



CUTTING TOOLS

PARTING AND GROOVING
TOOLS AND INSERTS

Welcome to the world of CERATIZIT ...

... a world of unique and consistently innovative solutions for wear parts, cutting tools and wood and stone machining. CERATIZIT is your partner for exceptional and highly personalized hard material products which guarantee cost efficiency, resistance and performance. Increasing both the productivity and service life of your products in a very diverse range of industrial sectors is the very essence of our business.

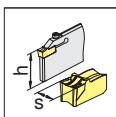
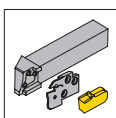
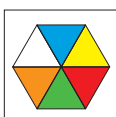
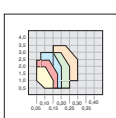
... because “hard material matters”

Hard materials in general and hard metals in particular are characterized by a range of interesting properties for all applications where maximum wear resistance is required. High pressure, high temperature and highly abrasive or aggressive conditions are factors to which hard materials or metals must be resistant. Our powder metallurgical production of parts for wear-protection enables tailor-made adaptation of the material properties to your wear criteria.

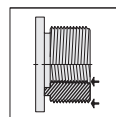
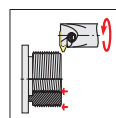
This fact makes CERATIZIT hard materials and carbides indispensable materials in order to significantly increase the service life of components which are subject to high stress. Ever more powerful machines, facilities and machining methods constantly create new challenges for the CERATIZIT development engineers. Intensive research and development activities which precisely match your requirements and work processes already today are able to provide the solutions for tomorrow.



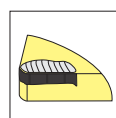
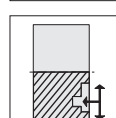
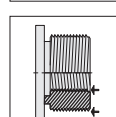
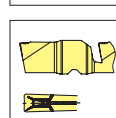
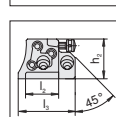
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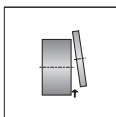
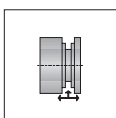
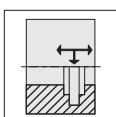
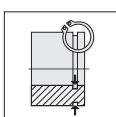
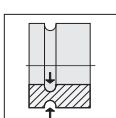
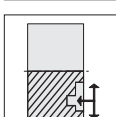
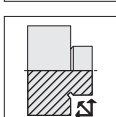
Application

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Application

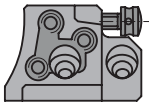
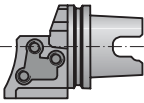
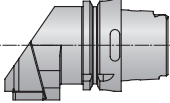
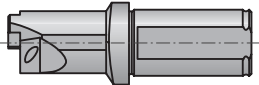
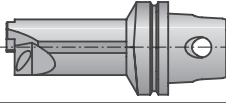
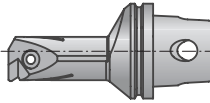
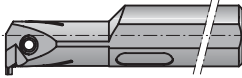
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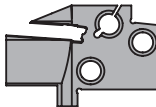
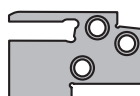
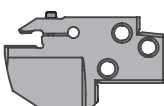
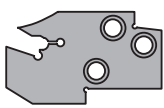
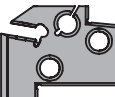
Inserts

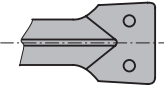
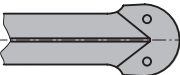
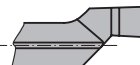
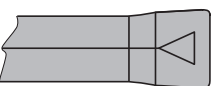
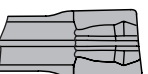
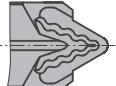
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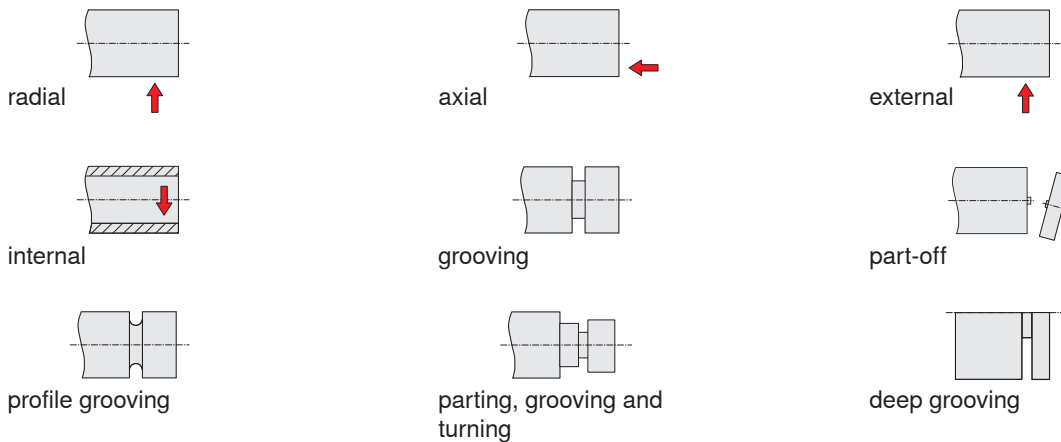
	UTS system	System assembly size	UTS system	E = external / I = internal	Assembly size	Hand	Approach angle	Parting and grooving depth	Shank section / execution	Shank length	Insert system
			MSS	E	25	R	00		2525	L	
			MSS	E	25	R	00		AD		
	UT	40	MSS	E	25	R	00				
	HSK	T63	MSS	E	32	L	90				
				E	16	R	00	21 (.827)	1616	K	GX24-1
			MC		05	R			1010	K	
				E	12	R	00	21 (.827)			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

	UTS system	E = external / I = internal	Assembly size	Hand	Maximum grooving depth	Insert system	Insert size	Width class	Axial diameter range D_{min} - D_{max}
	MSS	E	25	R	12	GX	16	2 (.079)	
	MSS	E	25	R	15	GX	24	3 (.118)	A70-100 (2.76-3.94)
	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 (.079)	
	MSS	I	25	R	06	GX	09	1 (.039)	
	MSS	I	32	R		TC	16	2 (.079)	

	Insert system	Insert size	Number of cutting edges	Width class	Insert shape / application	Width / pitch	Hand / thread standard	Corner radius / angle	Minimum axial grooving diameter	Chip groove code
	GX	16		2	E	3.00	N	0.30 (.012)		Code
	GX	16		2	R	1.50	N			Code
	GX	16		2	S	1.00	R			
	AX	10			E	3.00	N	0.30 (.012)	20 (.787)	Code
	SX				E	2.00	N	0.20 (.008)		Code
	SX				R	1.50	N			Code
	LX				E	8.00	N	0.80 (.031)		Code
	LX				R	4.00	N			Code
	FX					3.10	N	0.20 (.008)		Code
	PX	20		2	E	1.50	L	05 (.020)		Code
	MC	05	5			1.00	N	0.10 (.004)		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 center
- Entire main cutting edge applied



Intelligent tool design

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

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 optimized 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

Precision

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

Stability

- Application security
- Parting, grooving and longitudinal turning possible

Simplicity

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

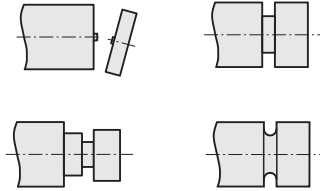
Economy

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

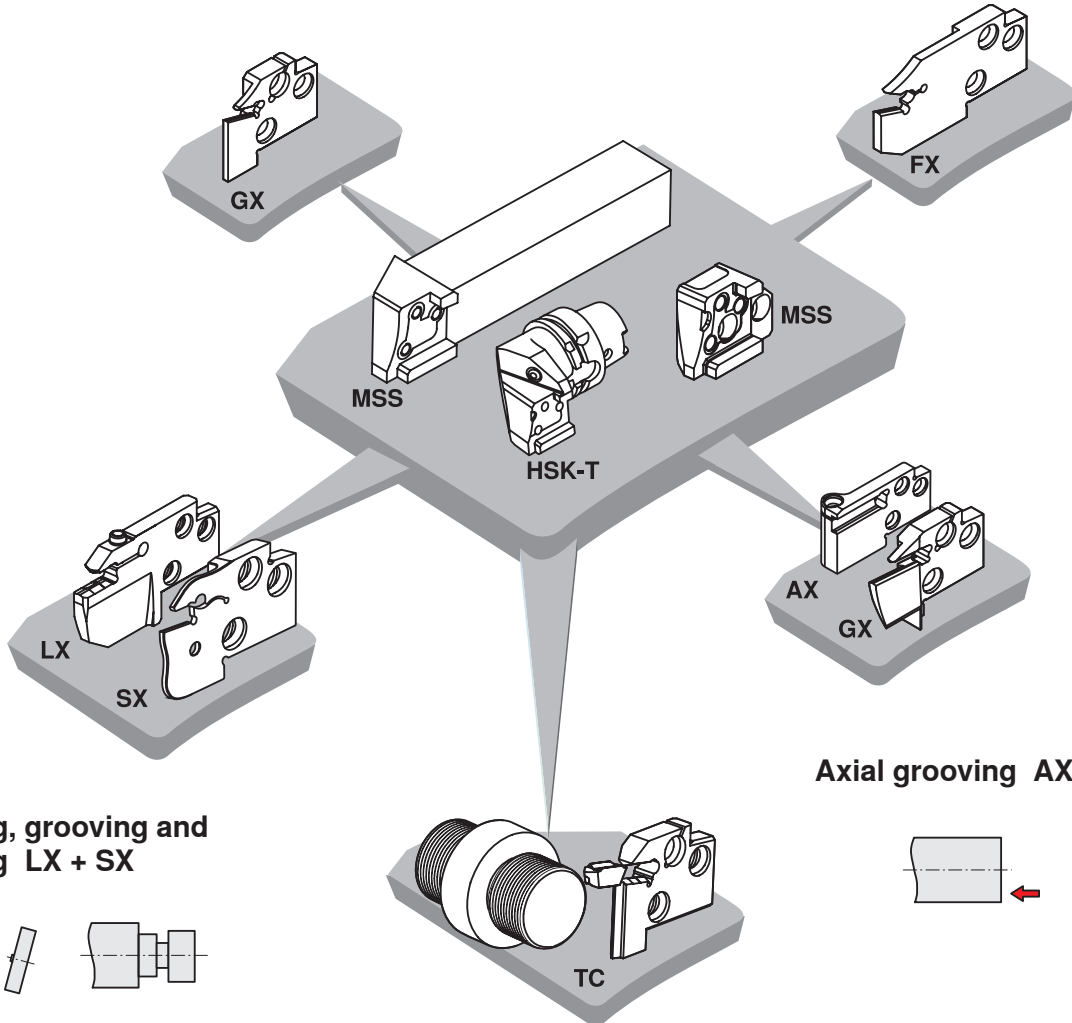
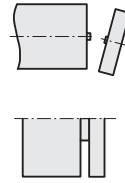
Completeness

- Components for all work pieces and materials

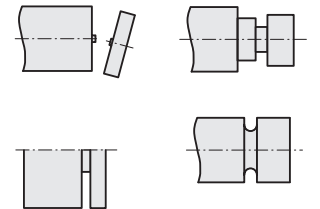
Parting, grooving and turning GX



Parting and grooving FX



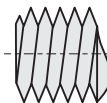
Parting, grooving and turning LX + SX

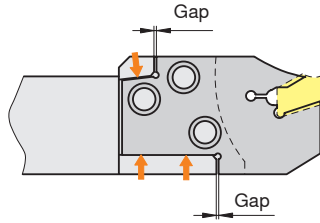


Axial grooving AX + GX



Thread turning TC

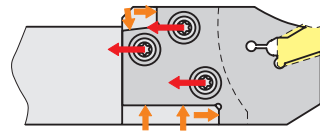




The strong connection

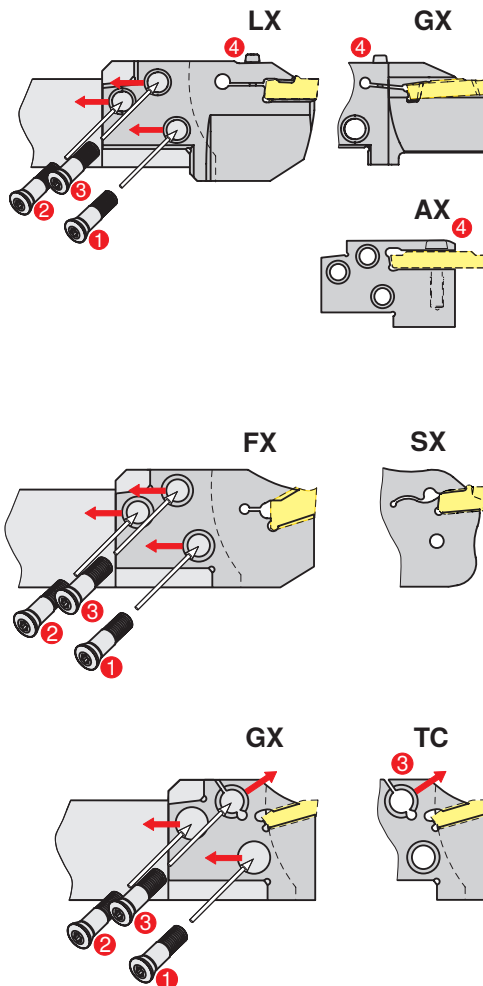
Unclamped module

- 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

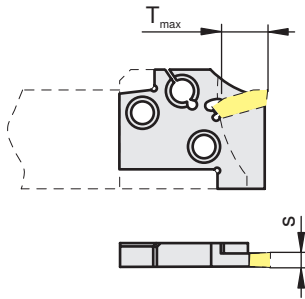
Screws 1, 2 and 3 are used to clamp the module. The insert is self-clamping.

GX / TC

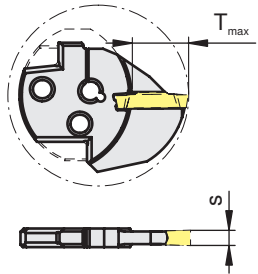
Active insert clamping

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

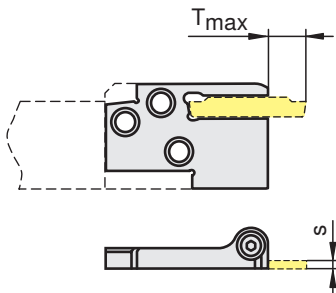
$T_{max} = .276 - .827$ inch
 $s = .079 - .315$ inch

Circlip grooves
 $T_{max} = .030 - .157$ inch
 $s = .0024 - .207$ inch

O-ring grooves
 $T_{max} = .070 - .102$ inch
 $s = .063 - .094$ inch

$T_{max} = .157 - .748$ inch
 $s = .079 - .236$ inch

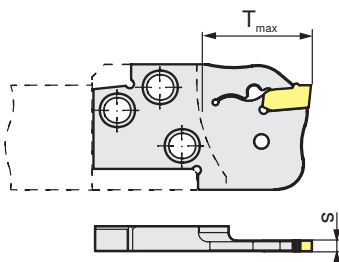
AX



Axial grooving

$T_{max} = .197 - .591$ inch
 $s = .118$ mm

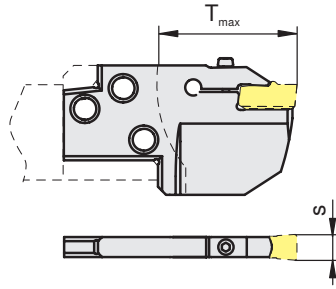
SX



Parting, grooving, longitudinal turning

$T_{max} = .787 - 1.378$ inch
 $s = .079 - .157$ inch

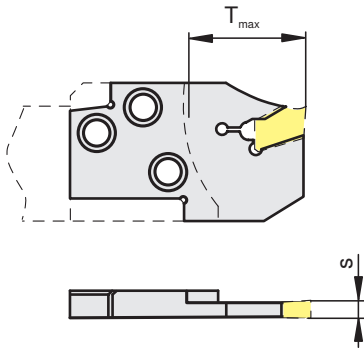
LX



Parting, grooving, longitudinal turning, axial grooving

$T_{\max} = .984 - 1.772$ inch
 $s = .315 - .394$ inch

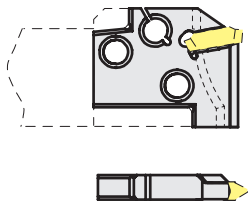
FX



Parting, grooving

$T_{\max} .787 - 1.772$ inch
 $s = .087 - .256$ inch

TC



Thread turning and milling

Pitch
 ISO .5 - 5.0 mm
 BSW 28 - 5 TPI

System characteristics

- Modules made of tempered steel with high strength
- Locating surfaces for MSS interface ground with highest precision
- Ground insert seat

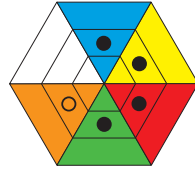
Benefits

- Long tool life, high rigidity
- Accurate repeatability
- Secure and precise insert clamping

Parting, grooving, longitudinal turning, axial grooving



GX

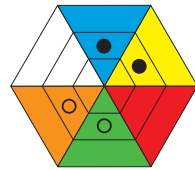


Insert size					
09	.024-.128	.031-.047	.079-.138	.039-.047	
16	.024-.207	.031-.047	.079-.236	.059-.118	Upon request
24			.079-.236	.059-.118	

Axial grooving



AX

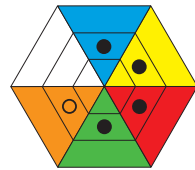


				
.118				

Parting, grooving, longitudinal turning



SX

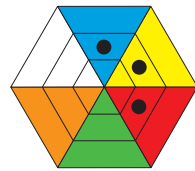


				
.059-.118	.079-.236	.079-.157	.079-.157	

Parting, grooving, longitudinal turning, axial grooving



LX

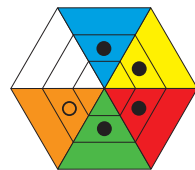


				
.157	.315-.394			

Parting and grooving



FX



				
.087-.382	.087-.256	.087-.256		



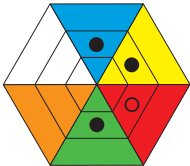
The inserts

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

Thread turning and milling

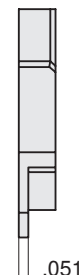
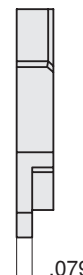
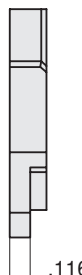
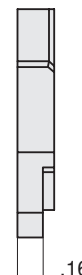
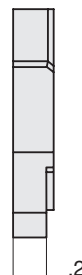
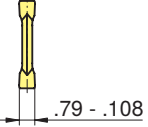
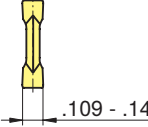
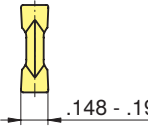
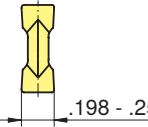
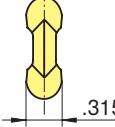
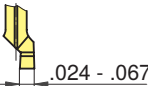
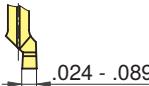


TC



			
	Full and partial profile external, internal	Full and partial profile external, internal	
	Pitch .5 - 5.0 mm	48 - 5 TPI	

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

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**

Insert designation

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

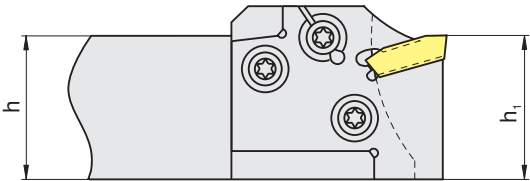
Width class ¹⁾

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



Tool designation

MSS- **E25** R00-2525L

Module designation

MSS- **E25** R25-GX16-2

Assembly size (h)

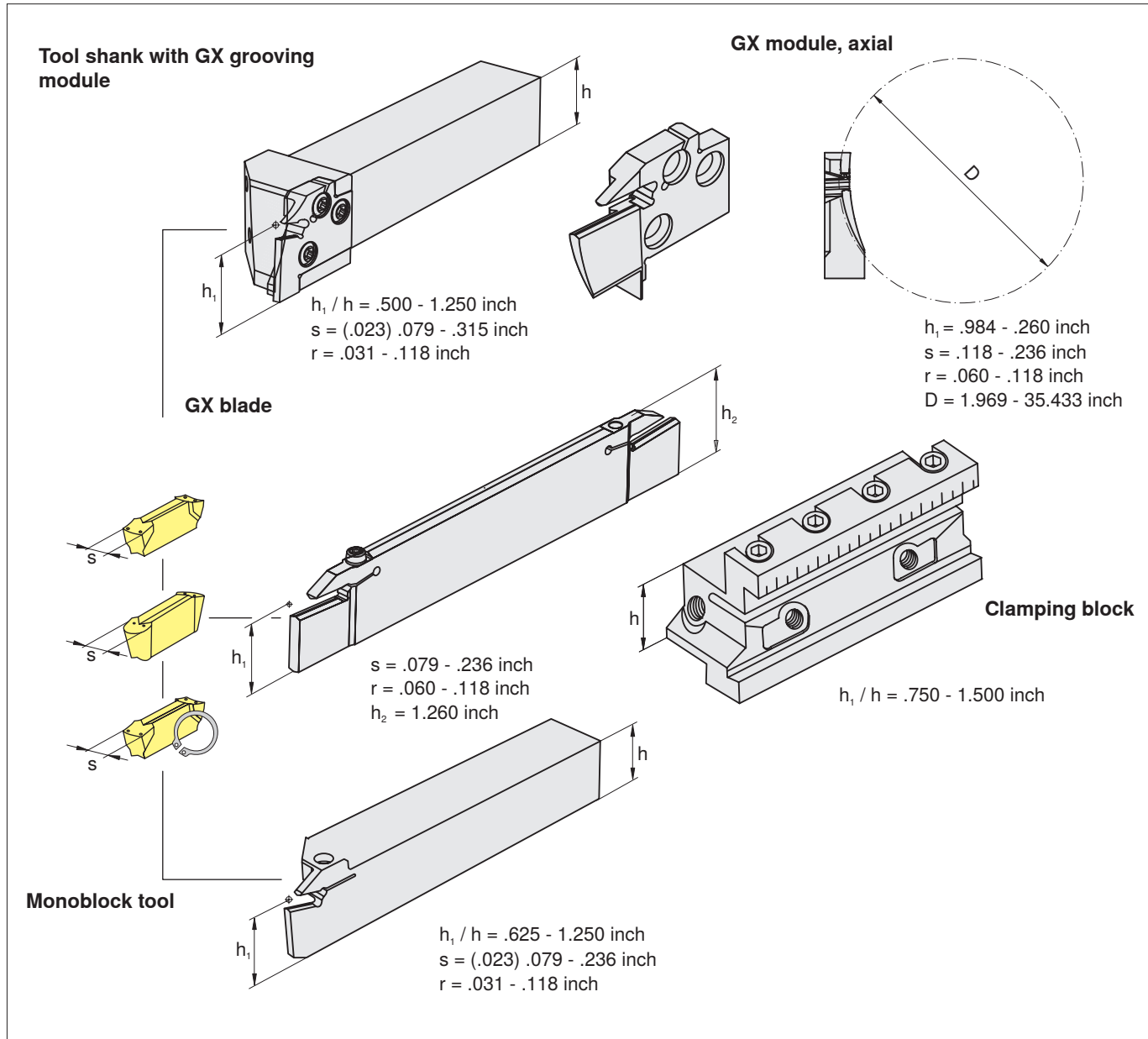
The assembly size is determined by the shank dimensions of the MSS tool holders.
In this manner the correct tool holder can be assigned to the correct module size and vice versa.
The following tables will give you an overview of the width classes and insert sizes for the available assembly sizes.

Assembly size (h)	external				GX	internal			
									
	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						

System GX is characterized by 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

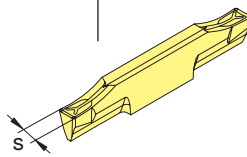
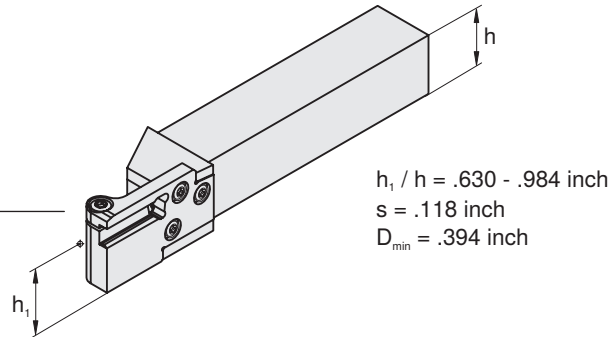
- Good economy
- Optimum solution for all situations

System overview

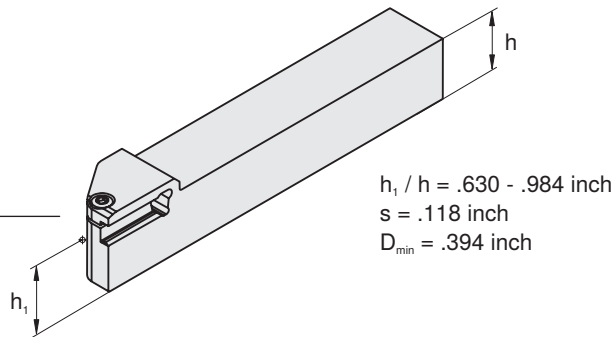
System AX

System AX 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



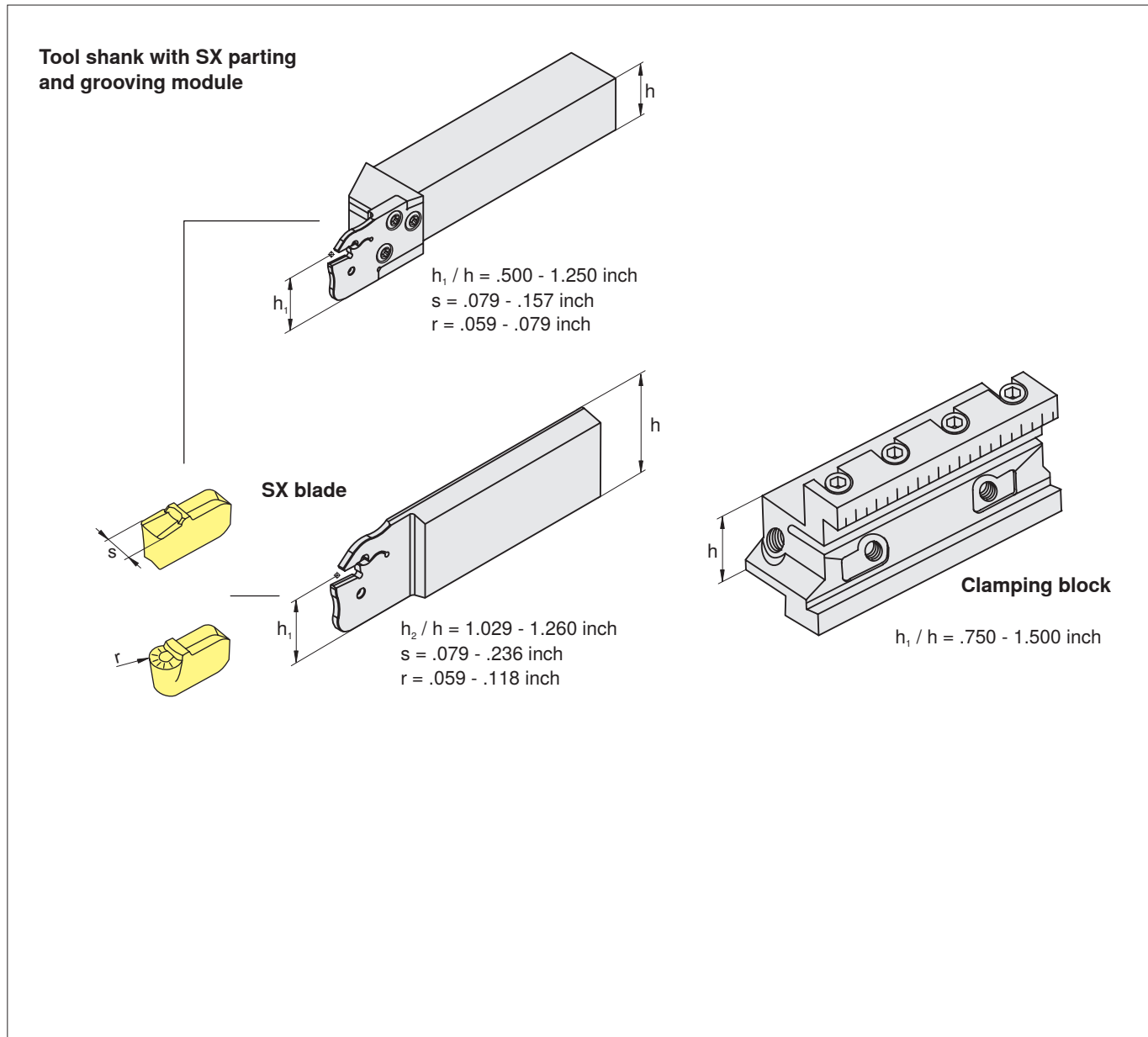
System characteristics

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



System characteristics

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

Benefits

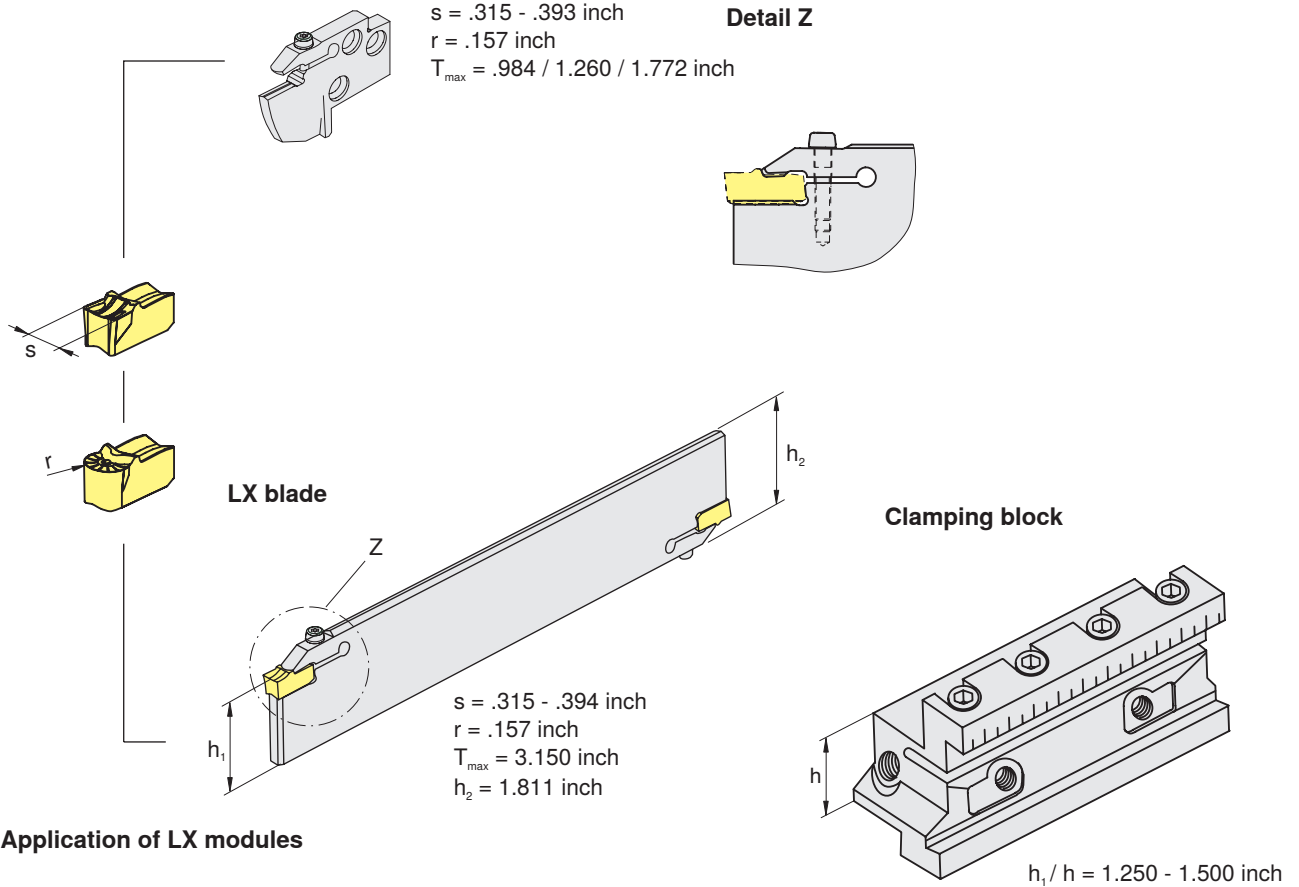
- Inserts will not pull out of the cutting blade
- Exact positioning of the cutting edge
- Quick insert change
- Maximum stability also when longitudinal turning

System overview

System LX

System LX is characterized 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



Application of LX modules

- Part-off
- Grooving and turning
- Axial grooving with $D > 19.7 \text{ inch}$
- Internal grooving and turning with $D > 7.9 \text{ inch}$

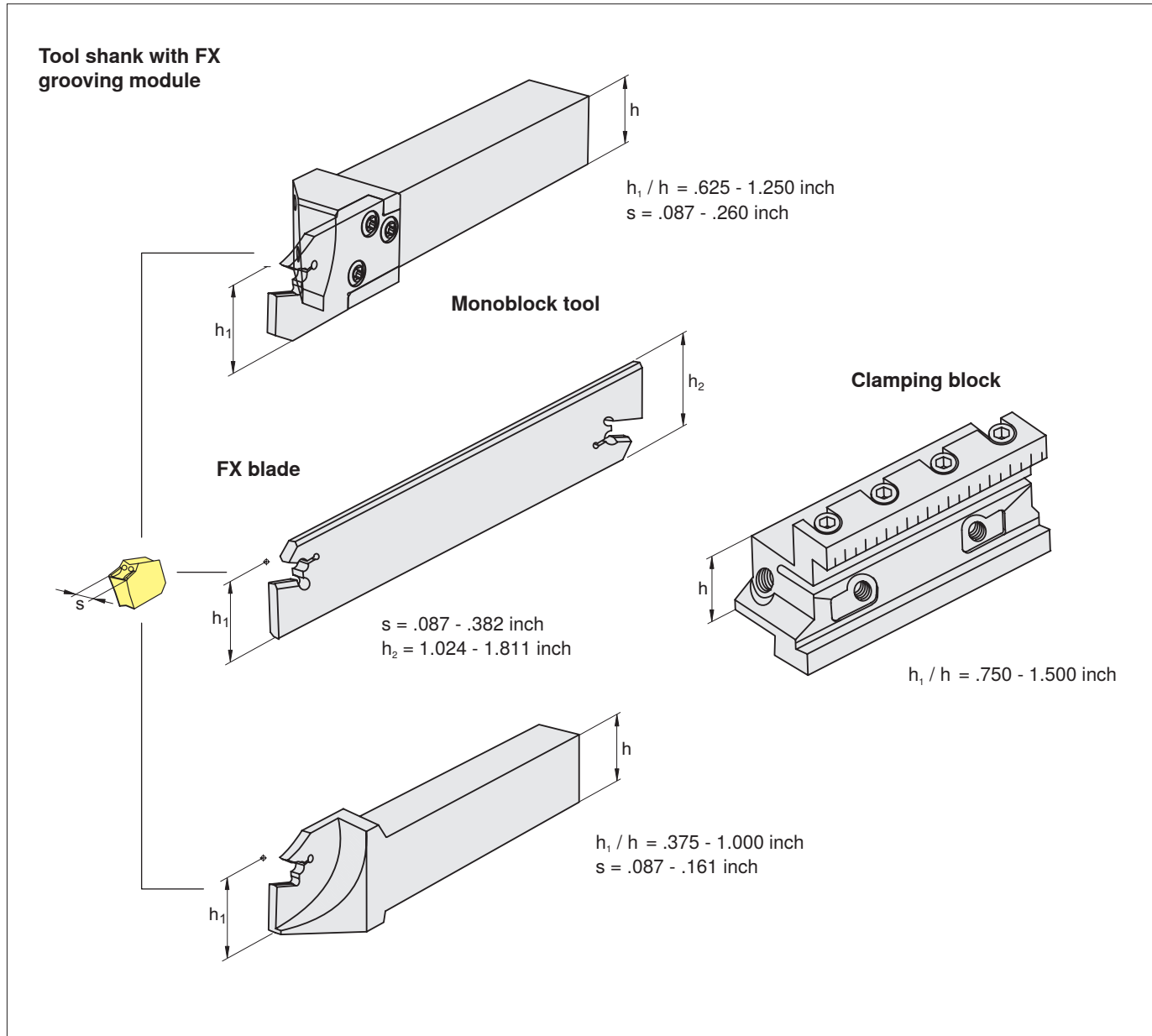
System characteristics

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

Benefits

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

System FX is characterized 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

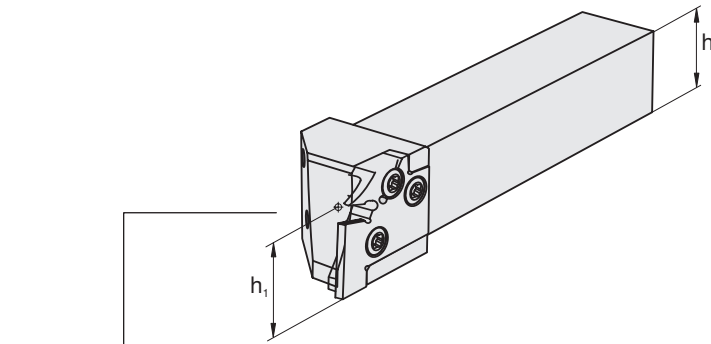
- Easy handling, no clamping parts
- Parting and grooving depth, overhang optimally adjustable
- Economic for deep parting and grooving

System overview

System TC

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.

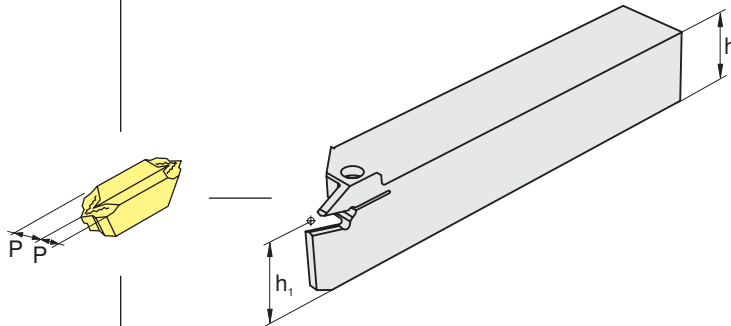
Monoblock tool



$$h_1 / h = .625 - 1.000 \text{ inch}$$

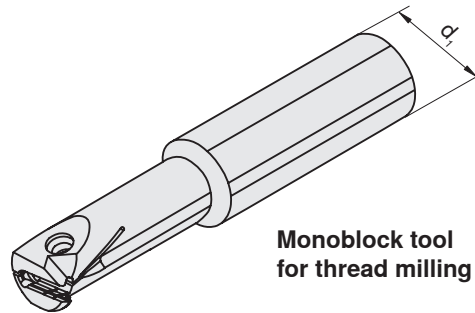
Pitch
 $P = .5 - 5.0 \text{ mm}$
 $P = 48 - 5 \text{ TPI}$

Monoblock tool



$$h_1 / h = .500 \text{ inch}$$

Pitch
 $P = .5 - 3.0 \text{ mm}$
 $P = 48 - 8 \text{ TPI}$



**Monoblock tool
for thread milling**

$$d_1 = .750 - 1.250 \text{ inch}$$

Pitch
 $P = .5 - 5.0 \text{ mm}$
 $P = 48 - 5 \text{ TPI}$

System characteristics

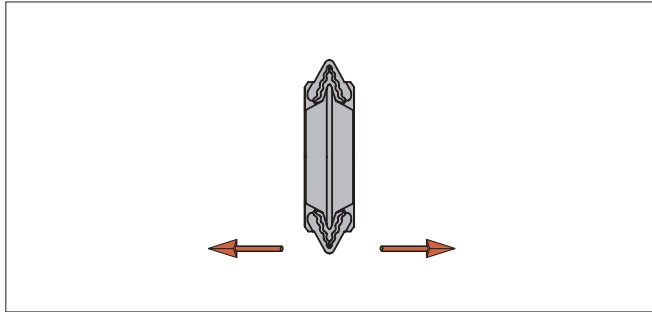
- Turning and milling with the same insert
- Neutral configuration of insert

Benefits

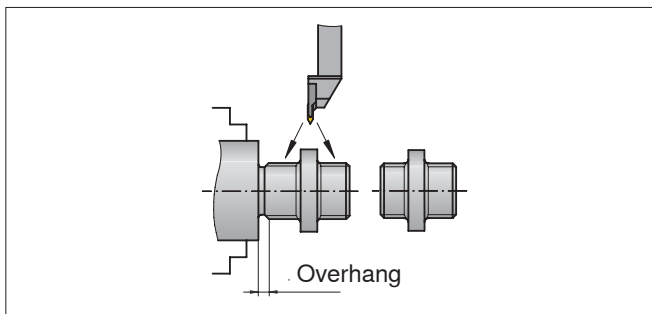
- Flexibility, reduced variety and costs
- Right-hand and left-hand threads possible using one insert only
- Reduced storage

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

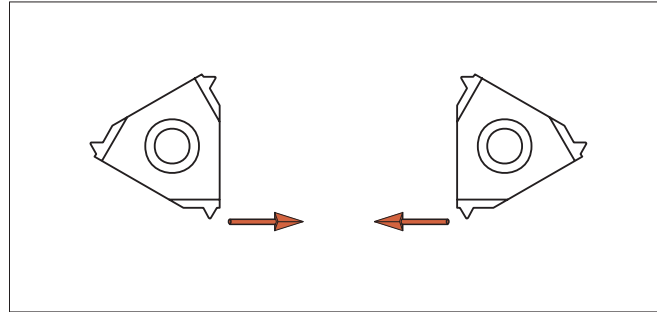


- Neutral configuration of insert makes operation in both directions possible
- Only one threading insert per pitch for partial profile and Whitworth thread; only two threading inserts (internal - external) per pitch for ISO threads
- Reduced storage
- Good chip formation through chip groove with rake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

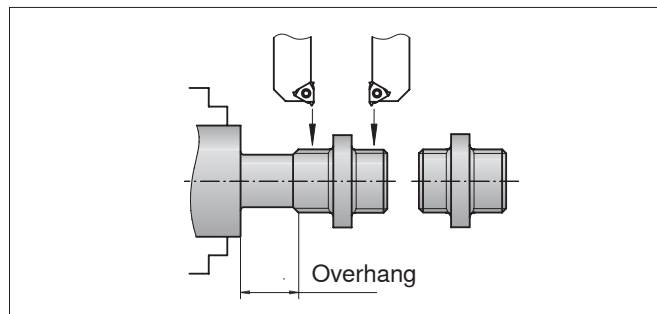


- Enhanced economy through
- reduced machining time
 - fewer tool changes
 - improved stability, small overhang
 - material saving
 - thread turning between shoulders possible
 - fewer tools and inserts

Conventional system

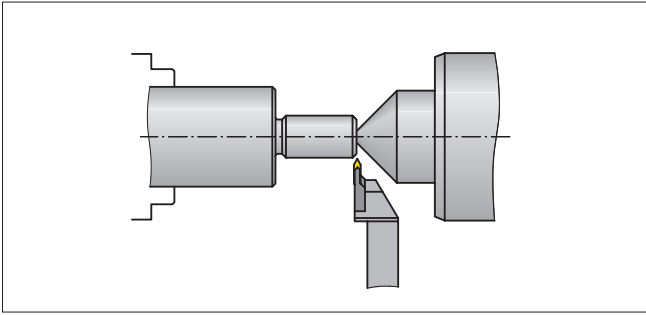


- Right-hand and left-hand version of insert, therefore operation only in one direction
- For every pitch 4 threading inserts are necessary (right- and - left-hand, internal - external)



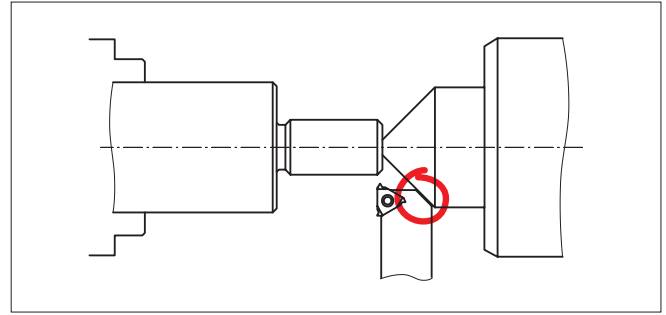
- for this machining method 2 tools are necessary
- additional loss of stability and material caused by large overhangs

System TC

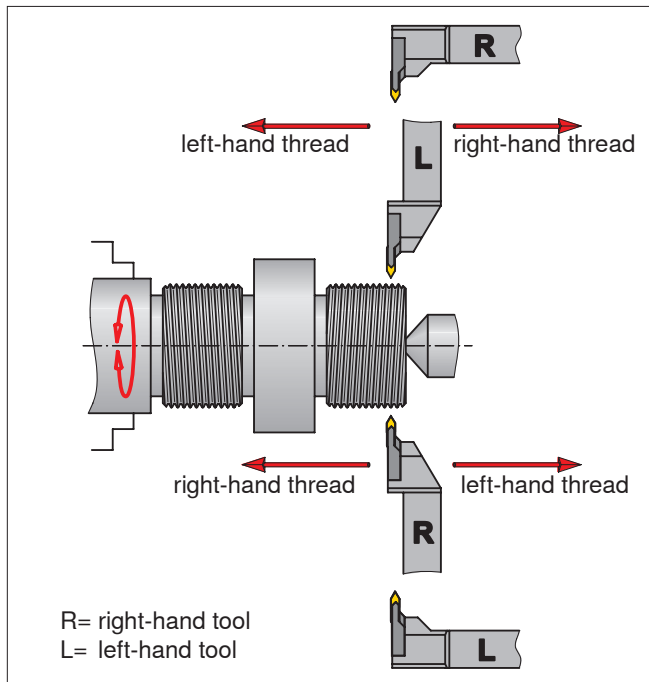


- Easy access to work piece therefore use of tailstock also possible with small thread diameters

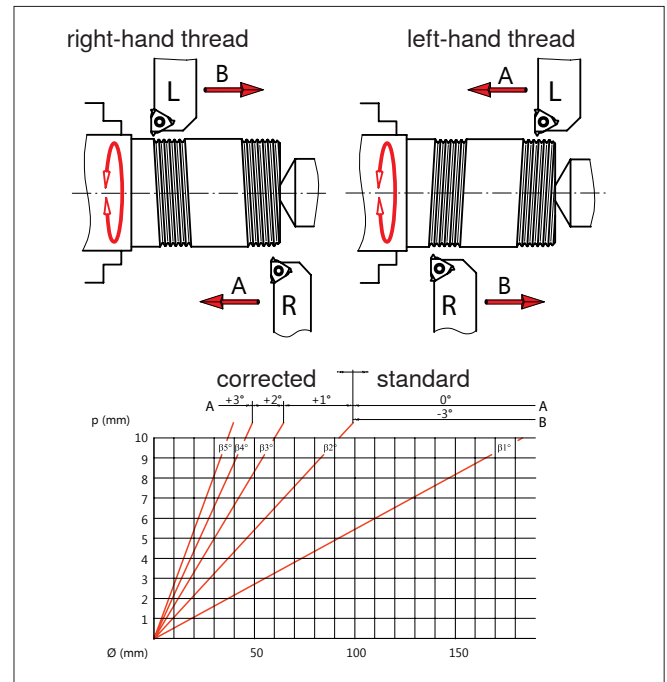
Conventional system



- Difficult component access
- Danger of collision

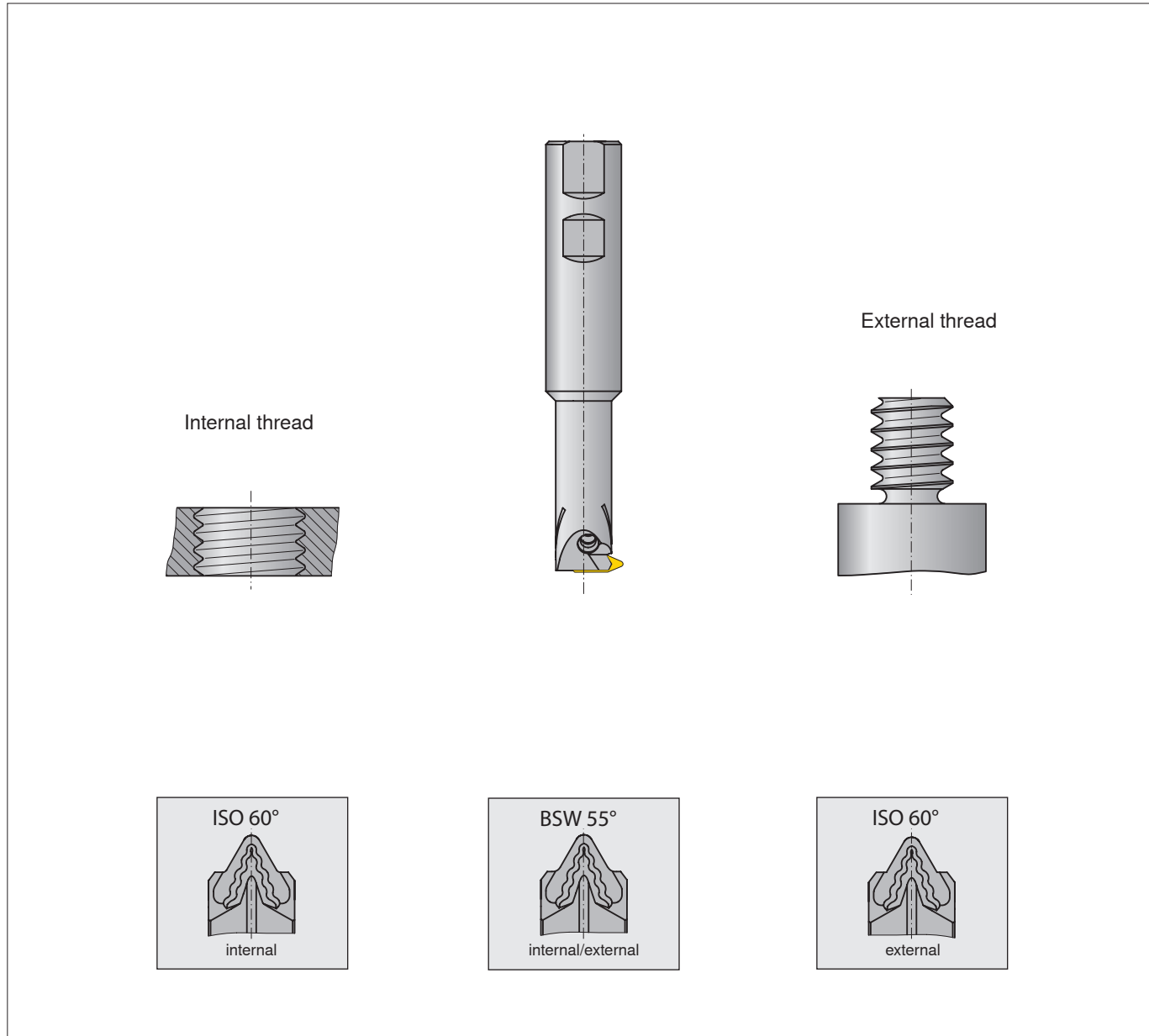


- Easy to apply as the tools can be used in both directions without correcting the helix angle



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

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

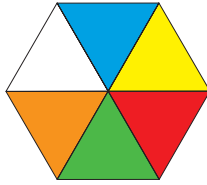


System characteristics

- 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



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



Steel



Stainless steel



Cast iron



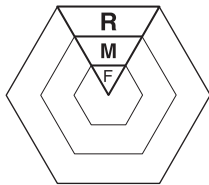
Non-ferrous metals and non-metals



Heat-resistant alloys, titanium



Hard materials



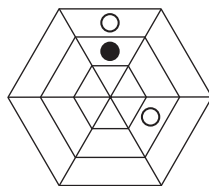
Machining application type

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

R = rough machining

M = medium machining

F = fine machining



Application

The ideal application area for the 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 stocks.

- Main application
- Extended application

CTC P335



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
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 ISO 513
Application range**

For example:
05 ISO K05/P05
10
15
25-

**5 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

Carbide

- HW** Uncoated carbide, consisting mainly of tungsten carbide (WC)
HT¹⁾ 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 aluminum oxide (Al_2O_3)
CM Mixed ceramic, based on aluminum 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** Polycrystalline diamond²⁾

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

Boron nitride

- BN** Cubic crystalline boron nitride (polycrystalline boron nitride) ²⁾

¹⁾ These carbides are also called 'cermets'.

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

Grade designation	Standard designation	*Cutting material	Application range										P	M	K	N	S	H		
													Steel	Stainless	Cast iron	Non-ferrous metals	Heat-resistant	Hard materials		
			01	05	10	15	20	25	30	35	40	45	50							
CTC1325	HC-P25	C																		
	HC-M20	C																		
	HC-K30	C																		
CTCP335	HC-P35	C																		
	HC-M30	C																		
	HC-K35	C																		
CTP1340	HC-P30	P																		
	HC-M25	P																		
	HC-K30	P																		
CTPP345	HC-P45	P																		
	HC-M40	P																		
	HC-S40	P																		
CTW7120	HW-M20	W																		
	HW-K20	W																		
GM127	HC-P30	C																		
	HC-M25	C																		
H216T	HW-K15	W																		
S40T	HW-P40	W																		
	HW-M40	W																		
SR127	HC-P25	C																		
	HC-M20	C																		
	HC-K30	C																		
TSM20	HW-K15	W																		
			01	05	10	15	20	25	30	35	40	45	50	● Main application ○ Extended application						

*Type of cutting material





Grade overview – threading

Grade designation	Standard designation	*Cutting material	Application range										P	M	K	N	S	H				
													Steel	Stainless	Cast iron	Non-ferrous metals	Heat-resistant	Hard materials				
			01	05	10	15	20	25	30	35	40	45	50									
GM213	HC-P20	C																				
	HC-M15	C																				
	HC-K25	C																				
GM240	HC-P35	C																				
	HC-M25	C																				
H216T	HW-K15	W																				
			01	05	10	15	20	25	30	35	40	45	50									
													● Main application									
													○ Extended application									

Introduction

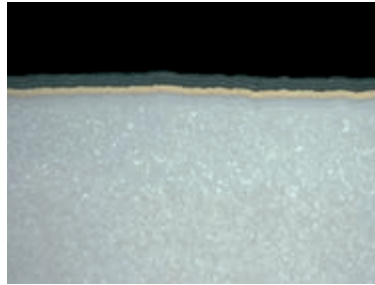
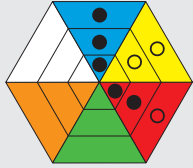
Tools and inserts for parting and grooving

*Type of cutting material



CTC1325

HC-P25
HC-M20
HC-K30

**Composition:**

Co 7.0%; composite carbides 8.0%; WC balance

Grain size:

1 - 2 μm

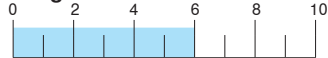
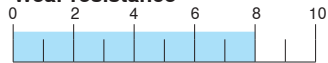
Hardness:

HV₃₀ 1450

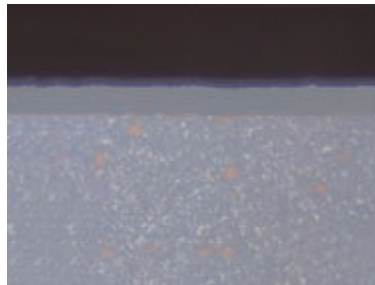
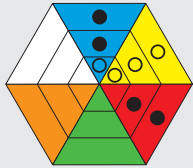
Coating specification:

CVD

Ti(C,N) + Ti(C,N) + TiN + Al₂O₃; 12 μm

Toughness**Wear resistance****CTCP335**

HC-P35
HC-M30
HC-K35

**Composition:**

Co 10.5%; mixed carbides 2.0%; WC balance

Grain size:

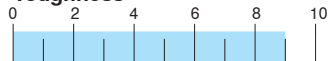
1 - 2 μm

Hardness:

HV₃₀ 1400

Coating specification:

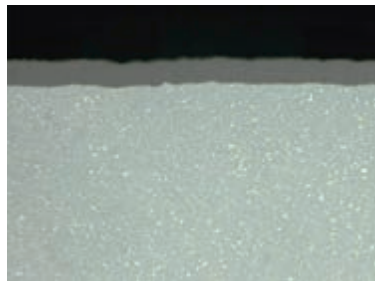
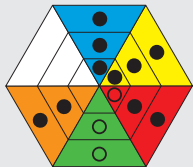
Ti(C,N) + Al₂O₃; 7.5 μm

Toughness**Wear resistance****Properties, application:**

- Excellent wear resistance
- Good resistance to oxidation
- High toughness
- Good heat resistance

CTP1340

HC-P30
HC-M25
HC-K30

**Composition:**

Co 9.0%; WC balance

Grain size:

.7 - 1 μm

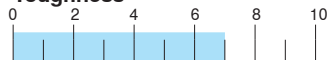
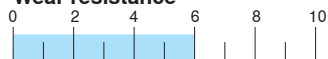
Hardness:

HV₃₀ 1590

Coating specification:

PVD

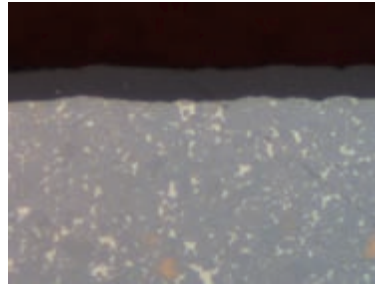
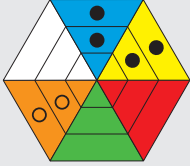
TiAlN; 4 μm

Toughness**Wear resistance****Properties, application:**

- Excellent suitability for universal application
- Ideal for stainless steels
- High cutting edge stability

CTPP345

HC-P45
HC-M40
HC-S40

**Composition:**

Co 12.5%; mixed carbides 2.0%; WC balance

Grain size:

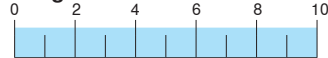
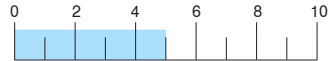
1 - 1.5 μm

Hardness:

HV₃₀ 1380

Coating specification:

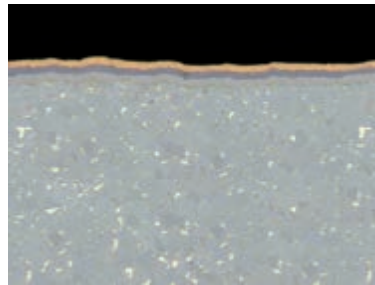
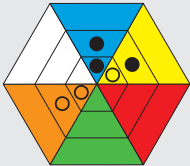
TiAlN; 7 μm

Toughness**Wear resistance****Properties, application:**

- For universal application
- Excellent toughness
- Good wear resistance
- High application security

GM127

HC-P30
HC-M25

**Composition:**

Co 6.0%; composite carbides .6%; WC balance

Grain size:

2 μm

Hardness:

HV₃₀ 1460

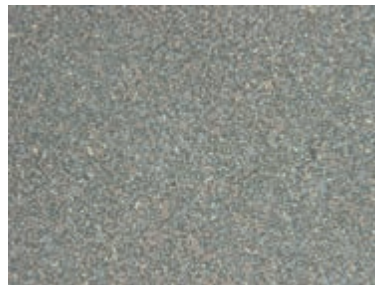
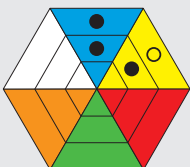
Coating specification:

CVD

TiC + Ti(C,N) + TiN; 5 μm

Toughness**Wear resistance****S40T**

HW-P40
HW-M40

**Composition:**

Co 11.0%; mixed carbides 12.0%; WC balance

Grain size:

1 - 2 μm

Hardness:

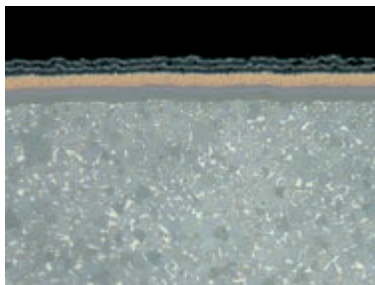
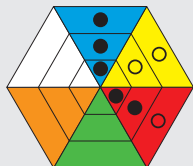
HV₃₀ 1420

Toughness**Wear resistance****Properties, application:**

- High toughness
- Medium to low cutting speed
- For universal application on steel

SR127

HC-P25
HC-M20
HC-K30

**Composition:**

Co 6.0%; composite carbides .6%; WC balance

Grain size:

2 μm

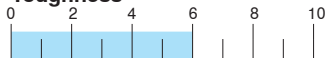
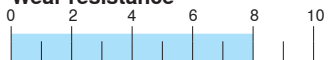
Hardness:

HV₃₀ 1460

Coating specification:

CVD

Ti(C,N) + TiN + Al₂O₃; 12 μm

Toughness**Wear resistance****Properties, application:**

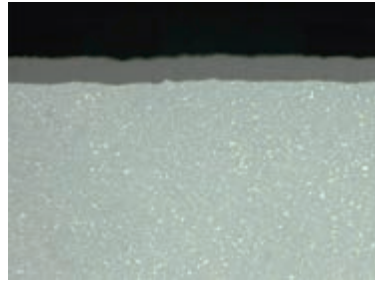
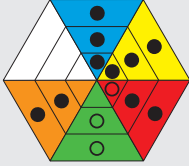
- Wide range of applications (steel and cast iron)
- Excellent resistance to oxidation
- Good toughness
- High wear resistance

Grade description – parting and grooving

Stainless steel

CTP1340

HC-P30
HC-M25
HC-K30



Composition:

Co 9.0%; WC balance

Grain size:

.7 - 1 μm

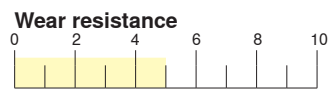
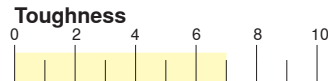
Hardness:

HV₃₀ 1590

Coating specification:

PVD

TiAlN; 4 μm

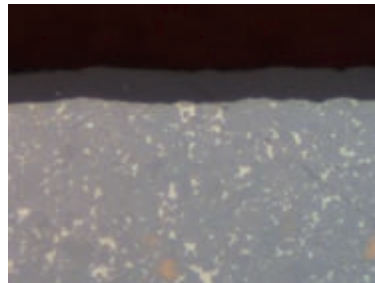
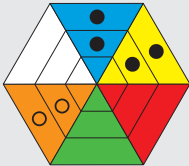


Properties, application:

- Excellent suitability for universal application
- Ideal for stainless steels
- High cutting edge stability

CTPP345

HC-P45
HC-M40
HC-S40



Composition:

Co 12.5%; mixed carbides 2.0%; WC balance

Grain size:

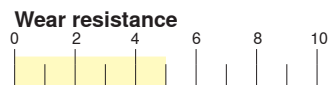
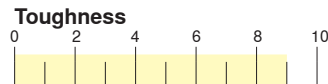
1 - 1.5 μm

Hardness:

HV₃₀ 1380

Coating specification:

TiAlN; 7 μm

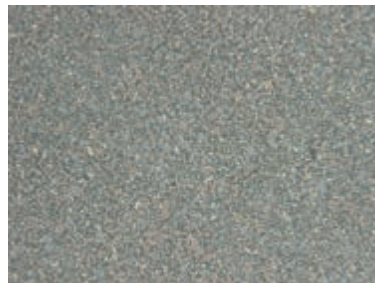
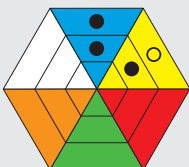


Properties, application:

- For universal application
- Excellent toughness
- Good wear resistance
- High application security

S40T

HW-P40
HW-M40



Composition:

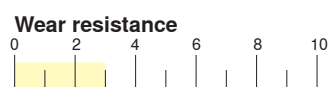
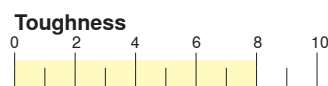
Co 11.0%; mixed carbides 12.0%; WC balance

Grain size:

1 - 2 μm

Hardness:

HV₃₀ 1420

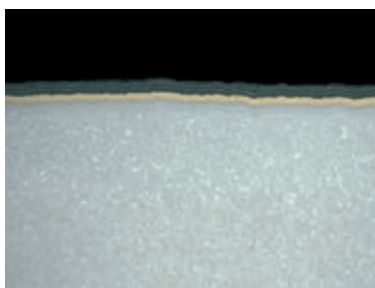
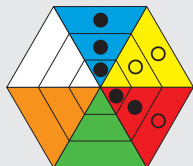


Properties, application:

- High toughness
- Medium to low cutting speed
- For universal application on steel

CTC1325

HC-P25
HC-M20
HC-K30

**Composition:**

Co 7.0%; composite carbides 8.0%; WC balance

Grain size:

1 - 2 μm

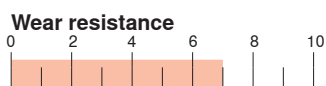
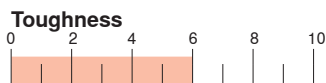
Hardness:

HV₃₀ 1450

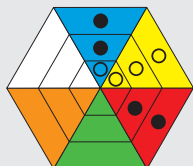
Coating specification:

CVD

Ti(C,N) + Ti(C,N) + TiN + Al₂O₃; 12 μm

**CTCP335**

HC-P35
HC-M30
HC-K35

**Composition:**

Co 10.5%; mixed carbides 2.0%; WC balance

Grain size:

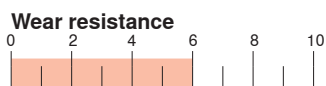
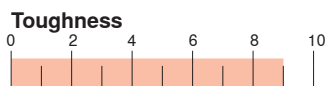
1 - 2 μm

Hardness:

HV₃₀ 1400

Coating specification:

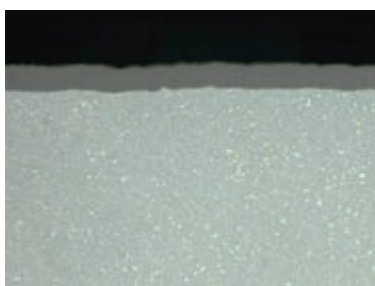
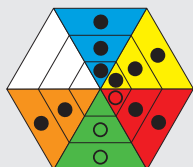
Ti(C,N) + Al₂O₃; 7.5 μm

**Properties, application:**

- Excellent wear resistance
- Good resistance to oxidation
- High toughness
- Good heat resistance

CTP1340

HC-P30
HC-M25
HC-K30

**Composition:**

Co 9.0%; WC balance

Grain size:

.7 - 1 μm

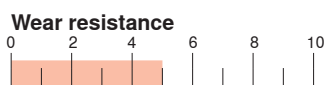
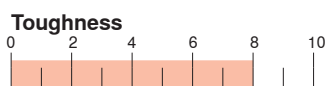
Hardness:

HV₃₀ 1590

Coating specification:

PVD

TiAlN; 4 μm

**Properties, application:**

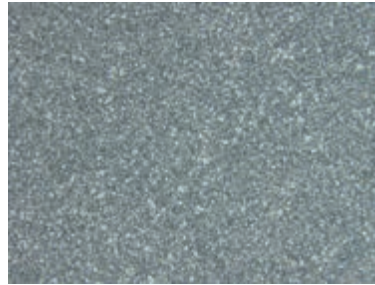
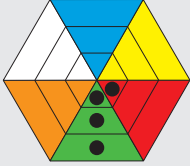
- Excellent suitability for universal application
- Ideal for stainless steels
- High cutting edge stability

Grade description – parting and grooving

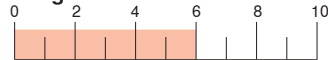
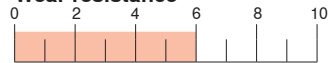
Cast iron

H216T

HW-K15


Composition:

Co 6%; WC balance

Grain size:
1 μm
Hardness:
HV₃₀ 1630
Toughness

Wear resistance

Properties, application:

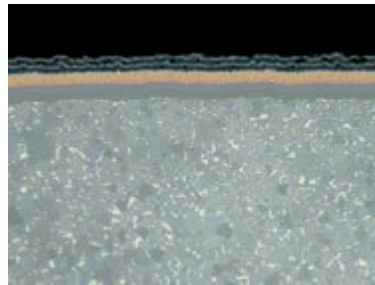
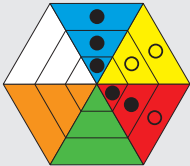
- Optimally suitable for aluminum
- High wear resistance
- High heat resistance
- Low tendency for adhesion

SR127

HC-P25

HC-M20

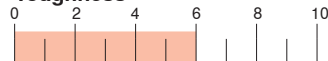
HC-K30


Composition:

Co 6.0%; composite carbides .6%; WC balance

Grain size:
2 μm
Hardness:
HV₃₀ 1460
Coating specification:

CVD

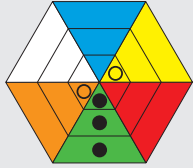
Ti(C,N) + TiN + Al₂O₃; 12 μm
Toughness

Wear resistance

Properties, application:

- Wide range of applications (steel and cast iron)
- Excellent resistance to oxidation
- Good toughness
- High wear resistance

CTW7120

HW-M20
HW-K20



Composition:

Co 10.0%; WC balance

Grain size:

0.7 μm (submicron grade)

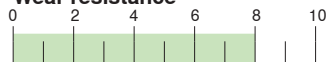
Hardness:

HV₃₀ 1550

Toughness



Wear resistance

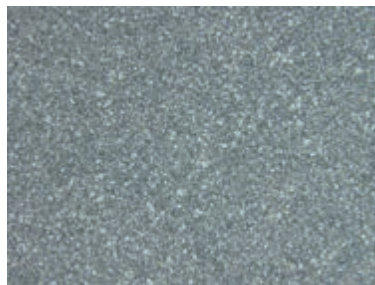
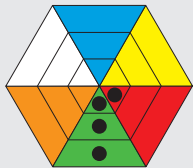


Properties, application:

- Ideal for non ferrous metals
- Substrate for PVD coatings

H216T

HW-K15



Composition:

Co 6%; WC balance

Grain size:

1 μm

Hardness:

HV₃₀ 1630

Toughness



Wear resistance



Properties, application:

- Optimally suitable for aluminum
- High wear resistance
- High heat resistance
- Low tendency for adhesion

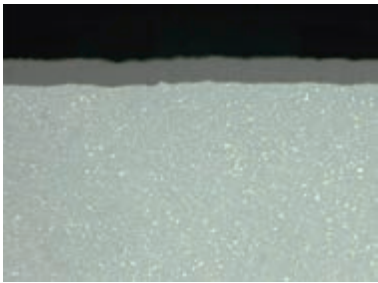
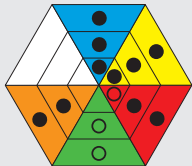


Grade description – parting and grooving

Heat-resistant alloys / titanium

CTP1340

HC-P30
HC-M25
HC-K30

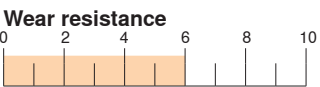
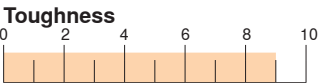


Composition:
Co 9.0%; WC balance

Grain size:
.7 - 1 μm

Hardness:
HV₃₀ 1590

Coating specification:
PVD
TiAlN; 4 μm

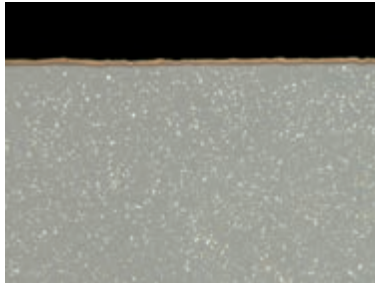
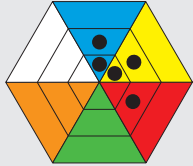


Properties, application:

- Excellent suitability for universal application
- Ideal for stainless steels
- High cutting edge stability

GM213

HC-P20
HC-M15
HC-K25

**Composition:**

Co 6.0%; WC balance

Grain size:

1 μm

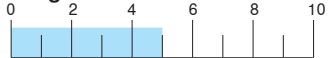
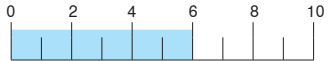
Hardness:

HV₃₀ 1630

Coating specification:

CVD

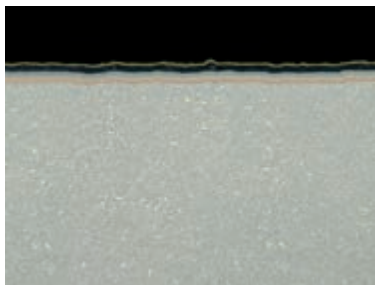
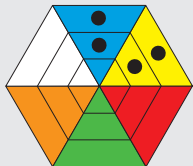
TiC + TiN; 3 μm

Toughness**Wear resistance****Properties, application:**

- Suitable for high cutting speed
- Good heat resistance
- Good wear resistance

GM240

HC-P35
HC-M25

**Composition:**

Co 10.0%; composite carbides .6%; WC balance

Grain size:

.7 μm

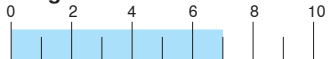
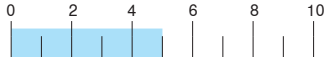
Hardness:

HV₃₀ 1590

Coating specification:

CVD

TiC + Ti(C,N) + Al₂O₃ + Ti(N,B); 6 μm

Toughness**Wear resistance****Properties, application:**

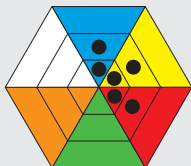
- For universal application
- High toughness
- Good wear resistance
- Low tendency for adhesion

Grade description – threading

Stainless steel

GM213

HC-P20
HC-M15
HC-K25



Composition:

Co 6.0%; WC balance

Grain size:

1 μm

Hardness:

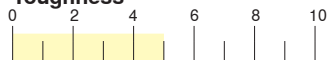
HV₃₀ 1630

Coating specification:

CVD

TiC + TiN; 3 μm

Toughness

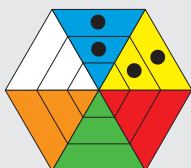


Wear resistance



GM240

HC-P35
HC-M25



Composition:

Co 10.0%; composite carbides .6%; WC balance

Grain size:

.7 μm

Hardness:

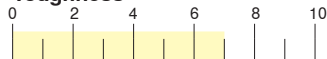
HV₃₀ 1590

Coating specification:

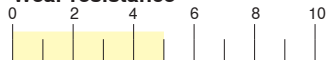
CVD

TiC + Ti(C,N) + Al₂O₃ + Ti(N,B); 6 μm

Toughness



Wear resistance

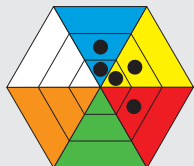


Properties, application:

- For universal application
- High toughness
- Good wear resistance
- Low tendency for adhesion

GM213

HC-P20
HC-M15
HC-K25

**Composition:**

Co 6.0%; WC balance

Grain size:

1 μm

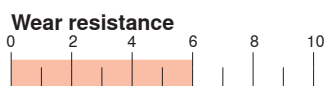
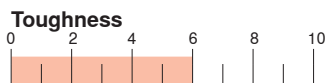
Hardness:

HV₃₀ 1630

Coating specification:

CVD

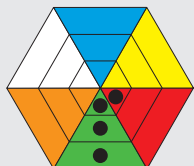
TiC + TiN; 3 μm

**Properties, application:**

- Suitable for high cutting speed
- Good heat resistance
- Good wear resistance

H216T

HW-K15

**Composition:**

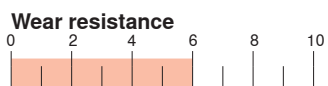
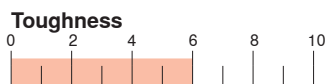
Co 6%; WC balance

Grain size:

1 μm

Hardness:

HV₃₀ 1630

**Properties, application:**

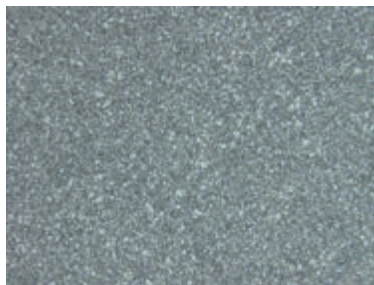
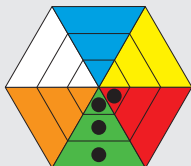
- Optimally suitable for aluminum
- High wear resistance
- High heat resistance
- Low tendency for adhesion

Grade description – threading

Non-ferrous metals and non-metals

H216T

HW-K15



Composition:

Co 6%; WC balance

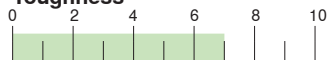
Grain size:

1 μm

Hardness:

HV₃₀ 1630

Toughness



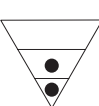
Wear resistance



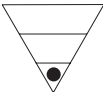
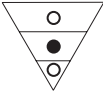
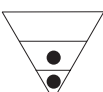
Properties, application:

- Optimally suitable for aluminum
- High wear resistance
- High heat resistance
- Low tendency for adhesion

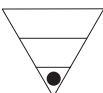
Part-off, grooving, turning

Chip groove	Machining type	Machining type	Consistent cutting depth	Inconsistent cutting depth	Interrupted cut
					
-F2 			CTC1325	CTC1325 / CTP1340	CTPP345
			CTP1340	CTP1340 / CTPP345	CTPP345
			CTC1325	CTC1325 / CTP1340	—
			—	—	—
			—	—	—
Standard 			CTC1325	CTC1325 / CTP1340	CTCP335
			CTP1340	CTP1340	CTP1340
			CTC1325	CTC1325 / CTP1340	CTP1340
			—	—	—
			—	—	—
-M40 			CTC1325	CTC1325 / CTP1340	CTP1340 / CTPP345
			CTP1340	CTP1340 / CTPP345	CTPP345
			CTC1325	CTC1325	CTP1340
			—	—	—
			CTP1340	CTP1340	CTP1340 / CTPP345
-M1 			CTC1325	CTC1325 / CTP1340	CTPP345
			CTP1340	CTP1340 / CTPP345	CTPP345
			CTC1325	CTC1325 / CTP1340	CTP1340
			—	—	—
			CTP1340	CTP1340	CTP1340 / CTPP345
-27P 			—	—	—
			—	—	—
			—	—	—
			H216T	H216T	H216T
			—	—	—

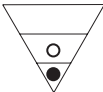
Radius grooves, copy turning

Chip groove		Machining type	Consistent cutting depth	Inconsistent cutting depth	Interrupted cut
					
R/L			CTC1325	CTC1325	—
			CTC1325	CTC1325	—
			CTC1325	CTC1325	—
			—	—	—
			—	—	—
Standard/ -M3			CTC1325	CTC1325 / CTP1340	CTP1340 / CTCP335
			CTC1325 / GM127	CTP1340	CTP1340
			CTC1325	CTC1325	CTCP335
			—	—	—
			—	—	—
-27P			—	—	—
			—	—	—
			—	—	—
			H216T	H216T	H216T
			—	—	—

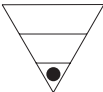
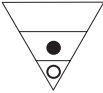
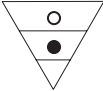
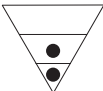
Circlip grooves

L/N/R			CTP1340	CTP1340	—
			CTP1340	CTP1340	—
			CTP1340	CTP1340	—
			CTP1340	CTP1340	—
			CTP1340	CTP1340	—

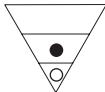
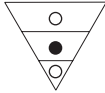
Axial grooving

Chip groove	Machining type	Machining type	Consistent cutting depth	Inconsistent cutting depth	Interrupted cut
					
-F50 			CTP1340	CTP1340	–
			CTP1340	CTP1340	–
			CTP1340	CTP1340	–
			CTP1340	CTP1340	–
			CTP1340	CTP1340	–

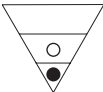
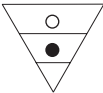
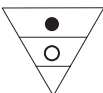
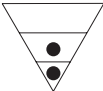
Part-off, grooving, turning

Chip groove		Machining type	Machining type	Consistent cutting depth	Inconsistent cutting depth	Interrupted cut
						
-F2				CTC1325	CTC1325 / CTP1340	CTPP345
				CTP1340	CTP1340 / CTPP345	CTPP345
				CTC1325	CTC1325 / CTCP335	—
				—	—	—
				CTP1340	CTP1340 / CTPP345	—
-M2				CTC1325	CTC1325 / CTP1340	CTCP335
				CTP1340	CTP1340 / CTPP345	CTCP335
				CTC1325	CTC1325 / CTP1340	CTCP335
				—	—	—
				CTP1340	CTP1340	CTP1340 / CTPP345
-M3				CTP1340	CTP1340 / CTCP335	CTP1340 / CTCP335
				CTP1340	CTP1340	CTP1340 / CTCP335
				CTP1340	CTCP335	CTCP335
				CTP1340	CTP1340	CTP1340
				CTP1340	CTP1340	CTP1340
-M1				CTC1325	CTP1340 / CTCP335	CTCP335 / CTPP345
				CTP1340	CTP1340 / CTPP345	CTPP345
				CTC1325	CTC1325	CTCP335
				—	—	—
				CTP1340	CTP1340	CTP1340 / CTPP345
-27P				—	—	—
				—	—	—
				—	—	—
				H216T	H216T	H216T
				—	—	—

Part-off, grooving, turning

Chip groove	Machining type	Machining type	Consistent cutting depth	Inconsistent cutting depth	Interrupted cut
					
-M2 			CTC1325	CTC1325 / CTCP335	CTCP335
			CTCP335	CTCP335	CTCP335
			CTC1325	CTC1325	CTCP335
			–	–	–
			–	–	–
-M3 			CTC1325	CTC1325 / CTCP335	CTCP335
			CTCP335	CTCP335	CTCP335
			CTC1325	CTC1325	CTCP335
			–	–	–
			–	–	–

Part-off, grooving

Chip groove		Machining type	Consistent cutting depth	Inconsistent cutting depth	Interrupted cut
					
-F1 			CTC1325	CTC1325 / CTP1340	CTPP345
			CTP1340	CTP1340 / CTPP345	CTPP345
			CTC1325	CTC1325 / CTP1340	–
			–	–	–
			–	–	–
-M1 			CTC1325	CTP1340 / CTC335	CTCP335 / CTPP345
			CTP1340	CTP1340 / CTPP345	CTPP345
			CTC1325	CTC1325	CTCP335
			–	–	–
			CTP1340	CTP1340	CTP1340 / CTPP345
-R2 			CTC1325	CTC1325 / CTP1340	CTPP345
			CTP1340	CTP1340 / CTPP345	CTPP345
			CTC1325	CTC1325	CTP1340
			–	–	–
			CTP1340	CTP1340	CTP1340 / CTPP345
-27P 			–	–	–
			–	–	–
			–	–	–
			H216T	H216T	H216T
			–	–	–

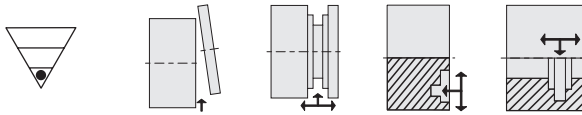


SX



GX09/GX16/GX24

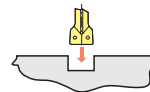
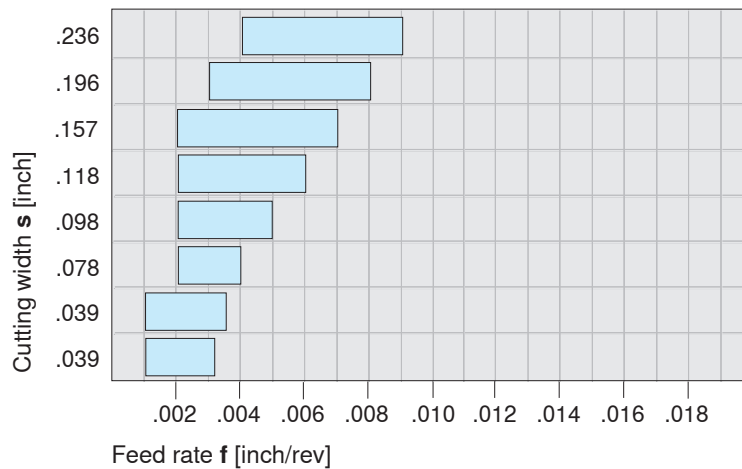
Application



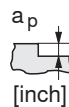
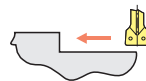
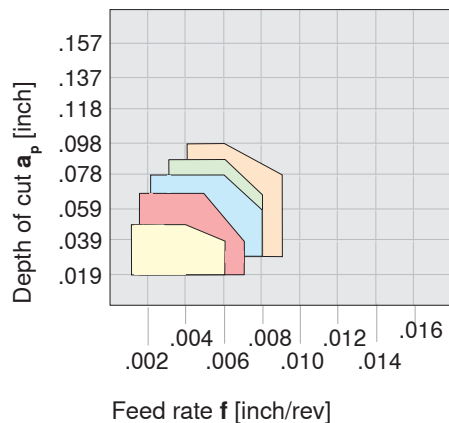
-F2

- For steels in general, particularly suitable for **stainless materials**
- Insert with ground periphery
- Tolerance cutting width $\pm .000787$ inch
- Suitable also for parting off tubes and thin-walled materials
- Special profiles (SX, GX) possible

Feed rate for parting and grooving

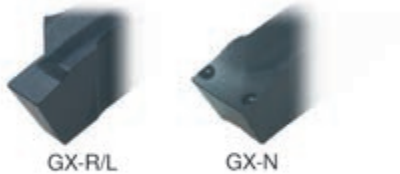


Feed rate for longitudinal turning

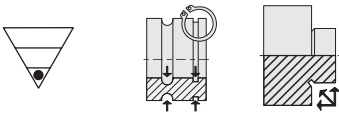


- = .236 inch
- = .196 inch
- = .157 inch
- = .118 inch
- = .078 inch

Cutting width s



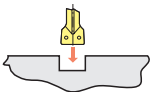
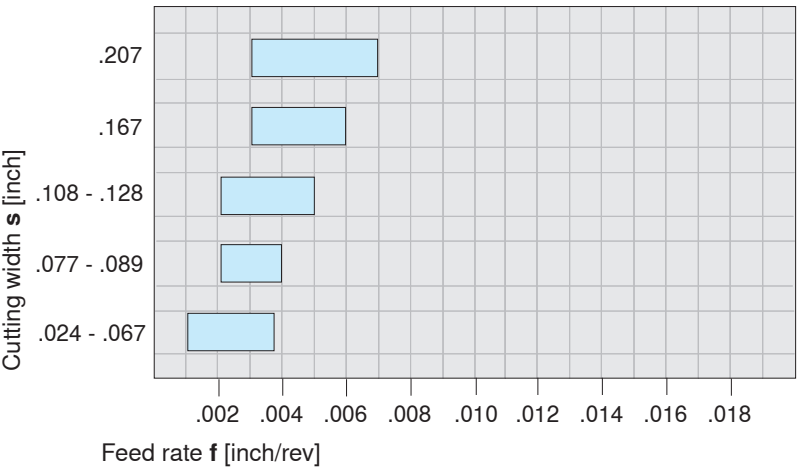
Application



Circlip grooves L/N/R

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

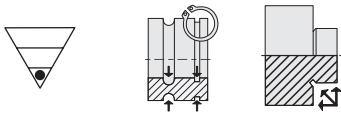
Feed rate for grooving operations





GX R/L

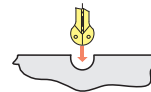
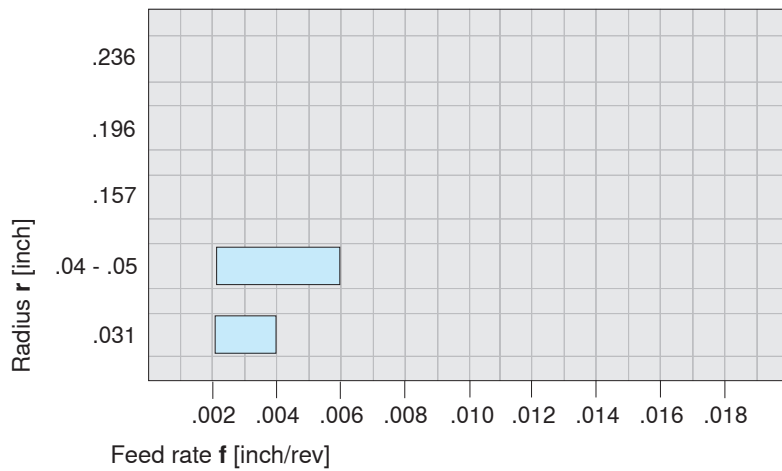
Application

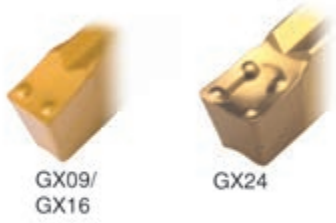


Radius grooves R/L

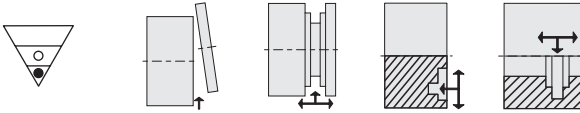
- Inserts for radius grooves and copy turning
- For all steel materials
- For internal and external machining

Feed rate for grooving operations





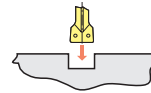
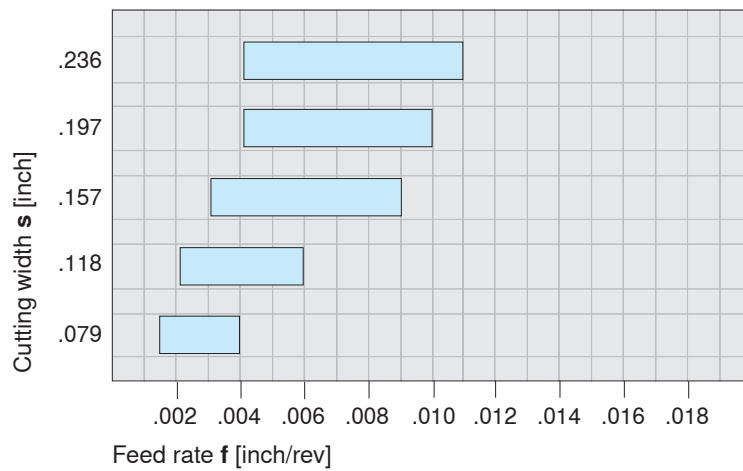
Application



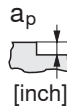
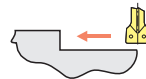
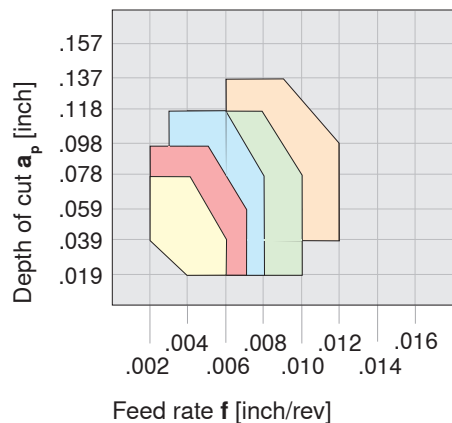
Standard

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

Feed rate for parting and grooving



Feed rate for longitudinal turning



- = .236 inch
- = .196 inch
- = .157 inch
- = .118 inch
- = .078 inch

Cutting width s



AX

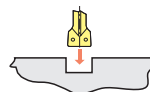
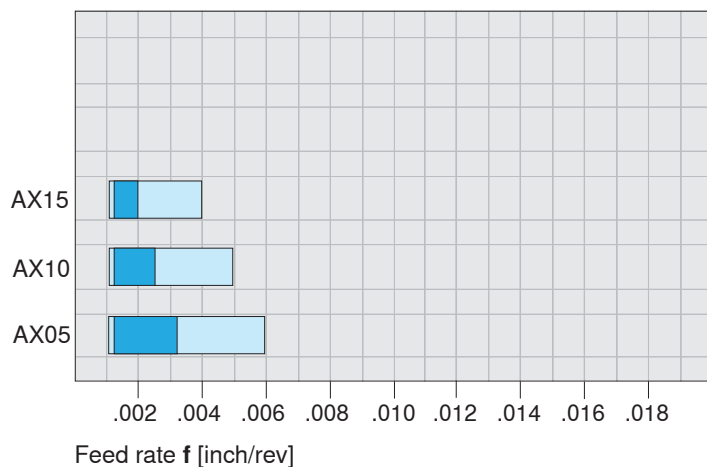
Application



-F50

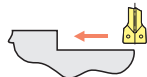
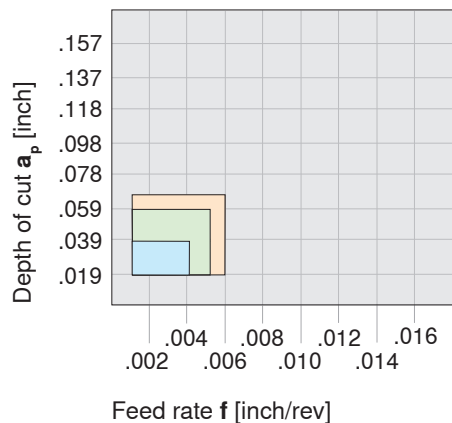
- Universal geometry for:
 - **Steel**
 - **Stainless steel**
 - Cast iron
 - Non-ferrous metals
- Insert with ground periphery
- Tolerance cutting width $\pm .000787$ inch

Feed rate axial grooving



- ... f feed rate for the first groove
- ... feed rate range f

Feed rate face turning

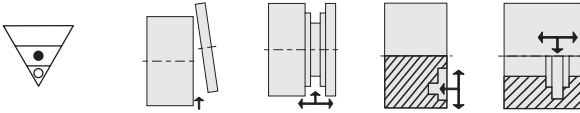


- = AX15
 - = AX10
 - = AX05
- Cutting width s



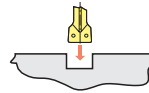
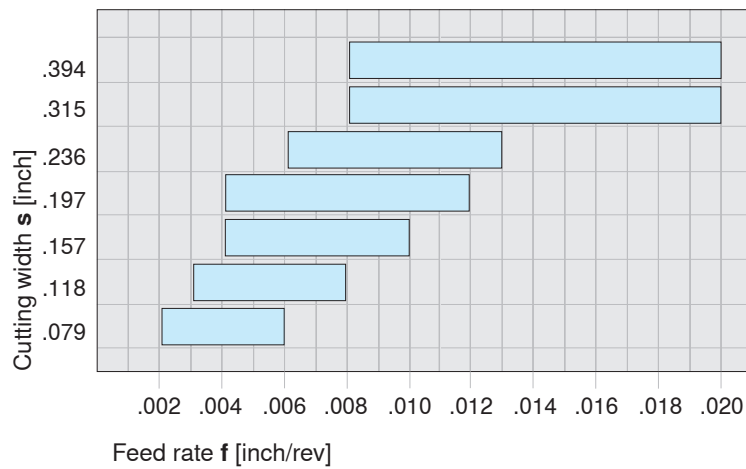
SX/LX

Application

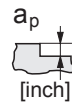
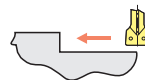
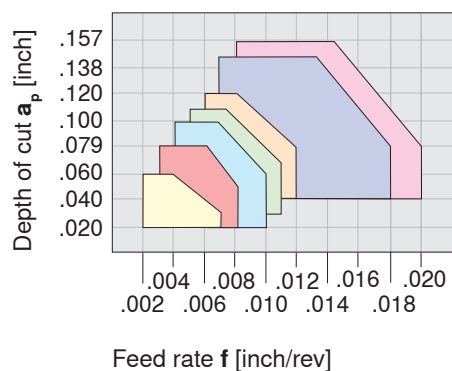
**-M2**

- 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



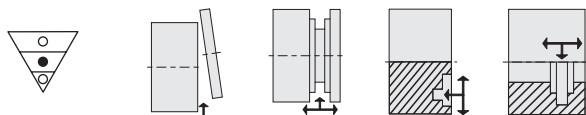
- = .393 inch
- = .315 inch
- = .236 inch
- = .197 inch
- = .157 inch
- = .118 inch
- = .079 inch

Cutting width s



GX

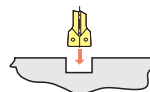
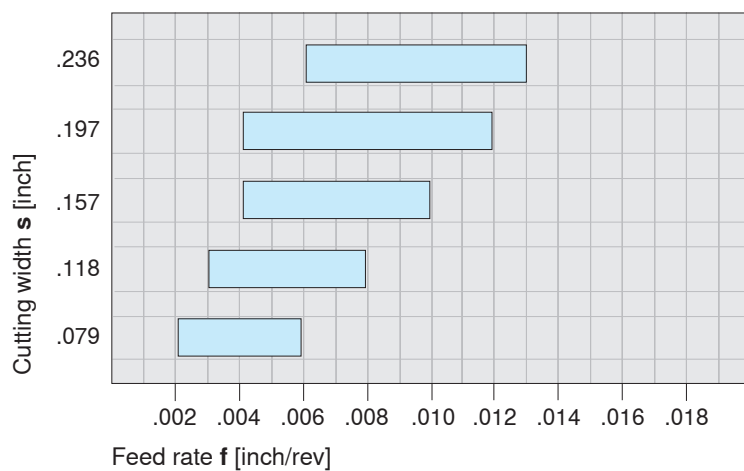
Application



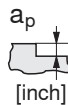
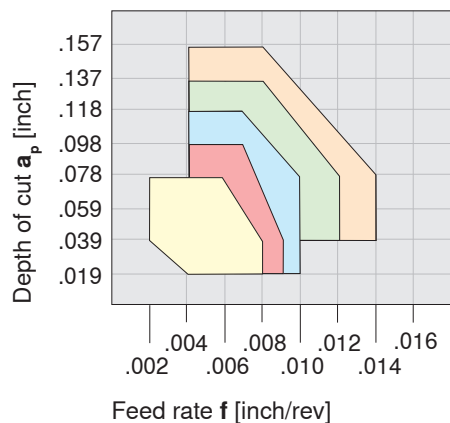
-M40

- For grooving and turning
- Suitable for all steel materials
- Very good chip control
- Tolerance cutting width $\pm .00196$ inch

Feed rate for parting and grooving



Feed rate for longitudinal turning



- = .236 inch
- = .196 inch
- = .157 inch
- = .118 inch
- = .078 inch

Cutting width s





GX16/
GX24

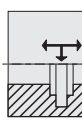
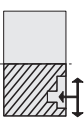
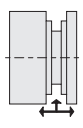


SX



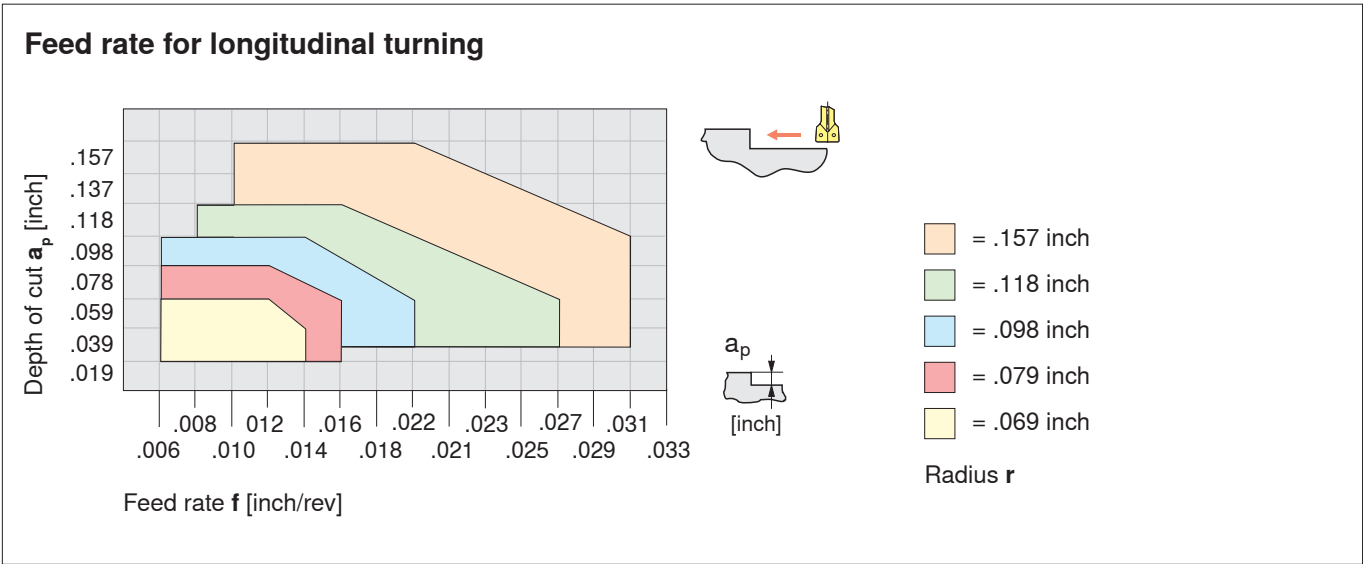
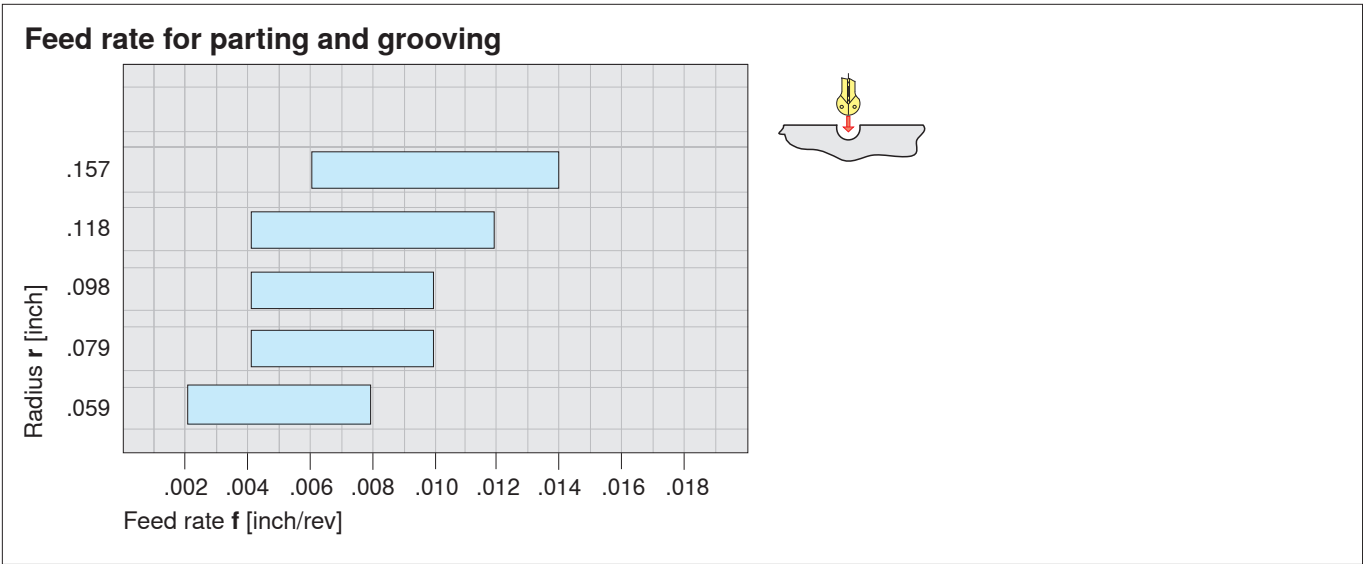
LX

Application



-M3

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



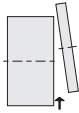


SX



GX16/GX24

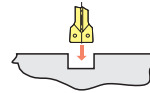
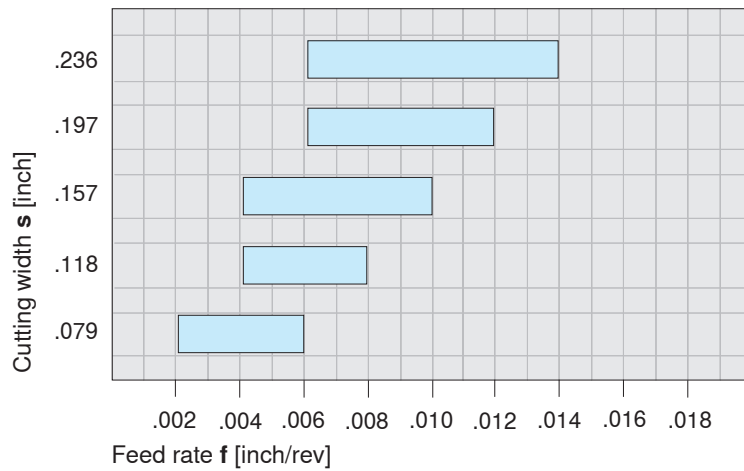
Application



-M1

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

Feed rate for parting and grooving





SX

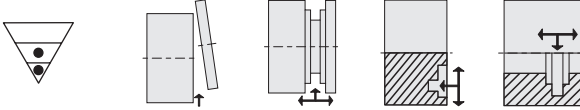


GX16

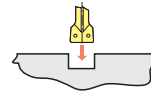
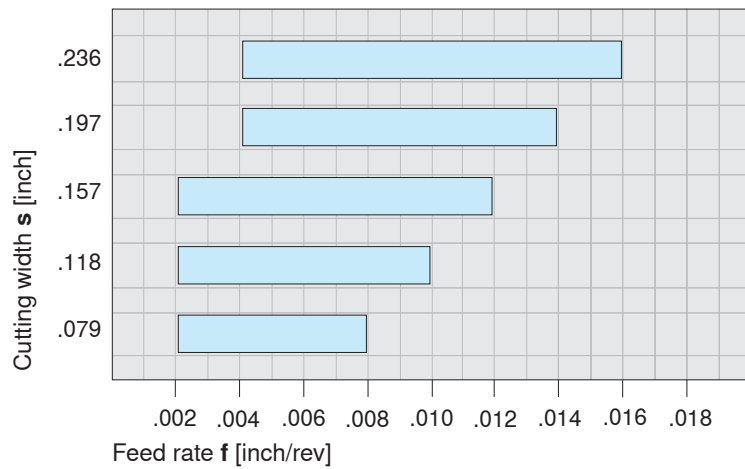


GX24

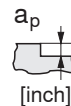
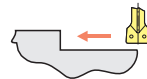
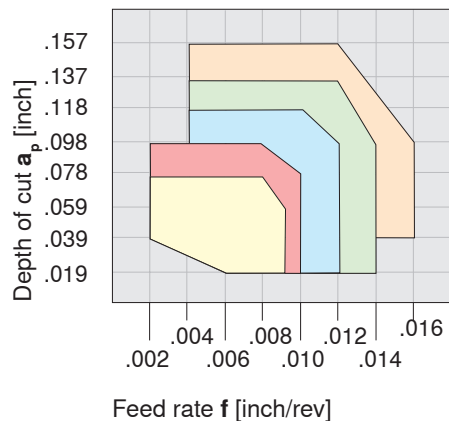
Application

**-27P**

- Particularly suitable for **aluminum and non-ferrous metals**
- Insert with highly positive cutting geometry and sharp cutting edge
- Insert with ground periphery
- Tolerance cutting width $\pm .000787$ inch
- Extra-smooth rake face through 'microfinish'

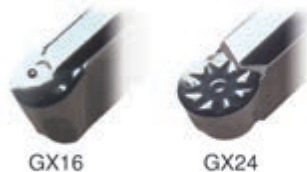


Feed rate for parting and grooving



- = .236 inch
- = .197 inch
- = .157 inch
- = .118 inch
- = .079 inch

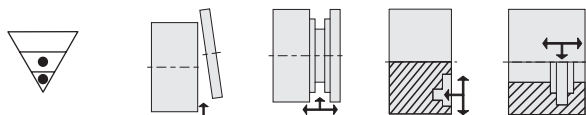
Cutting width s



GX16

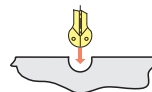
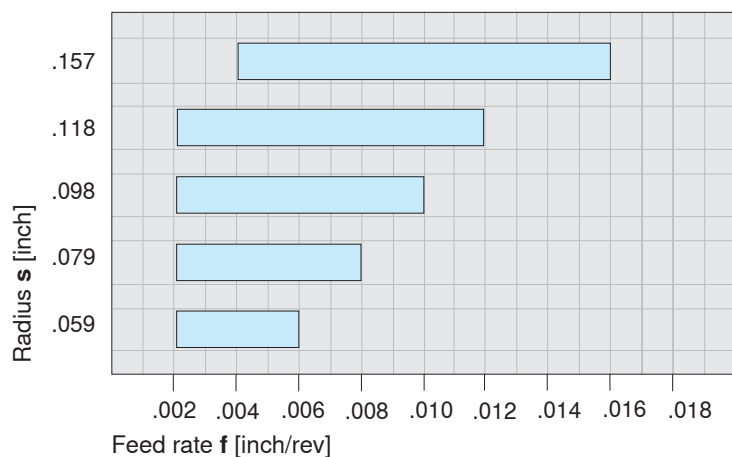
GX24

Application

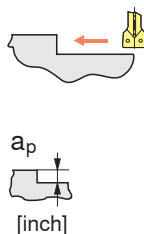
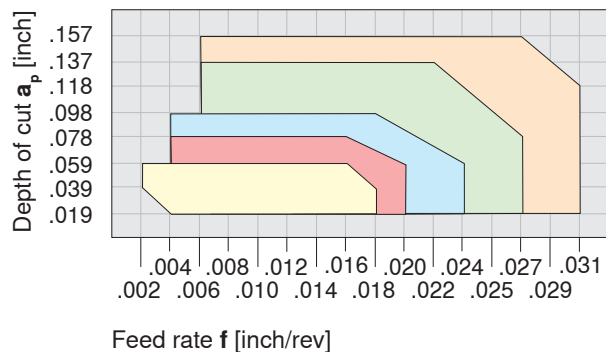


-27P

- 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 $\pm .000787$ inch
- Extra-smooth rake face through 'microfinish'



Feed rate for parting and grooving



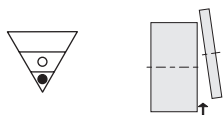
- = .157 inch
- = .118 inch
- = .098 inch
- = .079 inch
- = .059 inch

Radius r



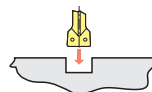
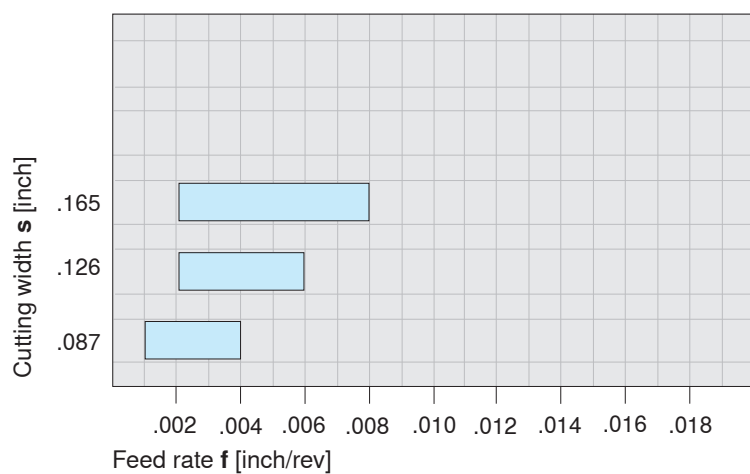
FX

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

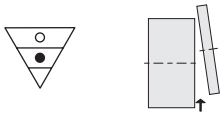
Feed rate for parting and grooving





FX

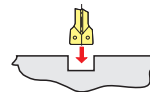
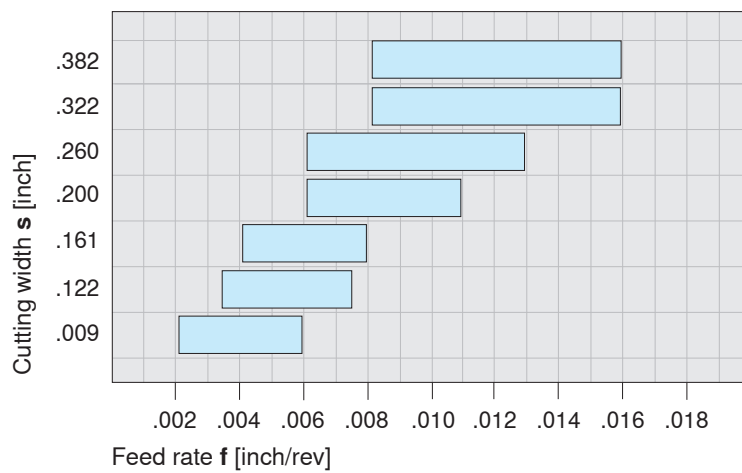
Application



-M1

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

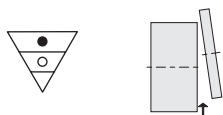
Feed rate for parting and grooving





FX

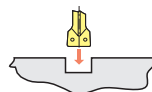
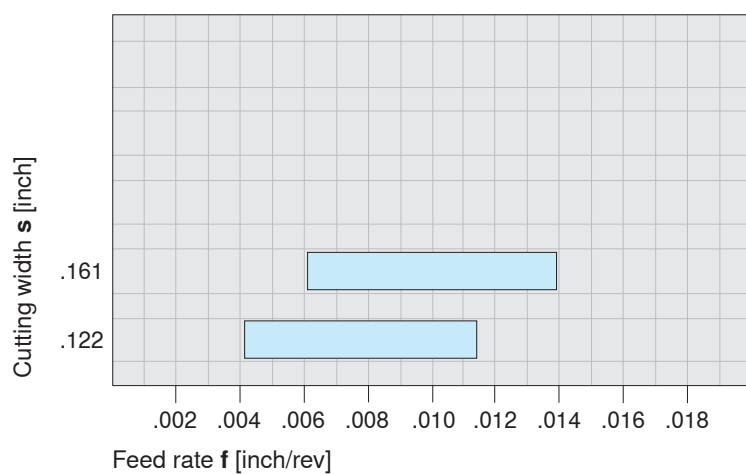
Application



-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

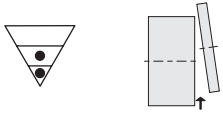
Feed rate for parting and grooving





FX

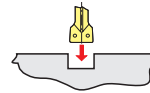
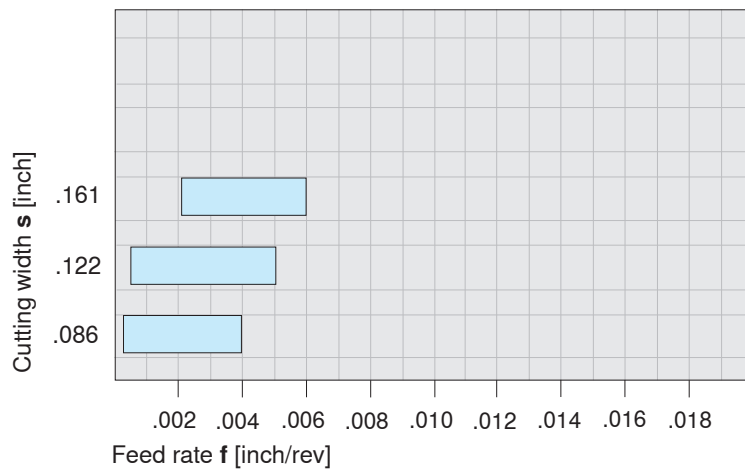
Application



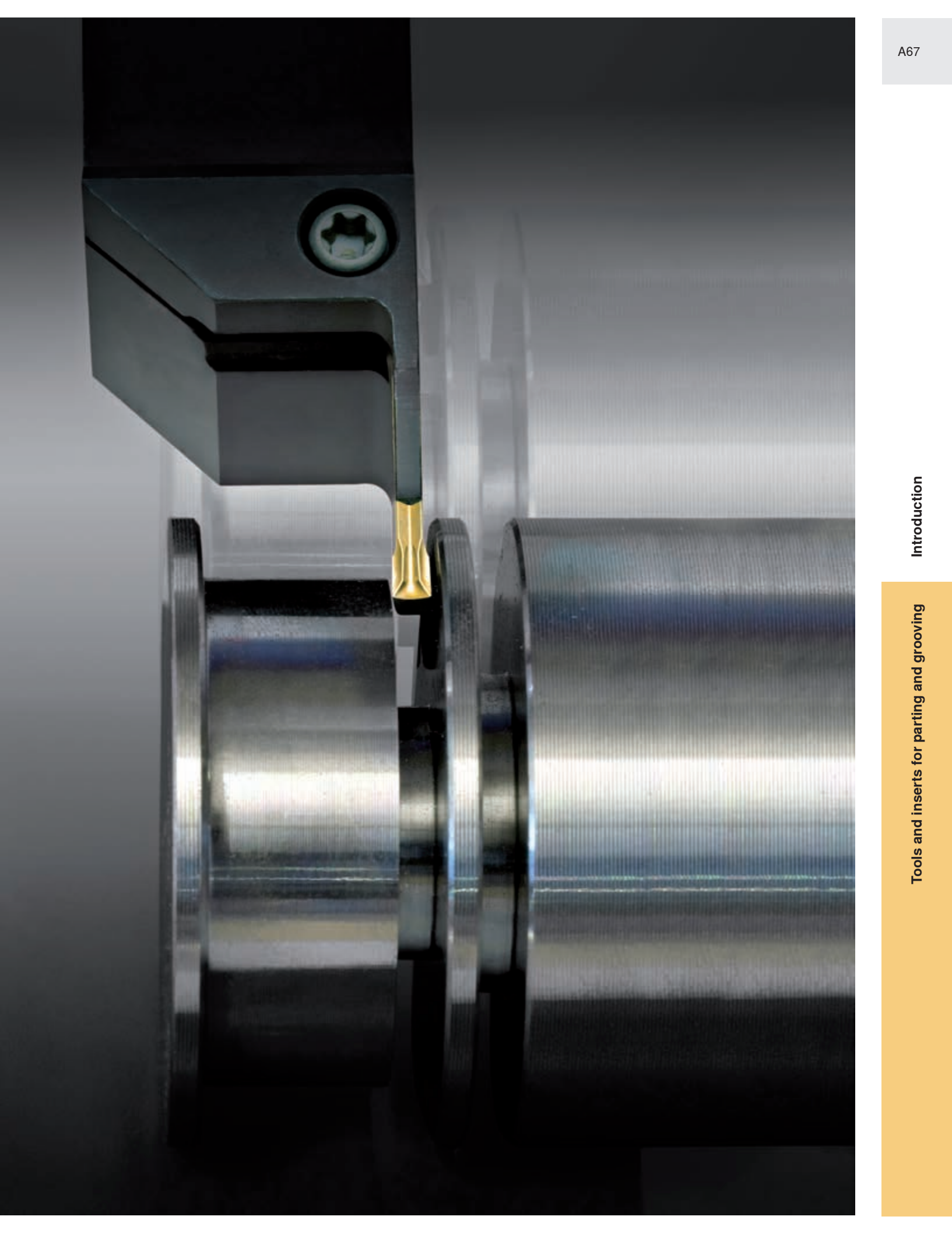
-27P

- Particularly suitable for **aluminum 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







Part-off

	Modular system	A70-A72
	Clamping blocks, blades	A73-A75
	Monoblock	A76-A77

Grooving and turning

	Modular system - external	A78-A82
	Monoblock - external	A83
	Modular system - internal	A84-A88
	Monoblock boring bars – internal	A89

Circlip grooves

	Modular system - external	A90-A94
	Monoblock - external	A95
	Modular system - internal	A96-A100
	Monoblock boring bars – internal	A101

Radius grooves

	Modular system - external	A102-A106
	Monoblock - external	A107-A108
	Modular system - internal	A109-A113
	Monoblock boring bars – internal	A114

Axial grooving

	Modular system	A115-A121
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External recessing

	Modular system	A122-A125
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Threading (turning)

	Modular system - external	A126-A129
	Monoblock - external	A130
	Modular system - internal	A132-A133
	Monoblock boring bars – internal	A134

Threading (milling)

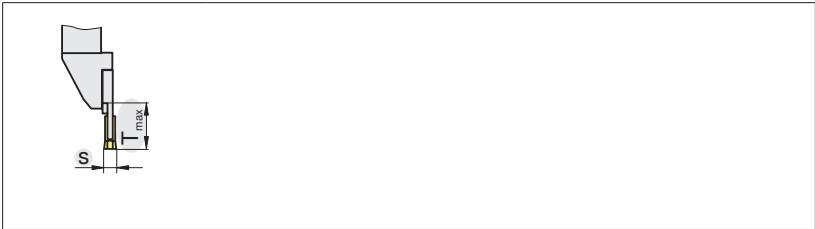
	Modular system	A136-A137
	Monoblock	A138



Part-off
Modular system, assembly size 20



Matching products see right-hand side.

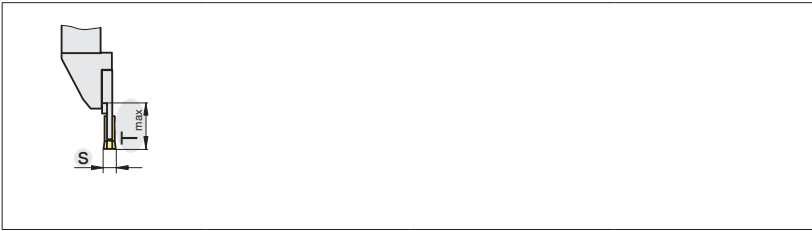
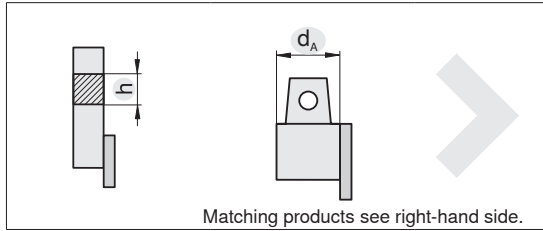


		h/d_A [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description
A158		.625	R	MSS-E20R00-10-E
		.750	R	MSS-E20R00-12-E
		0		
A159		.750	L	MSS-E20L90-12-E
		90		

		s/s_{min} [inch]	s_{max} [inch]	T_{max} [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description		
A163		.079	.108	.472	R	MSS-E20R12-GX16-1	GX16-1..	A142
		.109	.147	.472	R	MSS-E20R12-GX16-2	GX16-2..	A142
		.148	.197	.472	R	MSS-E20R12-GX16-3	GX16-3..	A142
A164		.079	.108	.827	R	MSS-E20R21-GX24-1	GX24-1..	A142
		.109	.147	.827	R	MSS-E20R21-GX24-2	GX24-2..	A142
		.148	.197	.827	R	MSS-E20R21-GX24-3	GX24-3..	A142
A170		.079		.787	R	MSS-E20R20-SX2	SX..2	A147
		.118		.787	R	MSS-E20R20-SX3	SX..3	A147
A172		.087		.787	R	MSS-E20R20-FX2.2	FX 2.2..	A149
		.122		.787	R	MSS-E20R20-FX3.1	FX 3.1..	A149
		.161		.787	R	MSS-E20R20-FX4.1	FX 4.1..	A149

		h/d_A [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description
A158		.625	L	MSS-E20L00-10-E
		.750	L	MSS-E20L00-12-E
		0		
A159		.750	R	MSS-E20R90-12-E
		90		

		s/s_{min} [inch]	s_{max} [inch]	T_{max} [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description		
A163		.079	.108	.472	L	MSS-E20L12-GX16-1	GX16-1..	A142
		.109	.147	.472	L	MSS-E20L12-GX16-2	GX16-2..	A142
		.148	.197	.472	L	MSS-E20L12-GX16-3	GX16-3..	A142
A164		.079	.108	.827	L	MSS-E20L21-GX24-1	GX24-1..	A142
		.109	.147	.827	L	MSS-E20L21-GX24-2	GX24-2..	A142
		.148	.197	.827	L	MSS-E20L21-GX24-3	GX24-3..	A142
A170		.079		.787	L	MSS-E20L20-SX2	SX..2	A147
		.118		.787	L	MSS-E20L20-SX3	SX..3	A147
A172		.087		.787	L	MSS-E20L20-FX2.2	FX 2.2..	A149
		.122		.787	L	MSS-E20L20-FX3.1	FX 3.1..	A149
		.161		.787	L	MSS-E20L20-FX4.1	FX 4.1..	A149



		h/d_A [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description
A158		1.000	R	MSS-E25R00-16-E
	0			
A159		1.000	L	MSS-E25L90-16-E
	90			
A198		2.480	R	HSK-T63-MSS-E25R00
	0	3.937	R	HSK-T100-MSS-E25R00

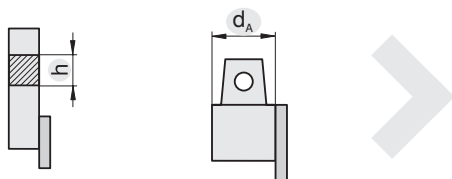
		s/s_{min} [inch]	s_{max} [inch]	T_{max} [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description	
A163		.079	.108	.472	R	MSS-E25R12-GX16-1	GX16-1.. A142
		.109	.147	.472	R	MSS-E25R12-GX16-2	GX16-2.. A142
		.148	.197	.472	R	MSS-E25R12-GX16-3	GX16-3.. A142
		.198	.256	.472	R	MSS-E25R12-GX16-4	GX16-4.. A142
A164		.079	.108	.827	R	MSS-E25R21-GX24-1	GX24-1.. A142
		.109	.147	.827	R	MSS-E25R21-GX24-2	GX24-2.. A142
		.148	.197	.827	R	MSS-E25R21-GX24-3	GX24-3.. A142
		.198	.256	.827	R	MSS-E25R21-GX24-4	GX24-4.. A142
A170		.079		.787	R	MSS-E25R20-SX2	SX..2 A147
		.118		.984	R	MSS-E25R25-SX3	SX..3 A147
		.118		1.378	R	MSS-E25R35-SX3	SX..3 A147
		.157		.984	R	MSS-E25R25-SX4	SX..4 A147
		.157		1.378	R	MSS-E25R35-SX4	SX..4 A147
A172		.087		.787	R	MSS-E25R20-FX2.2	FX 2.2.. A149
		.122		.984	R	MSS-E25R25-FX3.1	FX 3.1.. A149
		.161		.984	R	MSS-E25R25-FX4.1	FX 4.1.. A149
		.201		.984	R	MSS-E25R25-FX5.1	FX 5.1.. A149
		.256		.984	R	MSS-E25R25-FX6.5	FX 6.5.. A149
A173		.122		1.378	R	MSS-E25R35-FX3.1	FX 3.1.. A149
		.161		1.378	R	MSS-E25R35-FX4.1	FX 4.1.. A149
		.201		1.378	R	MSS-E25R35-FX5.1	FX 5.1.. A149
		.256		1.378	R	MSS-E25R35-FX6.5	FX 6.5.. A149

		h/d_A [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description
A158		1.000	L	MSS-E25L00-16-E
	0			
A159		1.000	R	MSS-E25R90-16-E
	90			
A198		2.480	L	HSK-T63-MSS-E25L00
	0	3.937	L	HSK-T100-MSS-E25L00

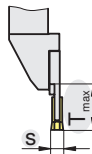
		s/s_{min} [inch]	s_{max} [inch]	T_{max} [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description	
A163		.079	.108	.472	L	MSS-E25L12-GX16-1	GX16-1.. A142
		.109	.147	.472	L	MSS-E25L12-GX16-2	GX16-2.. A142
		.148	.197	.472	L	MSS-E25L12-GX16-3	GX16-3.. A142
		.198	.256	.472	L	MSS-E25L12-GX16-4	GX16-4.. A142
A164		.079	.108	.827	L	MSS-E25L21-GX24-1	GX24-1.. A142
		.109	.147	.827	L	MSS-E25L21-GX24-2	GX24-2.. A142
		.148	.197	.827	L	MSS-E25L21-GX24-3	GX24-3.. A142
		.198	.256	.827	L	MSS-E25L21-GX24-4	GX24-4.. A142
A170		.079		.787	L	MSS-E25L20-SX2	SX..2 A147
		.118		1.378	L	MSS-E25L35-SX3	SX..3 A147
		.118		.984	L	MSS-E25L25-SX3	SX..3 A147
		.157		.984	L	MSS-E25L25-SX4	SX..4 A147
		.157		1.378	L	MSS-E25L35-SX4	SX..4 A147
A172		.087		.787	L	MSS-E25L20-FX2.2	FX 2.2.. A149
		.122		.984	L	MSS-E25L25-FX3.1	FX 3.1.. A149
		.161		.984	L	MSS-E25L25-FX4.1	FX 4.1.. A149
		.201		.984	L	MSS-E25L25-FX5.1	FX 5.1.. A149
		.256		.984	L	MSS-E25L25-FX6.5	FX 6.5.. A149
A173		.122		1.378	L	MSS-E25L35-FX3.1	FX 3.1.. A149
		.161		1.378	L	MSS-E25L35-FX4.1	FX 4.1.. A149
		.201		1.378	L	MSS-E25L35-FX5.1	FX 5.1.. A149
		.256		1.378	L	MSS-E25L35-FX6.5	FX 6.5.. A149

Part-off

Modular system, assembly size 32



Matching products see right-hand side.



		h/d_A [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description
A158		1.250	R	MSS-E32R00-20-E
		1.250	R	MSS-E32R00-85-E
A159		1.250	L	MSS-E32L90-20-E
		1.250	L	MSS-E32L90-85-E
A198		3.937	R	HSK-T100-MSS-E32R00
		2.480	R	HSK-T63-MSS-E32R00
A199		3.937	L	HSK-T100-MSS-E32L90
		2.480	L	HSK-T63-MSS-E32L90

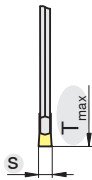
		s/s_{min} [inch]	s_{max} [inch]	T_{max} [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description		
A163		.109	.147	.472	R	MSS-E32R12-GX16-2	GX16-2..	A142
		.148	.197	.472	R	MSS-E32R12-GX16-3	GX16-3..	A142
		.198	.256	.472	R	MSS-E32R12-GX16-4	GX16-4..	A142
A164		.109	.147	.827	R	MSS-E32R21-GX24-2	GX24-2..	A142
		.148	.197	.827	R	MSS-E32R21-GX24-3	GX24-3..	A142
		.198	.256	.827	R	MSS-E32R21-GX24-4	GX24-4..	A142
A170		.118		1.378	R	MSS-E32R35-SX3	SX..3	A147
		.157		1.378	R	MSS-E32R35-SX4	SX..4	A147
A171		.315	.394	.984	N	MSS-E32N25-LX	LX..	A148
		.315	.394	1.260	N	MSS-E32N32-LX	LX..	A148
		.315	.394	1.772	N	MSS-E32N45-LX	LX..	A148
A172		.122		1.260	R	MSS-E32R32-FX3.1	FX 3.1..	A149
		.161		1.260	R	MSS-E32R32-FX4.1	FX 4.1..	A149
		.201		1.260	R	MSS-E32R32-FX5.1	FX 5.1..	A149
		.256		1.260	R	MSS-E32R32-FX6.5	FX 6.5..	A149
A173		.122		1.772	R	MSS-E32R45-FX3.1	FX 3.1..	A149
		.161		1.772	R	MSS-E32R45-FX4.1	FX 4.1..	A149
		.201		1.772	R	MSS-E32R45-FX5.1	FX 5.1..	A149
		.256		1.772	R	MSS-E32R45-FX6.5	FX 6.5..	A149

		h/d_A [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description
A158		1.250	L	MSS-E32L00-85-E
		1.250	L	MSS-E32L00-20-E
A159		1.250	R	MSS-E32R90-85-E
		1.250	R	MSS-E32R90-20-E
A198		2.480	L	HSK-T63-MSS-E32L00
		3.937	L	HSK-T100-MSS-E32L00
A199		2.480	R	HSK-T63-MSS-E32R90
		3.937	R	HSK-T100-MSS-E32R90

		s/s_{min} [inch]	s_{max} [inch]	T_{max} [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description		
A163		.109	.147	.472	L	MSS-E32L12-GX16-2	GX16-2..	A142
		.148	.197	.472	L	MSS-E32L12-GX16-3	GX16-3..	A142
		.198	.256	.472	L	MSS-E32L12-GX16-4	GX16-4..	A142
A164		.109	.147	.827	L	MSS-E32L21-GX24-2	GX24-2..	A142
		.148	.197	.827	L	MSS-E32L21-GX24-3	GX24-3..	A142
		.198	.256	.827	L	MSS-E32L21-GX24-4	GX24-4..	A142
A170		.118		1.378	L	MSS-E32L35-SX3	SX..3	A147
		.157		1.378	L	MSS-E32L35-SX4	SX..4	A147
A171		.315	.394	.984	N	MSS-E32N25-LX	LX..	A148
		.315	.394	1.260	N	MSS-E32N32-LX	LX..	A148
		.315	.394	1.772	N	MSS-E32N45-LX	LX..	A148
A172		.122		1.260	L	MSS-E32L32-FX3.1	FX 3.1..	A149
		.161		1.260	L	MSS-E32L32-FX4.1	FX 4.1..	A149
		.201		1.260	L	MSS-E32L32-FX5.1	FX 5.1..	A149
		.256		1.260	L	MSS-E32L32-FX6.5	FX 6.5..	A149
A173		.122		1.772	L	MSS-E32L45-FX3.1	FX 3.1..	A149
		.161		1.772	L	MSS-E32L45-FX4.1	FX 4.1..	A149
		.201		1.772	L	MSS-E32L45-FX5.1	FX 5.1..	A149
		.256		1.772	L	MSS-E32L45-FX6.5	FX 6.5..	A149



Matching products see right-hand side.



		h [inch]	L R N	Type, description
A183		.750	N	SBN 12-26K-E
A184		.750	N	SBN 12-26KS-E

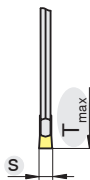
		s/s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	L R N	Type, description		
A178		.079		.984	R	XLCFR 2602-SX2	SX..2	A147
		.079		.984	L	XLCFL 2602-SX2	SX..2	A147
		.118		1.378	N	XLCFN 2603-SX3	SX..3	A147
		.157		1.575	N	XLCFN 2604-SX4	SX..4	A147
A179		.079		.866	R	XLCFR 2608-SX2	SX..2	A147
		.079		.866	L	XLCFL 2608-SX2	SX..2	A147
		.118		.866	R	XLCFR 2608-SX3	SX..3	A147
		.118		.866	L	XLCFL 2608-SX3	SX..3	A147
A182		.087		.984	N	XLCEN 2602 J22 FX	FX 2.2..	A149
		.122		1.378	N	XLCFN 2603 J31 FX	FX 3.1..	A149
		.161		1.575	N	XLCFN 2604 J41 FX	FX 4.1..	A149

Part-off

Clamping blocks, blades, height 32

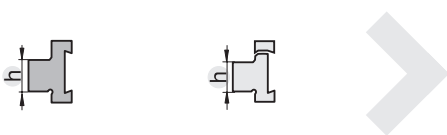


Matching products see right-hand side.

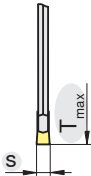


		h [inch]		Type, description
A183		1.000	N	SBN 16-32K-E
		1.250	N	SBN 20-32K-E
A184		1.250	N	SBN 20-32KS-E
		1.000	N	SBN 16-32KS-E

		s/s _{min} [inch]	s _{max} [inch]	T _{max} [inch]		Type, description		
A177		.079	.108	.827	N	XLCFN 3202-GX24-1S	GX24-1..	A142
		.109	.147	.827	N	XLCFN 3203 GX24-2S	GX24-2..	A142
		.148	.197	.827	N	XLCFN 3204 GX24-3S	GX24-3..	A142
		.198	.256	.827	N	XLCFN 3206 GX24-4S	GX24-4..	A142
A178		.079		.984	R	XLCFR 3202-SX2	SX..2	A147
		.079		.984	L	XLCFL 3202-SX2	SX..2	A147
		.118		1.969	N	XLCFN 3203-SX3	SX..3	A147
		.157		1.969	N	XLCFN 3204-SX4	SX..4	A147
		.197		2.165	N	XLCFN 3205-SX5	SX..5	A147
		.236		2.362	N	XLCFN 3206-SX6	SX..6	A147
A180		.118		1.300	L	XLCFL 3208-SX3	SX..3	A147
		.118		1.300	R	XLCFR 3208-SX3	SX..3	A147
		.157		1.300	R	XLCFR 3208-SX4	SX..4	A147
		.157		1.300	L	XLCFL 3208-SX4	SX..4	A147
A182		.087		1.181	N	XLCEN 3202 M22 FX	FX 2.2..	A149
		.122		1.969	N	XLCFN 3203 M31 FX	FX 3.1..	A149
		.161		1.969	N	XLCFN 3204 M41 FX	FX 4.1..	A149
		.201		2.165	N	XLCFN 3205 M51 FX	FX 5.1..	A149
		.256		2.165	N	XLCFN 3206 M65 FX	FX 6.5..	A149



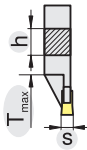
Matching products see right-hand side.



		h [inch]		Type, description			s/s _{min} [inch]	s _{max} [inch]	T _{max} [inch]		Type, description			
A183		1.500	N	SBN 24-46K-E	A181		.315	.394	3.150	N	XLCEN 4608 LX	LX..	A148	
		1.250	N	SBN 20-46K-E										
A182					A182		.323		3.150	N	XLCEN 4608 S82 FX	FX 8.2..	A149	
							.382		3.150	N	XLCEN 4609 S97 FX	FX 9.7..	A149	



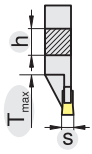
Part-off
Monoblock tools – GX



		h [inch]	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]		Type, description		
A175		.625	.109	.147	.827	R	E16R0021-10C-GX24-2-E	GX24-2..	A142
		.750	.109	.147	.827	R	E20R0021-12C-GX24-2-E	GX24-2..	A142
		.750	.148	.197	.827	R	E20R0021-12C-GX24-3-E	GX24-3..	A142
		1.000	.109	.147	.827	R	E25R0021-16D-GX24-2-E	GX24-2..	A142
		1.000	.148	.197	.827	R	E25R0021-16D-GX24-3-E	GX24-3..	A142
		1.000	.198	.256	.827	R	E25R0021-16D-GX24-4-E	GX24-4..	A142
		1.250	.109	.147	.827	R	E32R0021-85D-GX24-2-E	GX24-2..	A142
		1.250	.148	.197	.827	R	E32R0021-85D-GX24-3-E	GX24-3..	A142
		1.250	.198	.256	.827	R	E32R0021-85D-GX24-4-E	GX24-4..	A142
		.625	.109	.147	.827	L	E16L0021-10C-GX24-2-E	GX24-2..	A142
		.750	.109	.147	.827	L	E20L0021-12C-GX24-2-E	GX24-2..	A142
		.750	.148	.197	.827	L	E20L0021-12C-GX24-3-E	GX24-3..	A142
		1.000	.109	.147	.827	L	E25L0021-16D-GX24-2-E	GX24-2..	A142
		1.000	.148	.197	.827	L	E25L0021-16D-GX24-3-E	GX24-3..	A142
		1.000	.198	.256	.827	L	E25L0021-16D-GX24-4-E	GX24-4..	A142
		1.250	.109	.147	.827	L	E32L0021-85D-GX24-2-E	GX24-2..	A142
		1.250	.148	.197	.827	L	E32L0021-85D-GX24-3-E	GX24-3..	A142
		1.250	.198	.256	.827	L	E32L0021-85D-GX24-4-E	GX24-4..	A142

Application

Tools and inserts for parting and grooving

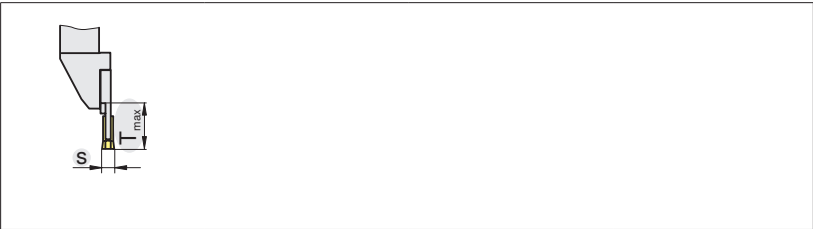


		h [inch]	s [inch]	T _{max} [inch]		Type, description		
A176		.375	.087	.591	R	XLCER 06 M22 FX-E	FX 2.2..	A149
		.500	.087	.591	R	XLCER 08 M22 FX-E	FX 2.2..	A149
		.500	.087	.591	R	XLCER 08 F22 FX-E	FX 2.2..	A149
		.563	.087	.591	R	XLCER 09 M22 FX-E	FX 2.2..	A149
		.625	.087	.591	R	XLCER 10 H22 FX-E	FX 2.2..	A149
		.625	.122	.689	R	XLCFR 10 H31 FX-E	FX 3.1..	A149
		.750	.122	.787	R	XLCFR 12 K31 FX-E	FX 3.1..	A149
		.750	.161	.787	R	XLCFR 12 K41 FX-E	FX 4.1..	A149
		1.000	.122	.984	R	XLCFR 64 M31 FX-E	FX 3.1..	A149
		1.000	.161	.984	R	XLCFR 64 M41 FX-E	FX 4.1..	A149
		.375	.087	.591	L	XLCEL 06 M22 FX-E	FX 2.2..	A149
		.500	.087	.591	L	XLCEL 08 F22 FX-E	FX 2.2..	A149
		.500	.087	.591	L	XLCEL 08 M22 FX-E	FX 2.2..	A149
		.563	.087	.591	L	XLCEL 09 M22 FX-E	FX 2.2..	A149
		.625	.087	.591	L	XLCEL 10 H22 FX-E	FX 2.2..	A149
		.625	.122	.689	L	XLCFL 10 H31 FX-E	FX 3.1..	A149
		.750	.122	.787	L	XLCFL 12 K31 FX-E	FX 3.1..	A149
		.750	.161	.787	L	XLCFL 12 K41 FX-E	FX 4.1..	A149
		1.000	.122	.984	L	XLCFL 64 M31 FX-E	FX 3.1..	A149
		1.000	.161	.984	L	XLCFL 64 M41 FX-E	FX 4.1..	A149



Grooving and turning – external

Modular system – external, assembly size 12



		h/d_A [inch]		Type, description
A158		.500	R	MSS-E12R00-08-E
	0			

		s/s_{min} [inch]	s/s_{max} [inch]	T_{max} [inch]		Type, description		
A162		.079	.108	.276	R	MSS-E12R07-GX09-1	GX09-1..	A142
		.109	.148	.276	R	MSS-E12R07-GX09-2	GX09-2..	A142

		h/d_A [inch]		Type, description
A158		.500	L	MSS-E12L00-08-E
	0			

		s/s_{min} [inch]	s/s_{max} [inch]	T_{max} [inch]		Type, description		
A162		.079	.108	.276	L	MSS-E12L07-GX09-1	GX09-1..	A142
		.109	.148	.276	L	MSS-E12L07-GX09-2	GX09-2..	A142

Grooving and turning – external

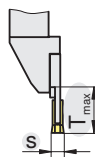
Modular system – external, assembly size 16



A79



Matching products see right-hand side.



		h/d_A [inch]		Type, description
A158		.625	R	MSS-E16R00-10-E

		s/s_{min} [inch]	s_{max} [inch]	T_{max} [inch]		Type, description		
A162		.079	.108	.276	R	MSS-E16R07-GX09-1	GX09-1..	A142
		.109	.148	.276	R	MSS-E16R07-GX09-2	GX09-2..	A142

		h/d_A [inch]		Type, description
A158		.625	L	MSS-E16L00-10-E

		s/s_{min} [inch]	s_{max} [inch]	T_{max} [inch]		Type, description		
A162		.079	.108	.276	L	MSS-E16L07-GX09-1	GX09-1..	A142
		.109	.148	.276	L	MSS-E16L07-GX09-2	GX09-2..	A142

Application

Tools and inserts for parting and grooving

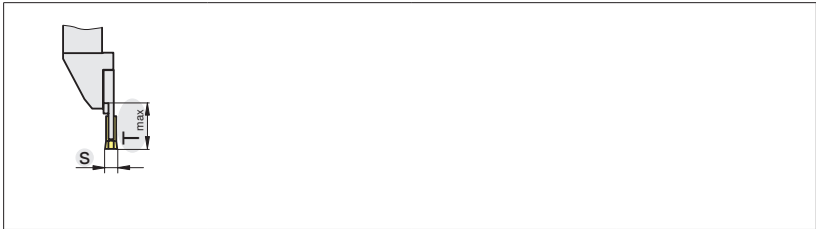


Grooving and turning – external

Modular system – external, assembly size 20



Matching products see right-hand side.



		h/d_A [inch]		Type, description
A158		.625	R	MSS-E20R00-10-E
		.750	R	MSS-E20R00-12-E
		0		
A159		.750	L	MSS-E20L90-12-E
		90		

		s/s_{min} [inch]	s_{max} [inch]	T_{max} [inch]		Type, description		
A163		.079	.108	.472	R	MSS-E20R12-GX16-1	GX16-1..	A142
		.109	.147	.472	R	MSS-E20R12-GX16-2	GX16-2..	A142
		.148	.197	.472	R	MSS-E20R12-GX16-3	GX16-3..	A142
A164		.079	.108	.827	R	MSS-E20R21-GX24-1	GX24-1..	A142
		.109	.147	.827	R	MSS-E20R21-GX24-2	GX24-2..	A142
		.148	.197	.827	R	MSS-E20R21-GX24-3	GX24-3..	A142
A170		.079		.787	R	MSS-E20R20-SX2	SX..2	A147
		.118		.787	R	MSS-E20R20-SX3	SX..3	A147

		h/d_A [inch]		Type, description
A158		.625	L	MSS-E20L00-10-E
		.750	L	MSS-E20L00-12-E
		0		
A159		.750	R	MSS-E20R90-12-E
		90		

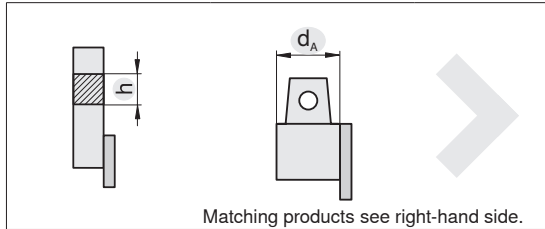
		s/s_{min} [inch]	s_{max} [inch]	T_{max} [inch]		Type, description		
A163		.079	.108	.472	L	MSS-E20L12-GX16-1	GX16-1..	A142
		.109	.147	.472	L	MSS-E20L12-GX16-2	GX16-2..	A142
		.148	.197	.472	L	MSS-E20L12-GX16-3	GX16-3..	A142
A164		.079	.108	.827	L	MSS-E20L21-GX24-1	GX24-1..	A142
		.109	.147	.827	L	MSS-E20L21-GX24-2	GX24-2..	A142
		.148	.197	.827	L	MSS-E20L21-GX24-3	GX24-3..	A142
A170		.079		.787	L	MSS-E20L20-SX2	SX..2	A147
		.118		.787	L	MSS-E20L20-SX3	SX..3	A147

Grooving and turning – external

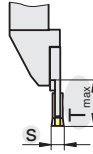
Modular system – external, assembly size 25



A81



Matching products see right-hand side.



		h/d_A [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description
A158		1.000	R	MSS-E25R00-16-E
A159		1.000	L	MSS-E25L90-16-E
A198		2.480 3.937	R R	HSK-T63-MSS-E25R00 HSK-T100-MSS-E25R00

		s/s_{min} [inch]	s_{max} [inch]	T_{max} [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description	
A163		.079 .109 .148 .198	.108 .147 .197 .256	.472 .472 .472 .472	R R R R	MSS-E25R12-GX16-1 MSS-E25R12-GX16-2 MSS-E25R12-GX16-3 MSS-E25R12-GX16-4	GX16-1.. A142 GX16-2.. A142 GX16-3.. A142 GX16-4.. A142
A164		.079 .109 .148 .198	.108 .147 .197 .256	.827 .827 .827 .827	R R R R	MSS-E25R21-GX24-1 MSS-E25R21-GX24-2 MSS-E25R21-GX24-3 MSS-E25R21-GX24-4	GX24-1.. A142 GX24-2.. A142 GX24-3.. A142 GX24-4.. A142
A170		.079 .118 .118 .157 .157		.787 1.378 .984 .984 1.378	R R R R R	MSS-E25R20-SX2 MSS-E25R35-SX3 MSS-E25R25-SX3 MSS-E25R25-SX4 MSS-E25R35-SX4	SX..2 A147 SX..3 A147 SX..3 A147 SX..4 A147 SX..4 A147

		h/d_A [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description
A158		1.000	L	MSS-E25L00-16-E
A159		1.000	R	MSS-E25R90-16-E
A198		3.937 2.480	L L	HSK-T100-MSS-E25L00 HSK-T63-MSS-E25L00

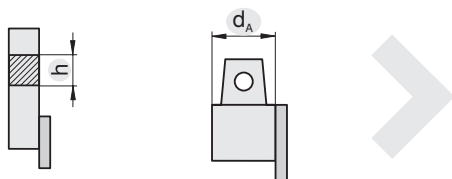
		s/s_{min} [inch]	s_{max} [inch]	T_{max} [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description	
A163		.079 .109 .148 .198	.108 .147 .197 .256	.472 .472 .472 .472	L L L L	MSS-E25L12-GX16-1 MSS-E25L12-GX16-2 MSS-E25L12-GX16-3 MSS-E25L12-GX16-4	GX16-1.. A142 GX16-2.. A142 GX16-3.. A142 GX16-4.. A142
A164		.079 .109 .148 .198	.108 .147 .197 .256	.827 .827 .827 .827	L L L L	MSS-E25L21-GX24-1 MSS-E25L21-GX24-2 MSS-E25L21-GX24-3 MSS-E25L21-GX24-4	GX24-1.. A142 GX24-2.. A142 GX24-3.. A142 GX24-4.. A142
A170		.079 .118 .118 .157 .157		.787 1.378 .984 .984 1.378	L L L L L	MSS-E25L20-SX2 MSS-E25L35-SX3 MSS-E25L25-SX3 MSS-E25L25-SX4 MSS-E25L35-SX4	SX..2 A147 SX..3 A147 SX..3 A147 SX..4 A147 SX..4 A147

Application

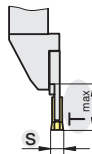
Tools and inserts for parting and grooving

Grooving and turning – external

Modular system – external, assembly size 32

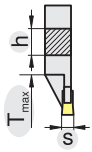


Matching products see right-hand side.



		h/d_A [inch]		Type, description		s/s_{min} [inch]	s/s_{max} [inch]	T_{max} [inch]		Type, description		
A158		1.250	R	MSS-E32R00-20-E		.109	.147	.472	R	MSS-E32R12-GX16-2	GX16-2..	A142
		1.250	R	MSS-E32R00-85-E		.148	.197	.472	R	MSS-E32R12-GX16-3	GX16-3..	A142
						.198	.256	.472	R	MSS-E32R12-GX16-4	GX16-4..	A142
A159		1.250	L	MSS-E32L90-20-E		.109	.147	.827	R	MSS-E32R21-GX24-2	GX24-2..	A142
		1.250	L	MSS-E32L90-85-E		.148	.197	.827	R	MSS-E32R21-GX24-3	GX24-3..	A142
						.198	.256	.827	R	MSS-E32R21-GX24-4	GX24-4..	A142
A198		3.937	R	HSK-T100-MSS-E32R00		.118		1.378	R	MSS-E32R35-SX3	SX..3	A147
		2.480	R	HSK-T63-MSS-E32R00		.157		1.378	R	MSS-E32R35-SX4	SX..4	A147
A199		3.937	L	HSK-T100-MSS-E32L90		.315	.394	1.772	N	MSS-E32N45-LX	LX..	A148
		2.480	L	HSK-T63-MSS-E32L90		.315	.394	1.260	N	MSS-E32N32-LX	LX..	A148
						.315	.394	.984	N	MSS-E32N25-LX	LX..	A148

		h/d_A [inch]		Type, description		s/s_{min} [inch]	s/s_{max} [inch]	T_{max} [inch]		Type, description		
A158		1.250	L	MSS-E32L00-85-E		.109	.147	.472	L	MSS-E32L12-GX16-2	GX16-2..	A142
		1.250	L	MSS-E32L00-20-E		.148	.197	.472	L	MSS-E32L12-GX16-3	GX16-3..	A142
						.198	.256	.472	L	MSS-E32L12-GX16-4	GX16-4..	A142
A159		1.250	R	MSS-E32R90-85-E		.109	.147	.827	L	MSS-E32L21-GX24-2	GX24-2..	A142
		1.250	R	MSS-E32R90-20-E		.148	.197	.827	L	MSS-E32L21-GX24-3	GX24-3..	A142
						.198	.256	.827	L	MSS-E32L21-GX24-4	GX24-4..	A142
A198		2.480	L	HSK-T63-MSS-E32L00		.118		1.378	L	MSS-E32L35-SX3	SX..3	A147
		3.937	L	HSK-T100-MSS-E32L00		.157		1.378	L	MSS-E32L35-SX4	SX..4	A147
A199		2.480	R	HSK-T63-MSS-E32R90		.315	.394	1.772	N	MSS-E32N45-LX	LX..	A148
		3.937	R	HSK-T100-MSS-E32R90		.315	.394	1.260	N	MSS-E32N32-LX	LX..	A148
						.315	.394	.984	N	MSS-E32N25-LX	LX..	A148



		h [inch]	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]		Type, description		
A174		.375	.024	.147	.276	R	E10R00-06-GX09-E	GX09..	A142
		.375	.024	.147	.276	L	E10L00-06-GX09-E	GX09..	A142

		h [inch]	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]		Type, description		
A175		.625	.109	.147	.827	R	E16R0021-10C-GX24-2-E	GX24-2..	A142
		.750	.109	.147	.827	R	E20R0021-12C-GX24-2-E	GX24-2..	A142
		.750	.148	.197	.827	R	E20R0021-12C-GX24-3-E	GX24-3..	A142
		1.000	.109	.147	.827	R	E25R0021-16D-GX24-2-E	GX24-2..	A142
		1.000	.148	.197	.827	R	E25R0021-16D-GX24-3-E	GX24-3..	A142
		1.000	.198	.256	.827	R	E25R0021-16D-GX24-4-E	GX24-4..	A142
		1.250	.109	.147	.827	R	E32R0021-85D-GX24-2-E	GX24-2..	A142
		1.250	.148	.197	.827	R	E32R0021-85D-GX24-3-E	GX24-3..	A142
		1.250	.198	.256	.827	R	E32R0021-85D-GX24-4-E	GX24-4..	A142
		.625	.109	.147	.827	L	E16L0021-10C-GX24-2-E	GX24-2..	A142
		.750	.109	.147	.827	L	E20L0021-12C-GX24-2-E	GX24-2..	A142
		.750	.148	.197	.827	L	E20L0021-12C-GX24-3-E	GX24-3..	A142
		1.000	.109	.147	.827	L	E25L0021-16D-GX24-2-E	GX24-2..	A142
		1.000	.148	.197	.827	L	E25L0021-16D-GX24-3-E	GX24-3..	A142
		1.000	.198	.256	.827	L	E25L0021-16D-GX24-4-E	GX24-4..	A142
		1.250	.109	.147	.827	L	E32L0021-85D-GX24-2-E	GX24-2..	A142
		1.250	.148	.197	.827	L	E32L0021-85D-GX24-3-E	GX24-3..	A142
		1.250	.198	.256	.827	L	E32L0021-85D-GX24-4-E	GX24-4..	A142

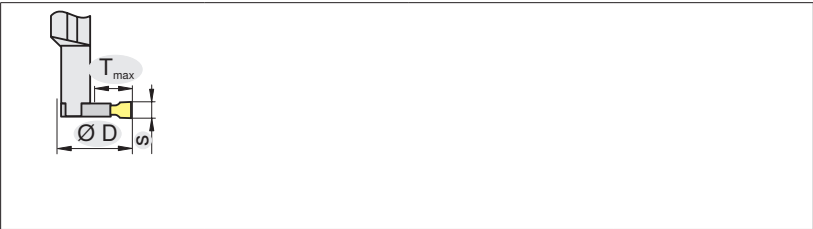


Grooving and turning – internal

Modular system – internal, assembly size 16



Matching products see right-hand side.



		d_A [inch]		Type, description
A185		.750	R	MSS-I16R90-1.5D-E
A186		.750	R	MSS-I16R90-2.5D-E

		D_{min} [inch]	s_{min} [inch]	s_{max} [inch]	T_{max} [inch]		Type, description		
A187		.787	.079	.108	.157	L	MSS-I16L04-GX09-1	GX09-1..	A142
		.787	.109	.147	.157	L	MSS-I16L04-GX09-2	GX09-2..	A142

		d_A [inch]		Type, description
A185		.750	L	MSS-I16L90-1.5D-E
A186		.750	L	MSS-I16L90-2.5D-E

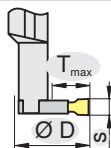
		D_{min} [inch]	s_{min} [inch]	s_{max} [inch]	T_{max} [inch]		Type, description		
A187		.787	.079	.108	.157	R	MSS-I16R04-GX09-1	GX09-1..	A142
		.787	.109	.147	.157	R	MSS-I16R04-GX09-2	GX09-2..	A142

Grooving and turning – internal

Modular system – internal, assembly size 20



A85



		d_A [inch]		Type, description
A185		.750	R	MSS-I20R90-1.5D-E
		1.5D		
A186		1.000	R	MSS-I20R90-2.5D-E
		2.5D		

		D_{min} [inch]	s_{min} [inch]	s_{max} [inch]	T_{max} [inch]		Type, description		
A187		.984	.079	.108	.197	L	MSS-I20L05-GX09-1	GX09-1..	A142
		.984	.109	.147	.197	L	MSS-I20L05-GX09-2	GX09-2..	A142

		d_A [inch]		Type, description
A185		.750	L	MSS-I20L90-1.5D-E
		1.5D		
A186		1.000	L	MSS-I20L90-2.5D-E
		2.5D		

		D_{min} [inch]	s_{min} [inch]	s_{max} [inch]	T_{max} [inch]		Type, description		
A187		.984	.079	.108	.197	R	MSS-I20R05-GX09-1	GX09-1..	A142
		.984	.109	.147	.197	R	MSS-I20R05-GX09-2	GX09-2..	A142

Application

Tools and inserts for parting and grooving

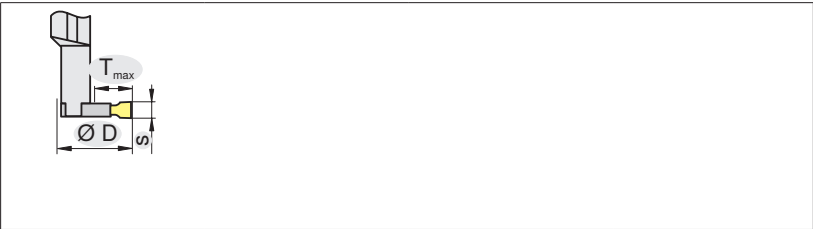


Grooving and turning – internal

Modular system – internal, assembly size 25



Matching products see right-hand side.

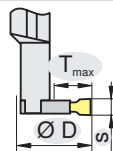


		d_A [inch]		Type, description
A185	 1.5D	1.000	R	MSS-I25R90-1.5D-E
A186	 2.5D	1.250	R	MSS-I25R90-2.5D-E

		D_{min} [inch]	s_{min} [inch]	s_{max} [inch]	T_{max} [inch]		Type, description		
A187		1.260	.079	.108	.236	L	MSS-I25L06-GX09-1	GX09-1..	A142
		1.260	.109	.147	.236	L	MSS-I25L06-GX09-2	GX09-2..	A142

		d_A [inch]		Type, description
A185	 1.5D	1.000	L	MSS-I25L90-1.5D-E
A186	 2.5D	1.250	L	MSS-I25L90-2.5D-E

		D_{min} [inch]	s_{min} [inch]	s_{max} [inch]	T_{max} [inch]		Type, description		
A187		1.260	.079	.108	.236	R	MSS-I25R06-GX09-1	GX09-1..	A142
		1.260	.109	.147	.236	R	MSS-I25R06-GX09-2	GX09-2..	A142



		d _A [inch]	L R	Type, description
A185		1.250	R	MSS-I32R90-1.5D-E
		1.500	R	MSS-I32R90-2.5D-E

		D _{min} [inch]	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	L R	Type, description		
A188		1.575	.079	.108	.354	L	MSS-I32L09-GX16-1	GX16-1..	A142
		1.575	.109	.147	.354	L	MSS-I32L09-GX16-2	GX16-2..	A142
		1.575	.148	.197	.354	L	MSS-I32L09-GX16-3	GX16-3..	A142
		1.575	.198	.256	.354	L	MSS-I32L09-GX16-4	GX16-4..	A142

		d _A [inch]	L R	Type, description
A185		1.250	L	MSS-I32L90-1.5D-E
		1.500	L	MSS-I32L90-2.5D-E

		D _{min} [inch]	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	L R	Type, description		
A188		1.575	.079	.108	.354	R	MSS-I32R09-GX16-1	GX16-1..	A142
		1.575	.109	.147	.354	R	MSS-I32R09-GX16-2	GX16-2..	A142
		1.575	.148	.197	.354	R	MSS-I32R09-GX16-3	GX16-3..	A142
		1.575	.198	.256	.354	R	MSS-I32R09-GX16-4	GX16-4..	A142

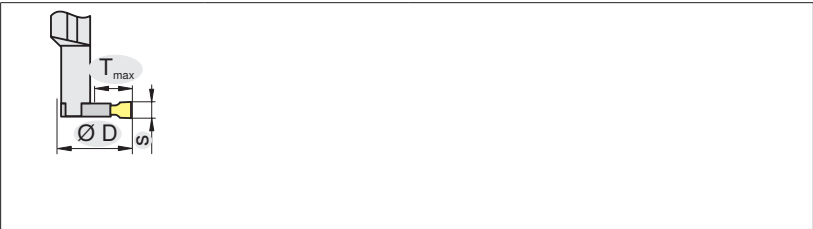


Grooving and turning – internal

Modular system – internal, assembly size 40



Matching products see right-hand side.

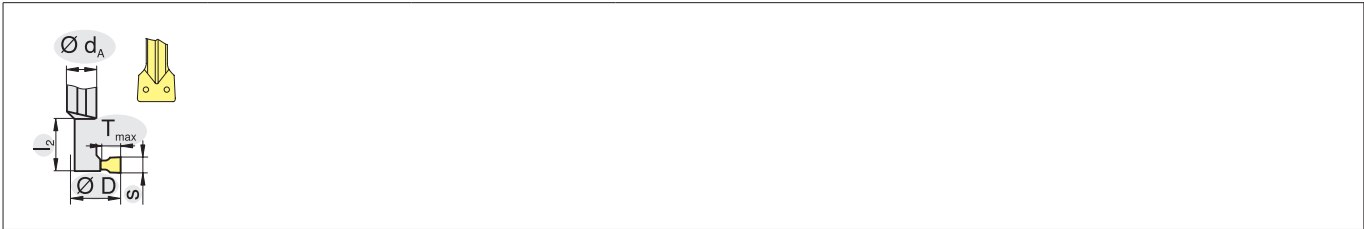


		d _A [inch]		Type, description
A185	 1.5D	1.500	R	MSS-I40R90-1.5D-E
A186	 2.5D	2.000	R	MSS-I40R90-2.5D-E

		D _{min} [inch]	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]		Type, description		
A188		1.969	.079	.108	.394	L	MSS-I40L10-GX16-1	GX16-1..	A142
		1.969	.109	.147	.394	L	MSS-I40L10-GX16-2	GX16-2..	A142
		1.969	.148	.197	.394	L	MSS-I40L10-GX16-3	GX16-3..	A142
		1.969	.198	.256	.394	L	MSS-I40L10-GX16-4	GX16-4..	A142
A189		2.362	.109	.147	.748	N	MSS-I40N19-GX24-2	GX24-2..	A142
		2.362	.148	.197	.748	N	MSS-I40N19-GX24-3	GX24-3..	A142
		2.362	.198	.256	.748	N	MSS-I40N19-GX24-4	GX24-4..	A142

		d _A [inch]		Type, description
A185	 1.5D	1.500	L	MSS-I40L90-1.5D-E
A186	 2.5D	2.000	L	MSS-I40L90-2.5D-E

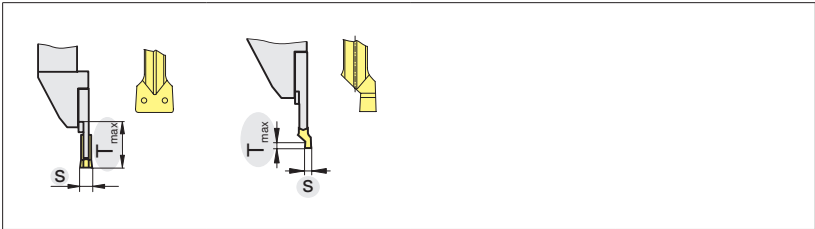
		D _{min} [inch]	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]		Type, description		
A188		1.969	.079	.108	.394	R	MSS-I40R10-GX16-1	GX16-1..	A142
		1.969	.148	.197	.394	R	MSS-I40R10-GX16-3	GX16-3..	A142
		1.969	.109	.147	.394	R	MSS-I40R10-GX16-2	GX16-2..	A142
		1.969	.198	.256	.394	R	MSS-I40R10-GX16-4	GX16-4..	A142
A189		2.362	.109	.147	.748	N	MSS-I40N19-GX24-2	GX24-2..	A142
		2.362	.198	.256	.748	N	MSS-I40N19-GX24-4	GX24-4..	A142
		2.362	.148	.197	.748	N	MSS-I40N19-GX24-3	GX24-3..	A142



		d _A [inch]	l ₂ [inch]	D _{min} [inch]	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]		Type, description		
A192		.625	1.181	.63	.024	.148	.118	R	I12R90-2.5D-GX09-E	GX09..	A142
		.625	1.181	.63	.024	.148	.118	L	I12L90-2.5D-GX09-E	GX09..	A142



Circlip grooving – external
Modular system – external, assembly size 12



		h/d_A [inch]		Type, description
A158		.500	R	MSS-E12R00-08-E
	0			

		s [inch]	T_{max} [inch]		Type, description		
A162		.077	.276	R	MSS-E12R07-GX09-1	GX09-1..	A144
		.089	.276	R	MSS-E12R07-GX09-1	GX09-1..	A144
		.108	.276	R	MSS-E12R07-GX09-2	GX09-2..	A144
		.128	.276	R	MSS-E12R07-GX09-2	GX09-2..	A144
A165		.024	.030	R	MSS-E12R02-GX09-1	GX09-1..R/L	A144
		.031	.037	R	MSS-E12R02-GX09-1	GX09-1..R/L	A144
		.035	.041	R	MSS-E12R02-GX09-1	GX09-1..R/L	A144
		.039	.045	R	MSS-E12R02-GX09-1	GX09-1..R/L	A144
		.047	.053	R	MSS-E12R02-GX09-1	GX09-1..R/L	A144
		.055	.060	R	MSS-E12R02-GX09-1	GX09-1..R/L	A144
		.067	.072	R	MSS-E12R02-GX09-1	GX09-1..R/L	A144

		h/d_A [inch]		Type, description
A158		.500	L	MSS-E12L00-08-E
	0			

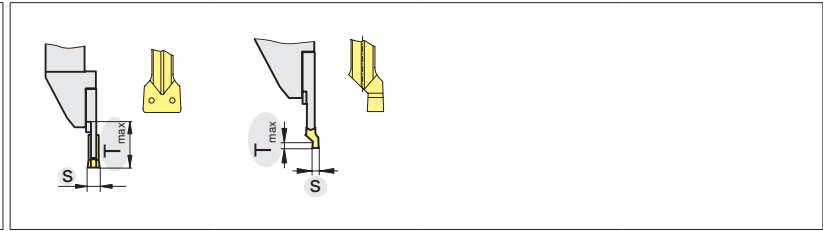
		s [inch]	T_{max} [inch]		Type, description		
A162		.077	.276	L	MSS-E12L07-GX09-1	GX09-1..	A144
		.089	.276	L	MSS-E12L07-GX09-1	GX09-1..	A144
		.108	.276	L	MSS-E12L07-GX09-2	GX09-2..	A144
		.128	.276	L	MSS-E12L07-GX09-2	GX09-2..	A144
A165		.024	.030	L	MSS-E12L02-GX09-1	GX09-1..R/L	A144
		.031	.037	L	MSS-E12L02-GX09-1	GX09-1..R/L	A144
		.035	.041	L	MSS-E12L02-GX09-1	GX09-1..R/L	A144
		.039	.045	L	MSS-E12L02-GX09-1	GX09-1..R/L	A144
		.047	.053	L	MSS-E12L02-GX09-1	GX09-1..R/L	A144
		.055	.060	L	MSS-E12L02-GX09-1	GX09-1..R/L	A144
		.067	.072	L	MSS-E12L02-GX09-1	GX09-1..R/L	A144

Circlip grooving – external

Modular system – external, assembly size 16



A91



		h/d_A [inch]		Type, description
A158		.625	R	MSS-E16R00-10-E

		s [inch]	T _{max} [inch]	L R	Type, description		
A162		.077	.276	R	MSS-E16R07-GX09-1	GX09-1..	A144
		.089	.276	R	MSS-E16R07-GX09-1	GX09-1..	A144
		.108	.276	R	MSS-E16R07-GX09-2	GX09-2..	A144
		.128	.276	R	MSS-E16R07-GX09-2	GX09-2..	A144
A165		.024	.030	R	MSS-E16R02-GX09-1	GX09-1..R/L	A144
		.031	.037	R	MSS-E16R02-GX09-1	GX09-1..R/L	A144
		.035	.041	R	MSS-E16R02-GX09-1	GX09-1..R/L	A144
		.039	.045	R	MSS-E16R02-GX09-1	GX09-1..R/L	A144
		.047	.053	R	MSS-E16R02-GX09-1	GX09-1..R/L	A144
		.055	.060	R	MSS-E16R02-GX09-1	GX09-1..R/L	A144
		.067	.072	R	MSS-E16R02-GX09-1	GX09-1..R/L	A144

		h/d_A [inch]		Type, description
A158		.625	L	MSS-E16L00-10-E

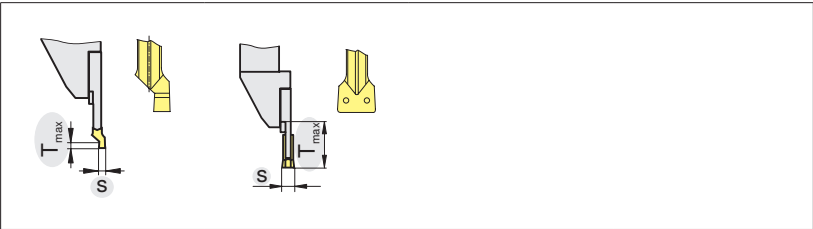
		s [inch]	T _{max} [inch]		Type, description	
A162		.077	.276	L	MSS-E16L07-GX09-1	GX09-1.. A144
		.089	.276	L	MSS-E16L07-GX09-1	GX09-1.. A144
		.108	.276	L	MSS-E16L07-GX09-2	GX09-2.. A144
		.128	.276	L	MSS-E16L07-GX09-2	GX09-2.. A144
A165		.024	.030	L	MSS-E16L02-GX09-1	GX09-1..R/L A144
		.031	.037	L	MSS-E16L02-GX09-1	GX09-1..R/L A144
		.035	.041	L	MSS-E16L02-GX09-1	GX09-1..R/L A144
		.039	.045	L	MSS-E16L02-GX09-1	GX09-1..R/L A144
		.047	.053	L	MSS-E16L02-GX09-1	GX09-1..R/L A144
		.055	.060	L	MSS-E16L02-GX09-1	GX09-1..R/L A144
		.067	.072	L	MSS-E16L02-GX09-1	GX09-1..R/L A144

Application

Tools and inserts for parting and grooving



Circlip grooving – external
Modular system – external, assembly size 20



		h/d_A [inch]		Type, description
A158		.625	R	MSS-E20R00-10-E
		.750	R	MSS-E20R00-12-E
		0		
A159		.750	L	MSS-E20L90-12-E
		90		

		s [inch]	T_{max} [inch]		Type, description		
A163		.108	.472	R	MSS-E20R12-GX16-2	GX16-2..	A144
		.128	.472	R	MSS-E20R12-GX16-2	GX16-2..	A144
		.167	.472	R	MSS-E20R12-GX16-3	GX16-3..	A144
A166		.024	.030	R	MSS-E20R03-GX16-2	GX16-2..R/L	A144
		.031	.037	R	MSS-E20R03-GX16-2	GX16-2..R/L	A144
		.035	.041	R	MSS-E20R03-GX16-2	GX16-2..R/L	A144
		.039	.045	R	MSS-E20R03-GX16-2	GX16-2..R/L	A144
		.047	.053	R	MSS-E20R03-GX16-2	GX16-2..R/L	A144
		.055	.060	R	MSS-E20R03-GX16-2	GX16-2..R/L	A144
		.067	.072	R	MSS-E20R03-GX16-2	GX16-2..R/L	A144
		.077	.081	R	MSS-E20R03-GX16-2	GX16-2..R/L	A144
		.089	.093	R	MSS-E20R03-GX16-2	GX16-2..R/L	A144

		h/d_A [inch]		Type, description
A158		.625	L	MSS-E20L00-10-E
		.750	L	MSS-E20L00-12-E
		0		
A159		.750	R	MSS-E20R90-12-E
		90		

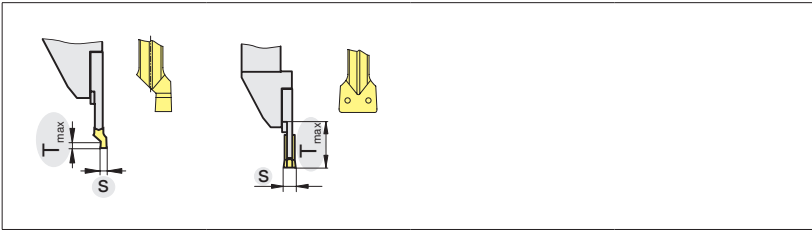
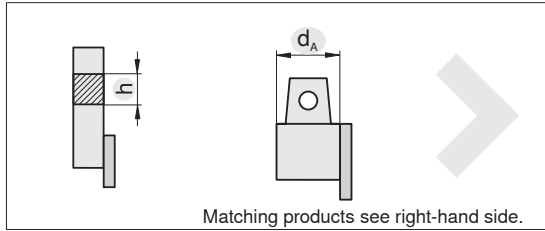
		s [inch]	T_{max} [inch]		Type, description		
A163		.108	.472	L	MSS-E20L12-GX16-2	GX16-2..	A144
		.128	.472	L	MSS-E20L12-GX16-2	GX16-2..	A144
		.167	.472	L	MSS-E20L12-GX16-3	GX16-3..	A144
A166		.024	.030	L	MSS-E20L03-GX16-2	GX16-2..R/L	A144
		.031	.037	L	MSS-E20L03-GX16-2	GX16-2..R/L	A144
		.035	.041	L	MSS-E20L03-GX16-2	GX16-2..R/L	A144
		.039	.045	L	MSS-E20L03-GX16-2	GX16-2..R/L	A144
		.047	.053	L	MSS-E20L03-GX16-2	GX16-2..R/L	A144
		.055	.060	L	MSS-E20L03-GX16-2	GX16-2..R/L	A144
		.067	.072	L	MSS-E20L03-GX16-2	GX16-2..R/L	A144
		.077	.081	L	MSS-E20L03-GX16-2	GX16-2..R/L	A144
		.089	.093	L	MSS-E20L03-GX16-2	GX16-2..R/L	A144

Circlip grooving – external

Modular system – external, assembly size 25



A93



		h/d_A [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description
A158		1.000	R	MSS-E25R00-16-E
A159		1.000	L	MSS-E25L90-16-E
A198		2.480 3.937	R R	HSK-T63-MSS-E25R00 HSK-T100-MSS-E25R00

	s [inch]	T_{max} [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description	
A163	.108 .128 .167 .207	.472 .472 .472 .472	R R R R	MSS-E25R12-GX16-2 MSS-E25R12-GX16-2 MSS-E25R12-GX16-3 MSS-E25R12-GX16-4	GX16-2.. A144 GX16-2.. A144 GX16-3.. A144 GX16-4.. A144
A166	.024 .031 .035 .039 .047 .055 .067 .077 .089	.030 .037 .041 .045 .053 .060 .072 .081 .093	R R R R R R R R R	MSS-E25R03-GX16-2 MSS-E25R03-GX16-2 MSS-E25R03-GX16-2 MSS-E25R03-GX16-2 MSS-E25R03-GX16-2 MSS-E25R03-GX16-2 MSS-E25R03-GX16-2 MSS-E25R03-GX16-2 MSS-E25R03-GX16-2	GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144

		h/d_A [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description
A158		1.000	L	MSS-E25L00-16-E
A159		1.000	R	MSS-E25R90-16-E
A198		3.937 2.480	L L	HSK-T100-MSS-E25L00 HSK-T63-MSS-E25L00

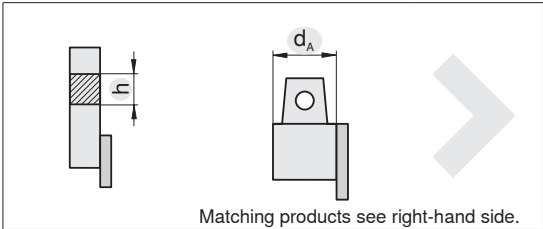
	s [inch]	T_{max} [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description	
A163	.108 .128 .167 .207	.472 .472 .472 .472	L L L L	MSS-E25L12-GX16-2 MSS-E25L12-GX16-2 MSS-E25L12-GX16-3 MSS-E25L12-GX16-4	GX16-2.. A144 GX16-2.. A144 GX16-3.. A144 GX16-4.. A144
A166	.024 .031 .035 .039 .047 .055 .067 .077 .089	.030 .037 .041 .045 .053 .060 .072 .081 .093	L L L L L L L L L	MSS-E25L03-GX16-2 MSS-E25L03-GX16-2 MSS-E25L03-GX16-2 MSS-E25L03-GX16-2 MSS-E25L03-GX16-2 MSS-E25L03-GX16-2 MSS-E25L03-GX16-2 MSS-E25L03-GX16-2 MSS-E25L03-GX16-2	GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144 GX16-2..R/L A144

Application

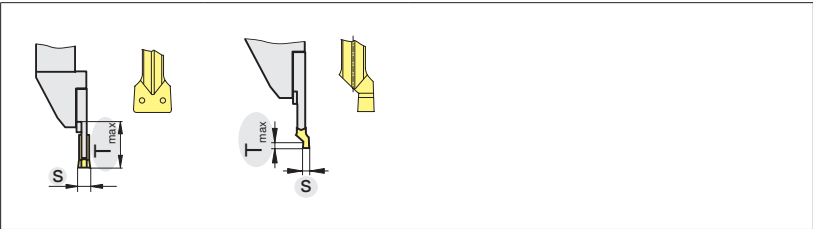
Tools and inserts for parting and grooving



Circlip grooving – external
Modular system – external, assembly size 32



Matching products see right-hand side.

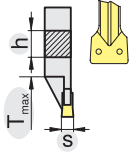


		h/d_A [inch]		Type, description
A158		1.250	R	MSS-E32R00-20-E
		1.250	R	MSS-E32R00-85-E
A159		1.250	L	MSS-E32L90-20-E
		1.250	L	MSS-E32L90-85-E
A198		3.937	R	HSK-T100-MSS-E32R00
		2.480	R	HSK-T63-MSS-E32R00
A199		3.937	L	HSK-T100-MSS-E32L90
		2.480	L	HSK-T63-MSS-E32L90

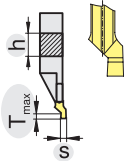
	s [inch]	T_{max} [inch]		Type, description		
A163	.108	.472	R	MSS-E32R12-GX16-2	GX16-2..	A144
	.128	.472	R	MSS-E32R12-GX16-2	GX16-2..	A144
	.167	.472	R	MSS-E32R12-GX16-3	GX16-3..	A144
	.207	.472	R	MSS-E32R12-GX16-4	GX16-4..	A144
A166	.024	.030	R	MSS-E32R03-GX16-2	GX16-2..R/L	A144
	.031	.037	R	MSS-E32R03-GX16-2	GX16-2..R/L	A144
	.035	.041	R	MSS-E32R03-GX16-2	GX16-2..R/L	A144
	.039	.045	R	MSS-E32R03-GX16-2	GX16-2..R/L	A144
	.047	.053	R	MSS-E32R03-GX16-2	GX16-2..R/L	A144
	.055	.060	R	MSS-E32R03-GX16-2	GX16-2..R/L	A144
	.067	.072	R	MSS-E32R03-GX16-2	GX16-2..R/L	A144
	.077	.081	R	MSS-E32R03-GX16-2	GX16-2..R/L	A144
	.089	.093	R	MSS-E32R03-GX16-2	GX16-2..R/L	A144
			R	MSS-E32R03-GX16-2	GX16-2..R/L	A144

		h/d_A [inch]		Type, description
A158		1.250	L	MSS-E32L00-85-E
		1.250	L	MSS-E32L00-20-E
A159		1.250	R	MSS-E32R90-85-E
		1.250	R	MSS-E32R90-20-E
A198		2.480	L	HSK-T63-MSS-E32L00
		3.937	L	HSK-T100-MSS-E32L00
A199		2.480	R	HSK-T63-MSS-E32R90
		3.937	R	HSK-T100-MSS-E32R90

	s [inch]	T_{max} [inch]		Type, description		
A163	.108	.472	L	MSS-E32L12-GX16-2	GX16-2..	A144
	.128	.472	L	MSS-E32L12-GX16-2	GX16-2..	A144
	.167	.472	L	MSS-E32L12-GX16-3	GX16-3..	A144
	.207	.472	L	MSS-E32L12-GX16-4	GX16-4..	A144
A166	.024	.030	L	MSS-E32L03-GX16-2	GX16-2..R/L	A144
	.031	.037	L	MSS-E32L03-GX16-2	GX16-2..R/L	A144
	.035	.041	L	MSS-E32L03-GX16-2	GX16-2..R/L	A144
	.039	.045	L	MSS-E32L03-GX16-2	GX16-2..R/L	A144
	.047	.053	L	MSS-E32L03-GX16-2	GX16-2..R/L	A144
	.055	.060	L	MSS-E32L03-GX16-2	GX16-2..R/L	A144
	.067	.072	L	MSS-E32L03-GX16-2	GX16-2..R/L	A144
	.077	.081	L	MSS-E32L03-GX16-2	GX16-2..R/L	A144
	.089	.093	L	MSS-E32L03-GX16-2	GX16-2..R/L	A144
			L	MSS-E32L03-GX16-2	GX16-2..R/L	A144



		h [inch]	s [inch]	T _{max} [inch]		Type, description		
A174		.375	.077	.276	R	E10R00-06-GX09-E	GX09..	A144
		.375	.089	.276	R	E10R00-06-GX09-E	GX09..	A144
		.375	.108	.276	R	E10R00-06-GX09-E	GX09..	A144
		.375	.128	.276	R	E10R00-06-GX09-E	GX09..	A144
		.375	.077	.276	L	E10L00-06-GX09-E	GX09..	A144
		.375	.089	.276	L	E10L00-06-GX09-E	GX09..	A144
		.375	.108	.276	L	E10L00-06-GX09-E	GX09..	A144
		.375	.128	.276	L	E10L00-06-GX09-E	GX09..	A144



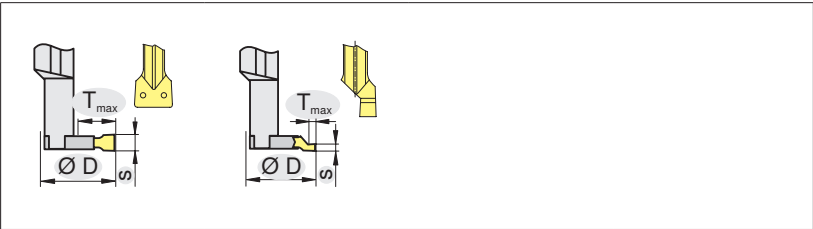
		h [inch]	s [inch]	T _{max} [inch]		Type, description		
A174		.375	.024	.030	R	E10R00-06-GX09-E	GX09-1..R/L	A144
		.375	.031	.037	R	E10R00-06-GX09-E	GX09-1..R/L	A144
		.375	.035	.041	R	E10R00-06-GX09-E	GX09-1..R/L	A144
		.375	.039	.045	R	E10R00-06-GX09-E	GX09-1..R/L	A144
		.375	.047	.053	R	E10R00-06-GX09-E	GX09-1..R/L	A144
		.375	.055	.060	R	E10R00-06-GX09-E	GX09-1..R/L	A144
		.375	.067	.072	R	E10R00-06-GX09-E	GX09-1..R/L	A144
		.375	.024	.030	L	E10L00-06-GX09-E	GX09-1..R/L	A144
		.375	.031	.037	L	E10L00-06-GX09-E	GX09-1..R/L	A144
		.375	.035	.041	L	E10L00-06-GX09-E	GX09-1..R/L	A144
		.375	.039	.045	L	E10L00-06-GX09-E	GX09-1..R/L	A144
		.375	.047	.053	L	E10L00-06-GX09-E	GX09-1..R/L	A144
		.375	.055	.060	L	E10L00-06-GX09-E	GX09-1..R/L	A144
		.375	.067	.072	L	E10L00-06-GX09-E	GX09-1..R/L	A144



Circlip grooving – internal
Modular system – internal, assembly size 16



Matching products see right-hand side.



		d_A [inch]		Type, description
A185		.750	R	MSS-I16R90-1.5D-E
A186		.750	R	MSS-I16R90-2.5D-E

		D_{min} [inch]	s [inch]	T_{max} [inch]		Type, description		
A187		.787	.128	.157	L	MSS-I16L04-GX09-2	GX09-2..	A144
		.787	.108	.157	L	MSS-I16L04-GX09-2	GX09-2..	A144
		.787	.089	.157	L	MSS-I16L04-GX09-1	GX09-1..	A144
		.787	.077	.157	L	MSS-I16L04-GX09-1	GX09-1..	A144
A190		.787	.055	.060	L	MSS-I16L02-GX09-1	GX09-1..R/L	A144
		.787	.024	.030	L	MSS-I16L02-GX09-1	GX09-1..R/L	A144
		.787	.047	.053	L	MSS-I16L02-GX09-1	GX09-1..R/L	A144
		.787	.039	.045	L	MSS-I16L02-GX09-1	GX09-1..R/L	A144
		.787	.035	.041	L	MSS-I16L02-GX09-1	GX09-1..R/L	A144
		.787	.031	.037	L	MSS-I16L02-GX09-1	GX09-1..R/L	A144
		.787	.067	.072	L	MSS-I16L02-GX09-1	GX09-1..R/L	A144
		.787	.067	.072	L	MSS-I16L02-GX09-1	GX09-1..R/L	A144

		d_A [inch]		Type, description
A185		.750	L	MSS-I16L90-1.5D-E
A186		.750	L	MSS-I16L90-2.5D-E

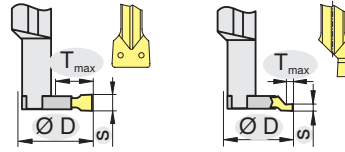
		D_{min} [inch]	s [inch]	T_{max} [inch]		Type, description		
A187		.787	.108	.157	R	MSS-I16R04-GX09-2	GX09-2..	A144
		.787	.089	.157	R	MSS-I16R04-GX09-1	GX09-1..	A144
		.787	.077	.157	R	MSS-I16R04-GX09-1	GX09-1..	A144
		.787	.128	.157	R	MSS-I16R04-GX09-2	GX09-2..	A144
A190		.787	.047	.053	R	MSS-I16R02-GX09-1	GX09-1..R/L	A144
		.787	.067	.072	R	MSS-I16R02-GX09-1	GX09-1..R/L	A144
		.787	.039	.045	R	MSS-I16R02-GX09-1	GX09-1..R/L	A144
		.787	.035	.041	R	MSS-I16R02-GX09-1	GX09-1..R/L	A144
		.787	.031	.037	R	MSS-I16R02-GX09-1	GX09-1..R/L	A144
		.787	.024	.030	R	MSS-I16R02-GX09-1	GX09-1..R/L	A144
		.787	.055	.060	R	MSS-I16R02-GX09-1	GX09-1..R/L	A144
		.787	.055	.060	R	MSS-I16R02-GX09-1	GX09-1..R/L	A144

Circlip grooving – internal

Modular system – external, assembly size 20



A97



		d_A [inch]		Type, description
A185	 1.5D	.750	R	MSS-I20R90-1.5D-E
A186	 2.5D	1.000	R	MSS-I20R90-2.5D-E

		D_{min} [inch]	s [inch]	T_{max} [inch]		Type, description		
A187		.984	.108	.197	L	MSS-I20L05-GX09-2	GX09-2..	A144
		.984	.089	.197	L	MSS-I20L05-GX09-1	GX09-1..	A144
		.984	.077	.197	L	MSS-I20L05-GX09-1	GX09-1..	A144
		.984	.128	.197	L	MSS-I20L05-GX09-2	GX09-2..	A144
A190		.984	.047	.053	L	MSS-I20L02-GX09-1	GX09-1..R/L	A144
		.984	.067	.072	L	MSS-I20L02-GX09-1	GX09-1..R/L	A144
		.984	.039	.045	L	MSS-I20L02-GX09-1	GX09-1..R/L	A144
		.984	.035	.041	L	MSS-I20L02-GX09-1	GX09-1..R/L	A144
		.984	.031	.037	L	MSS-I20L02-GX09-1	GX09-1..R/L	A144
		.984	.024	.030	L	MSS-I20L02-GX09-1	GX09-1..R/L	A144
		.984	.055	.060	L	MSS-I20L02-GX09-1	GX09-1..R/L	A144

		d_A [inch]		Type, description
A185	 1.5D	.750	L	MSS-I20L90-1.5D-E
A186	 2.5D	1.000	L	MSS-I20L90-2.5D-E

		D_{min} [inch]	s [inch]	T_{max} [inch]		Type, description		
A187		.984	.108	.197	R	MSS-I20R05-GX09-2	GX09-2..	A144
		.984	.089	.197	R	MSS-I20R05-GX09-1	GX09-1..	A144
		.984	.077	.197	R	MSS-I20R05-GX09-1	GX09-1..	A144
		.984	.128	.197	R	MSS-I20R05-GX09-2	GX09-2..	A144
A190		.984	.047	.053	R	MSS-I20R02-GX09-1	GX09-1..R/L	A144
		.984	.067	.072	R	MSS-I20R02-GX09-1	GX09-1..R/L	A144
		.984	.039	.045	R	MSS-I20R02-GX09-1	GX09-1..R/L	A144
		.984	.035	.041	R	MSS-I20R02-GX09-1	GX09-1..R/L	A144
		.984	.031	.037	R	MSS-I20R02-GX09-1	GX09-1..R/L	A144
		.984	.024	.030	R	MSS-I20R02-GX09-1	GX09-1..R/L	A144
		.984	.055	.060	R	MSS-I20R02-GX09-1	GX09-1..R/L	A144

Application

Tools and inserts for parting and grooving

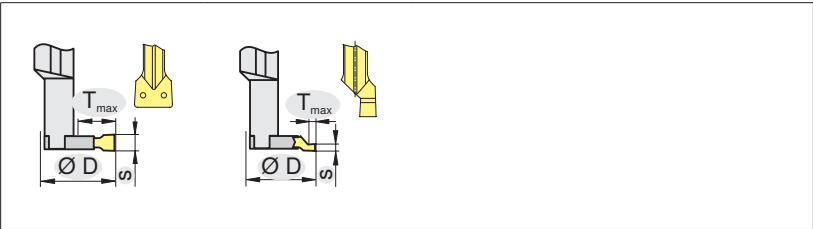


Circlip grooving – internal

Modular system – internal, assembly size 25



Matching products see right-hand side.



		d_A [inch]		Type, description
A185	 1.5D	1.000	R	MSS-I25R90-1.5D-E
A186	 2.5D	1.250	R	MSS-I25R90-2.5D-E

		D_{min} [inch]	s [inch]	T_{max} [inch]		Type, description		
A187		1.260	.108	.236	L	MSS-I25L06-GX09-2	GX09-2..	A144
		1.260	.089	.236	L	MSS-I25L06-GX09-1	GX09-1..	A144
		1.260	.077	.236	L	MSS-I25L06-GX09-1	GX09-1..	A144
		1.260	.128	.236	L	MSS-I25L06-GX09-2	GX09-2..	A144
A190		1.260	.047	.053	L	MSS-I25L02-GX09-1	GX09-1..R/L	A144
		1.260	.067	.072	L	MSS-I25L02-GX09-1	GX09-1..R/L	A144
		1.260	.039	.045	L	MSS-I25L02-GX09-1	GX09-1..R/L	A144
		1.260	.035	.041	L	MSS-I25L02-GX09-1	GX09-1..R/L	A144
		1.260	.031	.037	L	MSS-I25L02-GX09-1	GX09-1..R/L	A144
		1.260	.024	.030	L	MSS-I25L02-GX09-1	GX09-1..R/L	A144
		1.260	.055	.060	L	MSS-I25L02-GX09-1	GX09-1..R/L	A144

		d_A [inch]		Type, description
A185	 1.5D	1.000	L	MSS-I25L90-1.5D-E
A186	 2.5D	1.250	L	MSS-I25L90-2.5D-E

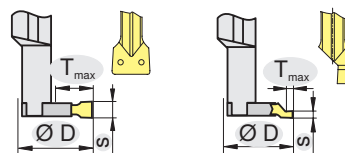
		D_{min} [inch]	s [inch]	T_{max} [inch]		Type, description		
A187		1.260	.108	.236	R	MSS-I25R06-GX09-2	GX09-2..	A144
		1.260	.089	.236	R	MSS-I25R06-GX09-1	GX09-1..	A144
		1.260	.077	.236	R	MSS-I25R06-GX09-1	GX09-1..	A144
		1.260	.128	.236	R	MSS-I25R06-GX09-2	GX09-2..	A144
A190		1.260	.047	.053	R	MSS-I25R02-GX09-1	GX09-1..R/L	A144
		1.260	.067	.072	R	MSS-I25R02-GX09-1	GX09-1..R/L	A144
		1.260	.039	.045	R	MSS-I25R02-GX09-1	GX09-1..R/L	A144
		1.260	.035	.041	R	MSS-I25R02-GX09-1	GX09-1..R/L	A144
		1.260	.031	.037	R	MSS-I25R02-GX09-1	GX09-1..R/L	A144
		1.260	.024	.030	R	MSS-I25R02-GX09-1	GX09-1..R/L	A144
		1.260	.055	.060	R	MSS-I25R02-GX09-1	GX09-1..R/L	A144

Circlip grooving – internal

Modular system – internal, assembly size 32



A99



		d _A [inch]	L R	Type, description
A185		1.250	R	MSS-I32R90-1.5D-E
	1.5D			
A186		1.500	R	MSS-I32R90-2.5D-E
	2.5D			

		D _{min} [inch]	s [inch]	T _{max} [inch]	L R	Type, description		
A188		1.575	.167	.354	L	MSS-I32L09-GX16-3	GX16-3..	A144
		1.575	.128	.354	L	MSS-I32L09-GX16-2	GX16-2..	A144
		1.575	.108	.354	L	MSS-I32L09-GX16-2	GX16-2..	A144
		1.575	.207	.354	L	MSS-I32L09-GX16-4	GX16-4..	A144
A191		1.575	.047	.053	L	MSS-I32L03-GX16-2	GX16-2..R/L	A144
		1.575	.055	.060	L	MSS-I32L03-GX16-2	GX16-2..R/L	A144
		1.575	.077	.081	L	MSS-I32L03-GX16-2	GX16-2..R/L	A144
		1.575	.089	.093	L	MSS-I32L03-GX16-2	GX16-2..R/L	A144
		1.575	.039	.045	L	MSS-I32L03-GX16-2	GX16-2..R/L	A144
		1.575	.035	.041	L	MSS-I32L03-GX16-2	GX16-2..R/L	A144
		1.575	.031	.037	L	MSS-I32L03-GX16-2	GX16-2..R/L	A144
		1.575	.024	.030	L	MSS-I32L03-GX16-2	GX16-2..R/L	A144
		1.575	.067	.072	L	MSS-I32L03-GX16-2	GX16-2..R/L	A144

		d _A [inch]	L R	Type, description
A185		1.250	L	MSS-I32L90-1.5D-E
	1.5D			
A186		1.500	L	MSS-I32L90-2.5D-E
	2.5D			

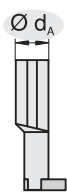
		D _{min} [inch]	s [inch]	T _{max} [inch]	L R	Type, description		
A188		1.575	.207	.354	R	MSS-I32R09-GX16-4	GX16-4..	A144
		1.575	.167	.354	R	MSS-I32R09-GX16-3	GX16-3..	A144
		1.575	.128	.354	R	MSS-I32R09-GX16-2	GX16-2..	A144
		1.575	.108	.354	R	MSS-I32R09-GX16-2	GX16-2..	A144
A191		1.575	.055	.060	R	MSS-I32R03-GX16-2	GX16-2..R/L	A144
		1.575	.067	.072	R	MSS-I32R03-GX16-2	GX16-2..R/L	A144
		1.575	.035	.041	R	MSS-I32R03-GX16-2	GX16-2..R/L	A144
		1.575	.089	.093	R	MSS-I32R03-GX16-2	GX16-2..R/L	A144
		1.575	.047	.053	R	MSS-I32R03-GX16-2	GX16-2..R/L	A144
		1.575	.039	.045	R	MSS-I32R03-GX16-2	GX16-2..R/L	A144
		1.575	.031	.037	R	MSS-I32R03-GX16-2	GX16-2..R/L	A144
		1.575	.024	.030	R	MSS-I32R03-GX16-2	GX16-2..R/L	A144
		1.575	.077	.081	R	MSS-I32R03-GX16-2	GX16-2..R/L	A144

Application

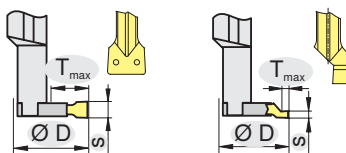
Tools and inserts for parting and grooving

Circlip grooving – internal

Modular system – internal, assembly size 40



Matching products see right-hand side.

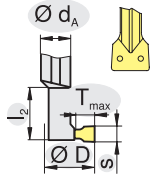


		d_A [inch]		Type, description
A185	 1.5D	1.500	R	MSS-I40R90-1.5D-E
A186	 2.5D	2.000	R	MSS-I40R90-2.5D-E

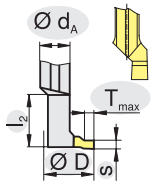
		D_{min} [inch]	s [inch]	T_{max} [inch]		Type, description		
A188		1.969	.207	.394	L	MSS-I40L10-GX16-4	GX16-4..	A144
		1.969	.167	.394	L	MSS-I40L10-GX16-3	GX16-3..	A144
		1.969	.128	.394	L	MSS-I40L10-GX16-2	GX16-2..	A144
		1.969	.108	.394	L	MSS-I40L10-GX16-2	GX16-2..	A144
A191		1.969	.055	.060	L	MSS-I40L03-GX16-2	GX16-2..R/L	A144
		1.969	.067	.072	L	MSS-I40L03-GX16-2	GX16-2..R/L	A144
		1.969	.024	.030	L	MSS-I40L03-GX16-2	GX16-2..R/L	A144
		1.969	.089	.093	L	MSS-I40L03-GX16-2	GX16-2..R/L	A144
		1.969	.047	.053	L	MSS-I40L03-GX16-2	GX16-2..R/L	A144
		1.969	.039	.045	L	MSS-I40L03-GX16-2	GX16-2..R/L	A144
		1.969	.035	.041	L	MSS-I40L03-GX16-2	GX16-2..R/L	A144
		1.969	.031	.037	L	MSS-I40L03-GX16-2	GX16-2..R/L	A144
		1.969	.077	.081	L	MSS-I40L03-GX16-2	GX16-2..R/L	A144
		1.969	.077	.081	L	MSS-I40L03-GX16-2	GX16-2..R/L	A144

		d_A [inch]		Type, description
A185	 1.5D	1.500	L	MSS-I40L90-1.5D-E
A186	 2.5D	2.000	L	MSS-I40L90-2.5D-E

		D_{min} [inch]	s [inch]	T_{max} [inch]		Type, description		
A188		1.969	.167	.394	R	MSS-I40R10-GX16-3	GX16-3..	A144
		1.969	.128	.394	R	MSS-I40R10-GX16-2	GX16-2..	A144
		1.969	.108	.394	R	MSS-I40R10-GX16-2	GX16-2..	A144
		1.969	.207	.394	R	MSS-I40R10-GX16-4	GX16-4..	A144
A191		1.969	.047	.053	R	MSS-I40R03-GX16-2	GX16-2..R/L	A144
		1.969	.055	.060	R	MSS-I40R03-GX16-2	GX16-2..R/L	A144
		1.969	.077	.081	R	MSS-I40R03-GX16-2	GX16-2..R/L	A144
		1.969	.089	.093	R	MSS-I40R03-GX16-2	GX16-2..R/L	A144
		1.969	.039	.045	R	MSS-I40R03-GX16-2	GX16-2..R/L	A144
		1.969	.035	.041	R	MSS-I40R03-GX16-2	GX16-2..R/L	A144
		1.969	.031	.037	R	MSS-I40R03-GX16-2	GX16-2..R/L	A144
		1.969	.024	.030	R	MSS-I40R03-GX16-2	GX16-2..R/L	A144
		1.969	.067	.072	R	MSS-I40R03-GX16-2	GX16-2..R/L	A144



		d_A [inch]	l_2 [inch]	D_{min} [inch]	s [inch]	T_{max} [inch]		Type, description		
A192		.625	1.181	.63	.077	.276	R	I12R90-2.5D-GX09-E	GX09..	A144
		.625	1.181	.63	.089	.276	R	I12R90-2.5D-GX09-E	GX09..	A144
		.625	1.181	.63	.108	.276	R	I12R90-2.5D-GX09-E	GX09..	A144
		.625	1.181	.63	.128	.276	R	I12R90-2.5D-GX09-E	GX09..	A144
		.625	1.181	.63	.077	.276	L	I12L90-2.5D-GX09-E	GX09..	A144
		.625	1.181	.63	.089	.276	L	I12L90-2.5D-GX09-E	GX09..	A144
		.625	1.181	.63	.108	.276	L	I12L90-2.5D-GX09-E	GX09..	A144
		.625	1.181	.63	.128	.276	L	I12L90-2.5D-GX09-E	GX09..	A144

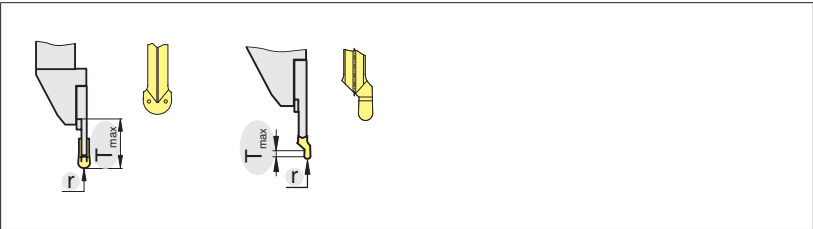


		d_A [inch]	l_2 [inch]	D_{min} [inch]	s [inch]	T_{max} [inch]		Type, description		
A192		.625	1.181	.63	.024	.030	R	I12R90-2.5D-GX09-E	GX09-1..R/L	A144
		.625	1.181	.63	.031	.037	R	I12R90-2.5D-GX09-E	GX09-1..R/L	A144
		.625	1.181	.63	.035	.041	R	I12R90-2.5D-GX09-E	GX09-1..R/L	A144
		.625	1.181	.63	.039	.045	R	I12R90-2.5D-GX09-E	GX09-1..R/L	A144
		.625	1.181	.63	.047	.053	R	I12R90-2.5D-GX09-E	GX09-1..R/L	A144
		.625	1.181	.63	.055	.060	R	I12R90-2.5D-GX09-E	GX09-1..R/L	A144
		.625	1.181	.63	.067	.072	R	I12R90-2.5D-GX09-E	GX09-1..R/L	A144
		.625	1.181	.63	.024	.030	L	I12L90-2.5D-GX09-E	GX09-1..R/L	A144
		.625	1.181	.63	.031	.037	L	I12L90-2.5D-GX09-E	GX09-1..R/L	A144
		.625	1.181	.63	.035	.041	L	I12L90-2.5D-GX09-E	GX09-1..R/L	A144
		.625	1.181	.63	.039	.045	L	I12L90-2.5D-GX09-E	GX09-1..R/L	A144
		.625	1.181	.63	.047	.053	L	I12L90-2.5D-GX09-E	GX09-1..R/L	A144
		.625	1.181	.63	.055	.060	L	I12L90-2.5D-GX09-E	GX09-1..R/L	A144
		.625	1.181	.63	.067	.072	L	I12L90-2.5D-GX09-E	GX09-1..R/L	A144



Radius grooves – external

Modular system – external, assembly size 12



		h/d _A [inch]		Type, description
A158		.500	R	MSS-E12R00-08-E
	0			

		r [inch]	T _{max} [inch]		Type, description		
A162		.039	.276	R	MSS-E12R07-GX09-1	GX09-1...	A145
		.047	.276	R	MSS-E12R07-GX09-1	GX09-1...	A145
A165		.031	.070	R	MSS-E12R02-GX09-1	GX09-1..R/L	A145

		h/d _A [inch]		Type, description
A158		.500	L	MSS-E12L00-08-E
	0			

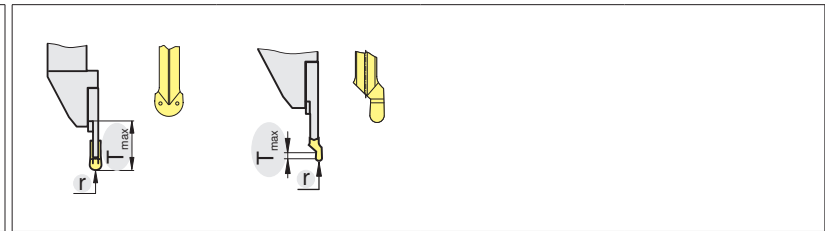
		r [inch]	T _{max} [inch]		Type, description		
A162		.039	.276	L	MSS-E12L07-GX09-1	GX09-1...	A145
		.047	.276	L	MSS-E12L07-GX09-1	GX09-1...	A145
A165		.031	.070	L	MSS-E12L02-GX09-1	GX09-1..R/L	A145

Radius grooves – external

Modular system – external, assembly size 16



A103



		h/d_A [inch]		Type, description
A158		.625	R	MSS-E16R00-10-E

		r [inch]	T_{max} [inch]		Type, description		
A162		.039	.276	R	MSS-E16R07-GX09-1	GX09-1..	A145
		.047	.276	R	MSS-E16R07-GX09-1	GX09-1..	A145
A165		.031	.070	R	MSS-E16R02-GX09-1	GX09-1..R/L	A145

		h/d_A [inch]		Type, description
A158		.625	L	MSS-E16L00-10-E

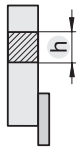
		r [inch]	T_{max} [inch]		Type, description		
A162		.039	.276	L	MSS-E16L07-GX09-1	GX09-1..	A145
		.047	.276	L	MSS-E16L07-GX09-1	GX09-1..	A145
A165		.031	.070	L	MSS-E16L02-GX09-1	GX09-1..R/L	A145

Application

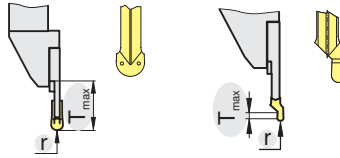
Tools and inserts for parting and grooving

Radius grooves – external

Modular system – external, assembly size 20



Matching products see right-hand side.



		h/d_A [inch]		Type, description
A158		.625	R	MSS-E20R00-10-E
		.750	R	MSS-E20R00-12-E
A159		.750	L	MSS-E20L90-12-E

		r [inch]	T_{max} [inch]		Type, description		
A163		.059	.472	R	MSS-E20R12-GX16-2	GX16-2..	A145
		.079	.472	R	MSS-E20R12-GX16-3	GX16-3..	A145
		.098	.472	R	MSS-E20R12-GX16-3	GX16-3..	A145
A164		.059	.827	R	MSS-E20R21-GX24-2	GX24-2..	A145
		.079	.827	R	MSS-E20R21-GX24-3	GX24-3..	A145
		.098	.827	R	MSS-E20R21-GX24-3	GX24-3..	A145
A166		.031	.070	R	MSS-E20R03-GX16-2	GX16-2..R/L	A145
		.039	.086	R	MSS-E20R03-GX16-2	GX16-2..R/L	A145
		.047	.102	R	MSS-E20R03-GX16-2	GX16-2..R/L	A145
A170		.059	.787	R	MSS-E20R20-SX3	SX..3	A147

		h/d_A [inch]		Type, description
A158		.625	L	MSS-E20L00-10-E
		.750	L	MSS-E20L00-12-E
A159		.750	R	MSS-E20R90-12-E

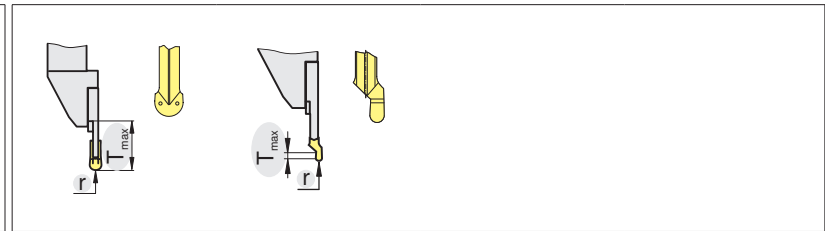
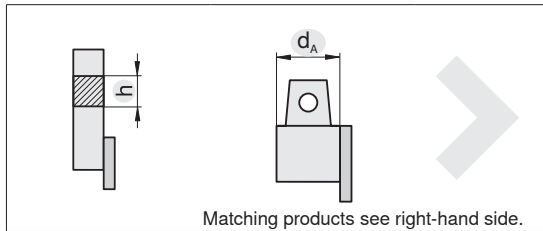
		r [inch]	T_{max} [inch]		Type, description		
A163		.059	.472	L	MSS-E20L12-GX16-2	GX16-2..	A145
		.079	.472	L	MSS-E20L12-GX16-3	GX16-3..	A145
		.098	.472	L	MSS-E20L12-GX16-3	GX16-3..	A145
A164		.059	.827	L	MSS-E20L21-GX24-2	GX24-2..	A145
		.079	.827	L	MSS-E20L21-GX24-3	GX24-3..	A145
		.098	.827	L	MSS-E20L21-GX24-3	GX24-3..	A145
A166		.031	.070	L	MSS-E20L03-GX16-2	GX16-2..R/L	A145
		.039	.086	L	MSS-E20L03-GX16-2	GX16-2..R/L	A145
		.047	.102	L	MSS-E20L03-GX16-2	GX16-2..R/L	A145
A170		.059	.787	L	MSS-E20L20-SX3	SX..3	A147

Radius grooves – external

Modular system – external, assembly size 25



A105



		h/d_A [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description
A158		1.000	R	MSS-E25R00-16-E
A159		1.000	L	MSS-E25L90-16-E
A198		2.480 3.937	R R	HSK-T63-MSS-E25R00 HSK-T100-MSS-E25R00

		r [inch]	T_{max} [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description	
A163		.059 .079 .098 .118	.472 .472 .472 .472	R R R R	MSS-E25R12-GX16-2 MSS-E25R12-GX16-3 MSS-E25R12-GX16-3 MSS-E25R12-GX16-4	GX16-2.. A145 GX16-3.. A145 GX16-3.. A145 GX16-4.. A145
A164		.059 .079 .098 .118	.827 .827 .827 .827	R R R R	MSS-E25R21-GX24-2 MSS-E25R21-GX24-3 MSS-E25R21-GX24-3 MSS-E25R21-GX24-4	GX24-2.. A145 GX24-3.. A145 GX24-3.. A145 GX24-4.. A145
A166		.031 .039 .047	.070 .086 .102	R R R	MSS-E25R03-GX16-2 MSS-E25R03-GX16-2 MSS-E25R03-GX16-2	GX16-2..R/L A145 GX16-2..R/L A145 GX16-2..R/L A145
A170		.059 .059 .079 .079	.984 1.378 1.378 .984	R R R R	MSS-E25R25-SX3 MSS-E25R35-SX3 MSS-E25R35-SX4 MSS-E25R25-SX4	SX..3 A147 SX..3 A147 SX..4 A147 SX..4 A147

		h/d_A [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description
A158		1.000	L	MSS-E25L00-16-E
A159		1.000	R	MSS-E25R90-16-E
A198		3.937 2.480	L L	HSK-T100-MSS-E25L00 HSK-T63-MSS-E25L00

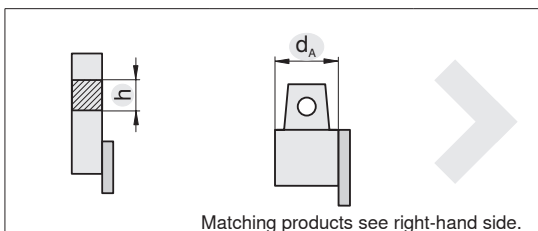
		r [inch]	T_{max} [inch]	$\begin{matrix} L \\ R \end{matrix}$	Type, description	
A163		.059 .079 .098 .118	.472 .472 .472 .472	L L L L	MSS-E25L12-GX16-2 MSS-E25L12-GX16-3 MSS-E25L12-GX16-3 MSS-E25L12-GX16-4	GX16-2.. A145 GX16-3.. A145 GX16-3.. A145 GX16-4.. A145
A164		.059 .079 .098 .118	.827 .827 .827 .827	L L L L	MSS-E25L21-GX24-2 MSS-E25L21-GX24-3 MSS-E25L21-GX24-3 MSS-E25L21-GX24-4	GX24-2.. A145 GX24-3.. A145 GX24-3.. A145 GX24-4.. A145
A166		.031 .039 .047	.070 .086 .102	L L L	MSS-E25L03-GX16-2 MSS-E25L03-GX16-2 MSS-E25L03-GX16-2	GX16-2..R/L A145 GX16-2..R/L A145 GX16-2..R/L A145
A170		.059 .059 .079 .079	.984 1.378 1.378 .984	L L L L	MSS-E25L25-SX3 MSS-E25L35-SX3 MSS-E25L35-SX4 MSS-E25L25-SX4	SX..3 A147 SX..3 A147 SX..4 A147 SX..4 A147

Application

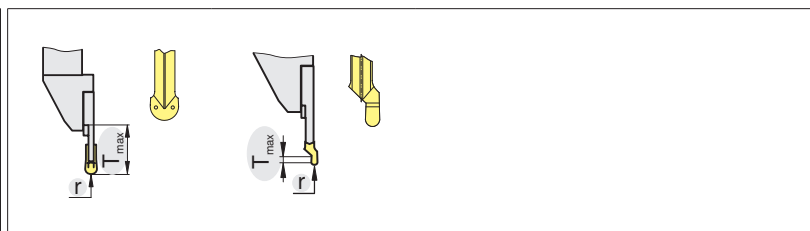
Tools and inserts for parting and grooving

Radius grooves – external

Modular system – external, assembly size 32



Matching products see right-hand side.

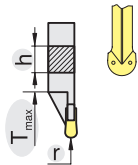


		h/d_A [inch]		Type, description
A158		1.250	R	MSS-E32R00-20-E
		1.250	R	MSS-E32R00-85-E
A159		1.250	L	MSS-E32L90-20-E
		1.250	L	MSS-E32L90-85-E
A198		3.937	R	HSK-T100-MSS-E32R00
		2.480	R	HSK-T63-MSS-E32R00
A199		3.937	L	HSK-T100-MSS-E32L90
		2.480	L	HSK-T63-MSS-E32L90

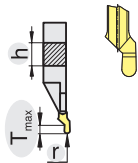
		r [inch]	T_{max} [inch]		Type, description		
A163		.059	.472	R	MSS-E32R12-GX16-2	GX16-2..	A145
		.079	.472	R	MSS-E32R12-GX16-3	GX16-3..	A145
		.098	.472	R	MSS-E32R12-GX16-3	GX16-3..	A145
		.118	.472	R	MSS-E32R12-GX16-4	GX16-4..	A145
A164		.059	.827	R	MSS-E32R21-GX24-2	GX24-2..	A145
		.079	.827	R	MSS-E32R21-GX24-3	GX24-3..	A145
		.098	.827	R	MSS-E32R21-GX24-3	GX24-3..	A145
		.118	.827	R	MSS-E32R21-GX24-4	GX24-4..	A145
A166		.031	.070	R	MSS-E32R03-GX16-2	GX16-2..R/L	A145
		.039	.086	R	MSS-E32R03-GX16-2	GX16-2..R/L	A145
		.047	.102	R	MSS-E32R03-GX16-2	GX16-2..R/L	A145
A170		.059	1.378	R	MSS-E32R35-SX3	SX..3	A147
		.079	1.378	R	MSS-E32R35-SX4	SX..4	A147
A171		.157	.984	N	MSS-E32N25-LX	LX..	A148
		.157	1.260	N	MSS-E32N32-LX	LX..	A148
		.157	1.772	N	MSS-E32N45-LX	LX..	A148

		h/d_A [inch]		Type, description
A158		1.250	L	MSS-E32L00-85-E
		1.250	L	MSS-E32L00-20-E
A159		1.250	R	MSS-E32R90-85-E
		1.250	R	MSS-E32R90-20-E
A198		2.480	L	HSK-T63-MSS-E32L00
		3.937	L	HSK-T100-MSS-E32L00
A199		2.480	R	HSK-T63-MSS-E32R90
		3.937	R	HSK-T100-MSS-E32R90

		r [inch]	T_{max} [inch]		Type, description		
A163		.059	.472	L	MSS-E32L12-GX16-2	GX16-2..	A145
		.079	.472	L	MSS-E32L12-GX16-3	GX16-3..	A145
		.098	.472	L	MSS-E32L12-GX16-3	GX16-3..	A145
		.118	.472	L	MSS-E32L12-GX16-4	GX16-4..	A145
A164		.059	.827	L	MSS-E32L21-GX24-2	GX24-2..	A145
		.079	.827	L	MSS-E32L21-GX24-3	GX24-3..	A145
		.098	.827	L	MSS-E32L21-GX24-3	GX24-3..	A145
		.118	.827	L	MSS-E32L21-GX24-4	GX24-4..	A145
A166		.031	.070	L	MSS-E32L03-GX16-2	GX16-2..R/L	A145
		.039	.086	L	MSS-E32L03-GX16-2	GX16-2..R/L	A145
		.047	.102	L	MSS-E32L03-GX16-2	GX16-2..R/L	A145
A170		.059	1.378	L	MSS-E32L35-SX3	SX..3	A147
		.079	1.378	L	MSS-E32L35-SX4	SX..4	A147
A171		.157	.984	N	MSS-E32N25-LX	LX..	A148
		.157	1.260	N	MSS-E32N32-LX	LX..	A148
		.157	1.772	N	MSS-E32N45-LX	LX..	A148



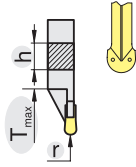
A174		h [inch]	r [inch]	T _{max} [inch]		Type, description		
		.375	.039	.276	R	E10R00-06-GX09-E	GX09..	A145
		.375	.047	.276	R	E10R00-06-GX09-E	GX09..	A145
		.375	.039	.276	L	E10L00-06-GX09-E	GX09..	A145
		.375	.047	.276	L	E10L00-06-GX09-E	GX09..	A145



A174		h [inch]	r [inch]	T _{max} [inch]		Type, description		
		.375	.031	.070	R	E10R00-06-GX09-E	GX09-1..R/L	A145
		.375	.031	.070	L	E10L00-06-GX09-E	GX09-1..R/L	A145

Radius grooves – external

Monoblock tools – GX



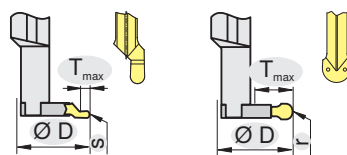
		h [inch]	r [inch]	T _{max} [inch]		Type, description		
A175		.625	.059	.827	R	E16R0021-10C-GX24-2-E	GX24-2..	A145
		.750	.059	.827	R	E20R0021-12C-GX24-2-E	GX24-2..	A145
		.750	.079	.827	R	E20R0021-12C-GX24-3-E	GX24-3..	A145
		.750	.098	.827	R	E20R0021-12C-GX24-3-E	GX24-3..	A145
		1.000	.059	.827	R	E25R0021-16D-GX24-2-E	GX24-2..	A145
		1.000	.079	.827	R	E25R0021-16D-GX24-3-E	GX24-3..	A145
		1.000	.098	.827	R	E25R0021-16D-GX24-3-E	GX24-3..	A145
		1.000	.118	.827	R	E25R0021-16D-GX24-4-E	GX24-4..	A145
		1.250	.059	.827	R	E32R0021-85D-GX24-2-E	GX24-2..	A145
		1.250	.079	.827	R	E32R0021-85D-GX24-3-E	GX24-3..	A145
		1.250	.098	.827	R	E32R0021-85D-GX24-3-E	GX24-3..	A145
		1.250	.118	.827	R	E32R0021-85D-GX24-4-E	GX24-4..	A145
		.625	.059	.827	L	E16L0021-10C-GX24-2-E	GX24-2..	A145
		.750	.059	.827	L	E20L0021-12C-GX24-2-E	GX24-2..	A145
		.750	.079	.827	L	E20L0021-12C-GX24-3-E	GX24-3..	A145
		.750	.098	.827	L	E20L0021-12C-GX24-3-E	GX24-3..	A145
		1.000	.059	.827	L	E25L0021-16D-GX24-2-E	GX24-2..	A145
		1.000	.079	.827	L	E25L0021-16D-GX24-3-E	GX24-3..	A145
		1.000	.098	.827	L	E25L0021-16D-GX24-3-E	GX24-3..	A145
		1.000	.118	.827	L	E25L0021-16D-GX24-4-E	GX24-4..	A145
		1.250	.059	.827	L	E32L0021-85D-GX24-2-E	GX24-2..	A145
		1.250	.079	.827	L	E32L0021-85D-GX24-3-E	GX24-3..	A145
		1.250	.098	.827	L	E32L0021-85D-GX24-3-E	GX24-3..	A145
		1.250	.118	.827	L	E32L0021-85D-GX24-4-E	GX24-4..	A145

Radius grooves – internal

Modular system – internal, assembly size 16



A109



		d _A [inch]		Type, description
A185		.750	R	MSS-I16R90-1.5D-E
		1.5D		
A186		.750	R	MSS-I16R90-2.5D-E
		2.5D		

		D _{min} [inch]	r [inch]	T _{max} [inch]		Type, description		
A187		.787	.039	.157	L	MSS-I16L04-GX09-1	GX09-1..	A145
		.787	.047	.157	L	MSS-I16L04-GX09-1	GX09-1..	A145
A190		.787	.031	.070	L	MSS-I16L02-GX09-1	GX09-1..R/L	A145

		d _A [inch]		Type, description
A185		.750	L	MSS-I16L90-1.5D-E
		1.5D		
A186		.750	L	MSS-I16L90-2.5D-E
		2.5D		

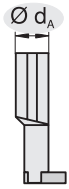
		D _{min} [inch]	r [inch]	T _{max} [inch]		Type, description		
A187		.787	.039	.157	R	MSS-I16R04-GX09-1	GX09-1..	A145
		.787	.047	.157	R	MSS-I16R04-GX09-1	GX09-1..	A145
A190		.787	.031	.070	R	MSS-I16R02-GX09-1	GX09-1..R/L	A145

Application

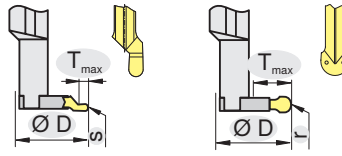
Tools and inserts for parting and grooving

Radius grooves – internal

Modular system – external, assembly size 20



Matching products see right-hand side.



		d_A [inch]		Type, description		D_{min} [inch]	r [inch]	T_{max} [inch]		Type, description		
A185	 1.5D	.750	R	MSS-I20R90-1.5D-E	 A187	.984	.039	.197	L	MSS-I20L05-GX09-1	GX09-1..	A145
						.984	.047	.197	L	MSS-I20L05-GX09-1	GX09-1..	A145
A186	 2.5D	1.000	R	MSS-I20R90-2.5D-E	 A190	.984	.031	.070	L	MSS-I20L02-GX09-1	GX09-1..R/L	A145

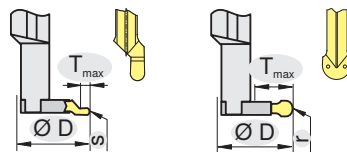
		d_A [inch]		Type, description		D_{min} [inch]	r [inch]	T_{max} [inch]		Type, description		
A185	 1.5D	.750	L	MSS-I20L90-1.5D-E	 A187	.984	.039	.197	R	MSS-I20R05-GX09-1	GX09-1..	A145
						.984	.047	.197	R	MSS-I20R05-GX09-1	GX09-1..	A145
A186	 2.5D	1.000	L	MSS-I20L90-2.5D-E	 A190	.984	.031	.070	R	MSS-I20R02-GX09-1	GX09-1..R/L	A145

Radius grooves – internal

Modular system – internal, assembly size 25



A111



		d _A [inch]		Type, description
A185		1.000	R	MSS-I25R90-1.5D-E
		1.5D		
A186		1.250	R	MSS-I25R90-2.5D-E
		2.5D		

		D _{min} [inch]	r [inch]	T _{max} [inch]		Type, description		
A187		1.260	.039	.236	L	MSS-I25L06-GX09-1	GX09-1..	A145
		1.260	.047	.236	L	MSS-I25L06-GX09-1	GX09-1..	A145
A190		1.260	.031	.070	L	MSS-I25L02-GX09-1	GX09-1..R/L	A145

		d _A [inch]		Type, description
A185		1.000	L	MSS-I25L90-1.5D-E
		1.5D		
A186		1.250	L	MSS-I25L90-2.5D-E
		2.5D		

		D _{min} [inch]	r [inch]	T _{max} [inch]		Type, description		
A187		1.260	.039	.236	R	MSS-I25R06-GX09-1	GX09-1..	A145
		1.260	.047	.236	R	MSS-I25R06-GX09-1	GX09-1..	A145
A190		1.260	.031	.070	R	MSS-I25R02-GX09-1	GX09-1..R/L	A145

Application

Tools and inserts for parting and grooving

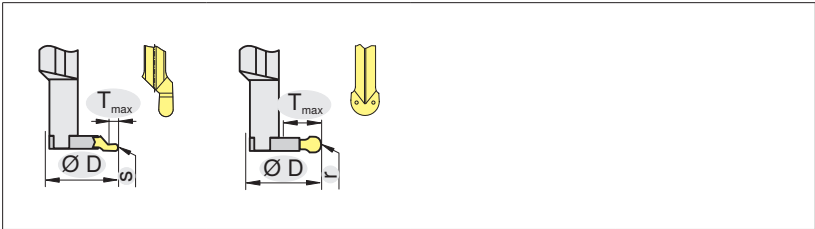


Radius grooves – internal

Modular system – internal, assembly size 32



Matching products see right-hand side.



		d _A [inch]		Type, description
A185	 1.5D	1.250	R	MSS-I32R90-1.5D-E
A186	 2.5D	1.500	R	MSS-I32R90-2.5D-E

		D _{min} [inch]	r [inch]	T _{max} [inch]		Type, description		
A188		1.575	.059	.354	L	MSS-I32L09-GX16-2	GX16-2..	A145
		1.575	.079	.354	L	MSS-I32L09-GX16-3	GX16-3..	A145
		1.575	.098	.354	L	MSS-I32L09-GX16-3	GX16-3..	A145
		1.575	.118	.354	L	MSS-I32L09-GX16-4	GX16-4..	A145
A191		1.575	.031	.070	L	MSS-I32L03-GX16-2	GX16-2..R/L	A145
		1.575	.039	.086	L	MSS-I32L03-GX16-2	GX16-2..R/L	A145
		1.575	.047	.102	L	MSS-I32L03-GX16-2	GX16-2..R/L	A145

		d _A [inch]		Type, description
A185	 1.5D	1.250	L	MSS-I32L90-1.5D-E
A186	 2.5D	1.500	L	MSS-I32L90-2.5D-E

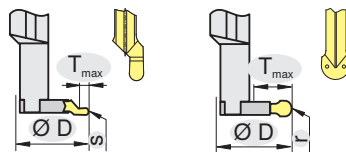
		D _{min} [inch]	r [inch]	T _{max} [inch]		Type, description		
A188		1.575	.059	.354	R	MSS-I32R09-GX16-2	GX16-2..	A145
		1.575	.079	.354	R	MSS-I32R09-GX16-3	GX16-3..	A145
		1.575	.098	.354	R	MSS-I32R09-GX16-3	GX16-3..	A145
		1.575	.118	.354	R	MSS-I32R09-GX16-4	GX16-4..	A145
A191		1.575	.031	.070	R	MSS-I32R03-GX16-2	GX16-2..R/L	A145
		1.575	.039	.086	R	MSS-I32R03-GX16-2	GX16-2..R/L	A145
		1.575	.047	.102	R	MSS-I32R03-GX16-2	GX16-2..R/L	A145

Radius grooves – internal

Modular system – internal, assembly size 40



A113



		d _A [inch]		Type, description
A185		1.500	R	MSS-I40R90-1.5D-E
		1.5D		
A186		2.000	R	MSS-I40R90-2.5D-E
		2.5D		

		D _{min} [inch]	r [inch]	T _{max} [inch]		Type, description		
A188		1.969	.079	.394	L	MSS-I40L10-GX16-3	GX16-3..	A145
		1.969	.098	.394	L	MSS-I40L10-GX16-3	GX16-3..	A145
		1.969	.118	.394	L	MSS-I40L10-GX16-4	GX16-4..	A145
		1.969	.059	.394	L	MSS-I40L10-GX16-2	GX16-2..	A145
A189		2.362	.098	.748	N	MSS-I40N19-GX24-3	GX24-3..	A145
		2.362	.079	.748	N	MSS-I40N19-GX24-3	GX24-3..	A145
		2.362	.118	.748	N	MSS-I40N19-GX24-4	GX24-4..	A145
		2.362	.059	.748	N	MSS-I40N19-GX24-2	GX24-2..	A145
A191		1.969	.047	.102	L	MSS-I40L03-GX16-2	GX16-2..R/L	A145
		1.969	.031	.070	L	MSS-I40L03-GX16-2	GX16-2..R/L	A145
		1.969	.039	.086	L	MSS-I40L03-GX16-2	GX16-2..R/L	A145

		d _A [inch]		Type, description
A185		1.500	L	MSS-I40L90-1.5D-E
		1.5D		
A186		2.000	L	MSS-I40L90-2.5D-E
		2.5D		

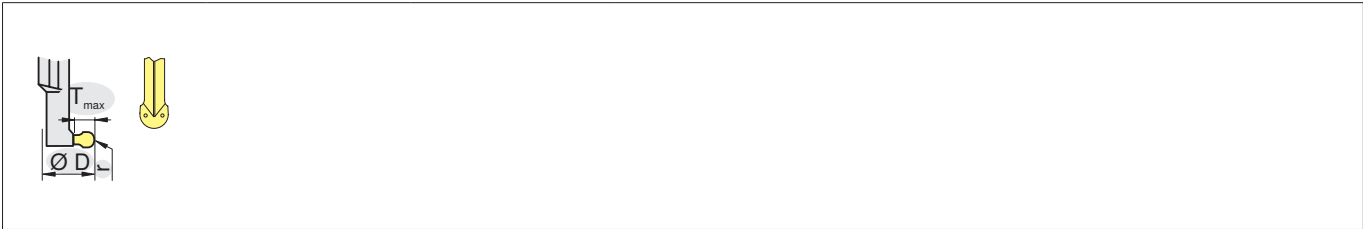
		D _{min} [inch]	r [inch]	T _{max} [inch]		Type, description		
A188		1.969	.079	.394	R	MSS-I40R10-GX16-3	GX16-3..	A145
		1.969	.098	.394	R	MSS-I40R10-GX16-3	GX16-3..	A145
		1.969	.118	.394	R	MSS-I40R10-GX16-4	GX16-4..	A145
		1.969	.059	.394	R	MSS-I40R10-GX16-2	GX16-2..	A145
A189		2.362	.098	.748	N	MSS-I40N19-GX24-3	GX24-3..	A145
		2.362	.079	.748	N	MSS-I40N19-GX24-3	GX24-3..	A145
		2.362	.118	.748	N	MSS-I40N19-GX24-4	GX24-4..	A145
		2.362	.059	.748	N	MSS-I40N19-GX24-2	GX24-2..	A145
A191		1.969	.047	.102	R	MSS-I40R03-GX16-2	GX16-2..R/L	A145
		1.969	.031	.070	R	MSS-I40R03-GX16-2	GX16-2..R/L	A145
		1.969	.039	.086	R	MSS-I40R03-GX16-2	GX16-2..R/L	A145

Application

Tools and inserts for parting and grooving



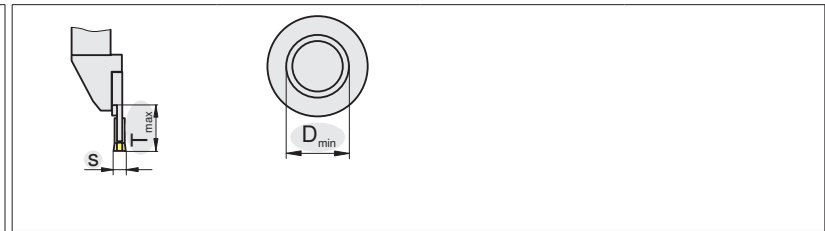
Radius grooves – internal
Monoblock boring bars – GX



		d _A [inch]	l ₂ [inch]	D _{min} [inch]	r [inch]	T _{max} [inch]		Type, description		
A192		.625	1.181	.63	.039	.276	R	I12R90-2.5D-GX09-E	GX09..	A145
		.625	1.181	.63	.047	.276	R	I12R90-2.5D-GX09-E	GX09..	A145
		.625	1.181	.63	.039	.276	L	I12L90-2.5D-GX09-E	GX09..	A145
		.625	1.181	.63	.047	.276	L	I12L90-2.5D-GX09-E	GX09..	A145



		d _A [inch]	l ₂ [inch]	D _{min} [inch]	r [inch]	T _{max} [inch]		Type, description		
A192		.625	1.181	.63	.031	.070	R	I12R90-2.5D-GX09-E	GX09-1..R/L	A145
		.625	1.181	.63	.031	.070	L	I12L90-2.5D-GX09-E	GX09-1..R/L	A145



		h/d_A [inch]		Type, description
A158		.625	R	MSS-E16R00-10-E
	0			

		s/s_{min} [inch]	D_{min} [inch]	T_{max} [inch]		Type, description		A146
A169		.118	.39	.197	R	MSS-E16R05-AX05	AX05..	A146

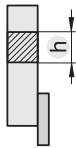
		h/d_A [inch]		Type, description
A158		.625	L	MSS-E16L00-10-E
	0			

		s/s_{min} [inch]	D_{min} [inch]	T_{max} [inch]		Type, description		A146
A169		.118	.39	.197	L	MSS-E16L05-AX05	AX05..	A146



Axial grooving

Modular system – external, assembly size 20



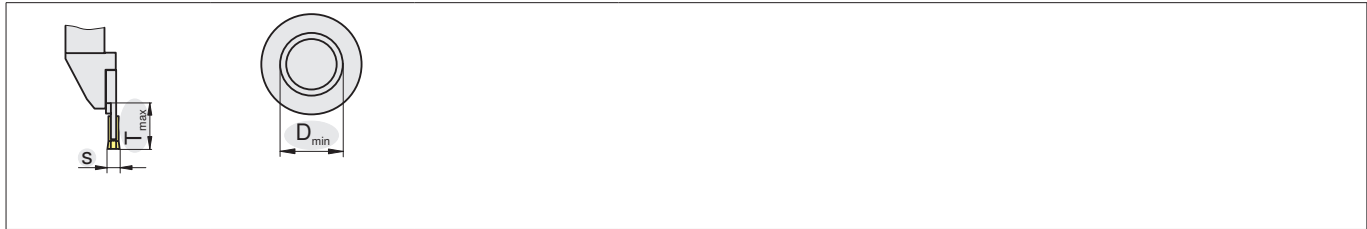
Matching products see right-hand side.

		h/d_A [inch]		Type, description
A158		.625	R	MSS-E20R00-10-E
		.750	R	MSS-E20R00-12-E
		0		
A159		.750	L	MSS-E20L90-12-E
		90		

Application

Tools and inserts for parting and grooving

		h/d_A [inch]		Type, description
A158		.625	L	MSS-E20L00-10-E
		.750	L	MSS-E20L00-12-E
		0		
A159		.750	R	MSS-E20R90-12-E
		90		



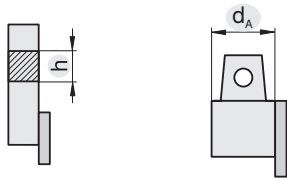
		s/s_{min} [inch]	s_{max} [inch]	D_{min} [inch]	D_{max} [inch]	T_{max} [inch]		Type, description		
A167		.109	.147	1.97	2.76	.551	R	MSS-E20R14-GX24-2 A50-70	GX24-2..	A142
		.109	.147	2.76	3.94	.551	R	MSS-E20R14-GX24-2 A70-100	GX24-2..	A142
		.109	.147	3.94	5.90	.551	R	MSS-E20R14-GX24-2 A100-150	GX24-2..	A142
A169		.118		.39		.197	R	MSS-E20R05-AX05	AX05..	A146
		.118		.79		.394	R	MSS-E20R10-AX10	AX10..	A146
		.118		1.18		.591	R	MSS-E20R15-AX15	AX15..	A146

		s/s_{min} [inch]	s_{max} [inch]	D_{min} [inch]	D_{max} [inch]	T_{max} [inch]		Type, description		
A167		.109	.147	1.97	2.76	.551	L	MSS-E20L14-GX24-2 A50-70	GX24-2..	A142
		.109	.147	2.76	3.94	.551	L	MSS-E20L14-GX24-2 A70-100	GX24-2..	A142
		.109	.147	3.94	5.90	.551	L	MSS-E20L14-GX24-2 A100-150	GX24-2..	A142
A169		.118		.39		.197	L	MSS-E20L05-AX05	AX05..	A146
		.118		.79		.394	L	MSS-E20L10-AX10	AX10..	A146
		.118		1.18		.591	L	MSS-E20L15-AX15	AX15..	A146



Axial grooving

Modular system – external, assembly size 25



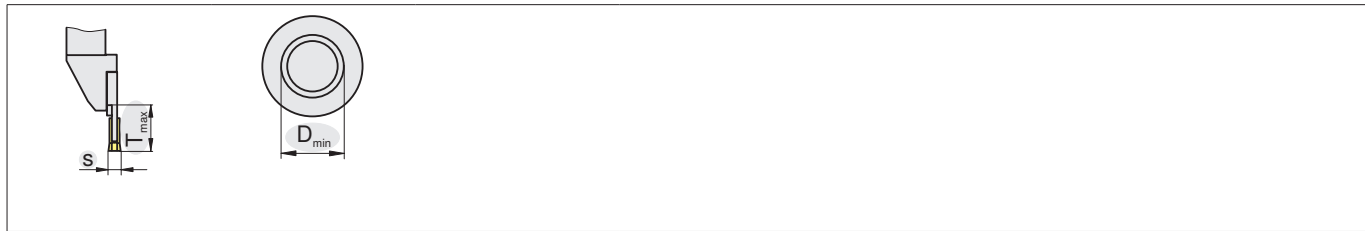
Matching products see right-hand side.

Application

Tools and inserts for parting and grooving

		h/d_A [inch]		Type, description
A158		1.000	R	MSS-E25R00-16-E
		0		
A159		1.000	L	MSS-E25L90-16-E
		90		
A198		2.480	R	HSK-T63-MSS-E25R00
		3.937	R	HSK-T100-MSS-E25R00
		0		

		h/d_A [inch]		Type, description
A158		1.000	L	MSS-E25L00-16-E
		0		
A159		1.000	R	MSS-E25R90-16-E
		90		
A198		3.937	L	HSK-T100-MSS-E25L00
		2.480	L	HSK-T63-MSS-E25L00
		0		

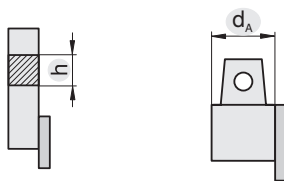


		s/s _{min} [inch]	s _{max} [inch]	D _{min} [inch]	D _{max} [inch]	T _{max} [inch]	LR	Type, description		
A167		.109	.147	1.97	2.76	.590	R	MSS-E25R15-GX24-2 A50-70	GX24-2..	A142
		.109	.147	2.76	3.94	.590	R	MSS-E25R15-GX24-2 A70-100	GX24-2..	A142
		.109	.147	3.94	5.90	.590	R	MSS-E25R15-GX24-2 A100-150	GX24-2..	A142
		.148	.197	1.97	2.76	.590	R	MSS-E25R15-GX24-3 A50-70	GX24-3..	A142
		.148	.197	2.76	3.94	.590	R	MSS-E25R15-GX24-3 A70-100	GX24-3..	A142
		.148	.197	3.94	5.90	.590	R	MSS-E25R15-GX24-3 A100-150	GX24-3..	A142
		.148	.197	5.90	11.81	.590	R	MSS-E25R15-GX24-3 A150-300	GX24-3..	A142
		.198	.256	1.97	2.76	.590	R	MSS-E25R15-GX24-4 A50-70	GX24-4..	A142
		.198	.256	2.76	3.94	.590	R	MSS-E25R15-GX24-4 A70-100	GX24-4..	A142
		.198	.256	3.94	5.90	.590	R	MSS-E25R15-GX24-4 A100-150	GX24-4..	A142
A168		.148	.197	1.97	2.75	.827	R	MSS-E25R21-GX24-3 AS50-70	GX24-3..	A142
		.148	.197	2.75	3.94	.827	R	MSS-E25R21-GX24-3 AS70-100	GX24-3..	A142
		.148	.197	3.94	5.90	.827	R	MSS-E25R21-GX24-3 AS100-150	GX24-3..	A142
		.148	.197	5.90	11.81	.827	R	MSS-E25R21-GX24-3 AS150-300	GX24-3..	A142
		.198	.256	1.97	2.75	.984	R	MSS-E25R25-GX24-4 AS50-70	GX24-4..	A142
		.198	.256	2.75	3.94	.984	R	MSS-E25R25-GX24-4 AS70-100	GX24-4..	A142
		.198	.256	3.94	5.90	.984	R	MSS-E25R25-GX24-4 AS100-150	GX24-4..	A142
		.198	.256	5.90	11.81	.984	R	MSS-E25R25-GX24-4 AS150-300	GX24-4..	A142
A169		.118		.39		.197	R	MSS-E25R05-AX05	AX05..	A146
		.118		.79		.394	R	MSS-E25R10-AX10	AX10..	A146
		.118		1.18		.591	R	MSS-E25R15-AX15	AX15..	A146

		s/s _{min} [inch]	s _{max} [inch]	D _{min} [inch]	D _{max} [inch]	T _{max} [inch]	LR	Type, description		
A167		.109	.147	1.97	2.76	.590	L	MSS-E25L15-GX24-2 A50-70	GX24-2..	A142
		.109	.147	2.76	3.94	.590	L	MSS-E25L15-GX24-2 A70-100	GX24-2..	A142
		.109	.147	3.94	5.90	.590	L	MSS-E25L15-GX24-2 A100-150	GX24-2..	A142
		.148	.197	1.97	2.76	.590	L	MSS-E25L15-GX24-3 A50-70	GX24-3..	A142
		.148	.197	2.76	3.94	.590	L	MSS-E25L15-GX24-3 A70-100	GX24-3..	A142
		.148	.197	3.94	5.90	.590	L	MSS-E25L15-GX24-3 A100-150	GX24-3..	A142
		.148	.197	5.90	11.81	.590	L	MSS-E25L15-GX24-3 A150-300	GX24-3..	A142
		.198	.256	1.97	2.76	.590	L	MSS-E25L15-GX24-4 A50-70	GX24-4..	A142
		.198	.256	2.76	3.94	.590	L	MSS-E25L15-GX24-4 A70-100	GX24-4..	A142
		.198	.256	3.94	5.90	.590	L	MSS-E25L15-GX24-4 A100-150	GX24-4..	A142
A168		.148	.197	1.97	2.75	.827	L	MSS-E25L21-GX24-3 AS50-70	GX24-3..	A142
		.148	.197	2.75	3.94	.827	L	MSS-E25L21-GX24-3 AS70-100	GX24-3..	A142
		.148	.197	3.94	5.90	.827	L	MSS-E25L21-GX24-3 AS100-150	GX24-3..	A142
		.148	.197	5.90	11.81	.827	L	MSS-E25L21-GX24-3 AS150-300	GX24-3..	A142
		.198	.256	1.97	2.75	.984	L	MSS-E25L25-GX24-4 AS50-70	GX24-4..	A142
		.198	.256	2.75	3.94	.984	L	MSS-E25L25-GX24-4 AS70-100	GX24-4..	A142
		.198	.256	3.94	5.90	.984	L	MSS-E25L25-GX24-4 AS100-150	GX24-4..	A142
		.198	.256	5.90	11.81	.984	L	MSS-E25L25-GX24-4 AS150-300	GX24-4..	A142
A169		.118		.39		.197	L	MSS-E25L05-AX05	AX05..	A146
		.118		.79		.394	L	MSS-E25L10-AX10	AX10..	A146
		.118		1.18		.591	L	MSS-E25L15-AX15	AX15..	A146

Axial grooving

Modular system – external, assembly size 32



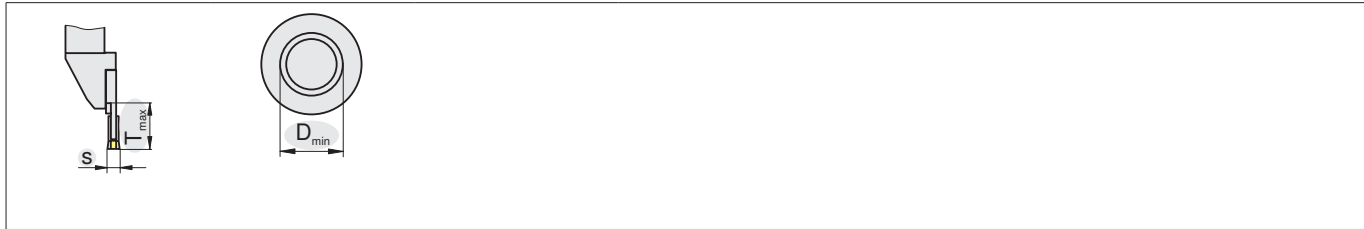
Matching products see right-hand side.

Application

		h/d_A [inch]		Type, description
A158		1.250	R	MSS-E32R00-20-E
		1.250	R	MSS-E32R00-85-E
		0		
A159		1.250	L	MSS-E32L90-20-E
		1.250	L	MSS-E32L90-85-E
		90		
A198		3.937	R	HSK-T100-MSS-E32R00
		2.480	R	HSK-T63-MSS-E32R00
		0		
A199		3.937	L	HSK-T100-MSS-E32L90
		2.480	L	HSK-T63-MSS-E32L90
		90		

Tools and inserts for parting and grooving

		h/d_A [inch]		Type, description
A158		1.250	L	MSS-E32L00-85-E
		1.250	L	MSS-E32L00-20-E
		0		
A159		1.250	R	MSS-E32R90-85-E
		1.250	R	MSS-E32R90-20-E
		90		
A198		2.480	L	HSK-T63-MSS-E32L00
		3.937	L	HSK-T100-MSS-E32L00
		0		
A199		2.480	R	HSK-T63-MSS-E32R90
		3.937	R	HSK-T100-MSS-E32R90
		90		



		s/s_{min} [inch]	s_{max} [inch]	D_{min} [inch]	D_{max} [inch]	T_{max} [inch]		Type, description		
A167		.148	.197	2.76	3.94	.590	R	MSS-E32R15-GX24-3 A70-100	GX24-3..	A142
		.148	.197	3.94	5.90	.590	R	MSS-E32R15-GX24-3 A100-150	GX24-3..	A142
		.148	.197	5.90	11.81	.590	R	MSS-E32R15-GX24-3 A150-300	GX24-3..	A142
		.198	.256	11.81	35.43	.590	R	MSS-E32R15-GX24-4 A300-900	GX24-4..	A142
		.198	.256	2.76	3.94	.590	R	MSS-E32R15-GX24-4 A70-100	GX24-4..	A142
		.198	.256	3.94	5.90	.590	R	MSS-E32R15-GX24-4 A100-150	GX24-4..	A142
		.198	.256	5.90	11.81	.590	R	MSS-E32R15-GX24-4 A150-300	GX24-4..	A142

		s/s_{min} [inch]	s_{max} [inch]	D_{min} [inch]	D_{max} [inch]	T_{max} [inch]		Type, description		
A167		.148	.197	2.76	3.94	.590	L	MSS-E32L15-GX24-3 A70-100	GX24-3..	A142
		.148	.197	3.94	5.90	.590	L	MSS-E32L15-GX24-3 A100-150	GX24-3..	A142
		.148	.197	5.90	11.81	.590	L	MSS-E32L15-GX24-3 A150-300	GX24-3..	A142
		.198	.256	11.81	35.43	.590	L	MSS-E32L15-GX24-4 A300-900	GX24-4..	A142
		.198	.256	2.76	3.94	.590	L	MSS-E32L15-GX24-4 A70-100	GX24-4..	A142
		.198	.256	3.94	5.90	.590	L	MSS-E32L15-GX24-4 A100-150	GX24-4..	A142
		.198	.256	5.90	11.81	.590	L	MSS-E32L15-GX24-4 A150-300	GX24-4..	A142

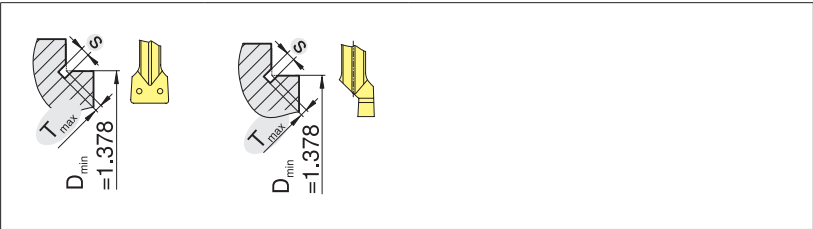


External recessing

Modular system – external, assembly size 20



Matching products see right-hand side.



		h/d_A [inch]		Type, description
A160		.750	R	MSS-E20R45-12-E
	45			

		s [inch]	T _{max} [inch]		Type, description	
		.039	.045	L	MSS-E20L03-GX16-2	GX16-2..R/L A144
		.047	.053	L	MSS-E20L03-GX16-2	GX16-2..R/L A144
		.055	.060	L	MSS-E20L03-GX16-2	GX16-2..R/L A144
		.067	.072	L	MSS-E20L03-GX16-2	GX16-2..R/L A144
		.077	.081	L	MSS-E20L03-GX16-2	GX16-2..R/L A144
		.089	.093	L	MSS-E20L03-GX16-2	GX16-2..R/L A144
		.118	.118	L	MSS-E20L03-GX16-2	GX16-2.. A144
		.128	.118	L	MSS-E20L03-GX16-2	GX16-2.. A144
		.138	.118	L	MSS-E20L03-GX16-2	GX16-2.. A144
		.157	.118	L	MSS-E20L03-GX16-2	GX16-3.. A144
		.167	.118	L	MSS-E20L03-GX16-2	GX16-3.. A144
		.177	.118	L	MSS-E20L03-GX16-2	GX16-3.. A144
	.197	.118	L	MSS-E20L03-GX16-2	GX16-3.. A144	

		h/d_A [inch]		Type, description
A160		.750	L	MSS-E20L45-12-E
	45			

		S [inch]	T _{max} [inch]		Type, description	
		.039	.045	R	MSS-E20R03-GX16-2	GX16-2..R/L A144
		.047	.053	R	MSS-E20R03-GX16-2	GX16-2..R/L A144
		.055	.060	R	MSS-E20R03-GX16-2	GX16-2..R/L A144
		.067	.072	R	MSS-E20R03-GX16-2	GX16-2..R/L A144
		.077	.081	R	MSS-E20R03-GX16-2	GX16-2..R/L A144
		.089	.093	R	MSS-E20R03-GX16-2	GX16-2..R/L A144
		.118	.118	R	MSS-E20R03-GX16-2	GX16-2.. A144
		.128	.118	R	MSS-E20R03-GX16-2	GX16-2.. A144
		.138	.118	R	MSS-E20R03-GX16-2	GX16-2.. A144
		.157	.118	R	MSS-E20R03-GX16-2	GX16-3.. A144
		.167	.118	R	MSS-E20R03-GX16-2	GX16-3.. A144
		.177	.118	R	MSS-E20R03-GX16-2	GX16-3.. A144
	.197	.118	R	MSS-E20R03-GX16-2	GX16-3.. A144	

External recessing

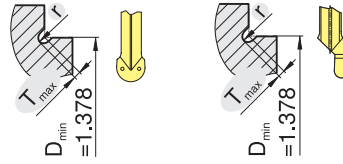
Modular system – external, assembly size 20



A123



Matching products see right-hand side.



		h/d _A [inch]	L R	Type, description
A160		.750	R	MSS-E20R45-12-E

		r [inch]	T _{max} [inch]	L R	Type, description	
A166		.031	.070	L	MSS-E20L03-GX16-2	GX16-2..R/L A145
		.039	.086	L	MSS-E20L03-GX16-2	GX16-2..R/L A145
		.047	.102	L	MSS-E20L03-GX16-2	GX16-2..R/L A145
		.059	.118	L	MSS-E20L03-GX16-2	GX16-2.. A145
		.079	.118	L	MSS-E20L03-GX16-2	GX16-3.. A145
		.098	.118	L	MSS-E20L03-GX16-2	GX16-3.. A145

		h/d _A [inch]	L R	Type, description
A160		.750	L	MSS-E20L45-12-E

		r [inch]	T _{max} [inch]	L R	Type, description	
A166		.031	.070	R	MSS-E20R03-GX16-2	GX16-2..R/L A145
		.039	.086	R	MSS-E20R03-GX16-2	GX16-2..R/L A145
		.047	.102	R	MSS-E20R03-GX16-2	GX16-2..R/L A145
		.059	.118	R	MSS-E20R03-GX16-2	GX16-2.. A145
		.079	.118	R	MSS-E20R03-GX16-2	GX16-3.. A145
		.098	.118	R	MSS-E20R03-GX16-2	GX16-3.. A145

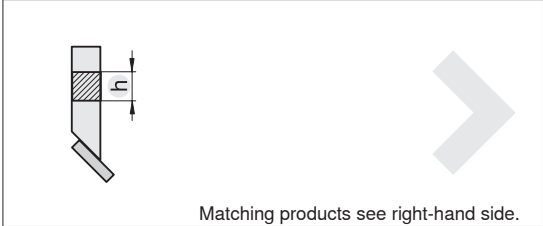
Application

Tools and inserts for parting and grooving

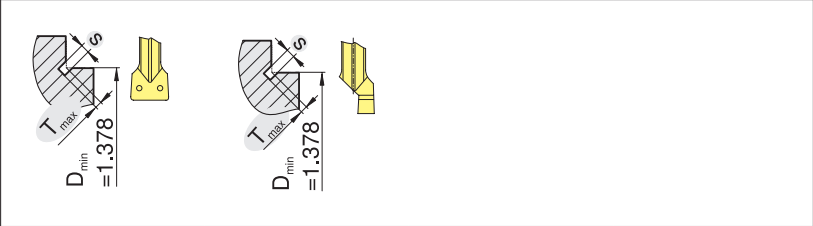


External recessing

Modular system – external, assembly size 25



Matching products see right-hand side.

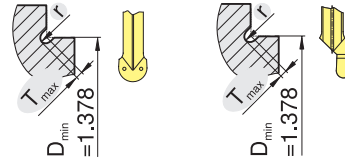


		h/d _A [inch]		Type, description
A160		1.000	R	MSS-E25R45-16-E
	45			

		S [inch]	T _{max} [inch]		Type, description	
A166 	.039	.045	L	MSS-E25L03-GX16-2	GX16-2..R/L	A144
	.047	.053	L	MSS-E25L03-GX16-2	GX16-2..R/L	A144
	.055	.060	L	MSS-E25L03-GX16-2	GX16-2..R/L	A144
	.067	.072	L	MSS-E25L03-GX16-2	GX16-2..R/L	A144
	.077	.081	L	MSS-E25L03-GX16-2	GX16-2..R/L	A144
	.089	.093	L	MSS-E25L03-GX16-2	GX16-2..R/L	A144
	.118	.118	L	MSS-E25L03-GX16-2	GX16-2..	A144
	.128	.118	L	MSS-E25L03-GX16-2	GX16-2..	A144
	.138	.118	L	MSS-E25L03-GX16-2	GX16-2..	A144
	.157	.118	L	MSS-E25L03-GX16-2	GX16-3..	A144
	.167	.118	L	MSS-E25L03-GX16-2	GX16-3..	A144
	.177	.118	L	MSS-E25L03-GX16-2	GX16-3..	A144
	.197	.118	L	MSS-E25L03-GX16-2	GX16-3..	A144
	.207	.118	L	MSS-E25L03-GX16-2	GX16-4..	A144
.236	.118	L	MSS-E25L03-GX16-2	GX16-4..	A144	

		h/d _A [inch]		Type, description
A160		1.000	L	MSS-E25L45-16-E
	45			

		s [inch]	T _{max} [inch]		Type, description	
A166 	.039	.045	R	MSS-E25R03-GX16-2	GX16-2..R/L	A144
	.047	.053	R	MSS-E25R03-GX16-2	GX16-2..R/L	A144
	.055	.060	R	MSS-E25R03-GX16-2	GX16-2..R/L	A144
	.067	.072	R	MSS-E25R03-GX16-2	GX16-2..R/L	A144
	.077	.081	R	MSS-E25R03-GX16-2	GX16-2..R/L	A144
	.089	.093	R	MSS-E25R03-GX16-2	GX16-2..R/L	A144
	.118	.118	R	MSS-E25R03-GX16-2	GX16-2..	A144
	.128	.118	R	MSS-E25R03-GX16-2	GX16-2..	A144
	.138	.118	R	MSS-E25R03-GX16-2	GX16-2..	A144
	.157	.118	R	MSS-E25R03-GX16-2	GX16-3..	A144
	.167	.118	R	MSS-E25R03-GX16-2	GX16-3..	A144
	.177	.118	R	MSS-E25R03-GX16-2	GX16-3..	A144
	.197	.118	R	MSS-E25R03-GX16-2	GX16-3..	A144
	.207	.118	R	MSS-E25R03-GX16-2	GX16-4..	A144
.236	.118	R	MSS-E25R03-GX16-2	GX16-4..	A144	



		h/d_A [inch]		Type, description
A160		1.000	R	MSS-E25R45-16-E
	45			

		r [inch]	T_{max} [inch]		Type, description	
A166		.031	.070	L	MSS-E25L03-GX16-2	GX16-2..R/L A145
		.039	.086	L	MSS-E25L03-GX16-2	GX16-2..R/L A145
		.047	.102	L	MSS-E25L03-GX16-2	GX16-2..R/L A145
		.059	.118	L	MSS-E25L03-GX16-2	GX16-2.. A145
		.079	.118	L	MSS-E25L03-GX16-2	GX16-3.. A145
		.098	.118	L	MSS-E25L03-GX16-2	GX16-3.. A145
		.118	.118	L	MSS-E25L03-GX16-2	GX16-4.. A145

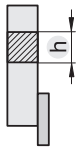
		h/d_A [inch]		Type, description
A160		1.000	L	MSS-E25L45-16-E
	45			

		r [inch]	T_{max} [inch]		Type, description	
A166		.031	.070	R	MSS-E25R03-GX16-2	GX16-2..R/L A145
		.039	.086	R	MSS-E25R03-GX16-2	GX16-2..R/L A145
		.047	.102	R	MSS-E25R03-GX16-2	GX16-2..R/L A145
		.059	.118	R	MSS-E25R03-GX16-2	GX16-2.. A145
		.079	.118	R	MSS-E25R03-GX16-2	GX16-3.. A145
		.098	.118	R	MSS-E25R03-GX16-2	GX16-3.. A145
		.118	.118	R	MSS-E25R03-GX16-2	GX16-4.. A145



Thread turning – external

Modular system – external, assembly size 20



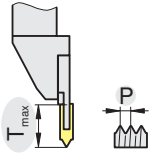
Matching products see right-hand side.

		h/d_A [inch]		Type, description
A158		.625	R	MSS-E20R00-10-E
		.750	R	MSS-E20R00-12-E
		0		
A159		.750	L	MSS-E20L90-12-E
		90		

Application

Tools and inserts for parting and grooving

		h/d_A [inch]		Type, description
A158		.625	L	MSS-E20L00-10-E
		.750	L	MSS-E20L00-12-E
		0		
A159		.750	R	MSS-E20R90-12-E
		90		



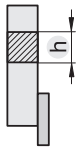
		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [inch]		Type, description		
A193		.50	1.50	48	16	.315	R	MSS-E20R-TC16-1	TC16-1..	A151
		1.75	3.00	14	8	.472	N	MSS-E20N-TC16-2	TC16-2..	A151

		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [inch]		Type, description		
A193		.50	1.50	48	16	.315	L	MSS-E20L-TC16-1	TC16-1..	A151
		1.75	3.00	14	8	.472	N	MSS-E20N-TC16-2	TC16-2..	A151



Thread turning – external

Modular system – external, assembly size 25



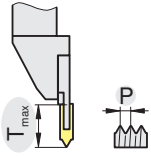
Matching products see right-hand side.

		h/d_A [inch]		Type, description
A158		1.000	R	MSS-E25R00-16-E
		0		
A159		1.000	L	MSS-E25L90-16-E
		90		
A198		2.480	R	HSK-T63-MSS-E25R00
		3.937	R	HSK-T100-MSS-E25R00
		0		

Application

		h/d_A [inch]		Type, description
A158		1.000	L	MSS-E25L00-16-E
		0		
A159		1.000	R	MSS-E25R90-16-E
		90		
A198		3.937	L	HSK-T100-MSS-E25L00
		2.480	L	HSK-T63-MSS-E25L00
		0		

Tools and inserts for parting and grooving

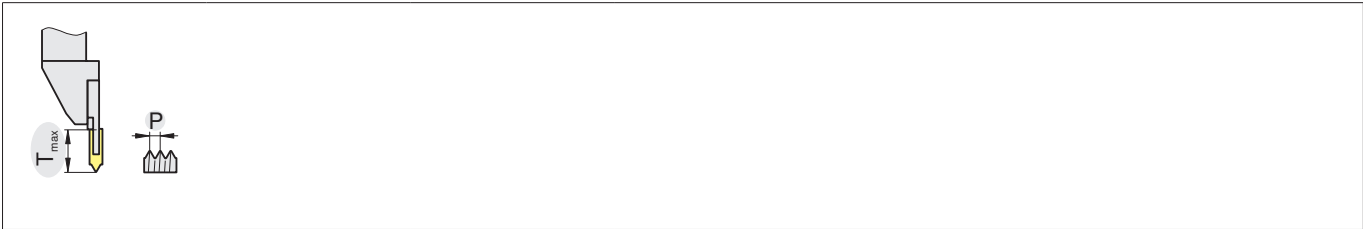


		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [inch]		Type, description		
A193		.50	1.50	48	16	.315	R	MSS-E25R-TC16-1	TC16-1..	A151
		1.75	3.00	14	8	.394	R	MSS-E25R-TC16-2	TC16-2..	A151
		3.50	5.00	7	5	.472	N	MSS-E25N-TC16-3	TC16-3..	A151

		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [inch]		Type, description		
A193		.50	1.50	48	16	.315	L	MSS-E25L-TC16-1	TC16-1..	A151
		1.75	3.00	14	8	.394	L	MSS-E25L-TC16-2	TC16-2..	A151
		3.50	5.00	7	5	.472	N	MSS-E25N-TC16-3	TC16-3..	A151



Thread turning – external
Monoblock tools – TC



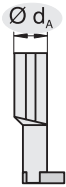
		h [inch]	P _{min} [mm]	P _{max} [mm]	P _{min} [TPI]	P _{max} [TPI]	T _{max} [inch]	L R	Type, description		
A194		.500	.50	3.00	48	8	.394	R	E12R00-08-TC16-E	TC16-1/2..	
		.500	.50	3.00	48	8	.394	L	E12L00-08-TC16-E	TC16-1/2..	





Thread turning – internal

Modular system – internal, assembly size 32



Matching products see right-hand side.

		d _A [inch]		Type, description
A185	 1.5D	1.250	R	MSS-I32R90-1.5D-E
A186	 2.5D	1.500	R	MSS-I32R90-2.5D-E

Application

Tools and inserts for parting and grooving

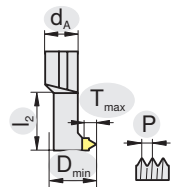
		d _A [inch]		Type, description
A185	 1.5D	1.250	L	MSS-I32L90-1.5D-E
A186	 2.5D	1.500	L	MSS-I32L90-2.5D-E

Thread turning – internal

Modular system – internal, assembly size 32



A133



		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	D_{min} [inch]	T_{max} [inch]		Type, description		
A195		.50	1.50	48	16	1.575	.276	L	MSS-I32L-TC16-1	TC16-1..	A151
		1.75	3.00	14	8	1.575	.276	L	MSS-I32L-TC16-2	TC16-2..	A151
		3.50	5.00	7	5	1.575	.276	N	MSS-I32N-TC16-3	TC16-3..	A151

		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	D_{min} [inch]	T_{max} [inch]		Type, description		
A195		.50	1.50	48	16	1.575	.276	R	MSS-I32R-TC16-1	TC16-1..	A151
		1.75	3.00	14	8	1.575	.276	R	MSS-I32R-TC16-2	TC16-2..	A151
		3.50	5.00	7	5	1.575	.276	N	MSS-I32N-TC16-3	TC16-3..	A151

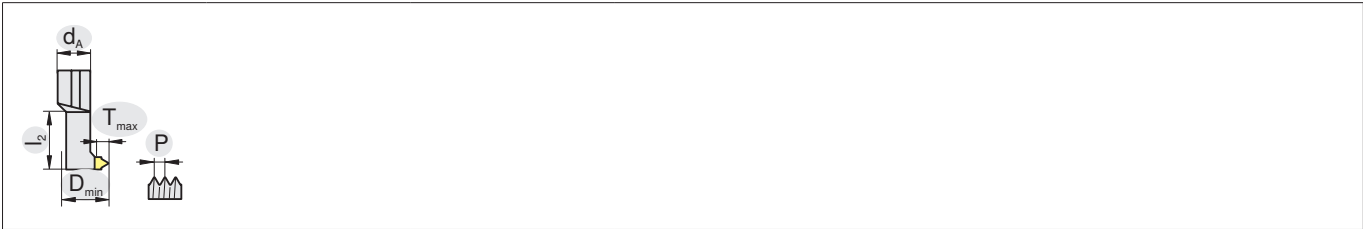
Application

Tools and inserts for parting and grooving

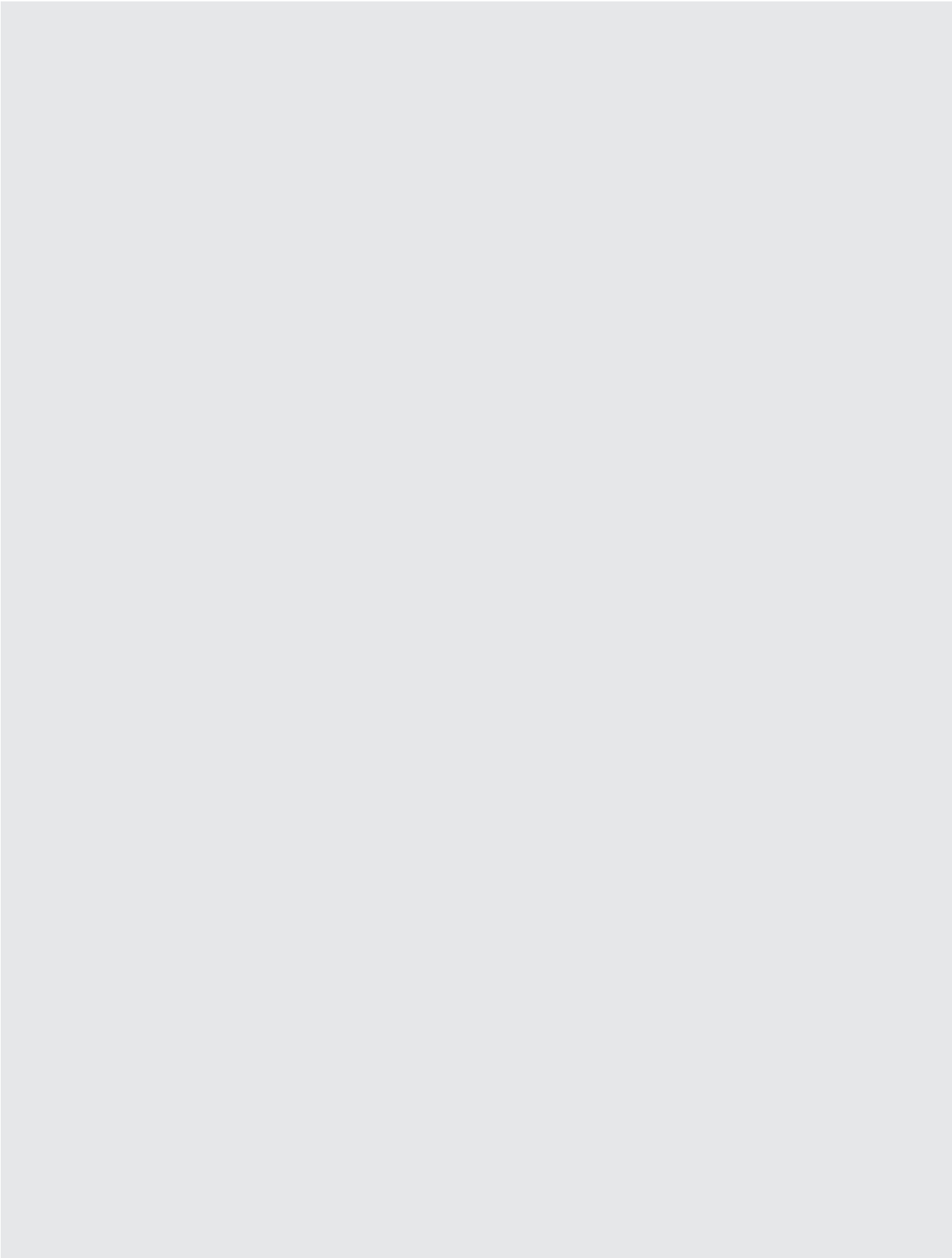


Thread turning – internal

Monoblock boring bars – TC



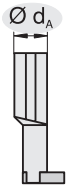
		D _{min} [inch]	d _A [inch]	l ₂ [inch]	T _{max} [inch]	P _{min} [mm]	P _{max} [mm]	P _{min} [TPI]	P _{max} [TPI]		Type, description		
A196		.787	.750	1.339	.157	.50	3.00	48	8		I16L90-2D-TC16-E	TC16-1/2..	A151
		.787	.750	1.339	.157	.50	3.00	48	8		I16R90-2D-TC16-E	TC16-1/2..	A151
		.984	1.000	1.654	.197	.50	5.00	48	5		I20R90-2D-TC16-E	TC16-..	A151
		.984	1.000	1.654	.197	.50	5.00	48	5		I20L90-2D-TC16-E	TC16-..	A151
		1.260	1.250	2.047	.236	.50	5.00	48	5		I25R90-2D-TC16-E	TC16-..	A151
		1.260	1.250	2.047	.236	.50	5.00	48	5		I25L90-2D-TC16-E	TC16-..	A151





Thread milling – external

Boring bars – TC



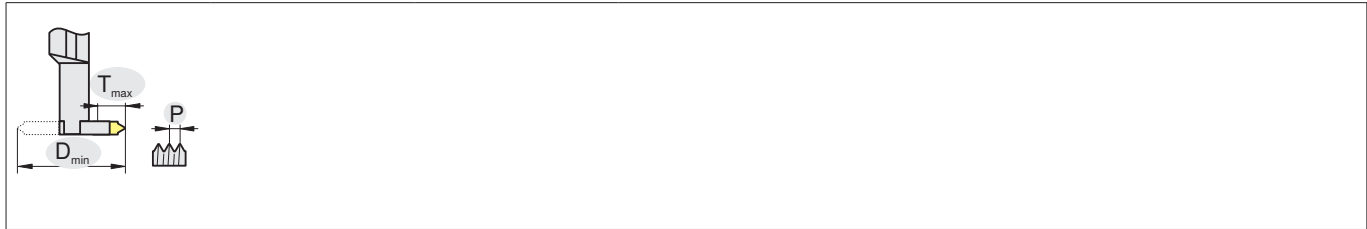
Matching products see right-hand side.

		d _A [inch]	 L R	Type, description
A185	 1.5D	1.250	R	MSS-I32R90-1.5D-E

		d _A [inch]	 L R	Type, description
A186	 2.5D	1.500	R	MSS-I32R90-2.5D-E

Application

Tools and inserts for parting and grooving



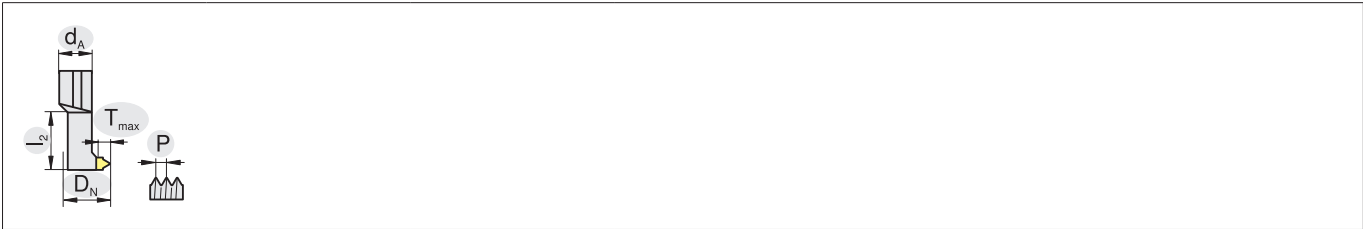
		D _{min} [inch]	P _{min} [mm]	P _{max} [mm]	P _{min} [TPI]	P _{max} [TPI]	T _{max} [inch]		Type, description		
A195		1.732	3.50	5.00	7	5	.276	N	MSS-I32N-TC16-3	TC16-3..	A151
		1.732	1.75	3.00	14	8	.276	R	MSS-I32R-TC16-2	TC16-2..	A151

		D _{min} [inch]	P _{min} [mm]	P _{max} [mm]	P _{min} [TPI]	P _{max} [TPI]	T _{max} [inch]		Type, description		
A195		2.323	3.50	5.00	7	5	.276	N	MSS-I32N-TC16-3	TC16-3..	A151
		2.323	1.75	3.00	14	8	.276	R	MSS-I32R-TC16-2	TC16-2..	A151



Thread milling – external

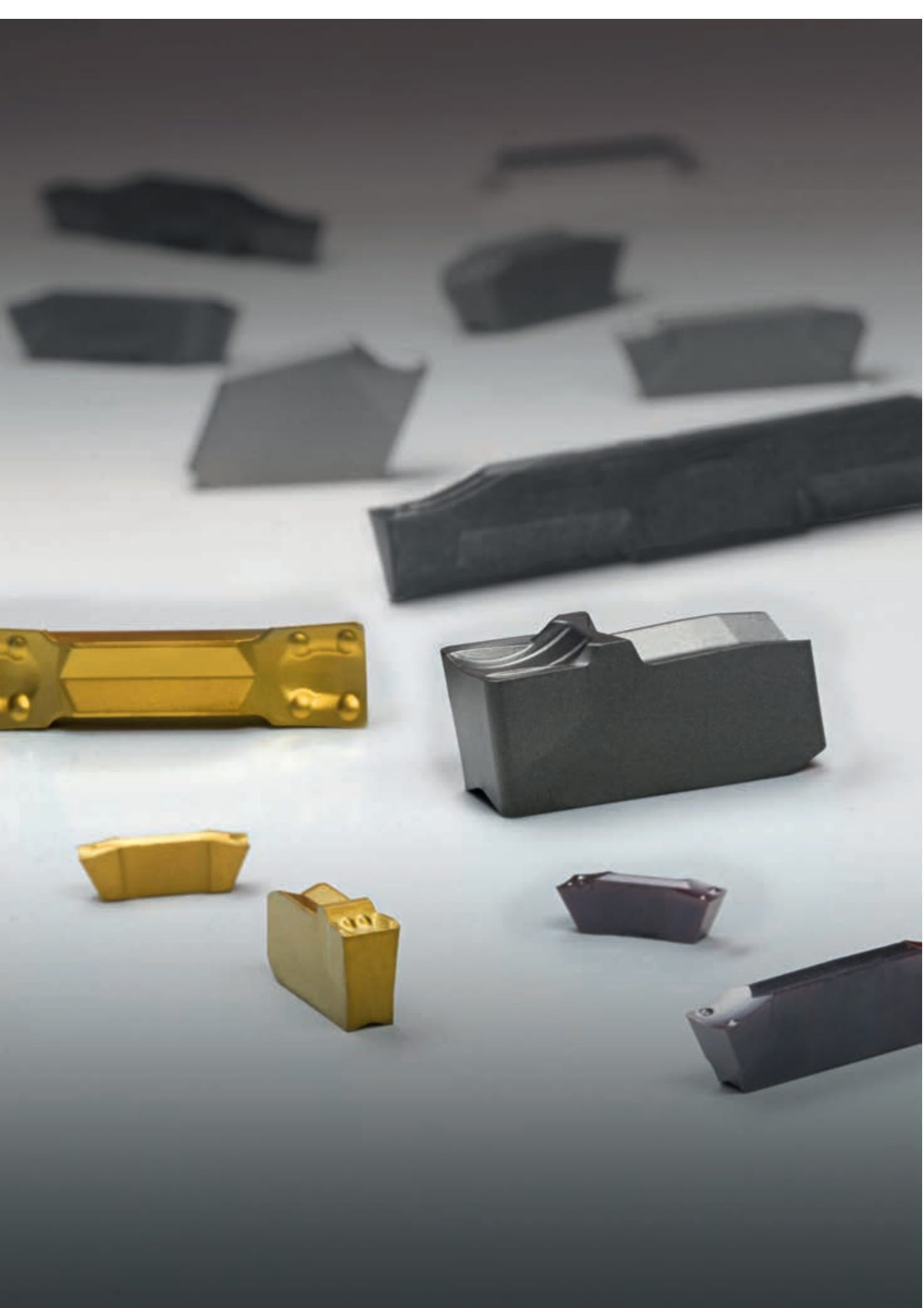
Thread milling cutters – TC



		d _A [inch]	D _N [inch]	l ₂ [inch]	T _{max} [inch]	P _{min} [mm]	P _{max} [mm]	P _{min} [TPI]	P _{max} [TPI]	 L R	Type, description		
A197		1.000	.984	2.13	.118	.50	5.00	28	5	R	I25R90-2D-TC16-W-E	TC16-..	A151
		1.250	1.260	2.68	.138	.50	5.00	28	5	R	I32R90-2D-TC16-W-E	TC16-..	A151

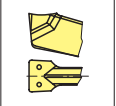
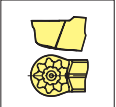
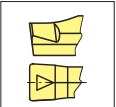
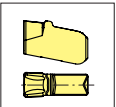
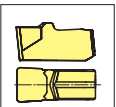
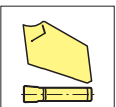
Application

Tools and inserts for parting and grooving





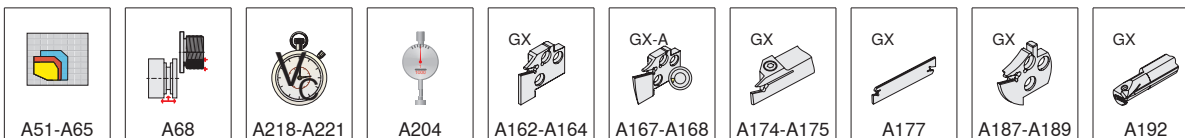
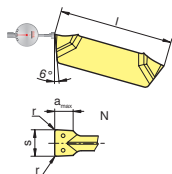
Parting and grooving inserts

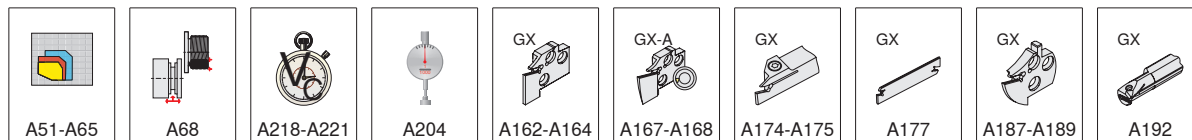
	System GX-E	A142-A143
	System GX-S	A144
	System GX-R	A145
	System AX	A146
	System SX	A147
	System LX	A148
	System FX	A149

Threading inserts

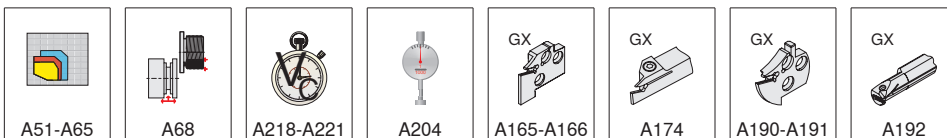
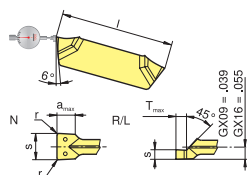
	Partial profile 60° / 55°	A152-A153
	Full profile 60° / 55°	A150-A151

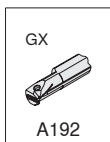
		P M K N S H																			
		H216T TSM20 CTW7120 S40T CTC1325 SR127 GM127 CTP1340 CTCP335 CTPP345 CTD4110																			
												LNR	s	l	r	a _{max}					
													[inch]	[inch]	[inch]	[inch]					
-F2		GX09-1E2.00N0.20-F2										N	.079	.354	.008	.079					
		GX09-1E2.50N0.20-F2										N	.098	.354	.008	.079					
		GX09-2E3.00N0.30-F2										N	.118	.354	.012	.098					
		GX16-1E2.00N0.20-F2										N	.079	.630	.008	.079					
		GX16-2E3.00N0.30-F2										N	.118	.630	.012	.098					
		GX16-3E4.00N0.40-F2										N	.157	.630	.016	.118					
		GX16-3E5.00N0.40-F2										N	.197	.630	.016	.118					
		GX24-2E3.00N0.30-F2										N	.118	.945	.012	.098					
		GX24-2E3.50N0.30-F2										N	.138	.945	.012	.098					
		GX24-3E4.00N0.40-F2										N	.157	.945	.016	.118					
		GX24-3E4.50N0.40-F2										N	.177	.945	.016	.118					
		GX24-3E5.00N0.40-F2										N	.197	.945	.016	.118					
GX24-4E6.00N0.50-F2										N	.236	.945	.020	.138							
EN		GX09-1E2.00N0.20										N	.079	.354	.008	.059					
		GX09-1E2.50N0.20										N	.098	.354	.008	.059					
		GX09-2E3.00N0.30										N	.118	.354	.012	.079					
		GX09-2E3.50N0.30										N	.138	.354	.012	.079					
		GX16-1E2.00N0.20										N	.079	.630	.008	.079					
		GX16-1E2.50N0.20										N	.098	.630	.008	.079					
		GX16-2E3.00N0.30										N	.118	.630	.012	.098					
		GX16-2E3.00N0.50										N	.118	.630	.020	.098					
		GX16-2E3.50N0.30										N	.138	.630	.012	.098					
		GX16-3E4.00N0.40										N	.157	.630	.016	.118					
		GX16-3E4.00N0.60										N	.157	.630	.024	.118					
		GX16-3E4.50N0.40										N	.177	.630	.016	.118					
		GX16-3E5.00N0.40										N	.197	.630	.016	.118					
		GX16-3E5.00N0.60										N	.197	.630	.024	.118					
		GX16-4E6.00N0.50										N	.236	.630	.020	.138					
		GX16-4E6.00N0.80										N	.236	.630	.031	.138					
		GX24-2E3.00N0.30										N	.118	.945	.012	.098					
		GX24-3E4.00N0.40										N	.157	.945	.016	.118					
GX24-3E5.00N0.40										N	.197	.945	.016	.118							
GX24-4E6.00N0.50										N	.236	.945	.020	.138							
-M40		GX09-1E2.00N0.20-M40										N	.079	.354	.008	.059					
		GX09-2E3.00N0.30-M40										N	.118	.354	.012	.079					
		GX16-1E2.00N0.20-M40										N	.079	.630	.008	.079					
		GX16-2E3.00N0.30-M40										N	.118	.630	.012	.118					
		GX16-3E4.00N0.40-M40										N	.157	.630	.016	.138					
		GX16-3E5.00N0.40-M40										N	.197	.630	.016	.138					
		GX16-4E6.00N0.50-M40										N	.236	.630	.020	.157					
		GX24-2E3.00N0.30-M40										N	.118	.945	.012	.138					
		GX24-3E4.00N0.40-M40										N	.157	.945	.016	.157					
		GX24-3E5.00N0.40-M40										N	.197	.945	.016	.157					
		GX24-4E6.00N0.50-M40										N	.236	.945	.020	.157					
						</															

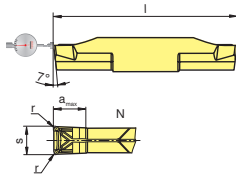




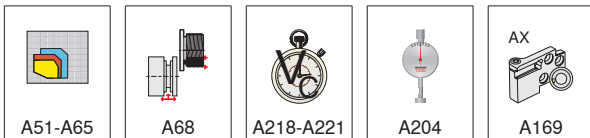
		P M K N S H																		
		H216T	TSM20	CTW7120	S40T	CTC1325	SR127	GM127	CTP1340	CTCP335	CTPP345	CTD4110								
												LNR	s	s ₁	s ₂	l	r	T _{max}	a _{max}	
													[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	
ER-EL		GX09-1S0.60L					●	●	●	●	●			L	.024	.016	.020	.354	.030	
		GX09-1S0.60R					●	●	●	●	●			R	.024	.016	.020	.354	.030	
		GX09-1S0.80L					●	●	●	●	●			L	.031	.024	.028	.354	.037	
		GX09-1S0.80R					●	●	●	●	●			R	.031	.024	.028	.354	.037	
		GX09-1S0.90L					●	●	●	●	●			L	.035	.028	.031	.354	.041	
		GX09-1S0.90R					●	●	●	●	●			R	.035	.028	.031	.354	.041	
		GX09-1S1.00L					●	●	●	●	●			L	.039	.031	.035	.354	.045	
		GX09-1S1.00R					●	●	●	●	●			R	.039	.031	.035	.354	.045	
		GX09-1S1.20L					●	●	●	●	●			L	.047	.039	.043	.354	.053	
		GX09-1S1.20R					●	●	●	●	●			R	.047	.039	.043	.354	.053	
		GX09-1S1.40L					●	●	●	●	●			L	.055	.047	.051	.354	.060	
		GX09-1S1.40R					●	●	●	●	●			R	.055	.047	.051	.354	.060	
		GX09-1S1.70L					●	●	●	●	●			L	.067	.059	.063	.354	.072	
		GX09-1S1.70R					●	●	●	●	●			R	.067	.059	.063	.354	.072	
		GX16-2S0.60L					●	●	●	●	●			L	.024	.016	.020	.630	.030	
		GX16-2S0.60R					●	●	●	●	●			R	.024	.016	.020	.630	.030	
		GX16-2S0.80L					●	●	●	●	●			L	.031	.024	.028	.630	.037	
		GX16-2S0.80R					●	●	●	●	●			R	.031	.024	.028	.630	.037	
		GX16-2S0.90L					●	●	●	●	●			L	.035	.028	.031	.630	.041	
		GX16-2S0.90R					●	●	●	●	●			R	.035	.028	.031	.630	.041	
		GX16-2S1.00L					●	●	●	●	●			L	.039	.031	.035	.630	.045	
		GX16-2S1.00R					●	●	●	●	●			R	.039	.031	.035	.630	.045	
		GX16-2S1.20L					●	●	●	●	●			L	.047	.039	.043	.630	.053	
		GX16-2S1.20R					●	●	●	●	●			R	.047	.039	.043	.630	.053	
		GX16-2S1.40L					●	●	●	●	●			L	.055	.047	.051	.630	.060	
		GX16-2S1.40R					●	●	●	●	●			R	.055	.047	.051	.630	.060	
		GX16-2S1.70L					●	●	●	●	●			L	.067	.059	.063	.630	.072	
		GX16-2S1.70R					●	●	●	●	●			R	.067	.059	.063	.630	.072	
		GX16-2S1.95L					●	●	●	●	●			L	.077	.069	.073	.630	.081	
		GX16-2S1.95R					●	●	●	●	●			R	.077	.069	.073	.630	.081	
		GX16-2S2.25L					●	●	●	●	●			L	.089	.079	.085	.630	.093	
		GX16-2S2.25R					●	●	●	●	●			R	.089	.079	.085	.630	.093	
EN		GX09-1S1.95N					●	●	●	●			N	.077	.069	.073	.354	.004	.276	.079
		GX09-1S2.25N					●	●	●	●			N	.089	.079	.085	.354	.004	.276	.079
		GX09-2S2.75N					●	●	●	●			N	.108	.098	.104	.354	.004	.276	.079
		GX09-2S3.25N					●	●	●	●			N	.128	.118	.124	.354	.004	.276	.079
		GX16-2S2.75N					●	●	●	●			N	.108	.098	.104	.630	.004	.472	.118
		GX16-2S3.25N					●	●	●	●			N	.128	.118	.124	.630	.004	.472	.118
		GX16-3S4.25N					●	●	●	●			N	.167	.157	.163	.630	.008	.472	.138
		GX16-4S5.25N					●	●	●	●			N	.207	.197	.203	.630	.008	.472	.157
		H216T	TSM20	CTW7120	S40T	CTC1325	SR127	GM127	CTP1340	CTCP335	CTPP345	CTD4110								
		LNR	s	s ₁	s ₂	l	r	T _{max}	a _{max}											

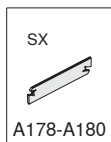


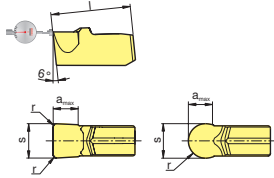
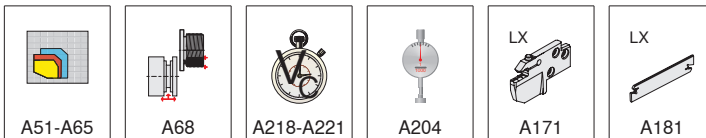


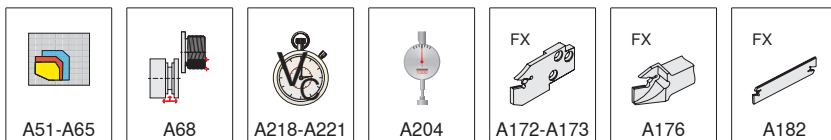


-F50		AX05-E3.00N0.30-10-F50																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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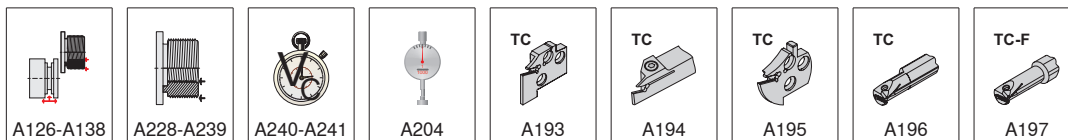


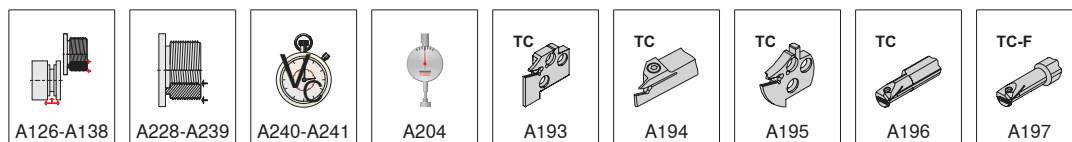


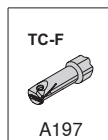
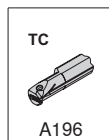
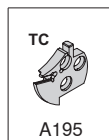
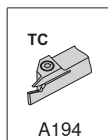
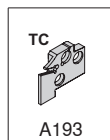
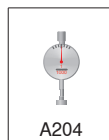
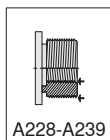
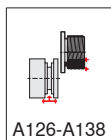
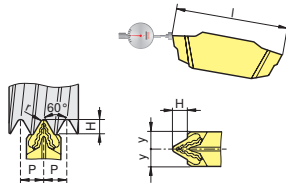
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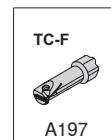
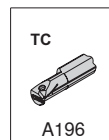
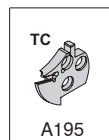
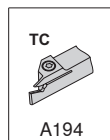
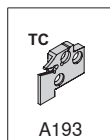
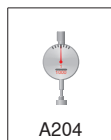
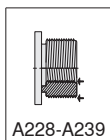
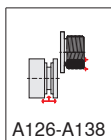
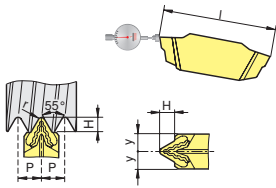
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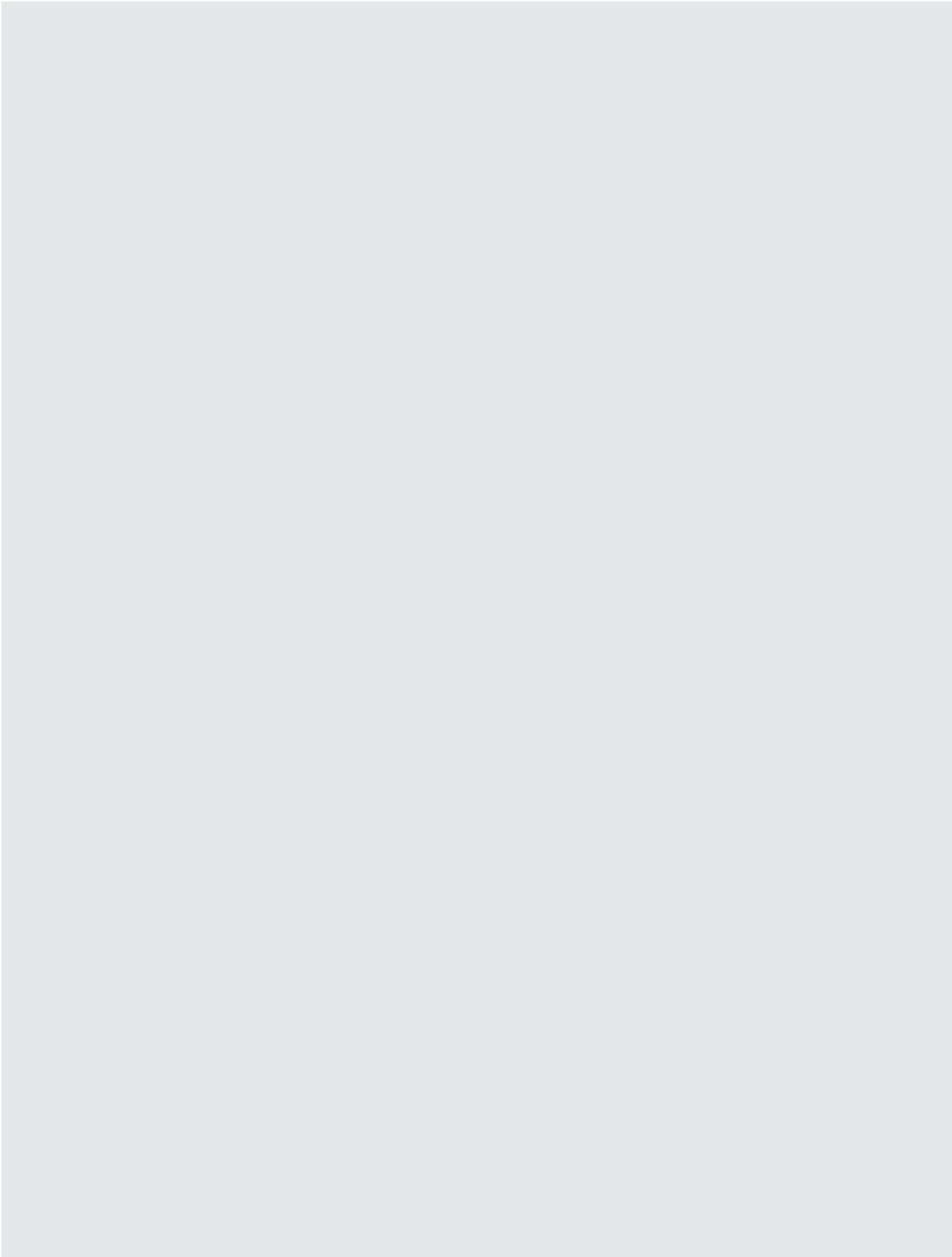




[illegible]

		P M K N S H																
		H216T GM213 GM240											P_{min} [TPI]	l [inch]	r [inch]	H [inch]	y [inch]	
-27P		TC16-1 EI 19 W-27P	●											19	.630	.007	.035	.041
		TC16-2 EI 11 W-27P	●											11	.630	.012	.060	.085
		TC16-2 EI 14 W-27P	●											14	.630	.009	.047	.085
EN		TC16-1 EI 16 W	●	●										16	.630	.008	.042	.041
		TC16-1 EI 18 W	●	●										18	.630	.007	.037	.041
		TC16-1 EI 19 W	●	●										19	.630	.007	.035	.041
		TC16-1 EI 20 W	●	●										20	.630	.006	.033	.041
		TC16-1 EI 24 W	●	●										24	.630	.005	.028	.041
		TC16-1 EI 26 W	●	●										26	.630	.005	.026	.041
		TC16-1 EI 28 W	●	●										28	.630	.005	.024	.041
		TC16-2 EI 10 W	●	●										10	.630	.013	.066	.085
		TC16-2 EI 11 W	●	●										11	.630	.012	.060	.085
		TC16-2 EI 12 W	●	●										12	.630	.011	.055	.085
		TC16-2 EI 14 W	●	●										14	.630	.009	.047	.085
		TC16-2 EI 8 W	●	●										8	.630	.016	.083	.085
		TC16-2 EI 9 W	●	●										9	.630	.014	.074	.085
		TC16-3 EI 5 W	●	●										5	.630	.025	.133	.122
		TC16-3 EI 6 W	●	●										6	.630	.021	.111	.122
TC16-3 EI 7 W	●	●										7	.630	.018	.095	.122		
		H216T GM213 GM240											P_{min}	l	r	H	y	







Tool holders

	MSS 0°	A158
	MSS 90°	A159
	MSS 45°	A160
	Adapters	A161

Modules - external

	SX	A170
	LX	A171
	FX	A172
	FX long	A173

Modules - external

	GX09	A162
	GX16	A163
	GX24	A164
	GX09	A165
	GX16	A166
	GX24 axial	A167
	GX axial long	A168
	AX	A169

Monoblock tool holders

	GX09	A174
	GX24	A175
	FX	A176

Blades, clamping blocks

	GX24	A177
	SX	A178
	SX reinforced	A179-A180
	LX	A181

Blades, clamping blocks

	FX	A182
	SBN...K	A183
	SBN...KS	A184

Boring bars

	1.5 x D	A185
	2.5 x D	A186

Modules - internal

	GX09	A187
	GX16	A188
	GX24	A189
	GX09	A190
	GX16	A191

Monoblock boring bars

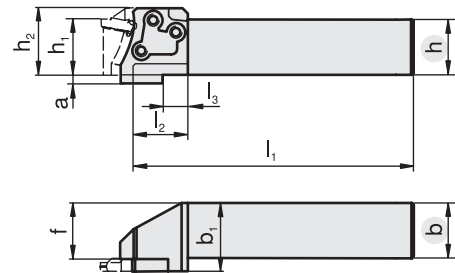
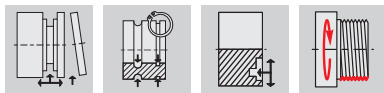
	GX09	A192
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Threading - monoblock tools and modules

	TC16	A193
	TC monoblock	A194
	TC16	A195
	TC monoblock	A196
	TC milling cutter	A197

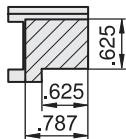
HSK-T tool holders

	HSK-T 0°	A198
	HSK-T 90°	A199



Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	h [inch]	b [inch]	h ₁ [inch]	h ₂ [inch]	b ₁ [inch]	l ₁ [inch]	l ₂ [inch]	l ₃ [inch]	a [inch]	f [inch]		
12	MSS-E12R00-08-E	R	.500	.500	.500	.598	.650	3.0	.472			.512	MSS-E12R..	E01
12	MSS-E12L00-08-E	L	.500	.500	.500	.598	.650	3.0	.472			.512	MSS-E12L..	E01
16	MSS-E16R00-10-E	R	.625	.625	.625	.763	.787	3.5	.630			.650	MSS-E16R..	E02
16	MSS-E16L00-10-E	L	.625	.625	.625	.763	.787	3.5	.630			.650	MSS-E16L..	E02
20	MSS-E20R00-10-E	R	.625	.787	.625	.955	.955	3.5	.787			.793	MSS-E20R..	E03
20	MSS-E20R00-12-E	R	.750	.750	.750	.955	.955	4.5	.787	.394	.077	.793	MSS-E20R..	E03
20	MSS-E20L00-10-E	L	.625	.787	.625	.955	.955	3.5	.787			.793	MSS-E20L..	E03
20	MSS-E20L00-12-E	L	.750	.750	.750	.955	.955	4.5	.787	.394	.077	.793	MSS-E20L..	E03
25	MSS-E25R00-16-E	R	1.000	1.000	1.000	1.236	1.236	5.5	.984			1.020	MSS-E25R..	E04
25	MSS-E25L00-16-E	L	1.000	1.000	1.000	1.236	1.236	5.5	.984			1.020	MSS-E25L..	E04
32	MSS-E32R00-85-E	R	1.250	1.000	1.250	1.236	1.236	6.5	1.260			1.020	MSS-E32R..	E05
32	MSS-E32R00-20-E	R	1.250	1.250	1.250	1.496	1.496	7.0	1.260	.630	.118	1.279	MSS-E32R..	E05
32	MSS-E32L00-85-E	L	1.250	1.000	1.250	1.236	1.236	6.5	1.260			1.020	MSS-E32L..	E05
32	MSS-E32L00-20-E	L	1.250	1.250	1.250	1.496	1.496	7.0	1.260	.630	.118	1.279	MSS-E32L..	E05

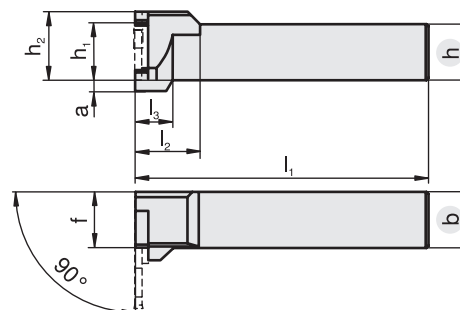
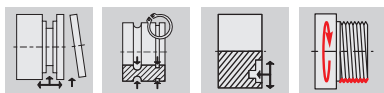


valid only for:

MSS-E20R/L00-10-E

			
E01	228617	56656	
E02	228620		220983
E03	195068		220983
E04	195069		220985
E05	195070		200317

								
A162-A164	A165-A166	A167-A168	A169	A170	A171	A172-A173	A193	A209



Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	h [inch]	b [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	l ₂ [inch]	l ₃ [inch]	a [inch]	f [inch]		
20	MSS-E20R90-12-E	R	.750	.750	.750	.907	4.5	.783	.287	.077	.787	MSS-E20L...	E01
20	MSS-E20L90-12-E	L	.750	.750	.750	.907	4.5	.783	.287	.077	.787	MSS-E20R...	E01
25	MSS-E25R90-16-E	R	1.000	1.000	1.000	1.197	5.5	1.098			1.000	MSS-E25L...	E02
25	MSS-E25L90-16-E	L	1.000	1.000	1.000	1.197	5.5	1.098			1.000	MSS-E25R...	E02
32	MSS-E32R90-20-E	R	1.250	1.250	1.250	1.528	8.0	1.339	.756	.118	1.260	MSS-E32L...	E03
32	MSS-E32R90-85-E	R	1.250	1.000	1.250	1.486	6.5	1.339			1.260	MSS-E32L...	E03
32	MSS-E32L90-85-E	L	1.250	1.000	1.250	1.486	6.5	1.339			1.260	MSS-E32R...	E03
32	MSS-E32L90-20-E	L	1.250	1.250	1.250	1.528	8.0	1.339	.756	.118	1.260	MSS-E32R...	E03

Tools

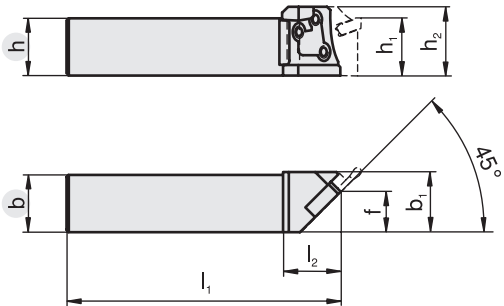
Tools and inserts for parting and grooving

		
E01	195068	220983
E02	195069	220985
E03	195070	200317

								
A162-A164	A165-A166	A167-A168	A169	A170	A171	A172-A173	A193	A209



MSS shanks
45°



Picture shows right-hand version

Bgr. [mm]	Type, description												
			h [inch]	b [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	l ₂ [inch]	l ₃ [inch]	a [inch]	f [inch]		
20	MSS-E20R45-12-E	R	.750	.750	.750	.984	4.5	.787	.771	.077	.571	MSS-E20L...	E01
20	MSS-E20L45-12-E	L	.750	.750	.750	.984	4.5	.787	.771	.077	.571	MSS-E20R...	E01
25	MSS-E25R45-16-E	R	1.000	1.000	1.000	1.197	5.5	.984			.709	MSS-E25L...	E02
25	MSS-E25L45-16-E	L	1.000	1.000	1.000	1.197	5.5	.984			.709	MSS-E25R...	E02

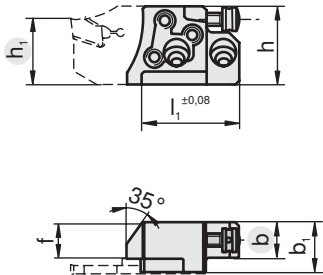
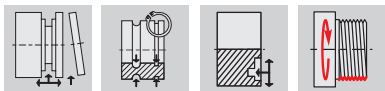
Tools

Tools and inserts for parting and grooving

E01	219981	195068	220983
E02	219982	195069	220985

A165-A166

A209



Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	h_1 [inch]	b [inch]	h [inch]	b_1 [inch]	l_1 [inch]	f [inch]		
20	MSS-E20R00-AD	R	.787	.421	.945	.602	1.181	.441	MSS-E20R..	E01
20	MSS-E20L00-AD	L	.787	.421	.945	.602	1.181	.441	MSS-E20L..	E01
25	MSS-E25R00-AD	R	.984	.496	1.181	.732	1.457	.516	MSS-E25R..	E02
25	MSS-E25L00-AD	L	.984	.496	1.181	.732	1.457	.516	MSS-E25L..	E02
32	MSS-E32R00-AD	R	1.260	.575	1.496	.811	1.811	.594	MSS-E32R..	E03
32	MSS-E32L00-AD	L	1.260	.575	1.496	.811	1.811	.594	MSS-E32L..	E03

Tools

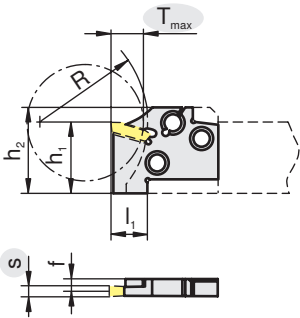
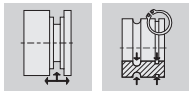
Tools and inserts for parting and grooving

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

 A162-A164	 A165-A166	 A167-A168	 A169	 A170	 A171	 A172-A173	 A193	 A209
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MSS modules – external
Grooving and turning – GX09



Picture shows right-hand version

Bgr. [mm]	Type, description	L N R 									
			s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	f [inch]	R [inch]	
12	MSS-E12R07-GX09-1	R	.079	.108	.276	.472	.571	.315	.124	.709	GX09-1..
12	MSS-E12R07-GX09-2	R	.109	.148	.276	.472	.571	.315	.124	.709	GX09-2..
12	MSS-E12L07-GX09-1	L	.079	.108	.276	.472	.571	.315	.124	.709	GX09-1..
12	MSS-E12L07-GX09-2	L	.109	.148	.276	.472	.571	.315	.124	.709	GX09-2..
16	MSS-E16R07-GX09-1	R	.079	.108	.276	.630	.768	.315	.124	.945	GX09-1..
16	MSS-E16R07-GX09-2	R	.109	.148	.276	.630	.768	.315	.124	.945	GX09-2..
16	MSS-E16L07-GX09-1	L	.079	.108	.276	.630	.768	.315	.124	.945	GX09-1..
16	MSS-E16L07-GX09-2	L	.109	.148	.276	.630	.768	.315	.124	.945	GX09-2..

Tools

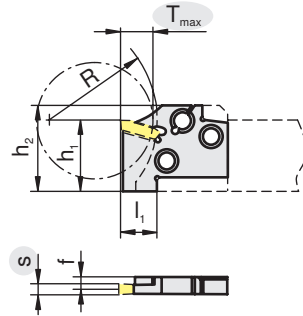
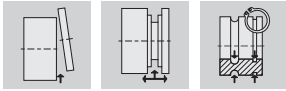
Tools and inserts for parting and grooving


GX-E
A142


GX-S
A144

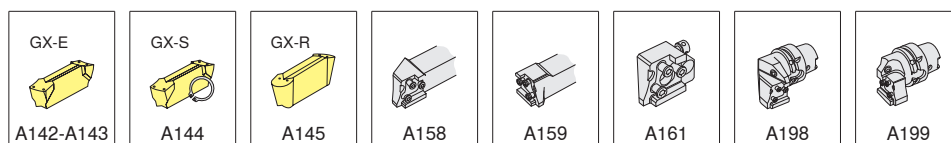

GX-R
A145


A158



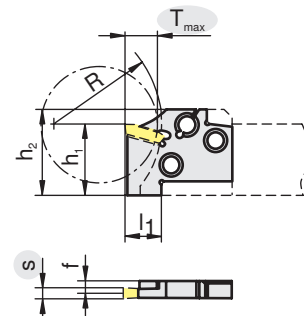
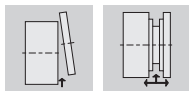
Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	f [inch]	R [inch]	
20	MSS-E20R12-GX16-1	R	.079	.108	.472	.787	.945	.512	.148	1.181	GX16-1..
20	MSS-E20R12-GX16-2	R	.109	.147	.472	.787	.945	.512	.134	1.181	GX16-2..
20	MSS-E20R12-GX16-3	R	.148	.197	.472	.787	.945	.512	.115	1.181	GX16-3..
20	MSS-E20L12-GX16-1	L	.079	.108	.472	.787	.945	.512	.148	1.181	GX16-1..
20	MSS-E20L12-GX16-2	L	.109	.147	.472	.787	.945	.512	.134	1.181	GX16-2..
20	MSS-E20L12-GX16-3	L	.148	.197	.472	.787	.945	.512	.115	1.181	GX16-3..
25	MSS-E25R12-GX16-1	R	.079	.108	.472	.984	1.181	.512	.207	1.476	GX16-1..
25	MSS-E25R12-GX16-2	R	.109	.147	.472	.984	1.181	.512	.193	1.476	GX16-2..
25	MSS-E25R12-GX16-3	R	.148	.197	.472	.984	1.181	.512	.174	1.476	GX16-3..
25	MSS-E25R12-GX16-4	R	.198	.256	.472	.984	1.181	.512	.150	1.476	GX16-4..
25	MSS-E25L12-GX16-1	L	.079	.108	.472	.984	1.181	.512	.207	1.476	GX16-1..
25	MSS-E25L12-GX16-2	L	.109	.147	.472	.984	1.181	.512	.193	1.476	GX16-2..
25	MSS-E25L12-GX16-3	L	.148	.197	.472	.984	1.181	.512	.174	1.476	GX16-3..
25	MSS-E25L12-GX16-4	L	.198	.256	.472	.984	1.181	.512	.150	1.476	GX16-4..
32	MSS-E32R12-GX16-2	R	.109	.147	.472	1.260	1.496	.512	.193	1.890	GX16-2..
32	MSS-E32R12-GX16-3	R	.148	.197	.472	1.260	1.496	.512	.174	1.890	GX16-3..
32	MSS-E32R12-GX16-4	R	.198	.256	.472	1.260	1.496	.512	.150	1.890	GX16-4..
32	MSS-E32L12-GX16-2	L	.109	.147	.472	1.260	1.496	.512	.193	1.890	GX16-2..
32	MSS-E32L12-GX16-3	L	.148	.197	.472	1.260	1.496	.512	.174	1.890	GX16-3..
32	MSS-E32L12-GX16-4	L	.198	.256	.472	1.260	1.496	.512	.150	1.890	GX16-4..



MSS modules – external

Grooving and turning – GX24

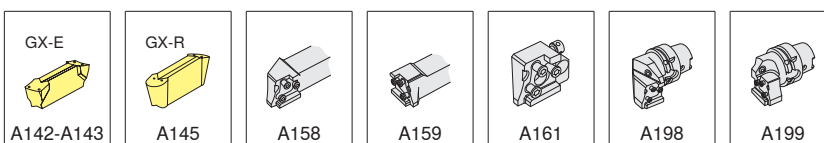


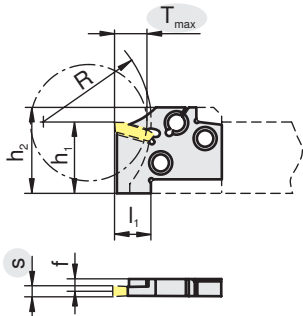
Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	f [inch]	R [inch]	
20	MSS-E20R21-GX24-1	R	.079	.108	.827	.787	.945	.866	.144	1.181	GX24-1..
20	MSS-E20R21-GX24-2	R	.109	.147	.827	.787	.945	.866	.134	1.181	GX24-2..
20	MSS-E20R21-GX24-3	R	.148	.197	.827	.787	.945	.866	.118	1.181	GX24-3..
20	MSS-E20L21-GX24-1	L	.079	.108	.827	.787	.945	.866	.144	1.181	GX24-1..
20	MSS-E20L21-GX24-2	L	.109	.147	.827	.787	.945	.866	.134	1.181	GX24-2..
20	MSS-E20L21-GX24-3	L	.148	.197	.827	.787	.945	.866	.118	1.181	GX24-3..
25	MSS-E25R21-GX24-1	R	.079	.108	.827	.984	1.181	.866	.203	1.476	GX24-1..
25	MSS-E25R21-GX24-2	R	.109	.147	.827	.984	1.181	.866	.193	1.476	GX24-2..
25	MSS-E25R21-GX24-3	R	.148	.197	.827	.984	1.181	.866	.175	1.476	GX24-3..
25	MSS-E25R21-GX24-4	R	.198	.256	.827	.984	1.181	.866	.150	1.476	GX24-4..
25	MSS-E25L21-GX24-1	L	.079	.108	.827	.984	1.181	.866	.203	1.476	GX24-1..
25	MSS-E25L21-GX24-2	L	.109	.147	.827	.984	1.181	.866	.193	1.476	GX24-2..
25	MSS-E25L21-GX24-3	L	.148	.197	.827	.984	1.181	.866	.175	1.476	GX24-3..
25	MSS-E25L21-GX24-4	L	.198	.256	.827	.984	1.181	.866	.150	1.476	GX24-4..
32	MSS-E32R21-GX24-2	R	.109	.147	.827	1.260	1.496	.866	.195	1.890	GX24-2..
32	MSS-E32R21-GX24-3	R	.148	.197	.827	1.260	1.496	.866	.174	1.890	GX24-3..
32	MSS-E32R21-GX24-4	R	.198	.256	.827	1.260	1.496	.866	.150	1.890	GX24-4..
32	MSS-E32L21-GX24-2	L	.109	.147	.827	1.260	1.496	.866	.195	1.890	GX24-2..
32	MSS-E32L21-GX24-3	L	.148	.197	.827	1.260	1.496	.866	.174	1.890	GX24-3..
32	MSS-E32L21-GX24-4	L	.198	.256	.827	1.260	1.496	.866	.150	1.890	GX24-4..

Tools

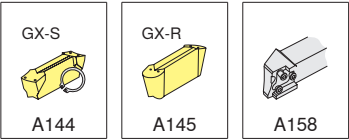
Tools and inserts for parting and grooving





Picture shows right-hand version

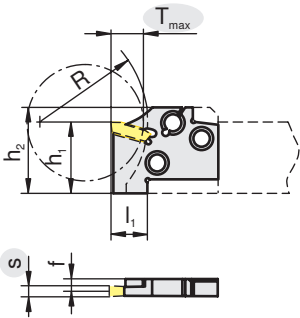
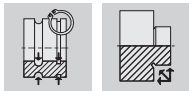
Bgr. [mm]	Type, description	L N R 									
			s_{min} [inch]	s_{max} [inch]	T_{max} [inch]	h_1 [inch]	h_2 [inch]	l_1 [inch]	f [inch]	R [inch]	
12	MSS-E12R02-GX09-1	R	.024	.077	.079	.472	.571	.315	.124	.709	GX09-1..R/L
12	MSS-E12L02-GX09-1	L	.024	.077	.079	.472	.571	.315	.124	.709	GX09-1..R/L
16	MSS-E16R02-GX09-1	R	.024	.077	.079	.630	.768	.315	.124	.945	GX09-1..R/L
16	MSS-E16L02-GX09-1	L	.024	.077	.079	.630	.768	.315	.124	.945	GX09-1..R/L





MSS modules – external

Circlip and radius grooves – GX16

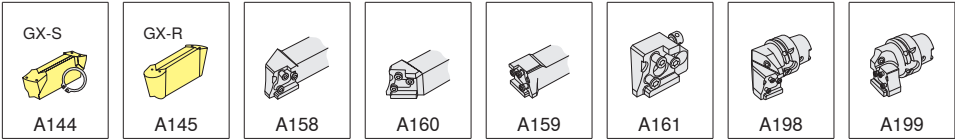


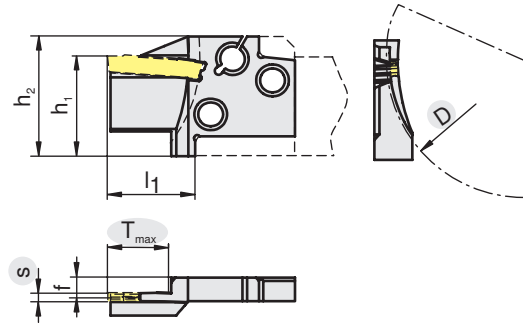
Picture shows right-hand version

Bgr. [mm]	Type, description	L N R 									
			s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	f [inch]	R [inch]	
20	MSS-E20R03-GX16-2	R	.024	.108	.118	.787	.945	.512	.134	1.181	GX16-2..R/L
20	MSS-E20L03-GX16-2	L	.024	.108	.118	.787	.945	.512	.134	1.181	GX16-2..R/L
25	MSS-E25R03-GX16-2	R	.024	.108	.118	.984	1.181	.512	.193	1.476	GX16-2..R/L
25	MSS-E25L03-GX16-2	L	.024	.108	.118	.984	1.181	.512	.193	1.476	GX16-2..R/L
32	MSS-E32R03-GX16-2	R	.024	.108	.118	1.260	1.497	.512	.193	1.890	GX16-2..R/L
32	MSS-E32L03-GX16-2	L	.024	.108	.118	1.260	1.497	.512	.193	1.890	GX16-2..R/L

Tools

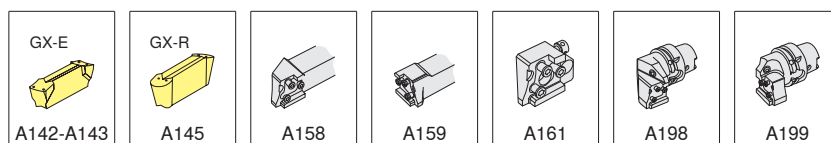
Tools and inserts for parting and grooving





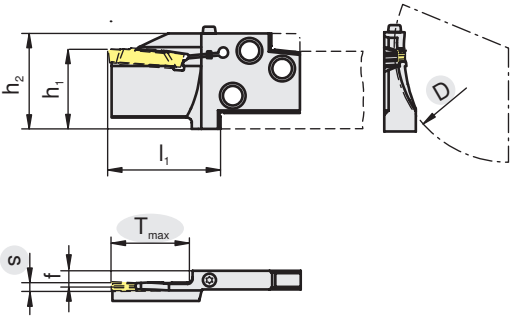
Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	D _{min} [inch]	D _{max} [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	f [inch]	
20	MSS-E20R14-GX24-2 A50-70	R	.109	.147	.551	1.97	2.76	.787	.945	.866	.134	GX24-2..
20	MSS-E20R14-GX24-2 A70-100	R	.109	.147	.551	2.76	3.94	.787	.945	.866	.134	GX24-2..
20	MSS-E20R14-GX24-2 A100-150	R	.109	.147	.551	3.94	5.90	.787	.945	.866	.134	GX24-2..
20	MSS-E20L14-GX24-2 A50-70	L	.109	.147	.551	1.97	2.76	.787	.945	.866	.134	GX24-2..
20	MSS-E20L14-GX24-2 A70-100	L	.109	.147	.551	2.76	3.94	.787	.945	.866	.134	GX24-2..
20	MSS-E20L14-GX24-2 A100-150	L	.109	.147	.551	3.94	5.90	.787	.945	.866	.134	GX24-2..
25	MSS-E25R15-GX24-2 A50-70	R	.109	.147	.590	1.97	2.76	.984	1.181	.866	.192	GX24-2..
25	MSS-E25R15-GX24-2 A100-150	R	.109	.147	.590	3.94	5.90	.984	1.181	.866	.192	GX24-2..
25	MSS-E25R15-GX24-2 A70-100	R	.109	.147	.590	2.76	3.94	.984	1.181	.866	.192	GX24-2..
25	MSS-E25R15-GX24-3 A100-150	R	.148	.197	.590	3.94	5.90	.984	1.181	.866	.174	GX24-3..
25	MSS-E25R15-GX24-3 A70-100	R	.148	.197	.590	2.76	3.94	.984	1.181	.866	.174	GX24-3..
25	MSS-E25R15-GX24-3 A150-300	R	.148	.197	.590	5.90	11.81	.984	1.181	.866	.174	GX24-3..
25	MSS-E25R15-GX24-3 A50-70	R	.148	.197	.590	1.97	2.76	.984	1.181	.866	.174	GX24-3..
25	MSS-E25R15-GX24-4 A50-70	R	.198	.256	.590	1.97	2.76	.984	1.181	.866	.150	GX24-4..
25	MSS-E25R15-GX24-4 A150-300	R	.198	.256	.590	5.90	11.81	.984	1.181	.866	.150	GX24-4..
25	MSS-E25R15-GX24-4 A100-150	R	.198	.256	.590	3.94	5.90	.984	1.181	.866	.150	GX24-4..
25	MSS-E25R15-GX24-4 A70-100	R	.198	.256	.590	2.76	3.94	.984	1.181	.866	.150	GX24-4..
25	MSS-E25L15-GX24-2 A50-70	L	.109	.147	.590	1.97	2.76	.984	1.181	.866	.193	GX24-2..
25	MSS-E25L15-GX24-2 A100-150	L	.109	.147	.590	3.94	5.90	.984	1.181	.866	.193	GX24-2..
25	MSS-E25L15-GX24-2 A70-100	L	.109	.147	.590	2.76	3.94	.984	1.181	.866	.193	GX24-2..
25	MSS-E25L15-GX24-3 A100-150	L	.148	.197	.590	3.94	5.90	.984	1.181	.866	.174	GX24-3..
25	MSS-E25L15-GX24-3 A70-100	L	.148	.197	.590	2.76	3.94	.984	1.181	.866	.174	GX24-3..
25	MSS-E25L15-GX24-3 A150-300	L	.148	.197	.590	5.90	11.81	.984	1.181	.866	.174	GX24-3..
25	MSS-E25L15-GX24-3 A50-70	L	.148	.197	.590	1.97	2.76	.984	1.181	.866	.174	GX24-3..
25	MSS-E25L15-GX24-4 A100-150	L	.198	.256	.590	3.94	5.90	.984	1.181	.866	.150	GX24-4..
25	MSS-E25L15-GX24-4 A70-100	L	.198	.256	.590	2.76	3.94	.984	1.181	.866	.150	GX24-4..
25	MSS-E25L15-GX24-4 A50-70	L	.198	.256	.590	1.97	2.76	.984	1.181	.866	.150	GX24-4..
25	MSS-E25L15-GX24-4 A150-300	L	.198	.256	.590	5.90	11.81	.984	1.181	.866	.150	GX24-4..
32	MSS-E32R15-GX24-3 A70-100	R	.148	.197	.590	2.76	3.94	1.260	1.496	.866	.174	GX24-3..
32	MSS-E32R15-GX24-3 A150-300	R	.148	.197	.590	5.90	11.81	1.260	1.496	.866	.174	GX24-3..
32	MSS-E32R15-GX24-3 A100-150	R	.148	.197	.590	3.94	5.90	1.260	1.496	.866	.174	GX24-3..
32	MSS-E32R15-GX24-4 A70-100	R	.198	.256	.590	2.76	3.94	1.260	1.496	.866	.150	GX24-4..
32	MSS-E32R15-GX24-4 A150-300	R	.198	.256	.590	5.90	11.81	1.260	1.496	.866	.150	GX24-4..
32	MSS-E32R15-GX24-4 A100-150	R	.198	.256	.590	3.94	5.90	1.260	1.496	.866	.174	GX24-4..
32	MSS-E32R15-GX24-4 A300-900	R	.198	.256	.590	11.81	35.43	1.260	1.496	.866	.150	GX24-4..
32	MSS-E32L15-GX24-3 A150-300	L	.148	.197	.590	5.90	11.81	1.260	1.496	.866	.174	GX24-3..
32	MSS-E32L15-GX24-3 A70-100	L	.148	.197	.590	2.76	3.94	1.260	1.496	.866	.174	GX24-3..
32	MSS-E32L15-GX24-3 A100-150	L	.148	.197	.590	3.94	5.90	1.260	1.496	.866	.174	GX24-3..
32	MSS-E32L15-GX24-4 A70-100	L	.198	.256	.590	2.76	3.94	1.260	1.496	.866	.150	GX24-4..
32	MSS-E32L15-GX24-4 A300-900	L	.198	.256	.590	11.81	35.43	1.260	1.496	.866	.150	GX24-4..
32	MSS-E32L15-GX24-4 A100-150	L	.198	.256	.590	3.94	5.90	1.260	1.496	.866	.150	GX24-4..
32	MSS-E32L15-GX24-4 A150-300	L	.198	.256	.590	5.90	11.81	1.260	1.496	.866	.150	GX24-4..





MSS modules – external
Axial grooves – GX24

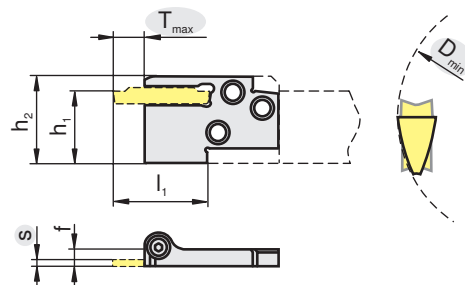


Picture shows right-hand version

Bgr. [mm]	Type, description	L N R 	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	D _{min} [inch]	D _{max} [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	f [inch]		
25	MSS-E25R21-GX24-3 AS100-150	R	.148	.197	.827	3.94	5.90	.984	1.181	1.378	.174	GX24-3..	E01
25	MSS-E25R21-GX24-3 AS70-100	R	.148	.197	.827	2.75	3.94	.984	1.181	1.378	.174	GX24-3..	E01
25	MSS-E25R21-GX24-3 AS50-70	R	.148	.197	.827	1.97	2.75	.984	1.181	1.378	.174	GX24-3..	E01
25	MSS-E25R21-GX24-3 AS150-300	R	.148	.197	.827	5.90	11.81	.984	1.181	1.378	.174	GX24-3..	E01
25	MSS-E25R25-GX24-4 AS100-150	R	.198	.256	.984	3.94	5.90	.984	1.181	1.378	.150	GX24-4..	E01
25	MSS-E25R25-GX24-4 AS70-100	R	.198	.256	.984	2.75	3.94	.984	1.181	1.378	.150	GX24-4..	E01
25	MSS-E25R25-GX24-4 AS50-70	R	.198	.256	.984	1.97	2.75	.984	1.181	1.378	.150	GX24-4..	E01
25	MSS-E25R25-GX24-4 AS150-300	R	.198	.256	.984	5.90	11.81	.984	1.181	1.378	.150	GX24-4..	E01
25	MSS-E25L21-GX24-3 AS50-70	L	.148	.197	.827	1.97	2.75	.984	1.181	1.378	.174	GX24-3..	E01
25	MSS-E25L21-GX24-3 AS70-100	L	.148	.197	.827	2.75	3.94	.984	1.181	1.378	.174	GX24-3..	E01
25	MSS-E25L21-GX24-3 AS100-150	L	.148	.197	.827	3.94	5.90	.984	1.181	1.378	.174	GX24-3..	E01
25	MSS-E25L21-GX24-3 AS150-300	L	.148	.197	.827	5.90	11.81	.984	1.181	1.378	.174	GX24-3..	E01
25	MSS-E25L25-GX24-4 AS50-70	L	.198	.256	.984	1.97	2.75	.984	1.181	1.378	.150	GX24-4..	E01
25	MSS-E25L25-GX24-4 AS70-100	L	.198	.256	.984	2.75	3.94	.984	1.181	1.378	.150	GX24-4..	E01
25	MSS-E25L25-GX24-4 AS100-150	L	.198	.256	.984	3.94	5.90	.984	1.181	1.378	.150	GX24-4..	E01
25	MSS-E25L25-GX24-4 AS150-300	L	.198	.256	.984	5.90	11.81	.984	1.181	1.378	.150	GX24-4..	E01

E01	11081190	11149570	220983

 A142-A143	 A145	 A158	 A159	 A209	 A161	 A198	 A199
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Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s [inch]	D _{min} [inch]	T _{max} [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	f [inch]		
16	MSS-E16R05-AX05	R	.118	.39	.197	.630	.807	.945	.098	AX05..	E01
16	MSS-E16L05-AX05	L	.118	.39	.197	.630	.807	.945	.098	AX05..	E01
20	MSS-E20R10-AX10	R	.118	.79	.394	.787	.984	1.299	.122	AX10..	E02
20	MSS-E20R15-AX15	R	.118	1.18	.591	.787	.984	1.732	.122	AX15..	E02
20	MSS-E20R05-AX05	R	.118	.39	.197	.787	.984	1.102	.122	AX05..	E02
20	MSS-E20L15-AX15	L	.118	1.18	.591	.787	.984	1.732	.122	AX15..	E02
20	MSS-E20L10-AX10	L	.118	.79	.394	.787	.984	1.299	.122	AX10..	E02
20	MSS-E20L05-AX05	L	.118	.39	.197	.787	.984	1.102	.122	AX05..	E02
25	MSS-E25R10-AX10	R	.118	.79	.394	.984	1.181	1.280	.181	AX10..	E03
25	MSS-E25R05-AX05	R	.118	.39	.197	.984	1.181	1.083	.181	AX05..	E03
25	MSS-E25R15-AX15	R	.118	1.18	.591	.984	1.181	1.713	.181	AX15..	E03
25	MSS-E25L15-AX15	L	.118	1.18	.591	.984	1.181	1.713	.181	AX15..	E03
25	MSS-E25L10-AX10	L	.118	.79	.394	.984	1.181	1.280	.181	AX10..	E03
25	MSS-E25L05-AX05	L	.118	.39	.197	.984	1.181	1.083	.181	AX05..	E03

Tools

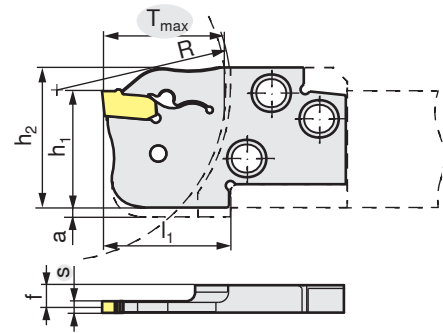
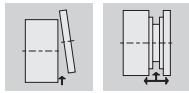
Tools and inserts for parting and grooving

		
E01	228620	220983
E02	195068	220983
E03	195069	220985

AX  A146	 A158	 A159	 A161	 A209
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MSS modules – external

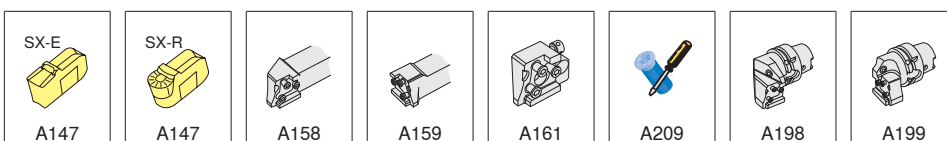
Grooving and turning – SX

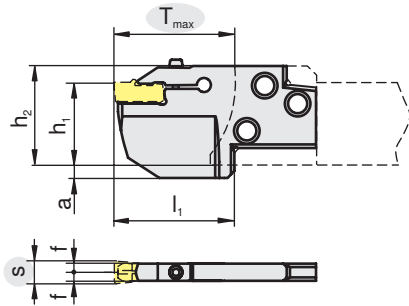
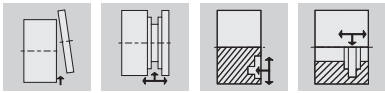


Picture shows right-hand version

Bgr. [mm]	Type, description	L N R 	s [inch]	T _{max} [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	f [inch]	a [inch]	R [inch]		
20	MSS-E20R20-SX2	R	.079	.787	.787	.945	.866	.141	.118	1.181	SX..2	E01
20	MSS-E20R20-SX3	R	.118	.787	.787	.945	.866	.126	.118	1.181	SX..3	E01
20	MSS-E20L20-SX2	L	.079	.787	.787	.945	.866	.141	.118	1.181	SX..2	E01
20	MSS-E20L20-SX3	L	.118	.787	.787	.945	.866	.126	.118	1.181	SX..3	E01
25	MSS-E25R20-SX2	R	.079	.787	.984	1.181	.866	.200		1.476	SX..2	E01
25	MSS-E25R35-SX3	R	.118	1.378	.984	1.181	1.457	.185		1.476	SX..3	E01
25	MSS-E25R25-SX3	R	.118	.984	.984	1.181	1.063	.185		1.476	SX..3	E01
25	MSS-E25R35-SX4	R	.157	1.378	.984	1.181	1.457	.169		1.476	SX..4	E02
25	MSS-E25R25-SX4	R	.157	.984	.984	1.181	1.063	.169		1.476	SX..4	E02
25	MSS-E25L20-SX2	L	.079	.787	.984	1.181	.866	.200		1.476	SX..2	E01
25	MSS-E25L35-SX3	L	.118	1.378	.984	1.181	1.457	.185		1.476	SX..3	E01
25	MSS-E25L25-SX3	L	.118	.984	.984	1.181	1.063	.185		1.476	SX..3	E01
25	MSS-E25L35-SX4	L	.157	1.378	.984	1.181	1.457	.169		1.476	SX..4	E02
25	MSS-E25L25-SX4	L	.157	.984	.984	1.181	1.063	.169		1.476	SX..4	E02
32	MSS-E32R35-SX3	R	.118	1.378	1.378	1.496	1.457	.185		1.890	SX..3	E01
32	MSS-E32R35-SX4	R	.157	1.378	1.378	1.496	1.457	.169		1.890	SX..4	E02
32	MSS-E32L35-SX3	L	.118	1.378	1.378	1.496	1.457	.185		1.890	SX..3	E01
32	MSS-E32L35-SX4	L	.157	1.378	1.378	1.496	1.457	.169		1.890	SX..4	E02

	
E01	11366865
E02	11366866



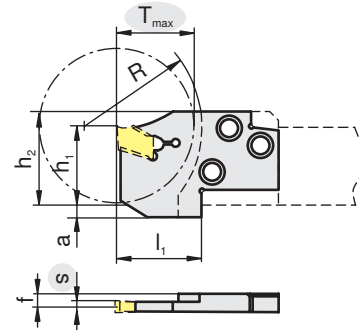


Picture shows right-hand version

Bgr. [mm]	Type, description	L N R 										
			S _{min} [inch]	S _{max} [inch]	T _{max} [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	f [inch]	a [inch]		
32	MSS-E32N25-LX	N	.315	.394	.984	1.260	1.526	1.063	.134	.207	LX..	E01
32	MSS-E32N32-LX	N	.315	.394	1.260	1.260	1.526	1.339	.134	.207	LX..	E01
32	MSS-E32N45-LX	N	.315	.394	1.772	1.260	1.526	1.850	.134	.207	LX..	E01

			
E01	11007006	11149571	220985

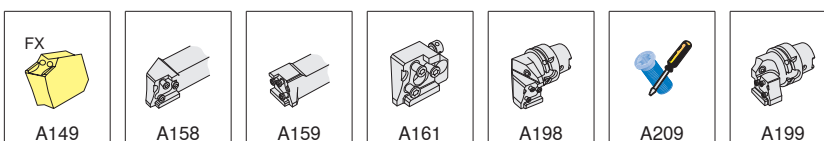
 A148	 A148	 A158	 A159	 A161	 A209	 A198	 A199
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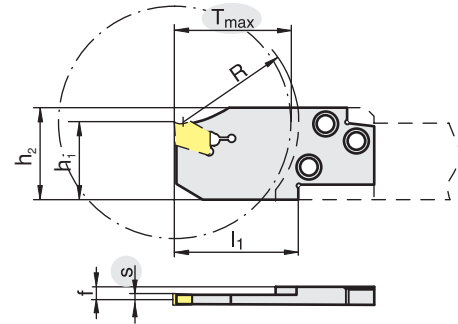


Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s [inch]	T _{max} [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	f [inch]	a [inch]	R [inch]		
20	MSS-E20R20-FX2.2	R	.087	.787	.787	.945	.866	.141	.118	1.181	FX 2.2..	E01
20	MSS-E20R20-FX3.1	R	.122	.787	.787	.945	.866	.126	.118	1.181	FX 3.1..	E02
20	MSS-E20R20-FX4.1	R	.161	.787	.787	.945	.866	.110	.118	1.181	FX 4.1..	E02
20	MSS-E20L20-FX2.2	L	.087	.787	.787	.945	.866	.141	.118	1.181	FX 2.2..	E01
20	MSS-E20L20-FX3.1	L	.122	.787	.787	.945	.866	.126	.118	1.181	FX 3.1..	E02
20	MSS-E20L20-FX4.1	L	.161	.787	.787	.945	.866	.110	.118	1.181	FX 4.1..	E02
25	MSS-E25R25-FX2.2	R	.087	.787	.984	1.181	.866	.200		1.476	FX 2.2..	E01
25	MSS-E25R25-FX3.1	R	.122	.984	.984	1.181	1.063	.185		1.476	FX 3.1..	E02
25	MSS-E25R25-FX4.1	R	.161	.984	.984	1.181	1.063	.169		1.476	FX 4.1..	E02
25	MSS-E25R25-FX5.1	R	.201	.984	.984	1.181	1.063	.154		1.476	FX 5.1..	E02
25	MSS-E25R25-FX6.5	R	.256	.984	.984	1.181	1.063	.130		1.476	FX 6.5..	E02
25	MSS-E25L20-FX2.2	L	.087	.787	.984	1.181	.866	.200		1.476	FX 2.2..	E01
25	MSS-E25L25-FX3.1	L	.122	.984	.984	1.181	1.063	.185		1.476	FX 3.1..	E02
25	MSS-E25L25-FX4.1	L	.161	.984	.984	1.181	1.063	.169		1.476	FX 4.1..	E02
25	MSS-E25L25-FX5.1	L	.201	.984	.984	1.181	1.063	.154		1.476	FX 5.1..	E02
25	MSS-E25L25-FX6.5	L	.256	.984	.984	1.181	1.063	.130		1.476	FX 6.5..	E02
32	MSS-E32R32-FX3.1	R	.122	1.260	1.260	1.496	1.339	.185		1.890	FX 3.1..	E02
32	MSS-E32R32-FX4.1	R	.161	1.260	1.260	1.496	1.339	.169		1.890	FX 4.1..	E02
32	MSS-E32R32-FX5.1	R	.201	1.260	1.260	1.496	1.339	.154		1.890	FX 5.1..	E02
32	MSS-E32R32-FX6.5	R	.256	1.260	1.260	1.496	1.339	.130		1.890	FX 6.5..	E02
32	MSS-E32L32-FX3.1	L	.122	1.260	1.260	1.496	1.339	.185		1.890	FX 3.1..	E02
32	MSS-E32L32-FX4.1	L	.161	1.260	1.260	1.496	1.339	.169		1.890	FX 4.1..	E02
32	MSS-E32L32-FX5.1	L	.201	1.260	1.260	1.496	1.339	.154		1.890	FX 5.1..	E02
32	MSS-E32L32-FX6.5	L	.256	1.260	1.260	1.496	1.339	.130		1.890	FX 6.5..	E02

	
E01	154461
E02	154463





Picture shows right-hand version

Bgr. [mm]	Type, description	L N R 	s [inch]	T _{max} [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	f [inch]	R [inch]		
25	MSS-E25R35-FX3.1	R	.122	1.378	.984	1.181	1.457	.185	1.476	FX 3.1..	E01
25	MSS-E25R35-FX4.1	R	.161	1.378	.984	1.181	1.457	.169	1.476	FX 4.1..	E01
25	MSS-E25R35-FX5.1	R	.201	1.378	.984	1.181	1.457	.154	1.476	FX 5.1..	E01
25	MSS-E25R35-FX6.5	R	.256	1.378	.984	1.181	1.457	.130	1.476	FX 6.5..	E01
25	MSS-E25L35-FX3.1	L	.122	1.378	.984	1.181	1.457	.185	1.476	FX 3.1..	E01
25	MSS-E25L35-FX4.1	L	.161	1.378	.984	1.181	1.457	.169	1.476	FX 4.1..	E01
25	MSS-E25L35-FX5.1	L	.201	1.378	.984	1.181	1.457	.154	1.476	FX 5.1..	E01
25	MSS-E25L35-FX6.5	L	.256	1.378	.984	1.181	1.457	.130	1.476	FX 6.5..	E01
32	MSS-E32R45-FX3.1	R	.122	1.772	1.260	1.496	1.850	.185	1.890	FX 3.1..	E01
32	MSS-E32R45-FX4.1	R	.161	1.772	1.260	1.496	1.850	.169	1.890	FX 4.1..	E01
32	MSS-E32R45-FX5.1	R	.201	1.772	1.260	1.496	1.850	.154	1.890	FX 5.1..	E01
32	MSS-E32R45-FX6.5	R	.256	1.772	1.260	1.496	1.850	.130	1.890	FX 6.5..	E01
32	MSS-E32L45-FX3.1	L	.122	1.772	1.260	1.496	1.850	.185	1.890	FX 3.1..	E01
32	MSS-E32L45-FX4.1	L	.161	1.772	1.260	1.496	1.850	.169	1.890	FX 4.1..	E01
32	MSS-E32L45-FX5.1	L	.201	1.772	1.260	1.496	1.850	.154	1.890	FX 5.1..	E01
32	MSS-E32L45-FX6.5	L	.256	1.772	1.260	1.496	1.850	.130	1.890	FX 6.5..	E01

Tools

Tools and inserts for parting and grooving



E01

154463

FX



A149



A158



A159



A161



A198



A209

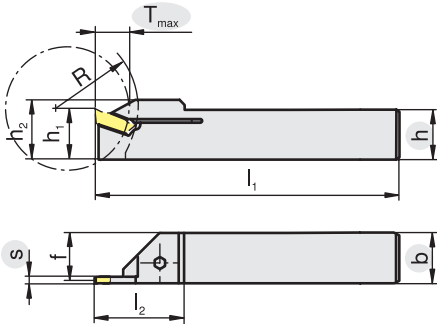
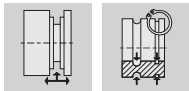


A199



Monoblock tool holders

GX09



Picture shows right-hand version

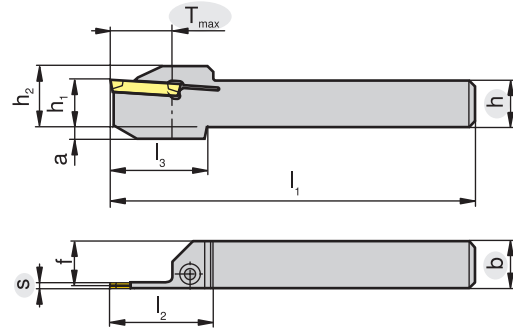
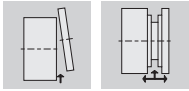
h [inch]	Type, description	L N R 												
			s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	h ₂ [inch]	b [inch]	h ₁ [inch]	l ₁ [inch]	l ₂ [inch]	f [inch]	R [inch]		
.375	E10R00-06-GX09-E	R	.024	.147	.276	.472	.375	.375	6.0	.709	.349	.591	GX09..	E01
.375	E10L00-06-GX09-E	L	.024	.147	.276	.472	.375	.375	6.0	.709	.349	.591	GX09..	E01

Tools

Tools and inserts for parting and grooving

		
E01	219981	220983

 A209	 A142	 A144	 A145
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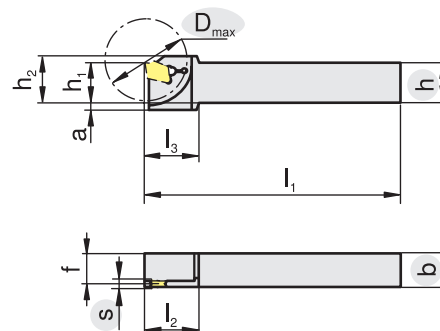


Picture shows right-hand version

h [inch]	Type, description	L N R	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	h ₂ [inch]	b [inch]	l ₁ [inch]	l ₂ [inch]	l ₃ [inch]	f [inch]	a [inch]		
.625	E16R0021-10C-GX24-2-E	R	.109	.147	.827	.822	.625	5.0	1.378	1.260	.586	.162	GX24-2..	E01
.625	E16L0021-10C-GX24-2-E	L	.109	.147	.827	.822	.625	5.0	1.378	1.260	.586	.162	GX24-2..	E01
.750	E20R0021-12C-GX24-2-E	R	.109	.147	.827	.947	.750	5.0	1.378		.711		GX24-2..	E01
.750	E20R0021-12C-GX24-3-E	R	.148	.197	.827	.947	.750	5.0	1.378		.692		GX24-3..	E01
.750	E20L0021-12C-GX24-2-E	L	.109	.147	.827	.947	.750	5.0	1.378		.711		GX24-2..	E01
.750	E20L0021-12C-GX24-3-E	L	.148	.197	.827	.947	.750	5.0	1.378		.692		GX24-3..	E01
1.000	E25R0021-16D-GX24-2-E	R	.109	.147	.827	1.197	1.000	6.0	1.378		.961		GX24-2..	E01
1.000	E25R0021-16D-GX24-3-E	R	.148	.197	.827	1.197	1.000	6.0	1.378		.942		GX24-3..	E01
1.000	E25R0021-16D-GX24-4-E	R	.198	.256	.827	1.197	1.000	6.0	1.378		.917		GX24-4..	E01
1.000	E25L0021-16D-GX24-2-E	L	.109	.147	.827	1.197	1.000	6.0	1.378		.961		GX24-2..	E01
1.000	E25L0021-16D-GX24-3-E	L	.148	.197	.827	1.197	1.000	6.0	1.378		.942		GX24-3..	E01
1.000	E25L0021-16D-GX24-4-E	L	.198	.256	.827	1.197	1.000	6.0	1.378		.917		GX24-4..	E01
1.250	E32R0021-85D-GX24-2-E	R	.109	.147	.827	1.447	1.000	6.0	1.378		.961		GX24-2..	E01
1.250	E32R0021-85D-GX24-3-E	R	.148	.197	.827	1.447	1.000	6.0	1.378		.942		GX24-3..	E01
1.250	E32R0021-85D-GX24-4-E	R	.198	.256	.827	1.447	1.000	6.0	1.378		.917		GX24-4..	E01
1.250	E32L0021-85D-GX24-2-E	L	.109	.147	.827	1.447	1.000	6.0	1.378		.961		GX24-2..	E01
1.250	E32L0021-85D-GX24-3-E	L	.148	.197	.827	1.447	1.000	6.0	1.378		.942		GX24-3..	E01
1.250	E32L0021-85D-GX24-4-E	L	.198	.256	.827	1.447	1.000	6.0	1.378		.917		GX24-4..	E01

		
E01	11007006	220985

GX-E  A142-A143	GX-R  A145	 A209
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Picture shows right-hand version

h [inch]	Type, description	L N R	s [inch]	D _{max} [inch]	b [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	l ₂ [inch]	l ₃ [inch]	f [inch]	a [inch]		
.375	XLCE 06 M22 FX-E	R	.087	1.181	.375	.375	.498	6.0	.709	.709	.343	.270	FX 2.2..	E01
.375	XLCE 06 M22 FX-E	L	.087	1.181	.375	.375	.498	6.0	.709	.709	.343	.270	FX 2.2..	E01
.500	XLCE 08 F22 FX-E	R	.087	1.181	.500	.500	.623	3.0	.709	.709	.497	.145	FX 2.2..	E01
.500	XLCE 08 M22 FX-E	R	.087	1.181	.500	.500	.623	6.0	.709	.709	.497	.145	FX 2.2..	E01
.500	XLCE 08 F22 FX-E	L	.087	1.181	.500	.500	.623	3.0	.709	.709	.497	.145	FX 2.2..	E01
.500	XLCE 08 M22 FX-E	L	.087	1.181	.500	.500	.623	6.0	.709	.709	.497	.145	FX 2.2..	E01
.563	XLCE 09 M22 FX-E	R	.087	1.181	.563	.563	.686	6.0	.709	.709	.530	.082	FX 2.2..	E01
.563	XLCE 09 M22 FX-E	L	.087	1.181	.563	.563	.686	6.0	.709	.709	.530	.082	FX 2.2..	E01
.625	XLCE 10 H31 FX-E	R	.122	1.380	.625	.625	.748	4.0	.827	.827	.578	.138	FX 3.1..	E02
.625	XLCE 10 H22 FX-E	R	.087	1.181	.625	.625	.748	4.0	.709	.709	.593	.020	FX 2.2..	E01
.625	XLCE 10 H22 FX-E	L	.087	1.181	.625	.625	.748	4.0	.709	.709	.593	.020	FX 2.2..	E01
.625	XLCE 10 H31 FX-E	L	.122	1.380	.625	.625	.748	4.0	.827	.827	.578	.138	FX 3.1..	E02
.750	XLCE 12 K31 FX-E	R	.122	1.575	.750	.750	.906	5.0	.984	.984	.703	.118	FX 3.1..	E02
.750	XLCE 12 K41 FX-E	R	.161	1.575	.750	.750	.906	5.0	.984	.984	.687	.118	FX 4.1..	E02
.750	XLCE 12 K31 FX-E	L	.122	1.575	.750	.750	.906	5.0	.984	.984	.703	.118	FX 3.1..	E02
.750	XLCE 12 K41 FX-E	L	.161	1.575	.750	.750	.906	5.0	.984	.984	.687	.118	FX 4.1..	E02
1.000	XLCE 64 M31 FX-E	R	.122	1.969	.750	1.000	1.118	6.0	1.220	1.220	.703	.138	FX 3.1..	E02
1.000	XLCE 64 M41 FX-E	R	.161	1.969	.750	1.000	1.118	6.0	1.220	1.220	.687	.138	FX 4.1..	E02
1.000	XLCE 64 M41 FX-E	L	.161	1.969	.750	1.000	1.118	6.0	1.220	1.220	.687	.138	FX 4.1..	E02
1.000	XLCE 64 M31 FX-E	L	.122	1.969	.750	1.000	1.118	6.0	1.220	1.220	.703	.138	FX 3.1..	E02



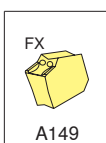
E01



154461

E02

154463

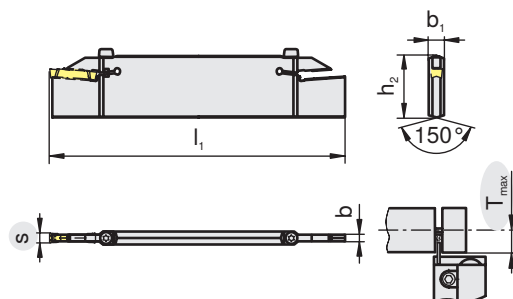
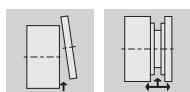


FX

A149



A209



Picture shows right-hand version

h_2 [inch]	Type, description	L N R	s_{min} [inch]	s_{max} [inch]	T_{max} [inch]	b [inch]	b_1 [inch]	l_1 [inch]		
1.260	XLCFN 3202-GX24-1S	N	.079	.108	.827	.063	.244	7.087	GX24-1..	E01
1.260	XLCFN 3203 GX24-2S	N	.109	.147	.827	.083	.244	7.087	GX24-2..	E01
1.260	XLCFN 3204 GX24-3S	N	.148	.197	.827	.120	.244	7.087	GX24-3..	E01
1.260	XLCFN 3206 GX24-4S	N	.198	.256	.827	.165	.244	7.087	GX24-4..	E01

Tools

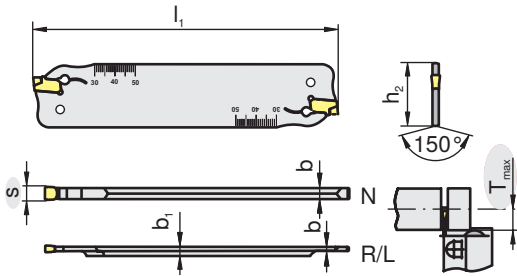
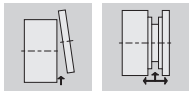
Tools and inserts for parting and grooving

E01	11081190	11149570	220983

GX-E A142-A143	GX-R A145	 A183-A184	 A209
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Blades
SX



Picture shows right-hand version

h ₂ [inch]	Type, description	L N R 	s [inch]	T _{max} [inch]	b [inch]	b ₁ [inch]	l ₁ [inch]		
1.024	XLCFR 2602-SX2	R	.079	.984	.060	.094	4.330	SX..2	E01
1.024	XLCFL 2602-SX2	L	.079	.984	.060	.094	4.330	SX..2	E01
1.024	XLCFN 2603-SX3	N	.118	1.378	.094		4.330	SX..3	E01
1.024	XLCFN 2604-SX4	N	.157	1.575	.126		4.330	SX..4	E02
1.260	XLCFR 3202-SX2	R	.079	.984	.060	.094	5.910	SX..2	E01
1.260	XLCFL 3202-SX2	L	.079	.984	.060	.094	5.910	SX..2	E01
1.260	XLCFN 3203-SX3	N	.118	1.969	.094		5.910	SX..3	E01
1.260	XLCFN 3204-SX4	N	.157	1.969	.126		5.910	SX..4	E02
1.260	XLCFN 3205-SX5	N	.197	2.165	.165		5.910	SX..5	E02
1.260	XLCFN 3206-SX6	N	.236	2.362	.205		5.910	SX..6	E02

Tools

Tools and inserts for parting and grooving

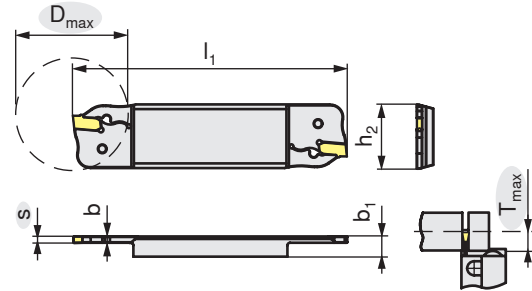
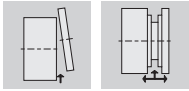
	
E01	11366865
E02	11366866


A147


A147


A183-A184


A209



Picture shows right-hand version

h_2 [inch]	Type, description	L N R	s [inch]	T_{max} [inch]	D_{max} [inch]	b [inch]	b_1 [inch]	l_1 [inch]		
1.024	XLCFR 2608-SX2	R	.079	.866	1.732	.060	.315	4.330	SX..2	E01
1.024	XLCFL 2608-SX2	L	.079	.866	1.732	.060	.315	4.330	SX..2	E01
1.024	XLCFR 2608-SX3	R	.118	.866	1.732	.098	.315	4.330	SX..3	E01
1.024	XLCFL 2608-SX3	L	.118	.866	1.732	.098	.315	4.330	SX..3	E01

Tools

Tools and inserts for parting and grooving

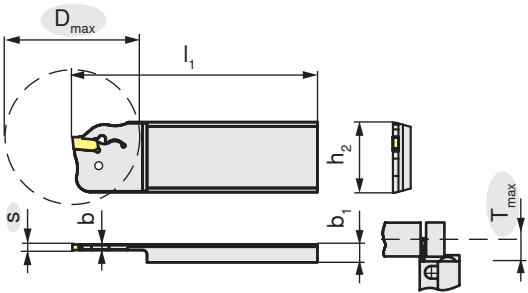
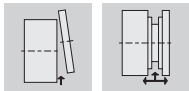
E01	11366865

SX-E A147	SX-R A147	A183-A184	A209



Blades

SX, reinforced blades



Picture shows right-hand version

h_2 [inch]	Type, description	L N R	s [inch]	T_{max} [inch]	D_{max} [inch]	b [inch]	b_1 [inch]	l_1 [inch]		
1.260	XLCFR 3208-SX3	R	.118	1.300	2.600	.098	.315	4.330	SX..3	E01
1.260	XLCFL 3208-SX3	L	.118	1.300	2.600	.098	.315	4.330	SX..3	E01
1.260	XLCFR 3208-SX4	R	.157	1.300	2.600	.134	.315	4.330	SX..4	E02
1.260	XLCFL 3208-SX4	L	.157	1.300	2.600	.134	.315	4.330	SX..4	E02

Tools

Tools and inserts for parting and grooving

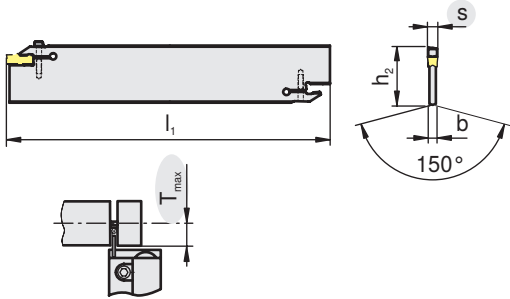
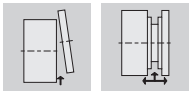
	
E01	11366865
E02	11366866


A147


A147


A183-A184


A209



Picture shows right-hand version

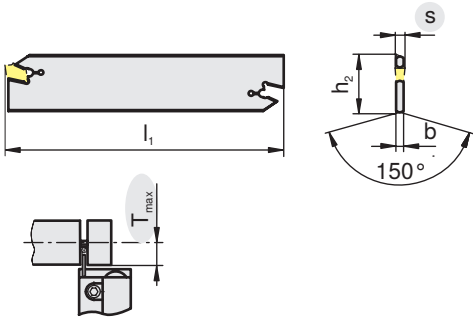
h_2 [inch]	Type, description	L N R 	s_{min} [inch]	s_{max} [inch]	T_{max} [inch]	b [inch]	l_1 [inch]		
1.811	XLCEN 4608 LX	N	.315	.394	3.150	.268	9.840	LX..	E01

			
E01	11007006	11149571	220985

 A148	 A148	 A183	 A209
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Blades
FX



Picture shows right-hand version

h_2 [inch]	Type, description	L N R 	s [inch]	T_{max} [inch]	b [inch]	l_1 [inch]		
1.024	XLCEN 2602 J22 FX	N	.087	.984	.065	4.330	FX 2.2..	E01
1.024	XLCFN 2603 J31 FX	N	.122	1.378	.094	4.330	FX 3.1..	E02
1.024	XLCFN 2604 J41 FX	N	.161	1.575	.126	4.330	FX 4.1..	E02
1.260	XLCEN 3202 M22 FX	N	.087	1.181	.065	5.910	FX 2.2..	E01
1.260	XLCFN 3203 M31 FX	N	.122	1.969	.094	5.910	FX 3.1..	E02
1.260	XLCFN 3204 M41 FX	N	.161	1.969	.126	5.910	FX 4.1..	E02
1.260	XLCFN 3205 M51 FX	N	.201	2.165	.157	5.910	FX 5.1..	E02
1.260	XLCFN 3206 M65 FX	N	.256	2.165	.205	5.910	FX 6.5..	E02
1.811	XLCEN 4608 S82 FX	N	.323	3.150	.268	9.840	FX 8.2..	E03
1.811	XLCEN 4609 S97 FX	N	.382	3.150	.315	9.840	FX 9.7..	E03

Tools

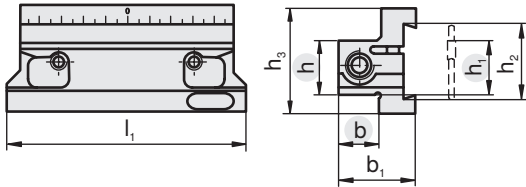
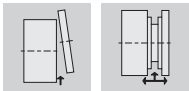
Tools and inserts for parting and grooving

E01	154461
E02	154463
E03	154464

A149

A183-A184

A209



Picture shows right-hand version

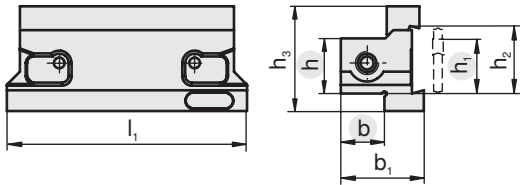
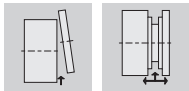
h_2 [inch]	Type, description	L N R	h [inch]	h_1 [inch]	h_3 [inch]	l_1 [inch]	b [inch]	b_1 [inch]		
1.024	SBN 12-26K-E	N	.750	1.024	1.535	3.540	.700	1.369	XLC.. 26..	E01
1.260	SBN 16-32K-E	N	1.000	1.260	1.890	4.330	.950	1.647	XLC.. 32..	E01
1.260	SBN 20-32K-E	N	1.250	1.260	1.890	4.720	1.200	1.909	XLC.. 32..	E01
1.811	SBN 20-46K-E	N	1.250	1.811	2.756	5.910	1.200	2.106	XLC.. 46..	E02
1.811	SBN 24-46K-E	N	1.500	1.811	2.756	5.910	1.450	2.362	XLC.. 46..	E02

			
E01	22485	4496	82952
E02	81158	4497	82954

GX  A177	SX  A178-A180	LX  A181	FX  A182	 A209
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Split clamping blocks



Picture shows right-hand version

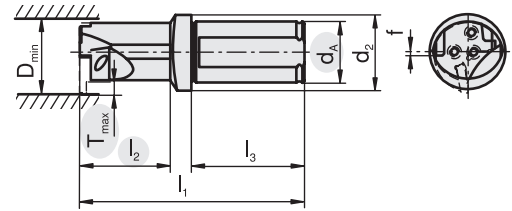
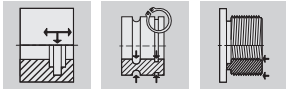
h_2 [inch]	Type, description	L N R	h [inch]	h_1 [inch]	h_3 [inch]	l_1 [inch]	b [inch]	b_1 [inch]		
1.024	SBN 12-26KS-E	N	.750	1.024	1.688	3.540	.700	1.369	XLC.. 26..	E01
1.260	SBN 16-32KS-E	N	1.000	1.260	1.929	4.330	.950	1.647	XLC.. 32..	E01
1.260	SBN 20-32KS-E	N	1.250	1.260	2.044	4.720	1.200	1.909	XLC.. 32..	E01

Tools

Tools and inserts for parting and grooving

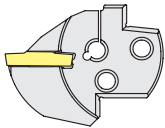
			
E01	22485	4496	82952

GX  A177	SX  A178-A180	LX  A181	FX  A182	 A209
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Picture shows right-hand version

Bgr. [mm]	Type, description	L N R 	T _{max} [inch]	D _{min} [inch]	d _A [inch]	d ₂ [inch]	l ₁ [inch]	l ₂ [inch]	l ₃ [inch]	f [inch]		
16	MSS-I16R90-1.5D-E	R	.160	.787	.750	1.000	3.250	.945	2.00	.039	MSS-I16R..	E01
16	MSS-I16L90-1.5D-E	L	.160	.787	.750	1.000	3.250	.945	2.00	.039	MSS-I16L..	E01
20	MSS-I20R90-1.5D-E	R	.197	.984	.750	1.000	3.450	1.181	2.00	.039	MSS-I20R..	E02
20	MSS-I20L90-1.5D-E	L	.197	.984	.750	1.000	3.450	1.181	2.00	.039	MSS-I20L..	E02
25	MSS-I25R90-1.5D-E	R	.236	1.260	1.000	1.260	4.050	1.496	2.25	.059	MSS-I25R..	E03
25	MSS-I25L90-1.5D-E	L	.236	1.260	1.000	1.260	4.050	1.496	2.25	.059	MSS-I25L..	E03
32	MSS-I32R90-1.5D-E	R	.354	1.575	1.250	1.575	4.810	1.890	2.50	.079	MSS-I32R..	E04
32	MSS-I32L90-1.5D-E	L	.354	1.575	1.250	1.575	4.810	1.890	2.50	.079	MSS-I32L..	E04
40	MSS-I40R90-1.5D-E	R	.394	1.969	1.500	1.969	5.820	2.362	3.00	.098	MSS-I40R..	E05
40	MSS-I40L90-1.5D-E	L	.394	1.969	1.500	1.969	5.820	2.362	3.00	.098	MSS-I40L..	E05



When using module **MSS-I40N19-GX24..** :

T_{max} + .354 inch / D_{min} + .394 inch

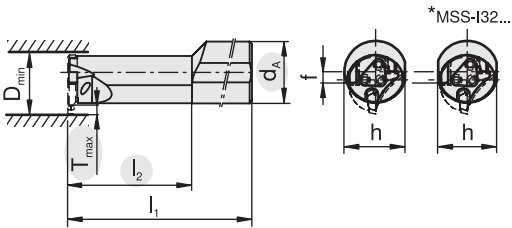
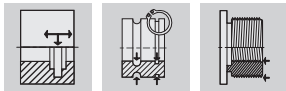
			
E01	228617	56656	
E02	228619	291576	
E03	228620		220983
E04	228621		220985
E05	195069		220985

			
A187-A164	A190-A191	A195	A209



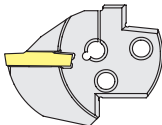
MSS boring bars

2.5 D



Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	T _{max} [inch]	D _{min} [inch]	d _A [inch]	l ₁ [inch]	l ₂ [inch]	h [inch]	f [inch]		
16	MSS-I16R90-2.5D-E	R	.160	.787	.750	7.0	1.575	.728	.177	MSS-I16R..	E01
16	MSS-I16L90-2.5D-E	L	.160	.787	.750	7.0	1.575	.728	.177	MSS-I16L..	E01
20	MSS-I20R90-2.5D-E	R	.197	.984	1.000	8.0	1.969	.953	.236	MSS-I20R..	E02
20	MSS-I20L90-2.5D-E	L	.197	.984	1.000	8.0	1.969	.953	.236	MSS-I20L..	E02
25	MSS-I25R90-2.5D-E	R	.236	1.260	1.250	10.0	2.480	1.216	.276	MSS-I25R..	E03
25	MSS-I25L90-2.5D-E	L	.236	1.260	1.250	10.0	2.480	1.216	.276	MSS-I25L..	E03
32	MSS-I32R90-2.5D-E	R	.354	1.575	1.500	12.0	3.150	1.425	.374	MSS-I32R..	E04
32	MSS-I32L90-2.5D-E	L	.354	1.575	1.500	12.0	3.150	1.425	.374	MSS-I32L..	E04
40	MSS-I40R90-2.5D-E	R	.394	1.969	2.000	14.0	3.937	1.941	.433	MSS-I40R..	E05
40	MSS-I40L90-2.5D-E	L	.394	1.969	2.000	14.0	3.937	1.941	.433	MSS-I40L..	E05



When using module **MSS-I40N19-GX24..** :
T_{max} + .354 inch / D_{min} + .394 inch

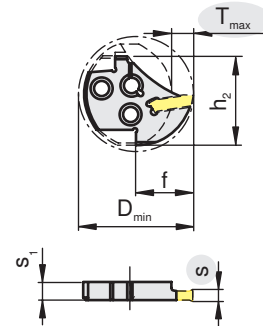
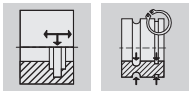
			
E01	228617	56656	
E02	228619	291576	
E03	228620		220983
E04	228621		220985
E05	195069		220985


A187-A189


A190-A191

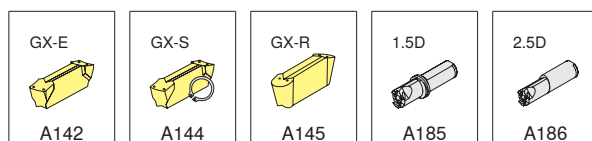

A195


A209



Picture shows right-hand version

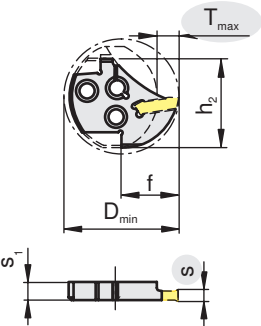
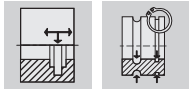
Bgr. [mm]	Type, description	L N R 								
			s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	h ₂ [inch]	D _{min} [inch]	s ₁ [inch]	f [inch]	
16	MSS-I16R04-GX09-1	R	.079	.108	.157	.646	.787	.150	.394	GX09-1..
16	MSS-I16R04-GX09-2	R	.109	.147	.157	.646	.787	.150	.394	GX09-2..
16	MSS-I16L04-GX09-1	L	.079	.108	.157	.646	.787	.150	.394	GX09-1..
16	MSS-I16L04-GX09-2	L	.109	.147	.157	.646	.787	.150	.394	GX09-2..
20	MSS-I20R05-GX09-1	R	.079	.108	.197	.799	.984	.150	.472	GX09-1..
20	MSS-I20R05-GX09-2	R	.109	.147	.197	.799	.984	.150	.472	GX09-2..
20	MSS-I20L05-GX09-1	L	.079	.108	.197	.799	.984	.150	.472	GX09-1..
20	MSS-I20L05-GX09-2	L	.109	.147	.197	.799	.984	.150	.472	GX09-2..
25	MSS-I25R06-GX09-1	R	.079	.108	.236	.980	1.260	.150	.610	GX09-1..
25	MSS-I25R06-GX09-2	R	.109	.147	.236	.980	1.260	.150	.610	GX09-2..
25	MSS-I25L06-GX09-1	L	.079	.108	.236	.980	1.260	.150	.610	GX09-1..
25	MSS-I25L06-GX09-2	L	.109	.147	.236	.980	1.260	.150	.610	GX09-2..





MSS modules – internal

Grooving and turning – GX16/24



Picture shows right-hand version

Bgr. [mm]	Type, description										
			s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	h ₂ [inch]	D _{min} [inch]	s ₁ [inch]	f [inch]		
32	MSS-I32R09-GX16-1	R	.079	.108	.354	1.268	1.575	.232	.787	GX16-1..	
32	MSS-I32R09-GX16-2	R	.109	.147	.354	1.268	1.575	.232	.787	GX16-2..	
32	MSS-I32R09-GX16-3	R	.148	.197	.354	1.268	1.575	.232	.787	GX16-3..	
32	MSS-I32R09-GX16-4	R	.198	.256	.354	1.268	1.575	.232	.787	GX16-4..	
32	MSS-I32L09-GX16-1	L	.079	.108	.354	1.268	1.575	.232	.787	GX16-1..	
32	MSS-I32L09-GX16-2	L	.109	.147	.354	1.268	1.575	.232	.787	GX16-2..	
32	MSS-I32L09-GX16-3	L	.148	.197	.354	1.268	1.575	.232	.787	GX16-3..	
32	MSS-I32L09-GX16-4	L	.198	.256	.354	1.268	1.575	.232	.787	GX16-4..	
40	MSS-I40R10-GX16-1	R	.079	.108	.394	1.559	1.969	.232	.965	GX16-1..	
40	MSS-I40R10-GX16-2	R	.109	.147	.394	1.559	1.969	.232	.965	GX16-2..	
40	MSS-I40R10-GX16-3	R	.148	.197	.394	1.559	1.969	.232	.965	GX16-3..	
40	MSS-I40R10-GX16-4	R	.198	.256	.394	1.559	1.969	.232	.965	GX16-4..	
40	MSS-I40L10-GX16-1	L	.079	.108	.394	1.559	1.969	.232	.965	GX16-1..	
40	MSS-I40L10-GX16-2	L	.109	.147	.394	1.559	1.969	.232	.965	GX16-2..	
40	MSS-I40L10-GX16-3	L	.148	.197	.394	1.559	1.969	.232	.965	GX16-3..	
40	MSS-I40L10-GX16-4	L	.198	.256	.394	1.559	1.969	.232	.965	GX16-4..	

Tools

Tools and inserts for parting and grooving

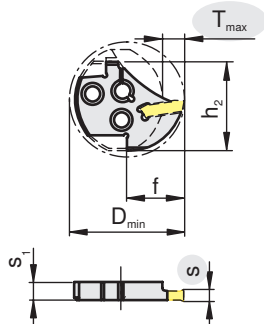
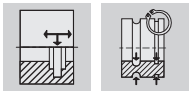

A142-A143


A144

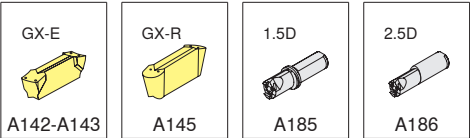

A145


A185


A186



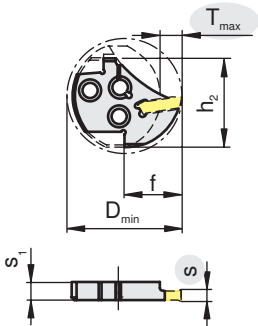
Bgr. [mm]	Type, description	L N R 								
			s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	h ₂ [inch]	D _{min} [inch]	s ₁ [inch]	f [inch]	
40	MSS-I40N19-GX24-2	N	.109	.147	.748	1.602	2.362	.244	1.319	GX24-2..
40	MSS-I40N19-GX24-3	N	.148	.197	.748	1.602	2.362	.244	1.319	GX24-3..
40	MSS-I40N19-GX24-4	N	.198	.256	.748	1.602	2.362	.244	1.319	GX24-4..





MSS modules – internal

Circlip and radius grooves – GX09



Picture shows right-hand version

Bgr. [mm]	Type, description									
			s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	h ₂ [inch]	D _{min} [inch]	s ₁ [inch]	f [inch]	
16	MSS-I16R02-GX09-1	R	.024	.077	.079	.648	.787	.150	.394	GX09-1..R/L
16	MSS-I16L02-GX09-1	L	.024	.077	.079	.648	.787	.150	.394	GX09-1..R/L
20	MSS-I20R02-GX09-1	R	.024	.077	.079	.799	.984	.150	.472	GX09-1..R/L
20	MSS-I20L02-GX09-1	L	.024	.077	.079	.799	.984	.150	.472	GX09-1..R/L
25	MSS-I25R02-GX09-1	R	.024	.077	.079	.980	1.260	.150	.610	GX09-1..R/L
25	MSS-I25L02-GX09-1	L	.024	.077	.079	.980	1.260	.150	.610	GX09-1..R/L

Tools

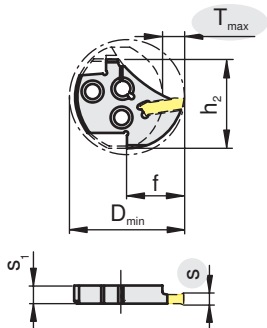
Tools and inserts for parting and grooving

A144

A145

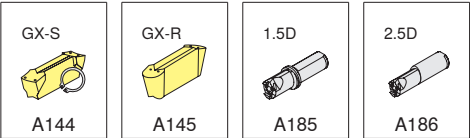
A185

A186



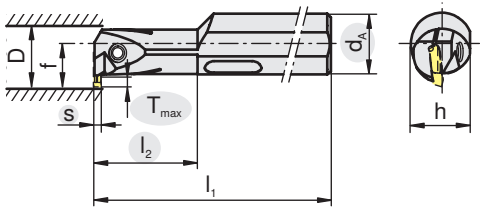
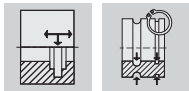
Picture shows right-hand version

Bgr. [mm]	Type, description	 L N R								
			s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	h ₂ [inch]	D _{min} [inch]	s ₁ [inch]	f [inch]	
32	MSS-I32R03-GX16-2	R	.024	.108	.118	1.268	1.575	.232	.787	GX16-2..R/L
32	MSS-I32L03-GX16-2	L	.024	.108	.118	1.268	1.575	.232	.787	GX16-2..R/L
40	MSS-I40R03-GX16-2	R	.024	.108	.118	1.559	1.969	.232	.965	GX16-2..R/L
40	MSS-I40L03-GX16-2	L	.024	.108	.118	1.559	1.969	.232	.965	GX16-2..R/L





MSS modules – internal
Circlip and radius grooves – GX09



Picture shows right-hand version

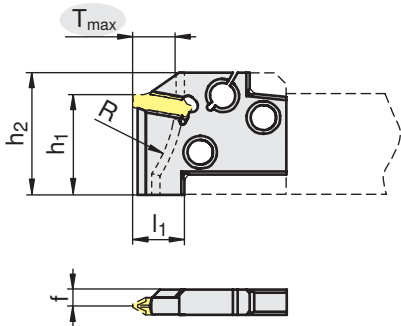
d _A [inch]	Type, description	L N R	s _{min} [inch]	s _{max} [inch]	T _{max} [inch]	h [inch]	l ₂ [inch]	l ₁ [inch]	D _{min} [inch]	f [inch]		
.625	I12R90-2.5D-GX09-E	R	.024	.148	.118	.600	1.181	6.0	.63	.433	GX09..	E01
.625	I12L90-2.5D-GX09-E	L	.024	.148	.118	.600	1.181	6.0	.63	.433	GX09..	E01

Tools

Tools and inserts for parting and grooving

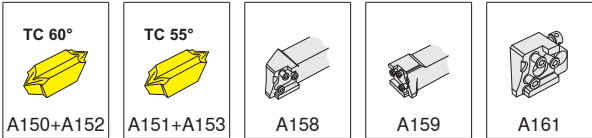
		
E01	228620	220983

 GX-E A142	 GX-S A144	 GX-R A145	 A209
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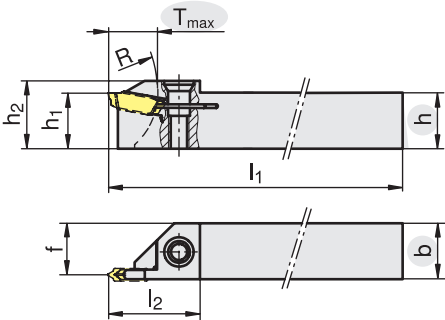
Picture shows right-hand version

Bgr. [mm]	Type, description	L N R 											
			P _{min} [mm]	P _{max} [mm]	P _{min} [TPI]	P _{max} [TPI]	T _{max} [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	f [inch]	R [inch]	
20	MSS-E20R-TC16-1	R	.50	1.50	48	16	.315	.787	.945	.787	.136	1.181	TC16-1..
20	MSS-E20N-TC16-2	N	1.75	3.00	14	8	.472	.787	.945	.787	.087		TC16-2..
20	MSS-E20L-TC16-1	L	.50	1.50	48	16	.315	.787	.945	.787	.136	1.181	TC16-1..
25	MSS-E25R-TC16-1	R	.50	1.50	48	16	.315	.984	1.181	.984	.205	1.476	TC16-1..
25	MSS-E25R-TC16-2	R	1.75	3.00	14	8	.394	.984	1.181	.984	.161	1.476	TC16-2..
25	MSS-E25N-TC16-3	N	3.50	5.00	7	5	.472	.984	1.181	.984	.122		TC16-3..
25	MSS-E25L-TC16-1	L	.50	1.50	48	16	.315	.984	1.181	.984	.205	1.476	TC16-1..
25	MSS-E25L-TC16-2	L	1.75	3.00	14	8	.394	.984	1.181	.984	.161	1.476	TC16-2..





Monoblock tool holders
TC threading



Picture shows right-hand version

h [inch] Type, description													f [inch]	R [inch]		
			P _{min} [mm]	P _{max} [mm]	P _{min} [TPI]	P _{max} [TPI]	T _{max} [inch]	h ₂ [inch]	b [inch]	h ₁ [inch]	l ₁ [inch]	l ₂ [inch]				
.500	E12R00-08-TC16-E	R	.50	3.00	48	8	.394	.598	.500	.500	6.0	.768	.461	.591	TC16-1/2..	E01
.500	E12L00-08-TC16-E	L	.50	3.00	48	8	.394	.598	.500	.500	6.0	.768	.461	.591	TC16-1/2..	E01

Tools

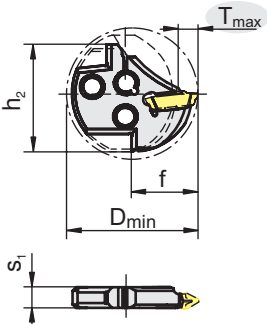
Tools and inserts for parting and grooving

E01	219981	220983

TC 60°
A150+A152

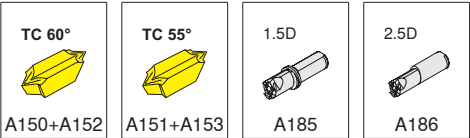
TC 55°
A151+A153

A209



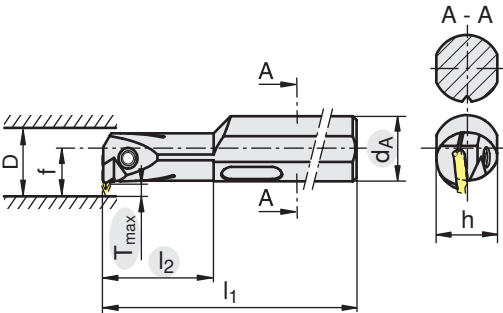
Picture shows right-hand version

Bgr. [mm]	Type, description	L N R 										
			P _{min} [mm]	P _{max} [mm]	P _{min} [TPI]	P _{max} [TPI]	T _{max} [inch]	D _{min} [inch]	h ₂ [inch]	s ₁ [inch]	f [inch]	
32	MSS-I32R-TC16-1	R	.50	1.50	48	16	.276	1.575	1.268	.244	.787	TC16-1..
32	MSS-I32R-TC16-2	R	1.75	3.00	14	8	.276	1.575	1.268	.244	.787	TC16-2..
32	MSS-I32N-TC16-3	N	3.50	5.00	7	5	.276	1.575	1.268	.244	.787	TC16-3..
32	MSS-I32L-TC16-1	L	.50	1.50	48	16	.276	1.575	1.268	.244	.787	TC16-1..
32	MSS-I32L-TC16-2	L	1.75	3.00	14	8	.276	1.575	1.268	.244	.787	TC16-2..





Monoblock boring bars
TC



Picture shows right-hand version

d _A [inch]	Type, description	L N R 	P _{min} [mm]	P _{max} [mm]	P _{min} [TPI]	P _{max} [TPI]	T _{max} [inch]	D _{min} [inch]	h [inch]	l ₁ [inch]	l ₂ [inch]	f [inch]		
.750	I16R90-2D-TC16-E	R	.50	3.00	48	8	.157	.787	.669	7.0	1.339	.551	TC16-1/2..	E01
.750	I16L90-2D-TC16-E	L	.50	3.00	48	8	.157	.787	.669	7.0	1.339	.551	TC16-1/2..	E01
1.000	I20R90-2D-TC16-E	R	.50	5.00	48	5	.197	.984	.906	8.0	1.654	.689	TC16-..	E02
1.000	I20L90-2D-TC16-E	L	.50	5.00	48	5	.197	.984	.906	8.0	1.654	.689	TC16-..	E02
1.250	I25R90-2D-TC16-E	R	.50	5.00	48	5	.236	1.260	1.181	10.0	2.047	.866	TC16-..	E03
1.250	I25L90-2D-TC16-E	L	.50	5.00	48	5	.236	1.260	1.181	10.0	2.047	.866	TC16-..	E03

Tools

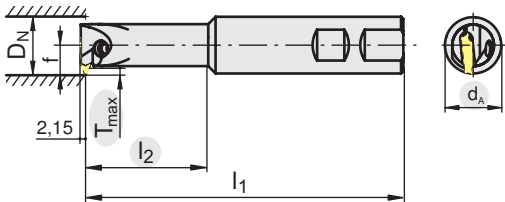
Tools and inserts for parting and grooving

E01	195068	220983
E02	195069	220985
E03	195070	200317

TC 60°
A150+A152

TC 55°
A151+A153

A209



d _A [inch]	Type, description	L N R 	l ₁ [inch]	l ₂ [inch]	T _{max} [inch]	D _N [inch]	f [inch]		
1.000	I25R90-2D-TC16-W-E	R	5.50	2.13	.118	.984	.492	TC16-..	E01
1.250	I32R90-2D-TC16-W-E	R	6.50	2.68	.138	1.260	.630	TC16-..	E02

Tools

Tools and inserts for parting and grooving

		
E01	228621	220985
E02	195070	200317

TC 55°



A150+A152

TC 60°



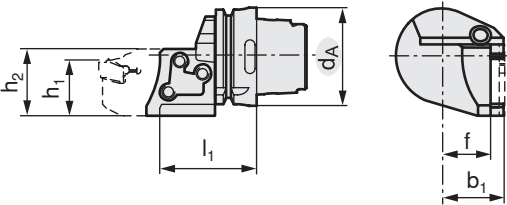
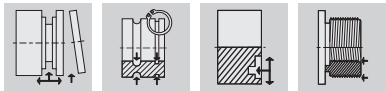
A151+A153



A209



Modular system (MSS)
HSK-T 0°



Picture shows right-hand version

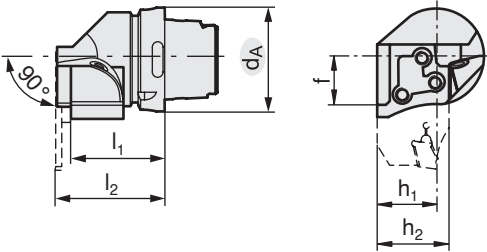
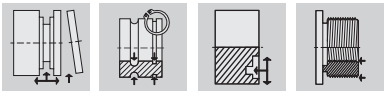
Bgr. [mm]	Type, description	L N R	d _A [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	b ₁ [inch]	f [inch]		
25	HSK-T63-MSS-E25R00	R	2.480	.984	1.232	2.638	1.740	1.524	MSS-E25R..	E01
25	HSK-T100-MSS-E25R00	R	3.937	1.228	1.929	3.937	2.146	1.929	MSS-E25R..	E01
25	HSK-T63-MSS-E25L00	L	2.480	.984	1.232	2.638	1.740	1.524	MSS-E25L..	E01
25	HSK-T100-MSS-E25L00	L	3.937	1.228	1.929	3.937	2.146	1.929	MSS-E25L..	E01
32	HSK-T63-MSS-E32R00	R	2.480	1.378	1.614	2.913	1.740	1.524	MSS-E32R..	E02
32	HSK-T100-MSS-E32R00	R	3.937	1.724	1.961	3.031	2.134	1.917	MSS-E32R..	E02
32	HSK-T63-MSS-E32L00	L	2.480	1.378	1.614	2.913	1.740	1.524	MSS-E32L..	E02
32	HSK-T100-MSS-E32L00	L	3.937	1.724	1.961	3.031	2.134	1.917	MSS-E32L..	E02

Tools

Tools and inserts for parting and grooving

			
E01	195069	231176	220985
E02	195070	231176	200317

 A162-A164	 A165-A166	 A167-A168	 A169	 A170	 A171	 A172-A173	 A193	 A209
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Picture shows right-hand version

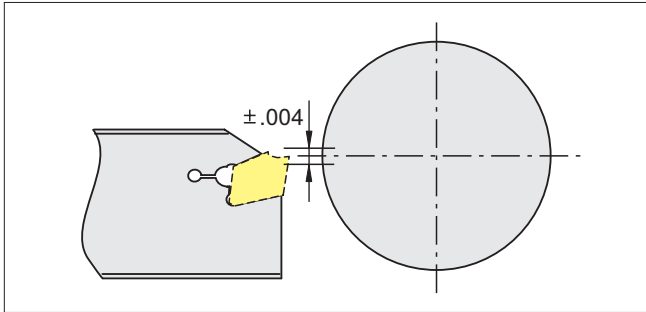
Bgr. [mm]	Type, description	L N R	d _A [inch]	h ₁ [inch]	h ₂ [inch]	l ₁ [inch]	l ₂ [inch]	f [inch]		
32	HSK-T63-MSS-E32R90	R	2.480	1.370	1.610	2.508	2.724	1.240	MSS-E32L...	E01
32	HSK-T100-MSS-E32R90	R	3.937	1.724	1.961	2.902	3.118	1.969	MSS-E32L...	E01
32	HSK-T63-MSS-E32L90	L	2.480	1.370	1.610	2.508	2.724	1.240	MSS-E32R...	E01
32	HSK-T100-MSS-E32L90	L	3.937	1.724	1.961	2.902	3.118	1.969	MSS-E32R...	E01

E01	195070	231176	200317

A162-A164	A165-A166	A167-A168	A169	A170	A171	A172-A173	A193	A209

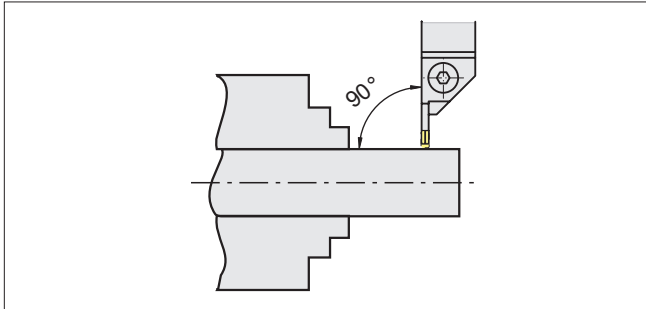






Center height

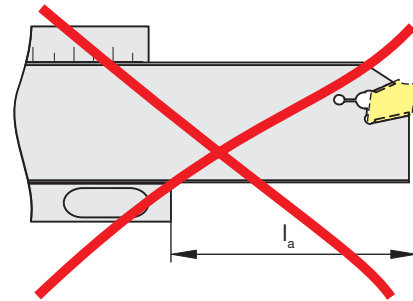
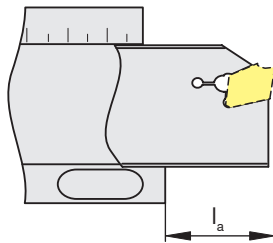
The center height should be set within a tolerance of $\pm .004$ inch to the work piece axis. This is especially important when parting into center.



Tool setting

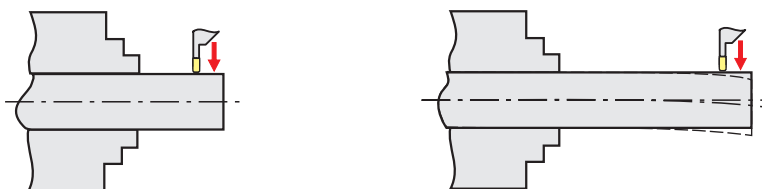
The parting and grooving tool must be mounted with a 90° angle to the axis of the work piece.

Tool overhang



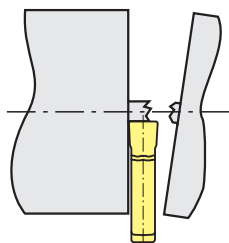
For optimum stability the tool overhang has to be kept as short as possible. The following rule can be applied: overhang l_a should not be larger than $8 \times s$ (cutting width).

Tool overhang



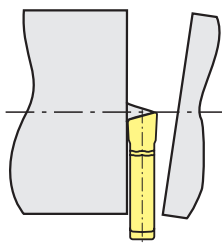
In order to avoid vibration the work piece should be clamped with the minimum overhang possible.

Advice for part-off operations



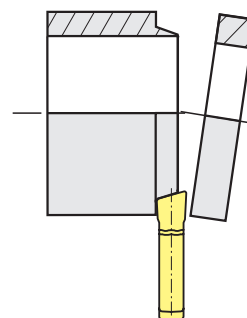
From dia. .197 mm on, reduce feed rate 'f' by approx. 50%.

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



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

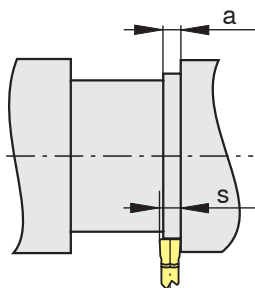
Reduce feed rate 'f' by approx. 20% - 50% to minimize lateral deflection.



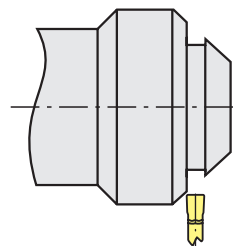
In order to prevent ring formation, use R or L inserts.

Reduce feed rate 'f' by approx. 20% - 50% to minimize 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.

GX09-S / GX 16-S

	Tolerances (mm)		
Chip groove	<i>x</i>	<i>s</i>	<i>r</i>
R/L	±.0008	±.0008	—
N			±.0008

GX09-R

	Tolerances (mm)		
Chip groove	<i>x</i>	<i>s</i>	<i>r</i>
—	±.0008	±.0008	±.0020

GX09-E

	Tolerances (mm)		
Chip groove	<i>x</i>	<i>s</i>	<i>r</i>
-F2 / —	±.0008	±.0008	±.0020
-M40	±.0039	±.0020	

GX 24-R

	Tolerances (mm)		
Chip groove	<i>x</i>	<i>s</i>	<i>r</i>
-27P	±.0008	±.0008	±.0020
-M3	±.0059	±.0020	±.0020

AX

	Tolerances (mm)		
Chip groove	<i>x</i>	<i>s</i>	<i>r</i>
-F50	±.0008	±.0008	±.0020

PX

	Tolerances (mm)		
Chip groove	<i>x</i>	<i>s</i>	<i>r</i>
-F3	±.0008	±.0008	±.0020

FX

Chip groove	Width	Tolerances (mm)		
		<i>x</i>	<i>s</i>	<i>r</i>
-27P	.0866 - .1614	±.0020	±.0020	±.0020
-F1	.0866 - .1614	±.0051	±.0020	±.0020
-M1	.0866 - .1614	±.0051	-.0039	±.0020
	.2008 - .2559		-.0059	
	.3228 - .3819	±.0059	-.0008	±.0004
-R2	.1220 - .1614	±.0051	±.0020	±.0020

SX

	Tolerances (mm)		
Chip groove	<i>x</i>	<i>s</i>	<i>r</i>
-27P / -F2	±.0008	±.0008	±.0020
-M1 / -M2 / -M3	±.0039	±.0020	±.0020

GX 24-R

	Tolerances (mm)		
Chip groove	<i>x</i>	<i>s</i>	<i>r</i>
-27P	±.0008	±.0008	±.0020
-M3	±.0059	±.0020	±.0020

GX 16-R

	Tolerances (mm)		
Chip groove	<i>x</i>	<i>s</i>	<i>r</i>
-27P / —	±.0008	±.0008	±.0020

GX16-E

	Tolerances (mm)		
Chip groove	<i>x</i>	<i>s</i>	<i>r</i>
-27P / -F2 / —	±.0008	±.0008	±.0020
-M40 / -M1	±.0059	±.0020	

GX24-E

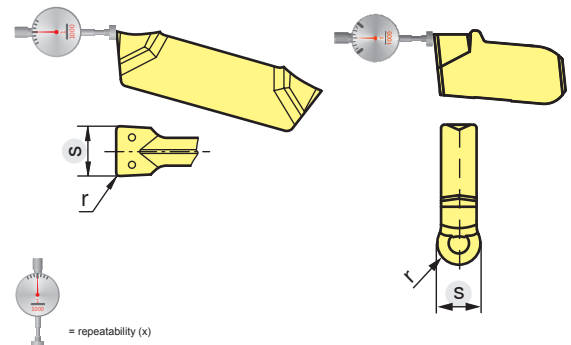
	Tolerances (mm)		
Chip groove	<i>x</i>	<i>s</i>	<i>r</i>
-27P / -F2 / —	±.0008	±.0008	±.0020
-M40 / -M1	±.0059	±.0020	

LX

	Tolerances (mm)		
Chip groove	<i>x</i>	<i>s</i>	<i>r</i>
-M2 / -M3	±.0059	±.0031	±.0031

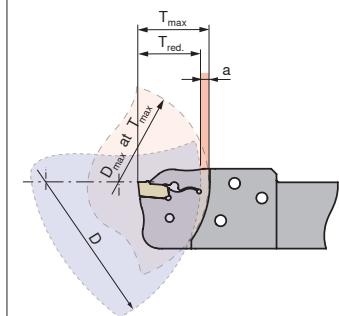
MaxiClick

	Tolerances (mm)		
Chip groove	<i>x</i>	<i>s</i>	<i>r</i>
-27P / -F2 / -F3	±.0098	±.0012	—



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 (inch)																	
	1.38	1.58	1.77	2.36	2.95	4.53	>9.84											
E12	1.38	1.58	1.77	2.36	2.95	4.53	>9.84											
E16	1.97	2.17	2.36	2.76	3.15	3.94	5.12	7.88	>16.5									
E20	2.36	2.56	2.76	2.95	3.35	3.75	4.33	5.12	6.50	8.66	12.99							
E25	2.95	3.15	3.35	3.54	3.94	4.33	4.92	5.51	6.30	7.48	9.45	12.60	>19.7					
E32	3.74	3.94	4.13	4.33	4.72	4.92	5.32	5.71	6.30	7.09	7.87	8.86	10.63	12.60	15.75	20.87	20.87	
		.02	.04	.06	.08	.10	.12	.14	.16	.18	.20	.22	.24	.26	.28	.30	.32	
Reduction of the maximum grooving depth a (inch)																		

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

Calculation example: module

MSS-**E25** R **21**-GX24-3

E25 assembly size 25

21 $T_{max} = .827$, Ø 2.953 inch

$D = \text{Ø } 100 \text{ inch}$

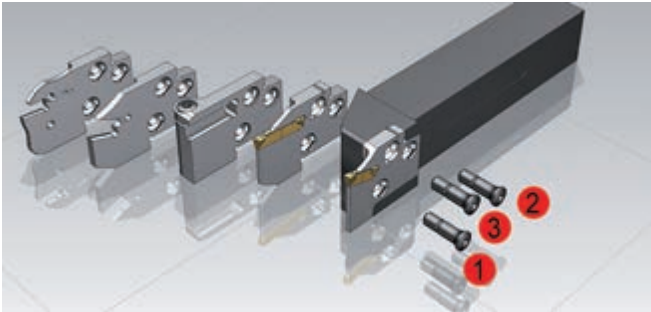
$$\Rightarrow T_{max} - a = T_{red.}$$

$$.827 - .079 = .748$$



Torque moments

MSS module clamping screws



MSS tool shanks

Note the order in which screws must be clamped!



A12

MSS tool shanks	Screw	Torx	Torque moments	
			Nm	in.lbs
MSS-E12...	7897200/M2,5x10/T08	T08	1.2	10.6
MSS-E16...	7897202/M3,5x12,5/T15	T15	3.2	28.3
MSS-E20...	7897203/M4x14/T15	T15	4	35.4
MSS-E25...	7897205/M5x18/T20	T20	5	44.3
MSS-E32...	7897206/M6x20/T25	T25	6	53.1



MSS tool shanks

Note the order in which screws must be clamped!

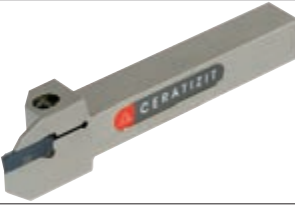


A12

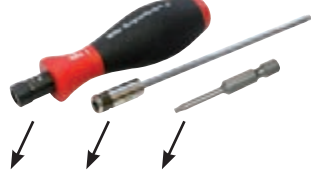
MSS boring bars	Screw	Torx	Torque moments	
			Nm	in.lbs
MSS-E12...	7897200/M2,5x10/T08	T08	1.2	10.6
MSS-E16...	7897202/M3,5x12,5/T15	T15	3.2	28.3
MSS-E20...	7897203/M4x14/T15	T15	4	35.4
MSS-E25...	7897205/M5x18/T20	T20	5	44.3
MSS-E32...	7897206/M6x20/T25	T25	6	53.1



Recommended torque moments

Tool	Screw	Torx	Torque moments	
			Nm	in.lbs
SX 	7897218/M4,0X18/T20	T20	4.0	35.4
PX 	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

Torque key (inserts/bits)

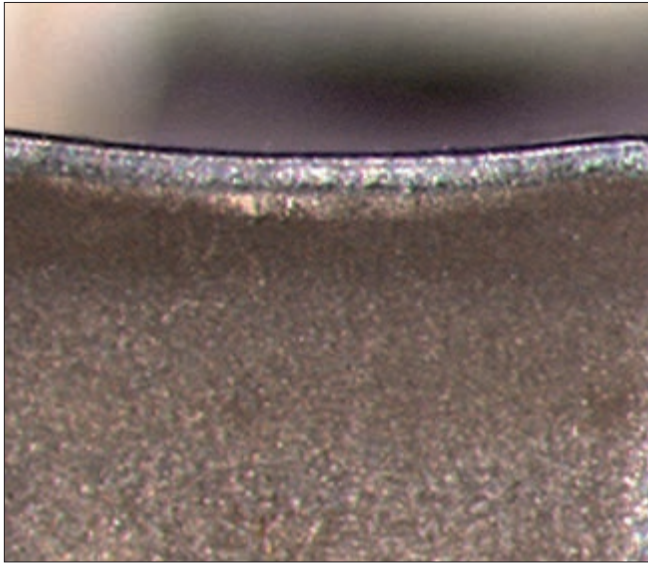
 1 + 1 + 5 pcs. (incl. in delivery)	DMSD 1,2Nm/SORT T08 DMSD 2,0Nm/SORT T10 DMSD 3,2Nm/SORT T15 DMSD 4,0Nm/SORT T15 DMSD 4,0Nm/SORT T20 DMSD 5,0Nm/SORT T20 DMSD 6,0Nm/SORT T25	Torque moment set to: 1.2 - 6.0 Nm
 1 + 1 piece (incl. in delivery)	DMSD 1-5Nm/SORT	Torque moment can be adjusted flexibly: 1.0-5.0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

	Material	Type, description	Key size	Torque moment [Nm]	Torque moment [in.lbs]
	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
	11206195	10002494/TORX 08IP F	T08IP
	11488748	10007404/TORX 07IP F	T07IP
	11843205	10014921/TORX 06IP F	T06IP
	11843208	10014922/TORX 09IP F	T09IP
	4496	7812301/SW 5	SW5
	4497	7812302/SW 6	SW6
	11450858	10006919/TORX 15IP	T15IP
	11816974	10013909/TORX 20IP	T20IP
	291576	7883306/TORX T10	T10
	56656	7724106/TORX T08	T08
	200317	7883304/TORX T25 T	T25
	220983	7897208/TORX T15 T	T15
	220985	7897207/TORX T20 T	T20

	Material	Type, description	Length	Thread size	Key size	Torque moment [Nm]	Torque moment [in.lbs]
	11227305	M3,0x7,0-09IP/10003007	7.0	M3,0	T09IP	2,2	19,5
	11610311	M3,5x8,6-15IP/10008749	8.6	M3,5	T15IP	3,2	28,3
	11684214	M2,2x5,0-07IP/10009244	5.0	M2,2	T07IP	1,0	8,9
	11684216	M2,5x6,0-08IP/10009243	6.0	M2,5	T08IP	1,2	10,6
	11801441	M4,5x10,5-20IP/10013040	10.5	M4,5	T20IP	5,0	44,3
	11807480	M2,0x4,3-06IP/10013332	4.3	M2,0	T06IP	0,7	6,2
	11807484	M1,8x3,6-06IP/10013338	3.6	M1,8	T06IP	0,4	3,6

	Material	Type, description	Length	Thread size	Key size
	310720	7897990/M8X1X8 DIN913	8.0	M8	SW4
	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
	11007006	7897218/M4,0X18/T20	18	M4	T20
	11081190	7897221/M3,5X14,0/T15	16.5	M3,5	T15
	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



Flank wear

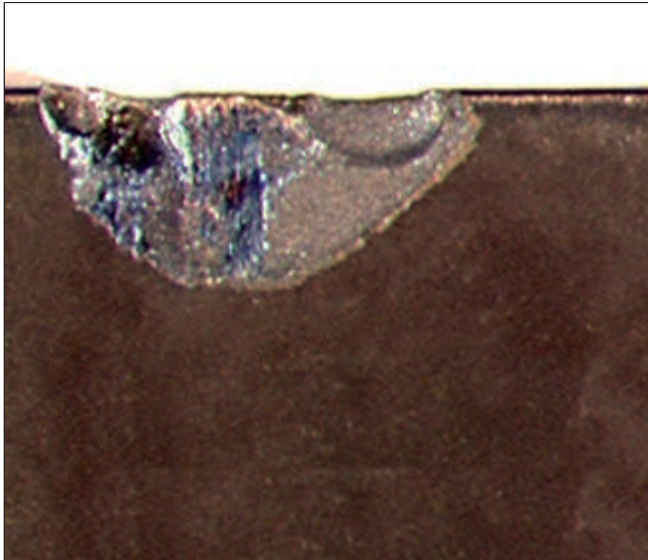
Reasons

- Cutting speed too high
- Carbide grade with insufficient wear resistance
- Insufficient amount of cooling lubricant

Remedies

- Reduce cutting speed
- Select more wear-resistant carbide grade
- Improve coolant supply

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



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 center height
- Increase stability of cutting edge

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



Cratering

Reasons

- Cutting speed and / or feed rate too high
- Rake angle too shallow
- Grade with insufficient wear resistance
- Incorrect coolant supply

Remedies

- Reduce cutting speed and / or feed rate
- Increase coolant quantity and / or pressure, optimize coolant supply
- Use grade which is more resistant to cratering

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



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

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



Built-up edge

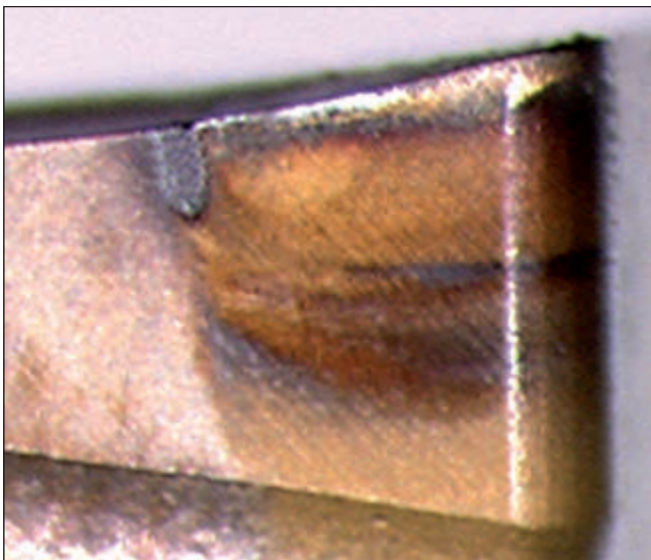
Reasons

- 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

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



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

Notch at the maximum depth of cut

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 - center area	
↑	↑		≈	≈	↓	↓	↓	↓	↑	Chip groove	Selection of inserts
					○					R / L - right-hand / left-hand version	
↑		↑	↑	↓	↓	↓	↑			Corner radius	
↓		↑	↑							Cutting material	
				↓		↑	↑			Cutting width	
≈				≈		≈	≈			Clamping of tool	General criteria
≈				≈		≈	≈			Clamping of work piece	
≈				≈			↓			Overhang	
≈		≈		≈	≈		≈			Tip height	
	○	○	○		○		○	○		Cooling lubricant	

raise, increase,
large influenceavoid, reduce
large influencecheck,
optimizeraise, increase
low influenceavoid, reduce
low influence

use

Tensile strength N/mm ²	Vickers HV	Brinell HB	Rockwell HRC	Shore C
575	180	171		
595	185	176		
610	190	181		
625	195	185		
640	200	190	12.0	
660	205	195	13.0	
675	210	199	14.0	
690	215	204	15.0	
705	220	209	15.5	28
720	225	214	16.0	
740	230	219	17.0	29
755	235	223	18.0	
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	24.0	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	31.0	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

Tensile strength N/mm ²	Vickers HV	Brinell HB	Rockwell HRC	Shore C
1845	560	532	53.0	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	67.0	
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		69.0	
3150	900		69.3	92
3190	910		69.6	
3220	920		69.9	
3260	930		70.1	

Comparison of materials

Technical information

Tools and inserts for parting and grooving

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	USA AISI	Japan JIS	K _{0.1} N/mm ²	m _c	VDI 3323 group
10 SPb 20	1.0722		10 PbF 2		11 L 08		1350	.21	1
100 Cr 6	1.2067	BL 3	Y 100 C 6		L 3	SUJ2	1775	.24	6/9
105 WCr 6	1.2419		105 WC 13			SKS31	1775	.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	.24	6/7
12 Ni 19	1.5680		Z 18 N 5		2515		2450	.23	10/11
13 CrMo 4 4	1.7335	1501-620 Gr. 27	15 CD 3.5	2216	A 182-F11; F12	SPVAF12	1675	.24	6/7
14 MoV 6 3	1.7715	1503-660-440					1675	.24	6/7
14 Ni 6	1.5622		16 N 6		A 350-LF 5		1675	.24	6/7
14 NiCr 10	1.5732		14 NC 11		3415	SNC415(H)	1675	.24	6/7
14 NiCr 14	1.5752	655 M 13	12 NC 15		3310; 9314	SNC815(H)	1675	.24	6/7
14 NiCrMo 13 4	1.6657						1675	.24	6/7
15 Cr 3	1.7015	523 M 15	12 C 3		5015		1675	.24	6/7
15 CrMo 5	1.7262		12 CD 4			SCM415(H)	1675	.24	6/7
15 Mo 3	1.5415	1501-240	15 D 3	2912	A 204 Gr. A		1675	.24	6/7
16 MnCr 5	1.7131	527 M 17	16 MC 5	2511	5115	SCR415	1675	.24	6/7
16 Mo 5	1.5423	1503-245-420			4520	SB450M	1675	.24	6/7
17 CrNiMo 6	1.6587	820 A 16	18 NCD 6				1675	.24	6/7
21 NiCrMo 2	1.6523	805 M 20	20 NCD 2	2506	8620	SNCM220(H)	1725	.24	6/8
25 CrMo 4	1.7218	1717 CDS 110	25 CD 4 S	2225	4130	SM420;SCM430	1725	.24	6/8
28 Mn 6	1.1170	150 M 28	20 M 5		1330		1500	.22	2
32 CrMo 12	1.7361	722 M 24	30 CD 12	2240			1775	.24	6/9
34 Cr 4	1.7033	530 A 32	32 C 4		5132	SCR430(H)	1725	.24	6/8
34 CrMo 4	1.7220	708 A 37	35 CD 4	2234	4135; 4137	SCM432;SCCRM3	1775	.24	6/9
34 CrNiMo 6	1.6582	817 M 40	35 NCD 6	2541	4340	SNCM447	1775	.24	6/9
35 S 20	1.0726	212 M 36	35 MF 4	1957	1140		1525	.22	2/3
36 CrNiMo 4	1.6511	816 M 40	40 NCD 3		9840	SNCM447	1775	.24	6/9
36 Mn 5	1.1167						1525	.22	2/3
36 NiCr 6	1.5710	640 A 35	35 NC 6		3135	SNC236	1800	.24	3/9
38 MnSi 4	1.5120						1800	.24	3/9
39 CrMoV 13 9	1.8523	897 M 39					1775	.24	6/9
40 Mn 4	1.1157	150 M 36	35 M 5		1039		1525	.22	2/3
40 NiCrMo 2 2	1.6546	311-Type 7	40 NCD 2		8740	SNCM240	1775	.24	6/9
41 Cr 4	1.7035	530 M 40	42 C 4		5140	SCR440(H)	1775	.24	6/9
41 CrAlMo 7	1.8509	905 M 39	40 CAD 6.12	2940	A 355 Cl. A	SACM645	1775	.24	6/9
41 CrMo 4	1.7223	708 M 40	42 CD 4 TS	2244	4142; 4140	SCM440	1775	.24	6/9
42 Cr 4	1.7045	530 A 40	42 C 4 TS	2245	5140	SCr440	1775	.24	6/9
42 CrMo 4	1.7225	708 M 40	42 CD 4	2244	4142; 4140	SCM440(H)	1775	.24	6/9
45 WCrV 7	1.2542	BS 1		2710	S 1		1775	.24	6/9
50 CrV 4	1.8159	735 A 50	50 CV 4	2230	6150	SUP10	1775	.24	6/9
55 Cr 3	1.7176	527 A 60	55 C 3	2253	5155	SUP9(A)	1775	.24	6/9
55 NiCrMoV 6	1.2713		55 NCDV 7		L 6	SKH1;SKT4	1775	.24	6/9
55 Si 7	1.0904	250 A 53	55 S 7	2085; 2090	9255		1775	.24	6/9
58 CrV 4	1.8161						1775	.24	6/9
60 SiCr 7	1.0961		60 SC 7		9262		1775	.24	6/9
9 SMn 28	1.0715	230 M 07	S 250	1912	1213	SUM22	1350	.21	1
9 SMn 36	1.0736	240 M 07	S 300		1215		1350	.21	1
9 SMnPb 28	1.0718		S 250 Pb	1914	12 L 13	SUM22L	1350	.21	1
9 SMnPb 36	1.0737		S 300 Pb	1926	12 L 14		1350	.21	1
Al99	3.0205						700	.25	21
AlCuMg1	3.1325						700	.25	22

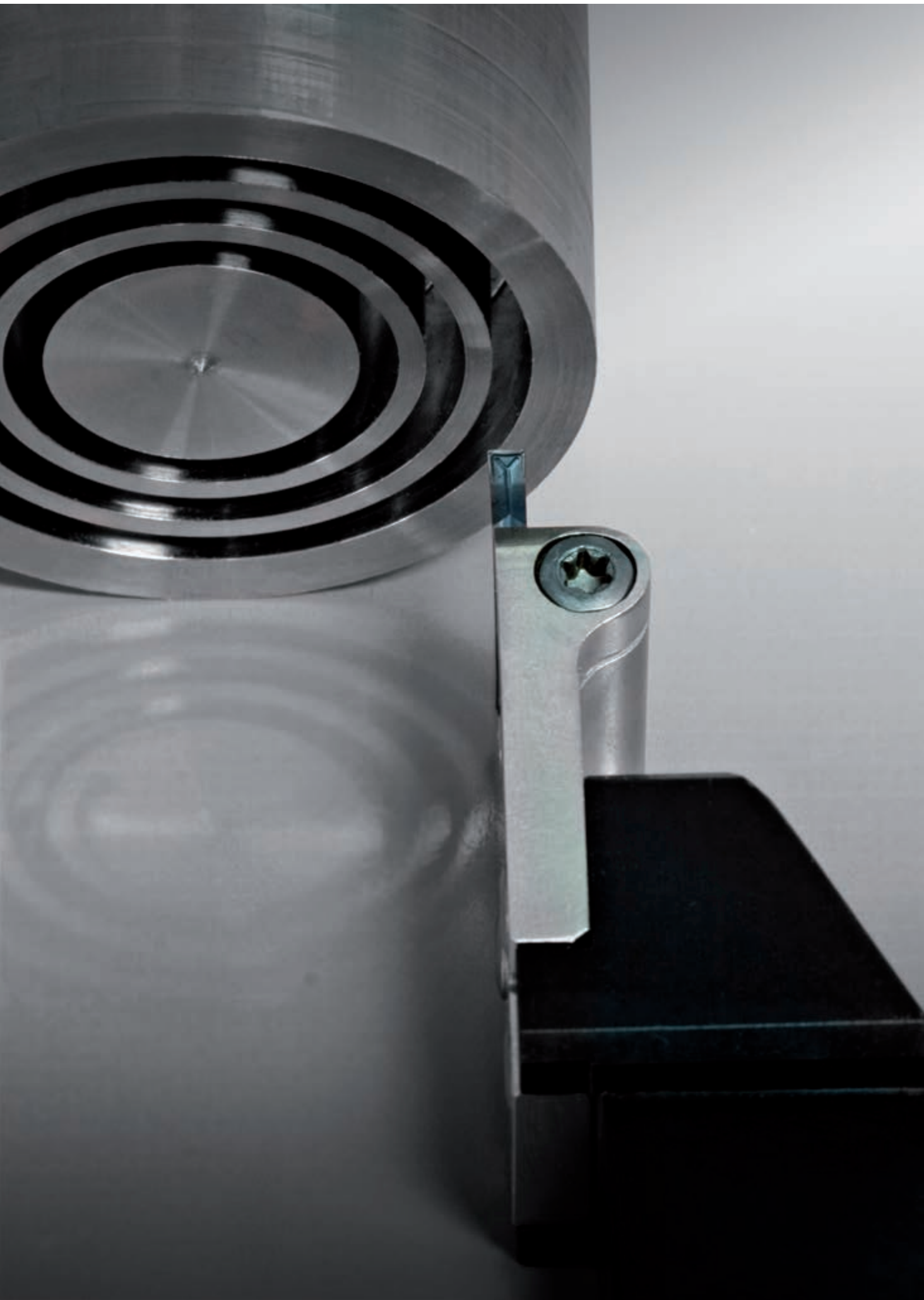
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AlMg1	3.3315						700	.25	21
AlMgSi1	3.2315						700	.25	22
C 105 W1	1.1545		Y1 105	1880	W 110	SK3	1675	.24	3
C 125 W	1.1663		Y2 120		W 112		1675	.24	3
C 15	1.0401	080 M 15	AF3 7 C 12; XC 18	1350	1015	S15C	1350	.21	1
C 22	1.0402	050 A 20	AF 42 C 20	1450	1020	S20C, S22C	1350	.21	1
C 35	1.0501	060 A 35	AF 55 C 35	1550	1035	S35C	1525	.22	2/3
C 45	1.0503	080 M 46	AF 65 C 45	1650	1045	S45C	1525	.22	2/3
C 55	1.0535	070 M 55		1655	1055	S55C	1675	.24	3
C 60	1.0601	080 A 62	CC 55		1060	S60C	1675	.24	3
Cf 35	1.1183					S35C	1525	.22	2/3
Cf 53	1.1213					S50C	1525	.22	2/3
Ck 101	1.1274	060 A 96		1870	1095		1675	.24	3
Ck 15	1.1141	080 M 15	XC 15; XC 18	1370	1015	S15C	1350	.21	1
Ck 55	1.1203	070 M 55	XC 55		1055	S55C	1675	.24	3
Ck 60	1.1221	080 A 62	XC 60	1665; 1678	1060	S58C	1675	.24	3
CoCr20W15Ni	2.4764						3300	.24	35
CuZn15	2.0240						700	.27	27
CuZn36Pb3	2.0375						700	.27	26
E-Cu57	2.0060						700	.27	28
G-AlSi10Mg	3.2381						700	.25	24
G-AlSi12	3.2581						700	.25	23
G-AlSi9Cu3	3.2163						700	.25	23
G-CuSn5ZnPb	2.1096						700	.27	26
G-CuZn40Fe	2.0590						700	.27	28
G-X 120 Mn 12	1.3401	Z 120 M 12	Z 120 M 12		A 128 (A)		3300	.24	35
G-X 20 Cr 14	1.4027	420 C 29	Z 20 C 13 M			SCS2	1875	.21	12/13
G-X 40 NiCrSi 38 18	1.4865	330 C 40					2600	.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	.21	12/13
G-X 5 CrNiMoNb 18 10	1.4581	318 C 17	Z 4 CNDNb 18.12 M				2150	.2	14
G-X 6 CrNi 18 9	1.4308	304 C 15	Z 6 CN 18.10 M	2333	CF-8		2150	.2	14
G-X 6 CrNiMo 18 10	1.4408						2150	.2	14
G-X 7 Cr 13	1.4001						1875	.21	12/13
GG-10	.6010		Ft 10 D	01 10-00	A48-20 B	FC100	1150	.2	15
GG-15	.6015	Grade 150	Ft 15 D	01 15-00	A48-25 B	FC150	1150	.2	15
GG-20	.6020	Grade 220	Ft 20 D	01 20-00	A48-30 B	FC200	1150	.2	15
GG-25	.6025	Grade 260	Ft 25 D	01 25-00	A48-40 B	FC250	1250	.24	15/16
GG-30	.6030	Grade 300	Ft 30 D	01 30-00	A48-45 B	FC300	1350	.28	16
GG-35	.6035	Grade 350	Ft 35 D	01 35-00	A48-50 B	FC350	1350	.28	16
GG-40	.6040	Grade 400	Ft 40 D	01 40-00	A48-60 B	FC400	1350	.28	16
GGG-35.3	.7033					FCD350	1225	.25	17
GGG-40	.7040	SNG 420/12	FGS 400-12	0717-02	60-40-18	FCD400	1225	.25	17
GGG-40.3	.7043	SNG 370/17	FGS 370-17	0717-15		FCD400	1225	.25	17
GGG-50	.7050	SNG 500/7	FGS 500-7	0727-02	65-45-12	FCD500	1350	.28	18
GGG-60	.7060	SNG 600/3	FGS 600-3	0732-03	80-55-06	FCD600	1350	.28	18
GGG-70	.7070	SNG 700/2	FGS 700-2	0737-01	100-70-03	FCD700	1350	.28	18
GGG-NiCr 20 2	.7660	S-NiCr 20 2	S-NC 20 2		A 439 Type D-2		1350	.28	18
GGG-NiMn 13 7	.7652	S-NiMn 13 7	S-NM 13 7				1350	.28	18
GS-Ck 45	1.1191	080 M 46	XC 42	1672	1045	S45C	1525	.22	2/3

Comparison of materials

Technical information

Tools and inserts for parting and grooving

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	USA AISI	Japan JIS	$K_{c1.1}$ N/mm ²	m_c	VDI 3323 group
GTS-35-10	.8135	B 340/12	MN 35-10				1225	.25	19
GTS-45-06	.8145	P 440/7					1420	.3	20
GTS-55-04	.8155	P 510/4	MP 50-5				1420	.3	20
GTS-65-02	.8165	P 570/3	MP 60-3				1420	.3	20
GTS-70-02	.8170	P 690/2	IP 70-2				1420	.3	20
NiCr20TiAl	2.4631	HR 401; 601	Nimonic 80 A				3300	.24	33
NiCr22Mo9Nb	2.4856		Inconel 625				3300	.24	33
NiCu30Al	2.4375		Monel K 500				3300	.24	34
NiFe25Cr20NbTi	2.4955						3300	.24	34
S 18-0-1	1.3355	BT 1	Z 80 WCV 18-04-01		T 1		2450	.23	10/11
S 18-1-2-5	1.3255	BT 4	Z 80 WKCV 18-05-04-0		T 4		2450	.23	10/11
S 2-9-2	1.3348		Z 100 DCWV 09-04-02-	2782	M 7		2450	.23	10/11
S 6-5-2	1.3343	BM 2	Z 85 WDCV 06-05-04-0	2722	M 2	SKH9; SKH51	2450	.23	10/11
S 6-5-2-5	1.3243		Z 85 WDKCV 06-05-05-	2723		SKH55	2450	.23	10/11
TiAl6V4	3.7165	TA 10 bis TA 13	T-A 6 V				2110	.22	37
X 10 Cr 13	1.4006	410 S 21	Z 12 C 13	2302	410; CA-15	SUS410	1875	.21	12/13
X 10 CrNiMoNb 18 12	1.4583				318		2150	.2	14
X 10 CrNiS 18 9	1.4305	303 S 21	Z 10 CNF 18.09	2346	303		2150	.2	14
X 100 CrMoV 5 1	1.2363	BA 2	Z 100 CDV 5	2260	A 2		2450	.23	10/11
X 12 CrMoS 17	1.4104		Z 10 CF 17	2383	430 F	SUS430F	1875	.21	12/13
X 12 CrNi 17 7	1.4310	301 S 21	Z 12 CN 17.07		301		2150	.2	14
X 12 CrNi 22 12	1.4829					SUS301	1350	.28	16
X 12 CrNi 25 21	1.4845	310 S24	Z 12 CN 25.20	2361	310 S	SUH310; SUS310S	2150	.2	14
X 12 CrNiTi 18 9	1.4878	321 S 20	Z 6 CNT 18.12 (B)	2337	321		2150	.2	14
X 12 NiCrSi 36 16	1.4864	NA 17	Z 12 NCS 37.18		330	SUH330	2600	.24	31
X 15 CrNiSi 20 12	1.4828	309 S 24	Z 15 CNS 20.12		309	SUH309	1350	.28	16
X 165 CrMoV 12	1.2601			2310			2450	.23	10/11
X 2 CrNiMo 18 13	1.4440						2150	.2	14
X 2 CrNiMoN 17 13 3	1.4429	316 S 62	Z 2 CND 17.13 Az	2375	316 LN	SUS316LN	2150	.2	14
X 2 CrNiN 18 10	1.4311	304 S 62	Z 2 CN 18 .10	2371	304 LN	SUS304LN	2150	.2	14
X 20 CrNi 17 2	1.4057	431 S 29	Z 15 CN 16.02	2321	431	SUS431	1875	.21	12/13
X 210 Cr 12	1.2080	BD 3	Z 200 C 12		D 3		2450	.23	10/11
X 210 CrW 12	1.2436			2312			2450	.23	10/11
X 30 WCrV 9 3	1.2581	BH 21	Z 30 WCV 9		H 21	SKD5	2450	.23	10/11
X 40 CrMoV 5 1	1.2344	BH 13	Z 40 CDV 5	2242	H 13	SKD61	2450	.23	10/11
X 46 Cr 13	1.4034	420 S 45	Z 40 C 14				1875	.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	.2	14
X 5 CrNiMo 17 13 3	1.4436	316 S 16	Z 6 CND 17.12	2343	316	SUS316	2150	.2	14
X 5 CrNiMo 18 10	1.4401	316 S 16	Z 6 CND 17.11	2347	316	SUS316	2150	.2	14
X 53 CrMnNiN 21 9	1.4871	349 S 54	Z 52 CMN 21.09		EV 8		1875	.21	12/13
X 6 Cr 13	1.4000	403 S 17	Z 6 C 13	2301	403	SUS403	1875	.21	12/13
X 6 Cr 17	1.4016	430 S 15	Z 8 C 17	2320	430	SUS430	1875	.21	12/13
X 6 CrMo 17	1.4113	434 S 17	Z 8 CD 17.01	2325	434	SUS434	1875	.21	12/13
X 6 CrNiMoTi 17 12 2	1.4571	320 S 31	Z 6 CNT 17.12	2350	316 Ti		2150	.2	14
X 6 CrNiNb 18 10	1.4550	347 S 17	Z 6 CNNb 18.10	2338	347		2150	.2	14
X 6 CrNiTi 18 10	1.4541	321 S 12	Z 6 CNT 18.10	2337	321		2150	.2	14
X2 CrNi 18-8	1.4317						2150	.2	14



Work piece material		Type of treatment / alloy		VDI 3323 group	Hardness HB
A	Non alloyed steel	annealed	≤ .15% C	1	125
		annealed	.15% - .45% C	2	150 - 250
		tempered	≥ .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
	Corrosion-resistant steel	annealed	ferritic	12	200
		tempered	martensitic	13	325
R	Stainless steel	annealed	ferritic / martensitic	14	200
		quenched	austenitic	14	180
		quenched	duplex	14	230 - 260
		hardened	martensitic / austenitic	14	330
F	Gray cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	–
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminum wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminum cast alloys	non hardened	< 12% Si	23	80
		hardened	< 12% Si	24	90
		non hardened	> 12% Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	–
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	29	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	–
		cast	Ni or Co-base 1500 - 2200 N/mm ²	35	–
	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		40	55 HRC

* R_m = ultimate tensile strength, measured in MPa

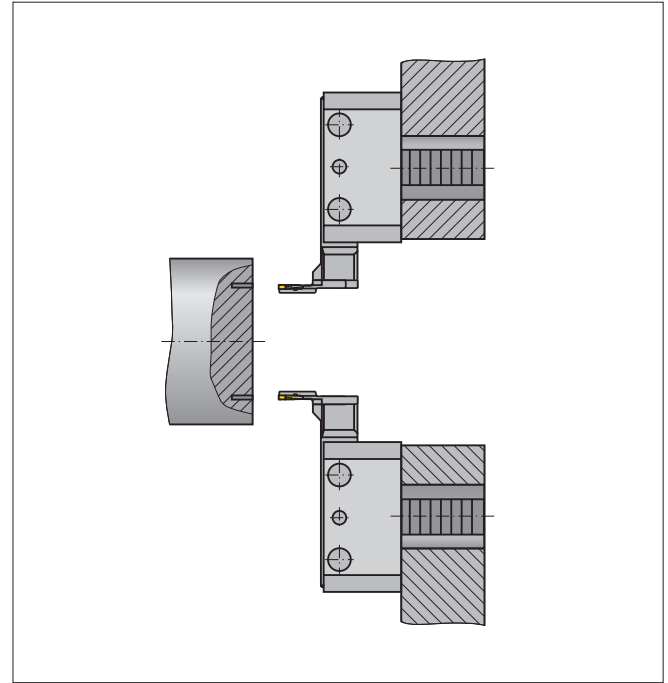
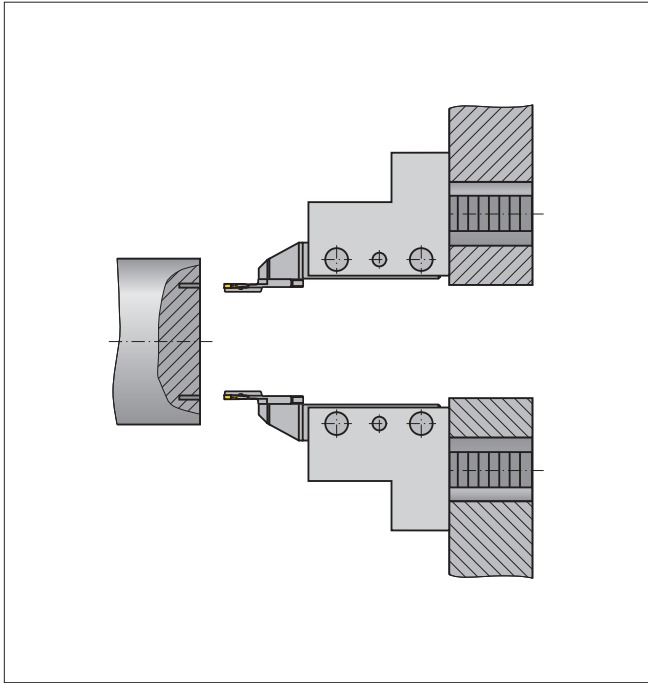
Uncoated carbide		
H216T v_c [sfpm]	CTW7120 v_c [sfpm]	
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394 - 525	—	
295 - 460	—	
427 - 558	—	
295 - 427	—	
460 - 657	—	
394 - 525	—	
985 - 8208	328 - 1642	
657 - 6506	328 - 985	
1313 - 4925	328 - 1642	
1313 - 4925	328 - 985	
657 - 2626	328 - 985	
821 - 1970	328 - 1642	
657 - 1970	328 - 1642	
492 - 1313	328 - 985	
492 - 985	328 - 985	
263 - 591	263 - 591	
197 - 492	197 - 492	
328 - 821	328 - 821	
98 - 148	—	
66 - 115	—	
66 - 115	—	
59 - 98	—	
49 - 82	—	
197 - 394	164 - 394	
98 - 263	98 - 164	
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Work piece material		Type of treatment / alloy		VDI 3323 group	Hardness HB
A	Non alloyed steel	annealed	≤ .15% C	1	125
		annealed	.15% - .45% C	2	150 - 250
		tempered	≥ .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
	Corrosion-resistant steel	annealed	ferritic	12	200
		tempered	martensitic	13	325
R	Stainless steel	annealed	ferritic / martensitic	14	200
		quenched	austenitic	14	180
		quenched	duplex	14	230 - 260
		hardened	martensitic / austenitic	14	330
F	Gray cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	–
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminum wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminum cast alloys	non hardened	< 12% Si	23	80
		hardened	< 12% Si	24	90
		non hardened	> 12% Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	–
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	29	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	–
		cast	Ni or Co-base 1500 - 2200 N/mm ²	35	–
	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		40	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Coated carbide					
CTC1325 v_c [sfpm]	SR127 v_c [sfpm]	GM127 v_c [sfpm]	CTP1340 v_c [sfpm]	CTCP335 v_c [sfpm]	CTPP345 v_c [sfpm]
492 - 919	492 - 919	492 - 919	394 - 821	427 - 821	361 - 624
427 - 788	427 - 788	427 - 788	263 - 591	361 - 624	263 - 492
328 - 657	328 - 657	328 - 657	197 - 492	230 - 558	230 - 460
460 - 722	460 - 722	460 - 722	263 - 591	394 - 657	230 - 460
427 - 591	427 - 591	427 - 591	197 - 492	361 - 591	230 - 394
328 - 525	328 - 525	328 - 525	197 - 394	230 - 492	197 - 394
394 - 558	394 - 558	394 - 558	263 - 525	295 - 558	197 - 328
328 - 492	328 - 492	328 - 492	164 - 394	230 - 525	197 - 328
492 - 821	492 - 821	492 - 821	164 - 657	394 - 657	295 - 525
197 - 328	197 - 328	197 - 328	164 - 492	197 - 328	197 - 328
460 - 722	460 - 722	460 - 722	164 - 657	394 - 657	328 - 591
394 - 657	394 - 657	394 - 657	164 - 591	328 - 558	263 - 492
263 - 427	263 - 427	263 - 427	164 - 328	230 - 361	230 - 361
197 - 328	197 - 328	197 - 328	164 - 263	197 - 295	197 - 295
394 - 722	394 - 722	—	328 - 657	295 - 591	—
328 - 657	328 - 657	—	295 - 525	263 - 492	—
427 - 624	427 - 624	—	328 - 591	328 - 525	—
328 - 624	328 - 624	—	263 - 525	230 - 460	—
460 - 919	460 - 919	—	361 - 755	328 - 657	—
295 - 624	295 - 624	—	263 - 525	263 - 492	—
—	—	—	328 - 1642	—	—
—	—	—	328 - 985	—	—
—	—	—	328 - 1642	—	—
—	—	—	328 - 985	—	—
—	—	—	328 - 657	—	—
—	—	—	328 - 1642	—	—
—	—	—	328 - 1642	—	—
—	—	—	328 - 985	—	—
—	—	—	328 - 985	—	—
—	—	—	263 - 591	—	—
—	—	—	197 - 492	—	—
—	—	—	328 - 821	—	—
82 - 148	82 - 148	82 - 148	66 - 164	—	—
66 - 131	66 - 131	66 - 131	66 - 131	—	66 - 131
49 - 82	49 - 82	49 - 82	49 - 82	—	66 - 98
33 - 66	33 - 66	33 - 66	33 - 66	—	—
33 - 66	33 - 66	33 - 66	33 - 66	—	—
—	—	—	164 - 394	—	—
—	—	—	98 - 164	—	—
33 - 66	33 - 66	—	—	—	—
—	—	—	—	—	—
33 - 66	33 - 66	—	—	—	—
33 - 66	33 - 66	—	—	—	—

Tool configuration



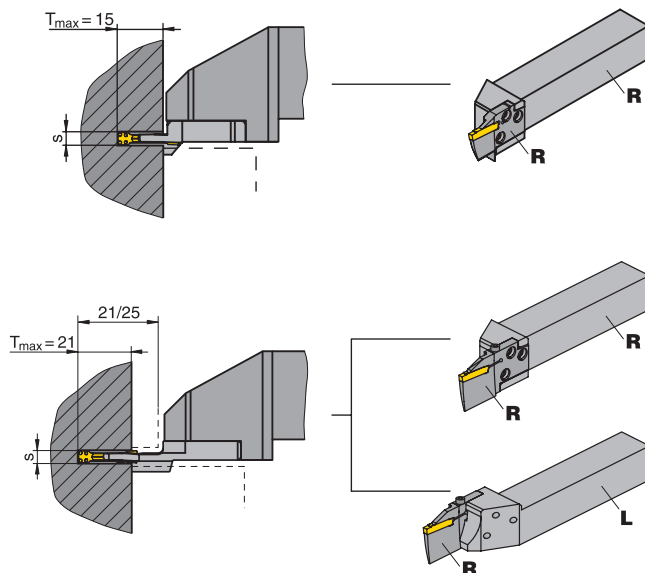
MSS tools 0°

- 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



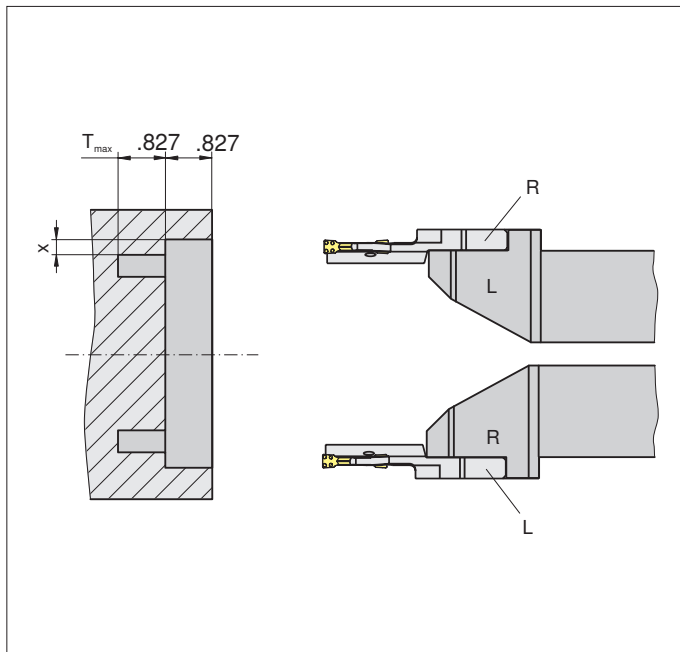
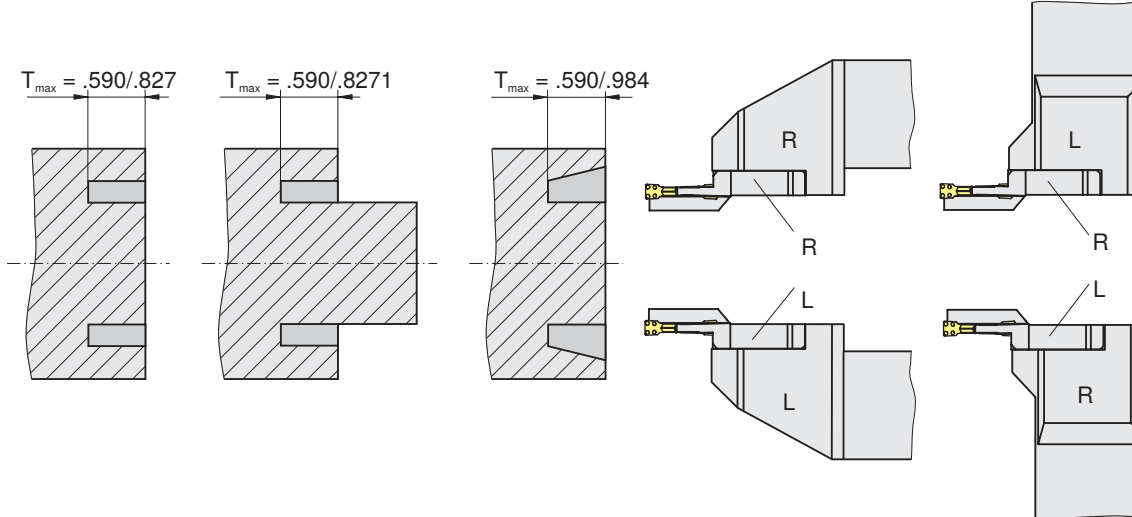
Short axial module

- Can be clamped on one side only
- Parting and grooving depth max. .591 inch

Long axial module

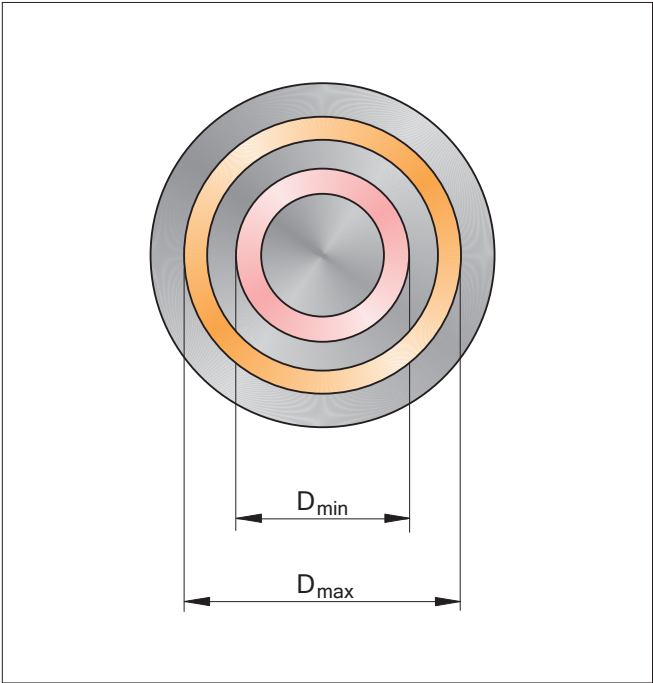
- Can be clamped from either side
- Parting and grooving depth max. .827 inch

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.



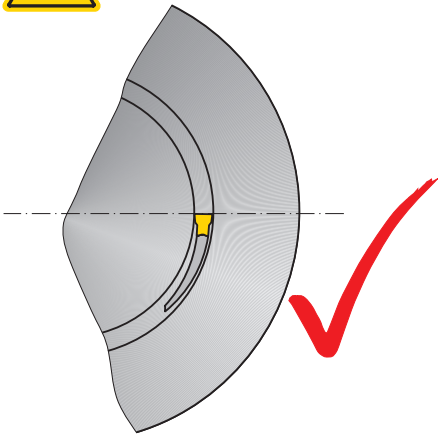
Diameter range
(D_{min} - D_{max})
1.97 - 2.76 inch
2.76 - 3.94 inch
3.94 - 5.91 inch
3.91 - 11.81 inch
11.81 - 35.43 inch

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

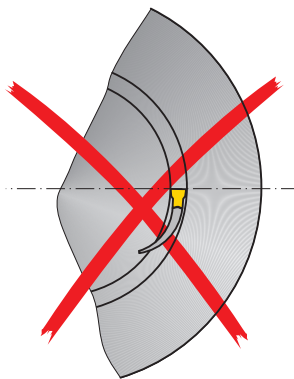
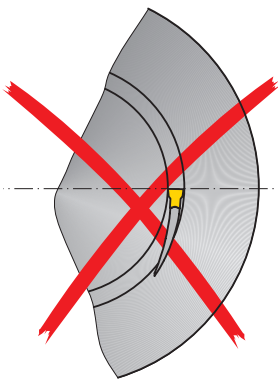
Diameter range	MSS assembly size							
	20	25					32	
	Cutting width	Cutting width					Cutting width	
		Short module			Long module			
	.109 - .147	.109 - .147	.148 - .197	.198 - .256	.148 - .197	.198 - .256	.148 - .197	.198 - .256
1.97 - 2.76	●	●	●	●				
2.76 - 3.94	●	●	●	●	●	●	●	●
3.94 - 5.91	●	●	●	●	●	●	●	●
5.91 - 11.81			●	●	●	●	●	●
11.81 - 35.43								●
max. grooving depth	.551	.591			.827		.591	



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.

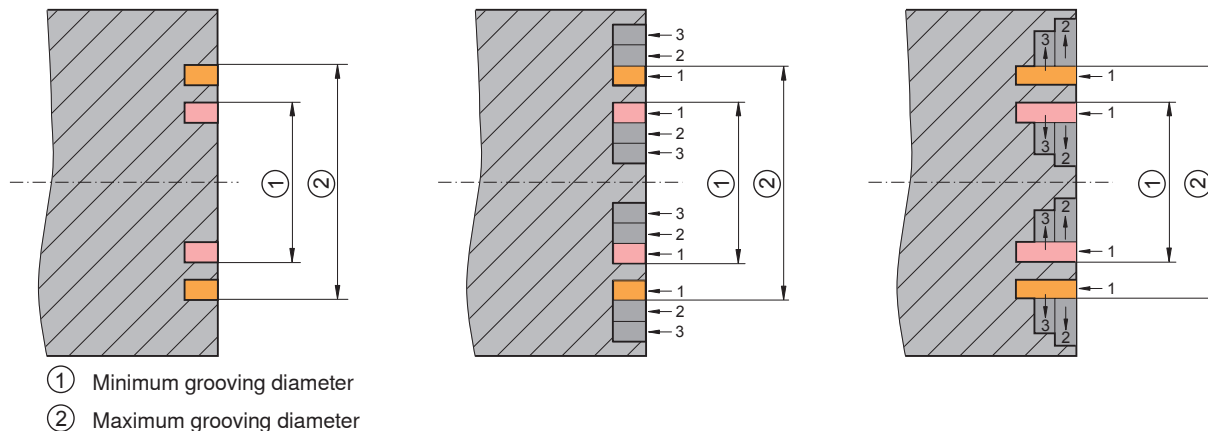


Correct axial grooving module



Incorrect axial grooving module

Application advice for axial grooving and face turning



Axial grooving

is only possible within the diameter range for that module (e.g. 1.969 - 2.756 inch).

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.

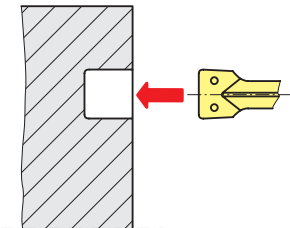
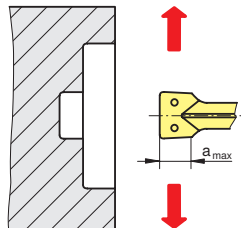
Please note: only the first groove must lie within the diameter range of the module. The depth of the widening groove must not be larger than the depth of the original groove.

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.

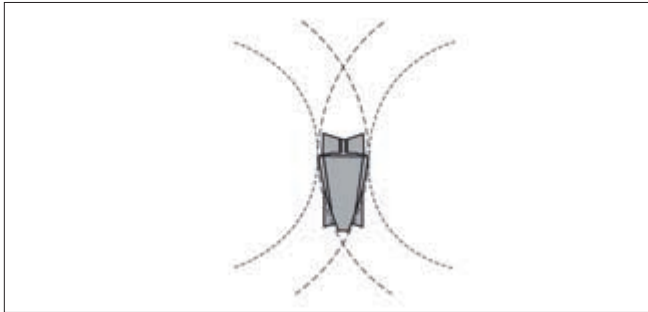
Please note: only the first groove must lie within the diameter range of the module.

Axial grooving and face turning

Designation	 f [mm/rev]	 a _{max} [inch] f [mm/rev]	
		a _{max} [inch]	f [mm/rev]
GX24-2E3.00N0.30	.002 - .006	.098	.002 - .008
GX24-3E4.00N0.40	.002 - .006	.118	.002 - .010
GX24-3E5.00N0.40	.002 - .006	.118	.004 - .010
GX24-4E6.00N0.50	.002 - .008	.138	.004 - .012
GX24-2E3.00N0.30-F2	.001 - .005	.098	.002 - .006
GX24-2E3.50N0.30-F2	.001 - .005	.098	.002 - .006
GX24-3E4.00N0.40-F2	.002 - .006	.118	.004 - .008
GX24-3E4.50N0.40-F2	.002 - .006	.118	.004 - .008
GX24-3E5.00N0.40-F2	.003 - .008	.138	.004 - .008
GX24-4E6.00N0.50-F2	.002 - .006	.157	.004 - .010

MSS-AX

Product characteristics, customer benefits



Neutral insert

- May be applied in left-hand and right-hand tools
- Application is independent 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



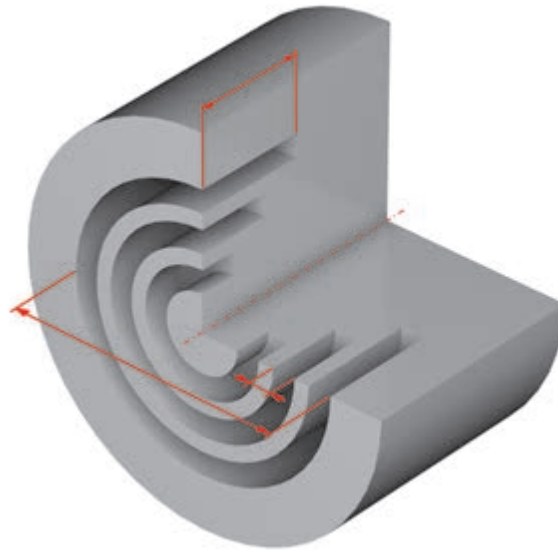
Tools provided with 'hard & tough' coating

- Maximum wear protection
- Maximum corrosion resistance

Monoblock and modular tools

- High flexibility
- Cost-optimized solution for every application





System GX



T_{max}	.591 [inch]	.827 [inch]
$D_{min} - D_{max}$		
1.97 - 2.76	X	X
2.76 - 3.94	X	X
3.94 - 5.91	X	X
5.91 - 11.81	X	X
11.81 - 35.43	X	
S [inch]	.109 - .256	.148 - .256

System AX



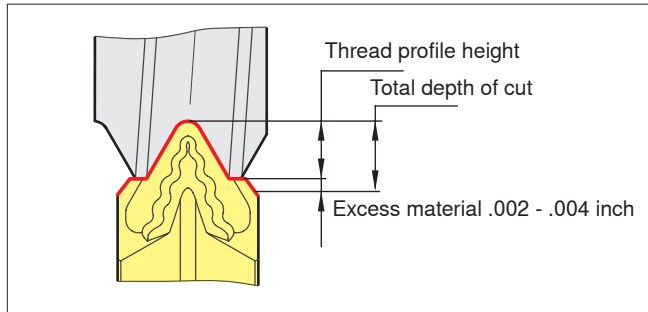
T_{max}	AX05	AX10	AX15
$D_{min} - D_{max}$			
$D_{min} - D_{max}$	.394 - ∞	.790 - ∞	1.180 - ∞
T_{max}	.200	.390	.590
S [inch]	.118	.118	.118

System LX



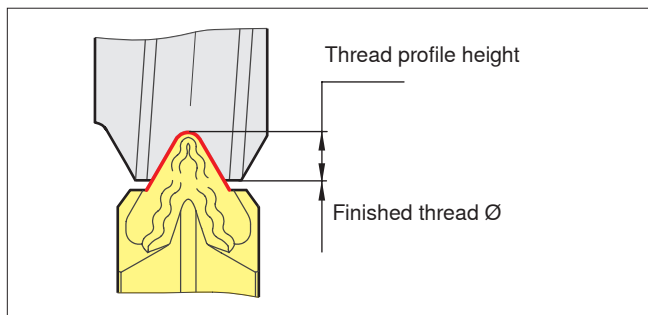
T_{max}	E32N25	E32N32	E32N45
$D_{min} - D_{max}$			
$D_{min} - D_{max}$	19.685 - ∞	19.685 - ∞	19.685 - ∞
T_{max}	.748	1.020	1.540
S [inch]	.310 - .390	.310 - .390	.310 - .390

Differences between full and partial profile inserts



Full profile insert

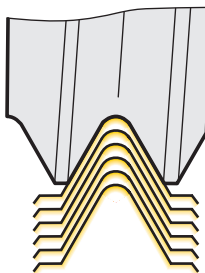
- + The entire thread profile including the external dia. is machined (excess material .002 - .004 inch over finished diameter) + high profile precision
- + Increased tool life thanks to larger point radii
- + Burr-free thread
- One insert per pitch



Partial profile insert

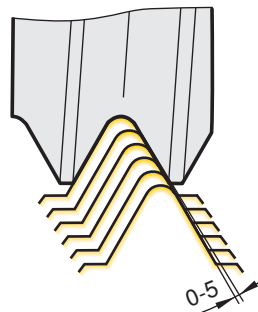
- + One insert for several pitches
- Therefore the thread profile does not exactly meet the standard
- The external dia. (or the core dia. in case of internal threads) is not machined

Approach selection



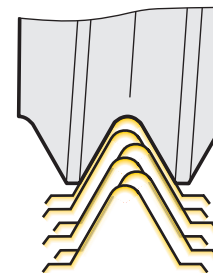
Radial approach

- + Conventional lathes
- + With pitches < .079 inch
- + With short chipping materials
- Reduced chip control



Flank approach

- + Preferred approach on CNC-machines
- + With pitches from .079 to .157 inch
- + Long chipping materials
- + Good chip control



Alternating approach

- + With pitches > .157 inch
- + 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	
	≈					≈	≈				Stability tool - insert	General criteria
	≈					≈	≈				Stability - work piece	
											Overhang	
≈	≈	≈			≈	≈	≈				Tip height	
○	○	○	○	○		○					Cooling lubricant	



raise, increase,
large influence



avoid, reduce
large influence



check,
optimize



raise, increase
low influence



avoid, reduce
low influence

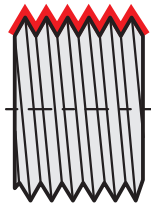


use

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	4	5	5	6	7	8	9	10	10	12	12	12
	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	6	7	8	9	10	11	12	14	18	18	20	20	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	4	5	5	6	7	8	9	10	10	12	12	12
	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	6	7	8	9	10	11	12	14	18	18	20	20	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

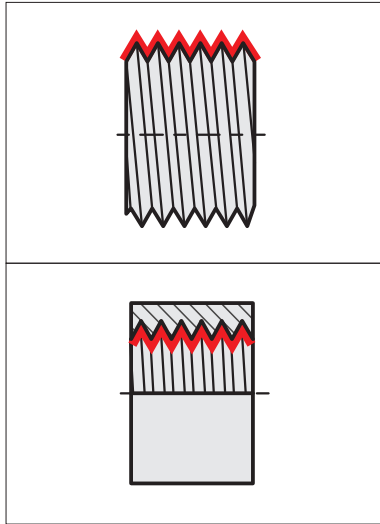
These are recommended values for steel machining

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	5	5	5	6	6	7	8	9	9	10	10	10	12	12	12
	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	8	8	9	9	10	10	11	12	14	14	17	18	18	20	20	20
Thread profile height	.024	.026	.028	.033	.035	.037	.041	.047	.055	.060	.066	.074	.083	.095	.111	.133

These are recommended values for steel machining

Partial profile



60° external and internal threads

Threading insert	TC16-2EI-AG60																
	TC16-1EI-A60									TC16-2EI-G60				TC16-3EI-N60			
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	4	5	6	7	8	9	10	12	8	9	10	12	12	13	14	14
	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	6	7	9	10	11	12	14	15	19	12	14	15	20	20	21	22	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

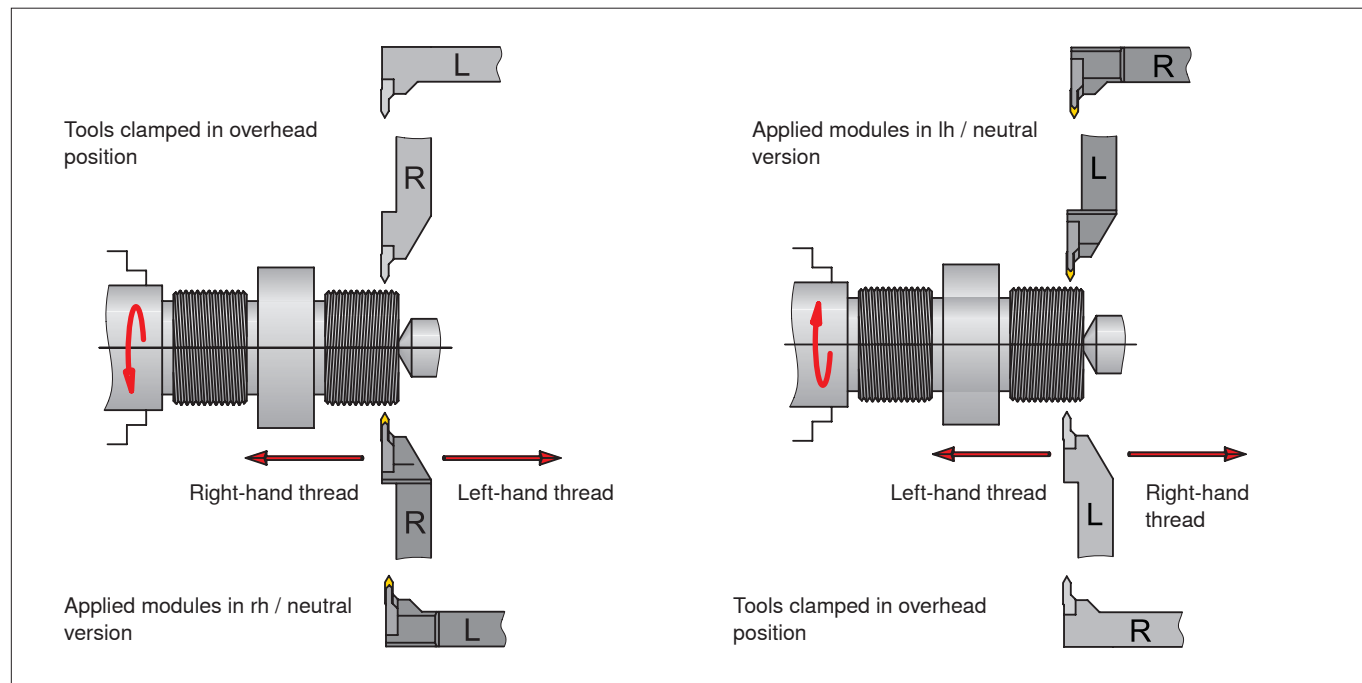
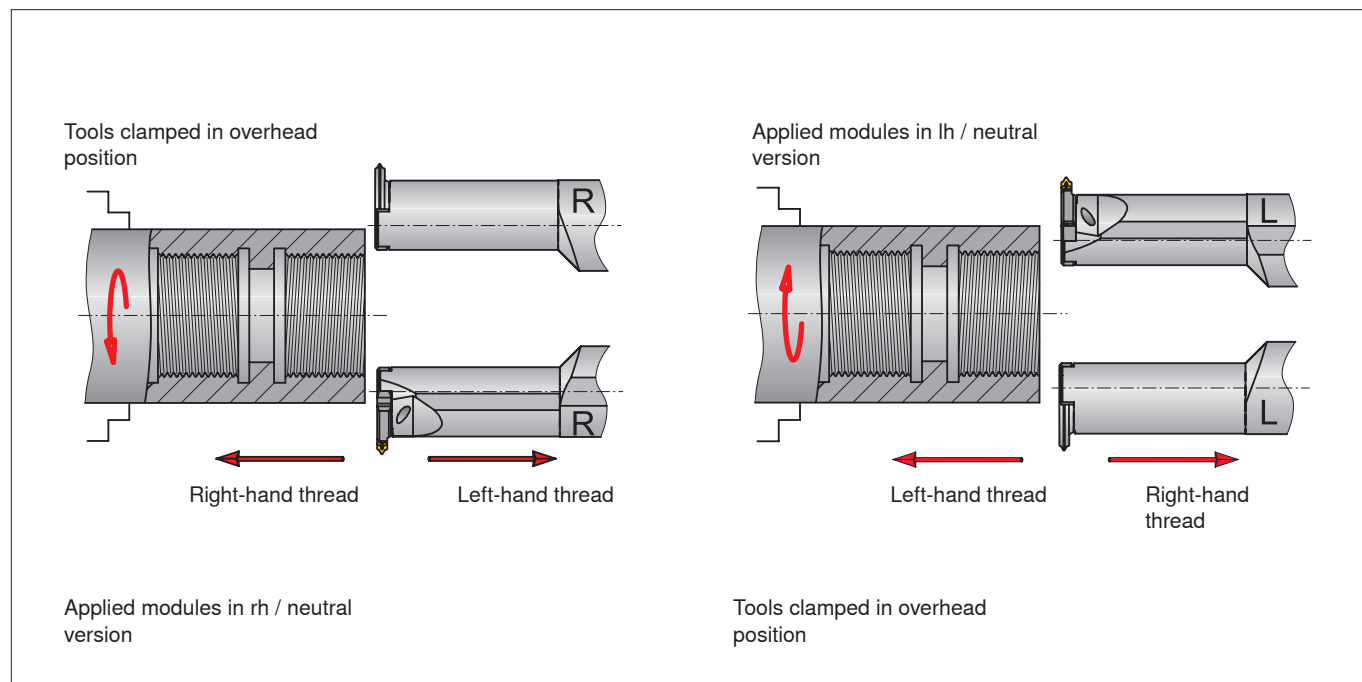
55° external threads

	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	5	6	6	7	7	8	9	10	10	11	12	12
	↓	↓	-	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	8	8	9	9	12	12	14	14	16	16	18	20	20
Thread profile height	.026	.028	.031	.037	.040	.042	.048	.055	.064	.070	.078	.087	.098

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	9	10	11	12	12	12	12	14
	↓	↓	↓	↓	↓	↓	↓	↓	↓
	12	14	15	18	20	20	20	20	22
Thread profile height	.048	.057	.061	.071	.080	.091	.094	.114	.140

These are recommended values for steel machining

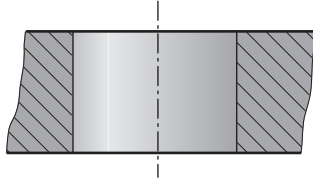
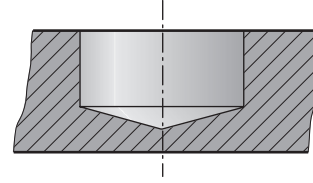
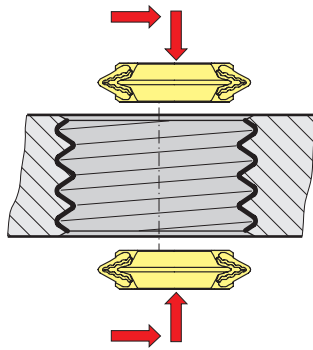
Application methods for external machining**Application methods for internal machining**

External thread

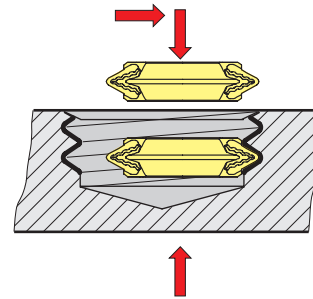
	Conventional milling	Climb milling
Right-hand thread		
Left-hand thread		

Internal thread

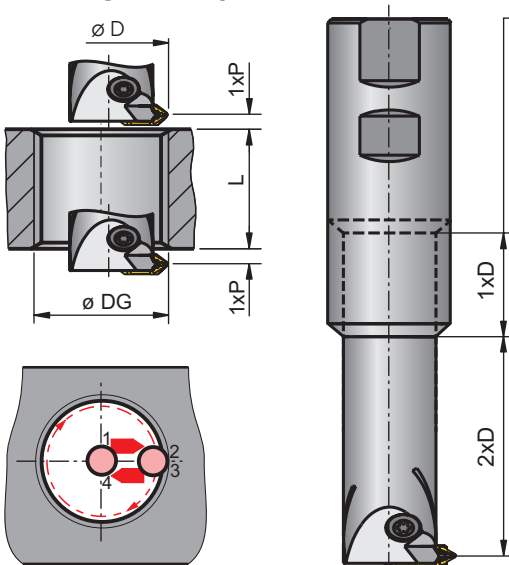
	Conventional milling	Climb milling
Right-hand thread		
Left-hand thread		

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

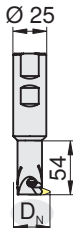
Advantages compared to multi-tooth threading inserts

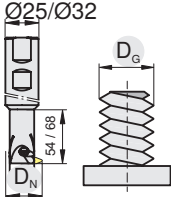
Readjustment possible when necessary

- 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 $2 \times D$. Tools may be modified up to $3 \times D$.
- Higher cutting values ($vc + f$) in this manner machining times are similar to multi-tooth insert machining
- Easy programming



Milling tool system MSS-TC

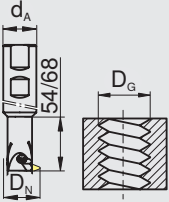
D _N	Type, description	Full profile metric ISO 60°											
		D _G [mm]	TC threading inserts										
			TC16-1 0,5 ISO	TC16-1 0,75 ISO	TC16-1 1,0 ISO	TC16-1 1,5 ISO	TC16-1 2,0 ISO	TC16-1 2,5 ISO	TC16-1 3,0 ISO	TC16-1 3,5 ISO	TC16-1 4,0 ISO	TC16-1 4,5 ISO	TC16-1 5,0 ISO
25	I25R90-2D-TC16-W 	M27	x	x									
		M28	x	x	x								
		M30	x	x	x	x							
		M32	x	x	x	x	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				
		M39	x	x	x	x	x		x		x		
		M40	x	x	x	x	x		x		x		
		M42	x	x	x	x	x		x		x	x	
		M45	x	x	x	x	x		x		x	x	
		M48	x	x	x	x	x		x		x		x

32	I32R90-2D-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			
			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			
			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			
			M76		x	x	x	x		x			x			
			M78		x	x	x	x		x			x			
			M80		x	x	x	x		x			x			

 = standard thread

Full profile Whitworth 55°							
D_g [inch]	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
R 1 $\frac{1}{4}$			x				
1 $\frac{1}{2}$							x
R 1 $\frac{1}{2}$			x				
1 $\frac{5}{8}$							
1 $\frac{3}{4}$							

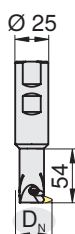
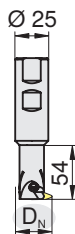
[illegible]

Bgr.	Type, description	Full profile metric ISO 60°				Full profile Whitworth 55°	
							
			MSS-I32R-TC16-2	MSS-I32N-TC16-3			
		D _e [mm]	TC16-2 2,0 ISO	TC16-2 3,0 ISO	TC16-3 4,0 ISO	D _e [inch]	TC16-2 EI 11W
32	1.5D MSS-I32R90-1.5D	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
	2.5D MSS-I32R90-2.5D	M155		x	x		
		M160		x	x		
		M165		x	x	R6	x
		M170		x	x		
		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 – external

Milling tool system MSS-TC

D _N	Type, description	D _e [mm]	Full profile metric ISO 60°											
			TC threading inserts											
			TC16-1 10,5 ISO	TC16-1 10,75 ISO	TC16-1 11,0 ISO	TC16-1 11,5 ISO	TC16-1 12,0 ISO	TC16-1 12,5 ISO	TC16-1 13,0 ISO	TC16-1 13,5 ISO	TC16-1 14,0 ISO	TC16-1 14,5 ISO	TC16-1 15,0 ISO	
25	I25R90-2D-TC16-W	↓ M16												
		↓												
32	I32R90-2D-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

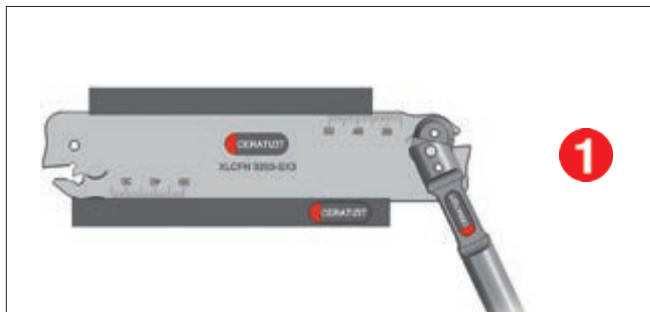
Bgr.	Type, description	Full profile metric ISO 60°			
		D _a [mm]	MSS-I32R-TC16-2		MSS-I32N-TC16-3
			TC16-2 I 2,0 ISO	TC16-2 I 3,0 ISO	TC16-3 I 4,0 ISO
32	1.5D MSS-I32R90-1.5D	M82	x	x	x
		M85	x	x	x
		M90	x	x	x
		M95	x	x	x
		M100	x	x	x
		M105	x	x	x
		M110	x	x	x
		M115	x	x	x
		M120	x	x	x
		M125	x	x	x
		M130	x	x	x
		M135	x	x	x
		M140	x	x	x
		M145	x	x	x
		M150	x	x	x
	2.5D MSS-I32R90-2.5D	M155		x	x
		M160		x	x
		M165		x	x
		M170		x	x
		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

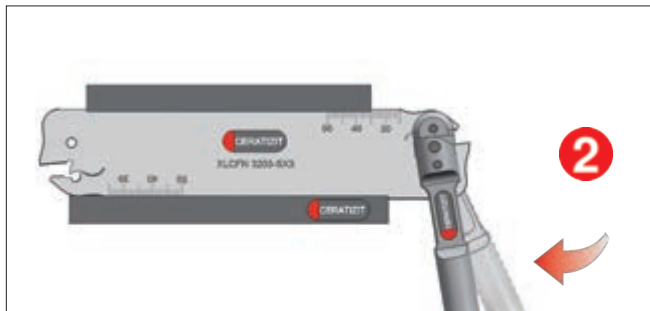
Work piece material		Type of treatment / alloy		VDI 3323 group	Hardness HB
A	Non alloyed steel	annealed	≤ .15% C	1	125
		annealed	.15% - .45% C	2	150 - 250
		tempered	≥ .45% C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Corrosion-resistant steel	annealed	ferritic	12	200
		tempered	martensitic	13	325
R	Stainless steel	annealed	ferritic / martensitic	14	200
		quenched	austenitic	14	180
		quenched	duplex	14	230 - 260
		hardened	martensitic / austenitic	14	330
F	Gray cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	–
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminum wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminum cast alloys	non hardened	< 12% Si	23	80
		hardened	< 12% Si	24	90
		non hardened	> 12% Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	–
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	29	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	–
		cast	Ni or Co-base 1500 - 2200 N/mm ²	35	–
	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		40	55 HRC

* R_m = ultimate tensile strength, measured in MPa

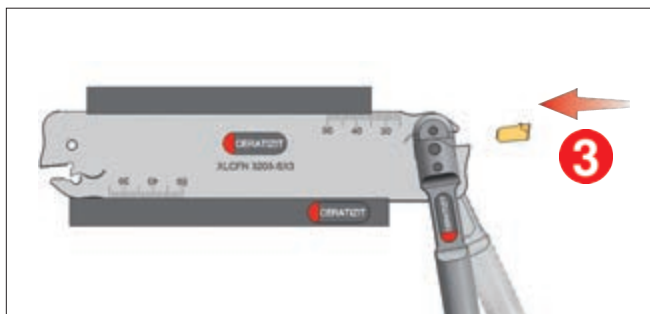
Coated carbide			Uncoated carbide		
GM213 v_c [sfpm]	GM240 v_c [sfpm]		H216T v_c [sfpm]		
492 - 821	657 - 886		—		
361 - 591	591 - 755		—		
295 - 525	460 - 624		—		
328 - 558	591 - 624		—		
263 - 492	394 - 624		—		
230 - 394	394 - 525		—		
295 - 427	460 - 657		—		
230 - 361	328 - 525		—		
361 - 558	558 - 755		—		
295 - 460	427 - 624		—		
361 - 591	492 - 657		—		
263 - 460	—		—		
230 - 328	—		—		
230 - 394	—		—		
394 - 525	427 - 657		—		
328 - 427	394 - 591		—		
525 - 657	394 - 558		—		
295 - 460	394 - 624		—		
394 - 460	492 - 755		—		
295 - 427	394 - 558		—		
—	—		328 - 2626		
—	—		328 - 2626		
—	—		328 - 1642		
—	—		328 - 1642		
—	—		328 - 1149		
—	—		263 - 1642		
—	—		263 - 1642		
—	—		263 - 1642		
—	—		263 - 1642		
—	—		263 - 1642		
—	—		263 - 1642		
—	—		263 - 1642		
98 - 164	66 - 131		—		
82 - 115	66 - 98		—		
82 - 115	33 - 66		—		
33 - 66	33 - 66		—		
33 - 82	33 - 66		—		
328 - 492	230 - 328		—		
131 - 197	82 - 148		—		
115 - 148	—		98 - 131		
—	—		—		
33 - 66	—		16 - 49		
115 - 148	—		98 - 131		



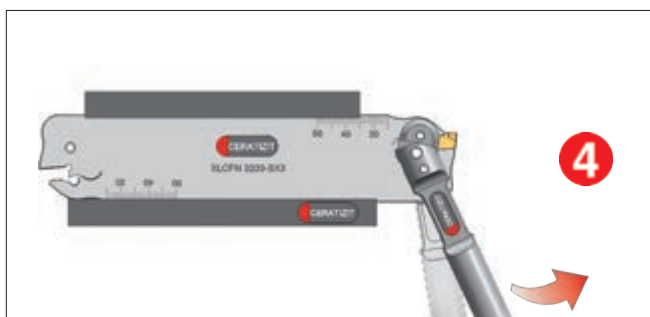
Insert mounting key with handle towards the front into the 2 tool location points.



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



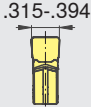
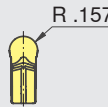
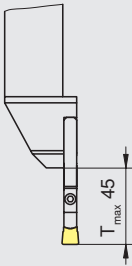
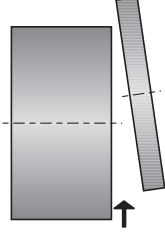
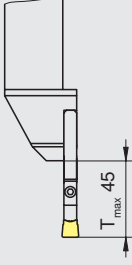
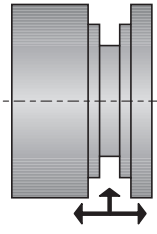
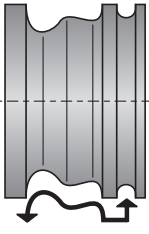
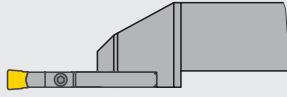
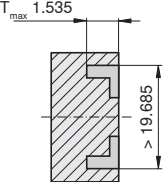
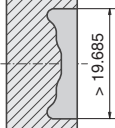
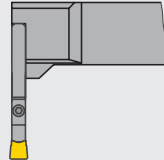
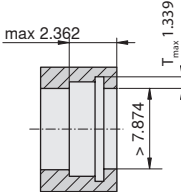
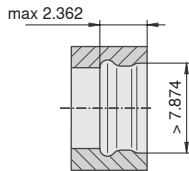
Position the insert pressing it against the location face.



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.

Insert Application		
Part-off 		
Grooving and turning 		
Axial grooving 		
Internal grooving and turning 		



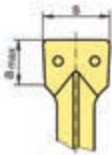
Kunde: Kunden-Nr.:
Ansprechpartner: Datum:
E-Mail: Tel.:

Stückzahl: Werkzeug / Modul:
Werkstoff: Festigkeit: [N/mm²]

GX-Stechwendplatten sind auf Wunsch auch in verschiedenen Sonderformen lieferbar. In der folgenden Übersicht sind die Wichtigsten angeführt. Die eingetragenen Maße zeigen welche Mindestangaben zur Definition der Sonderformen erforderlich sind.
Wichtig: Maße und Toleranzen des Werkstückes anführen!

Zeichnung auf Seite 3 einfügen

Rohlingstypen für Sonderformen			
Breitenklasse	WSP-Größe	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



Wendepfattendimensionen: ☐ 09 ☐ 16 ☐ 24

Breitenklasse:

Maße:

	Maß	Toleranz	
s			[mm]
T			[mm]
R1			[mm]
R2			[mm]
C1			[mm]
C2			[mm]
Ø1			[°]
Ø2			[°]

Innenbearbeitung - Bohrung Ø [mm]

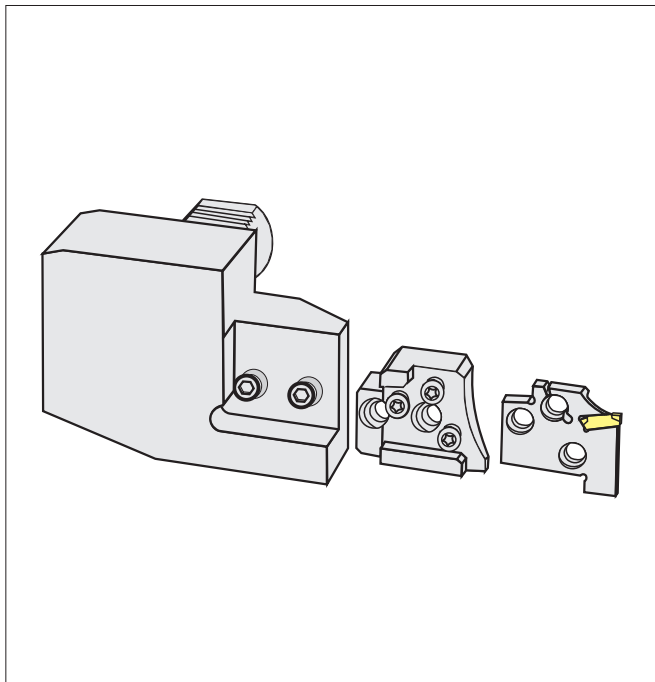
Ihre Anmerkungen:



You can download the form below at our website www.ceratzit.com ->Download ->Forms or using the QR code.

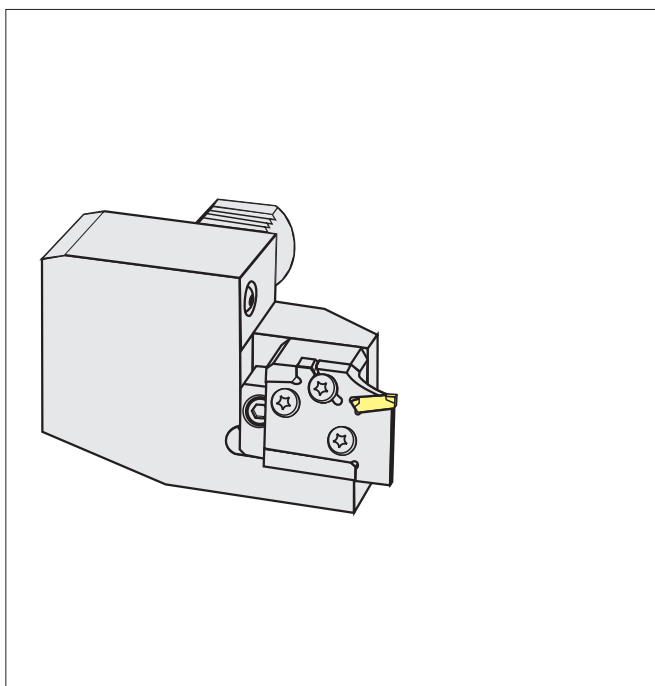
Application possibilities for MSS adapters

MSS adapters offer the possibility to apply the modular parting and grooving system where conventional tool shanks or Maxiflex 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

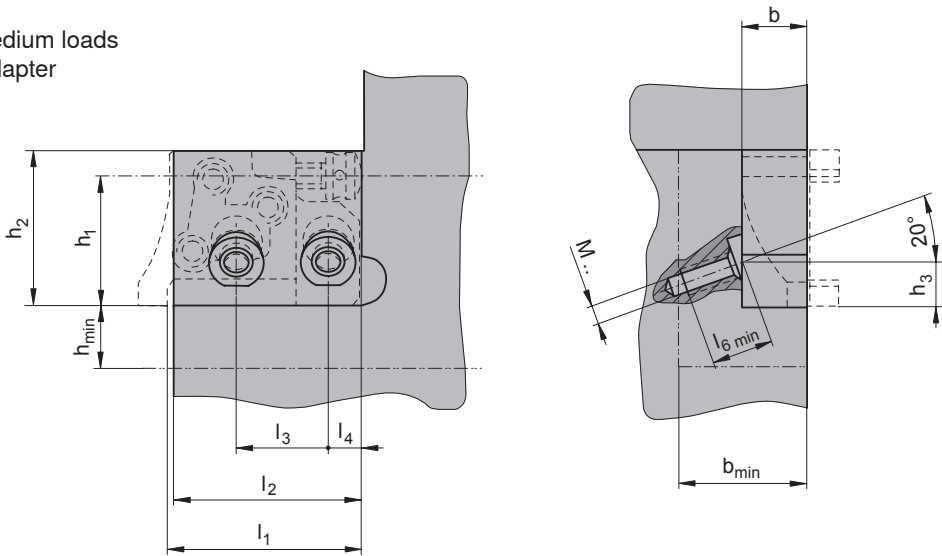


Assembly example

Adapters in combination with VDI shank

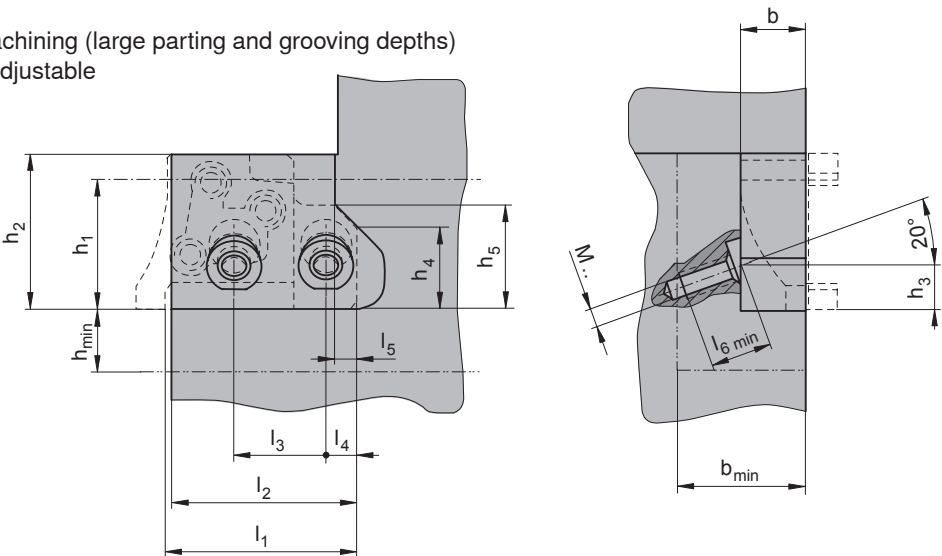
Assembly type A

- For low or medium loads
- Adjustable adapter

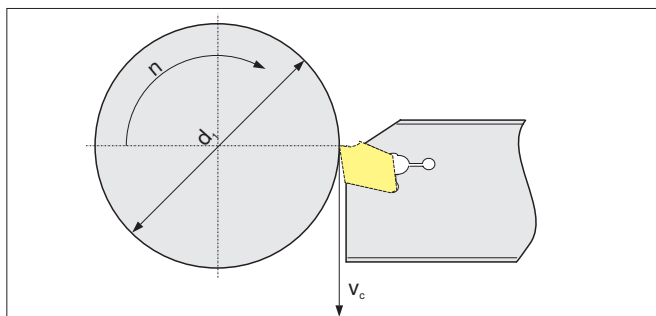


Assembly type B

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



Adapters for:	Dimensions in mm														
	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	.787	.945	.236	.512	.630	.394	.421	.748	1.181	1.142	.561	.197	.118	.315	M4
MSS-E25R00-AD MSS-E25L00-AD	.984	1.181	.335	.630	.787	.472	.496	.984	1.457	1.417	.709	.256	.157	.472	M5
MSS-E32R00-AD MSS-E32L00-AD	1.260	1.496	.531	.866	1.024	.630	.575	1.181	1.811	1.752	.925	.295	.157	.591	M6

**Cutting speed (v_c)**

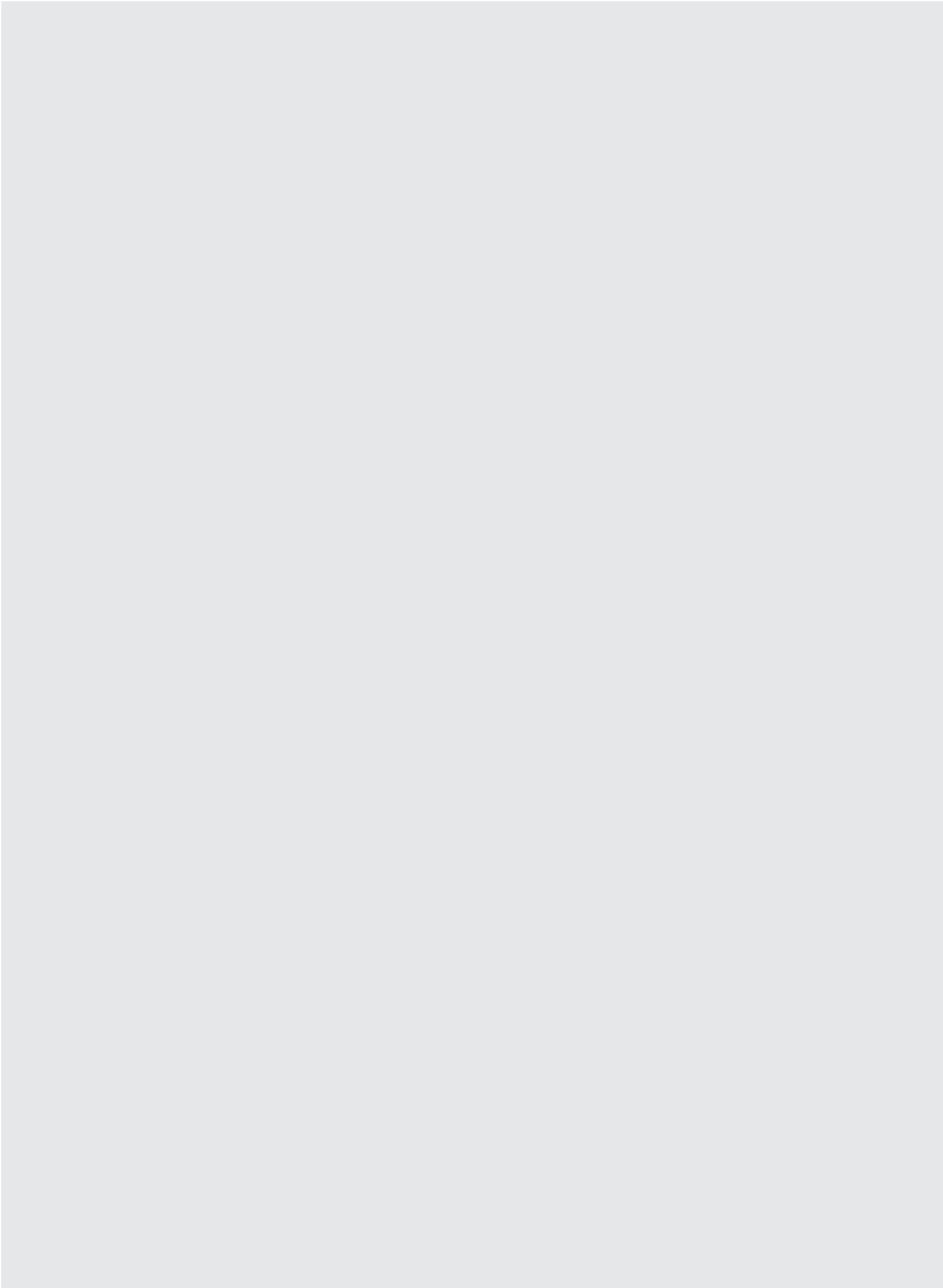
$$v_c = \frac{d_1 \cdot \pi \cdot n}{12} \text{ [sfpm]}$$

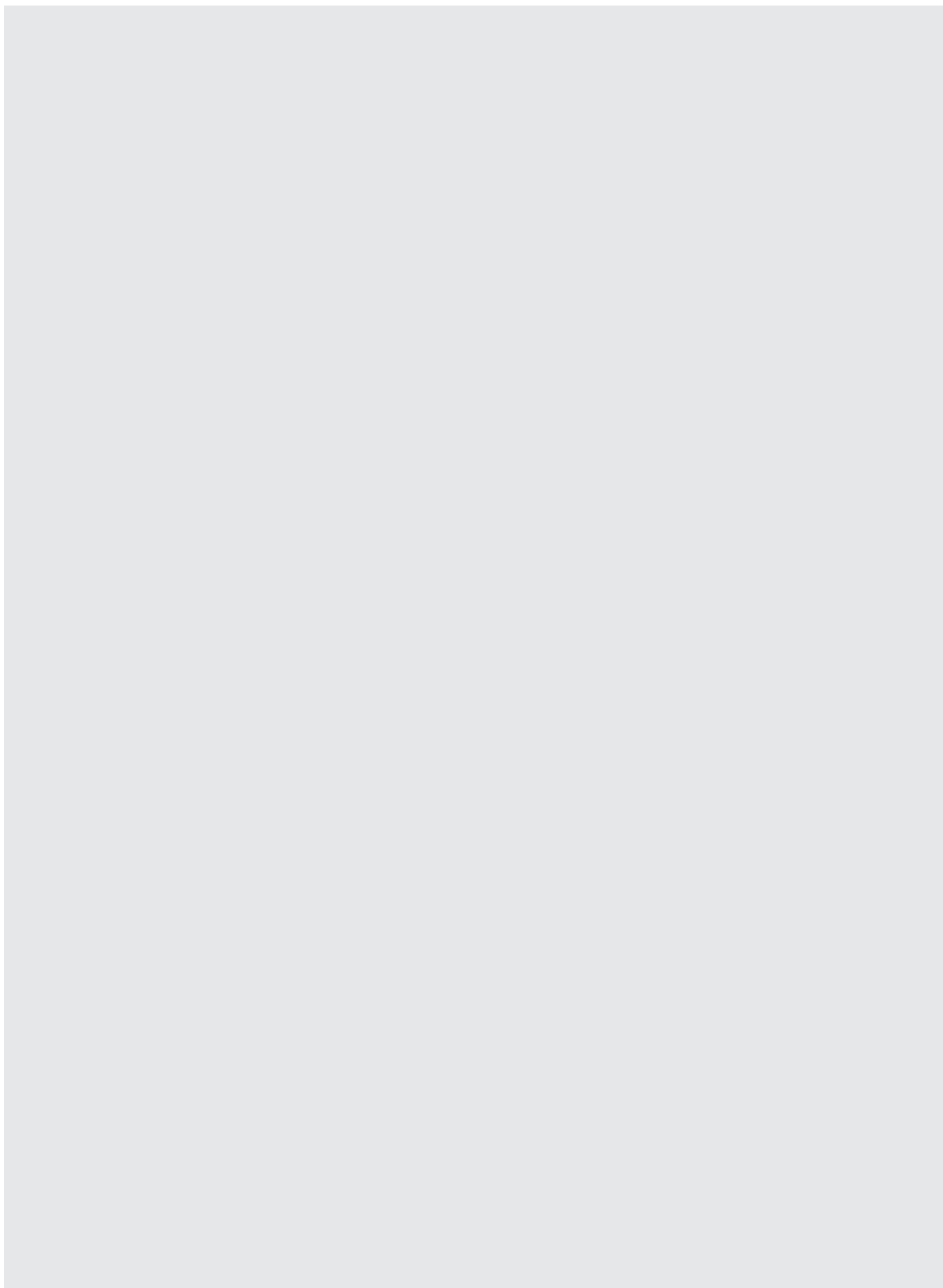
Revolutions per minute (n)

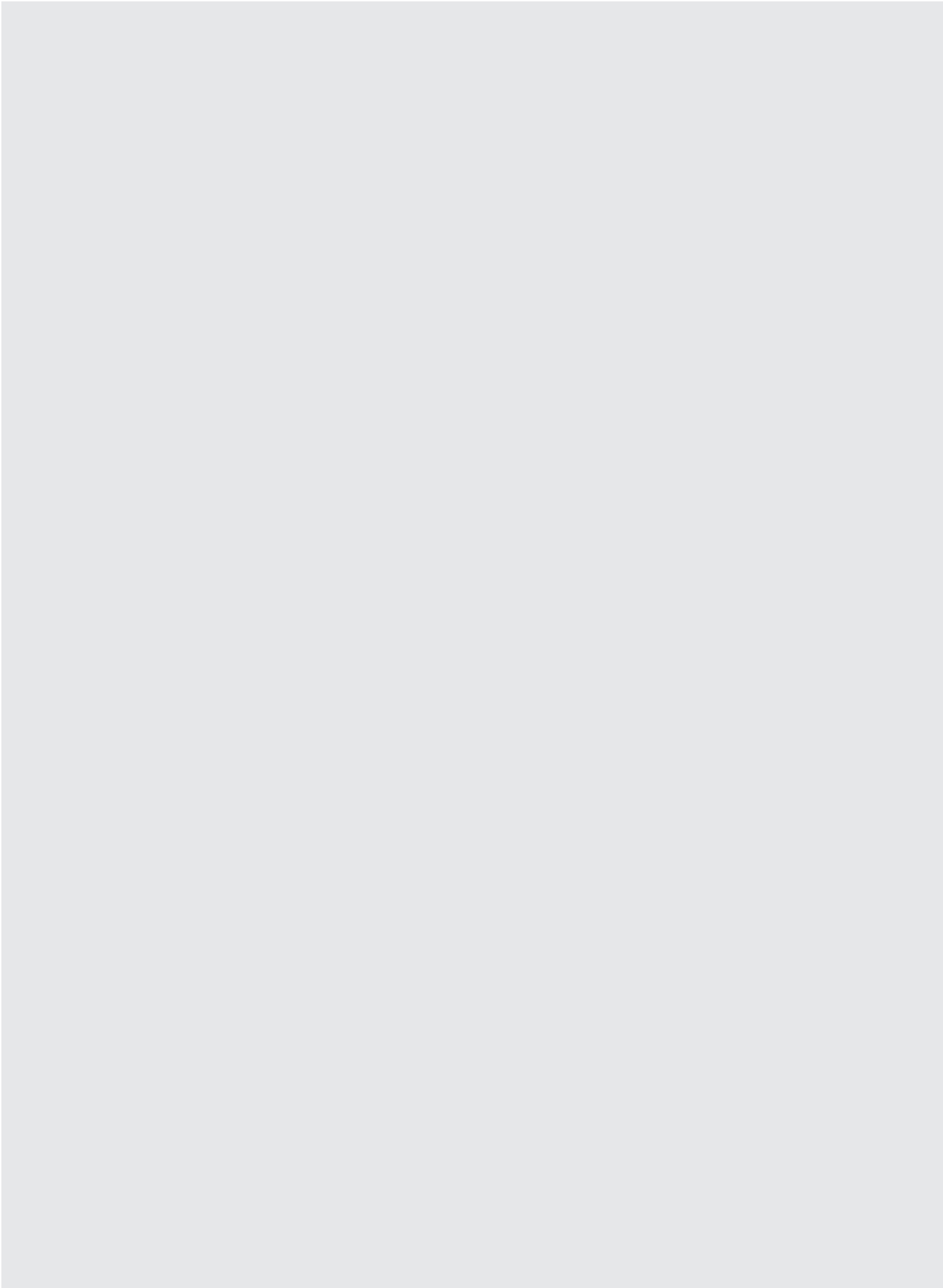
$$n = \frac{v_c \cdot 12}{d_1 \cdot \pi} \text{ [rev./min]}$$

Feed rate (v_f)

$$v_f = f \cdot n \text{ [inch/min]}$$







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