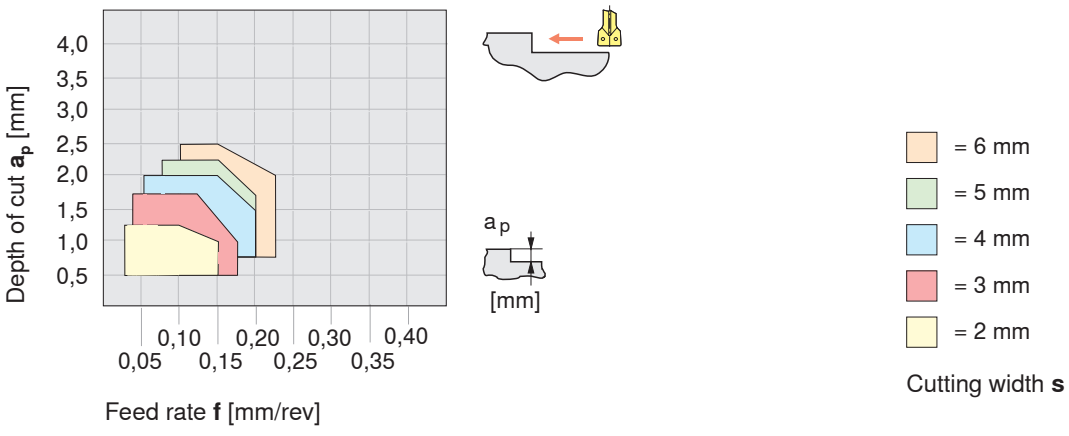
-F2

- For steels in general, particularly suitable for **stainless materials**
- Insert with ground periphery
- Tolerance cutting width ± 0.02 mm
- Suitable also for parting off tubes and thin-walled materials
- Special profiles (SX, GX) possible

Feed rate for parting and grooving



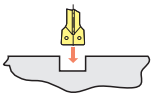
Feed rate for longitudinal turning

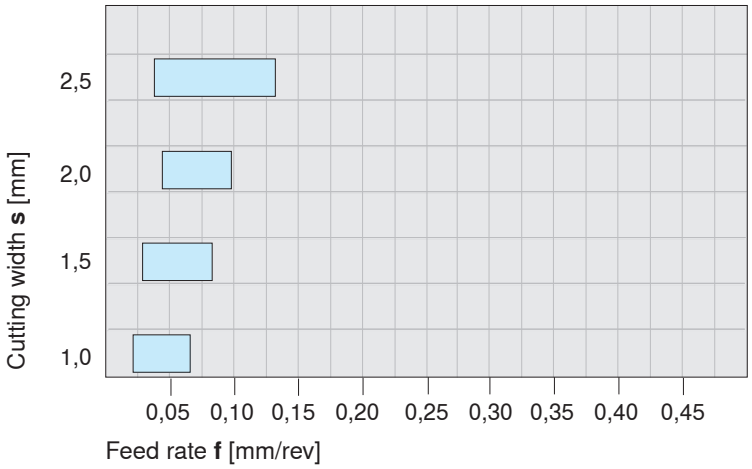


-F3

- Particularly suitable also for parting off tubes and thin-walled materials
- For steels in general, particularly suitable for stainless materials

Feed rate for parting and grooving

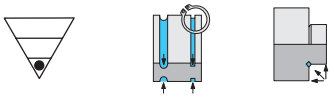




The easy way to success

Recommended application

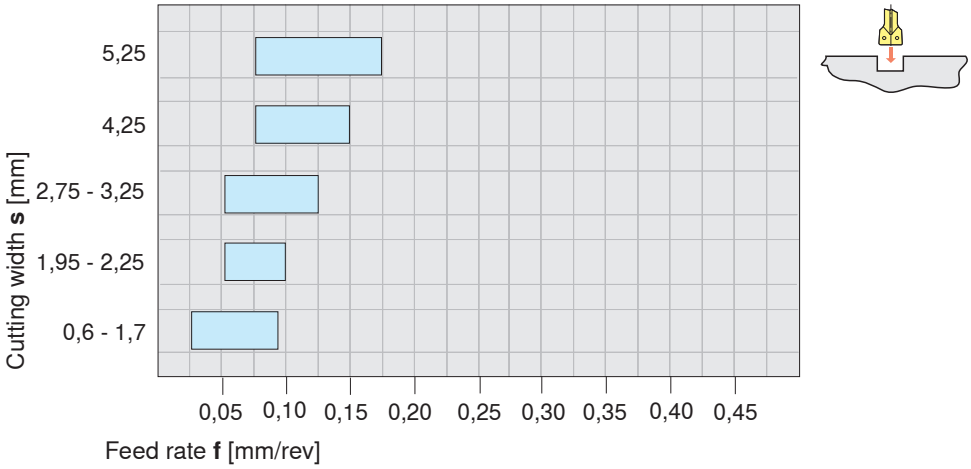
Application



Circlip grooves L/N/R

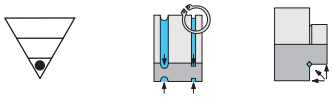
- Insert for circlip grooves according to DIN 471-472
- For internal and external machining

Feed rate for grooving operations



GX R/L

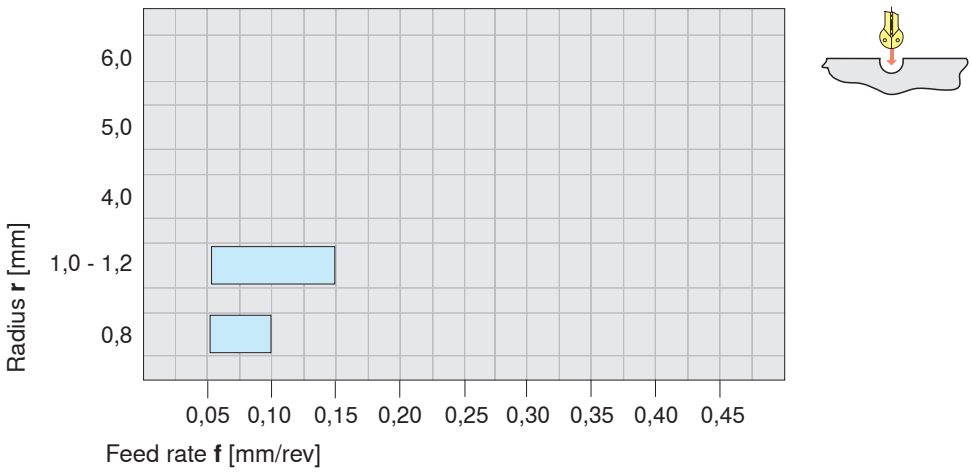
Application



Radius grooves R/L

- Inserts for radius grooves and copy turning
- For all steel materials
- For internal and external machining

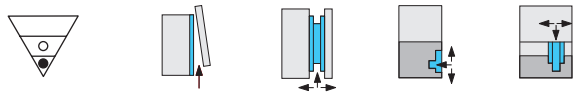
Feed rate for grooving operations



The easy way to success

Recommended application

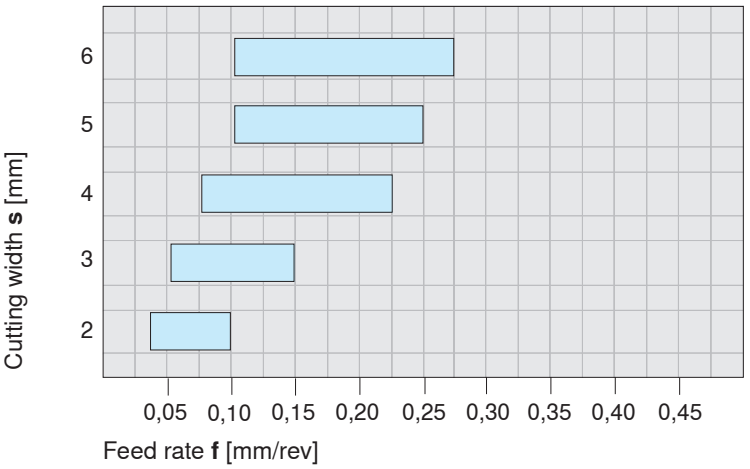
Application

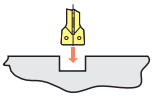


-EN

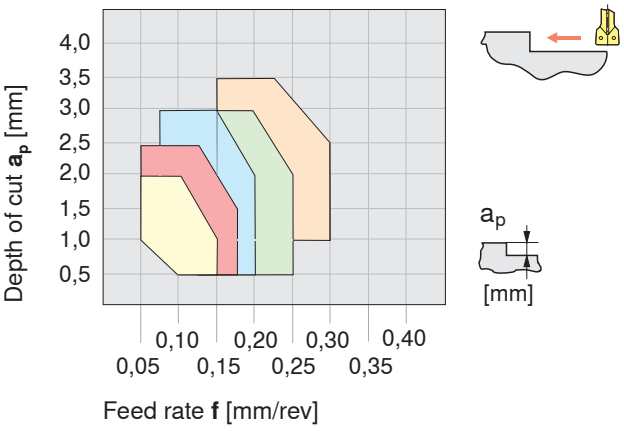
- For all steel materials
- For universal application
- Wide application range

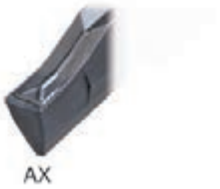
Feed rate for parting and grooving





Feed rate for longitudinal turning



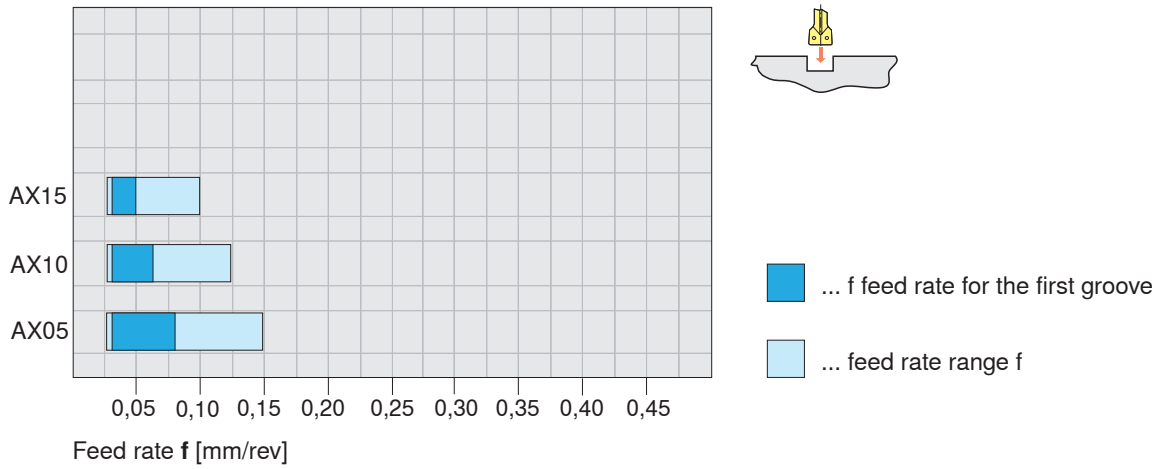


Application

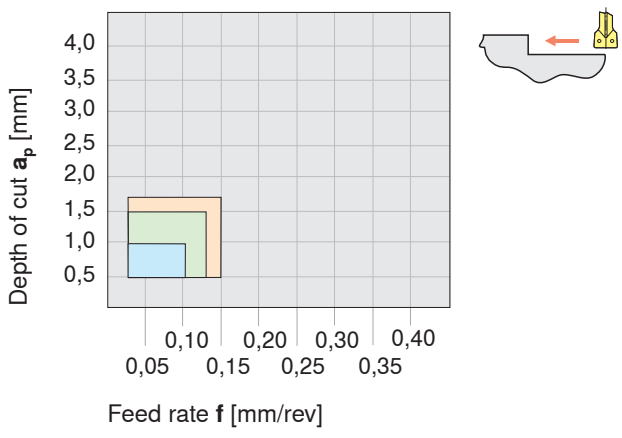
-F50

- Universal geometry for:
  - **Steel**
  - **Stainless steel**
  - Cast iron
  - Non-ferrous metals
- Insert with ground periphery
- Tolerance cutting width ± 0.02 mm

Feed rate for axial grooving



Feed rate for face turning

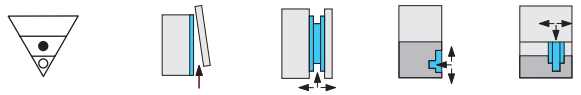


The easy way to success

Recommended application

SX/LX

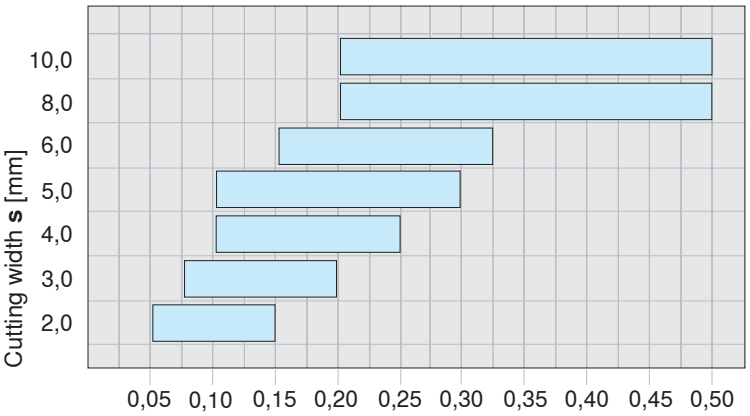
Application

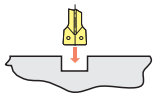


-M2

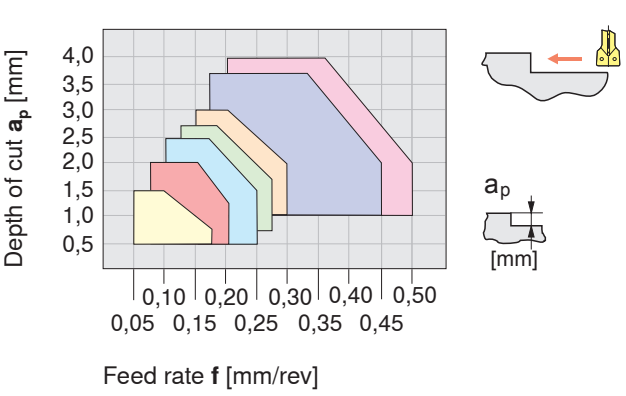
- For grooving and turning
- Suitable for all steel and cast iron materials
- Very good chip control

Feed rate for parting and grooving



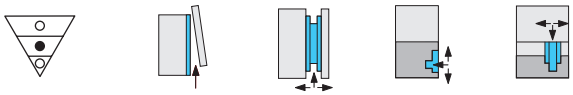


Feed rate for longitudinal turning



GX

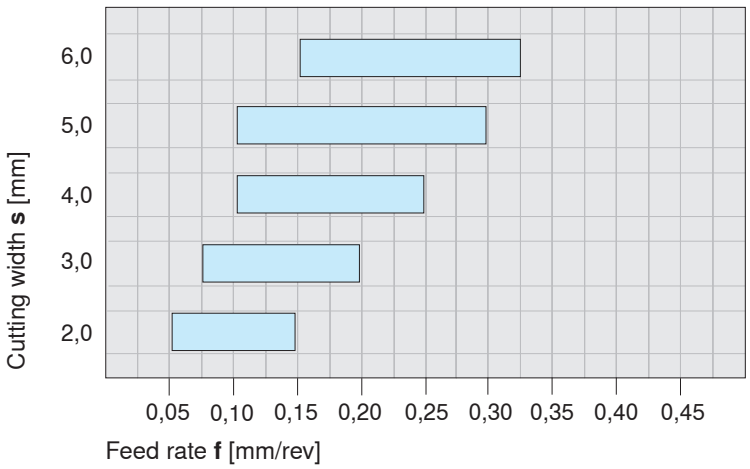
Application

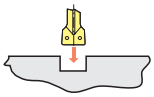


-M40

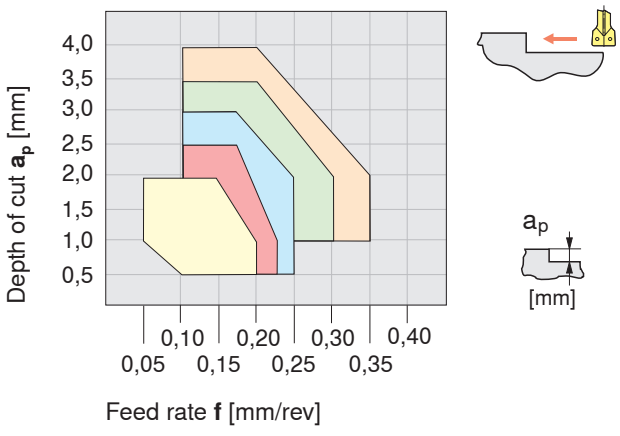
- For grooving and turning
- Suitable for all steel materials
- Very good chip control
- Tolerance cutting width ± 0.05 mm

Feed rate for parting and grooving





Feed rate for longitudinal turning



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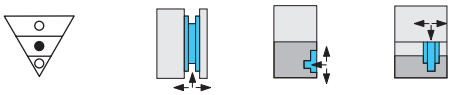
Recommended application

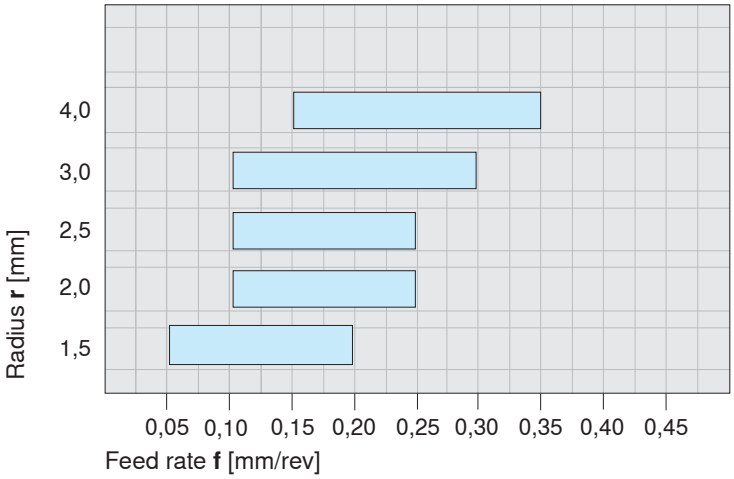
Application

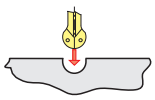


-M3

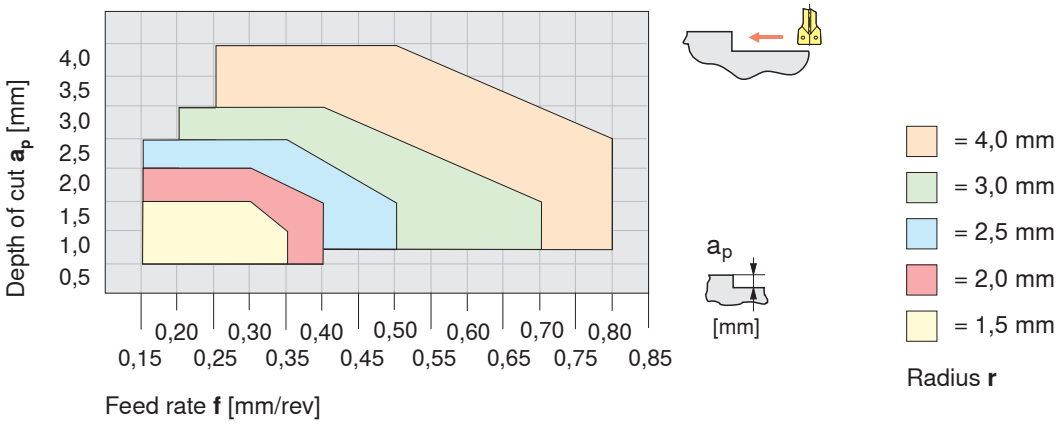
- Insert for radius grooves and copy turning
- For all steel materials
- For internal and external machining

Feed rate for parting and grooving





Feed rate for longitudinal turning



SX

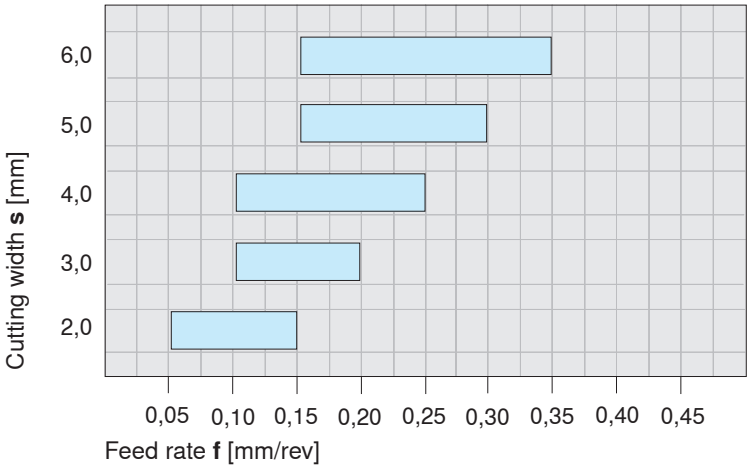
GX16/GX24

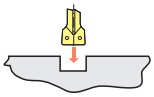
Application

-M1

- Insert with narrow negative chamfer
- Suitable for all steel materials with high strength
- Universally applicable grade
- For steel and grey cast iron

Feed rate for parting and grooving

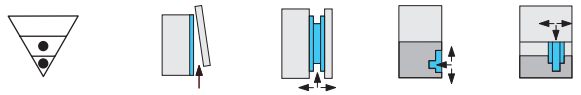




The easy way to success

Recommended application

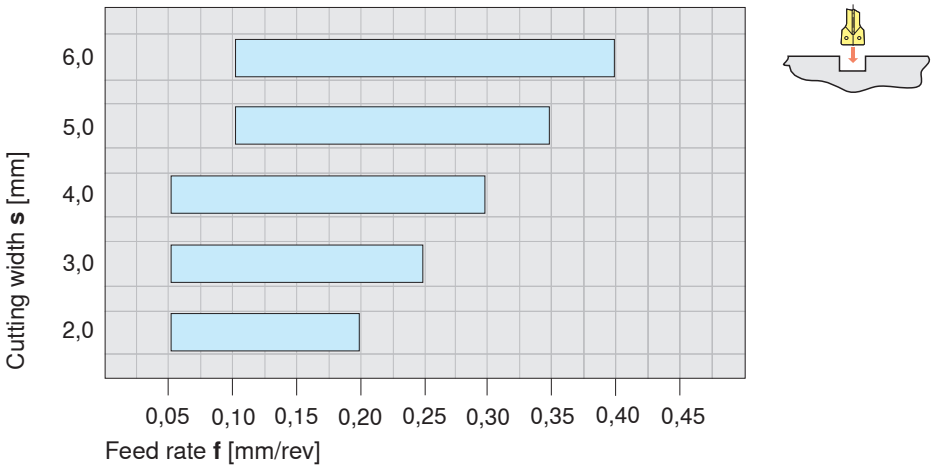
Application



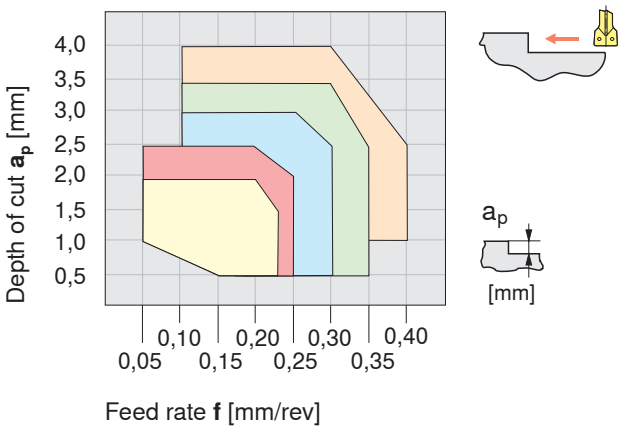
-27P

- Particularly suitable for **aluminium and non-ferrous metals**
- Insert with highly positive cutting geometry and sharp cutting edge
- Insert with ground periphery
- Tolerance cutting width ± 0.02 mm
- Extra-smooth rake face through 'microfinish'

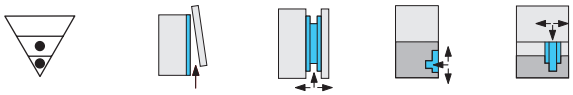
Feed rate for parting and grooving



Feed rate for longitudinal turning



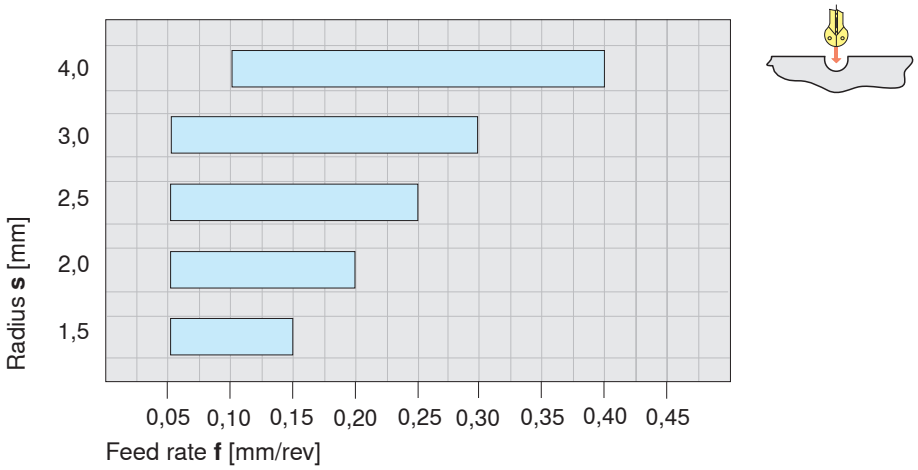
Application



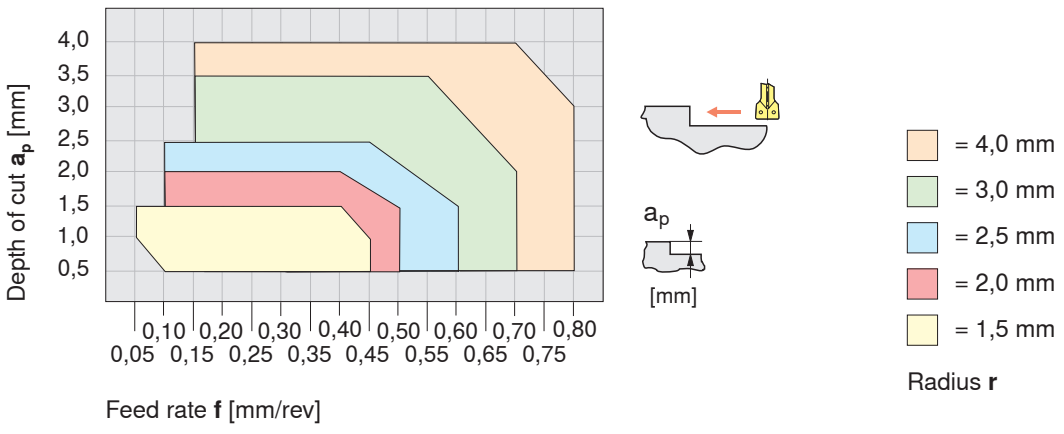
-27P

- Particularly suitable for **aluminium and non-ferrous metals**
- Insert with highly positive cutting geometry and sharp cutting edge
- Insert with ground periphery
- Tolerance cutting width ± 0.02 mm
- Extra-smooth rake face through 'microfinish'

Feed rate for parting and grooving



Feed rate for longitudinal turning



The easy way to success

Recommended application

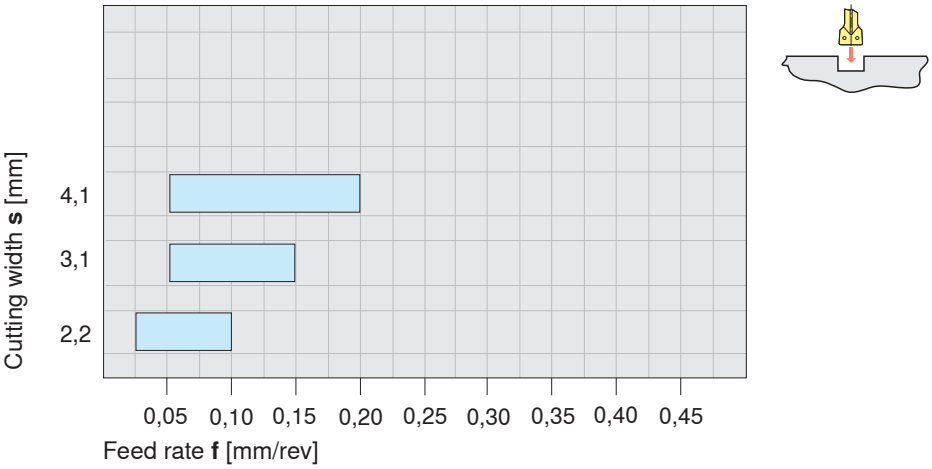
FX

Application

-F1

- Excellent cutting geometry with low cutting forces
- For low or medium strength materials
- Particularly suitable for parting off tubes and thin-walled work pieces
- Excellent chip control also with low feed
- Reduced built-up edge

Feed rate for parting and grooving



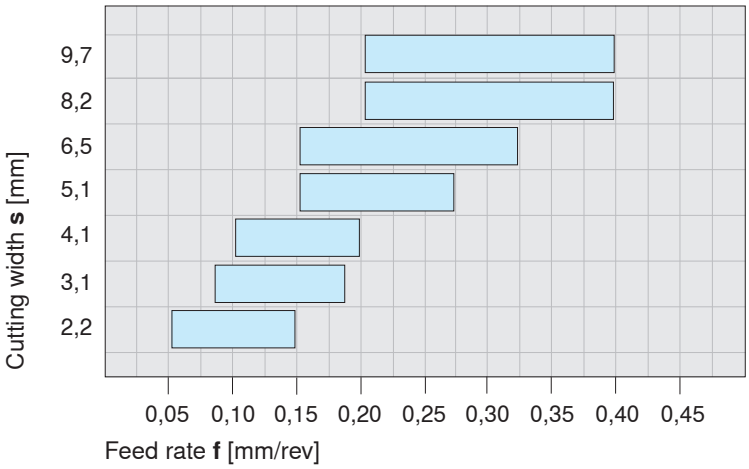
FX

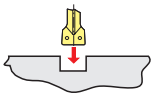
Application

-M1

- Insert with narrow negative chamfer
- Suitable for all steel materials with high strength
- Universal application
- For steel and grey cast iron

Feed rate for parting and grooving





The easy way to success

Recommended application

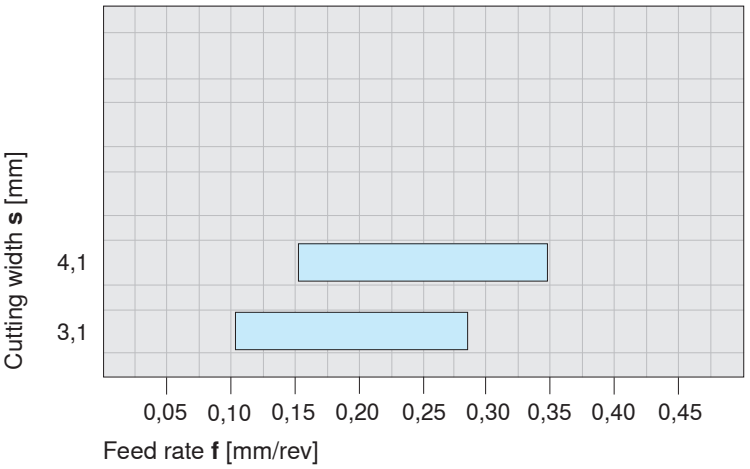
FX

Application

-R2

- Insert with excellent chip formation for a wide feed range
- Very stable cutting edge
- Particularly suitable for economic parting when rather intensive formation of burrs and pips does not cause any problems

Feed rate for parting and grooving



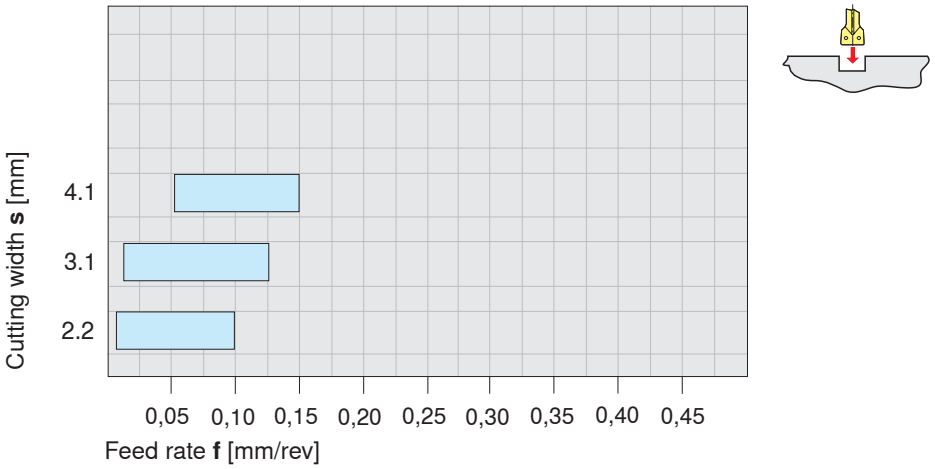
FX

Application

-27P

- Particularly suitable for **aluminium and non-ferrous metals**
- Insert with highly positive cutting geometry and sharp cutting edge
- Extra-smooth rake face through 'microfinish'
- Reduced built-up edge

Feed rate for parting and grooving



Overview

Application

Part-off

	Modular system	C65-C67
	Clamping blocks, blades	C68-C70
	Monoblock	C71-C73

Grooving and turning

	Modular system - external	C74-C78
	Monoblock - external	C79-C80
	Modular system - internal	C81-C85
	Monoblock boring bars – internal	C86

Circlip grooves

	Modular system - external	C87-C91
	Monoblock - external	C92-C95
	Modular system - internal	C96-C100
	Monoblock boring bars – internal	C101-C104

Radius grooves

	Modular system - external	C105-C109
	Monoblock - external	C110-C112
	Modular system - internal	C113-C117
	Monoblock boring bars – internal	C118-C120

Axial grooving

	Modular system	C121-C128
	Monoblock	C129-C130

External recessing

	Modular system	C131-C134

Threading (turning)

	Modular system - external	C135-C138
	Monoblock - external	C139
	Modular system - internal	C141-C142
	Monoblock boring bars – internal	C143

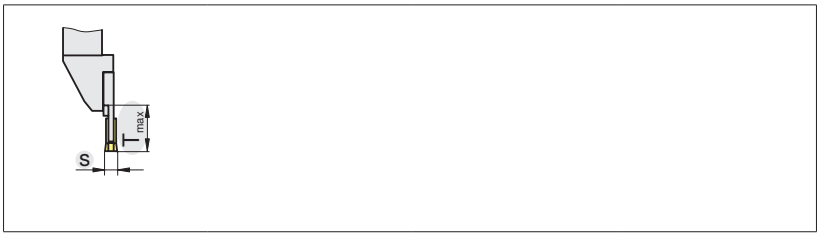
Threading (milling)

	Boring bars - TC	C145-C146
	Thread milling cutters - TC	C147

Part-off

Modular system, assembly size 20

Matching products see right-hand side.

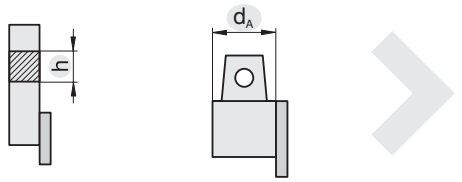


		h/d_A	L R	Type, description
C168	0	20	R	MSS-E20R00-2020J
		16	R	MSS-E20R00-1620G
C169	90	20	L	MSS-E20L90-2020J

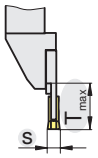
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.00	2.75	12	R	MSS-E20R12-GX16-1	GX16-1..	C151
		2.76	3.75	12	R	MSS-E20R12-GX16-2	GX16-2..	C151
		3.76	5.00	12	R	MSS-E20R12-GX16-3	GX16-3..	C151
C178		2.00	2.75	21	R	MSS-E20R21-GX24-1	GX24-1..	C151
		2.76	3.75	21	R	MSS-E20R21-GX24-2	GX24-2..	C151
		3.76	5.00	21	R	MSS-E20R21-GX24-3	GX24-3..	C151
C184		2.0		20	R	MSS-E20R20-SX2	SX..2	C156
		3.0		20	R	MSS-E20R20-SX3	SX..3	C156
C186		2.2		20	R	MSS-E20R20-FX2.2	FX 2.2..	C158
		3.1		20	R	MSS-E20R20-FX3.1	FX 3.1..	C158
		4.1		20	R	MSS-E20R20-FX4.1	FX 4.1..	C158

		h/d_A	L R	Type, description
C168	0	20	L	MSS-E20L00-2020J
		16	L	MSS-E20L00-1620G
C169	90	20	R	MSS-E20R90-2020J

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.00	2.75	12	L	MSS-E20L12-GX16-1	GX16-1..	C151
		2.76	3.75	12	L	MSS-E20L12-GX16-2	GX16-2..	C151
		3.76	5.00	12	L	MSS-E20L12-GX16-3	GX16-3..	C151
C178		2.00	2.75	21	L	MSS-E20L21-GX24-1	GX24-1..	C151
		2.76	3.75	21	L	MSS-E20L21-GX24-2	GX24-2..	C151
		3.76	5.00	21	L	MSS-E20L21-GX24-3	GX24-3..	C151
C184		2.0		20	L	MSS-E20L20-SX2	SX..2	C156
		3.0		20	L	MSS-E20L20-SX3	SX..3	C156
C186		2.2		20	L	MSS-E20L20-FX2.2	FX 2.2..	C158
		3.1		20	L	MSS-E20L20-FX3.1	FX 3.1..	C158
		4.1		20	L	MSS-E20L20-FX4.1	FX 4.1..	C158



Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	0	**25**	**R**	MSS-E25R00-2525L
C169	90	**25**	**L**	MSS-E25L90-2525L
C171	0	**63**	**R**	HSK-T63-MSS-E25R00
		100	**R**	HSK-T100-MSS-E25R00
C173	0	**40**	**R**	UT40-MSS-E25R00
		50	**R**	UT50-MSS-E25R00
		63	**R**	UT63-MSS-E25R00
C174	90	**40**	**L**	UT40-MSS-E25L90
		50	**L**	UT50-MSS-E25L90

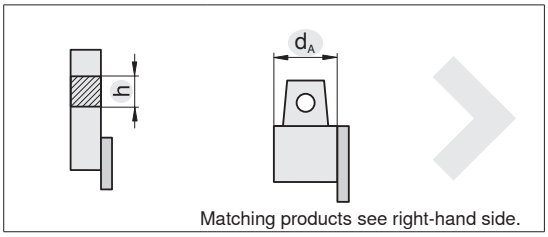
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.00	2.75	12	R	MSS-E25R12-GX16-1	GX16-1..	C151
		2.76	3.75	12	R	MSS-E25R12-GX16-2	GX16-2..	C151
		3.76	5.00	12	R	MSS-E25R12-GX16-3	GX16-3..	C151
		5.01	6.50	12	R	MSS-E25R12-GX16-4	GX16-4..	C151
C178		2.00	2.75	21	R	MSS-E25R21-GX24-1	GX24-1..	C151
		2.76	3.75	21	R	MSS-E25R21-GX24-2	GX24-2..	C151
		3.76	5.00	21	R	MSS-E25R21-GX24-3	GX24-3..	C151
		5.01	6.50	21	R	MSS-E25R21-GX24-4	GX24-4..	C151
C184		2.0		20	R	MSS-E25R20-SX2	SX..2	C156
		3.0		25	R	MSS-E25R25-SX3	SX..3	C156
		3.0		35	R	MSS-E25R35-SX3	SX..3	C156
		4.0		25	R	MSS-E25R25-SX4	SX..4	C156
		4.0		35	R	MSS-E25R35-SX4	SX..4	C156
C186		2.2		20	R	MSS-E25R20-FX2.2	FX 2.2..	C158
		3.1		25	R	MSS-E25R25-FX3.1	FX 3.1..	C158
		4.1		25	R	MSS-E25R25-FX4.1	FX 4.1..	C158
		5.1		25	R	MSS-E25R25-FX5.1	FX 5.1..	C158
		6.5		25	R	MSS-E25R25-FX6.5	FX 6.5..	C158
C187		3.1		35	R	MSS-E25R35-FX3.1	FX 3.1..	C158
		4.1		35	R	MSS-E25R35-FX4.1	FX 4.1..	C158
		5.1		35	R	MSS-E25R35-FX5.1	FX 5.1..	C158
		6.5		35	R	MSS-E25R35-FX6.5	FX 6.5..	C158

		h/d_A	L R	Type, description
C168	0	**25**	**L**	MSS-E25L00-2525L
C169	90	**25**	**R**	MSS-E25R90-2525L
C171	0	**63**	**L**	HSK-T63-MSS-E25L00
		100	**L**	HSK-T100-MSS-E25L00
C173	0	**40**	**L**	UT40-MSS-E25L00
		50	**L**	UT50-MSS-E25L00
		63	**L**	UT63-MSS-E25L00
C174	90	**40**	**R**	UT40-MSS-E25R90
		50	**R**	UT50-MSS-E25R90

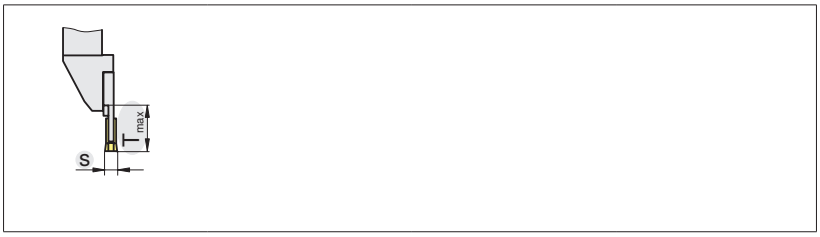
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.00	2.75	12	L	MSS-E25L12-GX16-1	GX16-1..	C151
		2.76	3.75	12	L	MSS-E25L12-GX16-2	GX16-2..	C151
		3.76	5.00	12	L	MSS-E25L12-GX16-3	GX16-3..	C151
		5.01	6.50	12	L	MSS-E25L12-GX16-4	GX16-4..	C151
C178		2.00	2.75	21	L	MSS-E25L21-GX24-1	GX24-1..	C151
		2.76	3.75	21	L	MSS-E25L21-GX24-2	GX24-2..	C151
		3.76	5.00	21	L	MSS-E25L21-GX24-3	GX24-3..	C151
		5.01	6.50	21	L	MSS-E25L21-GX24-4	GX24-4..	C151
C184		2.0		20	L	MSS-E25L20-SX2	SX..2	C156
		3.0		25	L	MSS-E25L25-SX3	SX..3	C156
		3.0		35	L	MSS-E25L35-SX3	SX..3	C156
		4.0		25	L	MSS-E25L25-SX4	SX..4	C156
		4.0		35	L	MSS-E25L35-SX4	SX..4	C156
C186		2.2		20	L	MSS-E25L20-FX2.2	FX 2.2..	C158
		3.1		25	L	MSS-E25L25-FX3.1	FX 3.1..	C158
		4.1		25	L	MSS-E25L25-FX4.1	FX 4.1..	C158
		5.1		25	L	MSS-E25L25-FX5.1	FX 5.1..	C158
		6.5		25	L	MSS-E25L25-FX6.5	FX 6.5..	C158
C187		3.1		35	L	MSS-E25L35-FX3.1	FX 3.1..	C158
		4.1		35	L	MSS-E25L35-FX4.1	FX 4.1..	C158
		5.1		35	L	MSS-E25L35-FX5.1	FX 5.1..	C158
		6.5		35	L	MSS-E25L35-FX6.5	FX 6.5..	C158

Part-off

Modular system, assembly size 32



Matching products see right-hand side.

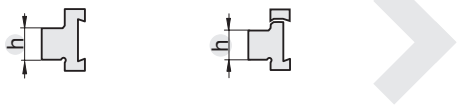


		h/d_A	L R	Type, description
C168	0	**32**	**R**	MSS-E32R00-3232Q
		32	**R**	MSS-E32R00-3225N
C169	90	**32**	**L**	MSS-E32L90-3225N
		32	**L**	MSS-E32L90-3232R
C171	0	**100**	**R**	HSK-T100-MSS-E32R00
		63	**R**	HSK-T63-MSS-E32R00
C172	90	**100**	**L**	HSK-T100-MSS-E32L90
		63	**L**	HSK-T63-MSS-E32L90
C173	0	**50**	**R**	UT50-MSS-E32R00
		63	**R**	UT63-MSS-E32R00

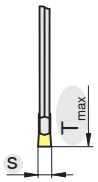
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.76	3.75	12	R	MSS-E32R12-GX16-2	GX16-2..	C151
		3.76	5.00	12	R	MSS-E32R12-GX16-3	GX16-3..	C151
		5.01	6.50	12	R	MSS-E32R12-GX16-4	GX16-4..	C151
C178		2.76	3.75	21	R	MSS-E32R21-GX24-2	GX24-2..	C151
		3.76	5.00	21	R	MSS-E32R21-GX24-3	GX24-3..	C151
		5.01	6.50	21	R	MSS-E32R21-GX24-4	GX24-4..	C151
C184		3.0		35	R	MSS-E32R35-SX3	SX..3	C156
		4.0		35	R	MSS-E32R35-SX4	SX..4	C156
C185		8.00	10.00	25	N	MSS-E32N25-LX	LX..	C157
		8.00	10.00	32	N	MSS-E32N32-LX	LX..	C157
		8.00	10.00	45	N	MSS-E32N45-LX	LX..	C157
C186		3.1		32	R	MSS-E32R32-FX3.1	FX 3.1..	C158
		4.1		32	R	MSS-E32R32-FX4.1	FX 4.1..	C158
		5.1		32	R	MSS-E32R32-FX5.1	FX 5.1..	C158
		6.5		32	R	MSS-E32R32-FX6.5	FX 6.5..	C158
C187		3.1		45	R	MSS-E32R45-FX3.1	FX 3.1..	C158
		4.1		45	R	MSS-E32R45-FX4.1	FX 4.1..	C158
		5.1		45	R	MSS-E32R45-FX5.1	FX 5.1..	C158
		6.5		45	R	MSS-E32R45-FX6.5	FX 6.5..	C158

		h/d_A	L R	Type, description
C168	0	**32**	**L**	MSS-E32L00-3225N
		32	**L**	MSS-E32L00-3232Q
C169	90	**32**	**R**	MSS-E32R90-3232R
		32	**R**	MSS-E32R90-3225N
C171	0	**100**	**L**	HSK-T100-MSS-E32L00
		63	**L**	HSK-T63-MSS-E32L00
C172	90	**100**	**R**	HSK-T100-MSS-E32R90
		63	**R**	HSK-T63-MSS-E32R90
C173	0	**63**	**L**	UT63-MSS-E32L00

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.76	3.75	12	L	MSS-E32L12-GX16-2	GX16-2..	C151
		3.76	5.00	12	L	MSS-E32L12-GX16-3	GX16-3..	C151
		5.01	6.50	12	L	MSS-E32L12-GX16-4	GX16-4..	C151
C178		2.76	3.75	21	L	MSS-E32L21-GX24-2	GX24-2..	C151
		3.76	5.00	21	L	MSS-E32L21-GX24-3	GX24-3..	C151
		5.01	6.50	21	L	MSS-E32L21-GX24-4	GX24-4..	C151
C184		3.0		35	L	MSS-E32L35-SX3	SX..3	C156
		4.0		35	L	MSS-E32L35-SX4	SX..4	C156
C185		8.00	10.00	25	N	MSS-E32N25-LX	LX..	C157
		8.00	10.00	32	N	MSS-E32N32-LX	LX..	C157
		8.00	10.00	45	N	MSS-E32N45-LX	LX..	C157
C186		3.1		32	L	MSS-E32L32-FX3.1	FX 3.1..	C158
		4.1		32	L	MSS-E32L32-FX4.1	FX 4.1..	C158
		5.1		32	L	MSS-E32L32-FX5.1	FX 5.1..	C158
		6.5		32	L	MSS-E32L32-FX6.5	FX 6.5..	C158
C187		3.1		45	L	MSS-E32L45-FX3.1	FX 3.1..	C158
		4.1		45	L	MSS-E32L45-FX4.1	FX 4.1..	C158
		5.1		45	L	MSS-E32L45-FX5.1	FX 5.1..	C158
		6.5		45	L	MSS-E32L45-FX6.5	FX 6.5..	C158



Matching products see right-hand side.



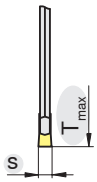
		h/d_A	L R	Type, description
C204			N	SBN 2020-26 K
C205			N	SBN 2020-26 KS

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C199		2.0		25	L	XLCFL 2602-SX2	SX..2	C156
		2.0		25	R	XLCFR 2602-SX2	SX..2	C156
		3.0		35	N	XLCFN 2603-SX3	SX..3	C156
		4.0		40	N	XLCFN 2604-SX4	SX..4	C156
C200		2.0		22	L	XLCFL 2608-SX2	SX..2	C156
		2.0		22	R	XLCFR 2608-SX2	SX..2	C156
		3.0		22	L	XLCFL 2608-SX3	SX..3	C156
		3.0		22	R	XLCFR 2608-SX3	SX..3	C156
C203		2.2		25	N	XLCEN 2602 J22 FX	FX 2.2..	C158
		3.1		35	N	XLCFN 2603 J31 FX	FX 3.1..	C158
		4.1		40	N	XLCFN 2604 J41 FX	FX 4.1..	C158

Part-off

Clamping blocks, blades, height 32

Matching products see right-hand side.



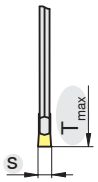
		h/d_A	L R	Type, description
C204			N	SBN 2520-32 K
			N	SBN 3229-32 K
C205			N	SBN 2520-32 KS
			N	SBN 3229-32 KS
C206			R	HSK-T63-KHR00-32
			L	HSK-T63-KHL00-32
			L	HSK-T100-KHL00-32
			R	HSK-T100-KHR00-32

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C198		2.00	2.75	21	N	XLCFN 3202-GX24-1S	GX24-1..	C151
		2.76	3.75	21	N	XLCFN 3203 GX24-2S	GX24-2..	C151
		3.76	5.00	21	N	XLCFN 3204 GX24-3S	GX24-3..	C151
		5.01	6.50	21	N	XLCFN 3206 GX24-4S	GX24-4..	C151
C199		2.0		25	L	XLCFL 3202-SX2	SX..2	C156
		2.0		25	R	XLCFR 3202-SX2	SX..2	C156
		3.0		50	N	XLCFN 3203-SX3	SX..3	C156
		4.0		50	N	XLCFN 3204-SX4	SX..4	C156
		5.0		55	N	XLCFN 3205-SX5	SX..5	C156
		6.0		60	N	XLCFN 3206-SX6	SX..6	C156
C201		3.0		33	L	XLCFL 3208C-SX3	SX..3	C156
		3.0		33	L	XLCFL 3208-SX3	SX..3	C156
		3.0		33	R	XLCFR 3208C-SX3	SX..3	C156
		3.0		33	R	XLCFR 3208-SX3	SX..3	C156
		4.0		33	L	XLCFL 3208-SX4	SX..4	C156
		4.0		33	R	XLCFR 3208-SX4	SX..4	C156
C203		2.2		30	N	XLCEN 3202 M22 FX	FX 2.2..	C158
		3.1		50	N	XLCFN 3203 M31 FX	FX 3.1..	C158
		4.1		50	N	XLCFN 3204 M41 FX	FX 4.1..	C158
		5.1		55	N	XLCFN 3205 M51 FX	FX 5.1..	C158
		6.5		55	N	XLCFN 3206 M65 FX	FX 6.5..	C158

Part-off

Clamping blocks, blades, height 46

Matching products see right-hand side.

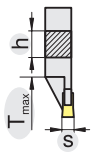


		h/d_A	L R	Type, description
C204			N	SBN 3229-46 K
			N	SBN 4037-46 K

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C202		8.00	10.00	80	N	XLCEN 4608 LX	LX..	C157
C203		8.2		80	N	XLCEN 4608 S82 FX	FX 8.2..	C158
		9.7		80	N	XLCEN 4609 S97 FX	FX 9.7..	C158

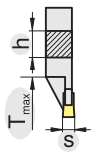
Part-off

Monoblock tools – GX



		h [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C189		12	2.00	2.75	12	R	E12R0012-1212K-GX16-1	GX16-1..	C151
		12	2.76	3.75	12	R	E12R0012-1212K-GX16-2	GX16-2..	C151
		16	2.00	2.75	12	R	E16R0012-1616K-GX16-1	GX16-1..	C151
		16	2.76	3.75	12	R	E16R0012-1616K-GX16-2	GX16-2..	C151
		16	3.76	5.00	12	R	E16R0012-1616K-GX16-3	GX16-3..	C151
		20	2.00	2.75	12	R	E20R0012-2020K-GX16-1	GX16-1..	C151
		20	2.76	3.75	12	R	E20R0012-2020K-GX16-2	GX16-2..	C151
		20	3.76	5.00	12	R	E20R0012-2020K-GX16-3	GX16-3..	C151
		25	2.76	3.75	12	R	E25R0012-2525M-GX16-2	GX16-2..	C151
		25	3.76	5.00	12	R	E25R0012-2525M-GX16-3	GX16-3..	C151
		12	2.00	2.75	12	L	E12L0012-1212K-GX16-1	GX16-1..	C151
		12	2.76	3.75	12	L	E12L0012-1212K-GX16-2	GX16-2..	C151
		16	2.00	2.75	12	L	E16L0012-1616K-GX16-1	GX16-1..	C151
		16	2.76	3.75	12	L	E16L0012-1616K-GX16-2	GX16-2..	C151
		16	3.76	5.00	12	L	E16L0012-1616K-GX16-3	GX16-3..	C151
		20	2.00	2.75	12	L	E20L0012-2020K-GX16-1	GX16-1..	C151
		20	2.76	3.75	12	L	E20L0012-2020K-GX16-2	GX16-2..	C151
		20	3.76	5.00	12	L	E20L0012-2020K-GX16-3	GX16-3..	C151
		25	2.76	3.75	12	L	E25L0012-2525M-GX16-2	GX16-2..	C151
		25	3.76	5.00	12	L	E25L0012-2525M-GX16-3	GX16-3..	C151

		h [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C190		16	2.00	2.75	21	R	E16R0021-1616K-GX24-1	GX24-1..	C151
		16	2.76	3.75	21	R	E16R0021-1616K-GX24-2	GX24-2..	C151
		20	2.00	2.75	21	R	E20R0021-2020K-GX24-1	GX24-1..	C151
		20	2.76	3.75	21	R	E20R0021-2020K-GX24-2	GX24-2..	C151
		20	3.76	5.00	21	R	E20R0021-2020K-GX24-3	GX24-3..	C151
		25	2.76	3.75	21	R	E25R0021-2525M-GX24-2	GX24-2..	C151
		25	3.76	5.00	21	R	E25R0021-2525M-GX24-3	GX24-3..	C151
		25	5.01	6.50	21	R	E25R0021-2525M-GX24-4	GX24-4..	C151
		32	2.76	3.75	21	R	E32R0021-3225P-GX24-2	GX24-2..	C151
		32	3.76	5.00	21	R	E32R0021-3225P-GX24-3	GX24-3..	C151
		32	5.01	6.50	21	R	E32R0021-3225P-GX24-4	GX24-4..	C151
		16	2.00	2.75	21	L	E16L0021-1616K-GX24-1	GX24-1..	C151
		16	2.76	3.75	21	L	E16L0021-1616K-GX24-2	GX24-2..	C151
		20	2.00	2.75	21	L	E20L0021-2020K-GX24-1	GX24-1..	C151
		20	2.76	3.75	21	L	E20L0021-2020K-GX24-2	GX24-2..	C151
		20	3.76	5.00	21	L	E20L0021-2020K-GX24-3	GX24-3..	C151
		25	2.76	3.75	21	L	E25L0021-2525M-GX24-2	GX24-2..	C151
		25	3.76	5.00	21	L	E25L0021-2525M-GX24-3	GX24-3..	C151
		25	5.01	6.50	21	L	E25L0021-2525M-GX24-4	GX24-4..	C151
		32	2.76	3.75	21	L	E32L0021-3225P-GX24-2	GX24-2..	C151
		32	3.76	5.00	21	L	E32L0021-3225P-GX24-3	GX24-3..	C151
		32	5.01	6.50	21	L	E32L0021-3225P-GX24-4	GX24-4..	C151

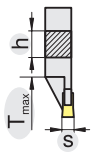


		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C194		16	2.0	16	R	E16R0016-1616K-SX2	SX..2	C156
		16	3.0	20	R	E16R0020-1616K-SX3	SX..3	C156
		20	2.0	16	R	E20R0016-2020K-SX2	SX..2	C156
		20	3.0	20	R	E20R0020-2020K-SX3	SX..3	C156
		20	4.0	25	R	E20R0025-2020K-SX4	SX..4	C156
		25	3.0	20	R	E25R0020-2525M-SX3	SX..3	C156
		25	4.0	25	R	E25R0025-2525M-SX4	SX..4	C156
		25	5.0	25	R	E25R0025-2525M-SX5	SX..5	C156
		25	6.0	32	R	E25R0032-2525M-SX6	SX..6	C156
		16	2.0	16	L	E16L0016-1616K-SX2	SX..2	C156
		16	3.0	20	L	E16L0020-1616K-SX3	SX..3	C156
		20	2.0	16	L	E20L0016-2020K-SX2	SX..2	C156
		20	3.0	20	L	E20L0020-2020K-SX3	SX..3	C156
		20	4.0	25	L	E20L0025-2020K-SX4	SX..4	C156
		25	3.0	20	L	E25L0020-2525M-SX3	SX..3	C156
		25	4.0	25	L	E25L0025-2525M-SX4	SX..4	C156
		25	5.0	25	L	E25L0025-2525M-SX5	SX..5	C156
		25	6.0	32	L	E25L0032-2525M-SX6	SX..6	C156

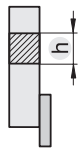
		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C195		10	2.2	15	R	XLCER 1010 M22 FX	FX 2.2..	C158
		12	2.2	15	R	XLCER 1212 M22 FX	FX 2.2..	C158
		12	2.2	15	R	XLCER 1212 F22 FX	FX 2.2..	C158
		14	2.2	15	R	XLCER 1414 M22 FX	FX 2.2..	C158
		16	2.2	15	R	XLCER 1612 H22 FX	FX 2.2..	C158
		16	3.1	17.5	R	XLCFR 1612 H31 FX	FX 3.1..	C158
		20	3.1	20	R	XLCFR 2016 K31 FX	FX 3.1..	C158
		20	4.1	20	R	XLCFR 2016 K41 FX	FX 4.1..	C158
		25	3.1	25	R	XLCFR 2520 M31 FX	FX 3.1..	C158
		25	4.1	25	R	XLCFR 2520 M41 FX	FX 4.1..	C158
		10	2.2	15	L	XLCEL 1010 M22 FX	FX 2.2..	C158
		12	2.2	15	L	XLCEL 1212 M22 FX	FX 2.2..	C158
		12	2.2	15	L	XLCEL 1212 F22 FX	FX 2.2..	C158
		14	2.2	15	L	XLCEL 1414 M22 FX	FX 2.2..	C158
		16	2.2	15	L	XLCEL 1612 H22 FX	FX 2.2..	C158
		16	3.1	17.5	L	XLCFL 1612 H31 FX	FX 3.1..	C158
		20	3.1	20	L	XLCFL 2016 K31 FX	FX 3.1..	C158
		20	4.1	20	L	XLCFL 2016 K41 FX	FX 4.1..	C158
		25	3.1	25	L	XLCFL 2520 M31 FX	FX 3.1..	C158
		25	4.1	25	L	XLCFL 2520 M41 FX	FX 4.1..	C158

Part-off

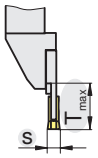
Monoblock tools – MaxiClick



		h [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C196		10	1.00	1.50	5	R	MC05R-1010K	MC 05..	C159
		12	1.00	1.50	5	R	MC05R-1212K	MC 05..	C159
		16	1.00	1.50	5	R	MC05R-1616K	MC 05..	C159
		20	1.00	1.50	5	R	MC05R-2020K	MC 05..	C159
		25	1.00	1.50	5	R	MC05R-2525M	MC 05..	C159
		10	1.00	1.50	5	L	MC05L-1010K	MC 05..	C159
		12	1.00	1.50	5	L	MC05L-1212K	MC 05..	C159
		16	1.00	1.50	5	L	MC05L-1616K	MC 05..	C159
		20	1.00	1.50	5	L	MC05L-2020K	MC 05..	C159
		25	1.00	1.50	5	L	MC05L-2525M	MC 05..	C159
C197		10	1.50	2.50	10	R	MC10R-1010K	MC 10..	C159
		10	1.50	2.50	10	R	MC10R-1010K-S	MC 10..	C159
		12	1.50	2.50	10	R	MC10R-1212K	MC 10..	C159
		12	1.50	2.50	10	R	MC10R-1212K-S	MC 10..	C159
		16	1.50	2.50	10	R	MC10R-1616K	MC 10..	C159
		20	1.50	2.50	10	R	MC10R-2020K	MC 10..	C159
		25	1.50	2.50	10	R	MC10R-2525M	MC 10..	C159
		10	1.50	2.50	10	L	MC10L-1010K	MC 10..	C159
		10	1.50	2.50	10	L	MC10L-1010K-S	MC 10..	C159
		12	1.50	2.50	10	L	MC10L-1212K	MC 10..	C159
		12	1.50	2.50	10	L	MC10L-1212K-S	MC 10..	C159
		16	1.50	2.50	10	L	MC10L-1616K	MC 10..	C159
		20	1.50	2.50	10	L	MC10L-2020K	MC 10..	C159
		25	1.50	2.50	10	L	MC10L-2525M	MC 10..	C159



Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	0	12	R	MSS-E12R00-1212E

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C176		2.00	2.75	7	R	MSS-E12R07-GX09-1	GX09-1..	C151
		2.76	3.75	7	R	MSS-E12R07-GX09-2	GX09-2..	C151

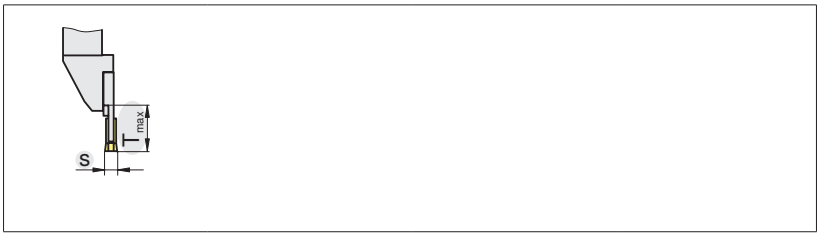
		h/d_A	L R	Type, description
C168	0	12	L	MSS-E12L00-1212E

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C176		2.00	2.75	7	L	MSS-E12L07-GX09-1	GX09-1..	C151
		2.76	3.75	7	L	MSS-E12L07-GX09-2	GX09-2..	C151

Grooving and turning – external

Modular system – external, assembly size 16

Matching products see right-hand side.

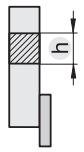


		h/d_A	L R	Type, description
C168	0	16	R	MSS-E16R00-1616G

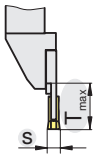
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C176		2.00	2.75	7	R	MSS-E16R07-GX09-1	GX09-1..	C151
		2.76	3.75	7	R	MSS-E16R07-GX09-2	GX09-2..	C151

		h/d_A	L R	Type, description
C168	0	16	L	MSS-E16L00-1616G

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C176		2.00	2.75	7	L	MSS-E16L07-GX09-1	GX09-1..	C151
		2.76	3.75	7	L	MSS-E16L07-GX09-2	GX09-2..	C151



Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	0	**20**	**R**	MSS-E20R00-2020J
		16	**R**	MSS-E20R00-1620G
C169	90	**20**	**L**	MSS-E20L90-2020J

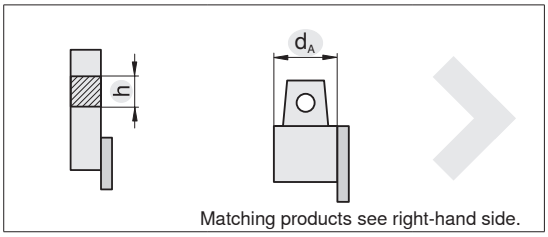
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.00	2.75	12	R	MSS-E20R12-GX16-1	GX16-1..	C151
		2.76	3.75	12	R	MSS-E20R12-GX16-2	GX16-2..	C151
		3.76	5.00	12	R	MSS-E20R12-GX16-3	GX16-3..	C151
C178		2.00	2.75	21	R	MSS-E20R21-GX24-1	GX24-1..	C151
		2.76	3.75	21	R	MSS-E20R21-GX24-2	GX24-2..	C151
		3.76	5.00	21	R	MSS-E20R21-GX24-3	GX24-3..	C151
C184		2.0		20	R	MSS-E20R20-SX2	SX..2	C156
		3.0		20	R	MSS-E20R20-SX3	SX..3	C156

		h/d_A	L R	Type, description
C168	0	**20**	**L**	MSS-E20L00-2020J
		16	**L**	MSS-E20L00-1620G
C169	90	**20**	**R**	MSS-E20R90-2020J

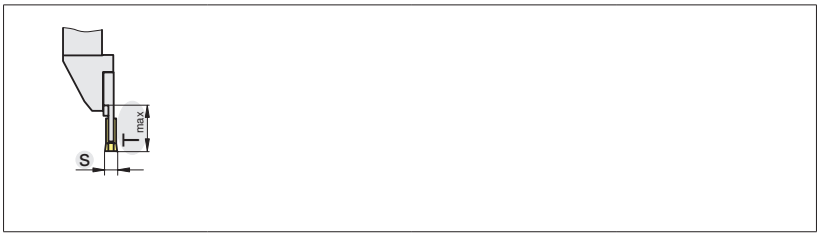
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.00	2.75	12	L	MSS-E20L12-GX16-1	GX16-1..	C151
		2.76	3.75	12	L	MSS-E20L12-GX16-2	GX16-2..	C151
		3.76	5.00	12	L	MSS-E20L12-GX16-3	GX16-3..	C151
C178		2.00	2.75	21	L	MSS-E20L21-GX24-1	GX24-1..	C151
		2.76	3.75	21	L	MSS-E20L21-GX24-2	GX24-2..	C151
		3.76	5.00	21	L	MSS-E20L21-GX24-3	GX24-3..	C151
C184		2.0		20	L	MSS-E20L20-SX2	SX..2	C156
		3.0		20	L	MSS-E20L20-SX3	SX..3	C156

Grooving and turning – external

Modular system – external, assembly size 25



Matching products see right-hand side.

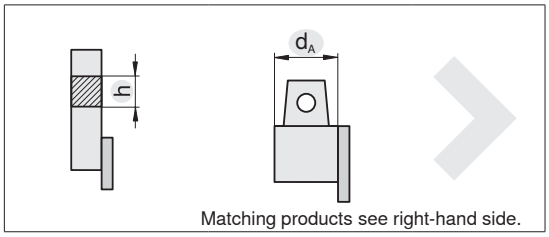


		h/d_A	L R	Type, description
C168	0	**25**	**R**	MSS-E25R00-2525L
C169	90	**25**	**L**	MSS-E25L90-2525L
C171	0	**100**	**R**	HSK-T100-MSS-E25R00
		63	**R**	HSK-T63-MSS-E25R00
C173	0	**63**	**R**	UT63-MSS-E25R00
		40	**R**	UT40-MSS-E25R00
		50	**R**	UT50-MSS-E25R00
C174	90	**40**	**L**	UT40-MSS-E25L90
		50	**L**	UT50-MSS-E25L90

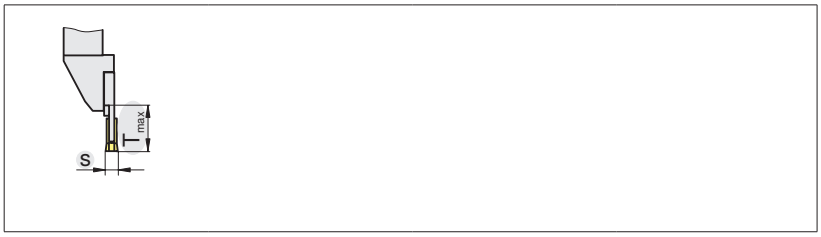
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.00	2.75	12	R	MSS-E25R12-GX16-1	GX16-1..	C151
		2.76	3.75	12	R	MSS-E25R12-GX16-2	GX16-2..	C151
		3.76	5.00	12	R	MSS-E25R12-GX16-3	GX16-3..	C151
		5.01	6.50	12	R	MSS-E25R12-GX16-4	GX16-4..	C151
C178		2.00	2.75	21	R	MSS-E25R21-GX24-1	GX24-1..	C151
		2.76	3.75	21	R	MSS-E25R21-GX24-2	GX24-2..	C151
		3.76	5.00	21	R	MSS-E25R21-GX24-3	GX24-3..	C151
		5.01	6.50	21	R	MSS-E25R21-GX24-4	GX24-4..	C151
C184		2.0		20	R	MSS-E25R20-SX2	SX..2	C156
		3.0		25	R	MSS-E25R25-SX3	SX..3	C156
		3.0		35	R	MSS-E25R35-SX3	SX..3	C156
		4.0		25	R	MSS-E25R25-SX4	SX..4	C156
		4.0		35	R	MSS-E25R35-SX4	SX..4	C156

		h/d_A	L R	Type, description
C168	0	**25**	**L**	MSS-E25L00-2525L
C169	90	**25**	**R**	MSS-E25R90-2525L
C171	0	**100**	**L**	HSK-T100-MSS-E25L00
		63	**L**	HSK-T63-MSS-E25L00
C173	0	**40**	**L**	UT40-MSS-E25L00
		50	**L**	UT50-MSS-E25L00
		63	**L**	UT63-MSS-E25L00
C174	90	**50**	**R**	UT50-MSS-E25R90
		40	**R**	UT40-MSS-E25R90

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.00	2.75	12	L	MSS-E25L12-GX16-1	GX16-1..	C151
		2.76	3.75	12	L	MSS-E25L12-GX16-2	GX16-2..	C151
		3.76	5.00	12	L	MSS-E25L12-GX16-3	GX16-3..	C151
		5.01	6.50	12	L	MSS-E25L12-GX16-4	GX16-4..	C151
C178		2.00	2.75	21	L	MSS-E25L21-GX24-1	GX24-1..	C151
		2.76	3.75	21	L	MSS-E25L21-GX24-2	GX24-2..	C151
		3.76	5.00	21	L	MSS-E25L21-GX24-3	GX24-3..	C151
		5.01	6.50	21	L	MSS-E25L21-GX24-4	GX24-4..	C151
C184		2.0		20	L	MSS-E25L20-SX2	SX..2	C156
		3.0		25	L	MSS-E25L25-SX3	SX..3	C156
		3.0		35	L	MSS-E25L35-SX3	SX..3	C156
		4.0		25	L	MSS-E25L25-SX4	SX..4	C156
		4.0		35	L	MSS-E25L35-SX4	SX..4	C156



Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	0	32	R	MSS-E32R00-3232Q
		32	R	MSS-E32R00-3225N
C169	90	32	L	MSS-E32L90-3225N
		32	L	MSS-E32L90-3232R
C171	0	100	R	HSK-T100-MSS-E32R00
		63	R	HSK-T63-MSS-E32R00
C172	90	100	L	HSK-T100-MSS-E32L90
		63	L	HSK-T63-MSS-E32L90
C173	0	50	R	UT50-MSS-E32R00
		63	R	UT63-MSS-E32R00

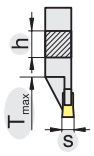
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.76	3.75	12	R	MSS-E32R12-GX16-2	GX16-2..	C151
		3.76	5.00	12	R	MSS-E32R12-GX16-3	GX16-3..	C151
		5.01	6.50	12	R	MSS-E32R12-GX16-4	GX16-4..	C151
C178		2.76	3.75	21	R	MSS-E32R21-GX24-2	GX24-2..	C151
		3.76	5.00	21	R	MSS-E32R21-GX24-3	GX24-3..	C151
		5.01	6.50	21	R	MSS-E32R21-GX24-4	GX24-4..	C151
C184		3.0		35	R	MSS-E32R35-SX3	SX..3	C156
		4.0		35	R	MSS-E32R35-SX4	SX..4	C156
C185		8.00	10.00	25	N	MSS-E32N25-LX	LX..	C157
		8.00	10.00	32	N	MSS-E32N32-LX	LX..	C157
		8.00	10.00	45	N	MSS-E32N45-LX	LX..	C157

		h/d_A	L R	Type, description
C168	0	32	L	MSS-E32L00-3225N
		32	L	MSS-E32L00-3232Q
C169	90	32	R	MSS-E32R90-3232R
		32	R	MSS-E32R90-3225N
C171	0	100	L	HSK-T100-MSS-E32L00
		63	L	HSK-T63-MSS-E32L00
C172	90	100	R	HSK-T100-MSS-E32R90
		63	R	HSK-T63-MSS-E32R90
C173	0	63	L	UT63-MSS-E32L00

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.76	3.75	12	L	MSS-E32L12-GX16-2	GX16-2..	C151
		3.76	5.00	12	L	MSS-E32L12-GX16-3	GX16-3..	C151
		5.01	6.50	12	L	MSS-E32L12-GX16-4	GX16-4..	C151
C178		2.76	3.75	21	L	MSS-E32L21-GX24-2	GX24-2..	C151
		3.76	5.00	21	L	MSS-E32L21-GX24-3	GX24-3..	C151
		5.01	6.50	21	L	MSS-E32L21-GX24-4	GX24-4..	C151
C184		3.0		35	L	MSS-E32L35-SX3	SX..3	C156
		4.0		35	L	MSS-E32L35-SX4	SX..4	C156
C185		8.00	10.00	25	N	MSS-E32N25-LX	LX..	C157
		8.00	10.00	32	N	MSS-E32N32-LX	LX..	C157
		8.00	10.00	45	N	MSS-E32N45-LX	LX..	C157

Grooving and turning – external

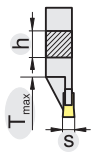
Monoblock tools – GX



		h [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C188		10	2.00	3.75	7	R	E10R00-1010M-GX09	GX09..	C151
		10	2.00	3.75	7	L	E10L00-1010M-GX09	GX09..	C151

		h [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C189		12	2.00	2.75	12	R	E12R0012-1212K-GX16-1	GX16-1..	C151
		12	2.76	3.75	12	R	E12R0012-1212K-GX16-2	GX16-2..	C151
		16	2.00	2.75	12	R	E16R0012-1616K-GX16-1	GX16-1..	C151
		16	2.76	3.75	12	R	E16R0012-1616K-GX16-2	GX16-2..	C151
		16	3.76	5.00	12	R	E16R0012-1616K-GX16-3	GX16-3..	C151
		20	2.00	2.75	12	R	E20R0012-2020K-GX16-1	GX16-1..	C151
		20	2.76	3.75	12	R	E20R0012-2020K-GX16-2	GX16-2..	C151
		20	3.76	5.00	12	R	E20R0012-2020K-GX16-3	GX16-3..	C151
		25	2.76	3.75	12	R	E25R0012-2525M-GX16-2	GX16-2..	C151
		25	3.76	5.00	12	R	E25R0012-2525M-GX16-3	GX16-3..	C151
		12	2.00	2.75	12	L	E12L0012-1212K-GX16-1	GX16-1..	C151
		12	2.76	3.75	12	L	E12L0012-1212K-GX16-2	GX16-2..	C151
		16	2.00	2.75	12	L	E16L0012-1616K-GX16-1	GX16-1..	C151
		16	2.76	3.75	12	L	E16L0012-1616K-GX16-2	GX16-2..	C151
		16	3.76	5.00	12	L	E16L0012-1616K-GX16-3	GX16-3..	C151
		20	2.00	2.75	12	L	E20L0012-2020K-GX16-1	GX16-1..	C151
		20	2.76	3.75	12	L	E20L0012-2020K-GX16-2	GX16-2..	C151
		20	3.76	5.00	12	L	E20L0012-2020K-GX16-3	GX16-3..	C151
		25	2.76	3.75	12	L	E25L0012-2525M-GX16-2	GX16-2..	C151
		25	3.76	5.00	12	L	E25L0012-2525M-GX16-3	GX16-3..	C151

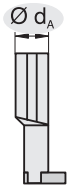
		h [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C190		16	2.00	2.75	21	R	E16R0021-1616K-GX24-1	GX24-1..	C151
		16	2.76	3.75	21	R	E16R0021-1616K-GX24-2	GX24-2..	C151
		20	2.00	2.75	21	R	E20R0021-2020K-GX24-1	GX24-1..	C151
		20	2.76	3.75	21	R	E20R0021-2020K-GX24-2	GX24-2..	C151
		20	3.76	5.00	21	R	E20R0021-2020K-GX24-3	GX24-3..	C151
		25	2.76	3.75	21	R	E25R0021-2525M-GX24-2	GX24-2..	C151
		25	3.76	5.00	21	R	E25R0021-2525M-GX24-3	GX24-3..	C151
		25	5.01	6.50	21	R	E25R0021-2525M-GX24-4	GX24-4..	C151
		32	2.76	3.75	21	R	E32R0021-3225P-GX24-2	GX24-2..	C151
		32	3.76	5.00	21	R	E32R0021-3225P-GX24-3	GX24-3..	C151
		32	5.01	6.50	21	R	E32R0021-3225P-GX24-4	GX24-4..	C151
		16	2.00	2.75	21	L	E16L0021-1616K-GX24-1	GX24-1..	C151
		16	2.76	3.75	21	L	E16L0021-1616K-GX24-2	GX24-2..	C151
		20	2.00	2.75	21	L	E20L0021-2020K-GX24-1	GX24-1..	C151
		20	2.76	3.75	21	L	E20L0021-2020K-GX24-2	GX24-2..	C151
		20	3.76	5.00	21	L	E20L0021-2020K-GX24-3	GX24-3..	C151
		25	2.76	3.75	21	L	E25L0021-2525M-GX24-2	GX24-2..	C151
		25	3.76	5.00	21	L	E25L0021-2525M-GX24-3	GX24-3..	C151
		25	5.01	6.50	21	L	E25L0021-2525M-GX24-4	GX24-4..	C151
		32	2.76	3.75	21	L	E32L0021-3225P-GX24-2	GX24-2..	C151
		32	3.76	5.00	21	L	E32L0021-3225P-GX24-3	GX24-3..	C151
		32	5.01	6.50	21	L	E32L0021-3225P-GX24-4	GX24-4..	C151



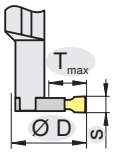
		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C194		16	2.0	16	R	E16R0016-1616K-SX2	SX..2	C156
		16	3.0	20	R	E16R0020-1616K-SX3	SX..3	C156
		20	2.0	16	R	E20R0016-2020K-SX2	SX..2	C156
		20	3.0	20	R	E20R0020-2020K-SX3	SX..3	C156
		20	4.0	25	R	E20R0025-2020K-SX4	SX..4	C156
		25	3.0	20	R	E25R0020-2525M-SX3	SX..3	C156
		25	4.0	25	R	E25R0025-2525M-SX4	SX..4	C156
		25	5.0	25	R	E25R0025-2525M-SX5	SX..5	C156
		25	6.0	32	R	E25R0032-2525M-SX6	SX..6	C156
		16	2.0	16	L	E16L0016-1616K-SX2	SX..2	C156
		16	3.0	20	L	E16L0020-1616K-SX3	SX..3	C156
		20	2.0	16	L	E20L0016-2020K-SX2	SX..2	C156
		20	3.0	20	L	E20L0020-2020K-SX3	SX..3	C156
		20	4.0	25	L	E20L0025-2020K-SX4	SX..4	C156
		25	3.0	20	L	E25L0020-2525M-SX3	SX..3	C156
		25	4.0	25	L	E25L0025-2525M-SX4	SX..4	C156
		25	5.0	25	L	E25L0025-2525M-SX5	SX..5	C156
		25	6.0	32	L	E25L0032-2525M-SX6	SX..6	C156

Grooving and turning – internal

Modular system – internal, assembly size 16



Matching products see right-hand side.

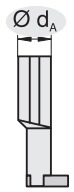


		d_A [mm]	L R	Type, description
C207		20	R	MSS-I16R90-1.5D-N
C208		20	R	MSS-I16R90-2.5D-N

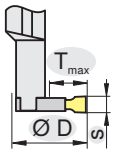
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C210		20	2.00	2.75	4	R	MSS-I16R04-GX09-1	GX09-1..	C151
		20	2.76	3.75	4	R	MSS-I16R04-GX09-2	GX09-2..	C151

		d_A [mm]	L R	Type, description
C207		20	L	MSS-I16L90-1.5D-N
C208		20	L	MSS-I16L90-2.5D-N

		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C210		20	2.00	2.75	4	L	MSS-I16L04-GX09-1	GX09-1..	C151
		20	2.76	3.75	4	L	MSS-I16L04-GX09-2	GX09-2..	C151



Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		20	R	MSS-I20R90-1.5D-N
C208		25	R	MSS-I20R90-2.5D-N

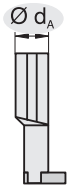
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C210		25	2.00	2.75	5	R	MSS-I20R05-GX09-1	GX09-1..	C151
		25	2.76	3.75	5	R	MSS-I20R05-GX09-2	GX09-2..	C151

		d_A [mm]	L R	Type, description
C207		20	L	MSS-I20L90-1.5D-N
C208		25	L	MSS-I20L90-2.5D-N

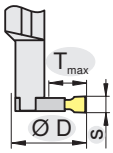
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C210		25	2.00	2.75	5	L	MSS-I20L05-GX09-1	GX09-1..	C151
		25	2.76	3.75	5	L	MSS-I20L05-GX09-2	GX09-2..	C151

Grooving and turning – internal

Modular system – internal, assembly size 25



Matching products see right-hand side.

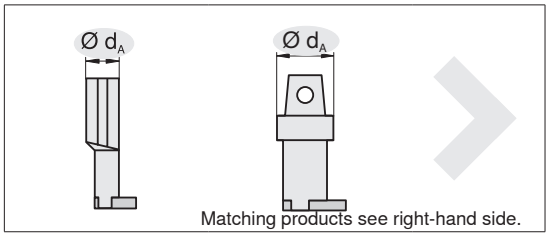


		d_A [mm]	L R	Type, description
C207		25	R	MSS-I25R90-1.5D-N
C208		32	R	MSS-I25R90-2.5D-N

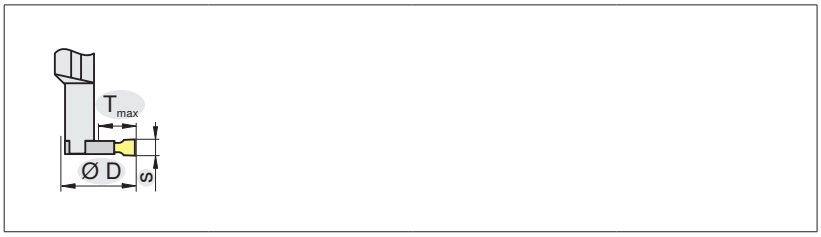
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C210		32	2.00	2.75	6	R	MSS-I25R06-GX09-1	GX09-1..	C151
		32	2.76	3.75	6	R	MSS-I25R06-GX09-2	GX09-2..	C151

		d_A [mm]	L R	Type, description
C207		25	L	MSS-I25L90-1.5D-N
C208		32	L	MSS-I25L90-2.5D-N

		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C210		32	2.00	2.75	6	L	MSS-I25L06-GX09-1	GX09-1..	C151
		32	2.76	3.75	6	L	MSS-I25L06-GX09-2	GX09-2..	C151



Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		32	R	MSS-I32R90-1.5D-N
C208		40	R	MSS-I32R90-2.5D-N
C209		40	R	UT40-MSS-I32R90-2D

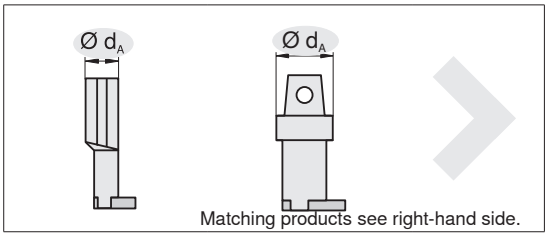
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C211		40	2.00	2.75	9	R	MSS-I32R09-GX16-1	GX16-1..	C151
		40	2.76	3.75	9	R	MSS-I32R09-GX16-2	GX16-2..	C151
		40	3.76	5.00	9	R	MSS-I32R09-GX16-3	GX16-3..	C151
		40	5.01	6.50	9	R	MSS-I32R09-GX16-4	GX16-4..	C151

		d_A [mm]	L R	Type, description
C207		32	L	MSS-I32L90-1.5D-N
C208		40	L	MSS-I32L90-2.5D-N
C209		50	L	UT50-MSS-I32L90-2D

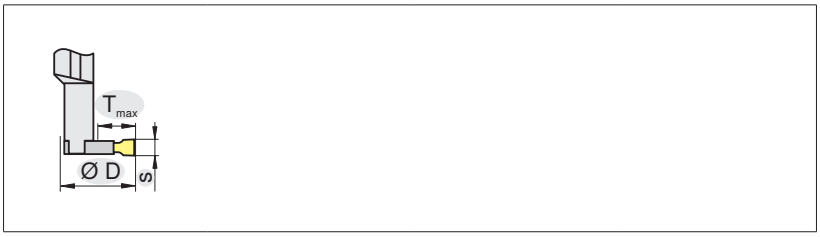
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C211		40	2.00	2.75	9	L	MSS-I32L09-GX16-1	GX16-1..	C151
		40	2.76	3.75	9	L	MSS-I32L09-GX16-2	GX16-2..	C151
		40	3.76	5.00	9	L	MSS-I32L09-GX16-3	GX16-3..	C151
		40	5.01	6.50	9	L	MSS-I32L09-GX16-4	GX16-4..	C151

Grooving and turning – internal

Modular system – internal, assembly size 40



Matching products see right-hand side.

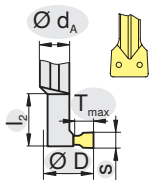


		d_A [mm]	L R	Type, description
C207		40	R	MSS-I40R90-1.5D-N
C208		50	R	MSS-I40R90-2.5D-N

		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C211		50	2.00	2.75	10	R	MSS-I40R10-GX16-1	GX16-1..	C151
		50	2.76	3.75	10	R	MSS-I40R10-GX16-2	GX16-2..	C151
		50	3.76	5.00	10	R	MSS-I40R10-GX16-3	GX16-3..	C151
		50	5.01	6.50	10	R	MSS-I40R10-GX16-4	GX16-4..	C151
C212		60	2.76	3.75	19	N	MSS-I40N19-GX24-2	GX24-2..	C151
		60	3.76	5.00	19	N	MSS-I40N19-GX24-3	GX24-3..	C151
		60	5.01	6.50	19	N	MSS-I40N19-GX24-4	GX24-4..	C151

		d_A [mm]	L R	Type, description
C207		40	L	MSS-I40L90-1.5D-N
C208		50	L	MSS-I40L90-2.5D-N
C209		40	L	UT40-MSS-I40L90-2D

		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C211		50	2.00	2.75	10	L	MSS-I40L10-GX16-1	GX16-1..	C151
		50	2.76	3.75	10	L	MSS-I40L10-GX16-2	GX16-2..	C151
		50	3.76	5.00	10	L	MSS-I40L10-GX16-3	GX16-3..	C151
		50	5.01	6.50	10	L	MSS-I40L10-GX16-4	GX16-4..	C151
C212		60	2.76	3.75	19	N	MSS-I40N19-GX24-2	GX24-2..	C151
		60	3.76	5.00	19	N	MSS-I40N19-GX24-3	GX24-3..	C151
		60	5.01	6.50	19	N	MSS-I40N19-GX24-4	GX24-4..	C151



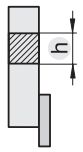
		d_A [mm]	l_2 [mm]	D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C215		16	30	16	2.00	3.75	3	R	I12R90-2.5D-GX09	GX09..	C151
		16	30	16	2.00	3.75	3	L	I12L90-2.5D-GX09	GX09..	C151

		d_A [mm]	l_2 [mm]	D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C216		16	32	20.5	2.00	2.75	5.0	R	I16R90-2.0D-GX16-1	GX16-1..	C151
		16	32	20.5	2.76	3.75	5.0	R	I16R90-2.0D-GX16-2	GX16-2..	C151
		20	40	25.0	2.76	3.75	5.5	R	I20R90-2.0D-GX16-2	GX16-2..	C151
		25	50	32.0	2.76	3.75	8.0	R	I25R90-2.0D-GX16-2	GX16-2..	C151
		25	50	32.0	3.76	5.00	10.0	R	I25R90-2.0D-GX16-3	GX16-3..	C151
		32	64	42.0	2.76	3.75	11.0	R	I32R90-2.0D-GX16-2	GX16-2..	C151
		32	64	42.0	3.76	5.00	11.0	R	I32R90-2.0D-GX16-3	GX16-3..	C151
		16	32	20.5	2.00	2.75	5.0	L	I16L90-2.0D-GX16-1	GX16-1..	C151
		16	32	20.5	2.76	3.75	5.0	L	I16L90-2.0D-GX16-2	GX16-2..	C151
		20	40	25.0	2.76	3.75	5.5	L	I20L90-2.0D-GX16-2	GX16-2..	C151
		25	50	32.0	2.76	3.75	8.0	L	I25L90-2.0D-GX16-2	GX16-2..	C151
		25	50	32.0	3.76	5.00	10.0	L	I25L90-2.0D-GX16-3	GX16-3..	C151
		32	64	42.0	2.76	3.75	11.0	L	I32L90-2.0D-GX16-2	GX16-2..	C151
		32	64	42.0	3.76	5.00	11.0	L	I32L90-2.0D-GX16-3	GX16-3..	C151

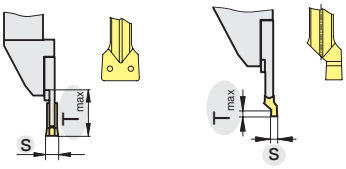
		d_A [mm]	l_2 [mm]	D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C217		32	64	42.0	2.76	3.75	11.0	R	I32R90-2.0D-GX24-2	GX24-2..	C151
		32	64	42.0	3.76	5.00	11.0	R	I32R90-2.0D-GX24-3	GX24-3..	C151
		32	64	47.0	5.01	6.50	17.5	R	I32R90-2.0D-GX24-4	GX24-4..	C151
		40	80	53.0	3.76	5.00	12.0	R	I40R90-2.0D-GX24-3	GX24-3..	C151
		40	80	57.0	5.01	6.50	17.5	R	I40R90-2.0D-GX24-4	GX24-4..	C151
		32	64	42.0	2.76	3.75	11.0	L	I32L90-2.0D-GX24-2	GX24-2..	C151
		32	64	42.0	3.76	5.00	11.0	L	I32L90-2.0D-GX24-3	GX24-3..	C151
		32	64	47.0	5.01	6.50	17.5	L	I32L90-2.0D-GX24-4	GX24-4..	C151
		40	80	53.0	3.76	5.00	12.0	L	I40L90-2.0D-GX24-3	GX24-3..	C151
		40	80	57.0	5.01	6.50	17.5	L	I40L90-2.0D-GX24-4	GX24-4..	C151

Circlip grooving – external

Modular system – external, assembly size 12



Matching products see right-hand side.



		h/d_A	L R	Type, description
C168		12	R	MSS-E12R00-1212E
	0			

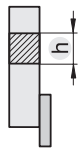
		s [mm]	T_{max} [mm]	L R	Type, description		
C176		1.95	7.00	R	MSS-E12R07-GX09-1	GX09-1..	C153
		2.25	7.00	R	MSS-E12R07-GX09-1	GX09-1..	C153
		2.75	7.00	R	MSS-E12R07-GX09-2	GX09-2..	C153
		3.25	7.00	R	MSS-E12R07-GX09-2	GX09-2..	C153
C179		0.60	0.75	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153
		0.80	0.94	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153
		0.90	1.04	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153
		1.00	1.14	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153
		1.20	1.34	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153
		1.40	1.53	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153
		1.70	1.82	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153

		h/d_A	L R	Type, description
C168		12	L	MSS-E12L00-1212E
	0			

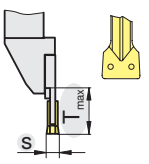
		s [mm]	T_{max} [mm]	L R	Type, description		
C176		1.95	7.00	L	MSS-E12L07-GX09-1	GX09-1..	C153
		2.25	7.00	L	MSS-E12L07-GX09-1	GX09-1..	C153
		2.75	7.00	L	MSS-E12L07-GX09-2	GX09-2..	C153
		3.25	7.00	L	MSS-E12L07-GX09-2	GX09-2..	C153
C179		0.60	0.75	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153
		0.80	0.94	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153
		0.90	1.04	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153
		1.00	1.14	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153
		1.20	1.34	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153
		1.40	1.53	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153
		1.70	1.82	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153

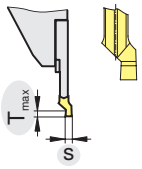
Circlip grooving – external

Modular system – external, assembly size 16



Matching products see right-hand side.





		h/d_A	L R	Type, description
C168	0	16	R	MSS-E16R00-1616G

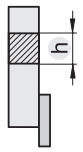
		s [mm]	T_{max} [mm]	L R	Type, description		
C176		1.95	7.00	R	MSS-E16R07-GX09-1	GX09-1..	C153
		2.25	7.00	R	MSS-E16R07-GX09-1	GX09-1..	C153
		2.75	7.00	R	MSS-E16R07-GX09-2	GX09-2..	C153
		3.25	7.00	R	MSS-E16R07-GX09-2	GX09-2..	C153
C179		0.60	0.75	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153
		0.80	0.94	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153
		0.90	1.04	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153
		1.00	1.14	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153
		1.20	1.34	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153
		1.40	1.53	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153
		1.70	1.82	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153

		h/d_A	L R	Type, description
C168	0	16	L	MSS-E16L00-1616G

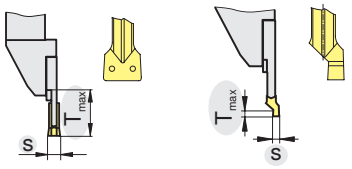
		s [mm]	T_{max} [mm]	L R	Type, description		
C176		1.95	7.00	L	MSS-E16L07-GX09-1	GX09-1..	C153
		2.25	7.00	L	MSS-E16L07-GX09-1	GX09-1..	C153
		2.75	7.00	L	MSS-E16L07-GX09-2	GX09-2..	C153
		3.25	7.00	L	MSS-E16L07-GX09-2	GX09-2..	C153
C179		0.60	0.75	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153
		0.80	0.94	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153
		0.90	1.04	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153
		1.00	1.14	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153
		1.20	1.34	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153
		1.40	1.53	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153
		1.70	1.82	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153

Circlip grooving – external

Modular system – external, assembly size 20



Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	0	20	R	MSS-E20R00-2020J
		16	R	MSS-E20R00-1620G
C169	90	20	L	MSS-E20L90-2020J

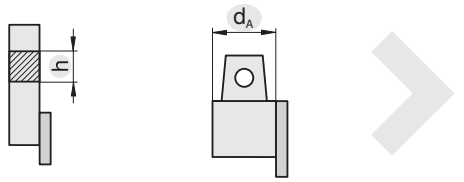
		s [mm]	T_{max} [mm]	L R	Type, description		
C177		2.75	12.00	R	MSS-E20R12-GX16-2	GX16-2..	C153
		3.25	12.00	R	MSS-E20R12-GX16-2	GX16-2..	C153
		4.25	12.00	R	MSS-E20R12-GX16-3	GX16-3..	C153
C180		0.60	0.75	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		0.80	0.94	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		0.90	1.04	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.00	1.14	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.95	2.07	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		2.25	2.36	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153

		h/d_A	L R	Type, description
C168	0	20	L	MSS-E20L00-2020J
		16	L	MSS-E20L00-1620G
C169	90	20	R	MSS-E20R90-2020J

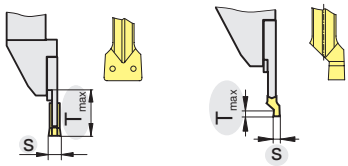
		s [mm]	T_{max} [mm]	L R	Type, description		
C177		2.75	12.00	L	MSS-E20L12-GX16-2	GX16-2..	C153
		3.25	12.00	L	MSS-E20L12-GX16-2	GX16-2..	C153
		4.25	12.00	L	MSS-E20L12-GX16-3	GX16-3..	C153
C180		0.60	0.75	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		0.80	0.94	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		0.90	1.04	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.00	1.14	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.95	2.07	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		2.25	2.36	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153

Circlip grooving – external

Modular system – external, assembly size 25



Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	0	**25**	**R**	MSS-E25R00-2525L
C169	90	**25**	**L**	MSS-E25L90-2525L
C171	0	**100**	**R**	HSK-T100-MSS-E25R00
		63	**R**	HSK-T63-MSS-E25R00
C173	0	**63**	**R**	UT63-MSS-E25R00
		40	**R**	UT40-MSS-E25R00
		50	**R**	UT50-MSS-E25R00
C174	90	**40**	**L**	UT40-MSS-E25L90
		50	**L**	UT50-MSS-E25L90

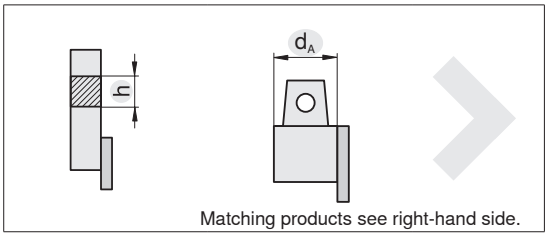
		s [mm]	T_{max} [mm]	L R	Type, description		
C177		2.75	12.00	R	MSS-E25R12-GX16-2	GX16-2..	C153
		3.25	12.00	R	MSS-E25R12-GX16-2	GX16-2..	C153
		4.25	12.00	R	MSS-E25R12-GX16-3	GX16-3..	C153
		5.25	12.00	R	MSS-E25R12-GX16-4	GX16-4..	C153
C180		0.60	0.75	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		0.80	0.94	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		0.90	1.04	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.00	1.14	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.95	2.07	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		2.25	2.36	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153

		h/d_A	L R	Type, description
C168	0	**25**	**L**	MSS-E25L00-2525L
C169	90	**25**	**R**	MSS-E25R90-2525L
C171	0	**100**	**L**	HSK-T100-MSS-E25L00
		63	**L**	HSK-T63-MSS-E25L00
C173	0	**40**	**L**	UT40-MSS-E25L00
		50	**L**	UT50-MSS-E25L00
		63	**L**	UT63-MSS-E25L00
C174	90	**50**	**R**	UT50-MSS-E25R90
		40	**R**	UT40-MSS-E25R90

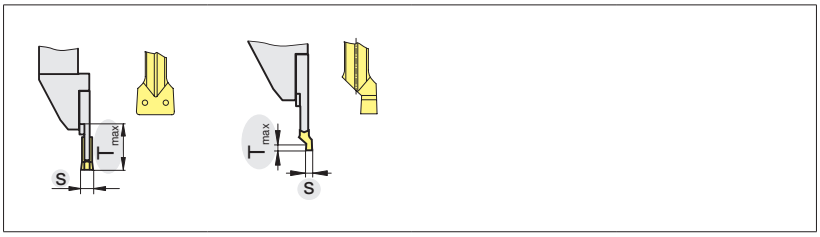
		s [mm]	T_{max} [mm]	L R	Type, description		
C177		2.75	12.00	L	MSS-E25L12-GX16-2	GX16-2..	C153
		3.25	12.00	L	MSS-E25L12-GX16-2	GX16-2..	C153
		4.25	12.00	L	MSS-E25L12-GX16-3	GX16-3..	C153
		5.25	12.00	L	MSS-E25L12-GX16-4	GX16-4..	C153
C180		0.60	0.75	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		0.80	0.94	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		0.90	1.04	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.00	1.14	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.95	2.07	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		2.25	2.36	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153

Circlip grooving – external

Modular system – external, assembly size 32



Matching products see right-hand side.

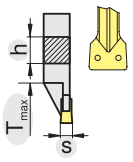


		h/d_A	L R	Type, description
C168	0	**32**	**R**	MSS-E32R00-3232Q
		32	**R**	MSS-E32R00-3225N
C169	90	**32**	**L**	MSS-E32L90-3225N
		32	**L**	MSS-E32L90-3232R
C171	0	**100**	**R**	HSK-T100-MSS-E32R00
		63	**R**	HSK-T63-MSS-E32R00
C172	90	**100**	**L**	HSK-T100-MSS-E32L90
		63	**L**	HSK-T63-MSS-E32L90
C173	0	**50**	**R**	UT50-MSS-E32R00
		63	**R**	UT63-MSS-E32R00

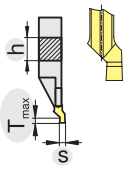
		s [mm]	T_{max} [mm]	L R	Type, description		
C177		2.75	12.00	R	MSS-E32R12-GX16-2	GX16-2..	C153
		3.25	12.00	R	MSS-E32R12-GX16-2	GX16-2..	C153
		4.25	12.00	R	MSS-E32R12-GX16-3	GX16-3..	C153
		5.25	12.00	R	MSS-E32R12-GX16-4	GX16-4..	C153
C180		0.60	0.75	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		0.80	0.94	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		0.90	1.04	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		1.00	1.14	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		1.95	2.07	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		2.25	2.36	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153

		h/d_A	L R	Type, description
C168	0	**32**	**L**	MSS-E32L00-3225N
		32	**L**	MSS-E32L00-3232Q
C169	90	**32**	**R**	MSS-E32R90-3232R
		32	**R**	MSS-E32R90-3225N
C171	0	**100**	**L**	HSK-T100-MSS-E32L00
		63	**L**	HSK-T63-MSS-E32L00
C172	90	**100**	**R**	HSK-T100-MSS-E32R90
		63	**R**	HSK-T63-MSS-E32R90
C173	0	**63**	**L**	UT63-MSS-E32L00

		s [mm]	T_{max} [mm]	L R	Type, description		
C177		2.75	12.00	L	MSS-E32L12-GX16-2	GX16-2..	C153
		3.25	12.00	L	MSS-E32L12-GX16-2	GX16-2..	C153
		4.25	12.00	L	MSS-E32L12-GX16-3	GX16-3..	C153
		5.25	12.00	L	MSS-E32L12-GX16-4	GX16-4..	C153
C180		0.60	0.75	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		0.80	0.94	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		0.90	1.04	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		1.00	1.14	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		1.95	2.07	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		2.25	2.36	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153



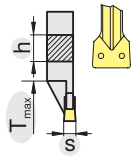
		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C188		10	1.95	7.00	R	E10R00-1010M-GX09	GX09..	C153
		10	2.25	7.00	R	E10R00-1010M-GX09	GX09..	C153
		10	2.75	7.00	R	E10R00-1010M-GX09	GX09..	C153
		10	3.25	7.00	R	E10R00-1010M-GX09	GX09..	C153
		10	1.95	7.00	L	E10L00-1010M-GX09	GX09..	C153
		10	2.25	7.00	L	E10L00-1010M-GX09	GX09..	C153
		10	2.75	7.00	L	E10L00-1010M-GX09	GX09..	C153
		10	3.25	7.00	L	E10L00-1010M-GX09	GX09..	C153



		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C188		10	0.60	0.75	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	0.80	0.94	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	0.90	1.04	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	1.00	1.14	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	1.20	1.34	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	1.40	1.53	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	1.70	1.82	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	0.60	0.75	L	E10L00-1010M-GX09	GX09-1..R/L	C153
		10	0.80	0.94	L	E10L00-1010M-GX09	GX09-1..R/L	C153
		10	0.90	1.04	L	E10L00-1010M-GX09	GX09-1..R/L	C153
		10	1.00	1.14	L	E10L00-1010M-GX09	GX09-1..R/L	C153
		10	1.20	1.34	L	E10L00-1010M-GX09	GX09-1..R/L	C153
		10	1.40	1.53	L	E10L00-1010M-GX09	GX09-1..R/L	C153
		10	1.70	1.82	L	E10L00-1010M-GX09	GX09-1..R/L	C153

Circlip grooving – external

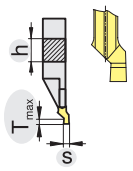
Monoblock tools – GX



		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C189		12	2.75	12.00	R	E12R0012-1212K-GX16-2	GX16-2..	C153
		12	3.25	12.00	R	E12R0012-1212K-GX16-2	GX16-2..	C153
		16	2.75	12.00	R	E16R0012-1616K-GX16-2	GX16-2..	C153
		16	3.25	12.00	R	E16R0012-1616K-GX16-2	GX16-2..	C153
		16	4.25	12.00	R	E16R0012-1616K-GX16-3	GX16-3..	C153
		20	2.75	12.00	R	E20R0012-2020K-GX16-2	GX16-2..	C153
		20	3.25	12.00	R	E20R0012-2020K-GX16-2	GX16-2..	C153
		20	4.25	12.00	R	E20R0012-2020K-GX16-3	GX16-3..	C153
		25	2.75	12.00	R	E25R0012-2525M-GX16-2	GX16-2..	C153
		25	3.25	12.00	R	E25R0012-2525M-GX16-2	GX16-2..	C153
		25	4.25	12.00	R	E25R0012-2525M-GX16-3	GX16-3..	C153
		12	2.75	12.00	L	E12L0012-1212K-GX16-2	GX16-2..	C153
		12	3.25	12.00	L	E12L0012-1212K-GX16-2	GX16-2..	C153
		16	2.75	12.00	L	E16L0012-1616K-GX16-2	GX16-2..	C153
		16	3.25	12.00	L	E16L0012-1616K-GX16-2	GX16-2..	C153
		16	4.25	12.00	L	E16L0012-1616K-GX16-3	GX16-3..	C153
		20	2.75	12.00	L	E20L0012-2020K-GX16-2	GX16-2..	C153
		20	3.25	12.00	L	E20L0012-2020K-GX16-2	GX16-2..	C153
		20	4.25	12.00	L	E20L0012-2020K-GX16-3	GX16-3..	C153
		25	2.75	12.00	L	E25L0012-2525M-GX16-2	GX16-2..	C153
		25	3.25	12.00	L	E25L0012-2525M-GX16-2	GX16-2..	C153
		25	4.25	12.00	L	E25L0012-2525M-GX16-3	GX16-3..	C153

Circlip grooving – external

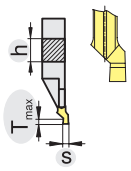
Monoblock tools – GX



		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C189		12	0.60	0.75	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	0.80	0.94	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	0.90	1.04	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.00	1.14	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.20	1.34	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.40	1.53	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.70	1.82	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.95	2.07	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	2.25	2.36	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		16	0.60	0.75	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	0.80	0.94	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	0.90	1.04	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.00	1.14	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.20	1.34	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.40	1.53	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.70	1.82	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.95	2.07	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	2.25	2.36	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		12	0.60	0.75	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	0.80	0.94	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	0.90	1.04	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.00	1.14	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.20	1.34	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.40	1.53	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.70	1.82	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.95	2.07	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	2.25	2.36	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		16	0.60	0.75	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	0.80	0.94	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	0.90	1.04	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.00	1.14	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.20	1.34	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.40	1.53	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.70	1.82	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.95	2.07	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	2.25	2.36	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153

Circlip grooving – external

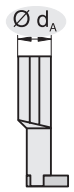
Monoblock tools – GX



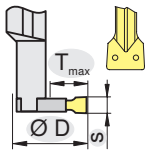
		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C189		20	0.60	0.75	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	0.80	0.94	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	0.90	1.04	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.00	1.14	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.20	1.34	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.40	1.53	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.70	1.82	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.95	2.07	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	2.25	2.36	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		25	0.60	0.75	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	0.80	0.94	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	0.90	1.04	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.00	1.14	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.20	1.34	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.40	1.53	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.70	1.82	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.95	2.07	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	2.25	2.36	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		20	0.60	0.75	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	0.80	0.94	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	0.90	1.04	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.00	1.14	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.20	1.34	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.40	1.53	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.70	1.82	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.95	2.07	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	2.25	2.36	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		25	0.60	0.75	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	0.80	0.94	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	0.90	1.04	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.00	1.14	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.20	1.34	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.40	1.53	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.70	1.82	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.95	2.07	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	2.25	2.36	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153

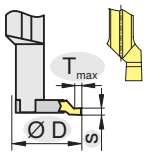
Circlip grooving – internal

Modular system – internal, assembly size 16



Matching products see right-hand side.





		d_A [mm]	L R	Type, description
C207		20	R	MSS-I16R90-1.5D-N
C208		20	R	MSS-I16R90-2.5D-N

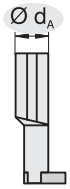
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C210		20	1.95	4.00	R	MSS-I16R04-GX09-1	GX09-1..	C153
		20	2.25	4.00	R	MSS-I16R04-GX09-1	GX09-1..	C153
		20	2.75	4.00	R	MSS-I16R04-GX09-2	GX09-2..	C153
		20	3.25	4.00	R	MSS-I16R04-GX09-2	GX09-2..	C153
C213		20	0.60	0.75	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153
		20	0.80	0.94	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153
		20	0.90	1.04	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153
		20	1.00	1.14	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153
		20	1.20	1.34	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153
		20	1.40	1.53	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153
		20	1.70	1.82	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153

		d_A [mm]	L R	Type, description
C207		20	L	MSS-I16L90-1.5D-N
C208		20	L	MSS-I16L90-2.5D-N

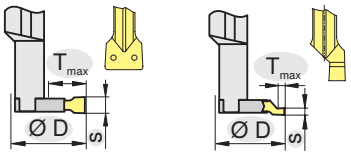
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C210		20	1.95	4.00	L	MSS-I16L04-GX09-1	GX09-1..	C153
		20	2.25	4.00	L	MSS-I16L04-GX09-1	GX09-1..	C153
		20	2.75	4.00	L	MSS-I16L04-GX09-2	GX09-2..	C153
		20	3.25	4.00	L	MSS-I16L04-GX09-2	GX09-2..	C153
C213		20	0.60	0.75	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153
		20	0.80	0.94	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153
		20	0.90	1.04	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153
		20	1.00	1.14	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153
		20	1.20	1.34	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153
		20	1.40	1.53	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153
		20	1.70	1.82	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153

Circlip grooving – internal

Modular system – internal, assembly size 20



Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		20	R	MSS-I20R90-1.5D-N
C208		25	R	MSS-I20R90-2.5D-N

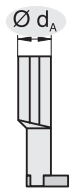
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C210		25	1.95	5.00	R	MSS-I20R05-GX09-1	GX09-1..	C153
		25	2.25	5.00	R	MSS-I20R05-GX09-1	GX09-1..	C153
		25	2.75	5.00	R	MSS-I20R05-GX09-2	GX09-2..	C153
		25	3.25	5.00	R	MSS-I20R05-GX09-2	GX09-2..	C153
C213		25	0.60	0.75	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153
		25	0.80	0.94	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153
		25	0.90	1.04	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153
		25	1.00	1.14	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153
		25	1.20	1.34	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153
		25	1.40	1.53	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153
		25	1.70	1.82	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153

		d_A [mm]	L R	Type, description
C207		20	L	MSS-I20L90-1.5D-N
C208		25	L	MSS-I20L90-2.5D-N

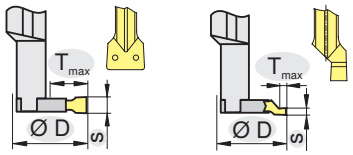
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C210		25	1.95	5.00	L	MSS-I20L05-GX09-1	GX09-1..	C153
		25	2.25	5.00	L	MSS-I20L05-GX09-1	GX09-1..	C153
		25	2.75	5.00	L	MSS-I20L05-GX09-2	GX09-2..	C153
		25	3.25	5.00	L	MSS-I20L05-GX09-2	GX09-2..	C153
C213		25	0.60	0.75	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153
		25	0.80	0.94	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153
		25	0.90	1.04	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153
		25	1.00	1.14	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153
		25	1.20	1.34	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153
		25	1.40	1.53	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153
		25	1.70	1.82	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153

Circlip grooving – internal

Modular system – internal, assembly size 25



Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		25	R	MSS-I25R90-1.5D-N
C208		32	R	MSS-I25R90-2.5D-N

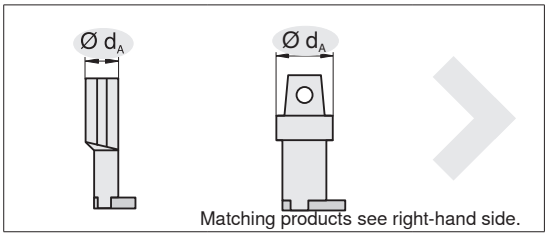
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C210		32	1.95	6.00	R	MSS-I25R06-GX09-1	GX09-1..	C153
		32	2.25	6.00	R	MSS-I25R06-GX09-1	GX09-1..	C153
		32	2.75	6.00	R	MSS-I25R06-GX09-2	GX09-2..	C153
		32	3.25	6.00	R	MSS-I25R06-GX09-2	GX09-2..	C153
C213		32	0.60	0.75	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153
		32	0.80	0.94	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153
		32	0.90	1.04	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153
		32	1.00	1.14	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153
		32	1.20	1.34	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153
		32	1.40	1.53	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153
		32	1.70	1.82	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153

		d_A [mm]	L R	Type, description
C207		25	L	MSS-I25L90-1.5D-N
C208		32	L	MSS-I25L90-2.5D-N

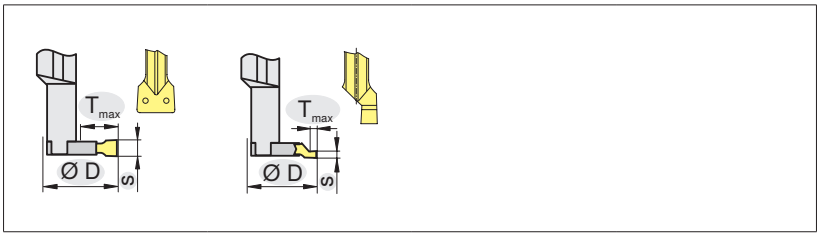
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C210		32	1.95	6.00	L	MSS-I25L06-GX09-1	GX09-1..	C153
		32	2.25	6.00	L	MSS-I25L06-GX09-1	GX09-1..	C153
		32	2.75	6.00	L	MSS-I25L06-GX09-2	GX09-2..	C153
		32	3.25	6.00	L	MSS-I25L06-GX09-2	GX09-2..	C153
C213		32	0.60	0.75	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153
		32	0.80	0.94	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153
		32	0.90	1.04	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153
		32	1.00	1.14	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153
		32	1.20	1.34	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153
		32	1.40	1.53	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153
		32	1.70	1.82	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153

Circlip grooving – internal

Modular system – internal, assembly size 32



Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		32	R	MSS-I32R90-1.5D-N
C208		40	R	MSS-I32R90-2.5D-N
C209		40	R	UT40-MSS-I32R90-2D

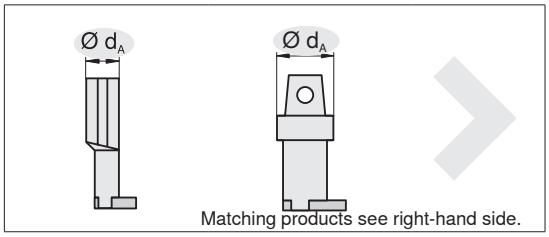
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C211		40	2.75	9.00	R	MSS-I32R09-GX16-2	GX16-2..	C153
		40	3.25	9.00	R	MSS-I32R09-GX16-2	GX16-2..	C153
		40	4.25	9.00	R	MSS-I32R09-GX16-3	GX16-3..	C153
		40	5.25	9.00	R	MSS-I32R09-GX16-4	GX16-4..	C153
C214		40	0.60	0.75	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	0.80	0.94	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	0.90	1.04	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	1.00	1.14	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	1.20	1.34	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	1.40	1.53	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	1.70	1.82	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	1.95	2.07	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	2.25	2.36	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153

		d_A [mm]	L R	Type, description
C207		32	L	MSS-I32L90-1.5D-N
C208		40	L	MSS-I32L90-2.5D-N
C209		50	L	UT50-MSS-I32L90-2D

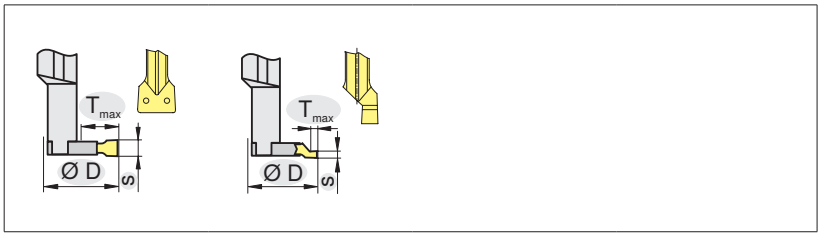
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C211		40	2.75	9.00	L	MSS-I32L09-GX16-2	GX16-2..	C153
		40	3.25	9.00	L	MSS-I32L09-GX16-2	GX16-2..	C153
		40	4.25	9.00	L	MSS-I32L09-GX16-3	GX16-3..	C153
		40	5.25	9.00	L	MSS-I32L09-GX16-4	GX16-4..	C153
C214		40	0.60	0.75	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	0.80	0.94	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	0.90	1.04	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	1.00	1.14	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	1.20	1.34	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	1.40	1.53	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	1.70	1.82	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	1.95	3.00	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	2.25	2.36	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153

Circlip grooving – internal

Modular system – internal, assembly size 40



Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		40	R	MSS-I40R90-1.5D-N
C208		50	R	MSS-I40R90-2.5D-N

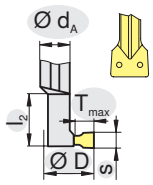
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C211		50	2.75	10.00	R	MSS-I40R10-GX16-2	GX16-2..	C153
		50	3.25	10.00	R	MSS-I40R10-GX16-2	GX16-2..	C153
		50	4.25	10.00	R	MSS-I40R10-GX16-3	GX16-3..	C153
		50	5.25	10.00	R	MSS-I40R10-GX16-4	GX16-4..	C153
C214		50	0.60	0.75	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	0.80	0.94	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	0.90	1.04	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	1.00	1.14	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	1.20	1.34	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	1.40	1.53	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	1.70	1.82	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	1.95	2.07	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	2.25	2.36	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153

		d_A [mm]	L R	Type, description
C207		40	L	MSS-I40L90-1.5D-N
C208		50	L	MSS-I40L90-2.5D-N
C209		40	L	UT40-MSS-I40L90-2D

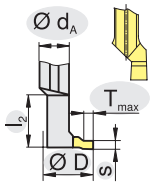
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C211		50	2.75	10.00	L	MSS-I40L10-GX16-2	GX16-2..	C153
		50	3.25	10.00	L	MSS-I40L10-GX16-2	GX16-2..	C153
		50	4.25	10.00	L	MSS-I40L10-GX16-3	GX16-3..	C153
		50	5.25	10.00	L	MSS-I40L10-GX16-4	GX16-4..	C153
C214		50	0.60	0.75	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	0.80	0.94	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	0.90	1.04	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	1.00	1.14	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	1.20	1.34	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	1.40	1.53	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	1.70	1.82	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	1.95	2.07	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	2.25	2.36	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153

Circlip grooving – internal

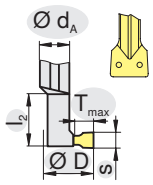
Monoblock boring bars – GX



		d_A [mm]	l_2 [mm]	D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C215		16	30	16	1.95	7.00	R	I12R90-2.5D-GX09	GX09..	C153
		16	30	16	2.25	7.00	R	I12R90-2.5D-GX09	GX09..	C153
		16	30	16	2.75	7.00	R	I12R90-2.5D-GX09	GX09..	C153
		16	30	16	3.25	7.00	R	I12R90-2.5D-GX09	GX09..	C153
		16	30	16	1.95	7.00	L	I12L90-2.5D-GX09	GX09..	C153
		16	30	16	2.25	7.00	L	I12L90-2.5D-GX09	GX09..	C153
		16	30	16	2.75	7.00	L	I12L90-2.5D-GX09	GX09..	C153
		16	30	16	3.25	7.00	L	I12L90-2.5D-GX09	GX09..	C153



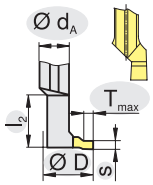
		d_A [mm]	l_2 [mm]	D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C215		16	30	16	0.60	0.75	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	0.80	0.94	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	0.90	1.04	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.00	1.14	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.20	1.34	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.40	1.53	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.70	1.82	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	0.60	0.75	L	I12L90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	0.80	0.94	L	I12L90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	0.90	1.04	L	I12L90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.00	1.14	L	I12L90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.20	1.34	L	I12L90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.40	1.53	L	I12L90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.70	1.82	L	I12L90-2.5D-GX09	GX09-1..R/L	C153



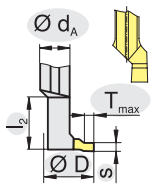
		d_A [mm]	l_2 [mm]	D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C216		16	32	20.5	2.75	12.00	R	I16R90-2.0D-GX16-2	GX16-2..	C153
		16	32	20.5	3.25	12.00	R	I16R90-2.0D-GX16-2	GX16-2..	C153
		20	40	25.0	2.75	12.00	R	I20R90-2.0D-GX16-2	GX16-2..	C153
		20	40	25.0	3.25	12.00	R	I20R90-2.0D-GX16-2	GX16-2..	C153
		25	50	32.0	2.75	12.00	R	I25R90-2.0D-GX16-2	GX16-2..	C153
		25	50	32.0	3.25	12.00	R	I25R90-2.0D-GX16-2	GX16-2..	C153
		25	50	32.0	4.25	12.00	R	I25R90-2.0D-GX16-3	GX16-3..	C153
		32	64	42.0	2.75	12.00	R	I32R90-2.0D-GX16-2	GX16-2..	C153
		32	64	42.0	3.25	12.00	R	I32R90-2.0D-GX16-2	GX16-2..	C153
		32	64	42.0	4.25	12.00	R	I32R90-2.0D-GX16-3	GX16-3..	C153
		16	32	20.5	2.75	12.00	L	I16L90-2.0D-GX16-2	GX16-2..	C153
		16	32	20.5	3.25	12.00	L	I16L90-2.0D-GX16-2	GX16-2..	C153
		20	40	25.0	2.75	12.00	L	I20L90-2.0D-GX16-2	GX16-2..	C153
		20	40	25.0	3.25	12.00	L	I20L90-2.0D-GX16-2	GX16-2..	C153
		25	50	32.0	2.75	12.00	L	I25L90-2.0D-GX16-2	GX16-2..	C153
		25	50	32.0	3.25	12.00	L	I25L90-2.0D-GX16-2	GX16-2..	C153
		25	50	32.0	4.25	12.00	L	I25L90-2.0D-GX16-3	GX16-3..	C153
		32	64	42.0	2.75	12.00	L	I32L90-2.0D-GX16-2	GX16-2..	C153
		32	64	42.0	3.25	12.00	L	I32L90-2.0D-GX16-2	GX16-2..	C153
		32	64	42.0	4.25	12.00	L	I32L90-2.0D-GX16-3	GX16-3..	C153

Circlip grooving – internal

Monoblock boring bars – GX



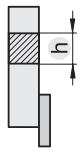
		d_A [mm]	l_2 [mm]	D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C216		16	32	20.5	0.60	0.75	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	0.80	0.94	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	0.90	1.04	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.00	1.14	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.20	1.34	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.40	1.53	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.70	1.82	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.95	2.07	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	2.25	2.36	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	0.60	0.75	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	0.80	0.94	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	0.90	1.04	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.00	1.14	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.20	1.34	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.40	1.53	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.70	1.82	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.95	2.07	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	2.25	2.36	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	0.60	0.75	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	0.80	0.94	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	0.90	1.04	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.00	1.14	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.20	1.34	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.40	1.53	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.70	1.82	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.95	2.07	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	2.25	2.36	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	0.60	0.75	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	0.80	0.94	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	0.90	1.04	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.00	1.14	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.20	1.34	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.40	1.53	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.70	1.82	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.95	2.07	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	2.25	2.36	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153



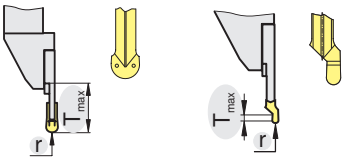
		d_A [mm]	l_2 [mm]	D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C216		25	50	32.0	0.60	0.75	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	0.80	0.94	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	0.90	1.04	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.00	1.14	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.20	1.34	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.40	1.53	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.70	1.82	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.95	2.07	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	2.25	2.36	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	0.60	0.75	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	0.80	0.94	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	0.90	1.04	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.00	1.14	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.20	1.34	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.40	1.53	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.70	1.82	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.95	2.07	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	2.25	2.36	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	0.60	0.75	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	0.80	0.94	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	0.90	1.04	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.00	1.14	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.20	1.34	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.40	1.53	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.70	1.82	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.95	2.07	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	2.25	2.36	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	0.60	0.75	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	0.80	0.94	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	0.90	1.04	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.00	1.14	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.20	1.34	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.40	1.53	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.70	1.82	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.95	2.07	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	2.25	2.36	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153

Radius grooves – external

Modular system – external, assembly size 12



Matching products see right-hand side.



		h/d_A	L R	Type, description
C168		12	R	MSS-E12R00-1212E
	0			

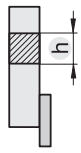
		r [mm]	T_{max} [mm]	L R	Type, description		
C176		1.00	7.00	R	MSS-E12R07-GX09-1	GX09-1..	C154
		1.20	7.00	R	MSS-E12R07-GX09-1	GX09-1..	C154
C179		0.80	1.78	R	MSS-E12R02-GX09-1	GX09-1..R/L	C154

		h/d_A	L R	Type, description
C168		12	L	MSS-E12L00-1212E
	0			

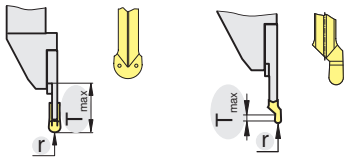
		r [mm]	T_{max} [mm]	L R	Type, description		
C176		1.00	7.00	L	MSS-E12L07-GX09-1	GX09-1..	C154
		1.20	7.00	L	MSS-E12L07-GX09-1	GX09-1..	C154
C179		0.80	1.78	L	MSS-E12L02-GX09-1	GX09-1..R/L	C154

Radius grooves – external

Modular system – external, assembly size 16



Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	0	16	R	MSS-E16R00-1616G

		r [mm]	T_{max} [mm]	L R	Type, description		
C176		1.00	7.00	R	MSS-E16R07-GX09-1	GX09-1..	C154
		1.20	7.00	R	MSS-E16R07-GX09-1	GX09-1..	C154
C179		0.80	1.78	R	MSS-E16R02-GX09-1	GX09-1..R/L	C154

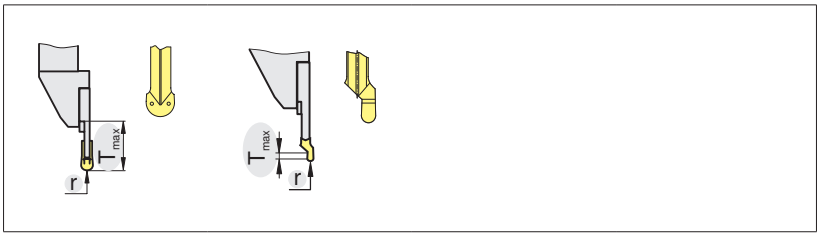
		h/d_A	L R	Type, description
C168	0	16	L	MSS-E16L00-1616G

		r [mm]	T_{max} [mm]	L R	Type, description		
C176		1.00	7.00	L	MSS-E16L07-GX09-1	GX09-1..	C154
		1.20	7.00	L	MSS-E16L07-GX09-1	GX09-1..	C154
C179		0.80	1.78	L	MSS-E16L02-GX09-1	GX09-1..R/L	C154

Radius grooves – external

Modular system – external, assembly size 20

Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	0	20	R	MSS-E20R00-2020J
		16	R	MSS-E20R00-1620G
C169	90	20	L	MSS-E20L90-2020J

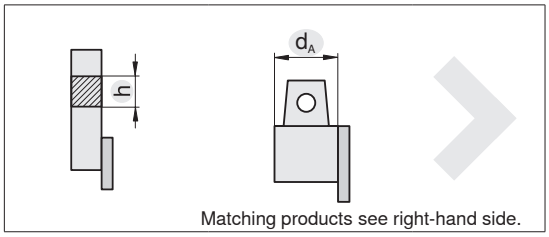
		r [mm]	T_{max} [mm]	L R	Type, description		
C177		1.50	12.00	R	MSS-E20R12-GX16-2	GX16-2..	C154
		2.00	12.00	R	MSS-E20R12-GX16-3	GX16-3..	C154
		2.50	12.00	R	MSS-E20R12-GX16-3	GX16-3..	C154
C178		1.50	21.00	R	MSS-E20R21-GX24-2	GX24-2..	C154
		2.00	21.00	R	MSS-E20R21-GX24-3	GX24-3..	C154
		2.50	21.00	R	MSS-E20R21-GX24-3	GX24-3..	C154
C180		0.80	1.78	R	MSS-E20R03-GX16-2	GX16-2..R/L	C154
		1.00	2.18	R	MSS-E20R03-GX16-2	GX16-2..R/L	C154
		1.20	2.58	R	MSS-E20R03-GX16-2	GX16-2..R/L	C154
C184		1.50	20.00	R	MSS-E20R20-SX3	SX..3	C156

		h/d_A	L R	Type, description
C168	0	20	L	MSS-E20L00-2020J
		16	L	MSS-E20L00-1620G
C169	90	20	R	MSS-E20R90-2020J

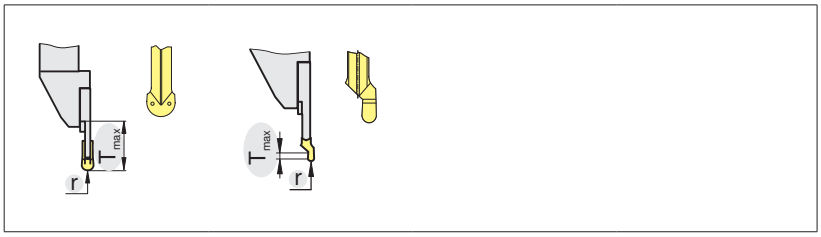
		r [mm]	T_{max} [mm]	L R	Type, description		
C177		1.50	12.00	L	MSS-E20L12-GX16-2	GX16-2..	C154
		2.00	12.00	L	MSS-E20L12-GX16-3	GX16-3..	C154
		2.50	12.00	L	MSS-E20L12-GX16-3	GX16-3..	C154
C178		1.50	21.00	L	MSS-E20L21-GX24-2	GX24-2..	C154
		2.00	21.00	L	MSS-E20L21-GX24-3	GX24-3..	C154
		2.50	21.00	L	MSS-E20L21-GX24-3	GX24-3..	C154
C180		0.80	1.78	L	MSS-E20L03-GX16-2	GX16-2..R/L	C154
		1.00	2.18	L	MSS-E20L03-GX16-2	GX16-2..R/L	C154
		1.20	2.58	L	MSS-E20L03-GX16-2	GX16-2..R/L	C154
C184		1.50	20.00	L	MSS-E20L20-SX3	SX..3	C156

Radius grooves – external

Modular system – external, assembly size 25



Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	0	25	R	MSS-E25R00-2525L
C169	90	25	L	MSS-E25L90-2525L
C171	0	100	R	HSK-T100-MSS-E25R00
		63	R	HSK-T63-MSS-E25R00
C173	0	63	R	UT63-MSS-E25R00
		40	R	UT40-MSS-E25R00
		50	R	UT50-MSS-E25R00
C174	90	40	L	UT40-MSS-E25L90
		50	L	UT50-MSS-E25L90

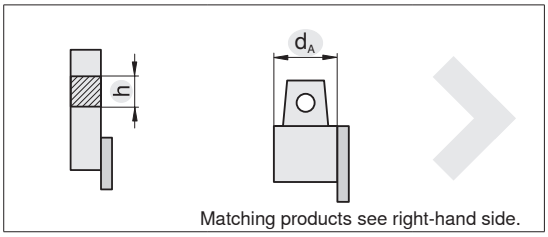
		r [mm]	T_{max} [mm]	L R	Type, description		
C177		1.50	12.00	R	MSS-E25R12-GX16-2	GX16-2..	C154
		2.00	12.00	R	MSS-E25R12-GX16-3	GX16-3..	C154
		2.50	12.00	R	MSS-E25R12-GX16-3	GX16-3..	C154
		3.00	12.00	R	MSS-E25R12-GX16-4	GX16-4..	C154
C178		1.50	21.00	R	MSS-E25R21-GX24-2	GX24-2..	C154
		2.00	21.00	R	MSS-E25R21-GX24-3	GX24-3..	C154
		2.50	21.00	R	MSS-E25R21-GX24-3	GX24-3..	C154
		3.00	21.00	R	MSS-E25R21-GX24-4	GX24-4..	C154
C180		0.80	1.78	R	MSS-E25R03-GX16-2	GX16-2..R/L	C154
		1.00	2.18	R	MSS-E25R03-GX16-2	GX16-2..R/L	C154
		1.20	2.58	R	MSS-E25R03-GX16-2	GX16-2..R/L	C154
C184		1.50	25.00	R	MSS-E25R25-SX3	SX..3	C156
		1.50	35.00	R	MSS-E25R35-SX3	SX..3	C156
		2.00	25.00	R	MSS-E25R25-SX4	SX..4	C156
		2.00	35.00	R	MSS-E25R35-SX4	SX..4	C156

		h/d_A	L R	Type, description
C168	0	25	L	MSS-E25L00-2525L
C169	90	25	R	MSS-E25R90-2525L
C171	0	100	L	HSK-T100-MSS-E25L00
		63	L	HSK-T63-MSS-E25L00
C173	0	40	L	UT40-MSS-E25L00
		50	L	UT50-MSS-E25L00
		63	L	UT63-MSS-E25L00
C174	90	50	R	UT50-MSS-E25R90
		40	R	UT40-MSS-E25R90

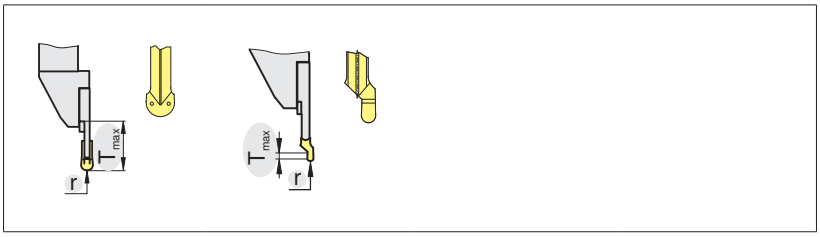
		r [mm]	T_{max} [mm]	L R	Type, description		
C177		1.50	12.00	L	MSS-E25L12-GX16-2	GX16-2..	C154
		2.00	12.00	L	MSS-E25L12-GX16-3	GX16-3..	C154
		2.50	12.00	L	MSS-E25L12-GX16-3	GX16-3..	C154
		3.00	12.00	L	MSS-E25L12-GX16-4	GX16-4..	C154
C178		1.50	21.00	L	MSS-E25L21-GX24-2	GX24-2..	C154
		2.00	21.00	L	MSS-E25L21-GX24-3	GX24-3..	C154
		2.50	21.00	L	MSS-E25L21-GX24-3	GX24-3..	C154
		3.00	21.00	L	MSS-E25L21-GX24-4	GX24-4..	C154
C180		0.80	1.78	L	MSS-E25L03-GX16-2	GX16-2..R/L	C154
		1.00	2.18	L	MSS-E25L03-GX16-2	GX16-2..R/L	C154
		1.20	2.58	L	MSS-E25L03-GX16-2	GX16-2..R/L	C154
C184		1.50	25.00	L	MSS-E25L25-SX3	SX..3	C156
		1.50	35.00	L	MSS-E25L35-SX3	SX..3	C156
		2.00	25.00	L	MSS-E25L25-SX4	SX..4	C156
		2.00	35.00	L	MSS-E25L35-SX4	SX..4	C156

Radius grooves – external

Modular system – external, assembly size 32



Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	0	32	R	MSS-E32R00-3232Q
		32	R	MSS-E32R00-3225N
C169	90	32	L	MSS-E32L90-3225N
		32	L	MSS-E32L90-3232R
C171	0	100	R	HSK-T100-MSS-E32R00
		63	R	HSK-T63-MSS-E32R00
C172	90	100	L	HSK-T100-MSS-E32L90
		63	L	HSK-T63-MSS-E32L90
C173	0	50	R	UT50-MSS-E32R00
		63	R	UT63-MSS-E32R00

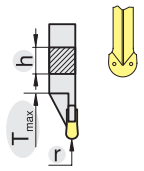
		r [mm]	T_{max} [mm]	L R	Type, description		
C177		1.50	12.00	R	MSS-E32R12-GX16-2	GX16-2..	C154
		2.00	12.00	R	MSS-E32R12-GX16-3	GX16-3..	C154
		2.50	12.00	R	MSS-E32R12-GX16-3	GX16-3..	C154
		3.00	12.00	R	MSS-E32R12-GX16-4	GX16-4..	C154
C178		1.50	21.00	R	MSS-E32R21-GX24-2	GX24-2..	C154
		2.00	21.00	R	MSS-E32R21-GX24-3	GX24-3..	C154
		2.50	21.00	R	MSS-E32R21-GX24-3	GX24-3..	C154
		3.00	21.00	R	MSS-E32R21-GX24-4	GX24-4..	C154
C180		0.80	1.78	R	MSS-E32R03-GX16-2	GX16-2..R/L	C154
		1.00	2.18	R	MSS-E32R03-GX16-2	GX16-2..R/L	C154
		1.20	2.58	R	MSS-E32R03-GX16-2	GX16-2..R/L	C154
C184		1.50	35.00	R	MSS-E32R35-SX3	SX..3	C156
		2.00	35.00	R	MSS-E32R35-SX4	SX..4	C156
C185		4.00	25.00	N	MSS-E32N25-LX	LX..	C157
		4.00	32.00	N	MSS-E32N32-LX	LX..	C157
		4.00	45.00	N	MSS-E32N45-LX	LX..	C157

		h/d_A	L R	Type, description
C168	0	32	L	MSS-E32L00-3225N
		32	L	MSS-E32L00-3232Q
C169	90	32	R	MSS-E32R90-3232R
		32	R	MSS-E32R90-3225N
C171	0	100	L	HSK-T100-MSS-E32L00
		63	L	HSK-T63-MSS-E32L00
C172	90	100	R	HSK-T100-MSS-E32R90
		63	R	HSK-T63-MSS-E32R90
C173	0	63	L	UT63-MSS-E32L00

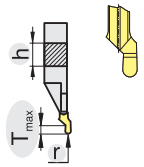
		r [mm]	T_{max} [mm]	L R	Type, description		
C177		1.50	12.00	L	MSS-E32L12-GX16-2	GX16-2..	C154
		2.00	12.00	L	MSS-E32L12-GX16-3	GX16-3..	C154
		2.50	12.00	L	MSS-E32L12-GX16-3	GX16-3..	C154
		3.00	12.00	L	MSS-E32L12-GX16-4	GX16-4..	C154
C178		1.50	21.00	L	MSS-E32L21-GX24-2	GX24-2..	C154
		2.00	21.00	L	MSS-E32L21-GX24-3	GX24-3..	C154
		2.50	21.00	L	MSS-E32L21-GX24-3	GX24-3..	C154
		3.00	21.00	L	MSS-E32L21-GX24-4	GX24-4..	C154
C180		0.80	1.78	L	MSS-E32L03-GX16-2	GX16-2..R/L	C154
		1.00	2.18	L	MSS-E32L03-GX16-2	GX16-2..R/L	C154
		1.20	2.58	L	MSS-E32L03-GX16-2	GX16-2..R/L	C154
C184		1.50	35.00	L	MSS-E32L35-SX3	SX..3	C156
		2.00	35.00	L	MSS-E32L35-SX4	SX..4	C156
C185		4.00	25.00	N	MSS-E32N25-LX	LX..	C157
		4.00	32.00	N	MSS-E32N32-LX	LX..	C157
		4.00	45.00	N	MSS-E32N45-LX	LX..	C157

Radius grooves – external

Monoblock tools – GX



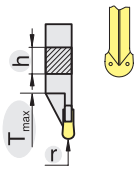
		h [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C188		10	1.00	7.00	R	E10R00-1010M-GX09	GX09-1..	C154
		10	1.20	7.00	R	E10R00-1010M-GX09	GX09-1..	C154
		10	1.00	7.00	L	E10L00-1010M-GX09	GX09-1..	C154
		10	1.20	7.00	L	E10L00-1010M-GX09	GX09-1..	C154



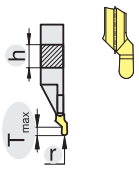
		h [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C188		10	0.80	1.78	R	E10R00-1010M-GX09	GX09-1..R/L	C154
		10	0.80	1.78	L	E10L00-1010M-GX09	GX09-1..R/L	C154

Radius grooves – external

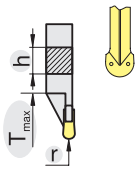
Monoblock tools – GX



		h [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C189		16	1.50	12.00	R	E16R0012-1616K-GX16-2	GX16-2..	C154
		16	2.00	12.00	R	E16R0012-1616K-GX16-3	GX16-3..	C154
		16	2.50	12.00	R	E16R0012-1616K-GX16-3	GX16-3..	C154
		20	1.50	12.00	R	E20R0012-2020K-GX16-2	GX16-2..	C154
		20	2.00	12.00	R	E20R0012-2020K-GX16-3	GX16-3..	C154
		20	2.50	12.00	R	E20R0012-2020K-GX16-3	GX16-3..	C154
		25	1.50	12.00	R	E25R0012-2525M-GX16-2	GX16-2..	C154
		25	2.00	12.00	R	E25R0012-2525M-GX16-3	GX16-3..	C154
		25	2.50	12.00	R	E25R0012-2525M-GX16-3	GX16-3..	C154
		16	1.50	12.00	L	E16L0012-1616K-GX16-2	GX16-2..	C154
		16	2.00	12.00	L	E16L0012-1616K-GX16-3	GX16-3..	C154
		16	2.50	12.00	L	E16L0012-1616K-GX16-3	GX16-3..	C154
		20	1.50	12.00	L	E20L0012-2020K-GX16-2	GX16-2..	C154
		20	2.00	12.00	L	E20L0012-2020K-GX16-3	GX16-3..	C154
		20	2.50	12.00	L	E20L0012-2020K-GX16-3	GX16-3..	C154
		25	1.50	12.00	L	E25L0012-2525M-GX16-2	GX16-2..	C154
		25	2.00	12.00	L	E25L0012-2525M-GX16-3	GX16-3..	C154
		25	2.50	12.00	L	E25L0012-2525M-GX16-3	GX16-3..	C154



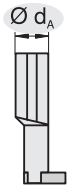
		h [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C189		12	0.80	1.78	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C154
		12	1.00	2.18	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C154
		12	1.20	2.58	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C154
		12	1.50	12.00	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C154
		16	0.80	1.78	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C154
		16	1.00	2.18	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C154
		16	1.20	2.58	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C154
		20	0.80	1.78	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C154
		20	1.00	2.18	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C154
		20	1.20	2.58	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C154
		25	0.80	1.78	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C154
		25	1.00	2.18	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C154
		25	1.20	2.58	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C154
		12	0.80	1.78	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C154
		12	1.00	2.18	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C154
		12	1.20	2.58	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C154
		12	1.50	12.00	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C154
		16	0.80	1.78	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C154
		16	1.00	2.18	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C154
		16	1.20	2.58	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C154
		20	0.80	1.78	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C154
		20	1.00	2.18	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C154
		20	1.20	2.58	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C154
		25	0.80	1.78	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C154
		25	1.00	2.18	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C154
		25	1.20	2.58	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C154



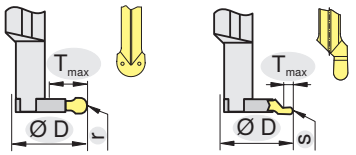
		h [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C190		16	1.50	21.00	R	E16R0021-1616K-GX24-2	GX24-2..	C154
		20	1.50	21.00	R	E20R0021-2020K-GX24-2	GX24-2..	C154
		20	2.00	21.00	R	E20R0021-2020K-GX24-3	GX24-3..	C154
		20	2.50	21.00	R	E20R0021-2020K-GX24-3	GX24-3..	C154
		25	1.50	21.00	R	E25R0021-2525M-GX24-2	GX24-2..	C154
		25	2.00	21.00	R	E25R0021-2525M-GX24-3	GX24-3..	C154
		25	2.50	21.00	R	E25R0021-2525M-GX24-3	GX24-3..	C154
		25	3.00	21.00	R	E25R0021-2525M-GX24-4	GX24-4..	C154
		32	1.50	21.00	R	E32R0021-3225P-GX24-2	GX24-2..	C154
		32	2.00	21.00	R	E32R0021-3225P-GX24-3	GX24-3..	C154
		32	2.50	21.00	R	E32R0021-3225P-GX24-3	GX24-3..	C154
		32	3.00	21.00	R	E32R0021-3225P-GX24-4	GX24-4..	C154
		16	1.50	21.00	L	E16L0021-1616K-GX24-2	GX24-2..	C154
		20	1.50	21.00	L	E20L0021-2020K-GX24-2	GX24-2..	C154
		20	2.00	21.00	L	E20L0021-2020K-GX24-3	GX24-3..	C154
		20	2.50	21.00	L	E20L0021-2020K-GX24-3	GX24-3..	C154
		25	1.50	21.00	L	E25L0021-2525M-GX24-2	GX24-2..	C154
		25	2.00	21.00	L	E25L0021-2525M-GX24-3	GX24-3..	C154
		25	2.50	21.00	L	E25L0021-2525M-GX24-3	GX24-3..	C154
		25	3.00	21.00	L	E25L0021-2525M-GX24-4	GX24-4..	C154
		32	1.50	21.00	L	E32L0021-3225P-GX24-2	GX24-2..	C154
		32	2.00	21.00	L	E32L0021-3225P-GX24-3	GX24-3..	C154
		32	2.50	21.00	L	E32L0021-3225P-GX24-3	GX24-3..	C154
		32	3.00	21.00	L	E32L0021-3225P-GX24-4	GX24-4..	C154

Radius grooves – internal

Modular system – internal, assembly size 16



Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		20	R	MSS-I16R90-1.5D-N
C208		20	R	MSS-I16R90-2.5D-N

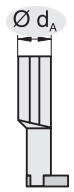
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C210		20	1.00	4.00	R	MSS-I16R04-GX09-1	GX09-1..	C154
		20	1.20	4.00	R	MSS-I16R04-GX09-1	GX09-1..	C154
C213		20	0.80	1.78	R	MSS-I16R02-GX09-1	GX09-1..R/L	C154

		d_A [mm]	L R	Type, description
C207		20	L	MSS-I16L90-1.5D-N
C208		20	L	MSS-I16L90-2.5D-N

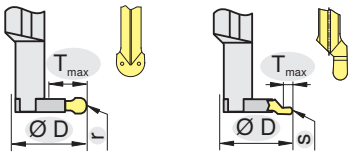
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C210		20	1.00	4.00	L	MSS-I16L04-GX09-1	GX09-1..	C154
		20	1.20	4.00	L	MSS-I16L04-GX09-1	GX09-1..	C154
C213		20	0.80	1.78	L	MSS-I16L02-GX09-1	GX09-1..R/L	C154

Radius grooves – internal

Modular system – internal, assembly size 20



Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		20	R	MSS-I20R90-1.5D-N
C208		25	R	MSS-I20R90-2.5D-N

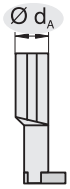
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C210		25	1.00	5.00	R	MSS-I20R05-GX09-1	GX09-1..	C154
		25	1.20	5.00	R	MSS-I20R05-GX09-1	GX09-1..	C154
C213		25	0.80	1.78	R	MSS-I20R02-GX09-1	GX09-1..R/L	C154

		d_A [mm]	L R	Type, description
C207		20	L	MSS-I20L90-1.5D-N
C208		25	L	MSS-I20L90-2.5D-N

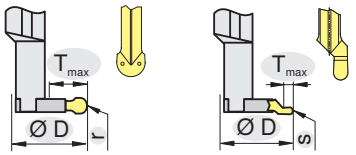
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C210		25	1.00	5.00	L	MSS-I20L05-GX09-1	GX09-1..	C154
		25	1.20	5.00	L	MSS-I20L05-GX09-1	GX09-1..	C154
C213		25	0.80	1.78	L	MSS-I20L02-GX09-1	GX09-1..R/L	C154

Radius grooves – internal

Modular system – internal, assembly size 25



Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		25	R	MSS-I25R90-1.5D-N
C208		32	R	MSS-I25R90-2.5D-N

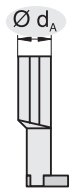
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C210		32	1.00	6.00	R	MSS-I25R06-GX09-1	GX09-1..	C154
		32	1.20	6.00	R	MSS-I25R06-GX09-1	GX09-1..	C154
C213		32	0.80	1.78	R	MSS-I25R02-GX09-1	GX09-1..R/L	C154

		d_A [mm]	L R	Type, description
C207		25	L	MSS-I25L90-1.5D-N
C208		32	L	MSS-I25L90-2.5D-N

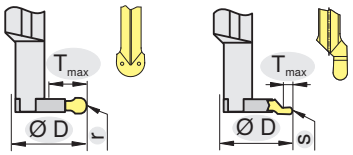
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C210		32	1.00	6.00	L	MSS-I25L06-GX09-1	GX09-1..	C154
		32	1.20	6.00	L	MSS-I25L06-GX09-1	GX09-1..	C154
C213		32	0.80	1.78	L	MSS-I25L02-GX09-1	GX09-1..R/L	C154

Radius grooves – internal

Modular system – internal, assembly size 32



Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		32	R	MSS-I32R90-1.5D-N
C208		40	R	MSS-I32R90-2.5D-N
C209		40	R	UT40-MSS-I32R90-2D

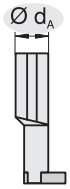
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C211		40	1.50	9.00	R	MSS-I32R09-GX16-2	GX16-2..	C154
		40	2.00	9.00	R	MSS-I32R09-GX16-3	GX16-3..	C154
		40	2.50	9.00	R	MSS-I32R09-GX16-3	GX16-3..	C154
		40	3.00	9.00	R	MSS-I32R09-GX16-4	GX16-4..	C154
C214		40	0.80	1.78	R	MSS-I32R03-GX16-2	GX16-2..R/L	C154
		40	1.00	2.18	R	MSS-I32R03-GX16-2	GX16-2..R/L	C154
		40	1.20	2.58	R	MSS-I32R03-GX16-2	GX16-2..R/L	C154

		d_A [mm]	L R	Type, description
C207		32	L	MSS-I32L90-1.5D-N
C208		40	L	MSS-I32L90-2.5D-N
C209		50	L	UT50-MSS-I32L90-2D

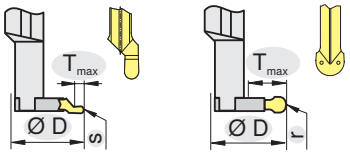
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C211		40	1.50	9.00	L	MSS-I32L09-GX16-2	GX16-2..	C154
		40	2.00	9.00	L	MSS-I32L09-GX16-3	GX16-3..	C154
		40	2.50	9.00	L	MSS-I32L09-GX16-3	GX16-3..	C154
		40	3.00	9.00	L	MSS-I32L09-GX16-4	GX16-4..	C154
C214		40	0.80	1.78	L	MSS-I32L03-GX16-2	GX16-2..R/L	C154
		40	1.00	2.18	L	MSS-I32L03-GX16-2	GX16-2..R/L	C154
		40	1.20	2.58	L	MSS-I32L03-GX16-2	GX16-2..R/L	C154

Radius grooves – internal

Modular system – internal, assembly size 40



Matching products see right-hand side.

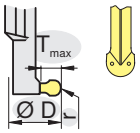


		d_A [mm]	L R	Type, description
C207		40	R	MSS-I40R90-1.5D-N
C208		50	R	MSS-I40R90-2.5D-N

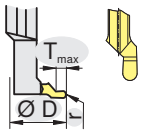
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C211		50	1.50	10.00	R	MSS-I40R10-GX16-2	GX16-2..	C154
		50	2.00	10.00	R	MSS-I40R10-GX16-3	GX16-3..	C154
		50	2.50	10.00	R	MSS-I40R10-GX16-3	GX16-3..	C154
		50	3.00	10.00	R	MSS-I40R10-GX16-4	GX16-4..	C154
C212		60	1.50	19.00	N	MSS-I40N19-GX24-2	GX24-2..	C154
		60	2.00	19.00	N	MSS-I40N19-GX24-3	GX24-3..	C154
		60	2.50	19.00	N	MSS-I40N19-GX24-3	GX24-3..	C154
		60	3.00	19.00	N	MSS-I40N19-GX24-4	GX24-4..	C154
C214		50	0.80	1.78	R	MSS-I40R03-GX16-2	GX16-2..R/L	C154
		50	1.00	2.18	R	MSS-I40R03-GX16-2	GX16-2..R/L	C154
		50	1.20	2.58	R	MSS-I40R03-GX16-2	GX16-2..R/L	C154

		d_A [mm]	L R	Type, description
C207		40	L	MSS-I40L90-1.5D-N
C208		50	L	MSS-I40L90-2.5D-N
C209		40	L	UT40-MSS-I40L90-2D

		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C211		50	1.50	10.00	L	MSS-I40L10-GX16-2	GX16-2..	C154
		50	2.00	10.00	L	MSS-I40L10-GX16-3	GX16-3..	C154
		50	2.50	10.00	L	MSS-I40L10-GX16-3	GX16-3..	C154
		50	3.00	10.00	L	MSS-I40L10-GX16-4	GX16-4..	C154
C212		60	1.50	19.00	N	MSS-I40N19-GX24-2	GX24-2..	C154
		60	2.00	19.00	N	MSS-I40N19-GX24-3	GX24-3..	C154
		60	2.50	19.00	N	MSS-I40N19-GX24-3	GX24-3..	C154
		60	3.00	19.00	N	MSS-I40N19-GX24-4	GX24-4..	C154
C214		50	0.80	1.78	L	MSS-I40L03-GX16-2	GX16-2..R/L	C154
		50	1.00	2.18	L	MSS-I40L03-GX16-2	GX16-2..R/L	C154
		50	1.20	2.58	L	MSS-I40L03-GX16-2	GX16-2..R/L	C154



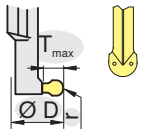
		d_A [mm]	l_2 [mm]	D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C215		16	30	16	1.00	7.00	R	I12R90-2.5D-GX09	GX09-1..	C154
		16	30	16	1.20	7.00	R	I12R90-2.5D-GX09	GX09-1..	C154
		16	30	16	1.00	7.00	L	I12L90-2.5D-GX09	GX09-1..	C154
		16	30	16	1.20	7.00	L	I12L90-2.5D-GX09	GX09-1..	C154



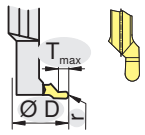
		d_A [mm]	l_2 [mm]	D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C215		16	30	16	0.80	1.78	R	I12R90-2.5D-GX09	GX09-1..R/L	C154
		16	30	16	0.80	1.78	L	I12L90-2.5D-GX09	GX09-1..R/L	C154

Radius grooves – internal

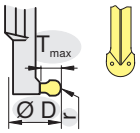
Monoblock boring bars – GX16



		d_A [mm]	l_2 [mm]	D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C216		16	32	20.5	1.50	12.00	R	I16R90-2.0D-GX16-2	GX16-2..	C154
		20	40	25.0	1.50	12.00	R	I20R90-2.0D-GX16-2	GX16-2..	C154
		25	50	32.0	1.50	12.00	R	I25R90-2.0D-GX16-2	GX16-2..	C154
		25	50	32.0	2.00	12.00	R	I25R90-2.0D-GX16-3	GX16-3..	C154
		25	50	32.0	2.50	12.00	R	I25R90-2.0D-GX16-3	GX16-3..	C154
		32	64	42.0	1.50	12.00	R	I32R90-2.0D-GX16-2	GX16-2..	C154
		32	64	42.0	2.00	12.00	R	I32R90-2.0D-GX16-3	GX16-3..	C154
		32	64	42.0	2.50	12.00	R	I32R90-2.0D-GX16-3	GX16-3..	C154
		16	32	20.5	1.50	12.00	L	I16L90-2.0D-GX16-2	GX16-2..	C154
		20	40	25.0	1.50	12.00	L	I20L90-2.0D-GX16-2	GX16-2..	C154
		25	50	32.0	1.50	12.00	L	I25L90-2.0D-GX16-2	GX16-2..	C154
		25	50	32.0	2.00	12.00	L	I25L90-2.0D-GX16-3	GX16-3..	C154
		25	50	32.0	2.50	12.00	L	I25L90-2.0D-GX16-3	GX16-3..	C154
		32	64	42.0	1.50	12.00	L	I32L90-2.0D-GX16-2	GX16-2..	C154
		32	64	42.0	2.00	12.00	L	I32L90-2.0D-GX16-3	GX16-3..	C154
		32	64	42.0	2.50	12.00	L	I32L90-2.0D-GX16-3	GX16-3..	C154



		d_A [mm]	l_2 [mm]	D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C216		16	32	20.5	0.80	1.78	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C154
		16	32	20.5	1.00	2.18	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C154
		16	32	20.5	1.20	2.58	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C154
		20	40	25.0	0.80	1.78	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C154
		20	40	25.0	1.00	2.18	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C154
		20	40	25.0	1.20	2.58	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C154
		25	50	32.0	0.80	1.78	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C154
		25	50	32.0	1.00	2.18	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C154
		25	50	32.0	1.20	2.58	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C154
		32	64	42.0	0.80	1.78	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C154
		32	64	42.0	1.00	2.18	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C154
		32	64	42.0	1.20	2.58	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C154
		16	32	20.5	0.80	1.78	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C154
		16	32	20.5	1.00	2.18	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C154
		16	32	20.5	1.20	2.58	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C154
		20	40	25.0	0.80	1.78	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C154
		20	40	25.0	1.00	2.18	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C154
		20	40	25.0	1.20	2.58	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C154
		25	50	32.0	0.80	1.78	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C154
		25	50	32.0	1.00	2.18	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C154
		25	50	32.0	1.20	2.58	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C154
		32	64	42.0	0.80	1.78	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C154
		32	64	42.0	1.00	2.18	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C154
		32	64	42.0	1.20	2.58	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C154

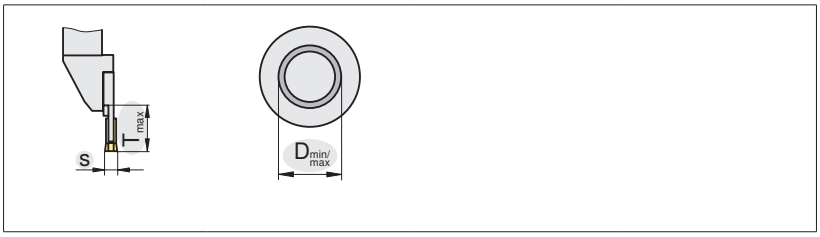


		d_A [mm]	l_2 [mm]	D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C217		32	64	42.0	1.50	21.00	R	I32R90-2.0D-GX24-2	GX24-2..	C154
		32	64	42.0	2.00	21.00	R	I32R90-2.0D-GX24-3	GX24-3..	C154
		32	64	42.0	2.50	21.00	R	I32R90-2.0D-GX24-3	GX24-3..	C154
		32	64	47.0	3.00	21.00	R	I32R90-2.0D-GX24-4	GX24-4..	C154
		40	80	53.0	2.00	21.00	R	I40R90-2.0D-GX24-3	GX24-3..	C154
		40	80	53.0	2.50	21.00	R	I40R90-2.0D-GX24-3	GX24-3..	C154
		40	80	57.0	3.00	21.00	R	I40R90-2.0D-GX24-4	GX24-4..	C154
		32	64	42.0	1.50	21.00	L	I32L90-2.0D-GX24-2	GX24-2..	C154
		32	64	42.0	2.00	21.00	L	I32L90-2.0D-GX24-3	GX24-3..	C154
		32	64	42.0	2.50	21.00	L	I32L90-2.0D-GX24-3	GX24-3..	C154
		32	64	47.0	3.00	21.00	L	I32L90-2.0D-GX24-4	GX24-4..	C154
		40	80	53.0	2.00	21.00	L	I40L90-2.0D-GX24-3	GX24-3..	C154
		40	80	53.0	2.50	21.00	L	I40L90-2.0D-GX24-3	GX24-3..	C154
		40	80	57.0	3.00	21.00	L	I40L90-2.0D-GX24-4	GX24-4..	C154

Axial grooving

Modular system – external, assembly size 16

Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	0	16	R	MSS-E16R00-1616G

		s/s_{min}	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C183		3.00	10	5	R	MSS-E16R05-AX05	AX05..	C155

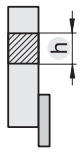
		h/d_A	L R	Type, description
C168	0	16	L	MSS-E16L00-1616G

		s/s_{min}	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C183		3.00	10	5	L	MSS-E16L05-AX05	AX05..	C155

Notes

Axial grooving

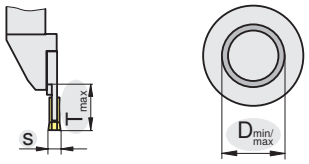
Modular system – external, assembly size 20



Matching products see right-hand side.

		h/d_A	L R	Type, description
C168	0	16	R	MSS-E20R00-1620G
		20	R	MSS-E20R00-2020J
C169	90	20	L	MSS-E20L90-2020J

		h/d_A	L R	Type, description
C168	0	16	L	MSS-E20L00-1620G
		20	L	MSS-E20L00-2020J
C169	90	20	R	MSS-E20R90-2020J

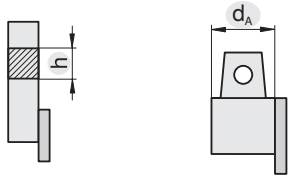


		s/s$_{min}$	s$_{max}$ [mm]	D$_{min}$ [mm]	D$_{max}$ [mm]	T$_{max}$ [mm]	L R	Type, description		
C181		2.76	3.75	50	70	14	R	MSS-E20R14-GX24-2 A50-70	GX24-2..	C151
		2.76	3.75	70	100	14	R	MSS-E20R14-GX24-2 A70-100	GX24-2..	C151
		2.76	3.75	100	150	14	R	MSS-E20R14-GX24-2 A100-150	GX24-2..	C151
C183		3.00	3.00	10		5	R	MSS-E20R05-AX05	AX05..	C155
		3.00	3.00	20		10	R	MSS-E20R10-AX10	AX10..	C155
		3.00	3.00	30		15	R	MSS-E20R15-AX15	AX15..	C155

		s/s$_{min}$	s$_{max}$ [mm]	D$_{min}$ [mm]	D$_{max}$ [mm]	T$_{max}$ [mm]	L R	Type, description		
C181		2.76	3.75	50	70	14	L	MSS-E20L14-GX24-2 A50-70	GX24-2..	C151
		2.76	3.75	70	100	14	L	MSS-E20L14-GX24-2 A70-100	GX24-2..	C151
		2.76	3.75	100	150	14	L	MSS-E20L14-GX24-2 A100-150	GX24-2..	C151
C183		3.00	3.00	10		5	L	MSS-E20L05-AX05	AX05..	C155
		3.00	3.00	20		10	L	MSS-E20L10-AX10	AX10..	C155
		3.00	3.00	30		15	L	MSS-E20L15-AX15	AX15..	C155

Axial grooving

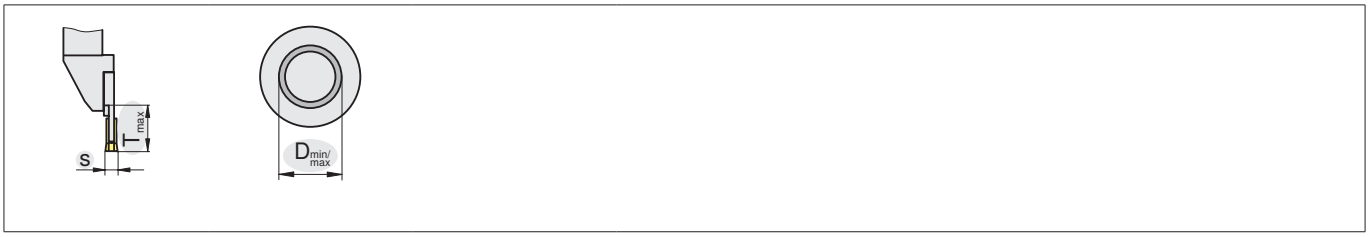
Modular system – external, assembly size 25



Matching products see right-hand side.

		h/d_A	L R	Type, description
C168	0	**25**	**R**	MSS-E25R00-2525L
C169	90	**25**	**L**	MSS-E25L90-2525L
C171	0	**100**	**R**	HSK-T100-MSS-E25R00
		63	**R**	HSK-T63-MSS-E25R00
C173	0	**40**	**R**	UT40-MSS-E25R00
		50	**R**	UT50-MSS-E25R00
		63	**R**	UT63-MSS-E25R00
C174	90	**40**	**L**	UT40-MSS-E25L90
		50	**L**	UT50-MSS-E25L90

		h/d_A	L R	Type, description
C168	0	**25**	**L**	MSS-E25L00-2525L
C169	90	**25**	**R**	MSS-E25R90-2525L
C171	0	**100**	**L**	HSK-T100-MSS-E25L00
		63	**L**	HSK-T63-MSS-E25L00
C173	0	**40**	**L**	UT40-MSS-E25L00
		50	**L**	UT50-MSS-E25L00
		63	**L**	UT63-MSS-E25L00
C174	90	**40**	**R**	UT40-MSS-E25R90
		50	**R**	UT50-MSS-E25R90

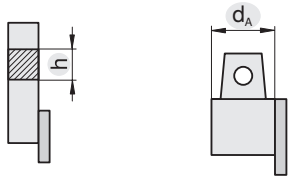


		s/s_{min}	s_{max} [mm]	D_{min} [mm]	D_{max} [mm]	T_{max} [mm]	L R	Type, description		
C181		2.76	3.75	50	70	15	R	MSS-E25R15-GX24-2 A50-70	GX24-2..	C151
		2.76	3.75	70	100	15	R	MSS-E25R15-GX24-2 A70-100	GX24-2..	C151
		2.76	3.75	100	150	15	R	MSS-E25R15-GX24-2 A100-150	GX24-2..	C151
		3.76	5.00	50	70	15	R	MSS-E25R15-GX24-3 A50-70	GX24-3..	C151
		3.76	5.00	70	100	15	R	MSS-E25R15-GX24-3 A70-100	GX24-3..	C151
		3.76	5.00	100	150	15	R	MSS-E25R15-GX24-3 A100-150	GX24-3..	C151
		3.76	5.00	150	300	15	R	MSS-E25R15-GX24-3 A150-300	GX24-3..	C151
		5.01	6.50	50	70	15	R	MSS-E25R15-GX24-4 A50-70	GX24-4..	C151
		5.01	6.50	70	100	15	R	MSS-E25R15-GX24-4 A70-100	GX24-4..	C151
		5.01	6.50	100	150	15	R	MSS-E25R15-GX24-4 A100-150	GX24-4..	C151
		5.01	6.50	150	300	15	R	MSS-E25R15-GX24-4 A150-300	GX24-4..	C151
C182		3.76	5.00	50	70	21	R	MSS-E25R21-GX24-3 AS50-70	GX24-3..	C151
		3.76	5.00	70	100	21	R	MSS-E25R21-GX24-3 AS70-100	GX24-3..	C151
		3.76	5.00	100	150	21	R	MSS-E25R21-GX24-3 AS100-150	GX24-3..	C151
		3.76	5.00	150	300	21	R	MSS-E25R21-GX24-3 AS150-300	GX24-3..	C151
		5.01	6.50	50	70	25	R	MSS-E25R25-GX24-4 AS50-70	GX24-4..	C151
		5.01	6.50	70	100	25	R	MSS-E25R25-GX24-4 AS70-100	GX24-4..	C151
		5.01	6.50	100	150	25	R	MSS-E25R25-GX24-4 AS100-150	GX24-4..	C151
		5.01	6.50	150	300	25	R	MSS-E25R25-GX24-4 AS150-300	GX24-4..	C151
C183		3.00	3.00	10		5	R	MSS-E25R05-AX05	AX05..	C155
		3.00	3.00	20		10	R	MSS-E25R10-AX10	AX10..	C155
		3.00	3.00	30		15	R	MSS-E25R15-AX15	AX15..	C155

		s/s_{min}	s_{max} [mm]	D_{min} [mm]	D_{max} [mm]	T_{max} [mm]	L R	Type, description		
C181		2.76	3.75	50	70	15	L	MSS-E25L15-GX24-2 A50-70	GX24-2..	C151
		2.76	3.75	70	100	15	L	MSS-E25L15-GX24-2 A70-100	GX24-2..	C151
		2.76	3.75	100	150	15	L	MSS-E25L15-GX24-2 A100-150	GX24-2..	C151
		3.76	5.00	50	70	15	L	MSS-E25L15-GX24-3 A50-70	GX24-3..	C151
		3.76	5.00	70	100	15	L	MSS-E25L15-GX24-3 A70-100	GX24-3..	C151
		3.76	5.00	100	150	15	L	MSS-E25L15-GX24-3 A100-150	GX24-3..	C151
		3.76	5.00	150	300	15	L	MSS-E25L15-GX24-3 A150-300	GX24-3..	C151
		5.01	6.50	50	70	15	L	MSS-E25L15-GX24-4 A50-70	GX24-4..	C151
		5.01	6.50	70	100	15	L	MSS-E25L15-GX24-4 A70-100	GX24-4..	C151
		5.01	6.50	100	150	15	L	MSS-E25L15-GX24-4 A100-150	GX24-4..	C151
		5.01	6.50	150	300	15	L	MSS-E25L15-GX24-4 A150-300	GX24-4..	C151
C182		3.76	5.00	50	70	21	L	MSS-E25L21-GX24-3 AS50-70	GX24-3..	C151
		3.76	5.00	70	100	21	L	MSS-E25L21-GX24-3 AS70-100	GX24-3..	C151
		3.76	5.00	100	150	21	L	MSS-E25L21-GX24-3 AS100-150	GX24-3..	C151
		3.76	5.00	150	300	21	L	MSS-E25L21-GX24-3 AS150-300	GX24-3..	C151
		5.01	6.50	50	70	25	L	MSS-E25L25-GX24-4 AS50-70	GX24-4..	C151
		5.01	6.50	70	100	25	L	MSS-E25L25-GX24-4 AS70-100	GX24-4..	C151
		5.01	6.50	100	150	25	L	MSS-E25L25-GX24-4 AS100-150	GX24-4..	C151
		5.01	6.50	150	300	25	L	MSS-E25L25-GX24-4 AS150-300	GX24-4..	C151
C183		3.00	3.00	10		5	L	MSS-E25L05-AX05	AX05..	C155
		3.00	3.00	20		10	L	MSS-E25L10-AX10	AX10..	C155
		3.00	3.00	30		15	L	MSS-E25L15-AX15	AX15..	C155

Axial grooving

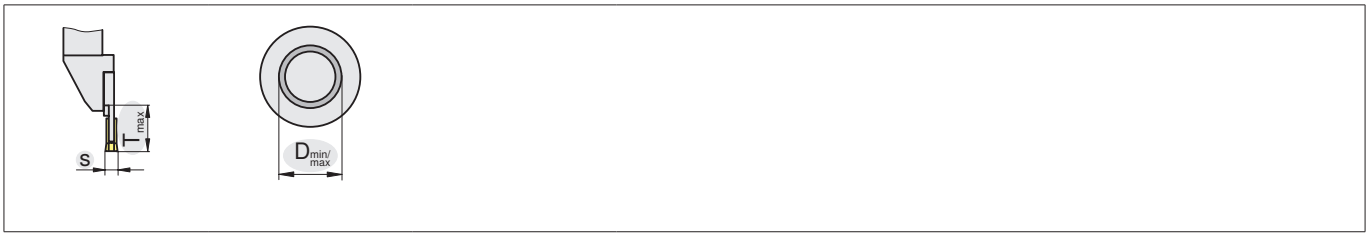
Modular system – external, assembly size 32



Matching products see right-hand side.

		h/d_A	L R	Type, description
C168	0	**32**	**R**	MSS-E32R00-3232Q
		32	**R**	MSS-E32R00-3225N
C169	90	**32**	**L**	MSS-E32L90-3225N
		32	**L**	MSS-E32L90-3232R
C171	0	**100**	**R**	HSK-T100-MSS-E32R00
		63	**R**	HSK-T63-MSS-E32R00
C172	90	**100**	**L**	HSK-T100-MSS-E32L90
		63	**L**	HSK-T63-MSS-E32L90
C173	0	**50**	**R**	UT50-MSS-E32R00
		63	**R**	UT63-MSS-E32R00

		h/d_A	L R	Type, description
C168	0	**32**	**L**	MSS-E32L00-3232Q
		32	**L**	MSS-E32L00-3225N
C169	90	**32**	**R**	MSS-E32R90-3232R
		32	**R**	MSS-E32R90-3225N
C171	0	**100**	**L**	HSK-T100-MSS-E32L00
		63	**L**	HSK-T63-MSS-E32L00
C172	90	**100**	**R**	HSK-T100-MSS-E32R90
		63	**R**	HSK-T63-MSS-E32R90
C173	0	**63**	**L**	UT63-MSS-E32L00

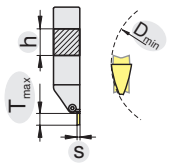


		s/s$_{min}$	s$_{max}$ [mm]	D$_{min}$ [mm]	D$_{max}$ [mm]	T$_{max}$ [mm]	L R	Type, description		
C181		3.76	5.00	70	100	15	R	MSS-E32R15-GX24-3 A70-100	GX24-3..	C151
		3.76	5.00	100	150	15	R	MSS-E32R15-GX24-3 A100-150	GX24-3..	C151
		3.76	5.00	150	300	15	R	MSS-E32R15-GX24-3 A150-300	GX24-3..	C151
		5.01	6.50	70	100	15	R	MSS-E32R15-GX24-4 A70-100	GX24-4..	C151
		5.01	6.50	100	150	15	R	MSS-E32R15-GX24-4 A100-150	GX24-4..	C151
		5.01	6.50	150	300	15	R	MSS-E32R15-GX24-4 A150-300	GX24-4..	C151
		5.01	6.50	300	900	15	R	MSS-E32R15-GX24-4 A300-900	GX24-4..	C151

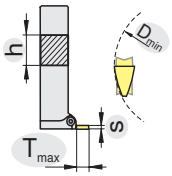
		s/s$_{min}$	s$_{max}$ [mm]	D$_{min}$ [mm]	D$_{max}$ [mm]	T$_{max}$ [mm]	L R	Type, description		
C181		3.76	5.00	70	100	15	L	MSS-E32L15-GX24-3 A70-100	GX24-3..	C151
		3.76	5.00	100	150	15	L	MSS-E32L15-GX24-3 A100-150	GX24-3..	C151
		3.76	5.00	150	300	15	L	MSS-E32L15-GX24-3 A150-300	GX24-3..	C151
		5.01	6.50	70	100	15	L	MSS-E32L15-GX24-4 A70-100	GX24-4..	C151
		5.01	6.50	100	150	15	L	MSS-E32L15-GX24-4 A100-150	GX24-4..	C151
		5.01	6.50	150	300	15	L	MSS-E32L15-GX24-4 A150-300	GX24-4..	C151
		5.01	6.50	300	900	15	L	MSS-E32L15-GX24-4 A300-900	GX24-4..	C151

Axial grooving

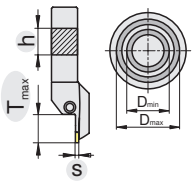
Monoblock tools – AX



		h [mm]	s [mm]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C192		16	3.0	10	5	R	E16R0005-1616L-AX05	AX05..	C155
		16	3.0	20	10	R	E16R0010-1616L-AX10	AX10..	C155
		20	3.0	10	5	R	E20R0005-2020L-AX05	AX05..	C155
		20	3.0	20	10	R	E20R0010-2020L-AX10	AX10..	C155
		20	3.0	30	15	R	E20R0015-2020L-AX15	AX15..	C155
		25	3.0	10	5	R	E25R0005-2525N-AX05	AX05..	C155
		25	3.0	20	10	R	E25R0010-2525N-AX10	AX10..	C155
		25	3.0	30	15	R	E25R0015-2525N-AX15	AX15..	C155
		16	3.0	10	5	L	E16L0005-1616L-AX05	AX05..	C155
		16	3.0	20	10	L	E16L0010-1616L-AX10	AX10..	C155
		20	3.0	10	5	L	E20L0005-2020L-AX05	AX05..	C155
		20	3.0	20	10	L	E20L0010-2020L-AX10	AX10..	C155
		20	3.0	30	15	L	E20L0015-2020L-AX15	AX15..	C155
		25	3.0	10	5	L	E25L0005-2525N-AX05	AX05..	C155
		25	3.0	20	10	L	E25L0010-2525N-AX10	AX10..	C155
		25	3.0	30	15	L	E25L0015-2525N-AX15	AX15..	C155



		h [mm]	s [mm]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C193		16	3.0	10	5	R	E16R9005-1616J-AX05	AX05..	C155
		16	3.0	20	10	R	E16R9010-1616J-AX10	AX10..	C155
		20	3.0	10	5	R	E20R9005-2020J-AX05	AX05..	C155
		20	3.0	20	10	R	E20R9010-2020J-AX10	AX10..	C155
		20	3.0	30	15	R	E20R9015-2020J-AX15	AX15..	C155
		25	3.0	10	5	R	E25R9005-2525L-AX05	AX05..	C155
		25	3.0	20	10	R	E25R9010-2525J-AX10	AX10..	C155
		25	3.0	30	15	R	E25R9015-2525L-AX15	AX15..	C155
		16	3.0	10	5	L	E16L9005-1616J-AX05	AX05..	C155
		16	3.0	20	10	L	E16L9010-1616J-AX10	AX10..	C155
		20	3.0	10	5	L	E20L9005-2020J-AX05	AX05..	C155
		20	3.0	20	10	L	E20L9010-2020J-AX10	AX10..	C155
		20	3.0	30	15	L	E20L9015-2020J-AX15	AX15..	C155
		25	3.0	10	5	L	E25L9005-2525L-AX05	AX05..	C155
		25	3.0	20	10	L	E25L9010-2525J-AX10	AX10..	C155
		25	3.0	30	15	L	E25L9015-2525L-AX15	AX15..	C155

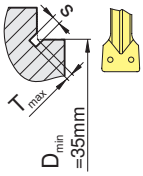


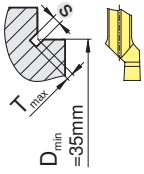
		h [mm]	s_{min} [mm]	s_{max} [mm]	D_{min} [mm]	D_{max} [mm]	T_{max} [mm]	L R	Type, description		
C191		25	2.76	3.75	40	45	12	R	E25R0012-2525X-GX24-2 AS40-45	GX24-2..	C151
		25	2.76	3.75	45	50	12	R	E25R0012-2525X-GX24-2 AS45-50	GX24-2..	C151
		25	2.76	3.75	50	60	16	R	E25R0016-2525X-GX24-2 AS50-60	GX24-2..	C151
		25	2.76	3.75	60	75	19	R	E25R0019-2525X-GX24-2 AS60-75	GX24-2..	C151
		25	2.76	3.75	75	100	19	R	E25R0019-2525X-GX24-2 AS75-100	GX24-2..	C151
		25	2.76	3.75	100	130	22	R	E25R0022-2525X-GX24-2 AS100-130	GX24-2..	C151
		25	2.76	3.75	130	180	22	R	E25R0022-2525X-GX24-2 AS130-180	GX24-2..	C151
		25	2.76	3.75	180	300	22	R	E25R0022-2525X-GX24-2 AS180-300	GX24-2..	C151
		25	3.76	5.00	40	45	12	R	E25R0012-2525X-GX24-3 AS40-45	GX24-3..	C151
		25	3.76	5.00	45	50	12	R	E25R0012-2525X-GX24-3 AS45-50	GX24-3..	C151
		25	3.76	5.00	50	60	20	R	E25R0020-2525X-GX24-3 AS50-60	GX24-3..	C151
		25	3.76	5.00	60	75	20	R	E25R0020-2525X-GX24-3 AS60-75	GX24-3..	C151
		25	3.76	5.00	75	100	22	R	E25R0022-2525X-GX24-3 AS75-100	GX24-3..	C151
		25	3.76	5.00	100	150	22	R	E25R0022-2525X-GX24-3 AS100-150	GX24-3..	C151
		25	3.76	5.00	150	300	22	R	E25R0022-2525X-GX24-3 AS150-300	GX24-3..	C151
		25	5.01	6.50	40	50	20	R	E25R0020-2525X-GX24-4 AS40-50	GX24-4..	C151
		25	5.01	6.50	50	70	22	R	E25R0022-2525X-GX24-4 AS50-70	GX24-4..	C151
		25	5.01	6.50	70	100	25	R	E25R0025-2525X-GX24-4 AS70-100	GX24-4..	C151
		25	5.01	6.50	100	150	25	R	E25R0025-2525X-GX24-4 AS100-150	GX24-4..	C151
		25	5.01	6.50	150	300	25	R	E25R0025-2525X-GX24-4 AS150-300	GX24-4..	C151
		25	2.76	3.75	40	45	12	L	E25L0012-2525X-GX24-2 AS40-45	GX24-2..	C151
		25	2.76	3.75	45	50	12	L	E25L0012-2525X-GX24-2 AS45-50	GX24-2..	C151
		25	2.76	3.75	50	60	16	L	E25L0016-2525X-GX24-2 AS50-60	GX24-2..	C151
		25	2.76	3.75	60	75	19	L	E25L0019-2525X-GX24-2 AS60-75	GX24-2..	C151
		25	2.76	3.75	75	100	19	L	E25L0019-2525X-GX24-2 AS75-100	GX24-2..	C151
		25	2.76	3.75	100	130	22	L	E25L0022-2525X-GX24-2 AS100-130	GX24-2..	C151
		25	2.76	3.75	130	180	22	L	E25L0022-2525X-GX24-2 AS130-180	GX24-2..	C151
		25	2.76	3.75	180	300	22	L	E25L0022-2525X-GX24-2 AS180-300	GX24-2..	C151
		25	3.76	5.00	40	45	12	L	E25L0012-2525X-GX24-3 AS40-45	GX24-3..	C151
		25	3.76	5.00	45	50	12	L	E25L0012-2525X-GX24-3 AS45-50	GX24-3..	C151
		25	3.76	5.00	50	60	20	L	E25L0020-2525X-GX24-3 AS50-60	GX24-3..	C151
		25	3.76	5.00	60	75	20	L	E25L0020-2525X-GX24-3 AS60-75	GX24-3..	C151
		25	3.76	5.00	75	100	22	L	E25L0022-2525X-GX24-3 AS75-100	GX24-3..	C151
		25	3.76	5.00	100	150	22	L	E25L0022-2525X-GX24-3 AS100-150	GX24-3..	C151
		25	3.76	5.00	150	300	22	L	E25L0022-2525X-GX24-3 AS150-300	GX24-3..	C151
		25	5.01	6.50	40	50	20	L	E25L0020-2525X-GX24-4 AS40-50	GX24-4..	C151
		25	5.01	6.50	50	70	22	L	E25L0022-2525X-GX24-4 AS50-70	GX24-4..	C151
		25	5.01	6.50	70	100	25	L	E25L0025-2525X-GX24-4 AS70-100	GX24-4..	C151
		25	5.01	6.50	100	150	25	L	E25L0025-2525X-GX24-4 AS100-150	GX24-4..	C151
		25	5.01	6.50	150	300	25	L	E25L0025-2525X-GX24-4 AS150-300	GX24-4..	C151

External recessing

Modular system – external, assembly size 20

Matching products see right-hand side.



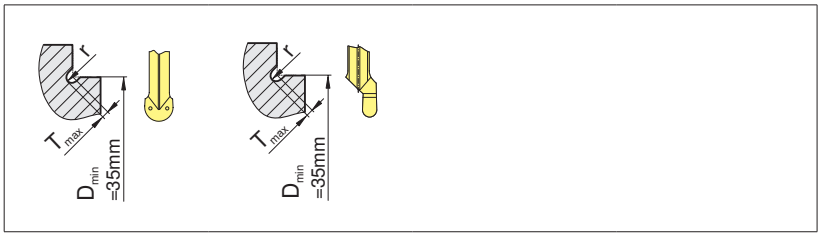


		h/d_A	L R	Type, description
C170		20	R	MSS-E20R45-2020J
	45			

		s [mm]	T_{max} [mm]	L R	Type, description		
C180		1.00	1.14	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.95	2.00	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		2.25	2.00	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		3.00	2.00	L	MSS-E20L03-GX16-2	GX16-2..	C151
		3.25	2.00	L	MSS-E20L03-GX16-2	GX16-2..	C151
		3.50	2.00	L	MSS-E20L03-GX16-2	GX16-2..	C151
		4.00	2.00	L	MSS-E20L03-GX16-2	GX16-3..	C151
		4.25	2.00	L	MSS-E20L03-GX16-2	GX16-3..	C151
		4.50	2.00	L	MSS-E20L03-GX16-2	GX16-3..	C151
		5.00	2.00	L	MSS-E20L03-GX16-2	GX16-3..	C151

		h/d_A	L R	Type, description
C170		20	L	MSS-E20L45-2020J
	45			

		s [mm]	T_{max} [mm]	L R	Type, description		
C180		1.00	1.14	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.95	2.00	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		2.25	2.00	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		3.00	2.00	R	MSS-E20R03-GX16-2	GX16-2..	C151
		3.25	2.00	R	MSS-E20R03-GX16-2	GX16-2..	C151
		3.50	2.00	R	MSS-E20R03-GX16-2	GX16-2..	C151
		4.00	2.00	R	MSS-E20R03-GX16-2	GX16-3..	C151
		4.25	2.00	R	MSS-E20R03-GX16-2	GX16-3..	C151
		4.50	2.00	R	MSS-E20R03-GX16-2	GX16-3..	C151
		5.00	2.00	R	MSS-E20R03-GX16-2	GX16-3..	C151



		h/d_A	L R	Type, description
C170	45	20	R	MSS-E20R45-2020J

		r [mm]	T_{max} [mm]	L R	Type, description		
C180		0.80	1.78	L	MSS-E20L03-GX16-2	GX16-2..R/L	C154
		1.00	2.00	L	MSS-E20L03-GX16-2	GX16-2..R/L	C154
		1.20	2.00	L	MSS-E20L03-GX16-2	GX16-2..R/L	C154
		1.50	2.00	L	MSS-E20L03-GX16-2	GX16-2..	C154
		2.00	2.00	L	MSS-E20L03-GX16-2	GX16-3..	C154
		2.50	2.00	L	MSS-E20L03-GX16-2	GX16-3..	C154

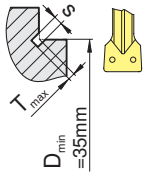
		h/d_A	L R	Type, description
C170	45	20	L	MSS-E20L45-2020J

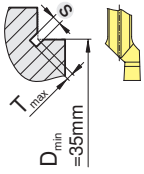
		r [mm]	T_{max} [mm]	L R	Type, description		
C180		0.80	1.78	R	MSS-E20R03-GX16-2	GX16-2..R/L	C154
		1.00	2.00	R	MSS-E20R03-GX16-2	GX16-2..R/L	C154
		1.20	2.00	R	MSS-E20R03-GX16-2	GX16-2..R/L	C154
		1.50	2.00	R	MSS-E20R03-GX16-2	GX16-2..	C154
		2.00	2.00	R	MSS-E20R03-GX16-2	GX16-3..	C154
		2.50	2.00	R	MSS-E20R03-GX16-2	GX16-3..	C154

External recessing

Modular system – external, assembly size 25

Matching products see right-hand side.



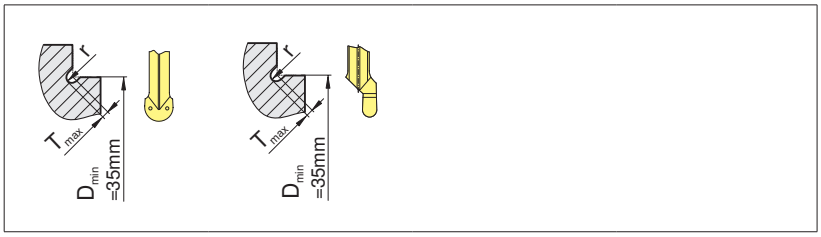


		h/d_A	L R	Type, description
C170	45	**25**	**R**	MSS-E25R45-2525L

		s [mm]	T_{max} [mm]	L R	Type, description		
C180		1.00	1.14	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.95	2.00	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		2.25	2.00	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		3.00	2.00	L	MSS-E25L03-GX16-2	GX16-2..	C151
		3.25	2.00	L	MSS-E25L03-GX16-2	GX16-2..	C151
		3.50	2.00	L	MSS-E25L03-GX16-2	GX16-2..	C151
		4.00	2.00	L	MSS-E25L03-GX16-2	GX16-3..	C151
		4.25	2.00	L	MSS-E25L03-GX16-2	GX16-3..	C151
		4.50	2.00	L	MSS-E25L03-GX16-2	GX16-3..	C151
		5.00	2.00	L	MSS-E25L03-GX16-2	GX16-3..	C151
		5.25	2.00	L	MSS-E25L03-GX16-2	GX16-4..	C151
		6.00	2.00	L	MSS-E25L03-GX16-2	GX16-4..	C151

		h/d_A	L R	Type, description
C170	45	**25**	**L**	MSS-E25L45-2525L

		s [mm]	T_{max} [mm]	L R	Type, description		
C180		1.00	1.14	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.95	2.00	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		2.25	2.00	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		3.00	2.00	R	MSS-E25R03-GX16-2	GX16-2..	C151
		3.25	2.00	R	MSS-E25R03-GX16-2	GX16-2..	C151
		3.50	2.00	R	MSS-E25R03-GX16-2	GX16-2..	C151
		4.00	2.00	R	MSS-E25R03-GX16-2	GX16-3..	C151
		4.25	2.00	R	MSS-E25R03-GX16-2	GX16-3..	C151
		4.50	2.00	R	MSS-E25R03-GX16-2	GX16-3..	C151
		5.00	2.00	R	MSS-E25R03-GX16-2	GX16-3..	C151
		5.25	2.00	R	MSS-E25R03-GX16-2	GX16-4..	C151
		6.00	2.00	R	MSS-E25R03-GX16-2	GX16-4..	C151



		h/d_A	L R	Type, description
C170	45	25	R	MSS-E25R45-2525L

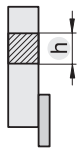
		r [mm]	T_{max} [mm]	L R	Type, description		
C180		0.80	1.78	L	MSS-E25L03-GX16-2	GX16-2..R/L	C154
		1.00	2.00	L	MSS-E25L03-GX16-2	GX16-2..R/L	C154
		1.20	2.00	L	MSS-E25L03-GX16-2	GX16-2..R/L	C154
		1.50	2.00	L	MSS-E25L03-GX16-2	GX16-2..	C154
		2.00	2.00	L	MSS-E25L03-GX16-2	GX16-3..	C154
		2.50	2.00	L	MSS-E25L03-GX16-2	GX16-3..	C154
		3.00	2.00	L	MSS-E25L03-GX16-2	GX16-4..	C154

		h/d_A	L R	Type, description
C170	45	25	L	MSS-E25L45-2525L

		r [mm]	T_{max} [mm]	L R	Type, description		
C180		0.80	1.78	R	MSS-E25R03-GX16-2	GX16-2..R/L	C154
		1.00	2.00	R	MSS-E25R03-GX16-2	GX16-2..R/L	C154
		1.20	2.00	R	MSS-E25R03-GX16-2	GX16-2..R/L	C154
		1.50	2.00	R	MSS-E25R03-GX16-2	GX16-2..	C154
		2.00	2.00	R	MSS-E25R03-GX16-2	GX16-3..	C154
		2.50	2.00	R	MSS-E25R03-GX16-2	GX16-3..	C154
		3.00	2.00	R	MSS-E25R03-GX16-2	GX16-4..	C154

Thread turning – external

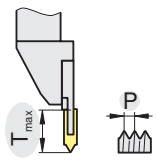
Modular system – external, assembly size 20



Matching products see right-hand side.

		h/d_A	L R	Type, description
C168	0	**20**	**R**	MSS-E20R00-2020J
		16	**R**	MSS-E20R00-1620G
C169	90	**20**	**L**	MSS-E20L90-2020J

		h/d_A	L R	Type, description
C168	0	**20**	**L**	MSS-E20L00-2020J
		16	**L**	MSS-E20L00-1620G
C169	90	**20**	**R**	MSS-E20R90-2020J

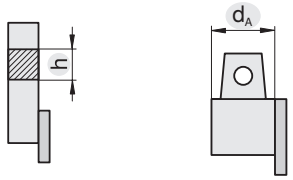


		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	L R	Type, description		
C218		0.50	1.50	48	16	8	R	MSS-E20R-TC16-1	TC16-1..	C161
		1.75	3.00	14	8	12	N	MSS-E20N-TC16-2	TC16-2..	C161

		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	L R	Type, description		
C218		0.50	1.50	48	16	8	L	MSS-E20L-TC16-1	TC16-1..	C161
		1.75	3.00	14	8	12	N	MSS-E20N-TC16-2	TC16-2..	C161

Thread turning – external

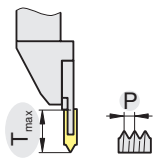
Modular system – external, assembly size 25



Matching products see right-hand side.

		h/d_A	L R	Type, description
C168	0	**25**	**R**	MSS-E25R00-2525L
C169	90	**25**	**L**	MSS-E25L90-2525L
C171	0	**100**	**R**	HSK-T100-MSS-E25R00
		63	**R**	HSK-T63-MSS-E25R00
C173	0	**63**	**R**	UT63-MSS-E25R00
		40	**R**	UT40-MSS-E25R00
		50	**R**	UT50-MSS-E25R00
C174	90	**40**	**L**	UT40-MSS-E25L90
		50	**L**	UT50-MSS-E25L90

		h/d_A	L R	Type, description
C168	0	**25**	**L**	MSS-E25L00-2525L
C169	90	**25**	**R**	MSS-E25R90-2525L
C171	0	**100**	**L**	HSK-T100-MSS-E25L00
		63	**L**	HSK-T63-MSS-E25L00
C173	0	**40**	**L**	UT40-MSS-E25L00
		50	**L**	UT50-MSS-E25L00
		63	**L**	UT63-MSS-E25L00
C174	90	**50**	**R**	UT50-MSS-E25R90
		40	**R**	UT40-MSS-E25R90

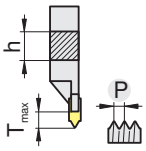


		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	L R	Type, description		
C218		0.50	1.50	48	16	8	R	MSS-E25R-TC16-1	TC16-1..	C161
		1.75	3.00	14	8	10	R	MSS-E25R-TC16-2	TC16-2..	C161
		3.50	5.00	7	5	12	N	MSS-E25N-TC16-3	TC16-3..	C161

		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	L R	Type, description		
C218		0.50	1.50	48	16	8	L	MSS-E25L-TC16-1	TC16-1..	C161
		1.75	3.00	14	8	10	L	MSS-E25L-TC16-2	TC16-2..	C161
		3.50	5.00	7	5	12	N	MSS-E25N-TC16-3	TC16-3..	C161

Thread turning – external

Monoblock tools – TC

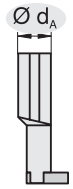


		h [mm]	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	L R	Type, description		
C219		12	0.50	3.00	48	8	10	R	E12R00-1212-TC16	TC16-1/2..	C161
		12	0.50	3.00	48	8	10	L	E12L00-1212-TC16	TC16-1/2..	C161

CERA

Thread turning – internal

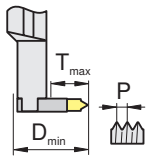
Modular system – internal, assembly size 32



Matching products see right-hand side.

		d_A [mm]	L R	Type, description
C207		32	R	MSS-I32R90-1.5D-N
C208		40	R	MSS-I32R90-2.5D-N
C209		40	R	UT40-MSS-I32R90-2D

		d_A [mm]	L R	Type, description
C207		32	L	MSS-I32L90-1.5D-N
C208		40	L	MSS-I32L90-2.5D-N
C209		50	L	UT50-MSS-I32L90-2D

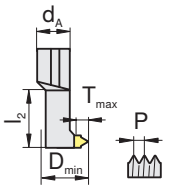


		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C220		0.50	1.50	48	16	40	7	R	MSS-I32R-TC16-1	TC16-1..	C161
		1.75	3.00	14	8	40	7	R	MSS-I32R-TC16-2	TC16-2..	C161
		3.50	5.00	7	5	40	7	N	MSS-I32N-TC16-3	TC16-3..	C161

		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C220		0.50	1.50	48	16	40	7	L	MSS-I32L-TC16-1	TC16-1..	C161
		1.75	3.00	14	8	40	7	L	MSS-I32L-TC16-2	TC16-2..	C161
		3.50	5.00	7	5	40	7	N	MSS-I32N-TC16-3	TC16-3..	C161

Thread turning – internal

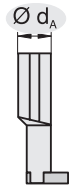
Monoblock boring bars – TC



		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	d_A [mm]	l_2 [mm]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C221		0.50	3.00	48	8	20	32	20	4	R	I16R90-2D-TC16	TC16-1/2..	C161
		0.50	5.00	48	5	25	40	25	5	R	I20R90-2D-TC16	TC16-..	C161
		0.50	5.00	48	5	32	50	32	6	R	I25R90-2D-TC16	TC16-..	C161
		0.50	3.00	48	8	20	32	20	4	L	I16L90-2D-TC16	TC16-1/2..	C161
		0.50	5.00	48	5	25	40	25	5	L	I20L90-2D-TC16	TC16-..	C161
		0.50	5.00	48	5	32	50	32	6	L	I25L90-2D-TC16	TC16-..	C161

Thread milling – external / internal

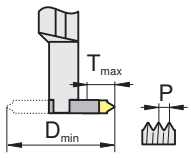
Boring bars – TC



Matching products see right-hand side.

		d_A [mm]	L R	Type, description
C207		32	R	MSS-I32R90-1.5D-N

		d_A [mm]	L R	Type, description
C208		40	R	MSS-I32R90-2.5D-N

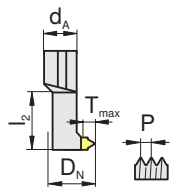


		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C220		1.75	3.00	14	8	44	7	R	MSS-I32R-TC16-2	TC16-2..	C161
		3.50	5.00	7	5	44	7	N	MSS-I32N-TC16-3	TC16-3..	C161

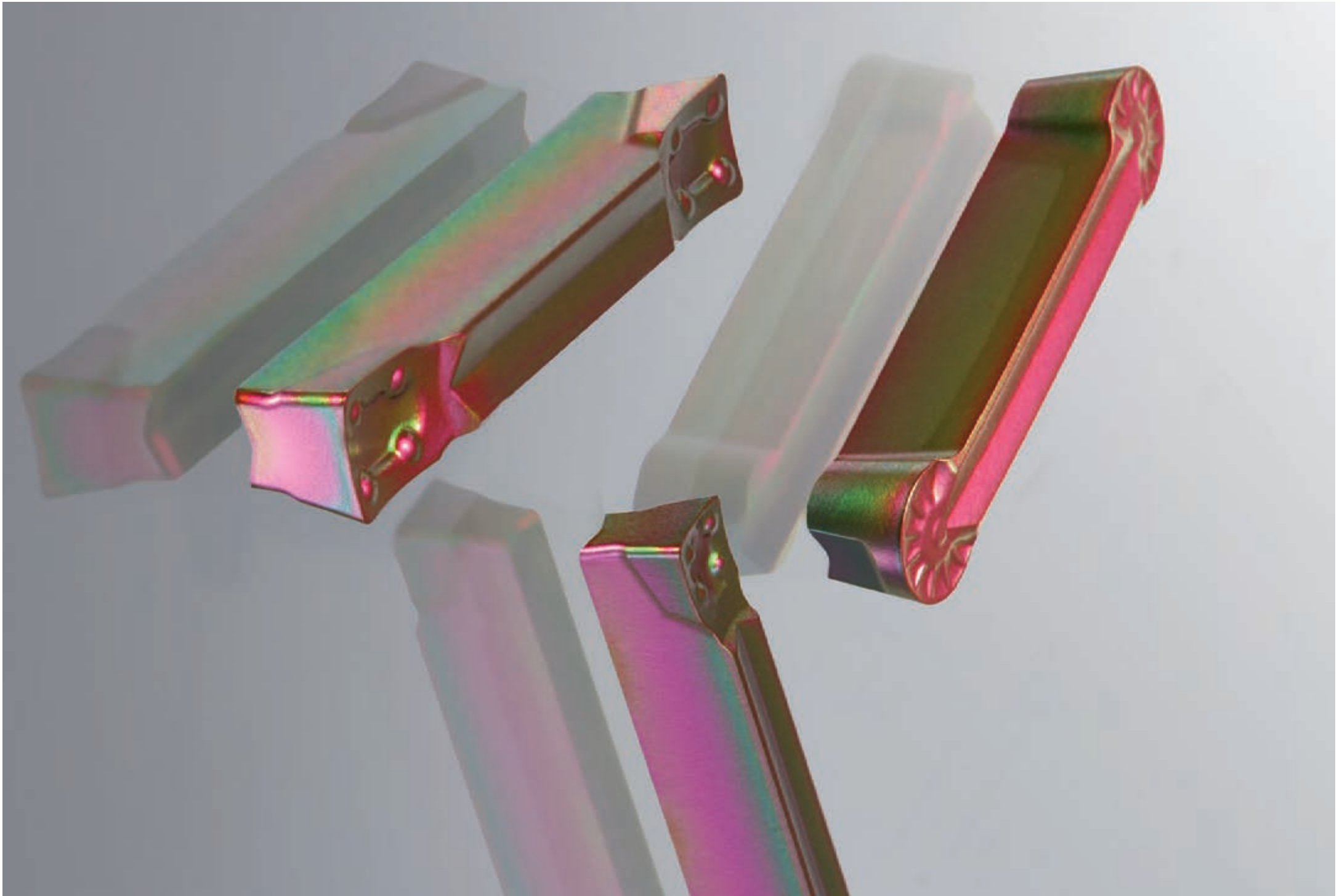
		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C220		1.75	3.00	14	8	59	7	R	MSS-I32R-TC16-2	TC16-2..	C161
		3.50	5.00	7	5	59	7	N	MSS-I32N-TC16-3	TC16-3..	C161

Thread milling – external / internal

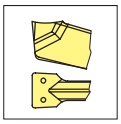
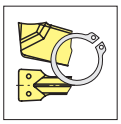
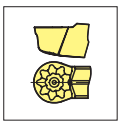
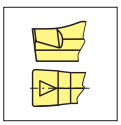
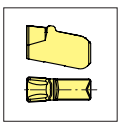
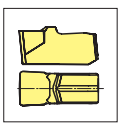
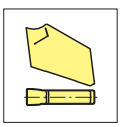
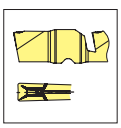
TC thread milling cutters



		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	d_A [mm]	l_2 [mm]	D_N [mm]	T_{max} [mm]	L R	Type, description		
C222		0.50	5.00	28	5	25	54	25	3.0	R	I25R90-2D-TC16-W	TC16-..	C161
		0.50	5.00	28	5	32	68	32	3.5	R	I32R90-2D-TC16-W	TC16-..	C161



Parting and grooving inserts

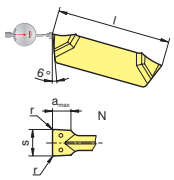
	GX-E system	C151-C152
	GX-S system	C153
	GX-R system	C154
	AX system	C155
	SX system	C156
	LX system	C157
	FX system	C158
	MaxiClick system	C159

Threading inserts

	Partial profile 60° / 55°	C160-C161
	Full profile 60° / 55°	C162-C163

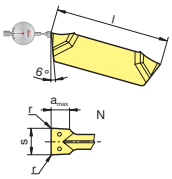
GX-E system

			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	l [mm]	r [mm]	a_{max} [mm]
P			●	●	●	●						
M			○	●	○	●						
K			●	●	●		●					
N							●					
S				●		○						
H												
-F2		GX09-1E2.00N0.20-F2		●				N	2.00	9.0	0.20	2.0
		GX09-1E2.50N0.20-F2		●				N	2.50	9.0	0.20	2.0
		GX09-2E3.00N0.30-F2		●				N	3.00	9.0	0.30	2.5
		GX16-1E2.00N0.20-F2		●				N	2.00	16.0	0.20	2.0
		GX16-2E3.00N0.30-F2		●				N	3.00	16.0	0.30	2.5
		GX16-3E4.00N0.40-F2		●				N	4.00	16.0	0.40	3.0
		GX16-3E5.00N0.40-F2		●				N	5.00	16.0	0.40	3.0
		GX24-2E3.00N0.30-F2	●	●		●		N	3.00	24.0	0.30	2.5
		GX24-2E3.50N0.30-F2				●		N	3.50	24.0	0.30	2.5
		GX24-3E4.00N0.40-F2	●	●		●		N	4.00	24.0	0.40	3.0
		GX24-3E5.00N0.40-F2	●	●		●		N	5.00	24.0	0.40	3.0
		GX24-4E6.00N0.50-F2		●		●		N	6.00	24.0	0.50	3.5
EN		GX09-1E2.00N0.20	●	●				N	2.00	9.0	0.20	1.5
		GX09-1E2.50N0.20	●	●				N	2.50	9.0	0.20	1.5
		GX09-2E3.00N0.30	●	●				N	3.00	9.0	0.30	2.0
		GX16-1E2.00N0.20	●	●	●			N	2.00	16.0	0.20	2.0
		GX16-1E2.50N0.20	●	●	●			N	2.50	16.0	0.20	2.0
		GX16-2E3.00N0.30	●	●	●			N	3.00	16.0	0.30	2.5
		GX16-2E3.00N0.50	●					N	3.00	16.0	0.50	2.5
		GX16-2E3.50N0.30	●	●	●			N	3.50	16.0	0.30	2.5
		GX16-3E4.00N0.40	●	●	●			N	4.00	16.0	0.40	3.0
		GX16-3E4.00N0.60	●					N	4.00	16.0	0.60	3.0
		GX16-3E5.00N0.40	●	●	●			N	5.00	16.0	0.40	3.0
		GX16-4E6.00N0.50	●	●				N	6.00	16.0	0.50	3.5
		GX16-4E6.00N0.80	●					N	6.00	16.0	0.80	3.5
		GX24-2E3.00N0.30	●	●	●	●		N	3.00	24.0	0.30	2.5
		GX24-3E4.00N0.40	●	●	●	●		N	4.00	24.0	0.40	3.0
		GX24-3E5.00N0.40	●	●	●	●		N	5.00	24.0	0.40	3.0
		GX24-4E6.00N0.50	●	●	●	●		N	6.00	24.0	0.50	3.5
-M40		GX09-1E2.00N0.20-M40	●	●		●		N	2.00	9.0	0.20	1.5
		GX09-2E3.00N0.30-M40	●	●		●		N	3.00	9.0	0.30	2.0
		GX16-1E2.00N0.20-M40	●	●		●		N	2.00	16.0	0.20	2.0
		GX16-2E3.00N0.30-M40	●	●		●		N	3.00	16.0	0.30	3.0
		GX16-3E4.00N0.40-M40	●	●		●		N	4.00	16.0	0.40	3.5
		GX16-3E5.00N0.40-M40	●	●		●		N	5.00	16.0	0.40	3.5
		GX16-4E6.00N0.50-M40	●	●		●		N	6.00	16.0	0.50	4.0
		GX24-2E3.00N0.30-M40	●	●		●		N	3.00	24.0	0.30	3.5
		GX24-3E4.00N0.40-M40	●	●		●		N	4.00	24.0	0.40	4.0
		GX24-3E5.00N0.40-M40	●	●		●		N	5.00	24.0	0.40	4.0
		GX24-4E6.00N0.50-M40	●	●		●		N	6.00	24.0	0.50	4.0
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s	l	r	a_{max}



C47-C62 C63-C64 C239 C227 GX C176-C178 GX-A C181-C182 GX C188-C190 GX C198 GX C210-C212 GX C215-C217

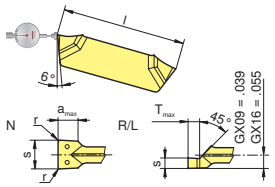
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	l [mm]	r [mm]	a_{max} [mm]
P			●	●	●	●						
M			○	●	○	●						
K			●	●	●		●					
N							●					
S				●		○						
H												
-M1		GX16-1E2.00N0.20-M1		●		●		N	2.00	16.0	0.20	2.0
		GX16-2E3.00N0.20-M1	●	●		●		N	3.00	16.0		2.5
		GX16-3E4.00N0.30-M1	●	●				N	4.00	16.0	0.30	3.0
		GX24-1E2.00N0.20-M1	●	●		●		N	2.00	24.0	0.20	2.5
		GX24-2E3.00N0.20-M1	●	●		●		N	3.00	24.0	0.20	2.5
		GX24-3E4.00N0.30-M1	●	●		●		N	4.00	24.0	0.30	3.0
-27P		GX16-1E2.00N0.20-27P					●	N	2.00	16.0	0.20	2.0
		GX16-2E3.00N0.30-27P					●	N	3.00	16.0	0.30	2.5
		GX16-3E4.00N0.40-27P					●	N	4.00	16.0	0.40	3.0
		GX16-4E6.00N0.50-27P					●	N	6.00	16.0	0.50	3.5
		GX24-2E3.00N0.30-27P					●	N	3.00	24.0	0.30	2.5
		GX24-3E4.00N0.40-27P					●	N	4.00	24.0	0.40	3.0
		GX24-3E5.00N0.40-27P					●	N	5.00	24.0	0.40	3.0
		GX24-4E6.00N0.50-27P					●	N	6.00	24.0	0.50	3.5
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s	l	r	a_{max}

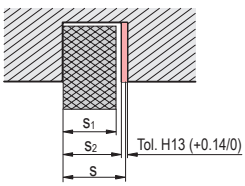


C47-C62 | C63-C64 | C239 | C227 | GX C176-C178 | GX-A C181-C182 | GX C188-C190 | GX C198 | GX C210-C212 | GX C215-C217

GX-S system

			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	s_1 [mm]	s_2 [mm]	l [mm]	r [mm]	T_{max} [mm]	a_{max} [mm]
ER-EL		GX09-1S0.60L		●				L	0.60	0.40	0.50	9.0		0.75	
		GX09-1S0.60R		●				R	0.60	0.40	0.50	9.0		0.75	
		GX09-1S0.80L		●				L	0.80	0.60	0.70	9.0		0.94	
		GX09-1S0.80R		●				R	0.80	0.60	0.70	9.0		0.94	
		GX09-1S0.90L		●				L	0.90	0.70	0.80	9.0		1.04	
		GX09-1S0.90R		●				R	0.90	0.70	0.80	9.0		1.04	
		GX09-1S1.00L		●				L	1.00	0.80	0.90	9.0		1.14	
		GX09-1S1.00R		●				R	1.00	0.80	0.90	9.0		1.14	
		GX09-1S1.20L		●				L	1.20	1.00	1.10	9.0		1.34	
		GX09-1S1.20R		●				R	1.20	1.00	1.10	9.0		1.34	
		GX09-1S1.40L		●				L	1.40	1.20	1.30	9.0		1.53	
		GX09-1S1.40R		●				R	1.40	1.20	1.30	9.0		1.53	
		GX09-1S1.70L		●				L	1.70	1.50	1.60	9.0		1.82	
		GX09-1S1.70R		●				R	1.70	1.50	1.60	9.0		1.82	
		GX16-2S0.60L		●				L	0.60	0.40	0.50	16.0		0.75	
		GX16-2S0.60R		●				R	0.60	0.40	0.50	16.0		0.75	
		GX16-2S0.80L		●				L	0.80	0.60	0.70	16.0		0.94	
		GX16-2S0.80R		●				R	0.80	0.60	0.70	16.0		0.94	
		GX16-2S0.90L		●				L	0.90	0.70	0.80	16.0		1.04	
		GX16-2S0.90R		●				R	0.90	0.70	0.80	16.0		1.04	
		GX16-2S1.00L		●				L	1.00	0.80	0.90	16.0		1.14	
		GX16-2S1.00R		●				R	1.00	0.80	0.90	16.0		1.14	
		GX16-2S1.20L		●				L	1.20	1.00	1.10	16.0		1.34	
		GX16-2S1.20R		●				R	1.20	1.00	1.10	16.0		1.34	
		GX16-2S1.40L		●				L	1.40	1.20	1.30	16.0		1.53	
		GX16-2S1.40R		●				R	1.40	1.20	1.30	16.0		1.53	
		GX16-2S1.70L		●				L	1.70	1.50	1.60	16.0		1.82	
		GX16-2S1.70R		●				R	1.70	1.50	1.60	16.0		1.82	
		GX16-2S1.95L		●				L	1.95	1.75	1.85	16.0		2.07	
		GX16-2S1.95R		●				R	1.95	1.75	1.85	16.0		2.07	
		GX16-2S2.25L		●				L	2.25	2.00	2.15	16.0		2.36	
		GX16-2S2.25R		●				R	2.25	2.00	2.15	16.0		2.36	
EN		GX09-1S1.95N		●				N	1.95	1.75	1.85	9.0	0.10	7.00	2.0
		GX09-1S2.25N		●				N	2.25	2.00	2.15	9.0	0.10	7.00	2.0
		GX09-2S2.75N		●				N	2.75	2.50	2.65	9.0	0.10	7.00	2.0
		GX09-2S3.25N		●				N	3.25	3.00	3.15	9.0	0.10	7.00	2.0
		GX16-2S2.75N		●				N	2.75	2.50	2.65	16.0	0.10	12.00	3.0
		GX16-2S3.25N		●				N	3.25	3.00	3.15	16.0	0.10	12.00	3.0
		GX16-3S4.25N		●				N	4.25	4.00	4.15	16.0	0.20	12.00	3.5
		GX16-4S5.25N		●				N	5.25	5.00	5.15	16.0	0.20	12.00	4.0
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s	s_1	s_2	l	r	T_{max}	a_{max}

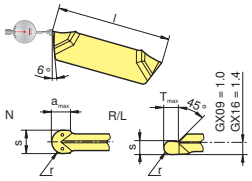




DIN 471 - 472: DIN standard for circlip grooves
s: insert width
s_1: circlip width
s_2: standard groove width H13 (+0.14/0)

C47-C62 | C63-C64 | C239 | C227 | C179-C180 | C188-C189 | C213-C214 | C215-C216

			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	l [mm]	r [mm]	T_{max} [mm]	a_{max} [mm]
P			●	●	●	●							
M			○	●	○	●							
K			●	●	●		●						
N							●						
S				●		○							
H													
ER-EL		GX09-1R0.80L	●					L	1.60	9.0	0.80	1.78	
		GX09-1R0.80R	●					R	1.60	9.0	0.80	1.78	
		GX16-2R0.80L	●					L	1.60	16.0	0.80	1.78	
		GX16-2R0.80R	●					R	1.60	16.0	0.80	1.78	
		GX16-2R1.00L	●					L	2.00	16.0	1.00	2.18	
		GX16-2R1.00R	●					R	2.00	16.0	1.00	2.18	
		GX16-2R1.20L	●					L	2.40	16.0	1.20	2.58	
		GX16-2R1.20R	●					R	2.40	16.0	1.20	2.58	
EN		GX09-1R1.00N	●					N	2.00	9.0	1.00	7.00	1.0
		GX09-1R1.20N	●					N	2.40	9.0	1.20	7.00	1.0
		GX16-2R1.50N	●	●				N	3.00	16.0	1.50	12.00	1.5
		GX16-3R2.00N	●	●				N	4.00	16.0	2.00	12.00	2.0
		GX16-3R2.50N	●	●				N	5.00	16.0	2.50	12.00	2.5
		GX16-4R3.00N	●	●				N	6.00	16.0	3.00	12.00	3.0
-M3		GX24-2R1.50N-M3	●		●			N	3.00	24.4	1.50	21.00	1.5
		GX24-3R2.00N-M3	●		●			N	4.00	24.4	2.00	21.00	2.5
		GX24-3R2.50N-M3	●		●			N	5.00	24.4	2.50	21.00	3.0
		GX24-4R3.00N-M3	●		●			N	6.00	24.4	3.00	21.00	4.0
-27P		GX16-2R1.50N-27P					●	N	3.00	16.0	1.50	12.00	1.5
		GX16-3R2.00N-27P					●	N	4.00	16.0	2.00	12.00	2.0
		GX16-3R2.50N-27P					●	N	5.00	16.0	2.50	12.00	2.5
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s	l	r	T_{max}	a_{max}

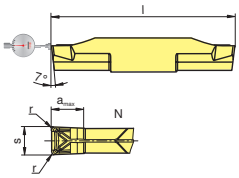


C47-C62 | C63-C64 | C239 | C227 | GX C181-C182 | GX-A C181-C182 | GX C188-C190 | GX C198 | GX C210-C214 | GX C215-C217

AX system

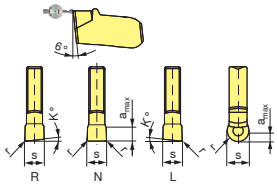
	CTCP325	CTP1340	CTCP335	CTPP345	H216T
P	●	●	●	●	
M	○	●	○	●	
K	●	●	●		●
N					●
S		●		○	
H					

			LNR	s [mm]	l [mm]	r [mm]	a_{max} [mm]
-F50		AX05-E3.00N0.30-10-F50	N	3.00	24.0	0.30	5.0
		AX10-E3.00N0.30-20-F50	N	3.00	34.0	0.30	10.0
		AX15-E3.00N0.30-30-F50	N	3.00	44.0	0.30	15.0



C47-C62
C63-C64
C239
C227
AX C183
AX C192-C193

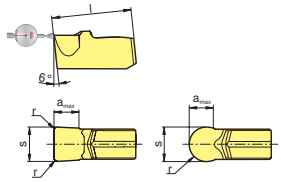
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	r [mm]	a_{max} [mm]	K [°]
P			●	●	●	●						
M			○	●	○	●						
K			●	●	●		●					
N							●					
S				●		○						
H												
-F2		SX E2.00N0.20-F2		●		●		N	2.00	0.20	1.5	
		SX E3.00N0.30-F2	●	●	●	●		N	3.00	0.30	2.0	
		SX E4.00N0.40-F2		●		●		N	4.00	0.40	2.5	
-M2		SX E2.00N0.20-M2	●	●	●	●		N	2.00	0.20	1.5	
		SX E3.00N0.30-M2	●	●	●	●		N	3.00	0.30	2.0	
		SX E4.00N0.40-M2	●	●	●	●		N	4.00	0.40	2.5	
		SX E5.00N0.40-M2	●	●	●	●		N	5.00	0.40	2.7	
		SX E6.00N0.50-M2	●	●	●	●		N	6.00	0.50	3.0	
-M3		SX R1.50N-M3		●	●			N	3.00	1.50	1.5	
		SX R2.00N-M3		●	●			N	4.00	2.00	2.0	
		SX R2.50N-M3		●	●			N	5.00	2.50	2.5	
		SX R3.00N-M3		●				N	6.00	3.00	3.0	
-M1		SX E2.00L6-M1		●				L	2.00	0.20		6
		SX E2.00N0.20-M1	●	●		●		N	2.00	0.20		
		SX E2.00R6-M1		●				R	2.00	0.20		6
		SX E3.00L6-M1	●	●				L	3.00	0.20		6
		SX E3.00N0.20-M1	●	●	●	●		N	3.00	0.20		
		SX E3.00R6-M1	●	●				R	3.00	0.20		6
		SX E4.00L6-M1		●				L	4.00	0.30		6
		SX E4.00N0.30-M1	●	●	●	●		N	4.00	0.30		
		SX E4.00R6-M1		●				R	4.00	0.30		6
		SX E5.00N0.30-M1	●	●		●		N	5.00	0.30		
		SX E6.00N0.40-M1	●	●		●		N	6.00	0.40		
-27P		SX E2.00N0.20-27P					●	N	2.00	0.20	2.0	
		SX E3.00N0.30-27P					●	N	3.00	0.30	2.5	
		SX E4.00N0.40-27P					●	N	4.00	0.40	3.0	
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s	r	a_{max}	K



C47-C62
C63-C64
C239
C227
C184
C199
C199-C201

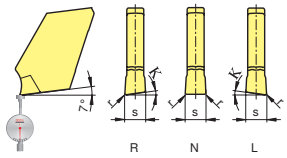
LX system

			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	l [mm]	r [mm]	a_{max} [mm]
P			●	●	●	●						
M			○	●	○	●						
K			●	●	●		●					
N							●					
S				●		○						
H												
-M2		LX E10.00N0.80-M2	●	●	●			N	10.00	19.0	0.80	5.0
		LX E8.00N0.80-M2	●	●	●			N	8.00	19.0	0.80	5.0
-M3		LX R4.00N-M3	●	●	●			N	8.00	19.0	4.00	5.0
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s	l	r	a_{max}



C47-C62 C63-C64 C239 C227 C185 C202

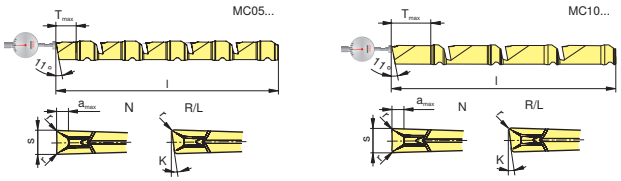
			P	M	K	N	S	H	LNR	s [mm]	r [mm]	K [°]
			CTCP325	CTP1340	CTCP335	CTPP345	H216T					
-F1		FX 2.2L5-F1		●		●			L	2.20	0.15	5
		FX 2.2N0.15-F1	●	●		●			N	2.20	0.15	
		FX 2.2R5-F1		●		●			R	2.20	0.15	5
		FX 3.1L5-F1		●		●			L	3.10	0.20	5
		FX 3.1L8-F1				●			L	3.10	0.20	8
		FX 3.1N0.20-F1	●	●		●			N	3.10	0.20	
		FX 3.1N0.40-F1	●	●		●			N	3.10	0.40	
		FX 3.1R5-F1		●		●			R	3.10	0.20	5
		FX 3.1R8-F1				●			R	3.10	0.20	8
		FX 4.1N0.20-F1		●		●			N	4.10	0.20	
		FX 4.1N0.50-F1				●			N	4.10	0.50	
-M1		FX 2.2L4-M1		●	●	●			L	2.20	0.10	4
		FX 2.2N0.10-M1	●	●	●	●			N	2.20	0.10	
		FX 2.2R4-M1		●	●	●			R	2.20	0.10	4
		FX 3.1L6-M1	●	●	●	●			L	3.10	0.15	6
		FX 3.1N0.15-M1	●	●	●	●			N	3.10	0.15	
		FX 3.1R6-M1	●	●	●	●			R	3.10	0.15	6
		FX 4.1L6-M1		●	●	●			L	4.10	0.20	6
		FX 4.1N0.20-M1	●	●	●	●			N	4.10	0.20	
		FX 4.1R6-M1		●	●	●			R	4.10	0.20	6
		FX 5.1N0.25-M1	●	●	●	●			N	5.10	0.25	
		FX 5.1R6-M1				●			R	5.10	0.25	6
		FX 6.5N0.30-M1	●	●	●				N	6.50	0.30	
		FX 8.2N0.40-M1	●	●	●				N	8.20	0.40	
		FX 9.7N0.40-M1	●	●	●				N	9.70	0.40	
-R2		FX 3.1N0.40-R2	●	●		●			N	3.10	0.40	
		FX 4.1N0.50-R2	●	●		●			N	4.10	0.50	
-27P		FX 2.2N0.10-27P					●		N	2.20	0.10	
		FX 3.1N0.15-27P					●		N	3.10	0.15	
		FX 4.1N0.15-27P					●		N	4.10	0.20	
			CTCP325	CTP1340	CTCP335	CTPP345	H216T		LNR	s	r	K



C47-C62 | C63-C64 | C239 | C227 | C186-C187 | C195 | C203

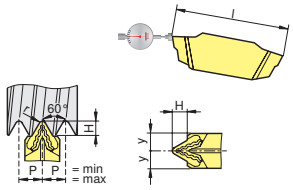
MaxiClick system

			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	l [mm]	r [mm]	a_{max} [mm]	T_{max} [mm]	K [°]
-F2		MC 05-5-1.00L07-F2		●				L	1.00	59.2	0.10		5.00	7
		MC 05-5-1.00N0.10-F2		●				N	1.00	59.2	0.10	0.5	5.00	
		MC 05-5-1.00R07-F2		●				R	1.00	59.2	0.10		5.00	7
		MC 05-5-1.50L07-F2		●				L	1.50	59.2	0.10		5.00	7
		MC 05-5-1.50N0.10-F2		●				N	1.50	59.2	0.10	0.7	5.00	
		MC 05-5-1.50R07-F2		●				R	1.50	59.2	0.10		5.00	7
		MC 10-4-1.50L07-F2		●				L	1.50	59.2	0.10		10.00	7
		MC 10-4-1.50N0.10-F2		●				N	1.50	59.2	0.10	1.0	10.00	
		MC 10-4-1.50R07-F2		●				R	1.50	59.2	0.10		10.00	7
		MC 10-4-2.00L07-F2		●				L	2.00	59.2	0.10		10.00	7
		MC 10-4-2.00N0.10-F2		●				N	2.00	59.2	0.10	1.2	10.00	
		MC 10-4-2.00R07-F2		●				R	2.00	59.2	0.10		10.00	7
		MC 10-4-2.50L07-F2		●				L	2.50	59.2	0.10		10.00	7
		MC 10-4-2.50N0.10-F2		●				N	2.50	59.2	0.10	1.5	10.00	
		MC 10-4-2.50R07-F2		●				R	2.50	59.2	0.10		10.00	7
-F3		MC 10-4-1.50L12-F3		●				L	1.50	59.2	0.10		10.00	12
		MC 10-4-1.50R12-F3		●				R	1.50	59.2	0.10		10.00	12
		MC 10-4-2.00L12-F3		●				L	2.00	59.2	0.10		10.00	12
		MC 10-4-2.00R12-F3		●				R	2.00	59.2	0.10		10.00	12
		MC 10-4-2.50L12-F3		●				L	2.50	59.2	0.10		10.00	12
		MC 10-4-2.50R12-F3		●				R	2.50	59.2	0.10		10.00	12



C47-C62 C63-C64 C239 C227 C196-C197

			H216T	GM213	GM240	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	l [mm]	r [mm]	H [mm]	y [mm]
-27P		TC16-1 EI-A60-27P	●			0.50	1.50	16	48	16.0	0.05	1.28	1.05
		TC16-2 EI-AG60-27P	●			0.50	3.00	8	48	16.0	0.05	2.58	2.15
		TC16-2 EI-G60-27P	●			1.75	3.00	8	14	16.0	0.15	2.49	2.15
		TC16-3 EI-N60-27P	●			3.50	5.00	5	7	16.0	0.25	4.11	3.10
EN		TC16-1 EI-A60		●	●	0.50	1.50	16	48	16.0	0.05	1.28	1.05
		TC16-2 EI-AG60		●	●	0.50	3.00	8	48	16.0	0.05	2.58	2.15
		TC16-2 EI-G60		●	●	1.75	3.00	8	14	16.0	0.15	2.49	2.15
		TC16-3 EI-N60		●	●	3.50	5.00	5	7	16.0	0.25	4.11	3.10
			H216T	GM213	GM240	P_{min}	P_{max}	P_{min}	P_{max}	l	r	H	y

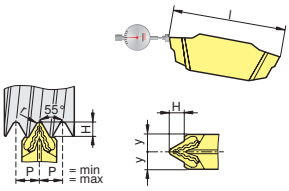


C135-C137 | C247-C259 | C227 | C218 | C219 | C220 | C221 | C222

TC system

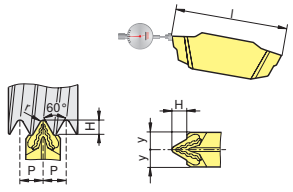
Partial profile 55°

		H216T	GM213	GM240	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	l [mm]	r [mm]	H [mm]	y [mm]
P			●	●								
M			●	●								
K		●	●									
N		●										
S												
H												
EN		TC16-1 EI-A55	●	●	0.50	1.50	16	48	16.0	0.12	1.39	1.05
		TC16-2 EI-AG55	●	●	0.50	3.00	8	48	16.0	0.12	2.92	2.15
		TC16-2 EI-G55	●	●	1.75	3.00	8	14	16.0	0.23	2.78	2.15
		TC16-3 EI-N55	●	●	3.50	5.00	5	7	16.0	0.46	4.34	3.10
			H216T	GM213	GM240	P_{min}	P_{max}	P_{min}	P_{max}	l	r	H	y



C135-C137 | C247-C259 | C227 | C218 | C219 | C219 | C221 | C222

			H216T	GM213	GM240	P_{min} [mm]	l [mm]	r [mm]	H [mm]	y [mm]
-27P		TC16-1 E 0,5 ISO-27P	●			0.50	16.0	0.05	0.33	1.05
		TC16-1 E 0,75 ISO-27P	●			0.75	16.0	0.08	0.49	1.05
		TC16-1 E 1,0 ISO-27P	●			1.00	16.0	0.12	0.64	1.05
		TC16-1 E 1,25 ISO-27P	●			1.25	16.0	0.15	0.80	1.05
		TC16-1 E 1,5 ISO-27P	●			1.50	16.0	0.18	0.96	1.05
		TC16-1 I 1,0 ISO-27P	●			1.00	16.0	0.05	0.60	1.05
		TC16-1 I 1,5 ISO-27P	●			1.50	16.0	0.08	0.89	1.05
		TC16-2 E 1,75 ISO-27P	●			1.75	16.0	0.22	1.11	2.15
		TC16-2 E 2,0 ISO-27P	●			2.00	16.0	0.25	1.27	2.15
		TC16-2 E 2,5 ISO-27P	●			2.50	16.0	0.31	1.58	2.15
		TC16-2 E 3,0 ISO-27P	●			3.00	16.0	0.38	1.90	2.15
		TC16-2 I 2,0 ISO-27P	●			2.00	16.0	0.12	1.18	2.15
		TC16-2 I 3,0 ISO-27P	●			3.00	16.0	0.19	1.76	2.15
EN		TC16-1 E 0,5 ISO		●	●	0.50	16.0	0.05	0.33	1.05
		TC16-1 E 0,75 ISO		●	●	0.75	16.0	0.08	0.49	1.05
		TC16-1 E 1,0 ISO		●	●	1.00	16.0	0.12	0.64	1.05
		TC16-1 E 1,25 ISO		●	●	1.25	16.0	0.15	0.80	1.05
		TC16-1 E 1,5 ISO		●	●	1.50	16.0	0.18	0.96	1.05
		TC16-1 I 0,5 ISO		●	●	0.50	16.0	0.02	0.30	1.05
		TC16-1 I 0,75 ISO		●	●	0.75	16.0	0.04	0.45	1.05
		TC16-1 I 1,0 ISO		●	●	1.00	16.0	0.05	0.60	1.05
		TC16-1 I 1,25 ISO		●	●	1.25	16.0	0.07	0.75	1.05
		TC16-1 I 1,5 ISO		●	●	1.50	16.0	0.08	0.89	1.05
		TC16-2 E 1,75 ISO		●	●	1.75	16.0	0.22	1.11	2.15
		TC16-2 E 2,0 ISO		●	●	2.00	16.0	0.25	1.27	2.15
		TC16-2 E 2,5 ISO		●	●	2.50	16.0	0.31	1.58	2.15
		TC16-2 E 3,0 ISO		●	●	3.00	16.0	0.38	1.90	2.15
		TC16-2 I 1,75 ISO		●	●	1.75	16.0	0.11	1.03	2.15
		TC16-2 I 2,0 ISO		●	●	2.00	16.0	0.12	1.18	2.15
		TC16-2 I 2,5 ISO		●	●	2.50	16.0	0.16	1.47	2.15
		TC16-2 I 3,0 ISO		●	●	3.00	16.0	0.19	1.76	2.15
		TC16-3 E 3,5 ISO		●	●	3.50	16.0	0.44	2.22	3.10
		TC16-3 E 4,0 ISO		●	●	4.00	16.0	0.50	2.53	3.10
		TC16-3 E 4,5 ISO		●	●	4.50	16.0	0.56	2.85	3.10
		TC16-3 E 5,0 ISO		●	●	5.00	16.0	0.63	3.16	3.10
		TC16-3 I 3,5 ISO		●	●	3.50	16.0	0.22	2.06	3.10
		TC16-3 I 4,0 ISO		●	●	4.00	16.0	0.25	2.35	3.10
		TC16-3 I 4,5 ISO		●	●	4.50	16.0	0.28	2.64	3.10
		TC16-3 I 5,0 ISO		●	●	5.00	16.0	0.31	2.94	3.10
			H216T	GM213	GM240	P_{min}	l	r	H	y

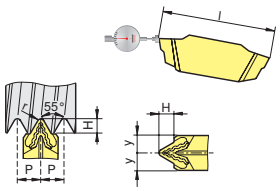


C135-C137 | C247-C259 | C227 | TC C218 | TC C219 | TC C219 | TC C221 | TC-F C222

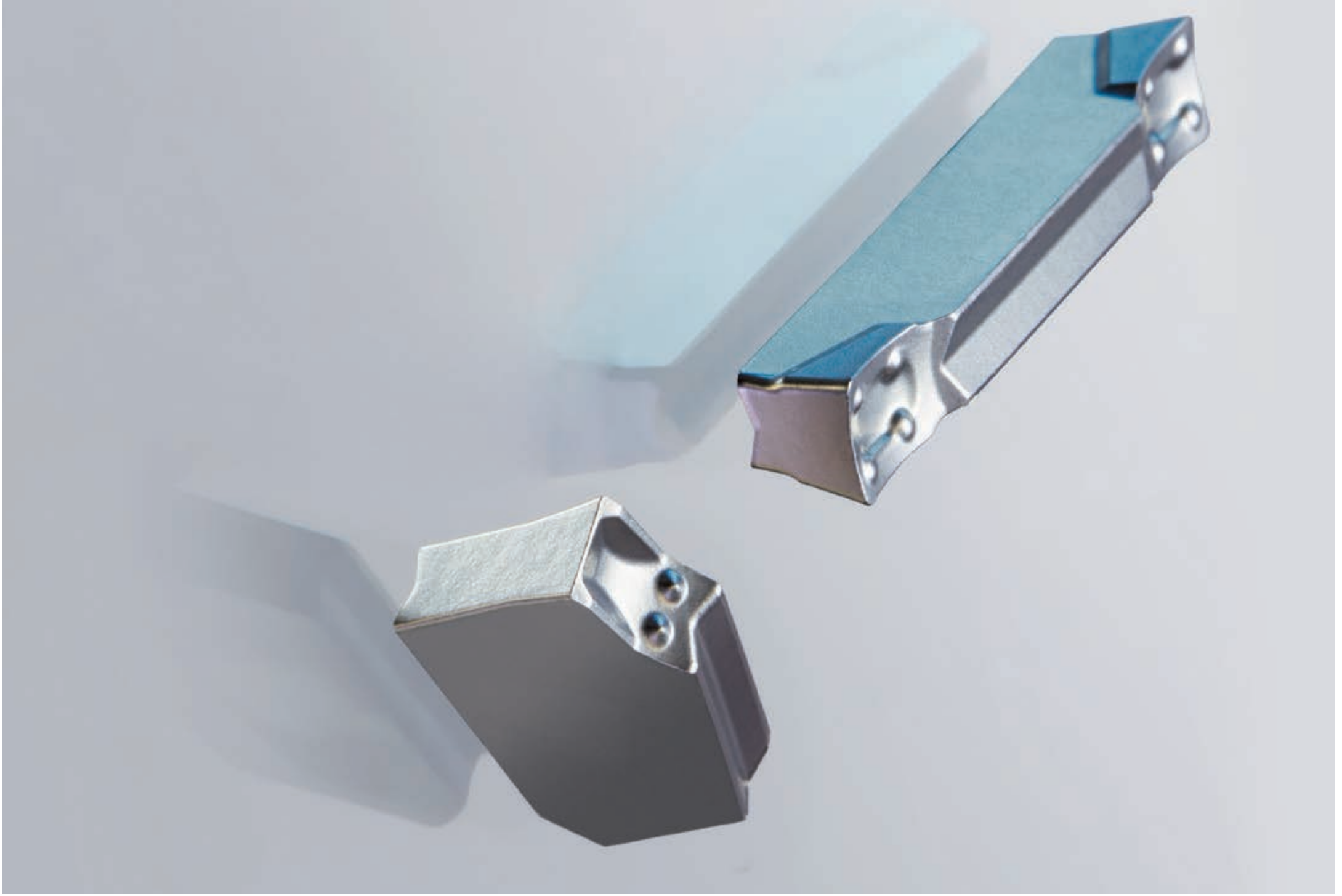
TC system

Full profile 55°

			H216T	GM213	GM240	P_{min} [TPI]	l [mm]	r [mm]	H [mm]	y [mm]
-27P		TC16-1 EI 19 W-27P	●			19	16.0	0.17	0.89	1.05
		TC16-2 EI 11 W-27P	●			11	16.0	0.29	1.54	2.15
		TC16-2 EI 14 W-27P	●			14	16.0	0.23	1.21	2.15
EN		TC16-1 EI 16 W		●	●	16	16.0	0.20	1.06	1.05
		TC16-1 EI 18 W		●	●	18	16.0	0.18	0.94	1.05
		TC16-1 EI 19 W		●	●	19	16.0	0.17	0.89	1.05
		TC16-1 EI 20 W		●	●	20	16.0	0.16	0.84	1.05
		TC16-1 EI 24 W		●	●	24	16.0	0.13	0.70	1.05
		TC16-1 EI 26 W		●	●	26	16.0	0.12	0.65	1.05
		TC16-1 EI 28 W		●	●	28	16.0	0.12	0.60	1.05
		TC16-2 EI 10 W		●	●	10	16.0	0.32	1.69	2.15
		TC16-2 EI 11 W		●	●	11	16.0	0.29	1.54	2.15
		TC16-2 EI 12 W		●	●	12	16.0	0.27	1.41	2.15
		TC16-2 EI 14 W		●	●	14	16.0	0.23	1.21	2.15
		TC16-2 EI 8 W		●	●	8	16.0	0.40	2.11	2.15
		TC16-2 EI 9 W		●	●	9	16.0	0.36	1.88	2.15
		TC16-3 EI 5 W		●	●	5	16.0	0.64	3.38	3.10
		TC16-3 EI 6 W		●		6	16.0	0.54	2.82	3.10
		TC16-3 EI 7 W		●	●	7	16.0	0.46	2.41	3.10
			H216T	GM213	GM240	P_{min}	l	r	H	y



C135-C137 C247-C259 C227 C218 C219 C219 C221 C222



Overview

Tools

Tool holders

	MSS 0°	C168
	MSS 90°	C169
	MSS 45°	C170
	HSK-T 0°	C171
	HSK-T 90°	C172
	UTS 0°	C173
	UTS 90°	C174
	Adapters	C175

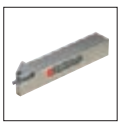
Modules - external

	GX24 axial	C181
	GX axial long	C182
	AX	C183
	SX	C184
	LX	C185
	FX	C186
	FX long	C187

Modules - external

	GX09	C176
	GX16	C177
	GX24	C178
	GX09	C179
	GX16	C180

Monoblock tool holders

	GX09	C188
	GX16	C189
	GX24	C190
	AX	C192-C193
	SX	C194
	FX	C195
	MaxiClick	C196-C197

Clamping blocks

	SBN...K	C204
	SBN...KS	C205
	HSK-T...KH	C206

Boring bars

	1.5 x D	C207
	2.5 x D	C208
	UTS 2.0 x D	C209

Blades

	GX24	C198
	SX	C199
	SX reinforced	C200-C201
	LX	C202
	FX	C203

Modules - internal

	GX09	C210
	GX16	C211
	GX24	C212
	GX09	C213
	GX16	C214

Overview

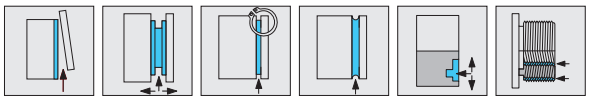
Tools

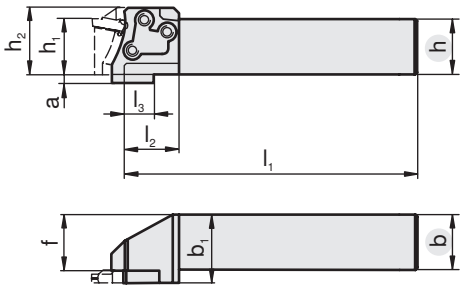
Monoblock boring bars

	GX09	C215
	GX16	C216
	GX24	C217

Threading - monoblock tools and modules

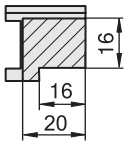
	TC16	C218
	TC monoblock	C219
	TC16	C220
	TC monoblock	C221
	TC milling cutters	C222





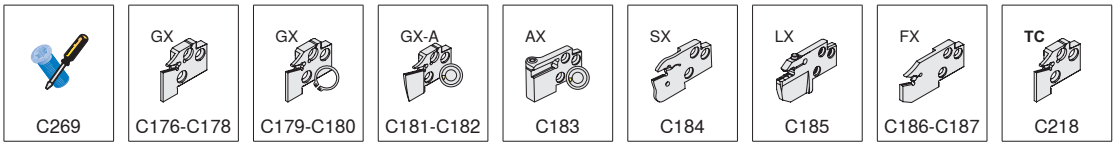
Picture shows right-hand version

Bgr. [mm]	Type, description	L NR	h [mm]	b [mm]	h_1 [mm]	h_2 [mm]	b_1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	a [mm]	f [mm]		
12	MSS-E12R00-1212E	R	12	12	12	14.5	15.25	70	12			11.75	MSS-E12R..	E01
12	MSS-E12L00-1212E	L	12	12	12	14.5	15.25	70	12			11.75	MSS-E12L..	E01
16	MSS-E16R00-1616G	R	16	16	16	19.5	19.25	90	16			15.75	MSS-E16R..	E02
16	MSS-E16L00-1616G	L	16	16	16	19.5	19.25	90	16			15.75	MSS-E16L..	E02
20	MSS-E20R00-1620G	R	16	20	16	24.0	24.25	90	20			20.15	MSS-E20R..	E03
20	MSS-E20R00-2020J	R	20	20	20	24.0	24.25	110	20			20.15	MSS-E20R..	E03
20	MSS-E20L00-1620G	L	16	20	16	24.0	24.25	90	20			20.15	MSS-E20L..	E03
20	MSS-E20L00-2020J	L	20	20	20	24.0	24.25	110	20			20.15	MSS-E20L..	E03
25	MSS-E25R00-2525L	R	25	25	25	30.0	31.00	140	25			25.50	MSS-E25R..	E04
25	MSS-E25L00-2525L	L	25	25	25	30.0	31.00	140	25			25.50	MSS-E25L..	E04
32	MSS-E32R00-3232Q	R	32	32	32	38.8	38.00	180	32	16.0	3.0	32.50	MSS-E32R..	E05
32	MSS-E32R00-3225N	R	32	25	32	38.0	31.00	160	32			25.50	MSS-E32R..	E05
32	MSS-E32L00-3232Q	L	32	32	32	38.8	38.00	180	32	16.0	3.0	32.50	MSS-E32L..	E05
32	MSS-E32L00-3225N	L	32	25	32	38.0	31.00	160	32			25.50	MSS-E32L..	E05



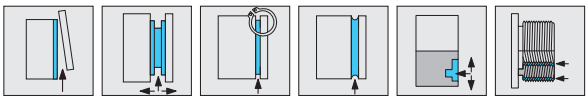
valid only for:
MSS-E20R/L00-10-E

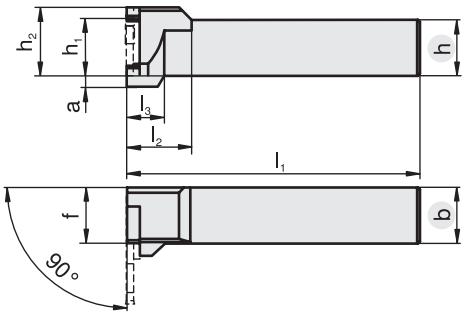
E01	228617	8095010200	
E02	228620		220983
E03	195068		220983
E04	195069		220985
E05	195070		200317



MSS shanks

90°





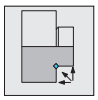
Picture shows right-hand version

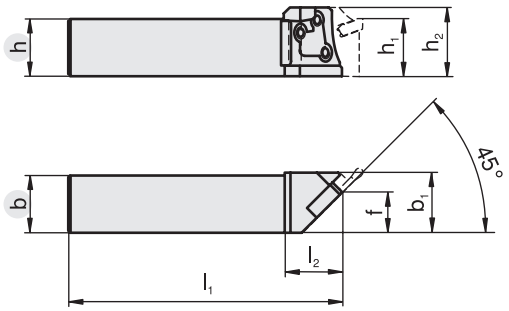
Bgr. [mm]	Type, description	L N R	h [mm]	b [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	a [mm]	f [mm]		
20	MSS-E20R90-2020J	R	20	20	20	24.0	110	20			20.00	MSS-E20L..	E01
20	MSS-E20L90-2020J	L	20	20	20	24.0	110	20			20.00	MSS-E20R..	E01
25	MSS-E25R90-2525L	R	25	25	25	30.0	140	28			25.00	MSS-E25L..	E02
25	MSS-E25L90-2525L	L	25	25	25	30.0	140	28			25.00	MSS-E25R..	E02
32	MSS-E32R90-3225N	R	32	25	32	38.0	160	34			32.00	MSS-E32L..	E03
32	MSS-E32L90-3225N	L	32	25	32	38.0	160	34			32.00	MSS-E32R..	E03
32	MSS-E32L90-3232R	L	32	32	32	38.8	200	34	19.2	3.0	32.00	MSS-E32R..	E03

Right-hand shank - left-hand module
Left-hand shank - right-hand module

E01	195068	220983
E02	195069	220985
E03	195070	200317

C269 | GX C176-C178 | GX C179-C180 | GX-A C181-C182 | AX C183 | SX C184 | LX C185 | FX C186-C187 | TC C218





Picture shows left-hand version

Bgr. [mm]	Type, description	L NR	h [mm]	b [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	a [mm]	f [mm]		
20	MSS-E20R45-2020J	R	20	20	20	24.0	110	20			14.50	MSS-E20L..	E01
20	MSS-E20L45-2020J	L	20	20	20	24.0	110	20			14.50	MSS-E20R..	E01
25	MSS-E25R45-2525L	R	25	25	25	30.0	140	25			18.00	MSS-E25L..	E02
25	MSS-E25L45-2525L	L	25	25	25	30.0	140	25			18.00	MSS-E25R..	E02

Right-hand shank - left-hand module
Left-hand shank - right-hand module

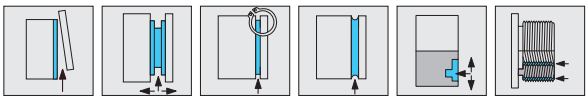
E01	219981	195068	220983
E02	219982	195069	220985

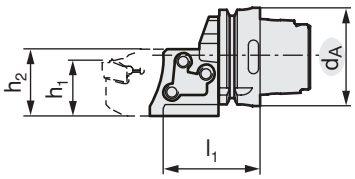
C269

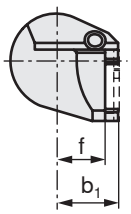
GX
C179

MSS tool holders

HSK-T 0°





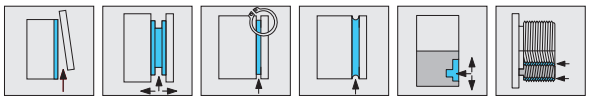


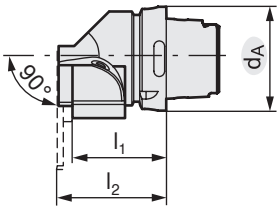
Picture shows right-hand version

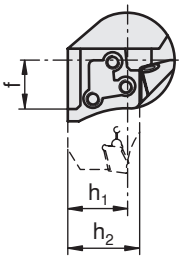
Bgr. [mm]	Type, description	L N R	d_A [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	b_1 [mm]	f [mm]		
25	HSK-T63-MSS-E25R00	R	63	25	31.3	67	44.20	38.70	MSS-E25R..	E01
25	HSK-T100-MSS-E25R00	R	100	31.2	49.0	100	54.50	49.00	MSS-E25R..	E01
25	HSK-T63-MSS-E25L00	L	63	25	31.3	67	44.20	38.70	MSS-E25L..	E01
25	HSK-T100-MSS-E25L00	L	100	31.2	49.0	100	54.50	49.00	MSS-E25L..	E01
32	HSK-T63-MSS-E32R00	R	63	35	41.0	74	44.20	38.70	MSS-E32R..	E02
32	HSK-T100-MSS-E32R00	R	100	43.8	49.8	77	54.20	48.70	MSS-E32R..	E02
32	HSK-T63-MSS-E32L00	L	63	35	41.0	74	44.20	38.70	MSS-E32L..	E02
32	HSK-T100-MSS-E32L00	L	100	43.8	49.8	77	54.20	48.70	MSS-E32L..	E02

E01	11848510	195069	220985
E02	11848510	195070	200317

C269 | GX C176-C178 | GX C179-C180 | GX-A C181-C182 | AX C183 | SX C184 | LX C185 | FX C186-C187 | TC C218







Picture shows right-hand version

Bgr. [mm]	Type, description	L NR	d_A [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
32	HSK-T63-MSS-E32R90	R	63	34.8	40.9	63.7	69.2	31.50	MSS-E32L..	E01
32	HSK-T100-MSS-E32R90	R	100	43.8	49.8	73.7	79.2	50.00	MSS-E32L..	E01
32	HSK-T63-MSS-E32L90	L	63	34.8	40.9	63.7	69.2	31.50	MSS-E32R..	E01
32	HSK-T100-MSS-E32L90	L	100	43.8	49.8	73.7	79.2	50.00	MSS-E32R..	E01

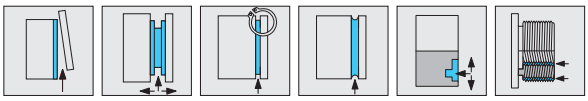
Right-hand shank - left-hand module
Left-hand shank - right-hand module

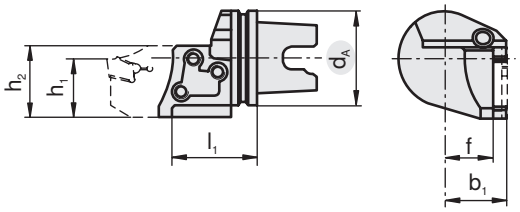
E01	11848510	195070	200317

C269 | GX C176-C178 | GX C179-C180 | GX-A C181-C182 | AX C183 | SX C184 | LX C185 | FX C186-C187 | TC C218

MSS tool holders

UTS 0°



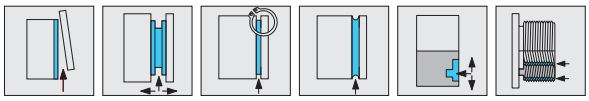


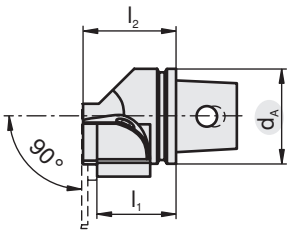
Picture shows right-hand version

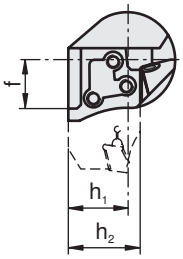
Bgr. [mm]	Type, description	L N R	d_A [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	b_1 [mm]	f [mm]		
25	UT40-MSS-E25R00	R	40	25	30.0	36	26.40	20.50	MSS-E25R..	E01
25	UT50-MSS-E25R00	R	50	25	30.0	42	31.40	25.50	MSS-E25R..	E02
25	UT63-MSS-E25R00	R	63	25	30.0	50	37.40	31.50	MSS-E25R..	E03
25	UT40-MSS-E25L00	L	40	25	30.0	36	26.40	20.50	MSS-E25L..	E01
25	UT50-MSS-E25L00	L	50	25	30.0	42	31.40	25.50	MSS-E25L..	E02
25	UT63-MSS-E25L00	L	63	25	30.0	50	37.40	31.50	MSS-E25L..	E03
32	UT50-MSS-E32R00	R	50	35	41.8	49	31.40	25.50	MSS-E32R..	E04
32	UT63-MSS-E32R00	R	63	35	41.8	50	37.40	31.50	MSS-E32R..	E05
32	UT63-MSS-E32L00	L	63	35	41.8	50	37.40	31.50	MSS-E32L..	E05

E01	201850	195069	194263	220985
E02	201850	195069	225429	220985
E03	231176	195069	225430	220985
E04	201850	195070	225429	200317
E05	231176	195070	225430	200317

C269 | GX C176-C178 | GX C179-C180 | GX-A C181-C182 | AX C183 | LX C185 | FX C186-C187 | TC C218







Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	d_A [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
25	UT40-MSS-E25R90	R	40	25	30.0	33.5	39	20.00	MSS-E25L..	E01
25	UT50-MSS-E25R90	R	50	25	30.0	43.5	49	25.00	MSS-E25L..	E02
25	UT40-MSS-E25L90	L	40	25	30.0	33.5	39	20.00	MSS-E25R..	E01
25	UT50-MSS-E25L90	L	50	25	30.0	43.5	49	25.00	MSS-E25R..	E02

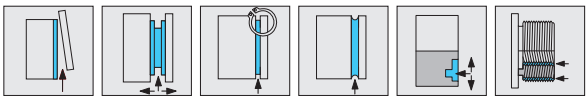
Right-hand shank - left-hand module
Left-hand shank - right-hand module

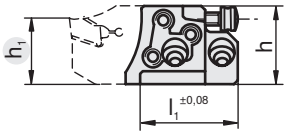
E01	201850	195069	194263	220985
E02	201850	195069	225429	220985

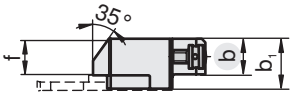
C269 | GX C176-C178 | GX C179-C180 | GX-A C181-C182 | AX C183 | SX C184 | LX C185 | FX C186-C187 | TC C218

MSS tool holders

Adapters







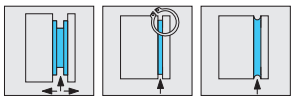
Picture shows right-hand version

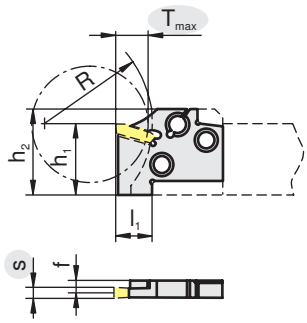
Bgr. [mm]	Type, description	L N R	h_1 [mm]	b [mm]	h [mm]	b_1 [mm]	l_1 [mm]	f [mm]		
20	MSS-E20R00-AD	R	20	10.7	24	15.3	30	11.2	MSS-E20R..	E01
20	MSS-E20L00-AD	L	20	10.7	24	15.3	30	11.2	MSS-E20L..	E01
25	MSS-E25R00-AD	R	25	12.6	30	18.6	37	13.1	MSS-E25R..	E02
25	MSS-E25L00-AD	L	25	12.6	30	18.6	37	13.1	MSS-E25L..	E02
32	MSS-E32R00-AD	R	32	14.6	38	20.6	46	15.1	MSS-E32R..	E03
32	MSS-E32L00-AD	L	32	14.6	38	20.6	46	15.1	MSS-E32L..	E03

For additional assembly dimensions see C267-C268

E01	195068	229131	220983
E02	195069	284518	220985
E03	195070	229126	200317

C269 | GX C176 | GX C179 | GX-A C181-C182 | AX C183 | SX C184 | LX C185 | FX C186-C187 | TC C218





Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]	
12	MSS-E12R07-GX09-1	R	2.00	2.75	7	12	14.5	8	3.15	18	GX09-1..
12	MSS-E12R07-GX09-2	R	2.76	3.75	7	12	14.5	8	3.15	18	GX09-2..
12	MSS-E12L07-GX09-1	L	2.00	2.75	7	12	14.5	8	3.15	18	GX09-1..
12	MSS-E12L07-GX09-2	L	2.76	3.75	7	12	14.5	8	3.15	18	GX09-2..
16	MSS-E16R07-GX09-1	R	2.00	2.75	7	16	19.5	8	3.15	24	GX09-1..
16	MSS-E16R07-GX09-2	R	2.76	3.75	7	16	19.5	8	3.15	24	GX09-2..
16	MSS-E16L07-GX09-1	L	2.00	2.75	7	16	19.5	8	3.15	24	GX09-1..
16	MSS-E16L07-GX09-2	L	2.76	3.75	7	16	19.5	8	3.15	24	GX09-2..

GX-E C151-C152

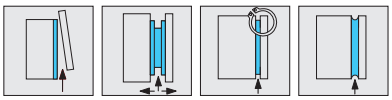
GX-S C153

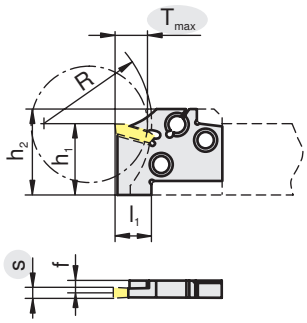
GX-R C154

C168

MSS modules – external

Grooving and turning – GX16

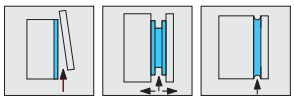


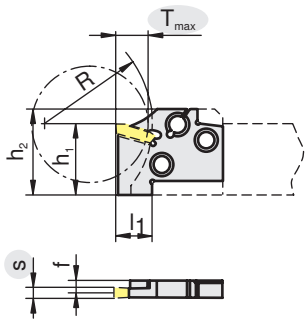


Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]	
20	MSS-E20R12-GX16-1	R	2.00	2.75	12	20	24	13	3.75	30	GX16-1..
20	MSS-E20R12-GX16-2	R	2.76	3.75	12	20	24	13	3.40	30	GX16-2..
20	MSS-E20R12-GX16-3	R	3.76	5.00	12	20	24	13	2.93	30	GX16-3..
20	MSS-E20L12-GX16-1	L	2.00	2.75	12	20	24	13	3.75	30	GX16-1..
20	MSS-E20L12-GX16-2	L	2.76	3.75	12	20	24	13	3.40	30	GX16-2..
20	MSS-E20L12-GX16-3	L	3.76	5.00	12	20	24	13	2.93	30	GX16-3..
25	MSS-E25R12-GX16-1	R	2.00	2.75	12	25	30	13	5.25	37.5	GX16-1..
25	MSS-E25R12-GX16-2	R	2.76	3.75	12	25	30	13	4.90	37.5	GX16-2..
25	MSS-E25R12-GX16-3	R	3.76	5.00	12	25	30	13	4.43	37.5	GX16-3..
25	MSS-E25R12-GX16-4	R	5.01	6.50	12	25	30	13	3.80	37.5	GX16-4..
25	MSS-E25L12-GX16-1	L	2.00	2.75	12	25	30	13	5.25	37.5	GX16-1..
25	MSS-E25L12-GX16-2	L	2.76	3.75	12	25	30	13	4.90	37.5	GX16-2..
25	MSS-E25L12-GX16-3	L	3.76	5.00	12	25	30	13	4.43	37.5	GX16-3..
25	MSS-E25L12-GX16-4	L	5.01	6.50	12	25	30	13	3.80	37.5	GX16-4..
32	MSS-E32R12-GX16-2	R	2.76	3.75	12	32	38	13	4.90	48	GX16-2..
32	MSS-E32R12-GX16-3	R	3.76	5.00	12	32	38	13	4.43	48	GX16-3..
32	MSS-E32R12-GX16-4	R	5.01	6.50	12	32	38	13	3.80	48	GX16-4..
32	MSS-E32L12-GX16-2	L	2.76	3.75	12	32	38	13	4.90	48	GX16-2..
32	MSS-E32L12-GX16-3	L	3.76	5.00	12	32	38	13	4.43	48	GX16-3..
32	MSS-E32L12-GX16-4	L	5.01	6.50	12	32	38	13	3.80	48	GX16-4..

GX-E C151 | GX-S C153 | GX-R C154 | C168 | C169 | C175 | C171+C173 | C172+C174





Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]	
20	MSS-E20R21-GX24-1	R	2.00	2.75	21	20	24	22	3.85	30	GX24-1..
20	MSS-E20R21-GX24-2	R	2.76	3.75	21	20	24	22	3.40	30	GX24-2..
20	MSS-E20R21-GX24-3	R	3.76	5.00	21	20	24	22	3.00	30	GX24-3..
20	MSS-E20L21-GX24-1	L	2.00	2.75	21	20	24	22	3.85	30	GX24-1..
20	MSS-E20L21-GX24-2	L	2.76	3.75	21	20	24	22	3.40	30	GX24-2..
20	MSS-E20L21-GX24-3	L	3.76	5.00	21	20	24	22	3.00	30	GX24-3..
25	MSS-E25R21-GX24-1	R	2.00	2.75	21	25	30	22	5.35	37.5	GX24-1..
25	MSS-E25R21-GX24-2	R	2.76	3.75	21	25	30	22	4.90	37.5	GX24-2..
25	MSS-E25R21-GX24-3	R	3.76	5.00	21	25	30	22	4.43	37.5	GX24-3..
25	MSS-E25R21-GX24-4	R	5.01	6.50	21	25	30	22	3.80	37.5	GX24-4..
25	MSS-E25R21-GX24-5	R	8.00	8.00	21	25	30	23	2.95	37.5	GX24-5..
25	MSS-E25L21-GX24-1	L	2.00	2.75	21	25	30	22	5.35	37.5	GX24-1..
25	MSS-E25L21-GX24-2	L	2.76	3.75	21	25	30	22	4.90	37.5	GX24-2..
25	MSS-E25L21-GX24-3	L	3.76	5.00	21	25	30	22	4.43	37.5	GX24-3..
25	MSS-E25L21-GX24-4	L	5.01	6.50	21	25	30	22	3.80	37.5	GX24-4..
25	MSS-E25L21-GX24-5	L	8.00	8.00	21	25	30	23	2.95	37.5	GX24-5..
32	MSS-E32R21-GX24-2	R	2.76	3.75	21	32	38	22	4.95	48	GX24-2..
32	MSS-E32R21-GX24-3	R	3.76	5.00	21	32	38	22	4.43	48	GX24-3..
32	MSS-E32R21-GX24-4	R	5.01	6.50	21	32	38	22	3.80	48	GX24-4..
32	MSS-E32L21-GX24-2	L	2.76	3.75	21	32	38	22	4.95	48	GX24-2..
32	MSS-E32L21-GX24-3	L	3.76	5.00	21	32	38	22	4.43	48	GX24-3..
32	MSS-E32L21-GX24-4	L	5.01	6.50	21	32	38	22	3.80	48	GX24-4..

GX-E C151-C152

GX-R C154

C168

C169

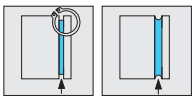
C175

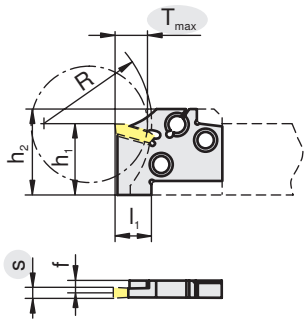
C171+C173

C172+C174

MSS modules – external

Circlip and radius grooves – GX09

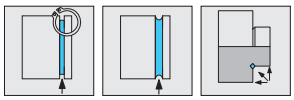


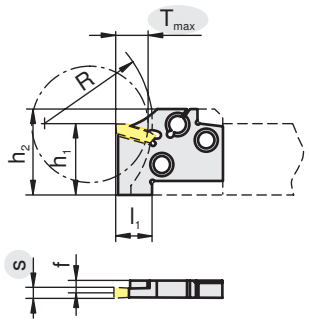


Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]	
12	MSS-E12R02-GX09-1	R	0.60	1.95	2	12	14.5	8	3.15	18	GX09-1..R/L
12	MSS-E12L02-GX09-1	L	0.60	1.95	2	12	14.5	8	3.15	18	GX09-1..R/L
16	MSS-E16R02-GX09-1	R	0.60	1.95	2	16	19.5	8	3.15	24	GX09-1..R/L
16	MSS-E16L02-GX09-1	L	0.60	1.95	2	16	19.5	8	3.15	24	GX09-1..R/L

GX-S
C153
GX-R
C154
C168





Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]	
20	MSS-E20R03-GX16-2	R	0.60	2.75	3	20	24	13	3.40	30	GX16-2..R/L
20	MSS-E20L03-GX16-2	L	0.60	2.75	3	20	24	13	3.40	30	GX16-2..R/L
25	MSS-E25R03-GX16-2	R	0.60	2.75	3	25	30	13	4.90	37.5	GX16-2..R/L
25	MSS-E25L03-GX16-2	L	0.60	2.75	3	25	30	13	4.90	37.5	GX16-2..R/L
32	MSS-E32R03-GX16-2	R	0.60	2.75	3	32	38	13	4.90	48	GX16-2..R/L
32	MSS-E32L03-GX16-2	L	0.60	2.75	3	32	38	13	4.90	48	GX16-2..R/L

GX-S C153

GX-R C154

C168

C170

C169

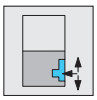
C175

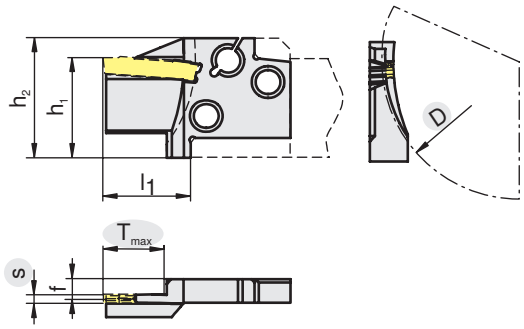
C171+C173

C172+C174

MSS modules – external

Axial grooves – GX24





Picture shows right-hand version

Bgr. [mm]	Type, description	LNR	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	D_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	
20	MSS-E20R14-GX24-2 A50-70	R	2.76	3.75	14	50	70	20	24	22	3.40	GX24-2..
20	MSS-E20R14-GX24-2 A70-100	R	2.76	3.75	14	70	100	20	24	22	3.40	GX24-2..
20	MSS-E20R14-GX24-2 A100-150	R	2.76	3.75	14	100	150	20	24	22	3.40	GX24-2..
20	MSS-E20L14-GX24-2 A50-70	L	2.76	3.75	14	50	70	20	24	22	3.40	GX24-2..
20	MSS-E20L14-GX24-2 A70-100	L	2.76	3.75	14	70	100	20	24	22	3.40	GX24-2..
20	MSS-E20L14-GX24-2 A100-150	L	2.76	3.75	14	100	150	20	24	22	3.40	GX24-2..
25	MSS-E25R15-GX24-2 A50-70	R	2.76	3.75	15	50	70	25	30	22	4.90	GX24-2..
25	MSS-E25R15-GX24-2 A100-150	R	2.76	3.75	15	100	150	25	30	22	4.90	GX24-2..
25	MSS-E25R15-GX24-2 A70-100	R	2.76	3.75	15	70	100	25	30	22	4.90	GX24-2..
25	MSS-E25R15-GX24-3 A100-150	R	3.76	5.00	15	100	150	25	30	22	4.43	GX24-3..
25	MSS-E25R15-GX24-3 A70-100	R	3.76	5.00	15	70	100	25	30	22	4.43	GX24-3..
25	MSS-E25R15-GX24-3 A150-300	R	3.76	5.00	15	150	300	25	30	22	4.43	GX24-3..
25	MSS-E25R15-GX24-3 A50-70	R	3.76	5.00	15	50	70	25	30	22	4.43	GX24-3..
25	MSS-E25R15-GX24-4 A50-70	R	5.01	6.50	15	50	70	25	30	22	3.80	GX24-4..
25	MSS-E25R15-GX24-4 A150-300	R	5.01	6.50	15	150	300	25	30	22	3.80	GX24-4..
25	MSS-E25R15-GX24-4 A100-150	R	5.01	6.50	15	100	150	25	30	22	3.80	GX24-4..
25	MSS-E25R15-GX24-4 A70-100	R	5.01	6.50	15	70	100	25	30	22	3.80	GX24-4..
25	MSS-E25L15-GX24-2 A50-70	L	2.76	3.75	15	50	70	25	30	22	4.90	GX24-2..
25	MSS-E25L15-GX24-2 A100-150	L	2.76	3.75	15	100	150	25	30	22	4.90	GX24-2..
25	MSS-E25L15-GX24-2 A70-100	L	2.76	3.75	15	70	100	25	30	22	4.90	GX24-2..
25	MSS-E25L15-GX24-3 A100-150	L	3.76	5.00	15	100	150	25	30	22	4.43	GX24-3..
25	MSS-E25L15-GX24-3 A70-100	L	3.76	5.00	15	70	100	25	30	22	4.43	GX24-3..
25	MSS-E25L15-GX24-3 A150-300	L	3.76	5.00	15	150	300	25	30	22	4.43	GX24-3..
25	MSS-E25L15-GX24-3 A50-70	L	3.76	5.00	15	50	70	25	30	22	4.43	GX24-3..
25	MSS-E25L15-GX24-4 A100-150	L	5.01	6.50	15	100	150	25	30	22	3.80	GX24-4..
25	MSS-E25L15-GX24-4 A70-100	L	5.01	6.50	15	70	100	25	30	22	3.80	GX24-4..
25	MSS-E25L15-GX24-4 A50-70	L	5.01	6.50	15	50	70	25	30	22	3.80	GX24-4..
25	MSS-E25L15-GX24-4 A150-300	L	5.01	6.50	15	150	300	25	30	22	3.80	GX24-4..
32	MSS-E32R15-GX24-3 A70-100	R	3.76	5.00	15	70	100	32	38	22	4.43	GX24-3..
32	MSS-E32R15-GX24-3 A150-300	R	3.76	5.00	15	150	300	32	38	22	4.43	GX24-3..
32	MSS-E32R15-GX24-3 A100-150	R	3.76	5.00	15	100	150	32	38	22	4.43	GX24-3..
32	MSS-E32R15-GX24-4 A70-100	R	5.01	6.50	15	70	100	32	38	22	3.80	GX24-4..
32	MSS-E32R15-GX24-4 A150-300	R	5.01	6.50	15	150	300	32	38	22	3.80	GX24-4..
32	MSS-E32R15-GX24-4 A100-150	R	5.01	6.50	15	100	150	32	38	22	4.43	GX24-4..
32	MSS-E32R15-GX24-4 A300-900	R	5.01	6.50	15	300	900	32	38	22	3.80	GX24-4..
32	MSS-E32L15-GX24-3 A150-300	L	3.76	5.00	15	150	300	32	38	22	4.43	GX24-3..
32	MSS-E32L15-GX24-3 A70-100	L	3.76	5.00	15	70	100	32	38	22	4.43	GX24-3..
32	MSS-E32L15-GX24-3 A100-150	L	3.76	5.00	15	100	150	32	38	22	4.43	GX24-3..
32	MSS-E32L15-GX24-4 A70-100	L	5.01	6.50	15	70	100	32	38	22	3.80	GX24-4..
32	MSS-E32L15-GX24-4 A300-900	L	5.01	6.50	15	300	900	32	38	22	3.80	GX24-4..
32	MSS-E32L15-GX24-4 A100-150	L	5.01	6.50	15	100	150	32	38	22	3.80	GX24-4..
32	MSS-E32L15-GX24-4 A150-300	L	5.01	6.50	15	150	300	32	38	22	3.80	GX24-4..

GX-E

C151-C152

GX-R

C154

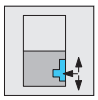
C168

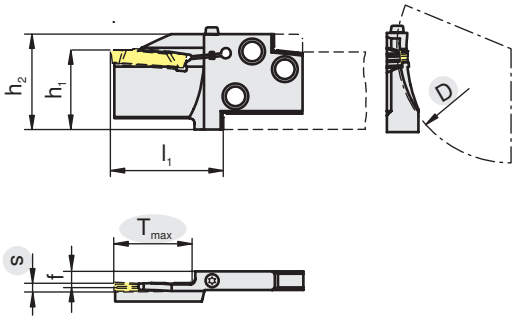
C169

C175

C171+C173

C172+C174





Picture shows right-hand version

Bgr. [mm]	Type, description	L NR	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	D_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]		
25	MSS-E25R21-GX24-3 AS100-150	R	3.76	5.00	21	100	150	25	30	35	4.43	GX24-3..	E01
25	MSS-E25R21-GX24-3 AS70-100	R	3.76	5.00	21	70	100	25	30	35	4.43	GX24-3..	E01
25	MSS-E25R21-GX24-3 AS50-70	R	3.76	5.00	21	50	70	25	30	35	4.43	GX24-3..	E01
25	MSS-E25R21-GX24-3 AS150-300	R	3.76	5.00	21	150	300	25	30	35	4.43	GX24-3..	E01
25	MSS-E25R25-GX24-4 AS100-150	R	5.01	6.50	25	100	150	25	30	35	3.80	GX24-4..	E01
25	MSS-E25R25-GX24-4 AS70-100	R	5.01	6.50	25	70	100	25	30	35	3.80	GX24-4..	E01
25	MSS-E25R25-GX24-4 AS50-70	R	5.01	6.50	25	50	70	25	30	35	3.80	GX24-4..	E01
25	MSS-E25R25-GX24-4 AS150-300	R	5.01	6.50	25	150	300	25	30	35	3.80	GX24-4..	E01
25	MSS-E25L21-GX24-3 AS50-70	L	3.76	5.00	21	50	70	25	30	35	4.43	GX24-3..	E01
25	MSS-E25L21-GX24-3 AS70-100	L	3.76	5.00	21	70	100	25	30	35	4.43	GX24-3..	E01
25	MSS-E25L21-GX24-3 AS100-150	L	3.76	5.00	21	100	150	25	30	35	4.43	GX24-3..	E01
25	MSS-E25L21-GX24-3 AS150-300	L	3.76	5.00	21	150	300	25	30	35	4.43	GX24-3..	E01
25	MSS-E25L25-GX24-4 AS50-70	L	5.01	6.50	25	50	70	25	30	35	3.80	GX24-4..	E01
25	MSS-E25L25-GX24-4 AS70-100	L	5.01	6.50	25	70	100	25	30	35	3.80	GX24-4..	E01
25	MSS-E25L25-GX24-4 AS100-150	L	5.01	6.50	25	100	150	25	30	35	3.80	GX24-4..	E01
25	MSS-E25L25-GX24-4 AS150-300	L	5.01	6.50	25	150	300	25	30	35	3.80	GX24-4..	E01

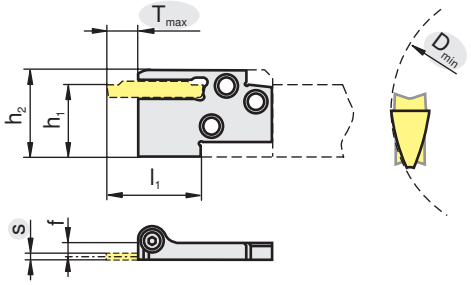
Axial modules in long version can be clamped from either side.
See pages C241-C244

E01	11081190	11149570	220983

C269 | GX-E C151-C152 | GX-R C154 | C168 | C169 | C175 | C171+C173 | C172+C174

MSS modules – external

Axial grooves – AX

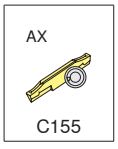


Picture shows right-hand version

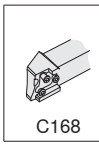
Bgr. [mm]	Type, description	L N R	s [mm]	D_{min} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]		
16	MSS-E16R05-AX05	R	3.0	10	5	16	20.5	24	2.50	AX05..	E01
16	MSS-E16L05-AX05	L	3.0	10	5	16	20.5	24	2.50	AX05..	E01
20	MSS-E20R10-AX10	R	3.0	20	10	20	25	33	3.10	AX10..	E02
20	MSS-E20R15-AX15	R	3.0	30	15	20	25	44	3.10	AX15..	E02
20	MSS-E20R05-AX05	R	3.0	10	5	20	25	28	3.10	AX05..	E02
20	MSS-E20L15-AX15	L	3.0	30	15	20	25	44	3.10	AX15..	E02
20	MSS-E20L10-AX10	L	3.0	20	10	20	25	33	3.10	AX10..	E02
20	MSS-E20L05-AX05	L	3.0	10	5	20	25	28	3.10	AX05..	E02
25	MSS-E25R10-AX10	R	3.0	20	10	25	30	32.5	4.60	AX10..	E03
25	MSS-E25R05-AX05	R	3.0	10	5	25	30	27.5	4.60	AX05..	E03
25	MSS-E25R15-AX15	R	3.0	30	15	25	30	43.5	4.60	AX15..	E03
25	MSS-E25L15-AX15	L	3.0	30	15	25	30	43.5	4.60	AX15..	E03
25	MSS-E25L10-AX10	L	3.0	20	10	25	30	32.5	4.60	AX10..	E03
25	MSS-E25L05-AX05	L	3.0	10	5	25	30	27.5	4.60	AX05..	E03

E01	228620	220983
E02	195068	220983
E03	195069	220985

C269

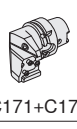


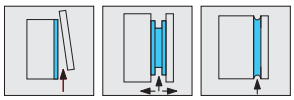
C155

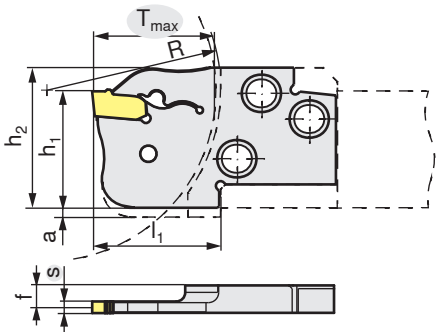

C168

C169

C175


C171+C173

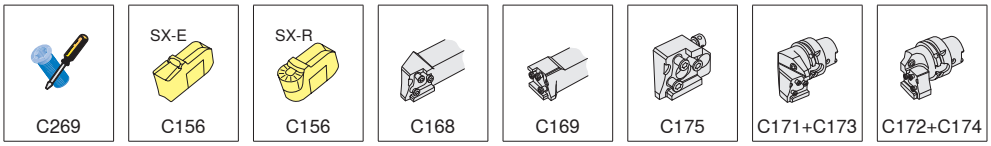




Picture shows right-hand version

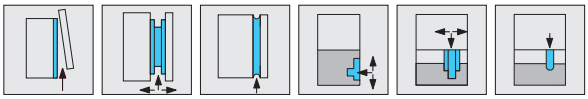
Bgr. [mm]	Type, description	L N R	s [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	a [mm]	R [mm]		
20	MSS-E20R20-SX2	R	2.0	20	20	24	22	3.57	3	30	SX..2	E01
20	MSS-E20R20-SX3	R	3.0	20	20	24	22	3.20	3	30	SX..3	E01
20	MSS-E20L20-SX2	L	2.0	20	20	24	22	3.57	3	30	SX..2	E01
20	MSS-E20L20-SX3	L	3.0	20	20	24	22	3.20	3	30	SX..3	E01
25	MSS-E25R20-SX2	R	2.0	20	25	30	22	5.07		37.5	SX..2	E01
25	MSS-E25R25-SX3	R	3.0	25	25	30	27	4.70		37.5	SX..3	E01
25	MSS-E25R35-SX3	R	3.0	35	25	30	37	4.70		37.5	SX..3	E01
25	MSS-E25R25-SX4	R	4.0	25	25	30	27	4.30		37.5	SX..4	E02
25	MSS-E25R35-SX4	R	4.0	35	25	30	37	4.30		37.5	SX..4	E02
25	MSS-E25L20-SX2	L	2.0	20	25	30	22	5.07		37.5	SX..2	E01
25	MSS-E25L25-SX3	L	3.0	25	25	30	27	4.70		37.5	SX..3	E01
25	MSS-E25L35-SX3	L	3.0	35	25	30	37	4.70		37.5	SX..3	E01
25	MSS-E25L25-SX4	L	4.0	25	25	30	27	4.30		37.5	SX..4	E02
25	MSS-E25L35-SX4	L	4.0	35	25	30	37	4.30		37.5	SX..4	E02
32	MSS-E32R35-SX3	R	3.0	35	32	38	37	4.70		48	SX..3	E01
32	MSS-E32R35-SX4	R	4.0	35	32	38	37	4.30		48	SX..4	E02
32	MSS-E32L35-SX3	L	3.0	35	32	38	37	4.70		48	SX..3	E01
32	MSS-E32L35-SX4	L	4.0	35	32	38	37	4.30		48	SX..4	E02

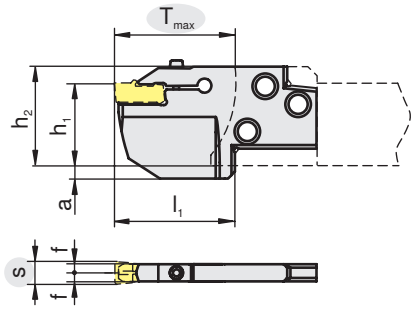
E01	11366865
E02	11366866



MSS modules – external

Grooving and turning – LX



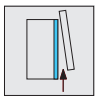


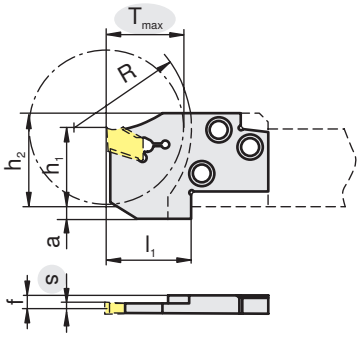
Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	a [mm]		
32	MSS-E32N25-LX	N	8.00	10.00	25	32	38.75	27	3.40	5.25	LX..	E01
32	MSS-E32N32-LX	N	8.00	10.00	32	32	38.75	34	3.40	5.25	LX..	E01
32	MSS-E32N45-LX	N	8.00	10.00	45	32	38.75	47	3.40	5.25	LX..	E01

E01	11007006	11149571	220985

C269	LX-E C157	LX-R C157	C168	C169	C175	C175	C171+C173	C172+C174





Picture shows right-hand version

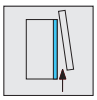
Bgr. [mm]	Type, description	L NR	s [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	a [mm]	R [mm]		
20	MSS-E20R20-FX2.2	R	2.2	20	20	24	22	3.58	3	30	FX 2.2..	E01
20	MSS-E20R20-FX3.1	R	3.1	20	20	24	22	3.20	3	30	FX 3.1..	E02
20	MSS-E20R20-FX4.1	R	4.1	20	20	24	22	2.80	3	30	FX 4.1..	E02
20	MSS-E20L20-FX2.2	L	2.2	20	20	24	22	3.58	3	30	FX 2.2..	E01
20	MSS-E20L20-FX3.1	L	3.1	20	20	24	22	3.20	3	30	FX 3.1..	E02
20	MSS-E20L20-FX4.1	L	4.1	20	20	24	22	2.80	3	30	FX 4.1..	E02
25	MSS-E25R20-FX2.2	R	2.2	20	25	30	22	5.08		37.5	FX 2.2..	E01
25	MSS-E25R25-FX3.1	R	3.1	25	25	30	27	4.70		37.5	FX 3.1..	E02
25	MSS-E25R25-FX4.1	R	4.1	25	25	30	27	4.30		37.5	FX 4.1..	E02
25	MSS-E25R25-FX5.1	R	5.1	25	25	30	27	3.90		37.5	FX 5.1..	E02
25	MSS-E25R25-FX6.5	R	6.5	25	25	30	27	3.30		37.5	FX 6.5..	E02
25	MSS-E25L20-FX2.2	L	2.2	20	25	30	22	5.08		37.5	FX 2.2..	E01
25	MSS-E25L25-FX3.1	L	3.1	25	25	30	27	4.70		37.5	FX 3.1..	E02
25	MSS-E25L25-FX4.1	L	4.1	25	25	30	27	4.30		37.5	FX 4.1..	E02
25	MSS-E25L25-FX5.1	L	5.1	25	25	30	27	3.90		37.5	FX 5.1..	E02
25	MSS-E25L25-FX6.5	L	6.5	25	25	30	27	3.30		37.5	FX 6.5..	E02
32	MSS-E32R32-FX3.1	R	3.1	32	32	38	34	4.70		48	FX 3.1..	E02
32	MSS-E32R32-FX4.1	R	4.1	32	32	38	34	4.30		48	FX 4.1..	E02
32	MSS-E32R32-FX5.1	R	5.1	32	32	38	34	3.90		48	FX 5.1..	E02
32	MSS-E32R32-FX6.5	R	6.5	32	32	38	34	3.30		48	FX 6.5..	E02
32	MSS-E32L32-FX3.1	L	3.1	32	32	38	34	4.70		48	FX 3.1..	E02
32	MSS-E32L32-FX4.1	L	4.1	32	32	38	34	4.30		48	FX 4.1..	E02
32	MSS-E32L32-FX5.1	L	5.1	32	32	38	34	3.90		48	FX 5.1..	E02
32	MSS-E32L32-FX6.5	L	6.5	32	32	38	34	3.30		48	FX 6.5..	E02

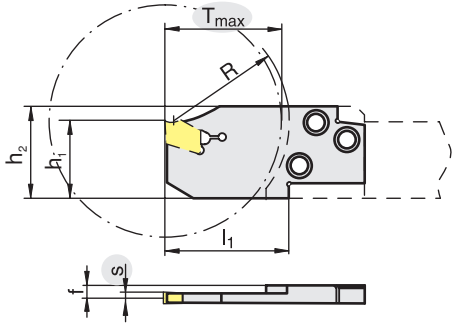
E01	154461
E02	154463

C269 C158 C168 C169 C175 C171+C173 C172+C174

MSS modules – external

Part-off – FX long



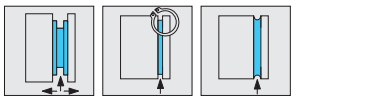


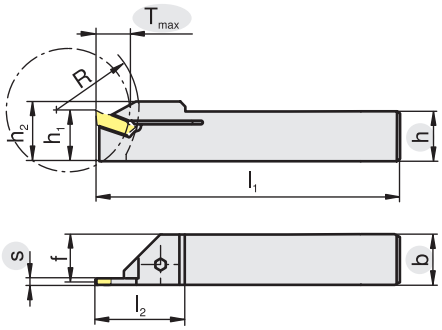
Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]		
25	MSS-E25R35-FX3.1	R	3.1	35	25	30	37	4.70	37.5	FX 3.1..	E01
25	MSS-E25R35-FX4.1	R	4.1	35	25	30	37	4.30	37.5	FX 4.1..	E01
25	MSS-E25R35-FX5.1	R	5.1	35	25	30	37	3.90	37.5	FX 5.1..	E01
25	MSS-E25R35-FX6.5	R	6.5	35	25	30	37	3.30	37.5	FX 6.5..	E01
25	MSS-E25L35-FX3.1	L	3.1	35	25	30	37	4.70	37.5	FX 3.1..	E01
25	MSS-E25L35-FX4.1	L	4.1	35	25	30	37	4.30	37.5	FX 4.1..	E01
25	MSS-E25L35-FX5.1	L	5.1	35	25	30	37	3.90	37.5	FX 5.1..	E01
25	MSS-E25L35-FX6.5	L	6.5	35	25	30	37	3.30	37.5	FX 6.5..	E01
32	MSS-E32R45-FX3.1	R	3.1	45	32	38	47	4.70	48	FX 3.1..	E01
32	MSS-E32R45-FX4.1	R	4.1	45	32	38	47	4.30	48	FX 4.1..	E01
32	MSS-E32R45-FX5.1	R	5.1	45	32	38	47	3.90	48	FX 5.1..	E01
32	MSS-E32R45-FX6.5	R	6.5	45	32	38	47	3.30	48	FX 6.5..	E01
32	MSS-E32L45-FX3.1	L	3.1	45	32	38	47	4.70	48	FX 3.1..	E01
32	MSS-E32L45-FX4.1	L	4.1	45	32	38	47	4.30	48	FX 4.1..	E01
32	MSS-E32L45-FX5.1	L	5.1	45	32	38	47	3.90	48	FX 5.1..	E01
32	MSS-E32L45-FX6.5	L	6.5	45	32	38	47	3.30	48	FX 6.5..	E01

E01	154463

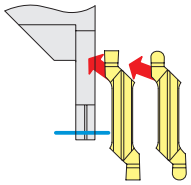
C269 | FX C158 | C168 | C169 | C175 | C171+C173 | C172+C174





Picture shows right-hand version

h [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_2 [mm]	b [mm]	h_1 [mm]	l_1 [mm]	l_2 [mm]	f [mm]	R [mm]		
10	E10R00-1010M-GX09	R	2.00	3.75	7	12.0	10	10	150	18	9.35	15	GX09..	E01
10	E10L00-1010M-GX09	L	2.00	3.75	7	12.0	10	10	150	18	9.35	15	GX09..	E01



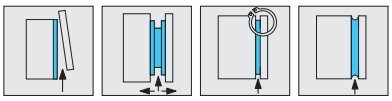
Attention:
When using right-hand or left-hand inserts (GX-S and GX-R), the tool requires modification to prevent the insert fouling.

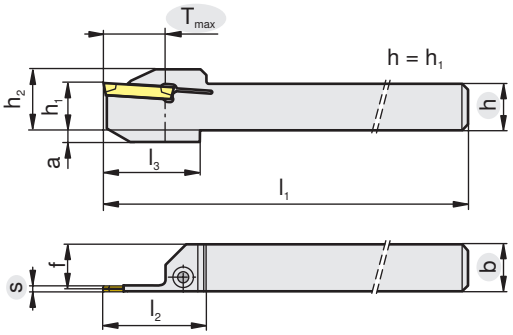
E01	219981	220983

C269 | GX-E C151-C152 | GX-S C153 | GX-R C154

Monoblock tool holders

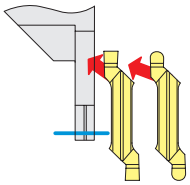
GX16





Picture shows right-hand version

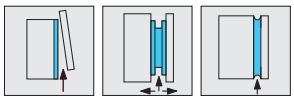
h [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_2 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]	a [mm]		
12	E12R0012-1212K-GX16-1	R	2.00	2.75	12	17.0	12	125	26	24.0	11.35	4	GX16-1..	E01
12	E12R0012-1212K-GX16-2	R	2.76	3.75	12	17.0	12	125	26	24.0	11.00	4	GX16-2..	E01
12	E12L0012-1212K-GX16-1	L	2.00	2.75	12	17.0	12	125	26	24.0	11.35	4	GX16-1..	E01
12	E12L0012-1212K-GX16-2	L	2.76	3.75	12	17.0	12	125	26	24.0	11.00	4	GX16-2..	E01
16	E16R0012-1616K-GX16-1	R	2.00	2.75	12	21.0	16	125	26	24.0	15.35	4	GX16-1..	E01
16	E16R0012-1616K-GX16-2	R	2.76	3.75	12	21.0	16	125	26	24.0	15.00	4	GX16-2..	E01
16	E16R0012-1616K-GX16-3	R	3.76	5.00	12	21.0	16	125	26	24.0	14.53	4	GX16-3..	E01
16	E16L0012-1616K-GX16-1	L	2.00	2.75	12	21.0	16	125	26	24.0	15.35	4	GX16-1..	E01
16	E16L0012-1616K-GX16-2	L	2.76	3.75	12	21.0	16	125	26	24.0	15.00	4	GX16-2..	E01
16	E16L0012-1616K-GX16-3	L	3.76	5.00	12	21.0	16	125	26	24.0	14.53	4	GX16-3..	E01
20	E20R0012-2020K-GX16-1	R	2.00	2.75	12	25.0	20	125	26		19.35		GX16-1..	E01
20	E20R0012-2020K-GX16-2	R	2.76	3.75	12	25.0	20	125	26		19.00		GX16-2..	E01
20	E20R0012-2020K-GX16-3	R	3.76	5.00	12	25.0	20	125	26		18.53		GX16-3..	E01
20	E20L0012-2020K-GX16-1	L	2.00	2.75	12	25.0	20	125	26		19.35		GX16-1..	E01
20	E20L0012-2020K-GX16-2	L	2.76	3.75	12	25.0	20	125	26		19.00		GX16-2..	E01
20	E20L0012-2020K-GX16-3	L	3.76	5.00	12	25.0	20	125	26		18.53		GX16-3..	E01
25	E25R0012-2525M-GX16-2	R	2.76	3.75	12	30.0	25	150	26		24.00		GX16-2..	E01
25	E25R0012-2525M-GX16-3	R	3.76	5.00	12	30.0	25	150	26		23.53		GX16-3..	E01
25	E25L0012-2525M-GX16-2	L	2.76	3.75	12	30.0	25	150	26		24.00		GX16-2..	E01
25	E25L0012-2525M-GX16-3	L	3.76	5.00	12	30.0	25	150	26		23.53		GX16-3..	E01

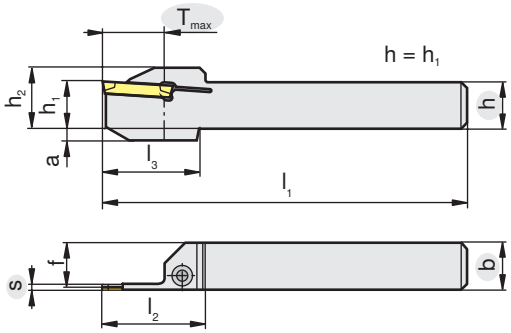


Attention:
When using right-hand or left-hand inserts (GX-S and GX-R), the tool requires modification to prevent the insert fouling.

E01	11081190	220983

C269	GX-E C151-C152	GX-S C153	GX-R C154





Picture shows right-hand version

h [mm]	Type, description	L NR	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_2 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]	a [mm]		
16	E16R0021-1616K-GX24-1	R	2.00	2.75	21	21.0	16	125	35	32.0	15.20	4	GX24-1..	E01
16	E16R0021-1616K-GX24-2	R	2.76	3.75	21	21.0	16	125	35	32.0	15.00	4	GX24-2..	E01
16	E16L0021-1616K-GX24-1	L	2.00	2.75	21	21.0	16	125	35	32.0	15.20	4	GX24-1..	E01
16	E16L0021-1616K-GX24-2	L	2.76	3.75	21	21.0	16	125	35	32.0	15.00	4	GX24-2..	E01
20	E20R0021-2020K-GX24-1	R	2.00	2.75	21	25.0	20	125	35		19.20		GX24-1..	E01
20	E20R0021-2020K-GX24-2	R	2.76	3.75	21	25.0	20	125	35		19.00		GX24-2..	E01
20	E20R0021-2020K-GX24-3	R	3.76	5.00	21	25.0	20	125	35		18.53		GX24-3..	E01
20	E20L0021-2020K-GX24-1	L	2.00	2.75	21	25.0	20	125	35		19.20		GX24-1..	E01
20	E20L0021-2020K-GX24-2	L	2.76	3.75	21	25.0	20	125	35		19.00		GX24-2..	E01
20	E20L0021-2020K-GX24-3	L	3.76	5.00	21	25.0	20	125	35		18.53		GX24-3..	E01
25	E25R0021-2525M-GX24-2	R	2.76	3.75	21	30.0	25	150	35		24.00		GX24-2..	E01
25	E25R0021-2525M-GX24-3	R	3.76	5.00	21	30.0	25	150	35		23.53		GX24-3..	E01
25	E25R0021-2525M-GX24-4	R	5.01	6.50	21	30.0	25	150	35		22.90		GX24-4..	E01
25	E25L0021-2525M-GX24-2	L	2.76	3.75	21	30.0	25	150	35		24.00		GX24-2..	E01
25	E25L0021-2525M-GX24-3	L	3.76	5.00	21	30.0	25	150	35		23.53		GX24-3..	E01
25	E25L0021-2525M-GX24-4	L	5.01	6.50	21	30.0	25	150	35		22.90		GX24-4..	E01
32	E32R0021-3225P-GX24-2	R	2.76	3.75	21	37.0	25	170	35		24.00		GX24-2..	E01
32	E32R0021-3225P-GX24-3	R	3.76	5.00	21	37.0	25	170	35		23.53		GX24-3..	E01
32	E32R0021-3225P-GX24-4	R	5.01	6.50	21	37.0	25	170	35		22.90		GX24-4..	E01
32	E32L0021-3225P-GX24-2	L	2.76	3.75	21	37.0	25	170	35		24.00		GX24-2..	E01
32	E32L0021-3225P-GX24-3	L	3.76	5.00	21	37.0	25	170	35		23.53		GX24-3..	E01
32	E32L0021-3225P-GX24-4	L	5.01	6.50	21	37.0	25	170	35		22.90		GX24-4..	E01

E01	11007006	220985

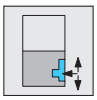
C269

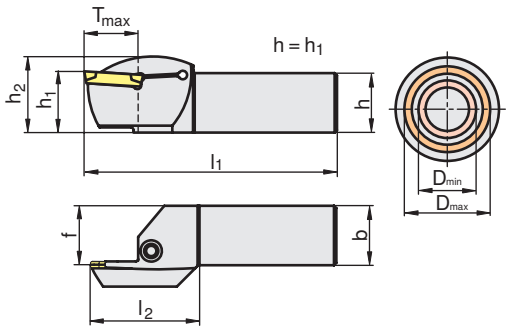
GX-E C151

GX-R C154

Monoblock tool holders

Axial grooves GX24





Picture shows right-hand version

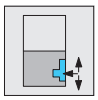
h [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	D_{min} [mm]	D_{max} [mm]	T_{max} [mm]	h_2 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
25	E25R0012-2525X-GX24-2 AS40-45	R	2.76	3.75	40	45	12	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0012-2525X-GX24-2 AS45-50	R	2.76	3.75	45	50	12	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0016-2525X-GX24-2 AS50-60	R	2.76	3.75	50	60	16	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0019-2525X-GX24-2 AS60-75	R	2.76	3.75	60	75	19	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0019-2525X-GX24-2 AS75-100	R	2.76	3.75	75	100	19	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0022-2525X-GX24-2 AS100-130	R	2.76	3.75	100	130	22	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0022-2525X-GX24-2 AS130-180	R	2.76	3.75	130	180	22	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0022-2525X-GX24-2 AS180-300	R	2.76	3.75	180	300	22	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0012-2525X-GX24-3 AS40-45	R	3.76	5.00	40	45	12	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0012-2525X-GX24-3 AS45-50	R	3.76	5.00	45	50	12	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0020-2525X-GX24-3 AS50-60	R	3.76	5.00	50	60	20	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0020-2525X-GX24-3 AS60-75	R	3.76	5.00	60	75	20	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0022-2525X-GX24-3 AS75-100	R	3.76	5.00	75	100	22	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0022-2525X-GX24-3 AS100-150	R	3.76	5.00	100	150	22	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0022-2525X-GX24-3 AS150-300	R	3.76	5.00	150	300	22	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0020-2525X-GX24-4 AS40-50	R	5.01	6.50	40	50	20	32.0	25	115	45	23.20	GX24-4..	E01
25	E25R0022-2525X-GX24-4 AS50-70	R	5.01	6.50	50	70	22	32.0	25	115	45	23.20	GX24-4..	E01
25	E25R0025-2525X-GX24-4 AS70-100	R	5.01	6.50	70	100	25	32.0	25	115	45	23.20	GX24-4..	E01
25	E25R0025-2525X-GX24-4 AS100-150	R	5.01	6.50	100	150	25	32.0	25	115	45	23.20	GX24-4..	E01
25	E25R0025-2525X-GX24-4 AS150-300	R	5.01	6.50	150	300	25	32.0	25	115	45	23.20	GX24-4..	E01
25	E25L0012-2525X-GX24-2 AS40-45	L	2.76	3.75	40	45	12	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0012-2525X-GX24-2 AS45-50	L	2.76	3.75	45	50	12	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0016-2525X-GX24-2 AS50-60	L	2.76	3.75	50	60	16	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0019-2525X-GX24-2 AS60-75	L	2.76	3.75	60	75	19	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0019-2525X-GX24-2 AS75-100	L	2.76	3.75	75	100	19	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0022-2525X-GX24-2 AS100-130	L	2.76	3.75	100	130	22	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0022-2525X-GX24-2 AS130-180	L	2.76	3.75	130	180	22	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0022-2525X-GX24-2 AS180-300	L	2.76	3.75	180	300	22	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0012-2525X-GX24-3 AS40-45	L	3.76	5.00	40	45	12	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0012-2525X-GX24-3 AS45-50	L	3.76	5.00	45	50	12	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0020-2525X-GX24-3 AS50-60	L	3.76	5.00	50	60	20	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0020-2525X-GX24-3 AS60-75	L	3.76	5.00	60	75	20	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0022-2525X-GX24-3 AS75-100	L	3.76	5.00	75	100	22	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0022-2525X-GX24-3 AS100-150	L	3.76	5.00	100	150	22	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0022-2525X-GX24-3 AS150-300	L	3.76	5.00	150	300	22	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0020-2525X-GX24-4 AS40-50	L	5.01	6.50	40	50	20	32.0	25	115	45	23.20	GX24-4..	E01
25	E25L0022-2525X-GX24-4 AS50-70	L	5.01	6.50	50	70	22	32.0	25	115	45	23.20	GX24-4..	E01
25	E25L0025-2525X-GX24-4 AS70-100	L	5.01	6.50	70	100	25	32.0	25	115	45	23.20	GX24-4..	E01
25	E25L0025-2525X-GX24-4 AS100-150	L	5.01	6.50	100	150	25	32.0	25	115	45	23.20	GX24-4..	E01
25	E25L0025-2525X-GX24-4 AS150-300	L	5.01	6.50	150	300	25	32.0	25	115	45	23.20	GX24-4..	E01

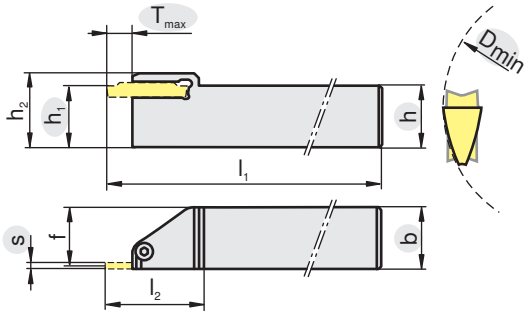
E01	11207638	11224503

C269 | GX-E C151 | GX-R C154

Monoblock tool holders

AX 0°



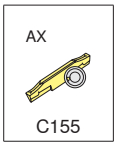


Picture shows right-hand version

h [mm]	Type, description	L NR	b [mm]	s [mm]	D_{min} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
16	E16R0005-1616L-AX05	R	16	3.0	10	5	16	21.0	140	28	14.70	AX05..	E01
16	E16R0010-1616L-AX10	R	16	3.0	20	10	16	21.0	140	38	14.70	AX10..	E01
16	E16L0005-1616L-AX05	L	16	3.0	10	5	16	21.0	140	28	14.70	AX05..	E01
16	E16L0010-1616L-AX10	L	16	3.0	20	10	16	21.0	140	38	14.70	AX10..	E01
20	E20R0005-2020L-AX05	R	20	3.0	10	5	20	25.0	140	28	18.70	AX05..	E02
20	E20R0010-2020L-AX10	R	20	3.0	20	10	20	25.0	140	38	18.70	AX10..	E02
20	E20R0015-2020L-AX15	R	20	3.0	30	15	20	25.0	140	49	18.70	AX15..	E02
20	E20L0005-2020L-AX05	L	20	3.0	10	5	20	25.0	140	28	18.70	AX05..	E02
20	E20L0010-2020L-AX10	L	20	3.0	20	10	20	25.0	140	38	18.70	AX10..	E02
20	E20L0015-2020L-AX15	L	20	3.0	30	15	20	25.0	140	49	18.70	AX15..	E02
25	E25R0005-2525N-AX05	R	25	3.0	10	5	25	30.0	160	28	23.70	AX05..	E02
25	E25R0010-2525N-AX10	R	25	3.0	20	10	25	30.0	160	38	23.70	AX10..	E02
25	E25R0015-2525N-AX15	R	25	3.0	30	15	25	30.0	160	49	23.70	AX15..	E02
25	E25L0005-2525N-AX05	L	25	3.0	10	5	25	30.0	160	28	23.70	AX05..	E02
25	E25L0010-2525N-AX10	L	25	3.0	20	10	25	30.0	160	38	23.70	AX10..	E02
25	E25L0015-2525N-AX15	L	25	3.0	30	15	25	30.0	160	49	23.70	AX15..	E02

E01	195068	220983
E02	195069	220985

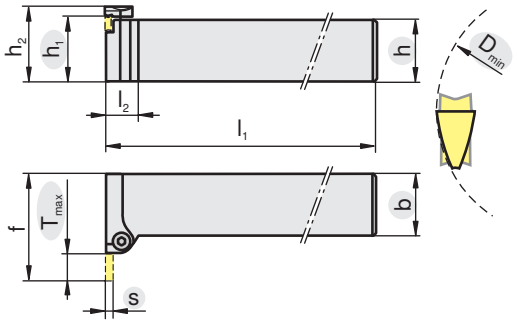
C269



C155

Monoblock tool holders

AX 90°



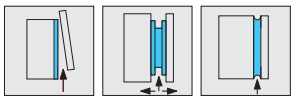
Picture shows right-hand version

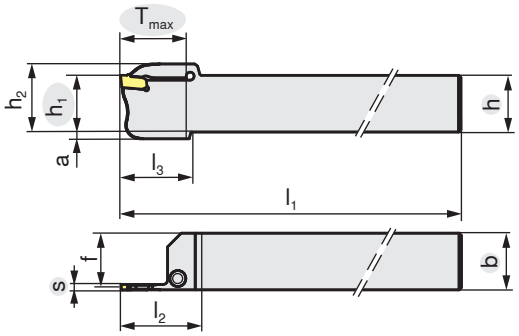
h [mm]	Type, description	L N R	b [mm]	s [mm]	D_{min} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
16	E16R9005-1616J-AX05	R	16	3.0	10	5	16	21.0	110	13.5	28.00	AX05..	E01
16	E16R9010-1616J-AX10	R	16	3.0	20	10	16	21.0	110	13.0	38.00	AX10..	E01
16	E16L9005-1616J-AX05	L	16	3.0	10	5	16	21.0	110	13.5	28.00	AX05..	E01
16	E16L9010-1616J-AX10	L	16	3.0	20	10	16	21.0	110	13.0	38.00	AX10..	E01
20	E20R9005-2020J-AX05	R	20	3.0	10	5	20	25.0	110	12.0	28.00	AX05..	E01
20	E20R9010-2020J-AX10	R	20	3.0	20	10	20	25.0	110	13.0	38.00	AX10..	E02
20	E20R9015-2020J-AX15	R	20	3.0	30	15	20	25.0	110	13.0	49.00	AX15..	E02
20	E20L9005-2020J-AX05	L	20	3.0	10	5	20	25.0	110	12.0	28.00	AX05..	E01
20	E20L9010-2020J-AX10	L	20	3.0	20	10	20	25.0	110	13.0	38.00	AX10..	E02
20	E20L9015-2020J-AX15	L	20	3.0	30	15	20	25.0	110	13.0	49.00	AX15..	E02
25	E25R9005-2525L-AX05	R	25	3.0	10	5	25	30.0	140	12.0	33.00	AX05..	E01
25	E25R9010-2525J-AX10	R	25	3.0	20	10	25	30.0	110	13.0	43.00	AX10..	E02
25	E25R9015-2525L-AX15	R	25	3.0	30	15	25	30.0	140	13.0	49.00	AX15..	E02
25	E25L9005-2525L-AX05	L	25	3.0	10	5	25	30.0	140	12.0	33.00	AX05..	E01
25	E25L9010-2525J-AX10	L	25	3.0	20	10	25	30.0	110	13.0	43.00	AX10..	E02
25	E25L9015-2525L-AX15	L	25	3.0	30	15	25	30.0	140	13.0	49.00	AX15..	E02

E01	195068	220983
E02	195069	220985

C269

AX
C155





Picture shows right-hand version

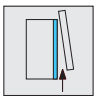
h [mm]	Type, description	L NR	b [mm]	s [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]		
16	E16R0016-1616K-SX2	R	16	2.0	16	16	21.0	125	31	26.0	15.20	SX..2	E01
16	E16R0020-1616K-SX3	R	16	3.0	20	16	21.0	125	36	30.0	14.75	SX..3	E01
16	E16L0016-1616K-SX2	L	16	2.0	16	16	21.0	125	31	26.0	15.20	SX..2	E01
16	E16L0020-1616K-SX3	L	16	3.0	20	16	21.0	125	36	30.0	14.75	SX..3	E01
20	E20R0016-2020K-SX2	R	20	2.0	16	20	25.0	125	31	26.0	19.20	SX..2	E01
20	E20R0020-2020K-SX3	R	20	3.0	20	20	25.0	125	38	30.0	18.75	SX..3	E01
20	E20R0025-2020K-SX4	R	20	4.0	25	20	27.0	125	44	35.0	18.35	SX..4	E01
20	E20L0016-2020K-SX2	L	20	2.0	16	20	25.0	125	31	26.0	19.20	SX..2	E01
20	E20L0020-2020K-SX3	L	20	3.0	20	20	25.0	125	38	30.0	18.75	SX..3	E01
20	E20L0025-2020K-SX4	L	20	4.0	25	20	27.0	125	44	35.0	18.35	SX..4	E01
25	E25R0020-2525M-SX3	R	25	3.0	20	25	30.0	150	40	30.0	23.75	SX..3	E01
25	E25R0025-2525M-SX4	R	25	4.0	25	25	32.0	150	46	35.0	23.35	SX..4	E01
25	E25R0025-2525M-SX5	R	25	5.0	25	25	32.0	150	46	35.0	22.85	SX..5	E01
25	E25R0032-2525M-SX6	R	25	6.0	32	25	33.0	150	54	43.0	22.40	SX..6	E01
25	E25L0020-2525M-SX3	L	25	3.0	20	25	30.0	150	40	30.0	23.75	SX..3	E01
25	E25L0025-2525M-SX4	L	25	4.0	25	25	32.0	150	46	35.0	23.35	SX..4	E01
25	E25L0025-2525M-SX5	L	25	5.0	25	25	32.0	150	46	35.0	22.85	SX..5	E01
25	E25L0032-2525M-SX6	L	25	6.0	32	25	33.0	150	54	43.0	22.40	SX..6	E01

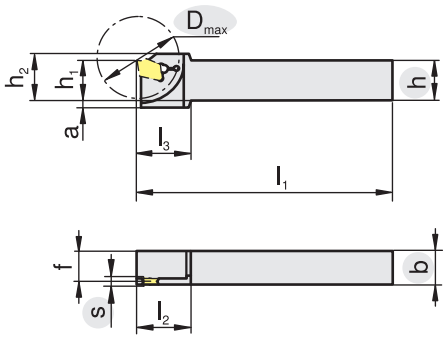
E01	11007006	220985

C269 | SX-E C156 | SX-R C156

Monoblock tool holders

FX





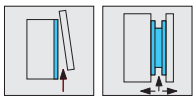
Picture shows left-hand version

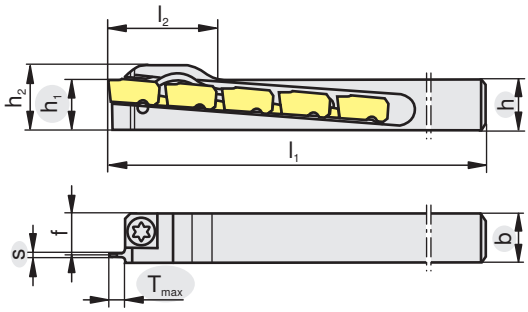
h [mm]	Type, description	L N R	s [mm]	D_{max} [mm]	b [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]	a [mm]		
10	XLCER 1010 M22 FX	R	2.2	30	10	10	19.5	150	19	19.0	9.18	6.5	FX 2.2..	E01
10	XLCEL 1010 M22 FX	L	2.2	30	10	10	19.5	150	19	19.0	9.18	6.5	FX 2.2..	E01
12	XLCER 1212 M22 FX	R	2.2	30	12	12	19.5	150	19	19.0	11.18	4.5	FX 2.2..	E01
12	XLCER 1212 F22 FX	R	2.2	30	12	12	19.5	80	19	19.0	11.18	4.5	FX 2.2..	E01
12	XLCEL 1212 M22 FX	L	2.2	30	12	12	19.5	150	19	19.0	11.18	4.5	FX 2.2..	E01
12	XLCEL 1212 F22 FX	L	2.2	30	12	12	19.5	80	19	19.0	11.18	4.5	FX 2.2..	E01
14	XLCER 1414 M22 FX	R	2.2	30	14	14	19.5	150	19	19.0	13.18	2.5	FX 2.2..	E01
14	XLCEL 1414 M22 FX	L	2.2	30	14	14	19.5	150	19	19.0	13.18	2.5	FX 2.2..	E01
16	XLCER 1612 H22 FX	R	2.2	30	12	16	19.5	100	19	19.0	11.18	0.5	FX 2.2..	E01
16	XLCFR 1612 H31 FX	R	3.1	35	12	16	22.5	100	22	22.0	10.80	3.5	FX 3.1..	E02
16	XLCEL 1612 H22 FX	L	2.2	30	12	16	19.5	100	19	19.0	11.18	0.5	FX 2.2..	E01
16	XLCFL 1612 H31 FX	L	3.1	35	12	16	22.5	100	22	22.0	10.80	3.5	FX 3.1..	E02
20	XLCFR 2016 K31 FX	R	3.1	40	16	20	26.0	125	26	26.0	14.80	3.0	FX 3.1..	E02
20	XLCFR 2016 K41 FX	R	4.1	40	16	20	26.0	125	26	26.0	14.40	3.0	FX 4.1..	E02
20	XLCFL 2016 K31 FX	L	3.1	40	16	20	26.0	125	26	26.0	14.80	3.0	FX 3.1..	E02
20	XLCFL 2016 K41 FX	L	4.1	40	16	20	26.0	125	26	26.0	14.40	3.0	FX 4.1..	E02
25	XLCFR 2520 M31 FX	R	3.1	50	20	25	31.5	150	32	32.0	18.80	3.5	FX 3.1..	E02
25	XLCFR 2520 M41 FX	R	4.1	50	20	25	31.5	150	32	32.0	18.40	3.5	FX 4.1..	E02
25	XLCFL 2520 M31 FX	L	3.1	50	20	25	31.5	150	32	32.0	18.80	3.5	FX 3.1..	E02
25	XLCFL 2520 M41 FX	L	4.1	50	20	25	31.5	150	32	32.0	18.40	3.5	FX 4.1..	E02

E01	154461
E02	154463

C269

FX C158





Picture shows right-hand version

h [mm]	Type, description	L N R	b [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
10	MC05R-1010K	R	10	1.00	1.50	5	10	13.0	125	23	8.50	MC 05..	E01
10	MC05L-1010K	L	10	1.00	1.50	5	10	13.0	125	23	8.50	MC 05..	E01
12	MC05R-1212K	R	12	1.00	1.50	5	12	15.0	125	23	10.50	MC 05..	E01
12	MC05L-1212K	L	12	1.00	1.50	5	12	15.0	125	23	10.50	MC 05..	E01
16	MC05R-1616K	R	16	1.00	1.50	5	16	19.0	125	23	14.50	MC 05..	E01
16	MC05L-1616K	L	16	1.00	1.50	5	16	19.0	125	23	14.50	MC 05..	E01
20	MC05R-2020K	R	20	1.00	1.50	5	20	23.0	125	23	18.50	MC 05..	E01
20	MC05L-2020K	L	20	1.00	1.50	5	20	23.0	125	23	18.80	MC 05..	E01
25	MC05R-2525M	R	25	1.00	1.50	5	25	28.0	150	23	23.50	MC 05..	E01
25	MC05L-2525M	L	25	1.00	1.50	5	25	28.0	150	23	23.50	MC 05..	E01

E01	11042274	220983

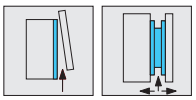
C269

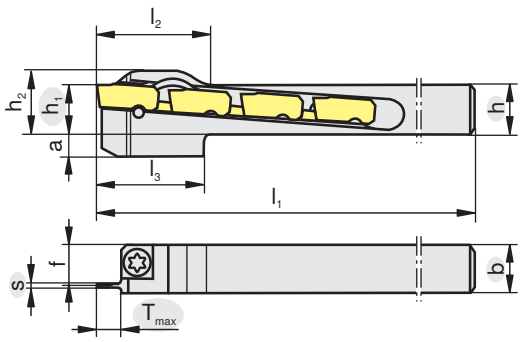
MaxiClick

C159

Monoblock tool holders

MaxiClick MC10





Picture shows right-hand version

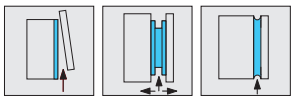
h [mm]	Type, description	LNR	b [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	a [mm]	f [mm]		
10	MC10R-1010K	R	10	1.50	2.50	10	10	13.0	125	28			8.50	MC 10..	E01
10	MC10R-1010K-S	R	10	1.50	2.50	10	10	19.0	125	28	27.0	6.0	8.50	MC 10..	E01
10	MC10L-1010K	L	10	1.50	2.50	10	10	13.0	125	28			8.50	MC 10..	E01
10	MC10L-1010K-S	L	10	1.50	2.50	10	10	19.0	125	28	27.0	6.0	8.50	MC 10..	E01
12	MC10R-1212K	R	12	1.50	2.50	10	12	15.0	125	28			10.50	MC 10..	E01
12	MC10R-1212K-S	R	12	1.50	2.50	10	12	19.0	125	28	27.0	4.0	10.50	MC 10..	E01
12	MC10L-1212K	L	12	1.50	2.50	10	12	15.0	125	28			10.50	MC 10..	E01
12	MC10L-1212K-S	L	12	1.50	2.50	10	12	19.0	125	28	27.0	4.0	10.50	MC 10..	E01
16	MC10R-1616K	R	16	1.50	2.50	10	16	19.0	125	28			14.50	MC 10..	E01
16	MC10L-1616K	L	16	1.50	2.50	10	16	19.0	125	28			14.50	MC 10..	E01
20	MC10R-2020K	R	20	1.50	2.50	10	20	23.0	125	28			18.50	MC 10..	E01
20	MC10L-2020K	L	20	1.50	2.50	10	20	23.0	125	28			18.50	MC 10..	E01
25	MC10R-2525M	R	25	1.50	2.50	10	25	28.0	152	28			23.50	MC 10..	E01
25	MC10L-2525M	L	25	1.50	2.50	10	25	28.0	152	28			23.50	MC 10..	E01

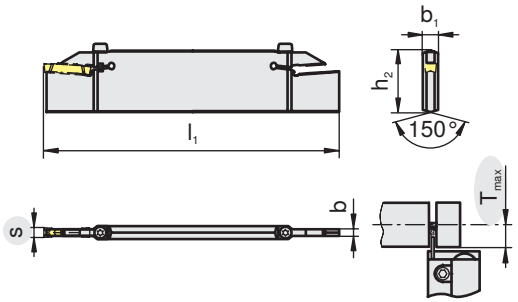
E01	11042274	220983

C269

MaxiClick

C159





Picture shows right-hand version

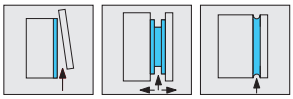
h_2 [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	b [mm]	b_1 [mm]	l_1 [mm]		
32	XLCFN 3202-GX24-1S	N	2.00	2.75	21	1.60	6.2	180	GX24-1..	E01
32	XLCFN 3203 GX24-2S	N	2.76	3.75	21	2.10	6.2	180	GX24-2..	E01
32	XLCFN 3204 GX24-3S	N	3.76	5.00	21	3.05	6.2	180	GX24-3..	E01
32	XLCFN 3206 GX24-4S	N	5.01	6.50	21	4.20	6.2	180	GX24-4..	E01

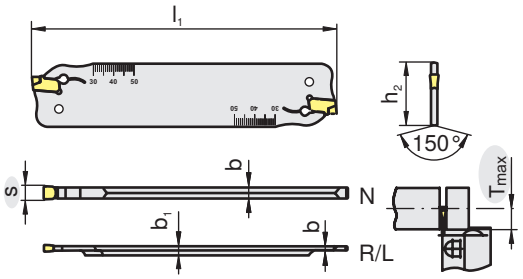
E01	11081190	11149570	220983

C269 | GX-E C151 | GX-R C154 | C204-C205

Blades

SX



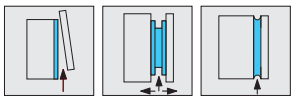


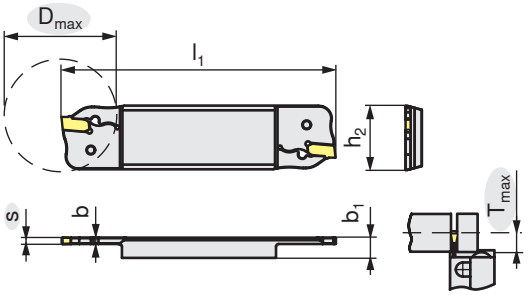
Picture shows right-hand version

h_2 [mm]	Type, description	L N R	s [mm]	T_{max} [mm]	b [mm]	b_1 [mm]	l_1 [mm]		
26	XLCFR 2602-SX2	R	2.0	25	1.50	2.4	110	SX..2	E01
26	XLCFN 2603-SX3	N	3.0	35	2.40		110	SX..3	E01
26	XLCFN 2604-SX4	N	4.0	40	3.20		110	SX..4	E02
26	XLCFL 2602-SX2	L	2.0	25	1.50	2.4	110	SX..2	E01
32	XLCFR 3202-SX2	R	2.0	25	1.50	2.4	150	SX..2	E01
32	XLCFN 3203-SX3	N	3.0	50	2.40		150	SX..3	E01
32	XLCFN 3204-SX4	N	4.0	50	3.20		150	SX..4	E02
32	XLCFN 3205-SX5	N	5.0	55	4.20		150	SX..5	E02
32	XLCFN 3206-SX6	N	6.0	60	5.20		150	SX..6	E02
32	XLCFL 3202-SX2	L	2.0	25	1.50	2.4	150	SX..2	E01

E01	11366865
E02	11366866

C269 | SX-E C156 | SX-R C156 | C204-C205





Picture shows right-hand version

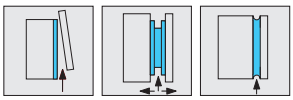
h_2 [mm]	Type, description	L N R	s [mm]	T_{max} [mm]	D_{max} [mm]	b [mm]	b_1 [mm]	l_1 [mm]		
26	XLCFR 2608-SX2	R	2.0	22	44	1.50	8.0	110	SX..2	E01
26	XLCFR 2608-SX3	R	3.0	22	44	2.50	8.0	110	SX..3	E01
26	XLCFL 2608-SX2	L	2.0	22	44	1.50	8.0	110	SX..2	E01
26	XLCFL 2608-SX3	L	3.0	22	44	2.50	8.0	110	SX..3	E01

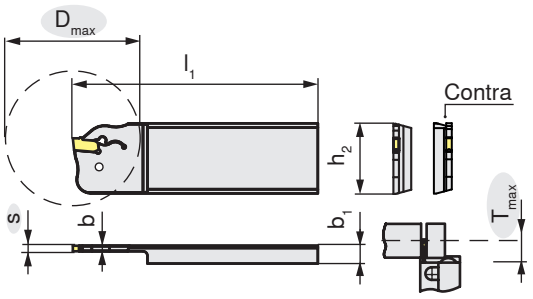
E01	11366865

C269 | SX-E C156 | SX-R C156 | C204-C205

Blades

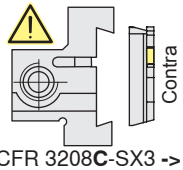
SX, reinforced blades





Picture shows right-hand version

h_2 [mm]	Type, description	L N R	s [mm]	T_{max} [mm]	D_{max} [mm]	b [mm]	b_1 [mm]	l_1 [mm]		
32	XLCFR 3208-SX3	R	3.0	33	66	2.50	8.0	110	SX..3	E01
32	XLCFR 3208C-SX3	R	3.0	33	66	2.50	8.0	110	SX..3	E01
32	XLCFR 3208-SX4	R	4.0	33	66	3.40	8.0	110	SX..4	E02
32	XLCFL 3208-SX3	L	3.0	33	66	2.50	8.0	110	SX..3	E01
32	XLCFL 3208C-SX3	L	3.0	33	66	2.50	8.0	110	SX..3	E01
32	XLCFL 3208-SX4	L	4.0	33	66	3.40	8.0	110	SX..4	E02

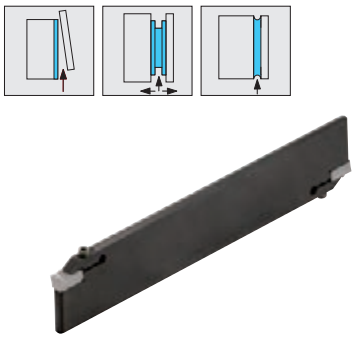


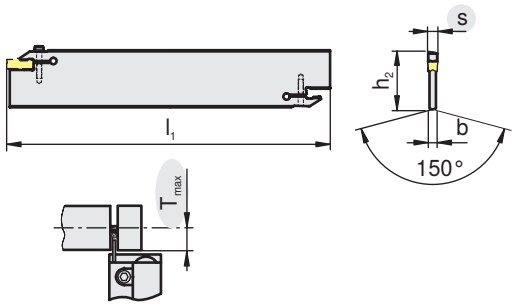
XLCFR 3208**C**-SX3 **-> C**=CONTRA

Additional information see page(s) C262

E01	11366865
E02	11366866

C269 | SX-E C156 | SX-R C156 | C204-C205





Picture shows right-hand version

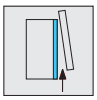
h2 [mm]	Type, description	L N R	smin [mm]	smax [mm]	Tmax [mm]	b [mm]	l1 [mm]		
46	XLCEN 4608 LX	N	8.00	10.00	80	6.80	250	LX..	E01

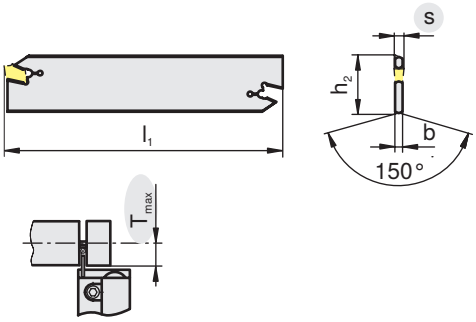
E01	11007006	11149571	220985

C269 | LX-E C157 | LX-R C157 | C204

Blades

FX



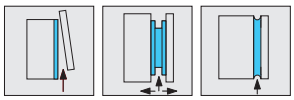


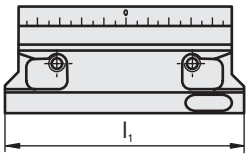
Picture shows right-hand version

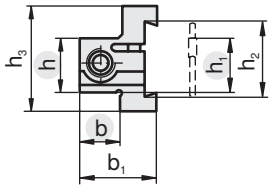
h_2 [mm]	Type, description	L N R	s [mm]	T_{max} [mm]	b [mm]	l_1 [mm]		
26	XLCEN 2602 J22 FX	N	2.2	25	1.65	110	FX 2.2..	E01
26	XLCFN 2603 J31 FX	N	3.1	35	2.40	110	FX 3.1..	E02
26	XLCFN 2604 J41 FX	N	4.1	40	3.20	110	FX 4.1..	E02
32	XLCEN 3202 M22 FX	N	2.2	30	1.65	150	FX 2.2..	E01
32	XLCFN 3203 M31 FX	N	3.1	50	2.40	150	FX 3.1..	E02
32	XLCFN 3204 M41 FX	N	4.1	50	3.20	150	FX 4.1..	E02
32	XLCFN 3205 M51 FX	N	5.1	55	4.00	150	FX 5.1..	E02
32	XLCFN 3206 M65 FX	N	6.5	55	5.20	150	FX 6.5..	E02
46	XLCEN 4608 S82 FX	N	8.2	80	6.80	250	FX 8.2..	E03
46	XLCEN 4609 S97 FX	N	9.7	80	8.00	250	FX 9.7..	E03

E01	154461
E02	154463
E03	154464

C269 C158 C204-C205







Picture shows right-hand version

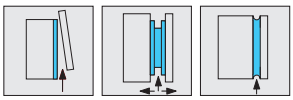
h_2 [mm]	Type, description	L N R	h [mm]	h_1 [mm]	h_3 [mm]	l_1 [mm]	b [mm]	b_1 [mm]		
26	SBN 2020-26 K	N	20	20	39	90	20	33.0	XLC.. 26..	E01
32	SBN 2520-32 K	N	25	25	48	110	20	36.0	XLC.. 32..	E01
32	SBN 3229-32 K	N	32	32	48	120	29	44.5	XLC.. 32..	E01
46	SBN 3229-46 K	N	32	32	70	150	29	52.0	XLC.. 46..	E02
46	SBN 4037-46 K	N	40	40	70	150	37	60.0	XLC.. 46..	E02

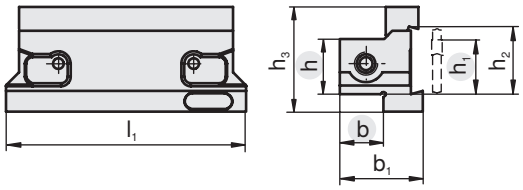
The blocks are delivered without coolant set.
When applying through-tool coolant, order the additional coolant set separately.

E01	22485	4496	82952
E02	81158	4497	82954

C269 | GX C198 | SX C199-C201 | LX C202 | FX C203

Split clamping blocks





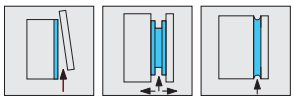
Picture shows right-hand version

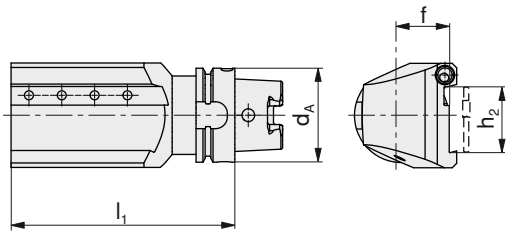
h_2 [mm]	Type, description	L N R	h [mm]	h_1 [mm]	h_3 [mm]	l_1 [mm]	b [mm]	b_1 [mm]		
26	SBN 2020-26 KS	N	20	20	43	90	20	37	XLC.. 26..	E01
32	SBN 2520-32 KS	N	25	25	49	110	20	38	XLC.. 32..	E01
32	SBN 3229-32 KS	N	32	32	52	120	29	47	XLC.. 32..	E01

The blocks are delivered without coolant set.
When applying through-tool coolant, order the additional coolant set separately.

E01	22485	4496	82952

C269 | GX C198 | SX C199 | LX C202 | FX C203





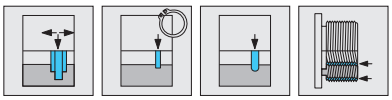
h_2 [mm]	Type, description	L N R	d_A [mm]	h_1 [mm]	l_1 [mm]		
32	HSK-T63-KHR00-32	R	63	32	150	XLC.. 32..	E01
32	HSK-T100-KHR00-32	R	100	32	160	XLC.. 32..	E01
32	HSK-T63-KHL00-32	L	63	32	150	XLC.. 32..	E01
32	HSK-T100-KHL00-32	L	100	32	160	XLC.. 32..	E01

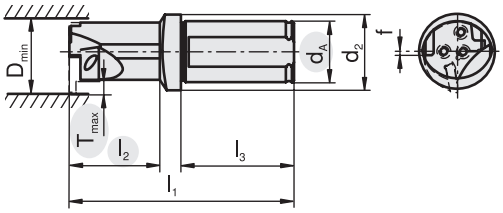
E01	11848510	11776816	11776756

C269 | GX C198 | SX C199 | LX C202 | FX C203

MSS boring bars

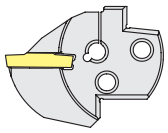
1.5 D





Picture shows right-hand version

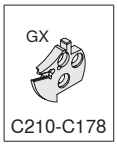
Bgr. [mm]	Type, description	L N R	T_{max} [mm]	D_{min} [mm]	d_A [mm]	d_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]		
16	MSS-I16R90-1.5D-N	R	4	20	20	25	82	24	50	1.00	MSS-I16R..	E01
16	MSS-I16L90-1.5D-N	L	4	20	20	25	82	24	50	1.00	MSS-I16L..	E01
20	MSS-I20R90-1.5D-N	R	5	25	20	25	87	30	50	1.00	MSS-I20R..	E02
20	MSS-I20L90-1.5D-N	L	5	25	20	25	87	30	50	1.00	MSS-I20L..	E02
25	MSS-I25R90-1.5D-N	R	6	32	25	32	102	38	56	1.50	MSS-I25R..	E03
25	MSS-I25L90-1.5D-N	L	6	32	25	32	102	38	56	1.50	MSS-I25L..	E03
32	MSS-I32R90-1.5D-N	R	9	40	32	40	119	48	60	2.00	MSS-I32R..	E04
32	MSS-I32L90-1.5D-N	L	9	40	32	40	119	48	60	2.00	MSS-I32L..	E04
40	MSS-I40R90-1.5D-N	R	10	50	40	50	142	60	70	2.50	MSS-I40R..	E05
40	MSS-I40L90-1.5D-N	L	10	50	40	50	142	60	70	2.50	MSS-I40L..	E05



When using module **MSS-I40N19-GX24..** :
T_{max} + 9 mm / D_{min} + 10 mm

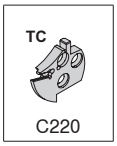
E01	228617	8095010200	
E02	228619	8095010400	
E03	228620		220983
E04	228621		220985
E05	195069		220985

C269

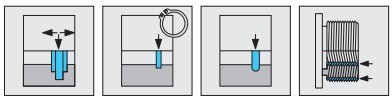


C210-C178

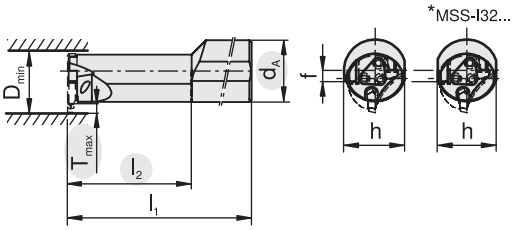
C213-C214



C220

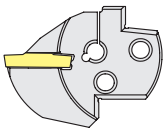


Picture shows right-hand version



* 2 clamping faces applies only for MSS-I32R/L90-2.5D-N

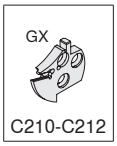
Bgr. [mm]	Type, description	L NR	T_{max} [mm]	D_{min} [mm]	d_A [mm]	l_1 [mm]	l_2 [mm]	h [mm]	f [mm]		
16	MSS-I16R90-2.5D-N	R	4	20	20	180	40	19	4.50	MSS-I16R..	E01
16	MSS-I16L90-2.5D-N	L	4	20	20	180	40	19	4.50	MSS-I16L..	E01
20	MSS-I20R90-2.5D-N	R	5	25	25	200	50	24	6.00	MSS-I20R..	E02
20	MSS-I20L90-2.5D-N	L	5	25	25	200	50	24	6.00	MSS-I20L..	E02
25	MSS-I25R90-2.5D-N	R	6	32	32	250	63	31	7.00	MSS-I25R..	E03
25	MSS-I25L90-2.5D-N	L	6	32	32	250	63	31	7.00	MSS-I25L..	E03
32	MSS-I32R90-2.5D-N	R	9	40	40	300	80	38	9.50	MSS-I32R..	E04
32	MSS-I32L90-2.5D-N	L	9	40	40	300	80	38	9.50	MSS-I32L..	E04
40	MSS-I40R90-2.5D-N	R	10	50	50	350	100	48.5	11.00	MSS-I40R..	E05
40	MSS-I40L90-2.5D-N	L	10	50	50	350	100	48.5	11.00	MSS-I40L..	E05



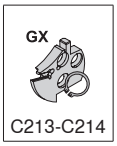
When using module **MSS-I40N19-GX24..** :
T_{max} + 9 mm / D_{min} + 10 mm

E01	228617	8095010200	
E02	228619	8095010400	
E03	228620		220983
E04	228621		220985
E05	195069		220985

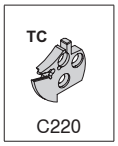
C269



C210-C212



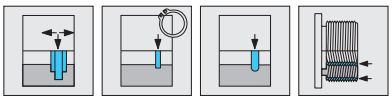
C213-C214

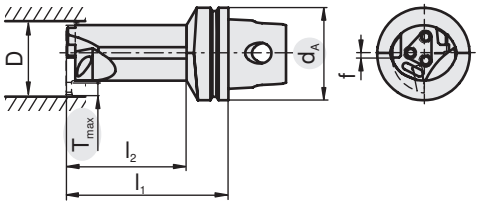


C220

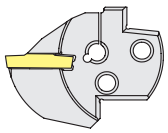
MSS boring bars

UTS 2.0 D





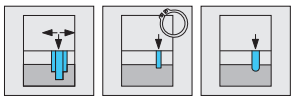
Bgr. [mm]	Type, description	L N R	T_{max} [mm]	D_{min} [mm]	d_A [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
32	UT40-MSS-I32R90-2D	R	9	40	40	80	64	2.00	MSS-I32R..	E01
32	UT50-MSS-I32L90-2D	L	9	40	50	90	64	2.00	MSS-I32L..	E01
40	UT40-MSS-I40L90-2D	L	10	50	40	92	80	2.50	MSS-I40L..	E02



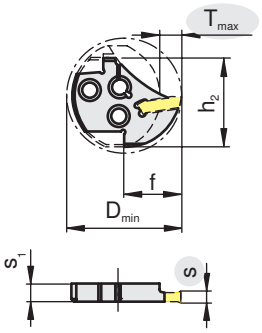
When using module **MSS-I40N19-GX24..** :
T_{max} + 9 mm / D_{min} + 10 mm

E01	228621	220985
E02	195069	220985

C269 C210-C212 C213-C214 C220



Picture shows right-hand version



Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	h_2 [mm]	s_1 [mm]	f [mm]	
16	MSS-I16R04-GX09-1	R	2.00	2.75	4	20	16.4	3.8	10.00	GX09-1..
16	MSS-I16R04-GX09-2	R	2.76	3.75	4	20	16.4	3.8	10.00	GX09-2..
16	MSS-I16L04-GX09-1	L	2.00	2.75	4	20	16.4	3.8	10.00	GX09-1..
16	MSS-I16L04-GX09-2	L	2.76	3.75	4	20	16.4	3.8	10.00	GX09-2..
20	MSS-I20R05-GX09-1	R	2.00	2.75	5	25	20.3	3.8	12.00	GX09-1..
20	MSS-I20R05-GX09-2	R	2.76	3.75	5	25	20.3	3.8	12.00	GX09-2..
20	MSS-I20L05-GX09-1	L	2.00	2.75	5	25	20.3	3.8	12.00	GX09-1..
20	MSS-I20L05-GX09-2	L	2.76	3.75	5	25	20.3	3.8	12.00	GX09-2..
25	MSS-I25R06-GX09-1	R	2.00	2.75	6	32	24.9	3.8	15.50	GX09-1..
25	MSS-I25R06-GX09-2	R	2.76	3.75	6	32	24.9	3.8	15.50	GX09-2..
25	MSS-I25L06-GX09-1	L	2.00	2.75	6	32	24.9	3.8	15.50	GX09-1..
25	MSS-I25L06-GX09-2	L	2.76	3.75	6	32	24.9	3.8	15.50	GX09-2..

GX-E C151

GX-S C153

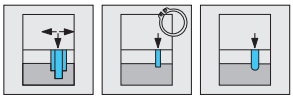
GX-R C154

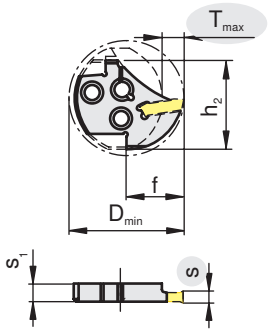
1.5D C207

2.5D C208

MSS modules – internal

Grooving and turning – GX16

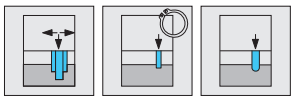


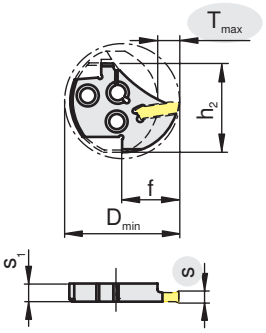


Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	h_2 [mm]	s_1 [mm]	f [mm]	
32	MSS-I32R09-GX16-1	R	2.00	2.75	9	40	32.2	5.9	20.00	GX16-1..
32	MSS-I32R09-GX16-2	R	2.76	3.75	9	40	32.2	5.9	20.00	GX16-2..
32	MSS-I32R09-GX16-3	R	3.76	5.00	9	40	32.2	5.9	20.00	GX16-3..
32	MSS-I32R09-GX16-4	R	5.01	6.50	9	40	32.2	5.9	20.00	GX16-4..
32	MSS-I32L09-GX16-1	L	2.00	2.75	9	40	32.2	5.9	20.00	GX16-1..
32	MSS-I32L09-GX16-2	L	2.76	3.75	9	40	32.2	5.9	20.00	GX16-2..
32	MSS-I32L09-GX16-3	L	3.76	5.00	9	40	32.2	5.9	20.00	GX16-3..
32	MSS-I32L09-GX16-4	L	5.01	6.50	9	40	32.2	5.9	20.00	GX16-4..
40	MSS-I40R10-GX16-1	R	2.00	2.75	10	50	39.6	5.9	24.50	GX16-1..
40	MSS-I40R10-GX16-2	R	2.76	3.75	10	50	39.6	5.9	24.50	GX16-2..
40	MSS-I40R10-GX16-3	R	3.76	5.00	10	50	39.6	5.9	24.50	GX16-3..
40	MSS-I40R10-GX16-4	R	5.01	6.50	10	50	39.6	5.9	24.50	GX16-4..
40	MSS-I40L10-GX16-1	L	2.00	2.75	10	50	39.6	5.9	24.50	GX16-1..
40	MSS-I40L10-GX16-2	L	2.76	3.75	10	50	39.6	5.9	24.50	GX16-2..
40	MSS-I40L10-GX16-3	L	3.76	5.00	10	50	39.6	5.9	24.50	GX16-3..
40	MSS-I40L10-GX16-4	L	5.01	6.50	10	50	39.6	5.9	24.50	GX16-4..

GX-E C151 | GX-S C153 | GX-R C154 | 1.5D C207 | 2.5D C208 | UTS C209





Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	h_2 [mm]	s_1 [mm]	f [mm]	
40	MSS-I40N19-GX24-2	N	2.76	3.75	19	60	40.7	6.2	33.50	GX24-2..
40	MSS-I40N19-GX24-3	N	3.76	5.00	19	60	40.7	6.2	33.50	GX24-3..
40	MSS-I40N19-GX24-4	N	5.01	6.50	19	60	40.7	6.2	33.50	GX24-4..

GX-E C151

GX-S C153

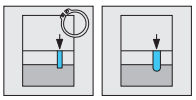
1.5D C207

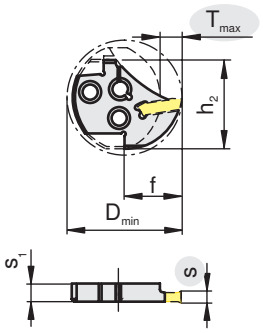
2.5D C208

UTS C209

MSS modules – internal

Circlip and radius grooves – GX09

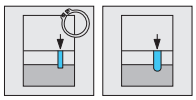


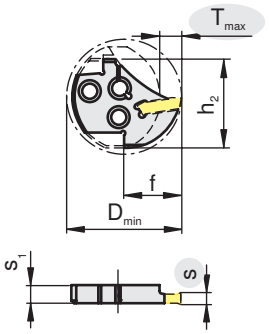


Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	h_2 [mm]	s_1 [mm]	f [mm]	
16	MSS-I16R02-GX09-1	R	0.60	1.95	2	20	16.45	3.8	10.00	GX09-1..R/L
16	MSS-I16L02-GX09-1	L	0.60	1.95	2	20	16.45	3.8	10.00	GX09-1..R/L
20	MSS-I20R02-GX09-1	R	0.60	1.95	2	25	20.35	3.8	12.00	GX09-1..R/L
20	MSS-I20L02-GX09-1	L	0.60	1.95	2	25	20.35	3.8	12.00	GX09-1..R/L
25	MSS-I25R02-GX09-1	R	0.60	1.95	2	32	24.95	3.8	15.50	GX09-1..R/L
25	MSS-I25L02-GX09-1	L	0.60	1.95	2	32	24.95	3.8	15.50	GX09-1..R/L

GX-S C153
GX-R C154
1.5D C207
2.5D C208





Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	h_2 [mm]	s_1 [mm]	f [mm]	
32	MSS-I32R03-GX16-2	R	0.60	2.75	3	40	32.2	5.9	20.00	GX16-2..R/L
32	MSS-I32L03-GX16-2	L	0.60	2.75	3	40	32.2	5.9	20.00	GX16-2..R/L
40	MSS-I40R03-GX16-2	R	0.60	2.75	3	50	39.6	5.9	24.50	GX16-2..R/L
40	MSS-I40L03-GX16-2	L	0.60	2.75	3	50	39.6	5.9	24.50	GX16-2..R/L

GX-S C153

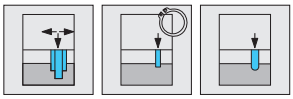
GX-R C154

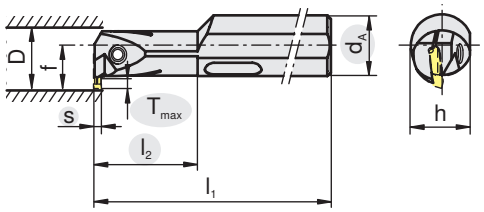
1.5D C207

2.5D C208

UTS C209

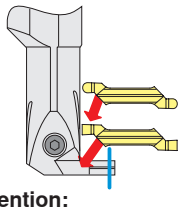
Monoblock boring bars – GX09





Picture shows right-hand version

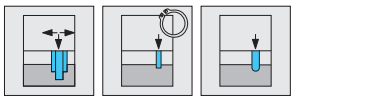
d_A [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	l_2 [mm]	l_1 [mm]	h [mm]	f [mm]		
16	I12R90-2.5D-GX09	R	2.00	3.75	3	16	30	150	15.25	11	GX09..	E01
16	I12L90-2.5D-GX09	L	2.00	3.75	3	16	30	150	15.25	11	GX09..	E01

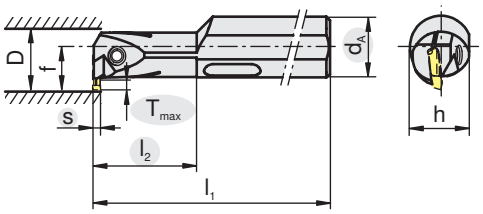


Attention:
When using right-hand or left-hand inserts (GX-S and GX-R), the tool requires modification to prevent the insert fouling.

E01	228620	220983

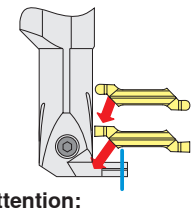
GX-E C151 | GX-S C153 | GX-R C154 | C269





Picture shows right-hand version

d_A [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	l_2 [mm]	l_1 [mm]	h [mm]	f [mm]		
16	I16R90-2.0D-GX16-1	R	2.00	2.75	5.0	20.5	32	150	15.25	13.5	GX16-1..	E01
16	I16R90-2.0D-GX16-2	R	2.76	3.75	5.0	20.5	32	150	15.25	13.5	GX16-2..	E01
16	I16L90-2.0D-GX16-1	L	2.00	2.75	5.0	20.5	32	150	15.25	13.5	GX16-1..	E01
16	I16L90-2.0D-GX16-2	L	2.76	3.75	5.0	20.5	32	150	15.25	13.5	GX16-2..	E01
20	I20R90-2.0D-GX16-2	R	2.76	3.75	5.5	25.0	40	180	19	15.5	GX16-2..	E01
20	I20L90-2.0D-GX16-2	L	2.76	3.75	5.5	25.0	40	180	19	15.5	GX16-2..	E01
25	I25R90-2.0D-GX16-2	R	2.76	3.75	8.0	32.0	50	200	24	20.5	GX16-2..	E01
25	I25R90-2.0D-GX16-3	R	3.76	5.00	10.0	32.0	50	200	24	22.5	GX16-3..	E01
25	I25L90-2.0D-GX16-2	L	2.76	3.75	8.0	32.0	50	200	24	20.5	GX16-2..	E01
25	I25L90-2.0D-GX16-3	L	3.76	5.00	10.0	32.0	50	200	24	22.5	GX16-3..	E01
32	I32R90-2.0D-GX16-2	R	2.76	3.75	11.0	42.0	64	250	31	27.5	GX16-2..	E01
32	I32R90-2.0D-GX16-3	R	3.76	5.00	11.0	42.0	64	250	31	27.5	GX16-3..	E01
32	I32L90-2.0D-GX16-2	L	2.76	3.75	11.0	42.0	64	250	31	27.5	GX16-2..	E01
32	I32L90-2.0D-GX16-3	L	3.76	5.00	11.0	42.0	64	250	31	27.5	GX16-3..	E01



Attention:
When using right-hand or left-hand inserts (GX-S and GX-R), the tool requires modification to prevent the insert fouling.

E01	195068	220983

C269

GX-E

C151-C152

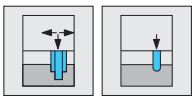
GX-S

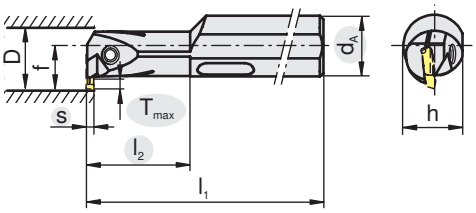
C153

GX-R

C154

Monoblock boring bars – GX24



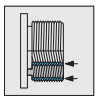


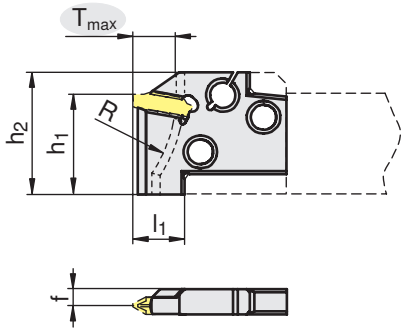
Picture shows right-hand version

d_A [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	l_2 [mm]	l_1 [mm]	h [mm]	f [mm]		
32	I32R90-2.0D-GX24-2	R	2.76	3.75	11.0	42	64	250	31.0	27.5	GX24-2..	E01
32	I32R90-2.0D-GX24-3	R	3.76	5.00	11.0	42	64	250	31.0	27.5	GX24-3..	E01
32	I32R90-2.0D-GX24-4	R	5.01	6.50	17.5	47	64	250	31.0	30.4	GX24-4..	E01
32	I32L90-2.0D-GX24-2	L	2.76	3.75	11.0	42	64	250	31.0	27.5	GX24-2..	E01
32	I32L90-2.0D-GX24-3	L	3.76	5.00	11.0	42	64	250	31.0	27.5	GX24-3..	E01
32	I32L90-2.0D-GX24-4	L	5.01	6.50	17.5	47	64	250	31.0	30.4	GX24-4..	E01
40	I40R90-2.0D-GX24-3	R	3.76	5.00	12.0	53	80	300	38.5	32.5	GX24-3..	E01
40	I40R90-2.0D-GX24-4	R	5.01	6.50	17.5	57	80	300	38.5	34.4	GX24-4..	E01
40	I40L90-2.0D-GX24-3	L	3.76	5.00	12.0	53	80	300	38.5	32.5	GX24-3..	E01
40	I40L90-2.0D-GX24-4	L	5.01	6.50	17.5	57	80	300	38.5	34.4	GX24-4..	E01

E01	195069	220985

C269 | GX-E C151-C152 | GX-R C154





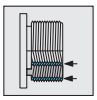
Picture shows right-hand version

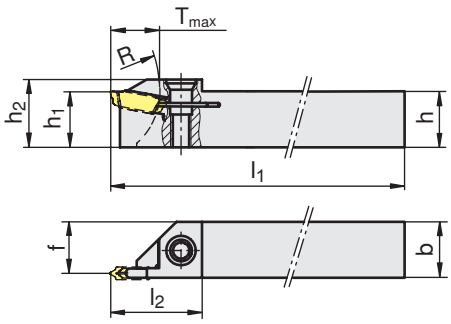
Bgr. [mm]	Type, description	L N R	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]	
20	MSS-E20R-TC16-1	R	0.50	1.50	48	16	8	20	24	20	3.45	30	TC16-1..
20	MSS-E20N-TC16-2	N	1.75	3.00	14	8	12	20	24	20	2.20		TC16-2..
20	MSS-E20L-TC16-1	L	0.50	1.50	48	16	8	20	24	20	3.45	30	TC16-1..
25	MSS-E25R-TC16-1	R	0.50	1.50	48	16	8	25	30	25	5.20	37.5	TC16-1..
25	MSS-E25R-TC16-2	R	1.75	3.00	14	8	10	25	30	25	4.10	37.5	TC16-2..
25	MSS-E25N-TC16-3	N	3.50	5.00	7	5	12	25	30	25	3.10		TC16-3..
25	MSS-E25L-TC16-1	L	0.50	1.50	48	16	8	25	30	25	5.20	37.5	TC16-1..
25	MSS-E25L-TC16-2	L	1.75	3.00	14	8	10	25	30	25	4.10	37.5	TC16-2..

TC60° C160
TC55° C161
C168
C169
C175
C171+C173

Monoblock tool holders

Thread turning – TC



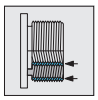


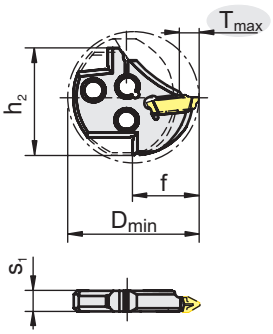
Picture shows right-hand version

h [mm]	Type, description	L N R	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	R [mm]		
12	E12R00-1212-TC16	R	0.50	3.00	48	8	10	12	14.5	12	150	20	11.00	15	TC16-1/2..	E01
12	E12L00-1212-TC16	L	0.50	3.00	48	8	10	12	14.5	12	150	20	11.00	15	TC16-1/2..	E01

E01	219981	220983

C269 | TC60° C160 | TC55° C161





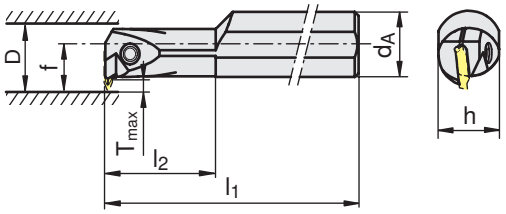
Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	D_{min} [mm]	h_2 [mm]	s_1 [mm]	f [mm]	
32	MSS-I32R-TC16-1	R	0.50	1.50	48	16	7	40	32.2	6.2	20.00	TC16-1..
32	MSS-I32R-TC16-2	R	1.75	3.00	14	8	7	40	32.2	6.2	20.00	TC16-2..
32	MSS-I32N-TC16-3	N	3.50	5.00	7	5	7	40	32.2	6.2	20.00	TC16-3..
32	MSS-I32L-TC16-1	L	0.50	1.50	48	16	7	40	32.2	6.2	20.00	TC16-1..
32	MSS-I32L-TC16-2	L	1.75	3.00	14	8	7	40	32.2	6.2	20.00	TC16-2..

TC60° C160 | TC55° C161 | 1.5D C207 | 2.5D C208 | UTS C209

Monoblock boring bars

Thread turning – TC



Picture shows right-hand version

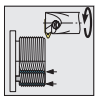
d_A [mm]	Type, description	L N R	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	D_{min} [mm]	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
20	I16R90-2D-TC16	R	0.50	3.00	48	8	4	20	18	181	32	14	TC16-1/2..	E01
20	I16L90-2D-TC16	L	0.50	3.00	48	8	4	20	18	181	32	14	TC16-1/2..	E01
25	I20R90-2D-TC16	R	0.50	5.00	48	5	5	25	23	200	40	17.5	TC16-..	E02
25	I20L90-2D-TC16	L	0.50	5.00	48	5	5	25	23	200	40	17.5	TC16-..	E02
32	I25R90-2D-TC16	R	0.50	5.00	48	5	6	32	30	250	50	22	TC16-..	E03
32	I25L90-2D-TC16	L	0.50	5.00	48	5	6	32	30	250	50	22	TC16-..	E03

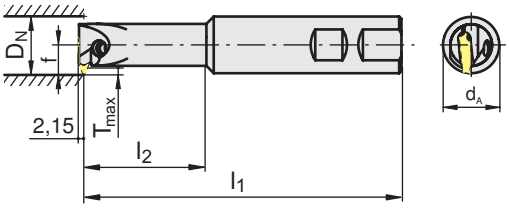
E01	195068	220983
E02	195069	220985
E03	195070	200317

C269

C160

C161

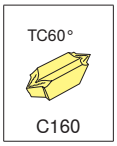




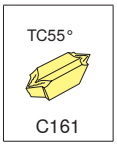
d_A [mm]	Type, description	L NR	l_1 [mm]	l_2 [mm]	T_{max} [mm]	D_N [mm]	f [mm]		
25	I25R90-2D-TC16-W	R	140	54	3.0	25	12.5	TC16-..	E01
32	I32R90-2D-TC16-W	R	166	68	3.5	32	16.0	TC16-..	E02

E01	228621	220985
E02	195070	200317

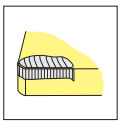
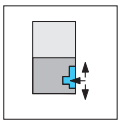
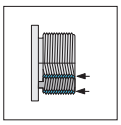
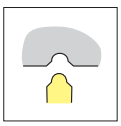
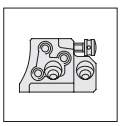
C269



C160

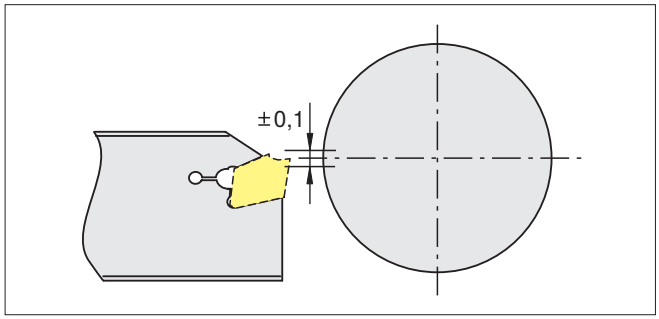


C161

	General	C225-C232
	Types of wear, corrective measures	C233-C234
	Comparison of materials	C235-C238
	Cutting data	C239
	Possible applications - axial grooving	C241-C246
	Threading (turning, milling)	C247-C260
	System features - how to use the system	C261-C265
	GX special tools	C266
	Possible applications MSS adapters	C267-C268
	Spare part description	C269

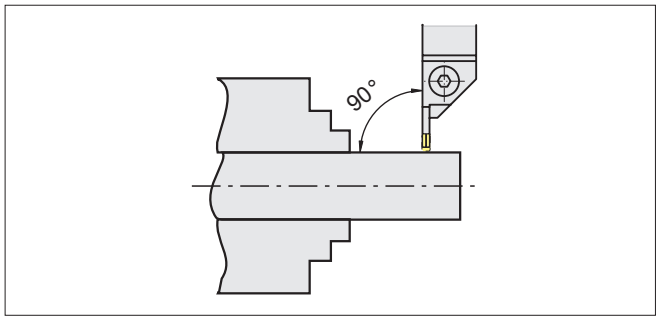
Tool - setting

Recommended application



Centre height

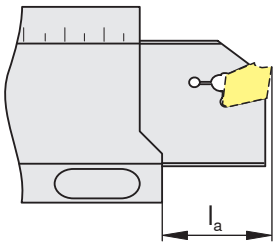
The centre height should be set within a tolerance of ± 0.1 mm to the work piece axis. This is especially important when parting into centre.

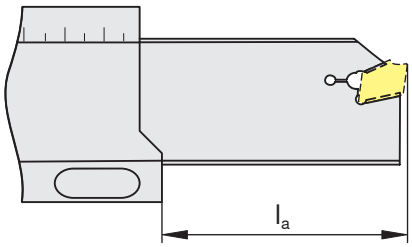


Tool setting

The parting and grooving tool must be mounted with a 90° angle to the axis of the work piece.

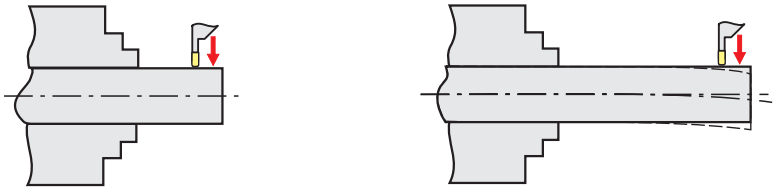
Tool overhang





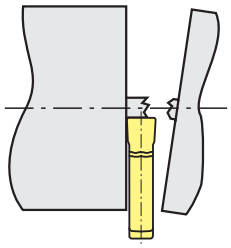
For optimum stability the tool overhang has to be kept as short as possible. The following rule can be applied: overhang l_a should not be larger than 8 x s (cutting width).

Tool overhang



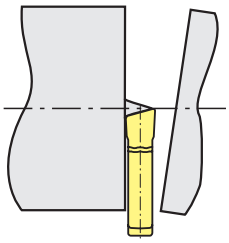
In order to avoid vibration the work piece should be clamped with the minimum overhang possible.

Advice for part-off operations



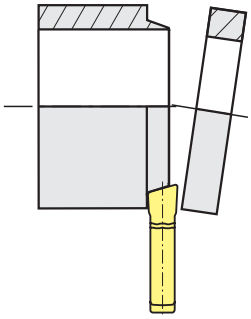
From dia. 5 mm on, reduce feed rate ‘f’ by approx. 50%.

No part-off across centre (risk of breakage).



For parting pip-free, use R or L inserts.

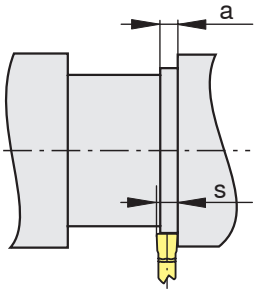
Reduce feed rate ‘f’ by approx. 20% - 50% to minimise lateral deflection.



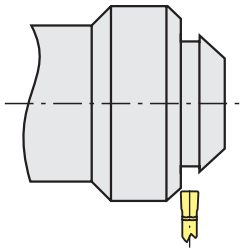
In order to prevent ring formation, use R or L inserts.

Reduce feed rate ‘f’ by approx. 20% - 50% to minimise lateral deflection.

Advice for grooving operations



When grooving with an axial displacement the width ‘a’ should be at least 70% of the cutting width ‘s’.



When grooving inclined surfaces the feed should be reduced by approx. 20% - 50% at the beginning.

Inserts

Tolerances

GX09-E			
	Tolerances (mm)		
Chip groove	*x*	*s*	*r*
-F2 / -EN	±0,02	±0,02	±0,05
-M40	±0,1	±0,05	

GX16-E			
	Tolerances (mm)		
Chip groove	*x*	*s*	*r*
-27P / -F2 / -EN	±0,02	±0,02	±0,05
-M40 / -M1	±0,15	±0,05	

GX24-E			
	Tolerances (mm)		
Chip groove	*x*	*s*	*r*
-27P / -F2	±0,02	±0,02	±0,05
-M40 / -M1 / -EN	±0,15	±0,05	

GX09-S / GX 16-S			
	Tolerances (mm)		
Chip groove	*x*	*s*	*r*
-ER/-EL	±0,02	±0,02	–
-EN			±0,05

GX09-R			
	Tolerances (mm)		
Chip groove	*x*	*s*	*r*
-EN / -ER / -EL	±0,02	±0,02	±0,05

GX 16-R			
	Tolerances (mm)		
Chip groove	*x*	*s*	*r*
-27P / -EN	±0,02	±0,02	±0,05

GX 24-R			
	Tolerances (mm)		
Chip groove	*x*	*s*	*r*
-27P	±0,02	±0,02	±0,05
-M3	±0,15	±0,05	±0,05

AX			
	Tolerances (mm)		
Chip groove	*x*	*s*	*r*
-F50	±0,02	±0,02	±0,05

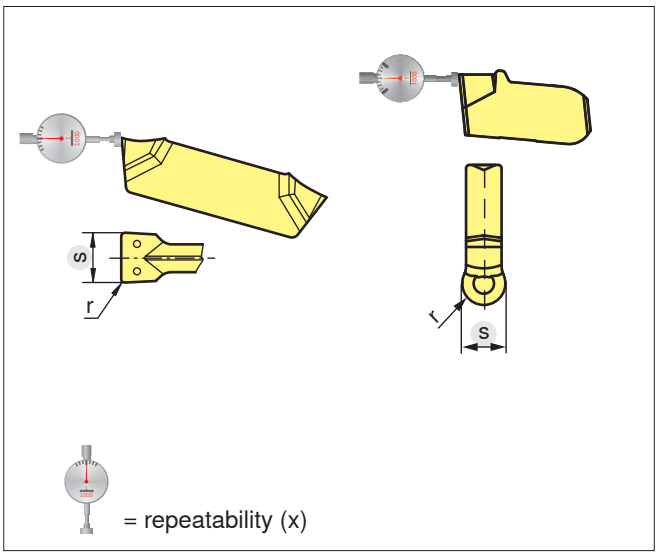
SX			
	Tolerances (mm)		
Chip groove	*x*	*s*	*r*
-27P / -F2	±0,02	±0,02	±0,05
-M1 / -M2 / -M3	±0,1	±0,05	±0,05

LX			
	Tolerances (mm)		
Chip groove	*x*	*s*	*r*
-M2 / -M3	±0,15	±0,08	±0,08

FX				
Chip groove	Width	Tolerances (mm) *x*	*s*	*r*
-27P	2,2 - 4,1	±0,05	±0,05	±0,05
-F1	2,2 - 4,1	±0,13	±0,05	±0,05
-M1	2,2 - 4,1	±0,13	-0,1	±0,05
	5,1 - 6,5		-0,15	
	8,2 - 9,7	±0,15	-0,2	±0,1
-R2	3,1 - 4,1	±0,13	±0,05	±0,05

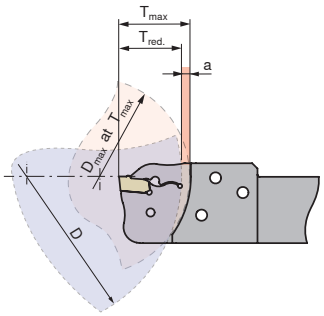
MaxiClick			
	Tolerances (mm)		
Chip groove	*x*	*s*	*r*
-F2 / -F3	±0,025	±0,03	–

TC			
	Tolerances (mm)		
Chip groove	*x*	*s*	*r*
-27P / -EN	±0,02	–	–



Reduced parting and grooving depth

The MSS parting and grooving modules are selected by size to suit a certain work piece diameter (D_{max}). If the diameter of the work piece is bigger than D_{max} of the module, then the achievable parting and grooving depth is reduced by dimension 'a'. The extent of the reduction is established by reference to the following table.



T_{max} = maximum grooving depth
D_{max} = maximum work piece diameter with full grooving depth T_{max} (a = 0)
a = reduction of grooving depth

$$T_{red.} = T_{max} - a$$

Assembly size	Work piece diameter (mm)																
E12	**35**	40	45	60	75	115	>250										
E16	**50**	55	60	70	80	100	130	200	>420								
E20	**60**	65	70	75	85	95	110	130	165	220	>330						
E25	**75**	80	85	90	100	110	125	140	160	190	240	320	>500				
E32	**95**	100	105	110	120	125	135	145	160	180	200	225	270	320	400	530	>800
		0,5	**1,0**	**1,5**	**2,0**	**2,5**	**3,0**	**3,5**	**4,0**	**4,5**	**5,0**	**5,5**	**6,0**	**6,5**	**7,0**	**7,5**	**8,0**

Reduction of the maximum grooving depth a (mm)

Maximum work piece diameter (D_{max}) in case of full parting and grooving depth (T_{max}) in mm

Calculation example: module

MSS-E25R21-GX24-3

E25 **assembly size 25**

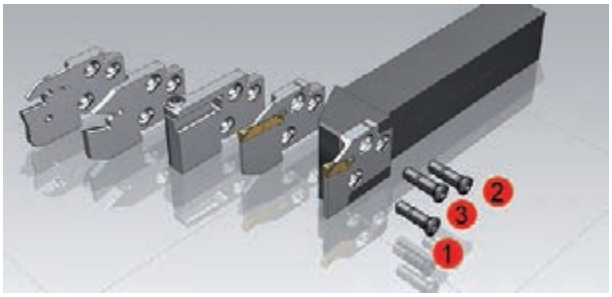
21 T_{max} = 21 mm, Ø 75 mm

D = Ø 100 mm

=> $T_{max} - a = T_{red.}$
$21 - 2 = 19$ mm

Torque moments

MSS module clamping screws



MSS tool shanks

Note the order in which screws must be clamped!

C11

MSS tool shanks	Screw	Torx	Torque moments	
			Nm	in.lbs
MSS-E12...	7897200/M2,5x10,0/T08	T08	1,2	10,6
MSS-E16...	7897202/M3,5x12,5/T15	T15	3,2	28,3
MSS-E20...	7897203/M4,0x14,0/T15	T15	4	35,4
MSS-E25...	7897205/M5,0x18,0/T20	T20	5	44,3
MSS-E32...	7897206/M6,0x20,0/T25	T25	6	53,1

MSS tool shanks

Note the order in which screws must be clamped!

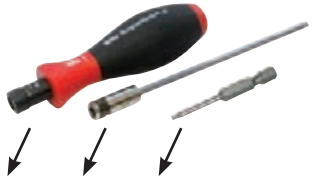
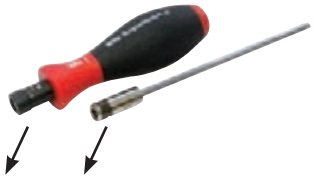
C11

MSS boring bars	Screw	Torx	Torque moments	
			Nm	in.lbs
MSS-I16...	7897200/M2,5x10,0/T08	T08	1,2	10,6
MSS-I20...	7897201/M3,0x11,0/T10	T10	2	17,7
MSS-I25...	7897202/M3,5x12,5/T15	T15	3,2	28,3
MSS-I32...	7897204/M4,5x17,0/T20	T20	4	35,4
MSS-I40...	7897205/M5,0x18,0/T20	T20	5	44,3

Recommended torque moments

Tool	Screw	Torx	Torque moments	
			Nm	in.lbs
SX	7897218/M4,0X18/T20	T20	4,0	35,4
AX	7897202/M3,5X12,5/T15 7897203/M4,0X14/T15 7897205/M5,0X18/T20	T15 T15 T20	3,2 4,0 5,0	28,3 35,4 44,3
GX	M5x18-15IP/10002133	T15IP	5,0	44,3

Torque key (inserts/bits)

 **1 + 1 + 5 pcs. (incl. in delivery)**	DMSD 1,2Nm/SORT T08 DMSD 2,0Nm/SORT T10 DMSD 3,2Nm/SORT T15 DMSD 4,0Nm/SORT T15 DMSD 4,0Nm/SORT T20 DMSD 5,0Nm/SORT T20 DMSD 6,0Nm/SORT T25	**Torque moment set to:** **1.2 - 6.0 Nm**
 **1 + 1 piece (incl. in delivery)**	DMSD 1-5Nm/SORT	**Torque moment can be adjusted flexibly:** **1.0-5.0 Nm**
	DMSD 2-8Nm/SORT	**Torque moment can be adjusted flexibly:** **2.0-8.0 Nm**
	DMSD-B T08-50MM DMSD-B T10-50MM DMSD-B T15-50MM DMSD-B T20-50MM DMSD-B T25-50MM	

Measures for parting and grooving problems

Type of problem										Corrective measures	
Type of wear				Work piece problems				Chip control			
Edge chipping	Built-up edge	Flank wear	Plastic deformation	Vibration	Formation of pips and burrs	Chattered surface	Surface quality	Chip too long (tangled swarf)	Chip too short (fragmented chip)		
	⇧	⇩	⇩	⇩			⇧	⇩		Cutting speed	Cutting values
⇩		≈	⇩	⇧		⇩	⇩	⇧	⇩	Feed rate	
⇩		⇩	⇩		⇩	⇩	⇩			Feed - centre area	
⇧	⇧		≈	≈	⇩	⇩	⇩	⇩	⇧	Chip groove ↓ -R -M -F ↑	Selection of inserts
					▢					R / L - right-hand / left-hand version	
⇧		⇧	⇧	⇩	⇩	⇩	⇧			Corner radius ↓ larger ↑ smaller	
⇩		⇧	⇧							Cutting material ↓ wear resistance ↑ toughness	
				⇩		⇧	⇧			Cutting width	
≈				≈		≈	≈			Clamping of tool	General criteria
≈				≈		≈	≈			Clamping of work piece	
≈				≈			⇩			Overhang	
≈		≈		≈	≈		≈			Tip height	
	▢	▢	▢		▢		▢	▢		Cooling lubricant	

⇧ raise, increase, large influence

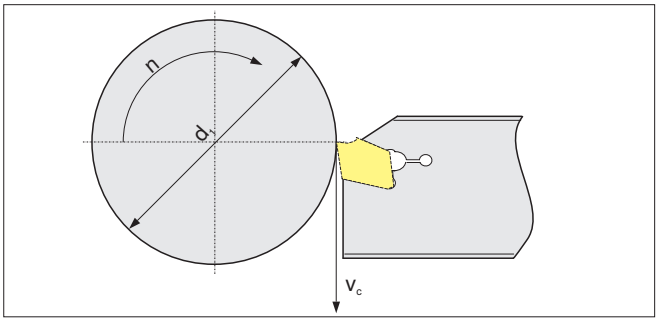
⇧ raise, increase low influence

⇩ avoid, reduce large influence

⇩ avoid, reduce low influence

≈ check, optimise

▢ use



Cutting speed (v_c)

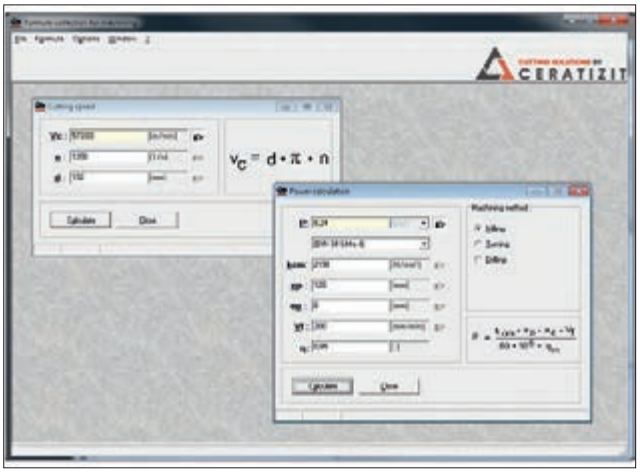
$$v_c = \frac{d_1 \cdot \pi \cdot n}{1000} \quad [m/min]$$

Revolutions per minute (n)

$$n = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \quad [rev./min]$$

Feed rate (v_f)

$$v_f = f \cdot n \quad [mm/min]$$



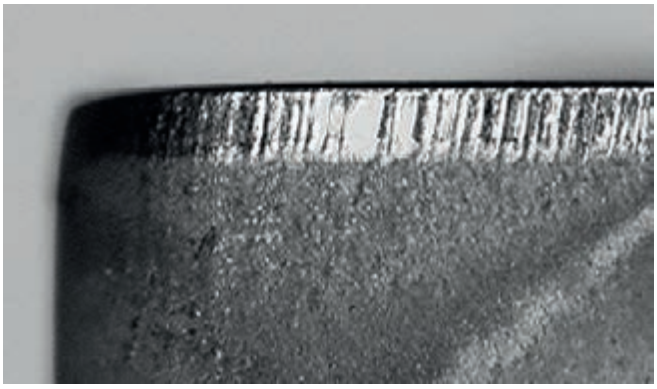
The CERATIZIT formula collection CT-CALC

PC - aided calculation of machining parameters
- Cutting speed
- Chip removal rate
- Power consumption
- Medium chip thickness

Languages
DE, EN, FR, IT, ES, DA, SE, FI

Free-of-charge download from
www.ceratizit.com

Types of wear

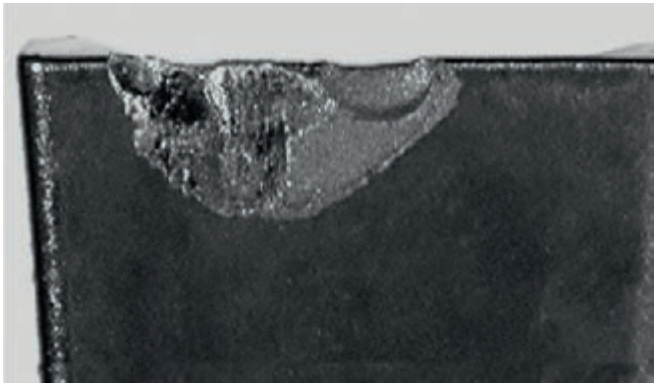


Abrasion on flank, normal wear after a certain machining time.

Flank wear

Reasons
- Cutting speed too high
- Carbide grade with insufficient wear resistance
- Incorrect feed rate

Remedies
- Reduce cutting speed
- Select more wear resistant carbide grade
- Adapt feed rate to cutting speed and cutting depth (increase feed rate)



Through excessive mechanical stress at the cutting edge fracture and chipping may occur.

Edge chipping

Reasons
- Grade with too high wear resistance
- Vibration
- Feed rate too high or excessive depth of cut
- Swarf damage

Remedies
- Use tougher grade
- Use negative cutting edge geometry with chip groove
- Reduce overhang; check centre height
- Increase stability of cutting edge

The hot chip which is being evacuated causes cratering at the rake face of the cutting edge.

Cratering

Reasons
- Cutting speed and / or feed rate too high
- Rake angle too shallow
- Grade with low wear resistance
- Insufficient coolant supply

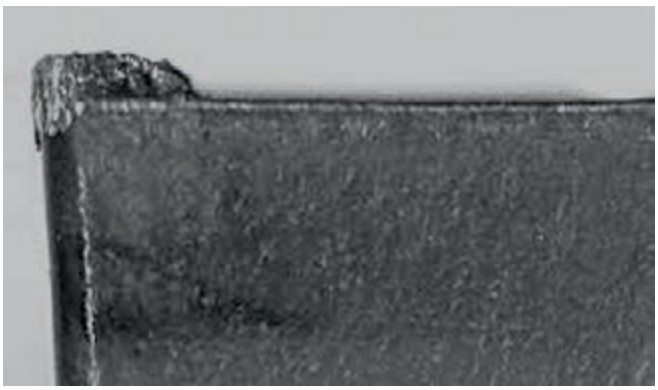
Remedies
- Reduce cutting speed and / or feed rate
- Increase coolant quantity and / or pressure, optimise coolant supply
- Use grade with higher resistance to cratering

High machining temperature and simultaneous mechanical stress may lead to plastic deformation.

Plastic deformation

Reasons
- Too high machining temperature resulting in softening of substrate
- Wear / heat resistance of carbide grade too low
- Insufficient coolant supply

Remedies
- Reduce cutting speed
- Choose carbide grade with higher wear resistance
- Provide cooling

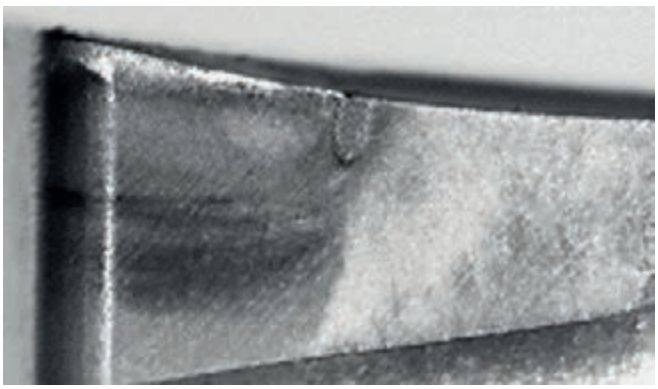


Built-up edge occurs when the chip is not evacuated properly due to insufficient cutting temperature.

Built-up edge

Reasons
- Cutting speed too low
- Rake angle too small
- Wrong cutting material
- Lack of cooling / lubrication

Remedies
- Increase cutting speed
- Enlarge rake angle
- Apply TiN-coating
- Use emulsion with higher concentration



Notch at the maximum depth of cut

Notching

Reasons
- Oxidation of the cutting edge
- Excessive heat on the cutting edge

Remedies
- Use various depths of cut
- Reduce cutting speed
- Improve coolant supply

Hardness values

Comparison table

Tensile strength N/mm²	Vickers HV	Brinell HB	Rockwell HRC	Shore C
575	180	171		
595	185	176		
610	190	181		
625	195	185		
640	200	190	12	
660	205	195	13	
675	210	199	14	
690	215	204	15	
705	220	209	15	28
720	225	214	16	
740	230	219	17	29
755	235	223	18	
770	240	228	20.3	30
785	245	233	21.3	
800	250	238	22.2	31
820	255	242	23.1	32
835	260	247	24	33
850	265	252	24.8	
865	270	257	25.6	
880	275	261	26.4	34
900	280	268	27.1	
915	285	271	27.8	35
930	290	276	28.5	
950	295	280	29.2	36
965	300	285	29.8	37
995	310	295	31	38
1030	320	304	32.2	39
1060	330	314	33.3	40
1095	340	323	34.3	41
1125	350	333	35.5	42
1155	360	342	36.6	43
1190	370	352	37.7	44
1220	380	361	38.8	45
1255	390	371	39.8	46
1290	400	380	40.8	47
1320	410	390	41.8	48
1350	420	399	42.7	
1385	430	409	43.6	49
1420	440	418	44.5	
1455	450	428	45.3	51
1485	460	437	46.1	52
1520	470	447	46.9	53
1555	480	465	47.7	54
1595	490	466	48.4	
1630	500	475	49.1	57
1665	510	485	49.8	58
1700	520	494	50.5	59
1740	530	504	51.1	60
1775	540	513	51.7	61
1810	550	523	52.3	62
1845	560	532	53	63
1880	570	542	53.6	64
1920	580	551	54.1	65
1955	590	561	54.7	66
1995	600	570	55.2	67
2030	610	580	55.7	68
2070	620	589	56.3	69
2105	630	599	56.8	70
2145	640	608	57.3	71
2180	650	618	57.8	72
2210	660	628	58.3	73
2240	665	633	58.8	74
2280	670	638	59.3	
2310	675	643	59.8	75
2350	680	648	60.3	76
2380	685	653	61.1	77
2410	690	658	61.3	78
2450	695	663	61.7	79
2480	710	668	62.2	80
2520	720	678	62.6	81
2550	730	683	63.1	82
2590	740	693	63.5	
2630	750	703	63.9	83
2660	760	708	64.3	84
2700	770	718	64.7	85
2730	780	723	65.1	
2770	790	733	65.5	86
2800	800	738	65.9	
2840	810	748	66.3	87
2870	820	753	66.7	88
2910	830	763	67	
2940	840	768	67.4	89
2980	850		67.7	
3010	860		68.1	90
3050	870		68.4	
3080	880		68.7	91
3120	890		69	
3150	900		69.3	92
3190	910		69.6	
3220	920		69.9	
3260	930		70.1	

The figures given are approximate according to DIN EN ISO18265 (02-2004)

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	United States AISI	Japan JIS	Kc1.1 N/mm²	mc	VDI 3323 group
10 SPb 20	1.0722		10 PbF 2		11 L 08		1350	0,20	**1**
100 Cr 6	1.2067	BL 3	Y 100 C 6		L 3	SUJ2	1775	0,24	**6/9**
105 WCr 6	1.2419		105 WC 13			SKS31	1775	0,24	**6/9**
12 CrMo 9 10	1.7380	1501-622 Gr. 31; 45	10 CD 9.10	2218	A 182-F22	SPVA,SCMV4	1675	0,24	**6/7**
12 Ni 19	1.5680		Z 18 N 5		2515		2450	0,23	**10/11**
13 CrMo 4 4	1.7335	1501-620 Gr. 27	15 CD 3.5	2216	A 182-F11; F12	SPVAF12	1675	0,24	**6/7**
14 MoV 6 3	1.7715	1503-660-440					1675	0,24	**6/7**
14 Ni 6	1.5622		16 N 6		A 350-LF 5		1675	0,24	**6/7**
14 NiCr 10	1.5732		14 NC 11		3415	SNC415(H)	1675	0,24	**6/7**
14 NiCr 14	1.5752	655 M 13	12 NC 15		3310; 9314	SNC815(H)	1675	0,24	**6/7**
14 NiCrMo 13 4	1.6657						1675	0,24	**6/7**
15 Cr 3	1.7015	523 M 15	12 C 3		5015		1675	0,24	**6/7**
15 CrMo 5	1.7262		12 CD 4			SCM415(H)	1675	0,24	**6/7**
15 Mo 3	1.5415	1501-240	15 D 3	2912	A 204 Gr. A		1675	0,24	**6/7**
16 MnCr 5	1.7131	527 M 17	16 MC 5	2511	5115	SCR415	1675	0,24	**6/7**
16 Mo 5	1.5423	1503-245-420			4520	SB450M	1675	0,24	**6/7**
17 CrNiMo 6	1.6587	820 A 16	18 NCD 6				1675	0,24	**6/7**
21 NiCrMo 2	1.6523	805 M 20	20 NCD 2	2506	8620	SNCM220(H)	1725	0,24	**6/8**
25 CrMo 4	1.7218	1717 CDS 110	25 CD 4 S	2225	4130	SM420;SCM430	1725	0,24	**6/8**
28 Mn 6	1.1170	150 M 28	20 M 5		1330		1500	0,22	**2**
32 CrMo 12	1.7361	722 M 24	30 CD 12	2240			1775	0,24	**6/9**
34 Cr 4	1.7033	530 A 32	32 C 4		5132	SCR430(H)	1725	0,24	**6/8**
34 CrMo 4	1.7220	708 A 37	35 CD 4	2234	4135; 4137	SCM432;SCCRM3	1775	0,24	**6/9**
34 CrNiMo 6	1.6582	817 M 40	35 NCD 6	2541	4340	SNCM447	1775	0,24	**6/9**
35 S 20	1.0726	212 M 36	35 MF 4	1957	1140		1525	0,22	**2/3**
36 CrNiMo 4	1.6511	816 M 40	40 NCD 3		9840	SNCM447	1775	0,24	**6/9**
36 Mn 5	1.1167						1525	0,22	**2/3**
36 NiCr 6	1.5710	640 A 35	35 NC 6		3135	SNC236	1800	0,24	**3/9**
38 MnSi 4	1.5120						1800	0,24	**3/9**
39 CrMoV 13 9	1.8523	897 M 39					1775	0,24	**6/9**
40 Mn 4	1.1157	150 M 36	35 M 5		1039		1525	0,22	**2/3**
40 NiCrMo 2 2	1.6546	311-Type 7	40 NCD 2		8740	SNCM240	1775	0,24	**6/9**
41 Cr 4	1.7035	530 M 40	42 C 4		5140	SCR440(H)	1775	0,24	**6/9**
41 CrAlMo 7	1.8509	905 M 39	40 CAD 6.12	2940	A 355 Cl. A	SACM645	1775	0,24	**6/9**
41 CrMo 4	1.7223	708 M 40	42 CD 4 TS	2244	4142; 4140	SCM440	1775	0,24	**6/9**
42 Cr 4	1.7045	530 A 40	42 C 4 TS	2245	5140	SCr440	1775	0,24	**6/9**
42 CrMo 4	1.7225	708 M 40	42 CD 4	2244	4142; 4140	SCM440(H)	1775	0,24	**6/9**
45 WCrV 7	1.2542	BS 1		2710	S 1		1775	0,24	**6/9**
50 CrV 4	1.8159	735 A 50	50 CV 4	2230	6150	SUP10	1775	0,24	**6/9**
55 Cr 3	1.7176	527 A 60	55 C 3	2253	5155	SUP9(A)	1775	0,24	**6/9**
55 NiCrMoV 6	1.2713		55 NCDV 7		L 6	SKH1;SKT4	1775	0,24	**6/9**
55 Si 7	1.0904	250 A 53	55 S 7	2085; 2090	9255		1775	0,24	**6/9**
58 CrV 4	1.8161						1775	0,24	**6/9**
60 SiCr 7	1.0961		60 SC 7		9262		1775	0,24	**6/9**
9 SMn 28	1.0715	230 M 07	S 250	1912	1213	SUM22	1350	0,21	**1**
9 SMn 36	1.0736	240 M 07	S 300		1215		1350	0,21	**1**
9 SMnPb 28	1.0718		S 250 Pb	1914	12 L 13	SUM22L	1350	0,21	**1**
9 SMnPb 36	1.0737		S 300 Pb	1926	12 L 14		1350	0,21	**1**
Al99	3.0205						700	0,25	**21**
AlCuMg1	3.1325						700	0,25	**22**
AlMg1	3.3315						700	0,25	**21**

Comparison of materials

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	United States AISI	Japan JIS	Kc1.1 N/mm²	mc	VDI 3323 group
AlMgSi1	3.2315						700	0,25	**22**
C 105 W1	1.1545		Y1 105	1880	W 110	SK3	1675	0,24	**3**
C 125 W	1.1663		Y2 120		W 112		1675	0,24	**3**
C 15	1.0401	080 M 15	AF3 7 C 12; XC 18	1350	1015	S15C	1350	0,21	**1**
C 22	1.0402	050 A 20	AF 42 C 20	1450	1020	S20C, S22C	1350	0,21	**1**
C 35	1.0501	060 A 35	AF 55 C 35	1550	1035	S35C	1525	0,22	**2/3**
C 45	1.0503	080 M 46	AF 65 C 45	1650	1045	S45C	1525	0,22	**2/3**
C 55	1.0535	070 M 55		1655	1055	S55C	1675	0,24	**3**
C 60	1.0601	080 A 62	CC 55		1060	S60C	1675	0,24	**3**
Cf 35	1.1183					S35C	1525	0,22	**2/3**
Cf 53	1.1213					S50C	1525	0,22	**2/3**
Ck 101	1.1274	060 A 96		1870	1095		1675	0,24	**3**
Ck 15	1.1141	080 M 15	XC 15; XC 18	1370	1015	S15C	1350	0,21	**1**
Ck 55	1.1203	070 M 55	XC 55		1055	S55C	1675	0,24	**3**
Ck 60	1.1221	080 A 62	XC 60	1665; 1678	1060	S58C	1675	0,24	**3**
CoCr20W15Ni	2.4764						3300	0,24	**35**
CuZn15	2.0240						700	0,27	**27**
CuZn36Pb3	2.0375						700	0,27	**26**
E-Cu57	2.0060						700	0,27	**28**
G-AlSi10Mg	3.2381						700	0,25	**24**
G-AlSi12	3.2581						700	0,25	**23**
G-AlSi9Cu3	3.2163						700	0,25	**23**
G-CuSn5ZnPb	2.1096						700	0,27	**26**
G-CuZn40Fe	2.0590						700	0,27	**28**
G-X 120 Mn 12	1.3401	Z 120 M 12	Z 120 M 12		A 128 (A)		3300	0,24	**35**
G-X 20 Cr 14	1.4027	420 C 29	Z 20 C 13 M			SCS2	1875	0,21	**12/13**
G-X 40 NiCrSi 38 18	1.4865	330 C 40					2600	0,24	**31**
G-X 45 CrSi 9 3	1.4718	401 S 45	Z 45 CS 9		HNV 3		2450	.23	**10/11**
G-X 5 CrNi 13 4	1.4313	425 C 11	Z 5 CN 13.4	2385	CA 6-NM		1875	0,21	**12/13**
G-X 5 CrNiMoNb 18 10	1.4581	318 C 17	Z 4 CNDNb 18.12 M				2150	.0,2	**14**
G-X 6 CrNi 18 9	1.4308	304 C 15	Z 6 CN 18.10 M	2333	CF-8		2150	.0,2	**14**
G-X 6 CrNiMo 18 10	1.4408						2150	.0,2	**14**
G-X 7 Cr 13	1.4001						1875	0,21	**12/13**
GG-10	.6010		Ft 10 D	01 10-00	A48-20 B	FC100	1150	.0,2	**15**
GG-15	.6015	Grade 150	Ft 15 D	01 15-00	A48-25 B	FC150	1150	.0,2	**15**
GG-20	.6020	Grade 220	Ft 20 D	01 20-00	A48-30 B	FC200	1150	.0,2	**15**
GG-25	.6025	Grade 260	Ft 25 D	01 25-00	A48-40 B	FC250	1250	0,24	**15/16**
GG-30	.6030	Grade 300	Ft 30 D	01 30-00	A48-45 B	FC300	1350	0,28	**16**
GG-35	.6035	Grade 350	Ft 35 D	01 35-00	A48-50 B	FC350	1350	0,28	**16**
GG-40	.6040	Grade 400	Ft 40 D	01 40-00	A48-60 B	FC400	1350	0,28	**16**
GGG-35.3	.7033					FCD350	1225	0,25	**17**
GGG-40	.7040	SNG 420/12	FGS 400-12	0717-02	60-40-18	FCD400	1225	0,25	**17**
GGG-40.3	.7043	SNG 370/17	FGS 370-17	0717-15		FCD400	1225	0,25	**17**
GGG-50	.7050	SNG 500/7	FGS 500-7	0727-02	65-45-12	FCD500	1350	0,28	**18**
GGG-60	.7060	SNG 600/3	FGS 600-3	0732-03	80-55-06	FCD600	1350	0,28	**18**
GGG-70	.7070	SNG 700/2	FGS 700-2	0737-01	100-70-03	FCD700	1350	0,28	**18**
GGG-NiCr 20 2	.7660	S-NiCr 20 2	S-NC 20 2		A 439 Type D-2		1350	0,28	**18**
GGG-NiMn 13 7	.7652	S-NiMn 13 7	S-NM 13 7				1350	0,28	**18**
GS-Ck 45	1.1191	080 M 46	XC 42	1672	1045	S45C	1525	0,22	**2/3**
GTS-35-10	.8135	B 340/12	MN 35-10				1225	0,25	**19**
GTS-45-06	.8145	P 440/7					1420	0,3	**20**

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	United States AISI	Japan JIS	Kc1.1 N/mm²	mc	VDI 3323 group
GTS-55-04	.8155	P 510/4	MP 50-5				1420	0,3	**20**
GTS-65-02	.8165	P 570/3	MP 60-3				1420	0,3	**20**
GTS-70-02	.8170	P 690/2	IP 70-2				1420	0,3	**20**
NiCr20TiAl	2.4631	HR 401; 601	Nimonic 80 A				3300	0,24	**33**
NiCr22Mo9Nb	2.4856		Inconel 625				3300	0,24	**33**
NiCu30Al	2.4375		Monel K 500				3300	0,24	**34**
NiFe25Cr20NbTi	2.4955						3300	0,24	**34**
S 18-0-1	1.3355	BT 1	Z 80 WCV 18-04-01		T 1		2450	0,23	**10/11**
S 18-1-2-5	1.3255	BT 4	Z 80 WKCV 18-05-04-0		T 4		2450	0,23	**10/11**
S 2-9-2	1.3348		Z 100 DCWV 09-04-02-	2782	M 7		2450	0,23	**10/11**
S 6-5-2	1.3343	BM 2	Z 85 WDCV 06-05-04-0	2722	M 2	SKH9; SKH51	2450	0,23	**10/11**
S 6-5-2-5	1.3243		Z 85 WDKCV 06-05-05-	2723		SKH55	2450	0,23	**10/11**
TiAl6V4	3.7165	TA 10 bis TA 13	T-A 6 V				2110	0,22	**37**
X 10 Cr 13	1.4006	410 S 21	Z 12 C 13	2302	410; CA-15	SUS410	1875	0,21	**12/13**
X 10 CrNiMoNb 18 12	1.4583				318		2150	0,2	**14**
X 10 CrNiS 18 9	1.4305	303 S 21	Z 10 CNF 18.09	2346	303		2150	0,2	**14**
X 100 CrMoV 5 1	1.2363	BA 2	Z 100 CDV 5	2260	A 2		2450	0,23	**10/11**
X 12 CrMoS 17	1.4104		Z 10 CF 17	2383	430 F	SUS430F	1875	0,21	**12/13**
X 12 CrNi 17 7	1.4310	301 S 21	Z 12 CN 17.07		301		2150	0,2	**14**
X 12 CrNi 22 12	1.4829					SUS301	1350	0,28	**16**
X 12 CrNi 25 21	1.4845	310 S24	Z 12 CN 25.20	2361	310 S	SUH310; SUS310S	2150	0,2	**14**
X 12 CrNiTi 18 9	1.4878	321 S 20	Z 6 CNT 18.12 (B)	2337	321		2150	0,2	**14**
X 12 NiCrSi 36 16	1.4864	NA 17	Z 12 NCS 37.18		330	SUH330	2600	0,24	**31**
X 15 CrNiSi 20 12	1.4828	309 S 24	Z 15 CNS 20.12		309	SUH309	1350	0,28	**16**
X 165 CrMoV 12	1.2601			2310			2450	0,23	**10/11**
X 2 CrNiMo 18 13	1.4440						2150	0,2	**14**
X 2 CrNiMoN 17 13 3	1.4429	316 S 62	Z 2 CND 17.13 Az	2375	316 LN	SUS316LN	2150	0,2	**14**
X 2 CrNiN 18 10	1.4311	304 S 62	Z 2 CN 18 .10	2371	304 LN	SUS304LN	2150	0,2	**14**
X 20 CrNi 17 2	1.4057	431 S 29	Z 15 CN 16.02	2321	431	SUS431	1875	0,21	**12/13**
X 210 Cr 12	1.2080	BD 3	Z 200 C 12		D 3		2450	0,23	**10/11**
X 210 CrW 12	1.2436			2312			2450	0,23	**10/11**
X 30 WCrV 9 3	1.2581	BH 21	Z 30 WCV 9		H 21	SKD5	2450	0,23	**10/11**
X 40 CrMoV 5 1	1.2344	BH 13	Z 40 CDV 5	2242	H 13	SKD61	2450	0,23	**10/11**
X 46 Cr 13	1.4034	420 S 45	Z 40 C 14				1875	0,21	**12/13**
X 5 CrNi 18 9	1.4301	304 S 15	Z 6 CN 18.09	2332; 2333	304; 304 H	SUS304	2150	0,2	**14**
X 5 CrNiMo 17 13 3	1.4436	316 S 16	Z 6 CND 17.12	2343	316	SUS316	2150	0,2	**14**
X 5 CrNiMo 18 10	1.4401	316 S 16	Z 6 CND 17.11	2347	316	SUS316	2150	0,2	**14**
X 53 CrMnNiN 21 9	1.4871	349 S 54	Z 52 CMN 21.09		EV 8		1875	0,21	**12/13**
X 6 Cr 13	1.4000	403 S 17	Z 6 C 13	2301	403	SUS403	1875	0,21	**12/13**
X 6 Cr 17	1.4016	430 S 15	Z 8 C 17	2320	430	SUS430	1875	0,21	**12/13**
X 6 CrMo 17	1.4113	434 S 17	Z 8 CD 17.01	2325	434	SUS434	1875	0,21	**12/13**
X 6 CrNiMoTi 17 12 2	1.4571	320 S 31	Z 6 CNT 17.12	2350	316 Ti		2150	0,2	**14**
X 6 CrNiNb 18 10	1.4550	347 S 17	Z 6 CNNb 18.10	2338	347		2150	0,2	**14**
X 6 CrNiTi 18 10	1.4541	321 S 12	Z 6 CNT 18.10	2337	321		2150	0,2	**14**
X2 CrNi 18-8	1.4317						2150	0,2	**14**

Cutting data

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hard-ness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

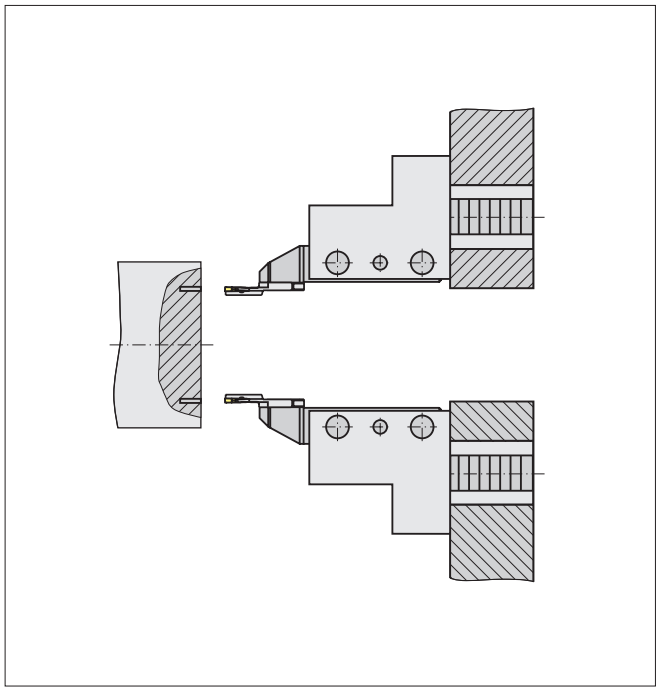
CTCP325 v_c [m/min]	CTP1340 v_c [m/min]	CTCP335 v_c [m/min]	CTPP345 v_c [m/min]	H216T v_c [m/min]
150 - 280	120 - 250	130 - 250	110 - 190	
130 - 240	80 - 180	110 - 190	80 - 150	
100 - 200	60 - 150	70 - 170	70 - 140	
140 - 220	80 - 180	120 - 200	70 - 140	
130 - 180	60 - 150	110 - 180	70 - 120	
100 - 160	60 - 120	70 - 150	60 - 120	
120 - 170	80 - 160	90 - 170	60 - 100	
100 - 150	50 - 120	70 - 160	60 - 100	
150 - 250	50 - 200	120 - 200	90 - 160	
60 - 100	50 - 150	60 - 100	60 - 100	
140 - 220	50 - 200	120 - 200	100 - 180	
120 - 200	50 - 180	100 - 170	80 - 150	
80 - 130	50 - 100	70 - 110	70 - 110	
60 - 100	50 - 80	60 - 90	60 - 90	
120 - 220	100 - 200	90 - 180		120 - 160
100 - 200	90 - 160	80 - 150		90 - 140
130 - 190	100 - 180	100 - 160		130 - 170
100 - 190	80 - 160	70 - 140		90 - 130
140 - 280	110 - 230	100 - 200		140 - 200
90 - 190	80 - 160	80 - 150		120 - 160
	100 - 500			300 - 2500
	100 - 300			200 - 2000
	100 - 500			400 - 1500
	100 - 300			400 - 1500
	100 - 200			200 - 800
	100 - 500			250 - 600
	100 - 500			200 - 600
	100 - 300			150 - 400
	100 - 300			150 - 300
	80 - 180			80 - 180
	60 - 150			60 - 150
	100 - 250			100 - 250
25 - 45	20 - 50			30 - 45
20 - 40	20 - 40		20 - 40	20 - 35
15 - 25	15 - 25		20 - 30	20 - 35
10 - 20	10 - 20			18 - 30
10 - 20	10 - 20			15 - 25
	50 - 120			60 - 120
	30 - 50			30 - 80
10 - 20				
10 - 20				
10 - 20				

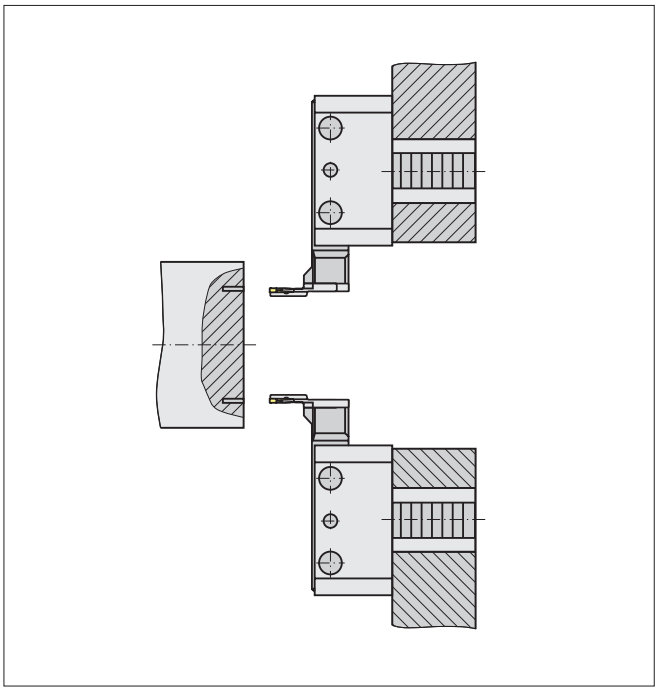
The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

Possible applications

System GX

Tool configuration





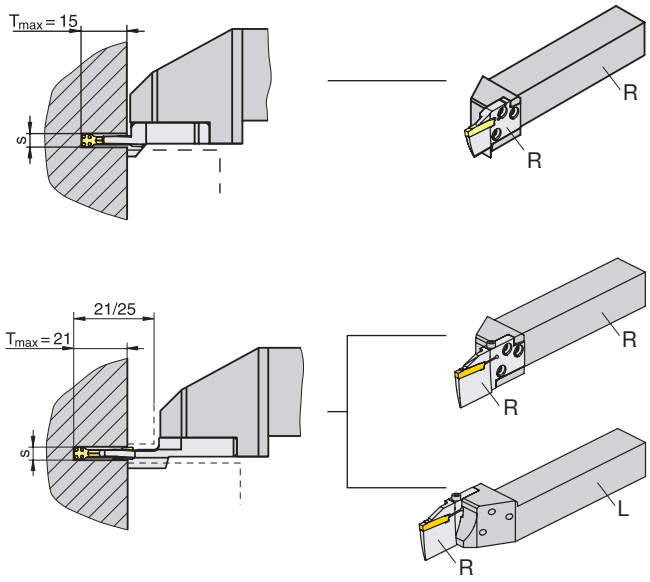
MSS tools 0°

- Large overhang
- Danger of collision
- Special VDI adapter necessary

MSS tools 90°

- Short overhang
- Increased stability
- Normal clamping in VDI shank possible

Parting and grooving depth



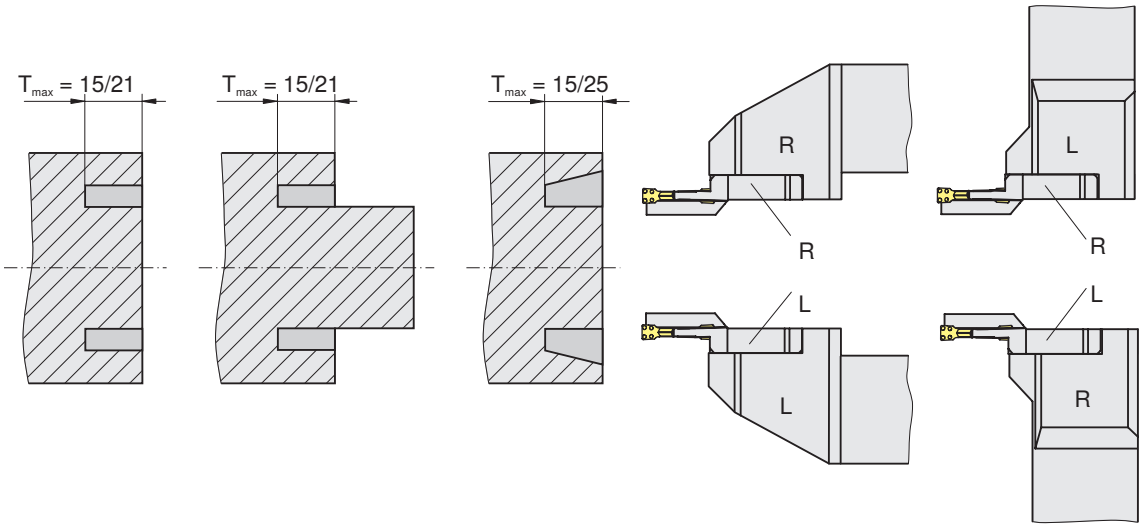
Short axial module

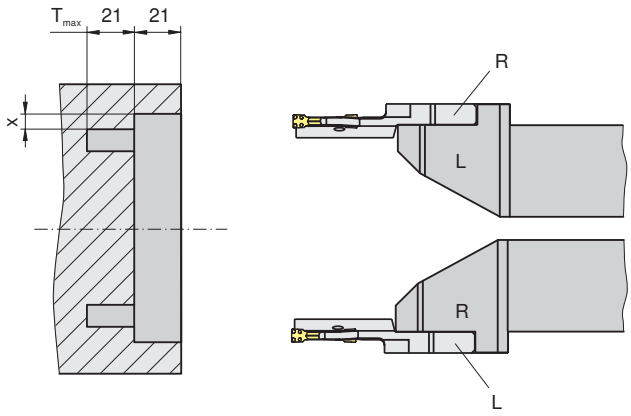
- Can be clamped on one side only
- Parting and grooving depth max. 15 mm

Long axial module

- Can be clamped from either side
- Parting and grooving depth max. 21 mm

Machining possibilities with short/long axial module



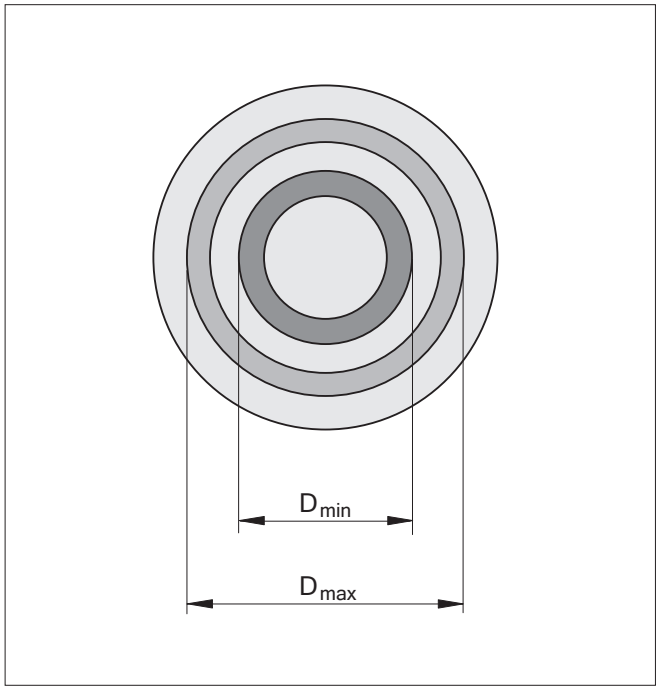


Machining possibilities with long axial module only

Depending on the diameter range or width class an axial displacement (dimension ‘x’) might be necessary when producing the second groove.
The dimension ‘x’ depends on the groove diameter and shank height.

Application advice

GX system

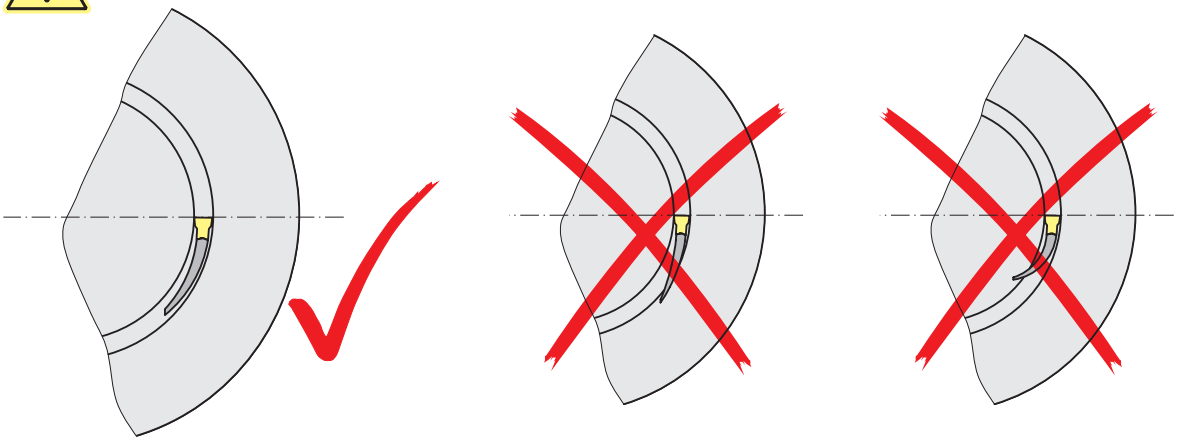


Diameter range (D_{min} - D_{max})
50 - 70 mm
70 - 100 mm
100 - 150 mm
150 - 300 mm
300 - 900 mm

Important: the indicated diameter refers to the outside diameter of the groove.

	MSS assembly size							
	20	25					32	
	Cutting width	Cutting width					Cutting width	
		Short module			Long module			
Diameter range	2,76 - 3,75	2,76 - 3,75	3,76 - 5,00	5,01 - 6,50	3,76 - 5,00	5,01 - 6,50	3,76 - 5,00	5,01 - 6,50
50 - 70	●	●	●	●				
70 - 100	●	●	●	●	●	●	●	●
100 - 150	●	●	●	●	●	●	●	●
150 - 300			●	●	●	●	●	●
300 - 900								●
max. grooving depth	14	15			21		15	

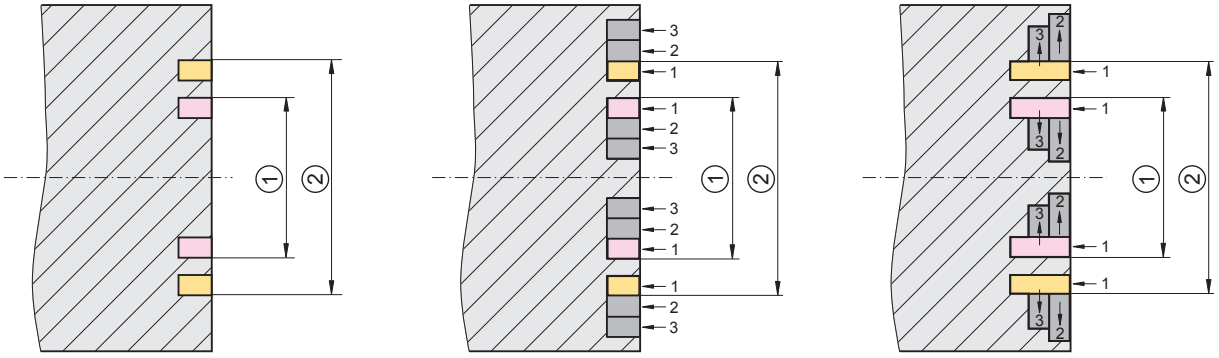
Please note: the diameter of face grooves must lie within the diameter range indicated on the module. Otherwise the tool may be damaged or destroyed.



Correct axial grooving module

Incorrect axial grooving module

Application advice for axial grooving and face turning



① Minimum grooving diameter
② Maximum grooving diameter

Axial grooving

is only possible within the diameter range for that module (e.g. 50 - 70 mm).

Please note: the indicated diameter range refers to the outside diameter of the groove.

Axial grooving - groove widening

Groove widening is possible above and below the diameter range indicated on the module.

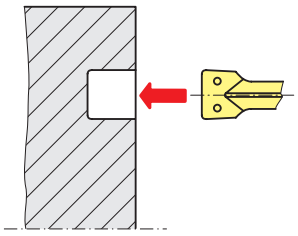
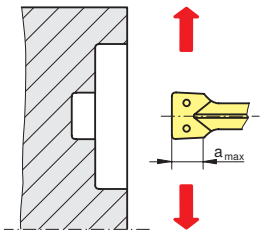
Please note: only the first groove must lie within the diameter range of the module. The depth of the widening groove must not be larger than the depth of the original groove.

Axial grooving and face turning

When face turning it is possible to widen the groove above and below the diameter range indicated on the module.

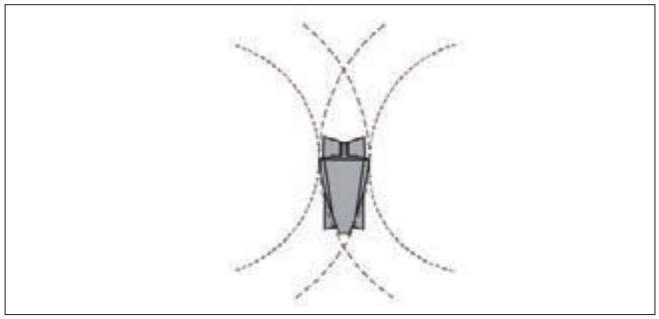
Please note: only the first groove must lie within the diameter range of the module.

Axial grooving and face turning

Designation	 f [mm/rev]	 a_{max} [mm]	f [mm/rev]
GX24-2E3.00N0.30	0,05 - 0,15	2,5	0,05 - 0,20
GX24-3E4.00N0.40	0,05 - 0,15	3,0	0,05 - 0,25
GX24-3E5.00N0.40	0,05 - 0,15	3,0	0,10 - 0,25
GX24-4E6.00N0.50	0,05 - 0,20	3,5	0,10 - 0,30
GX24-2E3.00N0.30-F2	0,025 - 0,125	2,5	0,05 - 0,15
GX24-2E3.50N0.30-F2	0,025 - 0,125	2,5	0,05 - 0,15
GX24-3E4.00N0.40-F2	0,05 - 0,15	3,0	0,10 - 0,20
GX24-3E4.50N0.40-F2	0,05 - 0,15	3,0	0,10 - 0,20
GX24-3E5.00N0.40-F2	0,075 - 0,20	3,5	0,10 - 0,20
GX24-4E6.00N0.50-F2	0,05 - 0,15	4,0	0,10 - 0,25

MSS-AX

Product characteristics, customer benefits



Neutral insert

- May be applied in left-hand and right-hand tools
- Application is indenpent on the groove diameter (tool position is possible in x+ or x-)
- Only limited by D_{min} for first grooving operation

Geometry -F50

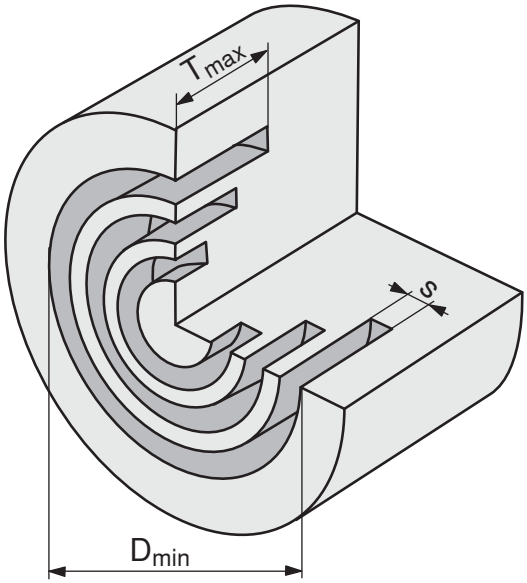
- Universal application, suitable for all materials
- Suitable for grooving and turning

Tools provided with ‘hard & tough’ coating

- Maximum wear protection
- Maximum corrosion resistance

Monoblock and modular tools

- High flexibility
- Cost-optimised solution for every application



GX system

T_{max} / $D_{min} – D_{max}$	15 [mm]	21 [mm]
50 - 70	x	x
70 - 100	x	x
100 - 150	x	x
150 - 300	x	x
300 - 900	x	
S [mm]	2,76 - 6,5	3,76 - 6,5

AX system

	AX05	AX10	AX15
$D_{min} – D_{max}$	10 – ∞	20 – ∞	30 – ∞
T_{max}	5,0	10,0	15,0
S [mm]	3,0	3,0	3,0

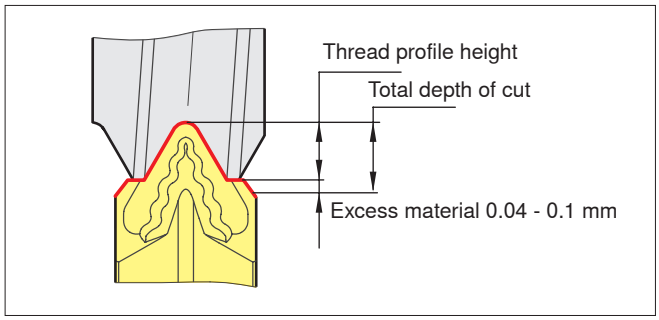
LX system

	E32N25	E32N32	E32N45
$D_{min} – D_{max}$	500 – ∞	500 – ∞	500 – ∞
T_{max}	19	26	39
S [mm]	8 - 10	8 - 10	8 - 10

TC - threading

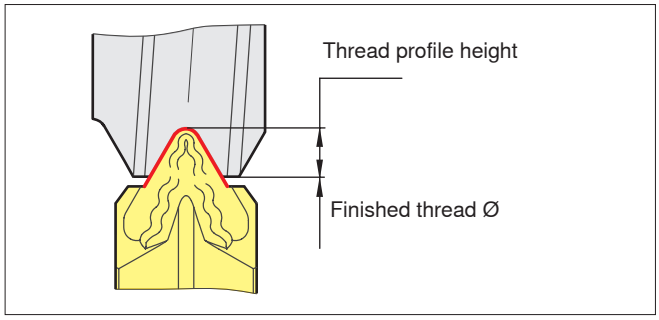
Basics of threading

Differences between full and partial profile inserts



Full profile insert

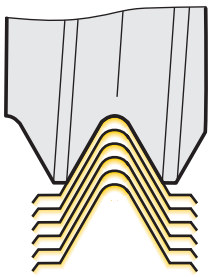
+ The entire thread profile including the external dia. is machined (excess material 0.04 - 0.1 mm over finished diameter) + high profile precision
+ Increased tool life thanks to larger point radii
+ Burr-free thread
- One insert per pitch



Partial profile insert

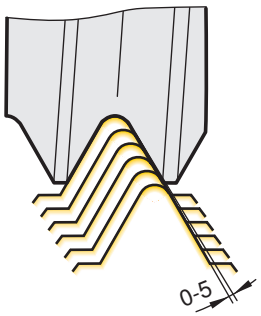
+ One insert for several pitches
- Therefore the thread profile does not exactly meet the standard
- The external dia. (or the core dia. in case of internal threads) is not machined

Approach selection



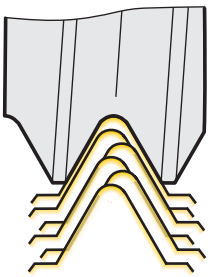
Radial approach

+ Conventional lathes
+ With pitches < 2 mm
+ With short chipping materials
- Reduced chip control



Flank approach

+ Preferred approach on CNC-machines
+ With pitches from 2 to 4 mm
+ Long chipping materials
+ Good chip control



Alternating approach

+ With pitches > 4 mm
+ Long chipping materials
+ Uniform insert wear
+ Long tool life
+ Good chip control
- More complex NC programming

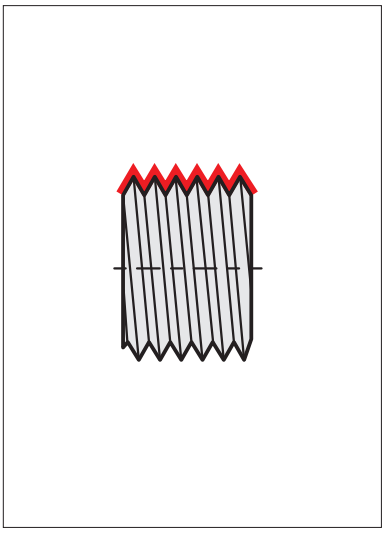
Type of problem											Corrective measures	
Type of wear				Work piece problems				Chip control				
Flank wear	Edge chipping	Plastic deformation	Built-up edge	Burr formation at external thread Ø	Profile precision	Surface quality	Chatter marks, vibration	Chip cross section too large	Chip cross section too small	Chip shape (tangled swarf)		
⇩		⇩	⇧			⇧	⇩				Cutting speed	Cutting values
a,b	a,b		a,b	a,b		a,b	a,b	a,b		a,b	Feed motion a) via the flanks b) alternating via the flanks	
⇧	⇩	⇩		⇩	⇩	⇩	⇩	⇩	⇧	≈	Approach (depth of cut)	
⇩	⇧	⇧		≈	≈	⇧	≈	⇧	⇩	⇩	Number of passes	Selection of inserts
				▢	▢	▢					Finish cut (idle cut)	
			▢			▢	▢			▢	Chip groove	
⇧	⇩	⇧									Cutting material ↓ wear resistance ↑ toughness	
				▢	▢	▢					Full profile	
											Partial profile	General criteria
	≈					≈	≈				Stability tool - insert	
	≈					≈	≈				Stability - work piece	
	⇩					⇩	⇩				Overhang	
≈	≈	≈			≈	≈	≈				Tip height	
▢	▢	▢	▢	▢		▢					Cooling lubricant	

⇧ raise, increase, large influence
⇩ avoid, reduce large influence
≈ check, optimise
⇧ raise, increase low influence
⇩ avoid, reduce low influence
▢ use

TC - thread turning

Recommended values for depth and number of cuts

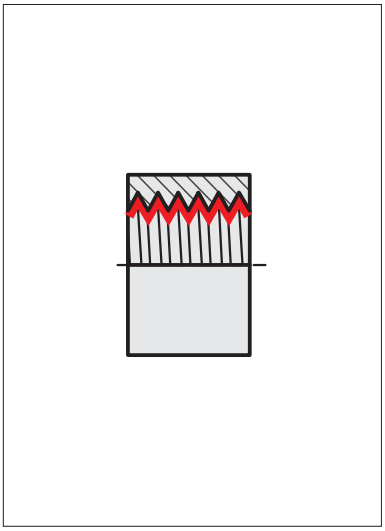
Full profile



Metric ISO 60° external threads

Pitch [mm]	0,5	0,75	1,0	1,25	1,5	1,75	2,0	2,5	3,0	3,5	4,0	4,5	5,0
Number of cuts	4 ↓ 6	4 ↓ 7	5 ↓ 8	5 ↓ 9	6 ↓ 10	7 ↓ 11	8 ↓ 12	9 ↓ 14	10 ↓ 18	10 ↓ 18	12 ↓ 20	12 ↓ 20	12 ↓ 20
Thread profile height	0,32	0,48	0,64	0,80	0,95	1,10	1,26	1,58	1,89	2,21	2,53	2,84	3,16

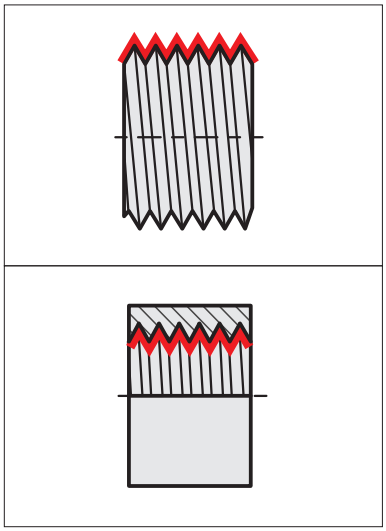
These are recommended values for steel machining



Metric ISO 60° internal threads

Pitch [mm]	0,5	0,75	1,0	1,25	1,5	1,75	2,0	2,5	3,0	3,5	4,0	4,5	5,0
Number of cuts	4 ↓ 6	4 ↓ 7	5 ↓ 8	5 ↓ 9	6 ↓ 10	7 ↓ 11	8 ↓ 12	9 ↓ 14	10 ↓ 18	10 ↓ 18	12 ↓ 20	12 ↓ 20	12 ↓ 20
Thread profile height	0,30	0,45	0,59	0,74	0,89	1,02	1,17	1,46	1,76	2,02	2,35	2,64	2,93

These are recommended values for steel machining

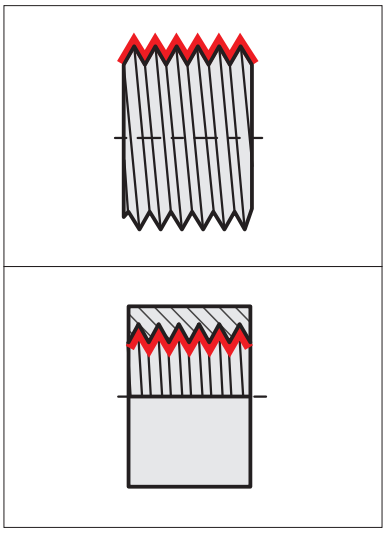


Whitworth 55° external and internal threads

Pitch [passes/inch]	28	26	24	20	19	18	16	14	12	11	10	9	8	7	6	5
Number of cuts	5 ↓ 8	5 ↓ 8	5 ↓ 9	5 ↓ 9	6 ↓ 10	6 ↓ 10	7 ↓ 11	8 ↓ 12	9 ↓ 14	9 ↓ 14	10 ↓ 17	10 ↓ 18	10 ↓ 18	12 ↓ 20	12 ↓ 20	12 ↓ 20
Thread profile height	0,60	0,65	0,70	0,84	0,88	0,93	1,05	1,20	1,40	1,53	1,68	1,87	2,11	2,41	2,81	3,37

These are recommended values for steel machining

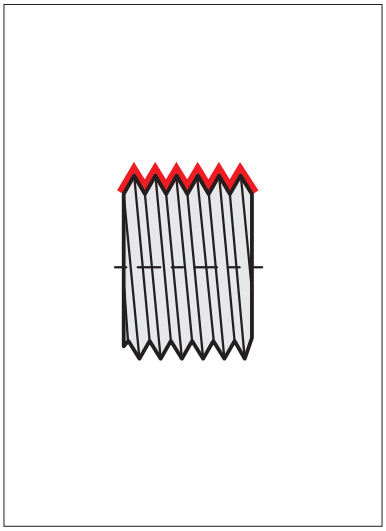
Partial profile



60° external and internal threads

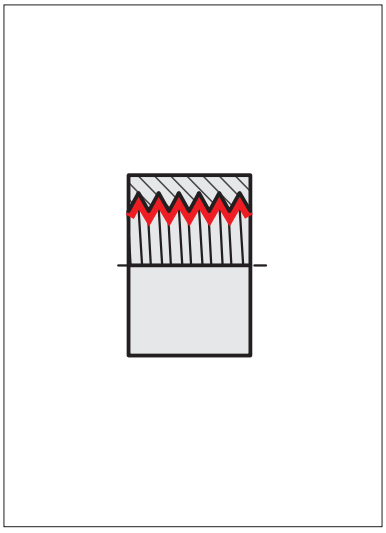
Threading insert	TC16-2EI-AG60									TC16-2EI-G60				TC16-3EI-N60			
	TC16-1EI-A60																
Pitch [mm]	0,5	0,75	1,0	1,25	1,5	1,75	2,0	2,5	3,0	1,75	2,0	2,5	3,0	3,5	4,0	4,5	5,0
Number of cuts	4 ↓ 6	4 ↓ 7	5 ↓ 9	6 ↓ 10	7 ↓ 11	8 ↓ 12	9 ↓ 14	10 ↓ 15	12 ↓ 19	8 ↓ 12	9 ↓ 14	10 ↓ 15	12 ↓ 20	12 ↓ 20	13 ↓ 21	14 ↓ 22	14 ↓ 22
Thread profile height external	0,33	0,52	0,71	0,90	1,09	1,28	1,47	1,84	2,22	1,23	1,42	1,79	2,17	2,45	2,83	3,21	3,59
Thread profile height internal	0,27	0,44	0,60	0,76	0,92	1,09	1,25	1,57	1,90	1,04	1,20	1,52	1,85	2,07	2,4	2,72	3,05

These are recommended values for steel machining



55° external threads

	TC16-2EI-AG55												
	TC16-1EI-A55												
Pitch [passes/inch]	28	26	24	20	19	18	16	14	12	11	10	9	8
Number of cuts	5 ↓ 8	5 ↓ 8	6 - 9	6 ↓ 9	7 ↓ 12	7 ↓ 12	8 ↓ 14	9 ↓ 14	10 ↓ 16	10 ↓ 16	11 ↓ 18	12 ↓ 20	12 ↓ 20
Thread profile height	0,66	0,72	0,79	0,95	1,01	1,07	1,21	1,39	1,63	1,79	1,97	2,20	2,48



55° internal threads

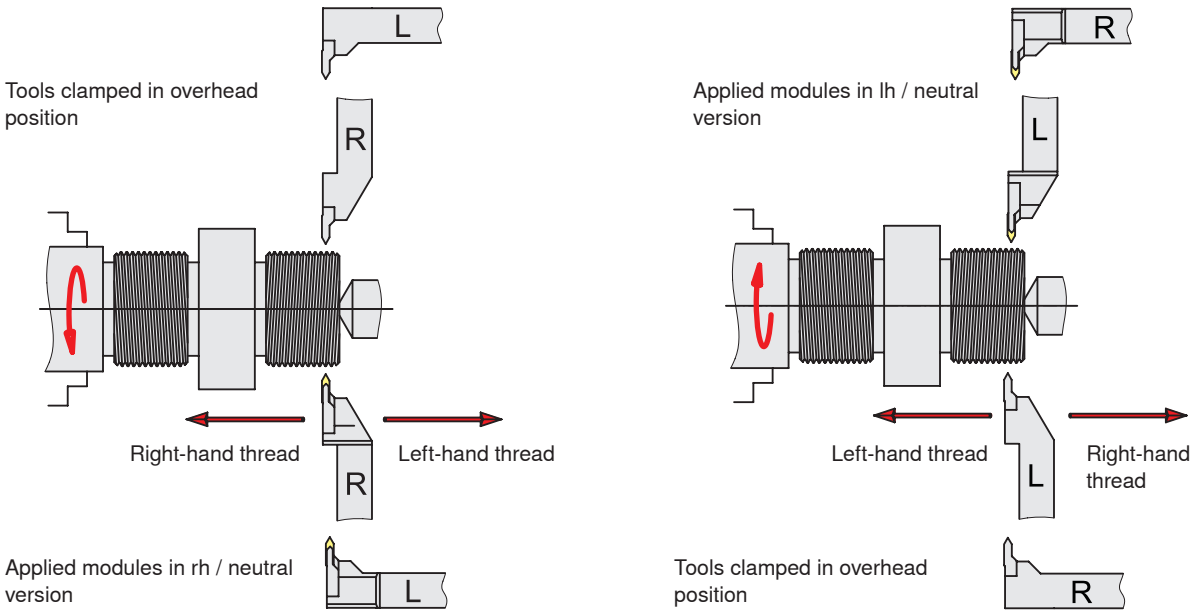
Threading insert	TC16-2EI-G55						TC16-3EI-N55		
Pitch [passes/inch]	14	12	11	10	9	8	7	6	5
Number of cuts	8 ↓ 12	9 ↓ 14	10 ↓ 15	11 ↓ 18	12 ↓ 20	12 ↓ 20	12 ↓ 20	12 ↓ 20	14 ↓ 22
Thread profile height	1,22	1,46	1,56	1,80	2,03	2,31	2,40	2,89	3,56

These are recommended values for steel machining

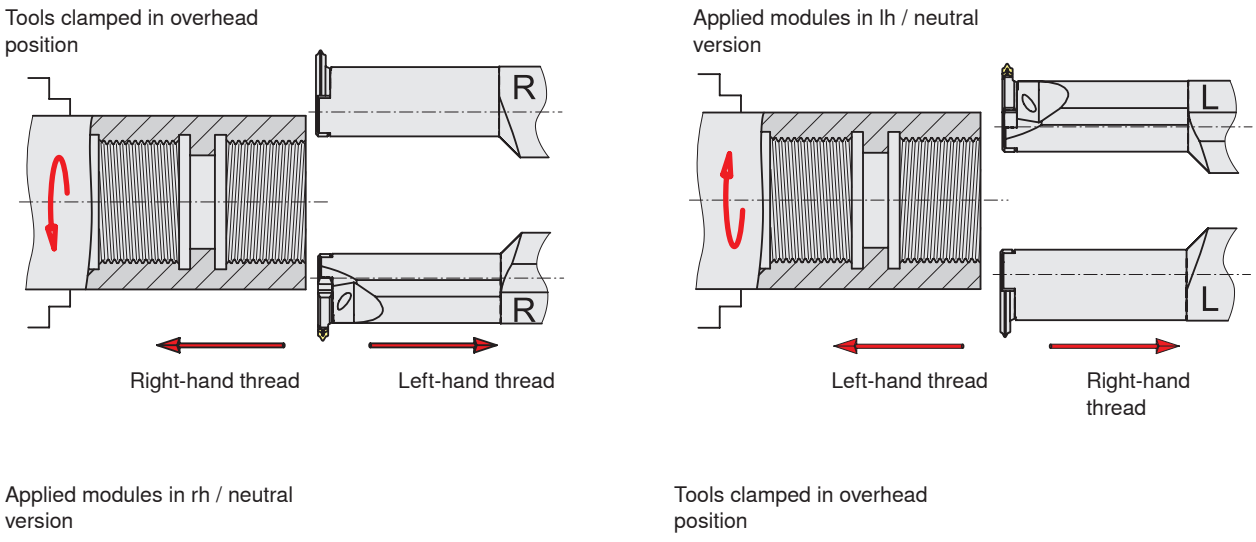
MSS - TC

Machining method thread turning

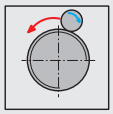
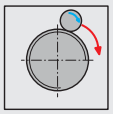
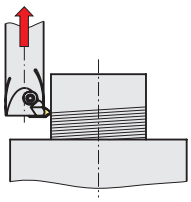
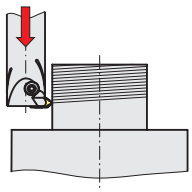
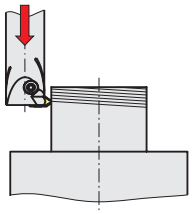
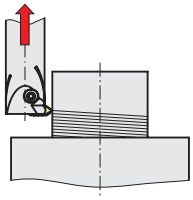
Application methods for external machining



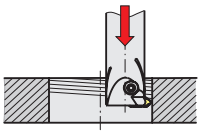
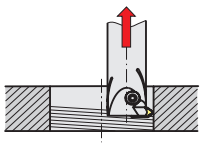
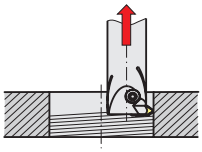
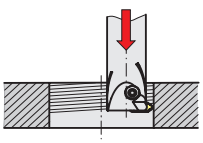
Application methods for internal machining



External thread

	Conventional milling	Climb milling
		
Right-hand thread		
Left-hand thread		

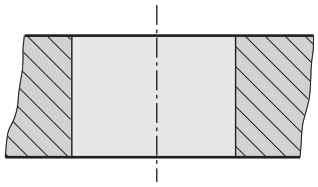
Internal thread

	Conventional milling	Climb milling
Right-hand thread		
Left-hand thread		

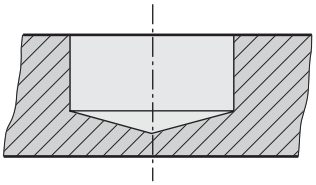
MSS - TC

Machining method thread milling

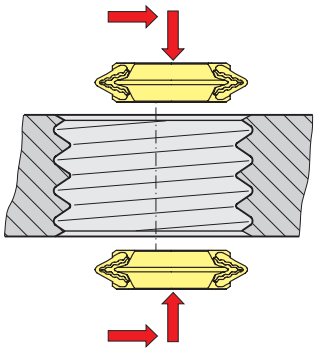
Drilling - through-hole thread



Drilling - bottom hole thread

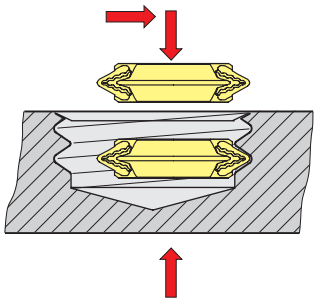


Through-hole thread



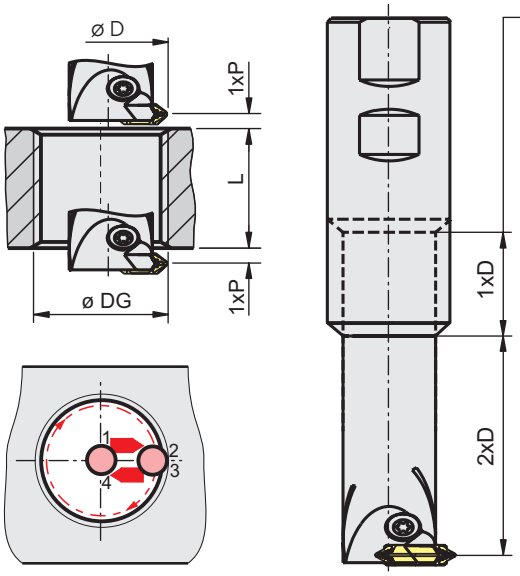
No radial plunging necessary, radial approach above or below work piece + spiral movement

Bottom hole thread



Radial approach until total profile depth + spiral movement
Radial plunging + spiral movement

Advantages compared to multi-tooth threading inserts



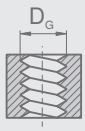
Readjustment possible when necessary

- Same insert for thread turning and milling
- Considerably lower cost of TC inserts
- Thread is cut in a single feed from outside inwards or vice versa, so no step in the thread
- Low cutting forces possible through single-tooth thread milling
- Stable conditions
- Standard reach is 2xD. Tools may be modified up to 3xD.
- Higher cutting values (vc + f) in this manner machining times are similar to multi-tooth insert machining
- Easy programming

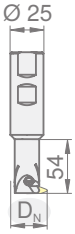
CERATIZIT

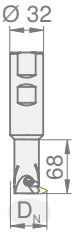
Thread milling

Milling tool system MSS-TC



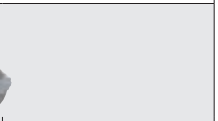
D_N	Type, description	D_G [mm]	Full profile metric ISO 60° – TC threading inserts: TC16-1 **I 0,5** ISO	TC16-1 **I 0,75** ISO	TC16-1 **I 1,0** ISO	TC16-1 **I 1,5** ISO	TC16-1 **I 2,0** ISO	TC16-1 **I 2,5** ISO	TC16-1 **I 3,0** ISO	TC16-1 **I 3,5** ISO	TC16-1 **I 4,0** ISO	TC16-1 **I 4,5** ISO	TC16-1 **I 5,0** ISO	Full profile Whitworth 55° – D_G [inch]	TC16-2 **EI** 14W	TC16-2 **EI** 12W	TC16-2 **EI** 11W	TC16-2 **EI** 10W	TC16-2 **EI** 9W	TC16-2 **EI** 8W	TC16-3 **EI** 7W	TC16-3 **EI** 6W	TC16-3 **EI** 5W
25	**I25**R90-2D-TC16-W	M27	x	x																			
		M28	x	x	x																		
		M30	x	x	x	x																	
		M32	x	x	x	x	x							R 1 1/4			x						
		M33	x	x	x	x	x																
		M34	x	x	x	x	x		x														
		M35	x	x	x	x	x		x														
		M36	x	x	x	x	x		x		x												
		M38	x	x	x	x	x		x					1 1/2								x	
		M39	x	x	x	x	x		x		x												
		M40	x	x	x	x	x		x		x			R 1 1/2			x						
		M42	x	x	x	x	x		x		x	x		1 5/8									x
		M45	x	x	x	x	x		x		x	x		1 3/4									x
		M48	x	x	x	x	x		x		x		x										
32	**I32**R90-2D-TC16-W	**M36**	x	x	x																		
		M38	x	x	x	x																	
		M39	x	x	x	x	x																
		M40	x	x	x	x	x																
		M42	x	x	x	x	x		x														
		M45	x	x	x	x	x		x														
		M48	x	x	x	x	x		x		x												
		M50	x	x	x	x	x		x		x			R2			x						
		M52		x	x	x	x		x		x		x										
		M55		x	x	x	x		x		x												
		M56		x	x	x	x		x		x												
		M58		x	x	x	x		x		x												
		M60		x	x	x	x		x		x												
		M62		x	x	x	x		x		x												
		M64		x	x	x	x		x		x												
		M65		x	x	x	x		x		x			R2 1/4			x						
		M68		x	x	x	x		x		x												
		M70		x	x	x	x		x		x												
		M72		x	x	x	x		x		x												
		M75		x	x	x	x		x		x			R2 1/2			x						
		M76		x	x	x	x		x		x												
		M78		x	x	x	x		x		x												
		M80		x	x	x	x		x		x												

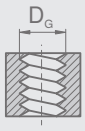


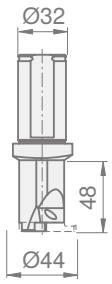


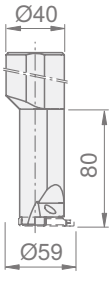
D_N = nominal milling Ø

= standard thread

Bgr.	Type, description	D_G [mm]	Full profile metric ISO 60°			D_G [inch]	Full profile Whitworth 55°
			MSS-**I32R**-TC16-2		 MSS-**I32N**-TC16-3		MSS-**I32R**-TC16-2
			TC16-2 **I 2,0** ISO	TC16-2 **I 3,0** ISO	TC16-3 **I 4,0** ISO		TC16-2 **EI** 11W
32	**1.5D** MSS-**I32R**90-1.5D	M82	x	x	x	R 2 3/4	x
		M85	x	x	x		
		M90	x	x	x	R3	x
		M95	x	x	x	R3 1/4	x
		M100	x	x	x	R3 1/2	x
		M105	x	x	x	R3 3/4	x
		M110	x	x	x	R4	x
		M115	x	x	x		
		M120	x	x	x		
		M125	x	x	x	R4 1/2	x
		M130	x	x	x		
		M135	x	x	x		
		M140	x	x	x	R5	x
		M145	x	x	x		
		M150	x	x	x	R5 1/2	x
		M155		x	x		
		M160		x	x		
		M165		x	x	R6	x
		M170		x	x		
	2.5D MSS-**I32R**90-2.5D	M175		x	x		
		M180		x	x		
		M185		x	x		
		M190		x	x		
		M195		x	x		
		M200		x	x		
		M205		x	x		
		M210		x	x		
		M215		x	x		
		M220		x	x		
		M225		x	x		
		M230		x	x		
		M235		x	x		
		M240		x	x		
		M245		x	x		
		M250		x	x		
		↓		↓	↓		
		M300		x	x		



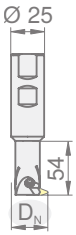
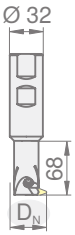




Bgr. = assembly size

Thread milling

Milling tool system MSS-TC

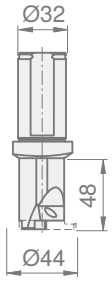
D_N	Type, description	D_G [mm]	Full profile metric ISO 60° — TC threading inserts: TC16-1 **I 0,5** ISO	TC16-1 **I 0,75** ISO	TC16-1 **I 1,0** ISO	TC16-1 **I 1,5** ISO	TC16-1 **I 2,0** ISO	TC16-1 **I 2,5** ISO	TC16-1 **I 3,0** ISO	TC16-1 **I 3,5** ISO	TC16-1 **I 4,0** ISO	TC16-1 **I 4,5** ISO	TC16-1 **I 5,0** ISO
25	**I25**R90-2D-TC16-W 	↓ M16 ↓											
32	**I32**R90-2D-TC16-W 	↓ ↓ M80											

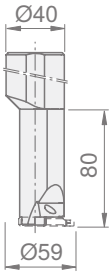
External threads in the range between M16 and M80 can be milled with both tools, I25... or I32.... Choose the adequate threading inserts with the required pitch.

D_G [inch]	Full profile Whitworth 55° — TC threading inserts: TC16-2 **EI** 14W	TC16-2 **EI** 12W	TC16-2 **EI** 11W	TC16-2 **EI** 10W	TC16-2 **EI** 9W	TC16-2 **EI** 8W	TC16-3 **EI** 7W	TC16-3 **EI** 6W	TC16-3 **EI** 5W
↓									
$^5/_8$			x						
$^3/_4$				x					
$^7/_8$					x				
1						x			
$1^1/_8$							x		
$1^3/_8$								x	
$1^1/_2$								x	
$1^5/_8$									x
$1^3/_4$									x

D_N = nominal milling Ø

Bgr.	Type, description	D_G [mm]	Full profile metric ISO 60°		
			MSS-**I32R**-TC16-2		MSS-**I32N**-TC16-3
			TC16-2 **I 2,0** ISO	TC16-2 **I 3,0** ISO	TC16-3 **I 4,0** ISO
32	**1.5D** MSS-**I32R**90-1.5D	M82	x	x	x
		M85	x	x	x
		M90	x	x	x
		M95	x	x	x
		M100	x	x	x
		M105	x	x	x
		M110	x	x	x
		M115	x	x	x
		M120	x	x	x
		M125	x	x	x
		M130	x	x	x
		M135	x	x	x
		M140	x	x	x
		M145	x	x	x
		M150	x	x	x
		M155		x	x
		M160		x	x
		M165		x	x
		M170		x	x
	2.5D MSS-**I32R**90-2.5D	M175		x	x
		M180		x	x
		M185		x	x
		M190		x	x
		M195		x	x
		M200		x	x
		M205		x	x
		M210		x	x
		M215		x	x
		M220		x	x
		M225		x	x
		M230		x	x
		M235		x	x
		M240		x	x
		M245		x	x
		M250		x	x
		↓		↓	↓
		M300		x	x





Bgr. = assembly size

Cutting data – threading

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hard-ness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

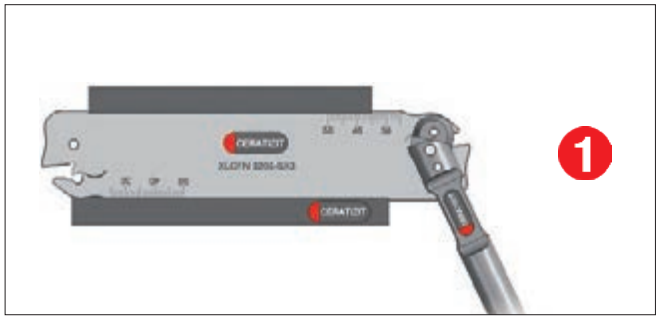
* R_m = ultimate tensile strength, measured in MPa

GM213 v_c [m/min]	GM240 v_c [m/min]	H216T v_c [m/min]
150 - 250	200 - 270	
110 - 180	180 - 230	
90 - 160	140 - 190	
100 - 170	180 - 240	
80 - 150	120 - 190	
70 - 120	120 - 160	
90 - 130	140 - 200	
70 - 110	100 -160	
110 - 170	170 - 230	
90 - 140	130 - 190	
110 - 180	150 - 200	
80 - 140		
70 - 100		
70 - 120		
120 - 160	130 - 200	
100 - 130	120 - 180	
160 - 200	120 - 170	
90 - 140	120 - 190	
120 - 140	150 - 230	
90 - 130	120 - 170	
		100 - 800
		100 - 800
		100 - 500
		100 - 500
		100 - 350
		80 - 300
		80 - 500
		80 - 500
		80 - 500
		80 - 500
		80 - 500
		80 - 500
30 - 50	20 - 40	
25 - 35	20 - 30	
15 - 25	10 - 20	
10 - 20	10 - 20	
10 - 25	10 - 20	
100 - 150	70 - 100	
40 - 60	25 - 45	
35 - 45		30 - 40
10 - 20		5 - 15
35 - 45		30 - 40

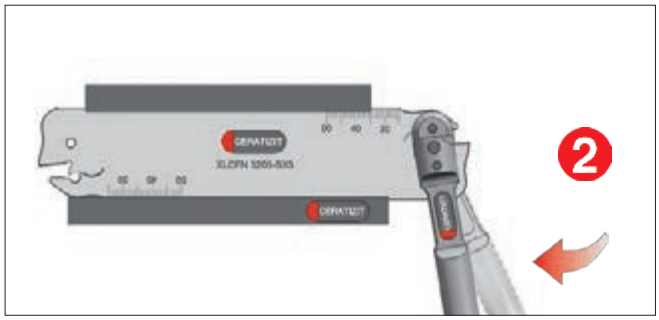
The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

MSS-SX

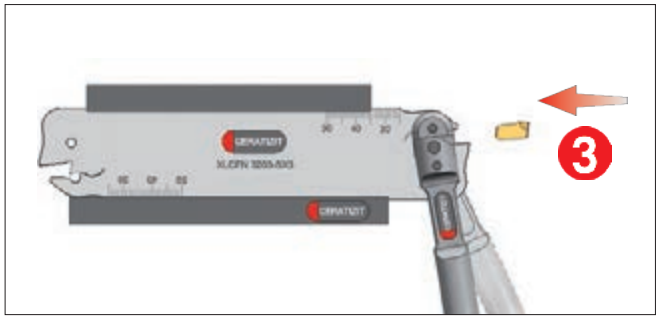
How to use the system



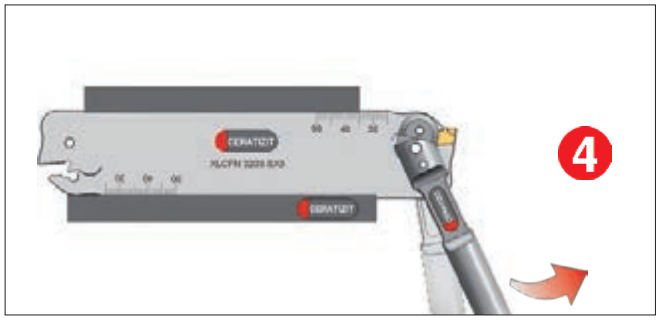
Insert mounting key with handle towards the front into the 2 tool location points.



When moving the mounting key in the direction of the arrows the insert seat is opened.



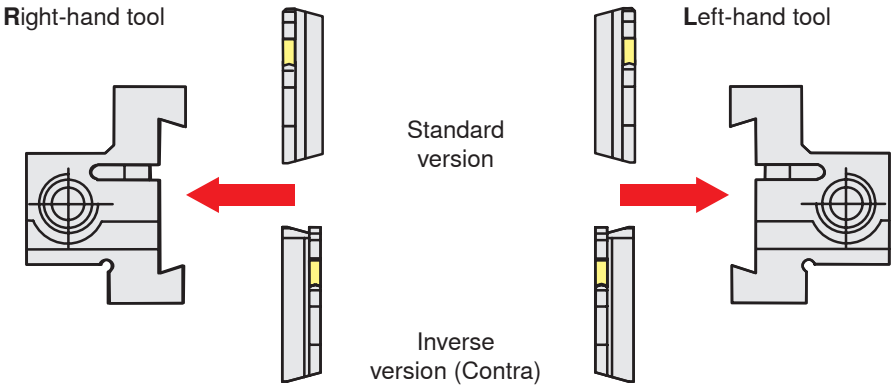
Position the insert pressing it against the location face.

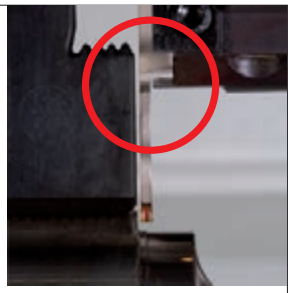


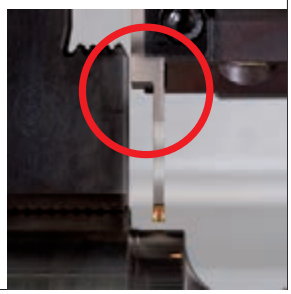
Moving the mounting key forward the insert seat locks and the insert is clamped securely.

The clamping system is designed in such a way that the mounting key can be inserted into the blade from either side.

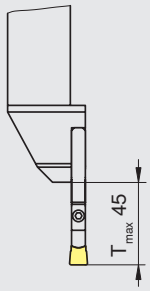
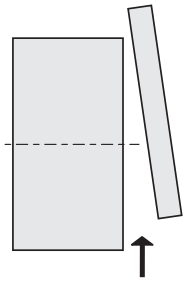
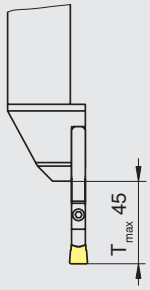
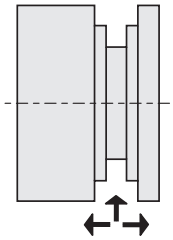
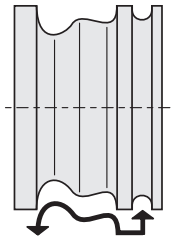
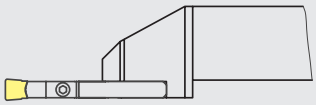
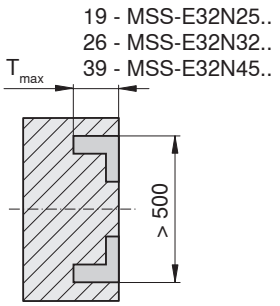
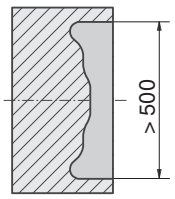
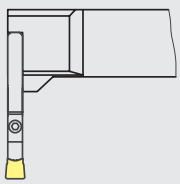
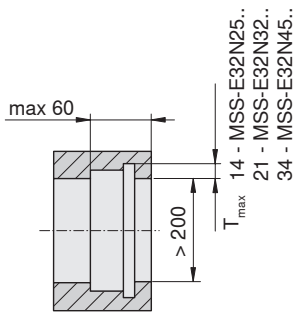
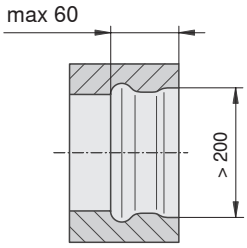
The correct tool selection

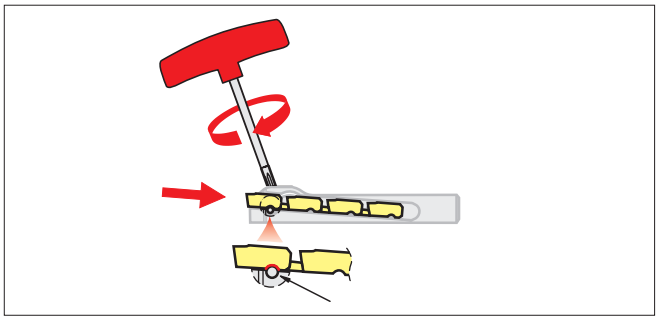




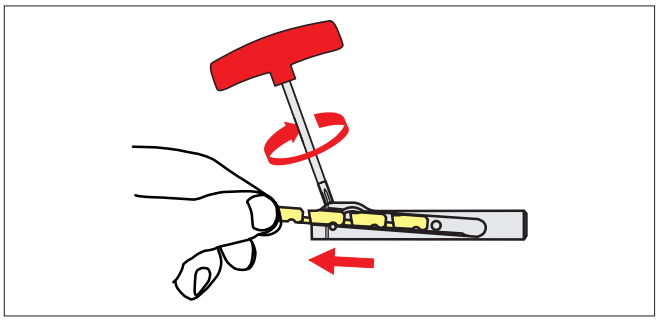


LX - possible applications

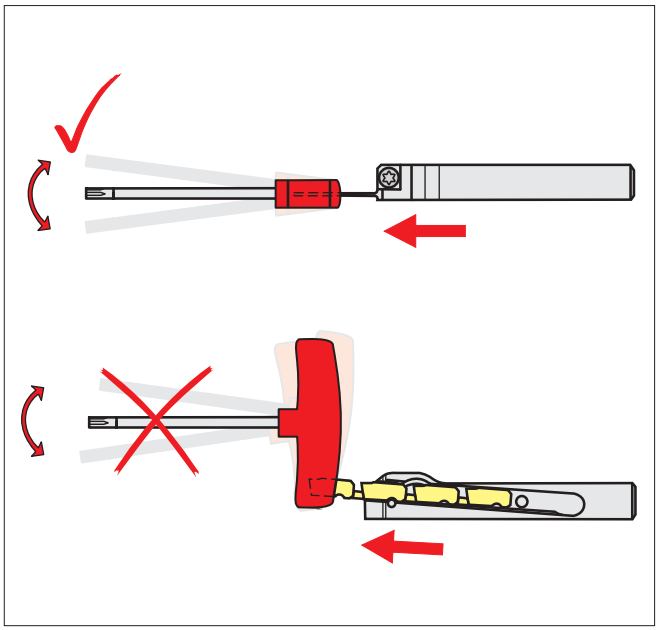
Application \ Insert	8-10	R 4
Part-off 		
Grooving and turning 		
Axial grooving 		
Internal grooving and turning 		



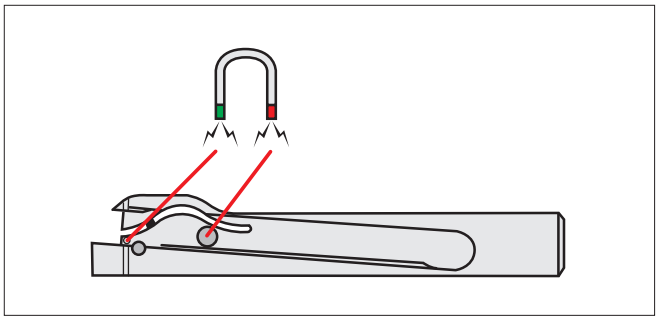
Important: ensure insert is correctly located on pin.



To change to the next cutting edge draw the insert forward.



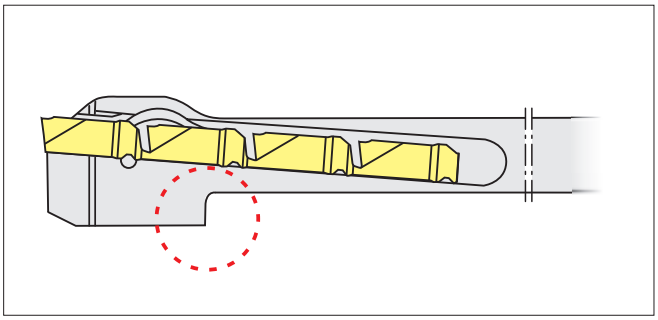
Worn cutting edge must be broken off to left or right



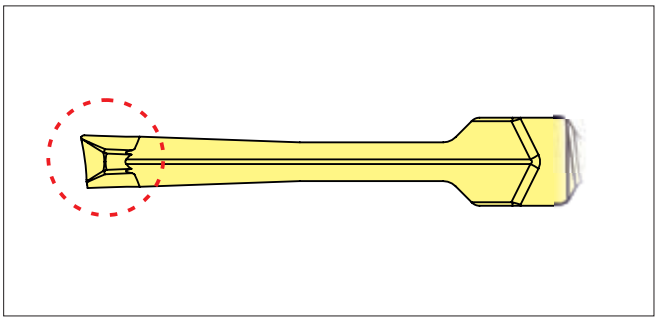
Information: during the positioning procedure, the magnets prevent the cutting inserts from falling out of the tool holder

MaxiClick

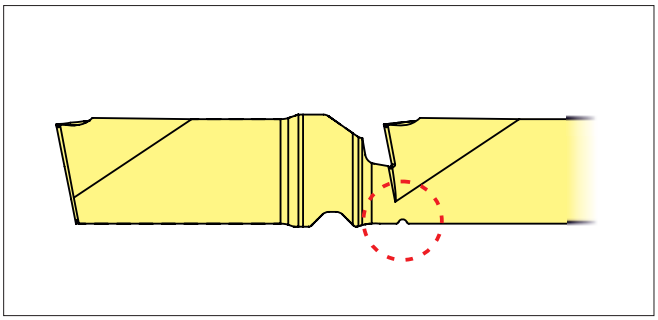
Product characteristics



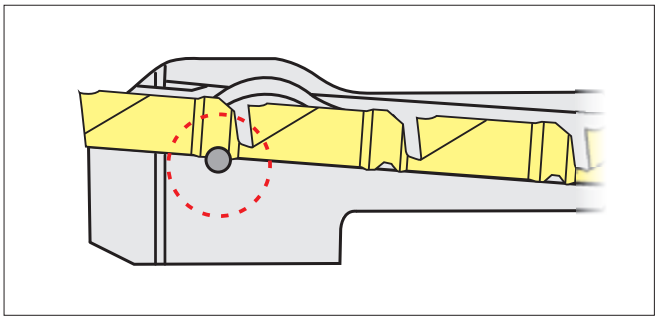
Reinforced tool head for additional stability



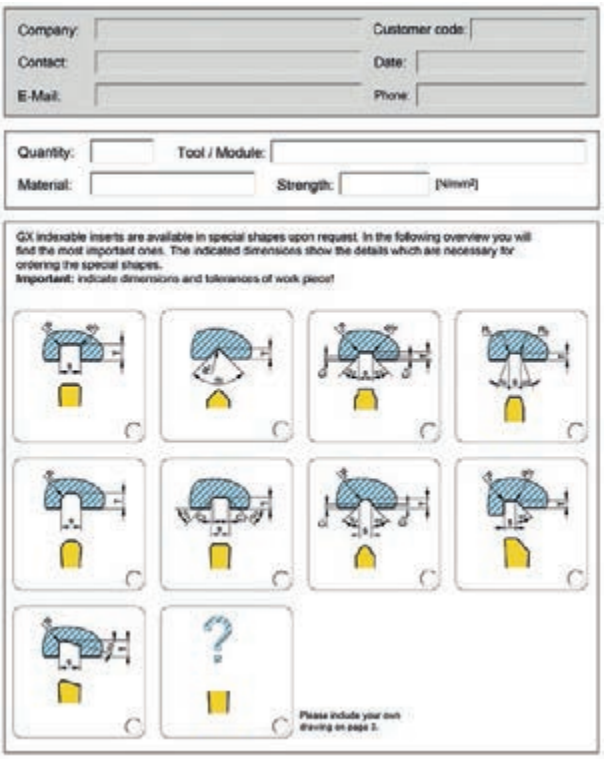
12° angle for part-off operations without burrs



'Break-off notch' for a clean breakage line



Carbide positioning pin for accurate repeatability

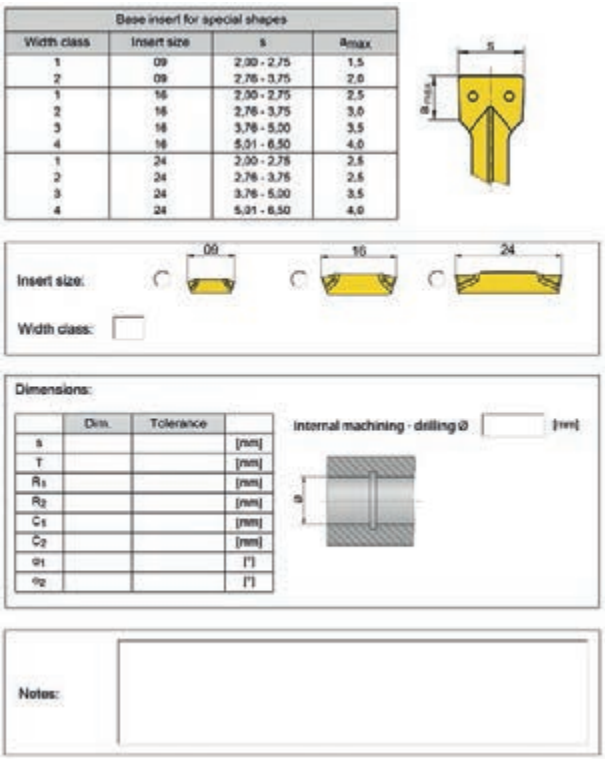


Company: Customer code:
Contact: Date:
E-Mail: Phone:

Quantity: Tool / Module:
Material: Strength: [N/mm²]

GX indexable inserts are available in special shapes upon request. In the following overview you will find the most important ones. The indicated dimensions show the details which are necessary for ordering the special shapes.
Important: indicate dimensions and tolerances of work piece!

Please include your own drawing on page 3.



Base insert for special shapes

Width class	Insert size	s	Rmax
1	09	2,00 - 2,75	1,5
2	09	2,76 - 3,75	2,0
1	16	2,00 - 2,75	2,5
2	16	2,76 - 3,75	3,0
3	16	3,76 - 5,00	3,5
4	16	5,01 - 6,50	4,0
1	24	2,00 - 2,75	2,5
2	24	2,76 - 3,75	2,5
3	24	3,76 - 5,00	3,5
4	24	5,01 - 6,50	4,0

Insert size: 09 16 24

Width class:

Dimensions:

	Dim.	Tolerance	
s			[mm]
T			[mm]
R_1			[mm]
R_2			[mm]
C_1			[mm]
C_2			[mm]
φ_1			[°]
φ_2			[°]

Internal machining - drilling Ø [mm]

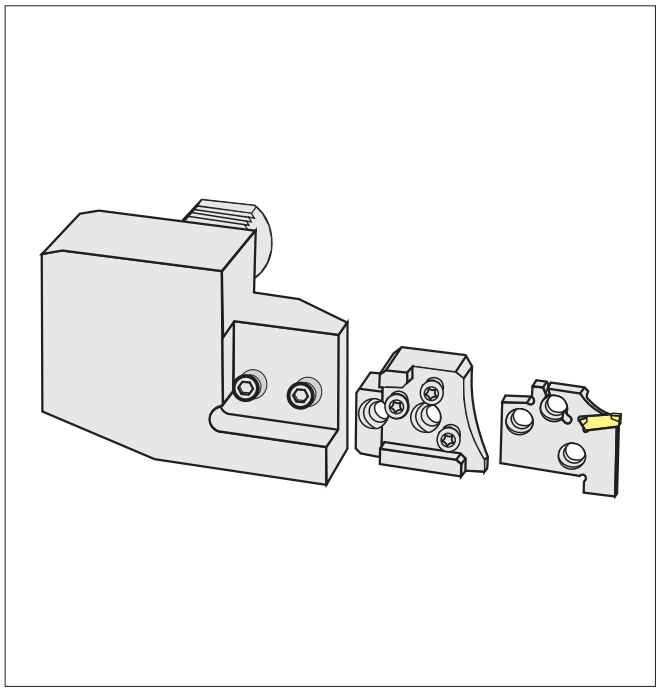
Notes:

You can download the form above at our website **https://www.e-techstore.com/ALLG/CT-BUZ-103.zip** or using the QR code.

Possible applications

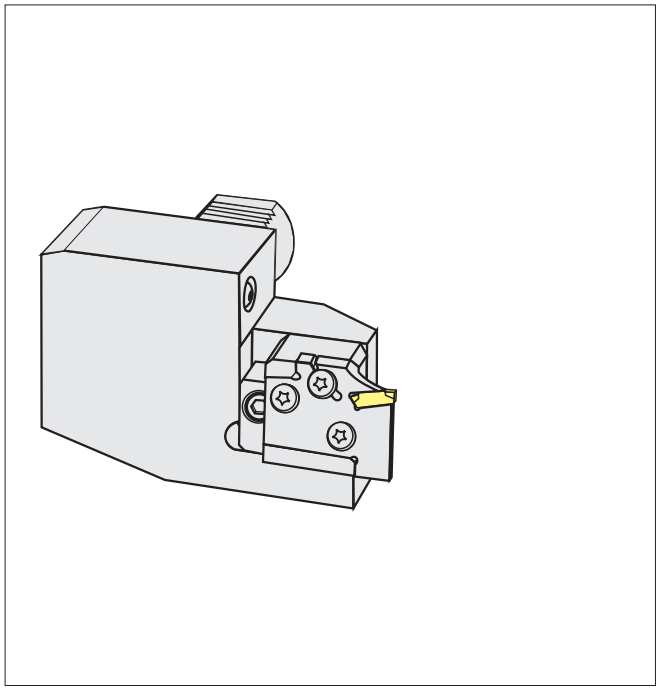
Possible applications for MSS adapters

MSS adapters offer the possibility to apply the modular parting and grooving system where conventional tool shanks or Maxi-flex UTS tool heads cannot be used.



Examples

- Special solutions of all kinds
- Special tools and shanks
- Rotating tools for circular milling
- Special machines
- Limited space

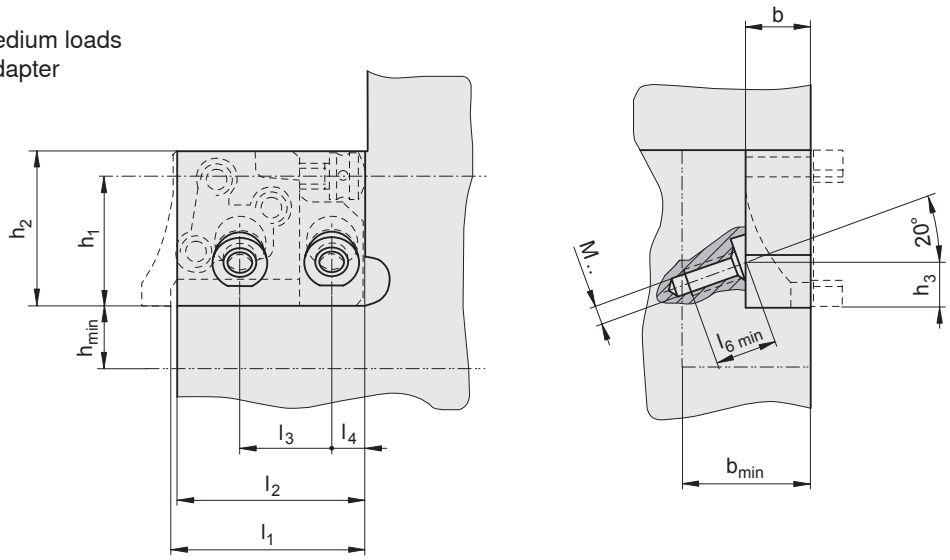


Assembly example

Adapters in combination with VDI shank

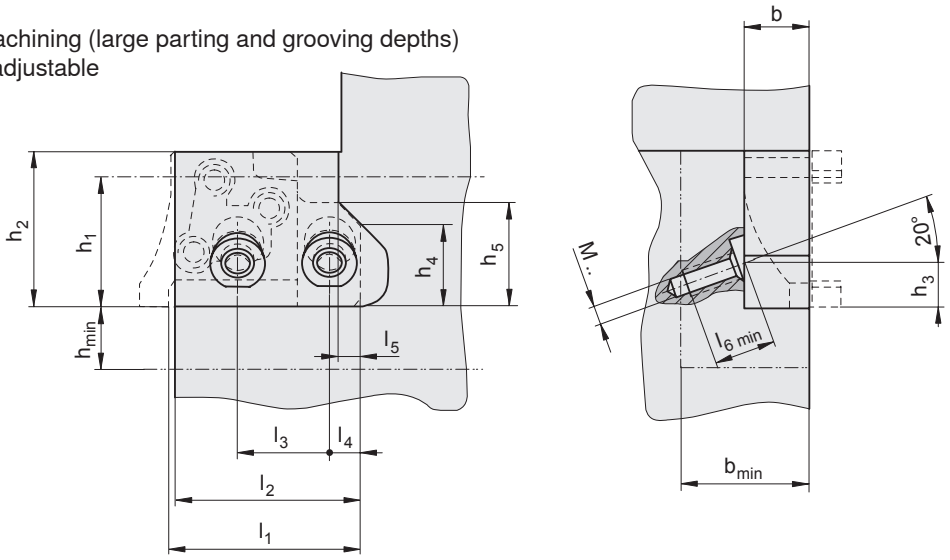
Assembly type A

- For low or medium loads
- Adjustable adapter



Assembly type B

- For heavy machining (large parting and grooving depths)
- Adapter not adjustable



	h_1	h_2	$h_3^{\pm 0,1}$	h_4	h_5	$h_{min.}$	b	$b_{min.}$	l_1	l_2	l_3	l_4	l_5	$l_{6\ min.}$	M..
MSS-E20R00-AD MSS-E20L00-AD	20	24	6,0	13	16	10	10,7	19	30	29,0	14,25	5,0	3	8	M4
MSS-E25R00-AD MSS-E25L00-AD	25	30	8,5	16	20	12	12,6	25	37	36,0	18,00	6,5	4	12	M5
MSS-E32R00-AD MSS-E32L00-AD	32	38	13,5	22	26	16	14,6	30	46	44,5	23,50	7,5	4	15	M6

Spare parts

	Material	Type, description	Key size	Torque moment [Nm]	Torque moment [in.lbs] [lb]
	11149570	DMSD 3,2Nm/SORT T15	T15	3.2	28,3
	11149571	DMSD 4,0Nm/SORT T20	T20	4.0	35,4

	Material	Type, description	Key size
	154461	7802180/A 2,2	A2,2
	154463	7802181/A 3,1	A3,1
	154464	7802182/A 8,2	A8,2
	11366865	10005884/S12-3	S12-3
	11366866	10001365/S15-4	S15-4
	4496	7812301/SW 5	SW5
	4497	7812302/SW 6	SW6
	8095010200	SD-T08-60mm	T08
	8095010400	SD-T10-80mm	T10
	11224503	S-15IP-T	T15IP
	200317	7883304/TORX T25 T	T25
	220983	7897208/TORX T15 T	T15
	220985	7897207/TORX T20 T	T20

	Material	Type, description	l [mm]	Thread size	Key size
	219981	7897209/M4,0X11/T15	11	M4	T15
	219982	7897210/M5,0X13,5/T20	13.5	M5	T20
	195068	7897203/M4,0X14/T15	14	M4	T15
	195069	7897205/M5,0X18/T20	18	M5	T20
	195070	7897206/M6,0X20/T25	20	M6	T25
	228617	7897200/M2,5X10/T08	10	M2,5	T08
	228619	7897201/M3,0X11/T10	11	M3	T15
	228620	7897202/M3,5X12,5/T15	12.5	M3,5	T15
	228621	7897204/M4,5X17/T20	17	M4,5	T20
	11042274	7818429/M4,0X11/T15	11	M4	T15
	11007006	7897218/M4,0X18/T20	18	M4	T20
	11081190	7897221/M3,5X14,0/T15	16.5	M3,5	T15
	11187405	10001938/M5X20/T25	20	M5	T25
	11207638	M5x18-15IP/10002133	20.5	M5	T15IP
	11776816	10010029/M6X12 DIN912- 12.9	12	M12	SW10
	22485	7802115/M6X25 DIN 912	25	M6	SW5
	229126	7897213/M6X20 12.9 DIN 912	20	M6	SW5
	229131	7897211/M4X12 DIN 912 - 12.9	12	M4	SW3
	284518	7818319/M5,0X16,0/DIN912-12.9	16	M5	SW4
	81158	7802133/M8X35 DIN 912	35	M8	SW6