KONRAD TOOLS

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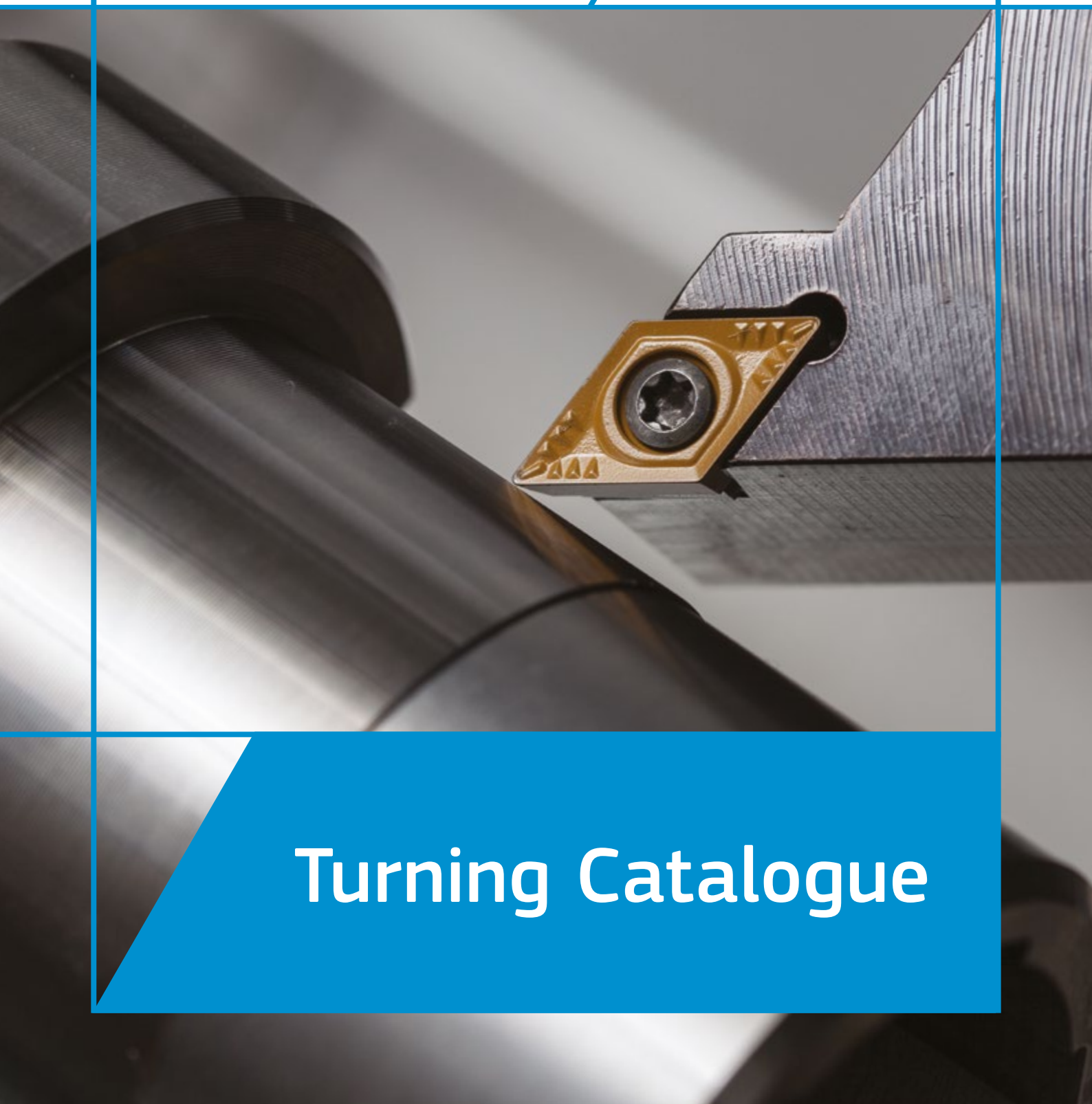


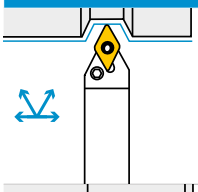
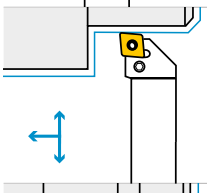
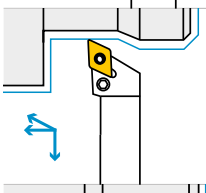
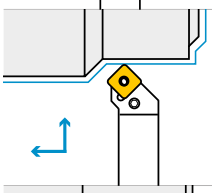
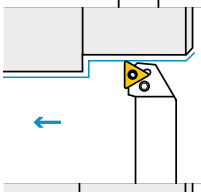
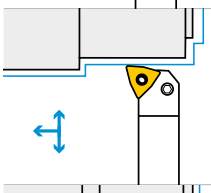
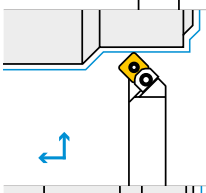
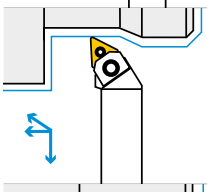
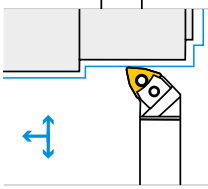
Turning Catalogue

KONRAD TOOLS

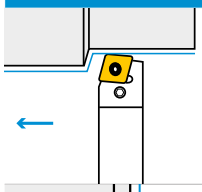
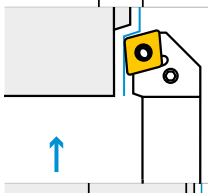
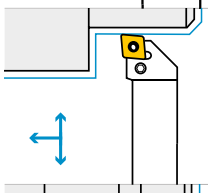
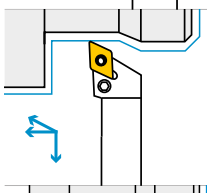
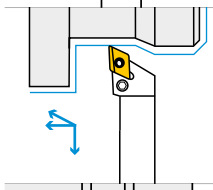
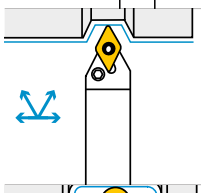
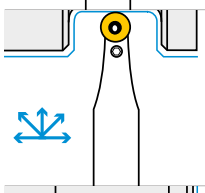
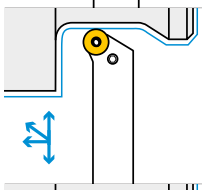
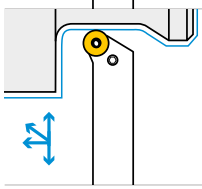
Contents

Turning

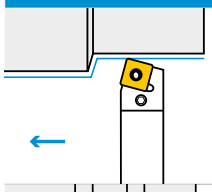
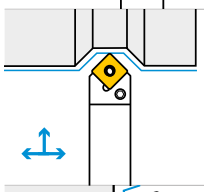
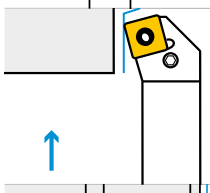
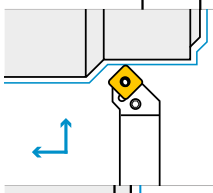
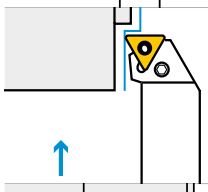
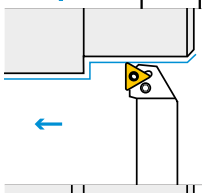
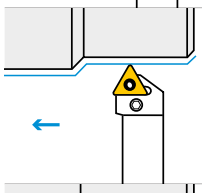
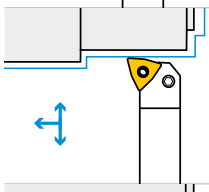
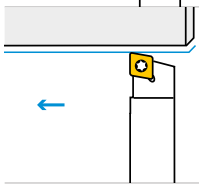
Tool holders and indexable inserts for external machining

Cutting direction	Setting angle	Tool	Ordering Code	Pages
	72,5°	Tool holder	BM51576	88
		Indexable inserts	XCGT ...	
	95°	Tool holder	DCLNR/L	63
		Indexable inserts	CN ...	
	93°	Tool holder	DDJNR/L	63
		Indexable inserts	DN ...	
	45°	Tool holder	DSSNR/L	63
		Indexable inserts	SN ...	
	90°	Tool holder	DTJNR/L 16	64
		Indexable inserts	TN ...	
	95°	Tool holder	DWLNR/L	64
		Indexable inserts	WN ...	
	45°	Tool holder	MSSNR/L	65
		Indexable inserts	SN ...	
	93°	Tool holder	MTJNR/L	65
		Indexable inserts	TN ...	
	95°	Tool holder	MWLNR/L	66
		Indexable inserts	WN ...	

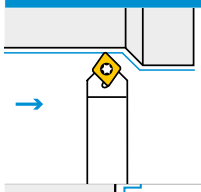
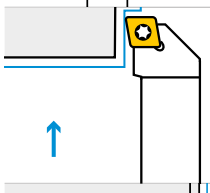
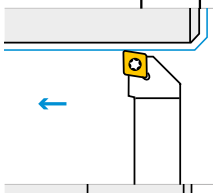
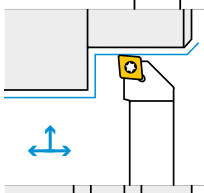
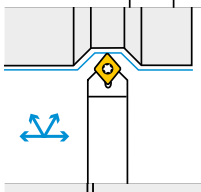
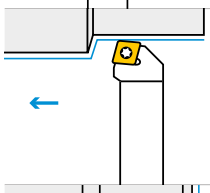
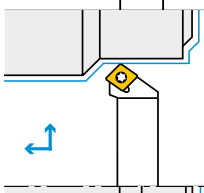
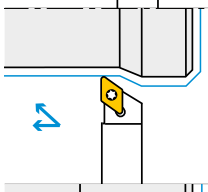
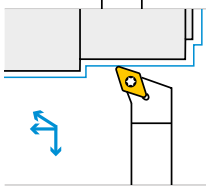
Tool holders and indexable inserts for external machining

Cutting direction	Setting angle	Tool	Ordering Code	Pages
	75°	Tool holder	PCBNR/L	67
		Indexable inserts	CN ...	
	75°	Tool holder	PCKNR/L	67
		Indexable inserts	CN ...	
	95°	Tool holder	PCLNR/L	67
		Indexable inserts	CN ...	
	93°	Tool holder	PDJNR/L	68
		Indexable inserts	DN ...	
	93°	Tool holder	PDJNR/L 14	68
		Indexable inserts	DN ... 14 ...	
	63°	Tool holder	PDNNR/L	68
		Indexable inserts	DN ...	
	–	Tool holder	PRDCN	69
		Indexable inserts	RC ...	
	–	Tool holder	PRGCR/L	69
		Indexable inserts	RC ...	
	–	Tool holder	PRSCR/L	69
		Indexable inserts	RC ...	

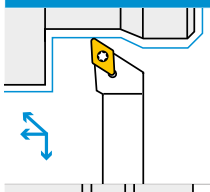
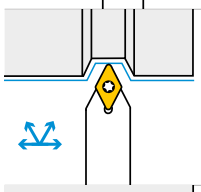
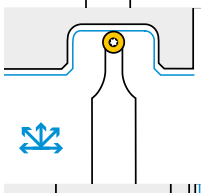
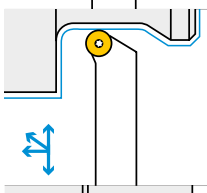
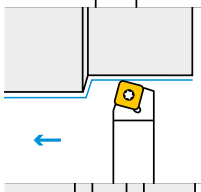
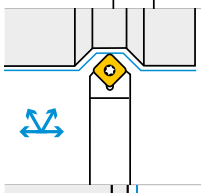
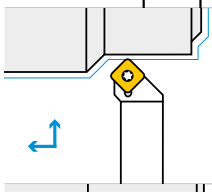
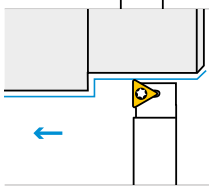
Tool holders and indexable inserts for external machining

Cutting direction	Setting angle	Tool	Ordering Code	Pages
	75°	Tool holder	PSBNR/L	70
		Indexable inserts	SN ...	
	45°	Tool holder	PSDNN	70
		Indexable inserts	SN ...	
	75°	Tool holder	PSKNR/L	70
		Indexable inserts	SN ...	
	45°	Tool holder	PSSNR/L	71
		Indexable inserts	SN ...	
	90°	Tool holder	PTFNR/L	72
		Indexable inserts	TN ...	
	90°	Tool holder	PTGNR/L	72
		Indexable inserts	TN ...	
	60°	Tool holder	PTTNR/L	72
		Indexable inserts	TN ...	
	95°	Tool holder	PWLNR/L	73
		Indexable inserts	WN ...	
	90°	Tool holder	SCACR/L	74
		Indexable inserts	CC ...	

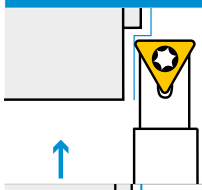
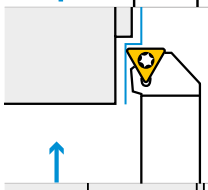
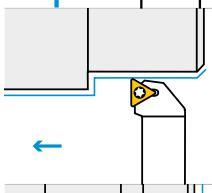
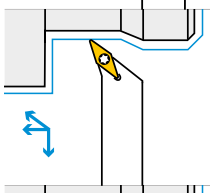
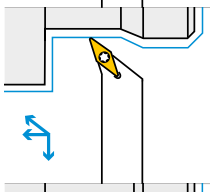
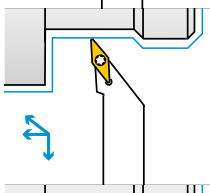
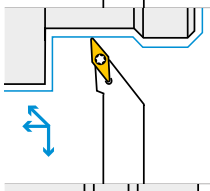
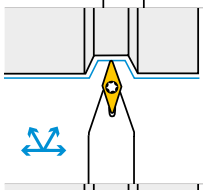
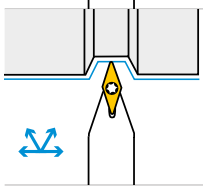
Tool holders and indexable inserts for external machining

Cutting direction	Setting angle	Tool	Ordering Code	Pages
	45°	Tool holder	SCDCL	74
		Indexable inserts	CC ...	
	90°	Tool holder	SCFCR/L	74
		Indexable inserts	CC ...	
	90°	Tool holder	SCGCR/L	75
		Indexable inserts	CC ...	
	95°	Tool holder	SCLCR/L	75
		Indexable inserts	CC ...	
	50°	Tool holder	SCMCN	75
		Indexable inserts	CC ...	
	75°	Tool holder	SCRCR/L	76
		Indexable inserts	CC ...	
	45°	Tool holder	SCSCR/L	76
		Indexable inserts	CC ...	
	90°	Tool holder	SDACR/L	77
		Indexable inserts	DC ...	
	107,5°	Tool holder	SDHCR/L	77
		Indexable inserts	DC ...	

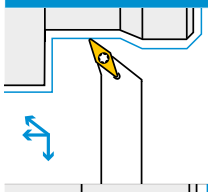
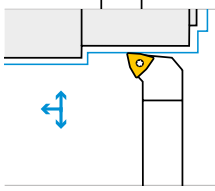
Tool holders and indexable inserts for external machining

Cutting direction	Setting angle	Tool	Ordering Code	Pages
	93°	Tool holder	SDJCR/L	76
		Indexable inserts	DC ...	
	62,5°	Tool holder	SDNCN	78
		Indexable inserts	DC ...	
	–	Tool holder	SRDCN	79
		Indexable inserts	RC ...	
	–	Tool holder	SRGCR/L	79
		Indexable inserts	RC ...	
	75°	Tool holder	SSBCR/L	80
		Indexable inserts	SC ...	
	45°	Tool holder	SSDCN	80
		Indexable inserts	SC ...	
	75°	Tool holder	SSKCR/L	80
		Indexable inserts	SC ...	
	45°	Tool holder	SSSCR/L	81
		Indexable inserts	SC ...	
	90°	Tool holder	STACR/L	82
		Indexable inserts	TC ...	

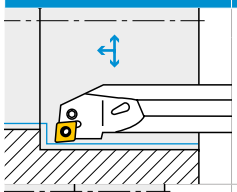
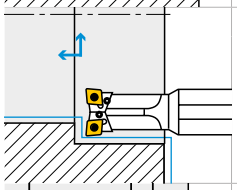
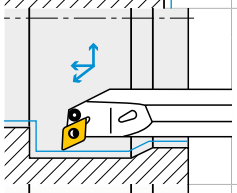
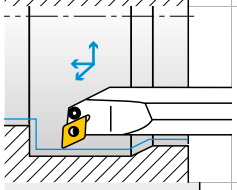
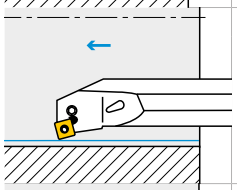
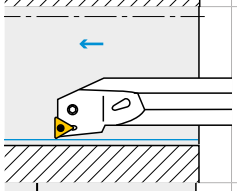
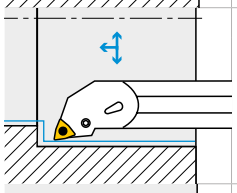
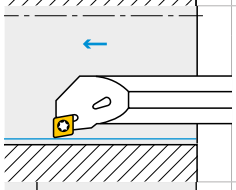
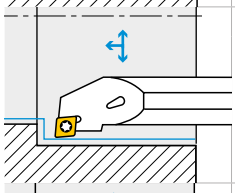
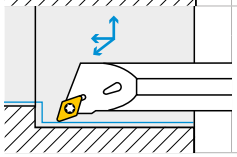
Tool holders and indexable inserts for external machining

Cutting direction	Setting angle	Tool	Ordering Code	Pages
	90°	Tool holder	STCCN	82
		Indexable inserts	TC ...	
	90°	Tool holder	STFCR/L	82
		Indexable inserts	TC ...	
	90°	Tool holder	STGCR/L	83
		Indexable inserts	TC ...	
	107,5°	Tool holder	SVHBR/L	84
		Indexable inserts	VB ...	
	107,5°	Tool holder	SVHCR/L	84
		Indexable inserts	VC ...	
	93°	Tool holder	SVJBR/L	85
		Indexable inserts	VB ...	
	93°	Tool holder	SVJCR/L	85
		Indexable inserts	VC ...	
	72,5°	Tool holder	SVVBN	86
		Indexable inserts	VB ...	
	72,5°	Tool holder	SVVCN	86
		Indexable inserts	VC ...	

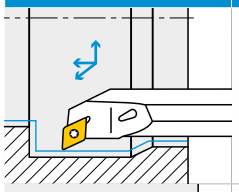
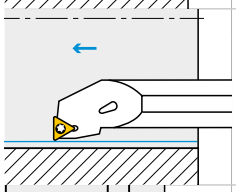
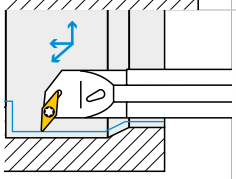
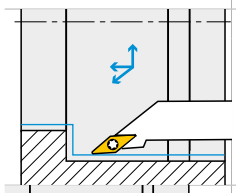
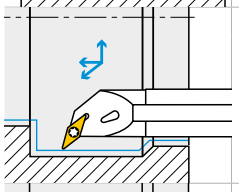
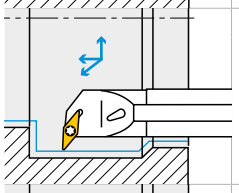
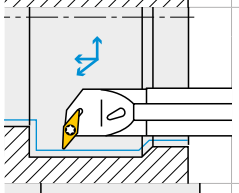
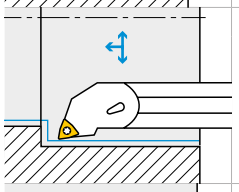
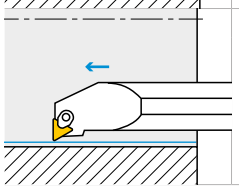
Tool holders and indexable inserts for external machining

Cutting direction	Setting angle	Tool	Ordering Code	Pages
	100°	Tool holder	SVZCR/L	86
		Indexable inserts	VC ...	
	95°	Tool holder	SWLCR/L	87
		Indexable inserts	WC ...	

Tool holders and indexable inserts for internal machining

Cutting direction	Setting angle	Tool	Ordering Code	Pages
	95°	Tool holder	PCLNR/L	89
		Indexable inserts	CN ...	
	95°	Tool holder	29629/29529	89
		Indexable inserts	CN ...	
	93°	Tool holder	PDUNR/L	90
		Indexable inserts	DN ...	
	93°	Tool holder	PDUNR/L 14	90
		Indexable inserts	DN ...	
	75°	Tool holder	PSKNR/L	91
		Indexable inserts	SN ...	
	90°	Tool holder	PTFNR/L	91
		Indexable inserts	TN ...	
	95°	Tool holder	PWLNR/L	92
		Indexable inserts	WN ...	
	90°	Tool holder	SCFCR/L	93
		Indexable inserts	CC ...	
	95°	Tool holder	SCLCR/L	93
		Indexable inserts	CC ...	
	107,5°	Tool holder	SDQCR/L	94
		Indexable inserts	DC ...	

Tool holders and indexable inserts for internal machining

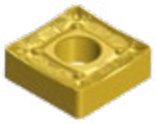
Cutting direction	Setting angle	Tool	Ordering Code	Pages
	93°	Tool holder	SDUCR/L	94
		Indexable inserts	DC ...	
	90°	Tool holder	STFCR/L	95
		Indexable inserts	TC ...	
	95°	Tool holder	SVLCR/L	95
		Indexable inserts	...	
	5°	Tool holder	SVOCR/L	95
		Indexable inserts	...	
	107,5°	Tool holder	SVQCR/L	96
		Indexable inserts	VC ...	
	93°	Tool holder	SVUBR/L	96
		Indexable inserts	VB ...	
	93°	Tool holder	SVUCR/L	96
		Indexable inserts	VC ...	
	95°	Tool holder	SWLCR/L	97
		Indexable inserts	WC ...	
	92°	Tool holder	S74P	98
		Indexable inserts	TP ...	

Main geometries

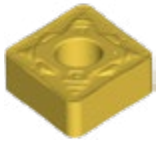
For negative indexable inserts suitable for ISO-P and M clamping systems

Controlled chip forming over the whole range of application.

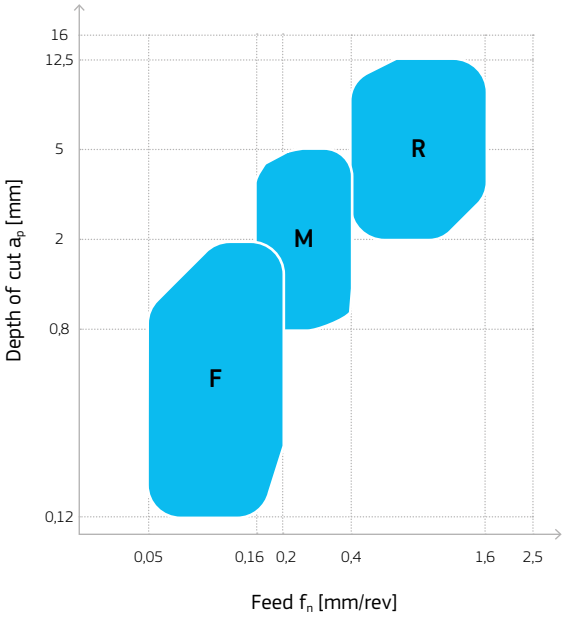
Roughing geometry "**R**" (**R**oughing)



Universal geometry "**M**" (**M**edium)



Finishing geometry "**F**" (**F**inishing)

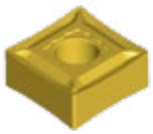


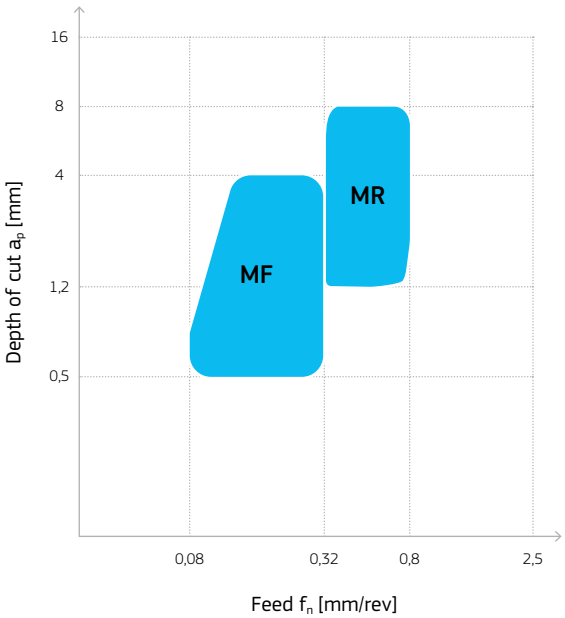
Intermediate geometries

For negative indexable inserts suitable for ISO-P and M clamping systems

Rough intermediate geometry "**MR**" (**M**edium/**R**oughing)

Fine intermediate geometry "**MF**" (**M**edium/**F**inishing)

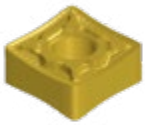


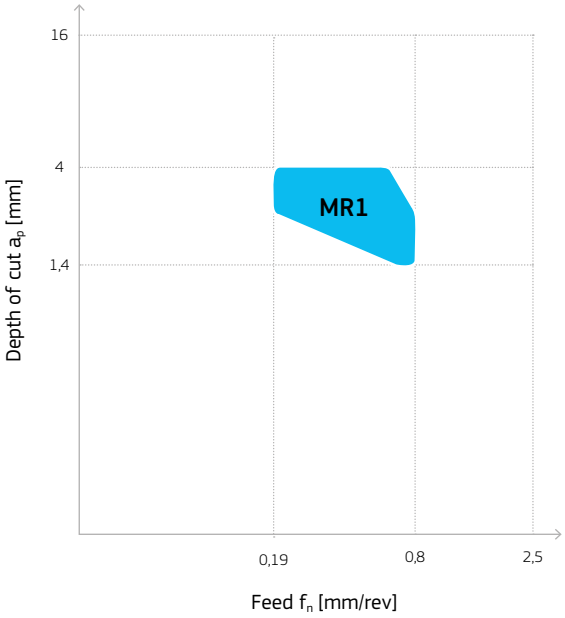


Geometry for better surface quality or higher feed

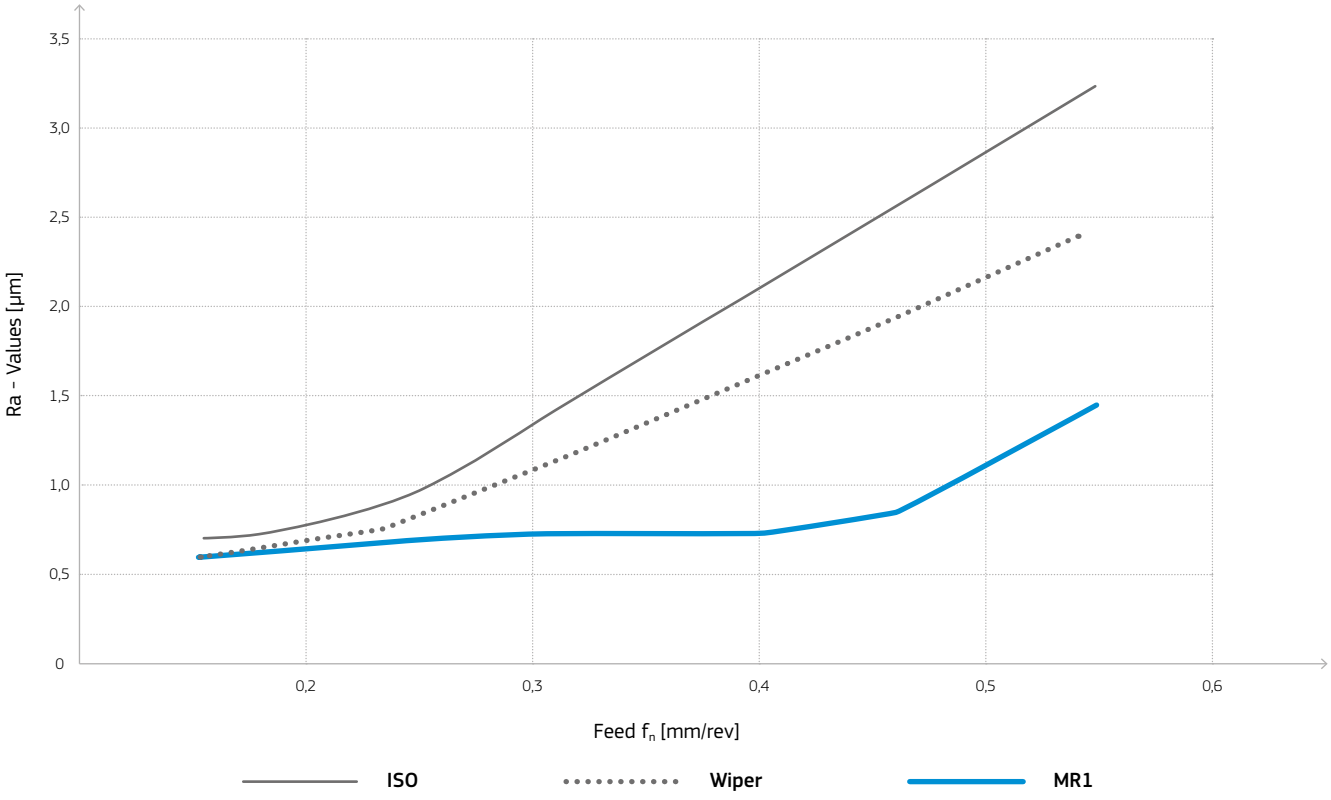
For negative indexable inserts suitable for ISO-P and M clamping systems

"**MR1**" High Performance Turning preferable for steel





CNMG 120408 ISO / MR1 / Wiper



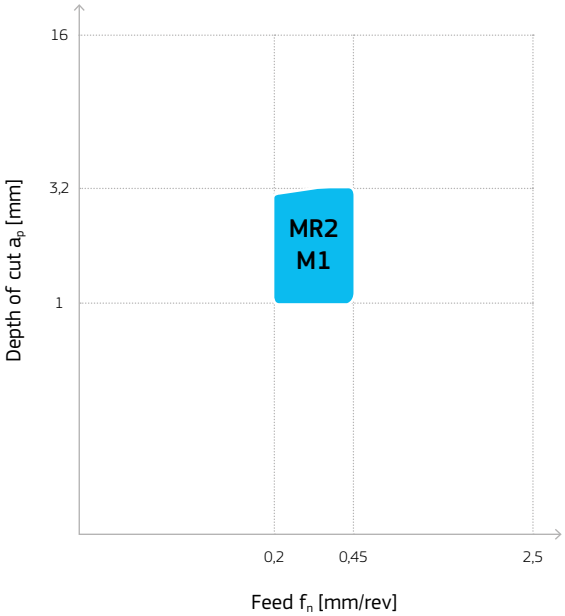
Geometry for copy turning

For negative indexable inserts suitable for ISO-P and M clamping system

Geometry for turning "**MR2**" (Copying Two Direction)

Geometry "**M1**" (Copying One Direction) *)

Only for internal machining!

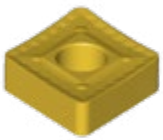


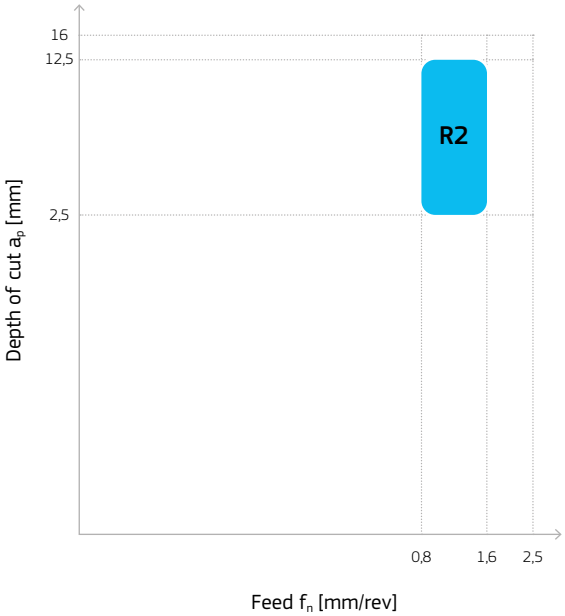
*) Attention: When working with M1 – Geometry inserts, please use **lefthand inserts with righthand holders** and **righthand inserts with lefthand** holders.

Roughing geometries

For negative indexable inserts suitable for ISO-P and M clamping systems

"**R2**" Roughing (**R**oughing)

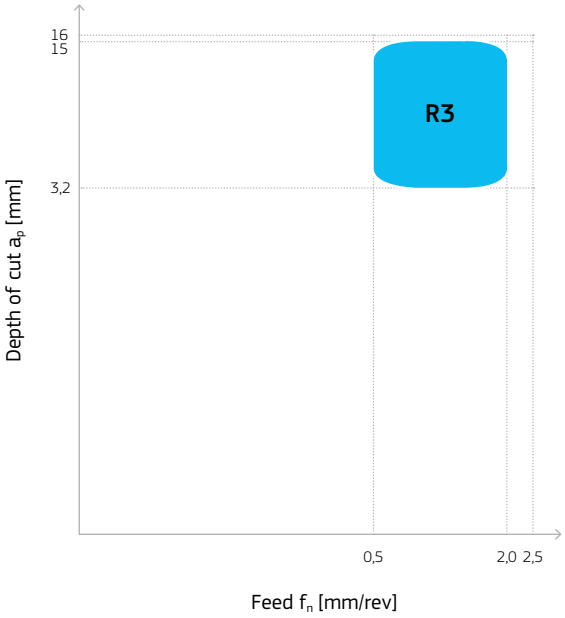




Geometry for turning

For positive indexable inserts suitable for ISO-S clamping system

Roughing "**R3**"



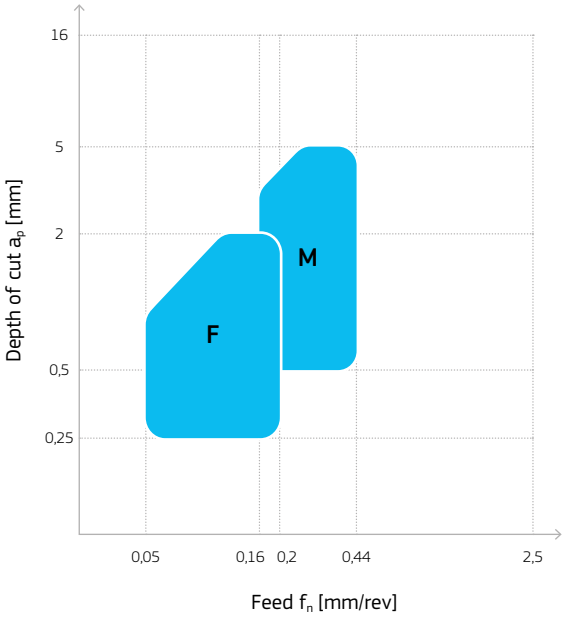
Main geometries

For positive indexable inserts suitable for ISO-S clamping systems

Controlled chip formation across the entire range of applications from microfinishing to medium turning.

Universal geometry "**M**" (**M**edium)

Finishing geometry "**F**" (**F**inishing)

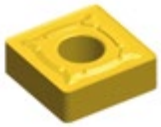


Main geometries

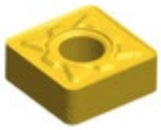
For negative indexable inserts suitable for ISO-P and M clamping systems

Controlled chip forming without cold hardening over the whole range of application from roughing to finishing of austenitic steels.

Roughing Geometry "**MR**"
(**M**edium/**R**oughing Stainless steel)

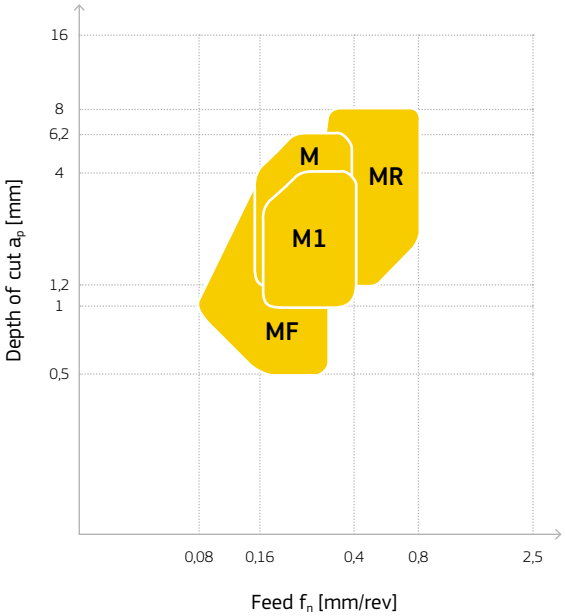


Universal Geometry **"M"**
(**M**edium Stainless steel)



Finishing Geometry **"MF"**
(**F**inishing/**M**edium Stainless steel)

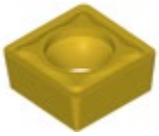
Universal Geometry **"M1"** (**M**edium)



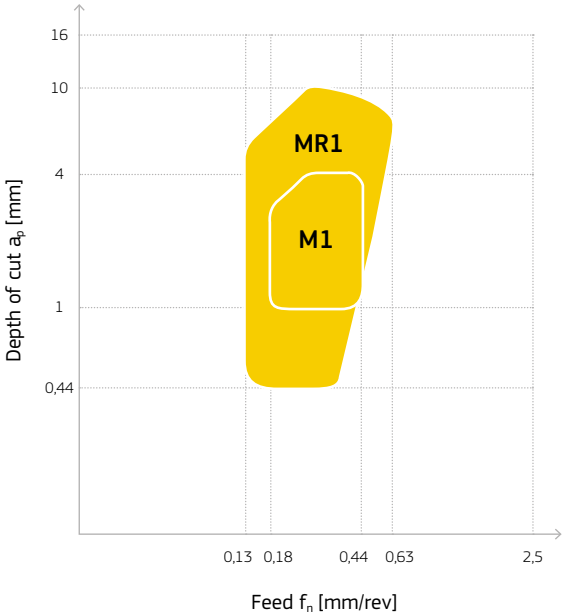
Main geometries

For positive indexable inserts suitable for ISO-S clamping system

Universal Geometry **"MR1"** (**M**edium/**R**oughing)



Universal Geometry **"M1"** (**M**edium)

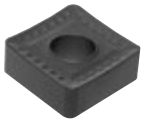


Main geometries

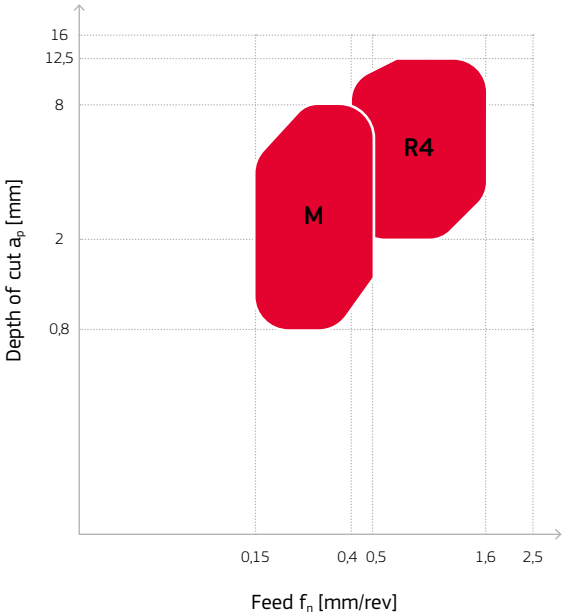
For negative indexable inserts suitable for ISO-P and M clamping systems

Controlled chip forming over the whole range from medium to roughing application.

"R" roughing geometry (**R**oughing) preferably for cast iron



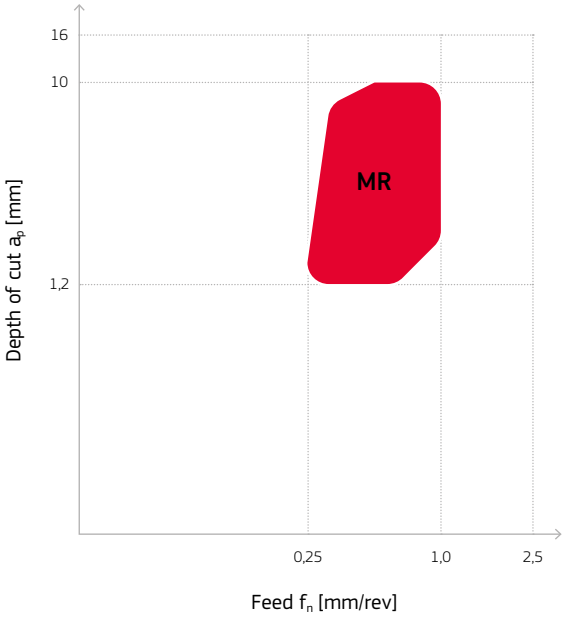
Universal **"M"** geometry (**M**edium) preferably for iron



Intermediate geometries

For negative indexable inserts suitable for ISO-P and M clamping systems

"MR" rough intermediate geometry (**M**edium/**R**oughing)

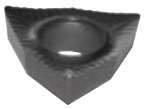


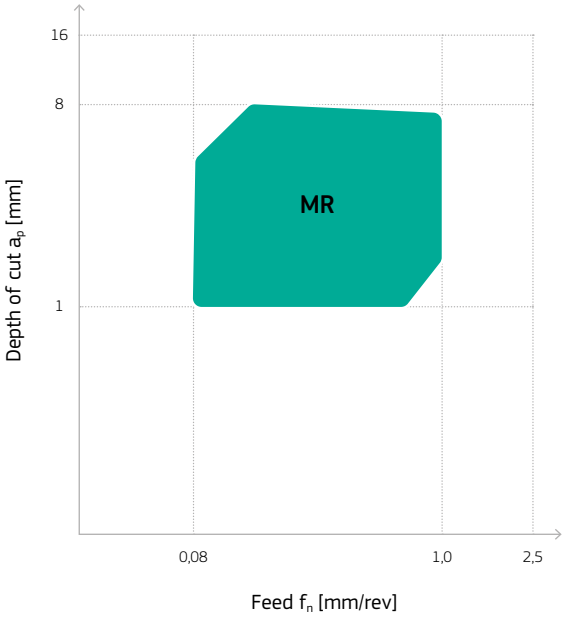
Geometry for aluminium machining

For positive indexable inserts suitable for ISO-S clamping system

Best suitable for finishing of stainless steels also.

"MR" (**M**edium/**R**oughing) for aluminium

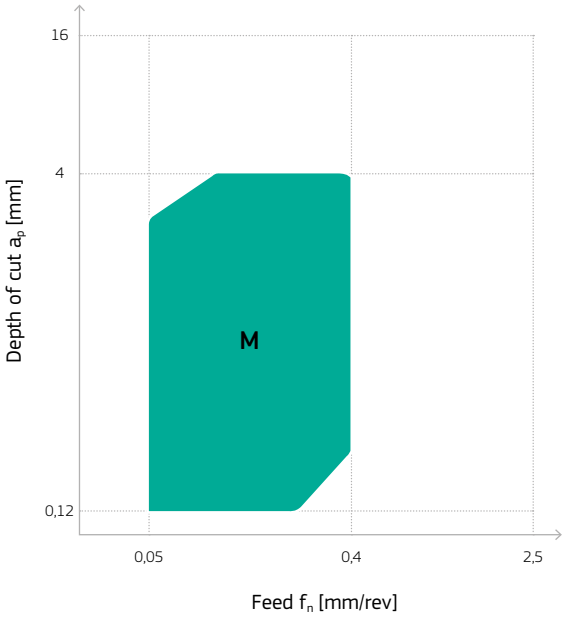




Geometry for plastic machining

For positive indexable inserts suitable for ISO-S clamping system

Geometry **"M"** for plastics

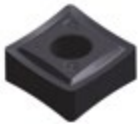


Geometries for super alloys

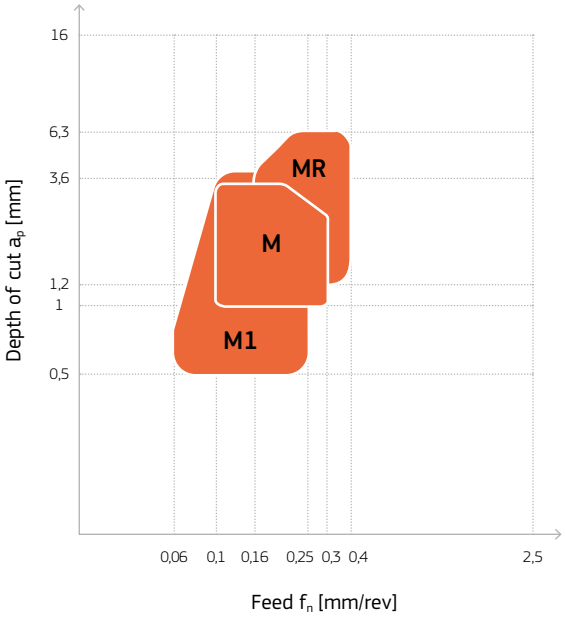
For negative indexable inserts suitable for ISO-P and M clamping systems

Geometry **"MR"** (**M**edium/**R**oughing) – stainless steel geometry suitable for special alloys in interrupted cut

Geometry **"M"** (**M**edium) specially for Inconel, Titanium, etc.



Geometry **"M1"** (**M**edium) – sharp geometry for machining superalloys

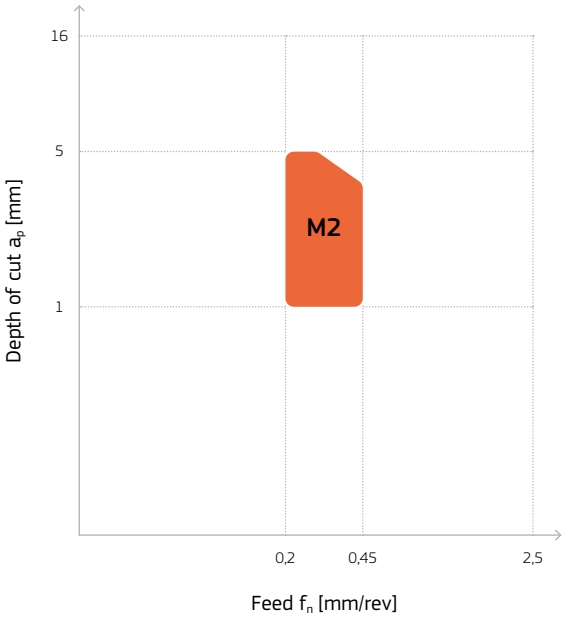


Chip groove geometries for titanium and super alloys

Geometries for super alloys

For positive indexable inserts suitable for ISO-S clamping system

Geometry **"M2"** (**M**edium) – special designed geometry for machining of titanium and super alloys as Inconel, Hastelloy, etc.



	a_p [mm]			1 2 3 4 5 6 7 8 9 10 11 12
Finishing f [mm/rev]	0,05 – 0,2		F	
	0,1 – 0,3		MF	
	0,1 – 0,3		M1	
	0,1 – 0,3		MF	
Medium machining f [mm/rev]	0,2 – 0,4		M	
	0,15 – 0,4		M1	
	0,16 – 0,4		M	
	0,16 – 0,4		M	
	0,2 – 0,45		M2	
	0,2 – 0,5		MR	
	0,15 – 0,4		M	
	0,2 – 0,8		MR1	
	0,2 – 0,5		MR1	
	0,15 – 0,65		MR	
	0,1 – 1,0		M	
	0,2 – 0,45		M1, MR2	
	0,32 – 0,7		MR	
Roughing f [mm/rev]	0,5 – 2,0		R3	
	0,32 – 0,8		MR MR	
	0,4 – 1,6		R4 R, R2	

Grade	ISO	Application Range	Material Group						Application					
		10 20 30 40	P Steel	M Stainless	K Grey cast iron	N Nonferrous metals	S High temperature materials	H Hard materials	T Turning	M Milling	D Drilling	S Threading	G Grooving	P Parting
HS A31-A1	HC-P15		■						●					
	HC-K15								●					
A51-B1	HC-P25		■						●					
	HC-M25			□					●					
IC A81-C1	HC-P40		■						●					
	HC-M40			□					●					
B41-D1	HC-M20			■					●					
	HC-S20						□		●					
B51-E1	HC-M25			■					●					
	HC-P30		□						●					
B81-F1	HC-M40			■					●					
	HC-P40		□						●					
B71-G1	HC-M35			■					●					
	HC-P35		□						●					
B91-H1	HC-M40			■					●		●			
	HC-P35		□						●		●			
C21-I1	HC-K10				■				●					
	HC-K15													
HS C31-J1	HC-K15				■				●					
D21-P1	HW-K10					■			●		●			
AL D21-K1	HC-K10		□	□	□	■			●					
E31-M1	HC-S15			□			■		●					
T E31-N1	HC-S15			□			■		●					
T E21-L1	HC-M10						■		●					
	HC-S10			□					●					
E41-O1	HC-M20						■		●					
	HC-S20			□					●					
C21-Q1	HW-K10				■	□			●					

Application peak

Full range to ISO 513

■ Main application

□ Further applications

● Standard grade

MF	X	–	IC		B	4	X	–	X	X
Operation	Interal code: **Number 0–9**		Special sign		Grade code: **Material group**	Grade code: **Application range**	Interal code: **Number 0–99**		Interal code: **Letter A–Z**	Interal code: **Number 0–9**

	Operation
F	Finishing
MF	Medium – Finishig
M	Medium
MR	Medium – Roughing
R	Roughing

	Special Sign
IC	For interupted cut
HS	High speed machinig
AL	Special for aluminium alloys
T	Special for titanium alloys

ISO	KONRAD TOOLS
P	A
M	B
K	C
N	D
S	E
H	F
Cermet	G
CBN	H
PCD	I

ISO	KONRAD TOOLS
10	2
15	3
20	4
25	5
30	6
35	7
40	8
45	9
50	0

Main grades, coated

- HS A31-A1 (HC-P15, HC-K15)

Wear resistant steel grade for not interrupted cut for high cutting speeds up to 300 m/min. As secondary application also for machining of cast iron.

- A51-B1 (HC-P25, HC-M25)

(Universal turning grade)
Main grade for machining steel materials and easily machinable stainless steels at medium cutting speeds, including interrupted cutting work. This general purpose grade is characterised by the properties of high durability and excellent toughness across a wide range of applications.

- IC A81-C1 (HC-P40, HC-M40)

The IC A81-C1 Steeltec steel turning grade guarantees maximum performance in heavy interrupted cutting thanks to the combination of an extremely tough carbide with the “Nanolock yellow MT-CVD layer”.

- B41-D1 (HC-M20, HC-S20)

Turning grade for machining of austenitic materials in the high cutting speed area of 170–220 m/min.

- B51-E1 (HC-M25, HC-P30)

Turning grade for austenitic stainless steels in medium and high cutting speed area.

- B81-F1 (HC-M40, HC-P40)

Very tough stainless grade for low cutting speeds suitable, also as alternative applicable on steel.

- B71-G1 (HC-M35, HC-P35)

Main grade for turning of austenitic stainless steels at medium cutting speeds. Applicable also for super alloys.

- B91-H1 (P20-P40, M20-M30)

Extreme tough, relative fine grained carbide substrate. Ideal grade for turning of austenitic stainless steel in the medium cutting speed area.

- C21-I1 (HC-K10-K15)

Cast iron grades in K10 range, optimum for machining cast iron in an uninterrupted cut.

- HS C31-J1 (HC-K15)

Cast iron turning grade for the area K15. Optimal for machining GG and GGG materials. Possible cutting speeds for GG up to 400 m/min.

- AL D21-K1 (HC-K10)

The ideal grade for working aluminium materials and other non-ferrous metals. Thanks to a very thin micropulse plasma CVD TiAlN coating it is also excellent for finish machining of stainless steels and grey cast iron.

- T E21-L1 (HC-M10, HC-S10)

Grade for turning of titanium. Selected temperature stable carbide plus TiBN - Plasma coating.

- E31-M1 (HC-S15)

Submicron grade with thin PVD-coating. Excellent appropriate for the production of small and smallest parts, f.e. watch industry and medical engineering. Preferred materials such as Inconel, titanium, stainless steel.

- T E31-N1 (HC-S15)

Special submicron grade for machining super alloys such as Inconel, Titan, etc.

- E41-O1 (HC-M20, HC-S20)

Tough alternative grade to T E31-N1 for machining of super alloys as Inconel, Hastelloy, Waspaloy, etc.

Main grades, uncoated

- D21-P1 (K10)

Turning grade with high wear resistance for machining of grey cast iron, aluminium alloys, and non-ferrous metals at medium to higher cutting speeds, even under unfavourable machining conditions.

- C21-Q1 (K05-K15)

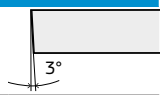
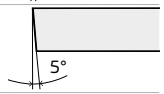
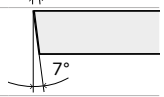
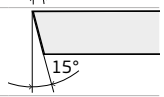
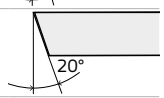
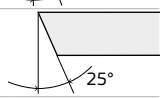
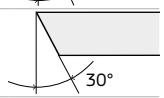
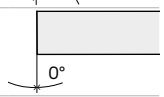
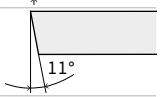
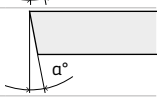
For turning chilled iron casting, grey cast iron with spheroidal graphite and alloyed grey cast iron as well as for aluminium and aluminium alloys. Turning high grade and hardened steels, also for austenitic manganese steels.

Indexable inserts

W
Basic form

A		85°
B		82°
C		80°
D		55°
E		75°
H		120°
K		55°
L		90°
M		86°
O		135°
P		108°
R		–
S		90°
T		60°
V		35°
W		80°

N
Clearance angle

A	 3°
B	 5°
C	 7°
D	 15°
E	 20°
F	 25°
G	 30°
N	 0°
P	 11°
O	 a°

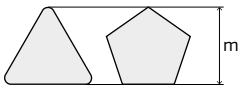
Clearance angle requiring special indication.

M
Tolerance classes

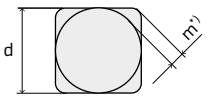
Limits of tolerance

	m	s	d
A	±0,005[1)]	±0,025	±0,025
C	±0,013	±0,025	±0,025
E	±0,025	±0,025	±0,025
F	±0,005[1)]	±0,025	±0,013
G	±0,025	±0,13	±0,025
H	±0,013	±0,025	±0,013
J	±0,005[1)]	±0,025	±0,05 – ±0,15
K	±0,013[1)]	±0,025	±0,05 – ±0,15
L	±0,025	±0,025	±0,05 – ±0,15
M	±0,08 – ±0,20	±0,13	±0,05 – ±0,15
U	±0,13 – ±0,38	±0,13	±0,08 – ±0,25

	d	m	d
M	6,35	±0,08	±0,05
	9,52	±0,08	±0,05
	12,7	±0,13	±0,08
	15,88	±0,15	±0,10
	19,05	±0,15	±0,10
	25,4	±0,18	±0,13
U	6,35	±0,13	±0,08
	9,52	±0,13	±0,08
	12,7	±0,20	±0,13
	15,88	±0,27	±0,18
	19,05	±0,27	±0,18
	25,4	±0,38	±0,25



Indexable insert with unequal number of sides

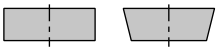


Indexable insert with equal number of sides

1) Generally used for indexable inserts with ground face cutting edges.

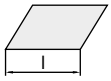
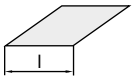
*) The calculation for the "m" measurement is based on the precise radius in inches.

G
Type of insert

A	 Without chip breaker, with cylindrical fixation hole
F	 Chip breakers at both sides, without fixation hole
G	 Chip breakers at both sides, with cylindrical fixation hole
M	 Chip breakers at one side, with cylindrical fixation hole
N	 Without chip breakers, without fixation hole
Q	 Without chip breakers, with fixation hole conical from both sides
R	 Chip breakers at one side, without fixation hole
T	 Chip breakers at one side, with conical fixation hole
U	 Chip breakers at both sides, with fixation hole conical from both sides
W	 Without chip breaker, with conical fixation hole
X	 With special features to drawing

Indexable inserts

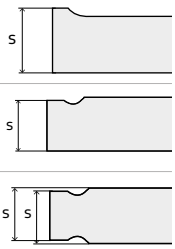
06 Length of cutting edge

A B	
C E	
D	
H	
K	
L	
M	
O	
P	
R	
S	
T	
V	
W	

Examples

06	**l = 6,350 mm**
09	l = 9,525 mm
11	l = 11,000 mm
12	l = 12,700 mm
15	l = 15,880 mm
16	l = 16,500 mm
19	l = 19,050 mm
22	l = 22,000 mm
25	l = 25,400 mm
27	l = 27,500 mm
33	l = 33,000 mm

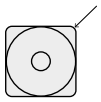
04 Thickness



Examples

01	s = 1,59 mm
T1	s = 1,98 mm
02	s = 2,38 mm
03	s = 3,18 mm
T3	s = 3,97 mm
04	**s = 4,76 mm**
05	s = 5,56 mm
06	s = 6,35 mm
07	s = 7,94 mm
09	s = 9,52 mm
12	s = 12,70 mm

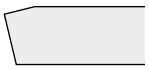
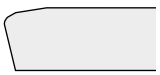
04 Corner radius



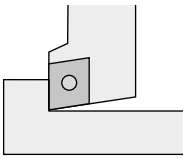
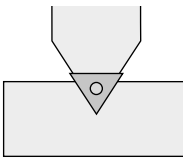
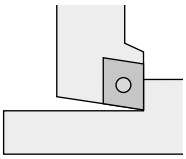
Examples

00	r = max 0,2 mm
04	**r = 0,4 mm ±0,1**
08	r = 0,8 mm ±0,1
12	r = 1,2 mm ±0,1
16	r = 1,6 mm ±0,1
20	r = 2,0 mm ±0,1
24	r = 2,4 mm ±0,1
25	r = 2,5 mm ±0,1

Edge condition

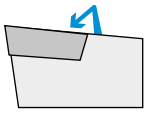
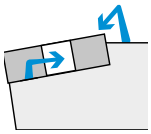
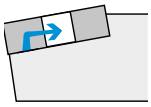
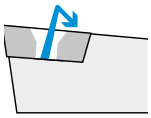
F	 Sharp cutting edges
E	 Rounded cutting edges
S	 Chamfered and rounded cutting edges
T	 Chamfered cutting edges
K	 Double-chamfered cutting edges
P	 Double-chamfered and rounded cutting edges

Direction of cut

L	 The indexable insert can only be used for cuts to the left
N	 The indexable insert can be used for cuts either to the left or to the right
R	 The indexable insert can only be used for cuts to the right

Tool holders, external machining

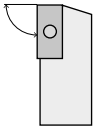
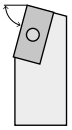
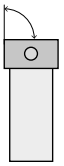
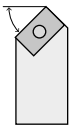
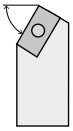
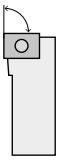
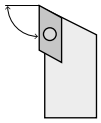
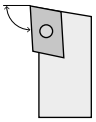
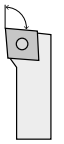
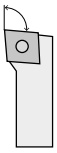
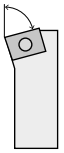
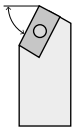
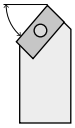
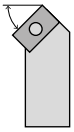
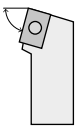
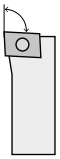
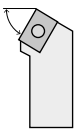
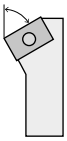
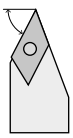
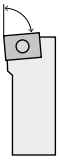
P Type of fixation

C	 Fixation from above
M	 Fixation from above and through a hole
P	 Fixation through a hole
S	 Fixation by screw through a conical hole

C Indexable insert shape

A		85°
B		82°
C		80°
D		55°
E		75°
H		120°
K		55°
L		90°
M		86°
O		135°
P		108°
R		–
S		90°
T		60°
V		35°
W		80°

L Tool holder shape

A		90°	B		75°
C		90°	D		45°
E		60°	F		90°
G		90°	J		93°
H		107,5°	L		95°
K		75°	N		63°
M		50°	S		45°
R		75°	U		93°
T		60°	W		60°
V		72,5°	Y		85°

N Insert clearance angle

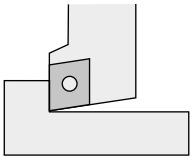
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	α°

Clearance angle requiring special indication.

Tool holders, external machining

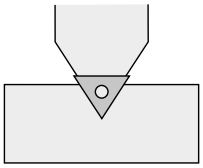
R
Direction of cut

L



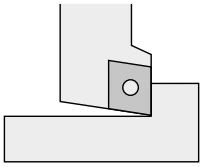
The indexable insert can only be used for cuts to the left

N



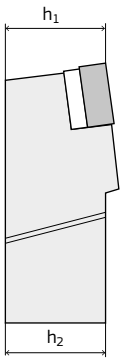
The indexable insert can be used for cuts either to the left or to the right

R



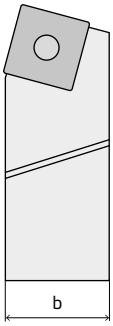
The indexable insert can only be used for cuts to the right

25
Cutting height

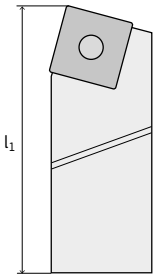


For clamped tools, the cutting height (h_1) generally corresponds to the shaft height (h_2). The exceptions to this include cartridge toolholders and clamped tools for internal turning.

25
Shank width



M
Tool length



Code letters for the length l_1

A	32 mm
B	40 mm
C	50 mm
D	60 mm
E	70 mm
F	80 mm
G	90 mm
H	100 mm
J	110 mm
K	125 mm
L	140 mm
M	**150 mm**
N	160 mm
P	170 mm
Q	180 mm
R	200 mm
S	250 mm
T	300 mm
U	350 mm
V	400 mm
W	450 mm
X	Special length
Y	500 mm

12
Length of cutting edge

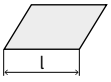
A
B

C
E

D

H

K



L

M

O

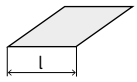
P

R

S

T

V



W

Examples

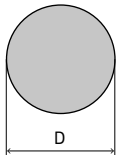
06	l = 6,350 mm
09	l = 9,525 mm
11	l = 11,000 mm
12	**l = 12,700 mm**
15	l = 15,880 mm
16	l = 16,500 mm
19	l = 19,050 mm
22	l = 22,000 mm
25	l = 25,400 mm
27	l = 27,500 mm
33	l = 33,000 mm

Tool holders, internal machining

S
Type of boring bar

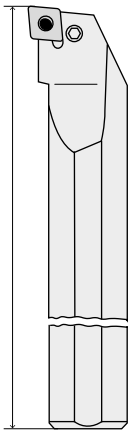
Identification letter	Material used for main body	Features of design
S	Solid steel	None
A		With internal coolant supply
B		With vibration damping
D		With vibration damping and internal coolant supply
C	Hard metal with steel head	None
E		With internal coolant supply
F		With vibration damping
G		With vibration damping and internal coolant supply
H	Heavy metal	None
J		With internal coolant supply

32
Shank diameter



08
10
12
16
20
25
32
40
50

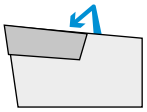
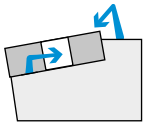
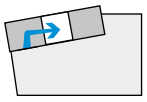
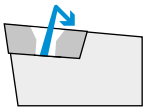
T
Tool length



Code letters for the length

A	32 mm
B	40 mm
C	50 mm
D	60 mm
E	70 mm
F	80 mm
G	90 mm
H	100 mm
J	110 mm
K	125 mm
L	140 mm
M	150 mm
N	160 mm
P	170 mm
Q	180 mm
R	200 mm
S	250 mm
T	**300 mm**
U	350 mm
V	400 mm
W	450 mm
X	Special length
Y	500 mm

P
Type of fixation

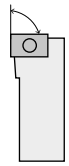
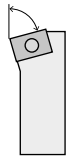
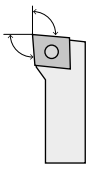
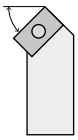
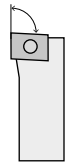
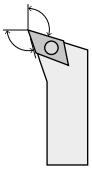
C	 Fixation from above
M	 Fixation from above and through a hole
P	 Fixation through a hole
S	 Fixation by screw through a conical hole

Tool holders, internal machining

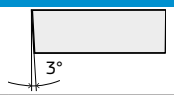
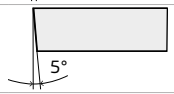
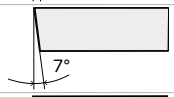
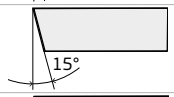
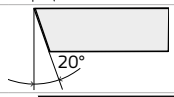
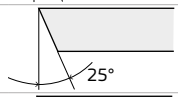
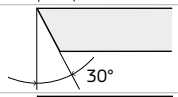
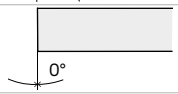
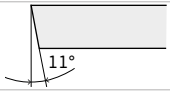
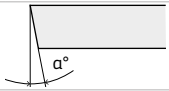
C
Indexable insert shape

A		85°
B		82°
C		80°
D		55°
E		75°
H		120°
K		55°
L		90°
M		86°
O		135°
P		108°
R		–
S		90°
T		60°
V		35°
W		80°

L
Tool holder shape

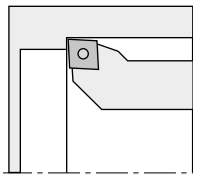
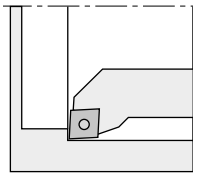
F		90°
K		75°
L		95°
S		45°
U		93°
Q		107°

N
Insert clearance angle

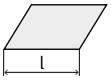
A	 3°	
B	 5°	
C	 7°	
D	 15°	
E	 20°	
F	 25°	
G	 30°	
N	 0°	
P	 11°	
O	 α°	

Clearance angle requiring special indication.

R
Direction of cut

L	 Boring bar suitable for operation to the left only.	
R	 Boring bar suitable for operation to the right only.	

12
Length of cutting edge

A B	
C E	
D	
H	
K	
L	
M	
O	
P	
R	
S	
T	
V	
W	

Examples

06	l = 6,350 mm
09	l = 9,525 mm
11	l = 11,000 mm
12	**l = 12,700 mm**
15	l = 15,880 mm
16	l = 16,500 mm
19	l = 19,050 mm
22	l = 22,000 mm
25	l = 25,400 mm
27	l = 27,500 mm
33	l = 33,000 mm

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW	HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
CCGT ... MR	CCGT 060202-MR	6,40	6,35													●	●							
	CCGT 060204-MR	6,40	6,35													●	●							
	CCGT 09T302-MR	9,70	9,52													●	●							
	CCGT 09T304-MR	9,70	9,52													●	●							
	CCGT 09T308-MR	9,70	9,52													●	●							
	CCGT 120404-MR	12,90	12,70													●	●							
	CCGT 120408-MR	12,90	12,70													●	●							
CCGT ... E.–M1	CCGT 060204 EL-M1	6,40	6,35		●	●			●															
	CCGT 060204 ER-M1	6,40	6,35		●	●			●															
	CCGT 060208 EL-M1	6,40	6,35		●	●			●															
	CCGT 060208 ER-M1	6,40	6,35		●	●			●															
	CCGT 09T304 EL-M1	9,70	9,52		●	●			●															
	CCGT 09T304 ER-M1	9,70	9,52		●	●			●															
	CCGT 09T308 EL-M1	9,70	9,52		●	●			●															
	CCGT 09T308 ER-M1	9,70	9,52		●	●			●															
	CCGT 120408 EL-M1	12,90	12,70		●	●			●															
	CCGT 120408 ER-M1	12,90	12,70		●	●			●															
	CCGT 120412 EL-M1	12,90	12,70		●	●			●															
	CCGT 120412 ER-M1	12,90	12,70		●	●			●															
CCMT ... M	CCMT 09T304-M	9,70	9,52										●											
	CCMT 09T308-M	9,70	9,52										●											
	CCMT 120408-M	12,90	12,70										●											
CCMT ... R3	CCMT 250924-R3	25,80	25,40	●	●							●												
CCMT ... MR1	CCMT 09T304-MR1	9,70	9,52						●															
	CCMT 09T308-MR1	9,70	9,52						●															
	CCMT 120404-MR1	12,90	12,70						●															
	CCMT 120408-MR1	12,90	12,70						●															

Order Example: 10 pieces CCGT 060202-MR-AL D21-K1

● Available from stock

For Toolholders see pages 74–76 / 93

For cutting data standard values see from page 109

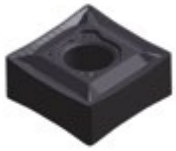
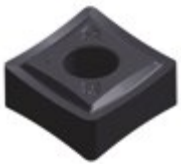
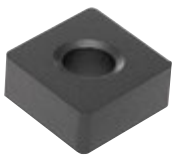
	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW	HC						
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
CCMT ... F	CCMT 060202-F	6,40	6,35	●	●																			
	CCMT 060204-F	6,40	6,35	●	●																			
	CCMT 060208-F	6,40	6,35	●	●																			
	CCMT 09T304-F	9,70	9,52	●	●																			
	CCMT 09T308-F	9,70	9,52	●	●																			
	CCMT 120404-F	12,90	12,70	●	●																			
	CCMT 09T304-F	9,70	9,52					●	●															
CCMT ... M1	CCMT 060202-M1	6,40	6,35					●	●	●														
	CCMT 060204-M1	6,40	6,35					●	●	●														
	CCMT 09T304-M1	9,70	9,52					●		●														
	CCMT 09T308-M1	9,70	9,52					●		●														
	CCMT 120404-M1	12,90	12,70							●														
	CCMT 120408-M1	12,90	12,70							●														
CCMT ... M	CCMT 060202-M	6,40	6,35	●	●																			
	CCMT 060204-M	6,40	6,35	●	●																			
	CCMT 060208-M	6,40	6,35	●	●																			
	CCMT 09T304-M	9,70	9,52	●	●																			
	CCMT 09T308-M	9,70	9,52	●	●																			
	CCMT 120404-M	12,90	12,70	●	●																			
	CCMT 120408-M	12,90	12,70	●	●																			
CCMT ... M2	CCMT 09T304-M2	9,70	9,52																		●	●		
CCMW ...	CCMW 09T304	9,70	9,52											●										

Order Example: 10 pieces CCGT 060202-MR-AL D21-K1

● Available from stock

For Toolholders see pages 74–76 / 93

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW	HC						
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
CNGG ... MR2	CNGG 120408-MR2	12,90	12,70	●	●															●				
																								
CNGG ... M1	CNGG 120404-M1	12,90	12,70																	●		●		
	CNGG 120408-M1	12,90	12,70																	●		●		
	CNGG 120412-M1	12,90	12,70																	●		●		
																								
CNGG ... M	CNGG 120404-M	12,90	12,70																	●				
	CNGG 120408-M	12,90	12,70																	●				
	CNGG 120412-M	12,90	12,70																	●				
																								
CNGG ... MR	CNGG 120408-MR	12,90	12,70																	●		●		
	CNGG 120412-MR	12,90	12,70																	●		●		
																								
CNMA	CNMA 120408	12,90	12,70									●	●											
	CNMA 120412	12,90	12,70									●	●											
	CNMA 190616	19,30	19,05										●											
	CNMA 250924	25,80	25,40										●											
																								

Order Example: 10 pieces CNGG 120408-MR-AL D21-K1

For Toolholders see pages 63 / 67 / 90

● Available from stock

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW	HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
CNMG ... MF	CNMG 090304-MF	9,70	9,52					●	●	●														
	CNMG 120404-MF	12,90	12,70					●	●	●														
	CNMG 120408-MF	12,90	12,70					●	●	●														
	CNMG 120412-MF	12,90	12,70					●	●	●														
CNMG ... M	CNMG 120408-M	12,90	12,70									●	●											
	CNMG 120412-M	12,90	12,70									●	●											
CNMG ... MR	CNMG 120408-MR	12,90	12,70									●	●											
	CNMG 120412-MR	12,90	12,70									●	●											
	CNMG 120416-MR	12,90	12,70									●	●											
	CNMG 160612-MR	16,10	15,87									●	●											
	CNMG 160616-MR	16,10	15,87									●	●											
CNMG ... MR	CNMG 120408-MR	12,90	12,70						●															
	CNMG 120412-MR	12,90	12,70						●															
	CNMG 160612-MR	16,10	15,87						●		●													
	CNMG 160616-MR	19,30	19,05								●													
	CNMG 190612-MR	19,30	19,05						●		●													
CNMG ... M	CNMG 120408-M	12,90	12,70						●															
	CNMG 120412-M	12,90	12,70						●															
	CNMG 160612-M	16,10	15,87						●															

Order Example: 10 pieces CNMG 090304-MR-AL D21-K1

● Available from stock

For Toolholders see pages 63 / 67 / 89

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW	HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
CNMG ... E.-M1	CNMG 120404 EL-M1	12,90	12,70		●	●			●														
	CNMG 120404 ER-M1	12,90	12,70		●	●			●														
	CNMG 120408 EL-M1	12,90	12,70		●	●			●														
	CNMG 120408 ER-M1	12,90	12,70		●	●			●														
																							
CNMG ... MF	CNMG 120404-MF	12,90	12,70	●	●							●	●										
	CNMG 120408-MF	12,90	12,70	●	●	●																	
																							
CNMG ... F	CNMG 120404-F	12,90	12,70	●	●																		
	CNMG 120408-F	12,90	12,70	●	●																		
																							
CNMG ... MR1	CNMG 120408-MR1	12,90	12,70	●	●																		
	CNMG 120412-MR1	12,90	12,70	●	●																		
																							
CNMG ... M1	CNMG 120408-M1	12,90	12,70					●		●	●												
	CNMG 120412-M1	12,90	12,70					●		●	●												
	CNMG 160612-M1	16,10	15,87					●		●	●												
	CNMG 160616-M1	16,10	15,87					●		●	●												
	CNMG 190612-M1	19,30	19,05					●			●												
	CNMG 190616-M1	19,30	19,05					●			●												
																							

Order Example: 10 pieces CNMG 120404 EL-M1 A51-B1

● Available from stock

For Toolholders see pages 63 / 67 / 89

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW		HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
CNMG ... M	CNMG 090308-M	9,70	9,52	●	●	●																		
	CNMG 120408-M	12,90	12,70	●	●	●																		
	CNMG 120412-M	12,90	12,70	●	●	●																		
	CNMG 120416-M	12,90	12,70	●	●	●																		
	CNMG 160608-M	16,10	15,87	●	●	●																		
	CNMG 160612-M	16,10	15,87	●	●	●																		
	CNMG 160616-M	16,10	15,87	●	●	●																		
	CNMG 190612-M	19,30	19,05	●	●	●																		
	CNMG 190616-M	19,30	19,05	●	●	●																		
CNMG ... MR	CNMG 120408-MR	12,90	12,70	●	●	●																		
	CNMG 120412-MR	12,90	12,70	●	●	●																		
	CNMG 120416-MR	12,90	12,70	●	●	●																		
	CNMG 160608-MR	16,10	15,87	●	●	●																		
	CNMG 160612-MR	16,10	15,87	●	●	●																		
	CNMG 160616-MR	16,10	15,87	●	●	●																		
	CNMG 190612-MR	19,30	19,05	●	●	●																		
	CNMG 190616-MR	19,30	19,05	●	●	●																		
	CNMG 190624-MR	19,30	19,05	●	●	●																		
CNMG ... M	CNMG 120404-M	12,90	12,70																	●				
	CNMG 120408-M	12,90	12,70																	●				
	CNMG 120412-M	12,90	12,70																	●				
CNMG ... M2	CNMG 120408-M2	12,90	12,70																		●	●		
CNMM ... R	CNMM 120408-R	12,90	12,70	●	●	●																		
	CNMM 120412-R	12,90	12,70	●	●	●																		
	CNMM 160612-R	16,10	15,87	●	●	●																		
	CNMM 160616-R	16,10	15,87	●	●	●																		
	CNMM 190612-R	19,30	19,05	●	●	●																		
	CNMM 190616-R	19,30	19,05	●	●	●																		
	CNMM 190624-R	19,30	19,05	●	●	●																		

Order Example: 10 pieces CNMG 090308-M-HS A31-A1

● Available from stock

For Toolholders see pages 63 / 67 / 89

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW		HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
CNMM ... R4	CNMM 190616-R4	19,30	19,05	●	●	●							●											
	CNMM 190624-R4	19,30	19,05										●											
																								
CNMM ... R2	CNMM 250724-R2	25,80	25,40	●	●	●																		
	CNMM 250924-R2	25,80	25,40	●	●	●																		
																								

	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW		HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
DCGT ...	DCGT 0702008	7,70	6,35																●					
	DCGT 0702015	7,70	6,35																●					
	DCGT 11T3015	11,60	9,52																●					
	DCGT 11T3035	11,60	9,52																●					
																								
DCGT ... MR	DCGT 070202-MR	7,70	6,35													●	●							
	DCGT 070204-MR	7,70	6,35													●	●							
	DCGT 11T302-MR	11,60	9,52													●	●							
	DCGT 11T304-MR	11,60	9,52													●	●							
	DCGT 11T308-MR	11,60	9,52													●	●							
																								

Order Example: 10 pieces CNMM 190616-R4 A51-B1

For Toolholders see pages 63 / 67 / 77-78 / 89 / 94

● Available from stock

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW	HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
DCGT ... E.-M1	DCGT 070204 EL-M1	7,70	6,35		●	●			●														
	DCGT 070204 ER-M1	7,70	6,35		●	●			●														
	DCGT 11T304 EL-M1	11,60	9,52		●	●			●														
	DCGT 11T304 ER-M1	11,60	9,52		●	●			●														
	DCGT 11T308 EL-M1	11,60	9,52	●	●	●			●														
	DCGT 11T308 ER-M1	11,60	9,52	●	●	●			●														
DCGT ... F.-M1	DCGT 0702008 FL-M1	7,70	6,35																●				
	DCGT 0702008 FR-M1	7,70	6,35																●				
	DCGT 0702015 FL-M1	7,70	6,35																●				
	DCGT 0702015 FR-M1	7,70	6,35																●				
	DCGT 11T3015 FL-M1	11,60	9,52																●				
	DCGT 11T3015 FR-M1	11,60	9,52																●				
	DCGT 11T3035 FL-M1	11,60	9,52																●				
	DCGT 11T3035 FR-M1	11,60	9,52																●				
DCMT ... M	DCMT 070204-M	7,70	6,35									●	●										
	DCMT 070208-M	7,70	6,35									●	●										
	DCMT 11T304-M	11,60	9,52									●	●										
	DCMT 11T308-M	11,60	9,52									●	●										
DCMT ... MR1	DCMT 11T304-MR1	11,60	9,52						●											●			
	DCMT 11T308-MR1	11,60	9,52						●														
DCMT ... F	DCMT 070202-F	7,70	6,35	●	●																		
	DCMT 070204-F	7,70	6,35	●	●																		
	DCMT 11T302-F	11,60	9,52		●																		
	DCMT 11T304-F	11,60	9,52	●	●																		
	DCMT 070202-F	7,70	6,35					●	●														
	DCMT 11T302-F	11,60	9,52						●														

Order Example: 10 pieces DCGT 070204 EL-M1 A51-B1

● Available from stock

For Toolholders see pages 77-78 / 94

For cutting data standard values see from page 109

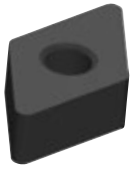
	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW	HC						
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
DCMT ... M1	DCMT 070204-M1	7,70	6,35						●															
	DCMT 11T304-M1	11,60	9,52					●		●														
	DCMT 11T308-M1	11,60	9,52					●		●														
DCMT ... M	DCMT 070204-M	7,70	6,35	●	●																			
	DCMT 11T304-M	11,60	9,52	●	●																			
	DCMT 11T308-M	11,60	9,52	●	●																			
DCMT ... M2	DCMT 11T304-M2	11,60	9,52																		●	●		
DCMW ...	DCMW 11T304	11,60	9,52											●										
	DCMW 11T308	11,60	9,52											●										
DNGG ... M1	DNGG 150404-M1	15,50	12,70																	●		●		
	DNGG 150408-M1	15,50	12,70																	●		●		
	DNGG 150412-M1	15,50	12,70																	●		●		
	DNGG 150604-M1	15,50	12,70																	●		●		
	DNGG 150608-M1	15,50	12,70																	●		●		
	DNGG 150612-M1	15,50	12,70																	●		●		

Order Example: 10 pieces DCMT 070204-M1 B71-G1

● Available from stock

For Toolholders see pages 63 / 68 / 77-78 / 90 / 94

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW	HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
DNMA ...	DNMA 150608	15,50	12,70										●											
	DNMA 150612	15,50	12,70										●											
																								
DNMG ... MF	DNMG 110404-MF	11,60	9,52					●	●	●														
	DNMG 110408-MF	11,60	9,52							●														
	DNMG 150604-MF	15,50	12,70					●	●	●														
	DNMG 150608-MF	15,50	12,70					●	●	●														
																								
DNMG ... MR1	DNMG 150612-MR1	15,50	12,70	●	●																			
																								
DNMG ... MR	DNMG 150408-MR	15,50	12,70									●	●											
	DNMG 150412-MR	15,50	12,70									●	●											
	DNMG 150608-MR	15,50	12,70									●	●											
	DNMG 150612-MR	15,50	12,70									●	●											
																								
DNMG ... MR	DNMG 150608-MR	15,50	12,70						●															
	DNMG 150612-MR	15,50	12,70						●	●														
																								

Order Example: 10 pieces DNMA 150608 HS C31-J1

● Available from stock

For Toolholders see pages 64 / 69 / 91

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW	HC						
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
DNMG ... M	DNMG 110408-M	11,60	9,52						●															
	DNMG 150408-M	15,50	12,70						●															
	DNMG 150608-M	15,50	12,70						●															
	DNMG 150612-M	15,50	12,70						●															
DNMG ... E.–M1	DNMG 110404 EL-M1	11,60	9,52	●	●	●																		
	DNMG 110404 ER-M1	11,60	9,52	●	●	●																		
	DNMG 110408 EL-M1	11,60	9,52	●	●	●																		
	DNMG 110408 ER-M1	11,60	9,52	●	●	●																		
	DNMG 150404 EL-M1	15,50	12,70		●																			
	DNMG 150404 ER-M1	15,50	12,70		●																			
	DNMG 150408 EL-M1	15,50	12,70		●																			
	DNMG 150408 ER-M1	15,50	12,70		●																			
	DNMG 150604 EL-M1	15,50	12,70	●	●	●			●															
	DNMG 150604 ER-M1	15,50	12,70	●	●	●			●															
	DNMG 150608 EL-M1	15,50	12,70	●	●	●			●															
	DNMG 150608 ER-M1	15,50	12,70	●	●	●			●															
DNMG ... MF	DNMG 110404-MF	11,60	9,52	●	●	●						●	●											
	DNMG 110408-MF	11,60	9,52	●	●	●						●	●											
	DNMG 150408-MF	15,50	12,70		●																			
	DNMG 150604-MF	15,50	12,70	●	●	●																		
	DNMG 150608-MF	15,50	12,70	●	●	●																		
DNMG ... F	DNMG 110404-F	11,60	9,52	●	●																			
	DNMG 110408-F	11,60	9,52	●	●																			
	DNMG 150404-F	15,50	12,70	●	●																			
	DNMG 150408-F	15,50	12,70	●	●																			
	DNMG 150604-F	15,50	12,70	●	●																			
	DNMG 150608-F	15,50	12,70	●	●																			
DNMG ... M	DNMG 110408-M	11,60	9,52	●	●	●																		
	DNMG 150408-M	15,50	12,70	●	●	●																		
	DNMG 150412-M	15,50	12,70	●	●	●																		
	DNMG 150608-M	15,50	12,70	●	●	●																		
	DNMG 150612-M	15,50	12,70	●	●	●																		
	DNMG 150616-M	15,50	12,70	●	●	●																		

Order Example: 10 pieces DNMG 110408-M B71-G1

● Available from stock

For Toolholders see pages 63 / 68 / 90

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW		HC				
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
DNMG ... MR	DNMG 150408-MR	15,50	12,70	●	●	●																	
	DNMG 150412-MR	15,50	12,70	●	●	●																	
	DNMG 150608-MR	15,50	12,70	●	●	●																	
	DNMG 150612-MR	15,50	12,70	●	●	●																	
	DNMG 150616-MR	15,50	12,70	●	●	●																	
DNMG ... M1	DNMG 110404-M1	11,60	9,52							●													
	DNMG 110408-M1	11,60	9,52							●													
	DNMG 150404-M1	15,50	12,70					●															
	DNMG 150408-M1	15,50	12,70					●		●													
	DNMG 150604-M1	15,50	12,70					●															
	DNMG 150608-M1	15,50	12,70					●		●	●												
	DNMG 150612-M1	15,50	12,70					●		●	●												
DNMG ... M	DNMG 150404-M	15,50	12,70																	●			
	DNMG 150408-M	15,50	12,70																	●			
	DNMG 150412-M	15,50	12,70																	●			
	DNMG 150604-M	15,50	12,70																	●			
	DNMG 150608-M	15,50	12,70																	●			
	DNMG 150612-M	15,50	12,70																	●			
DNMG ... M2	DNMG 150608-M2	15,50	12,70																		●	●	
DNMG ...	DNMG 140405TL20	14,00	11,95	●		●																	
	DNMG 140405TR20	14,00	11,95	●		●																	
	DNMG 140405TL25	14,00	11,95			●																	
	DNMG 140405TR25	14,00	11,95	●		●																	
	DNMG 140410TL25	14,00	11,95	●		●																	
	DNMG 140410TR25	14,00	11,95	●		●																	

Order Example: 10 pieces DNMG 150408-MR-HS A31-A1

● Available from stock

For Toolholders see pages 63 / 68 / 90

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW		HC				
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
DNMM ... R	DNMM 150608-R	15,50	12,70	●	●	●																	
	DNMM 150612-R	15,50	12,70	●	●	●																	
	DNMM 150616-R	15,50	12,70	●	●	●																	
																							

Order Example: 10 pieces DNMG DNMM 150608-R-HS A31-A1

For Toolholders see pages 63 / 68 / 90

● Available from stock

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW		HC				
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
RCGT ... MR	RCGT 0602MO-MR		6,00													●	●						
	RCGT 0803MO-MR		8,00													●	●						
	RCGT 1003MO-MR		10,00													●	●						
																							
RCMT ... MO	RCMT 0602MO		6,00														●						
																							
RCMT ... M2	RCMT 1606-M2		16,00																		●		
	RCMT 2006-M2		20,00																		●		
																							

Order Example: 10 pieces RCGT 0602MO-MR-AL D21-K1

For Toolholders see pages 69 / 79

● Available from stock

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW		HC				
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
RCMX ... MO	RCMX 1003M0		10,00			●																	
	RCMX 1204M0		12,00		●	●														●			
	RCMX 1606M0		16,00	●	●	●						●	●										
	RCMX 2006M0		20,00	●	●	●						●	●										
	RCMX 2507M0		25,00	●	●	●						●	●										
	RCMX 3209M0		32,00	●	●	●						●	●										

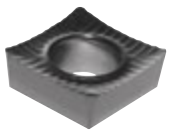
Order Example: 10 pieces RCMX 1003M0 IC A81-C1

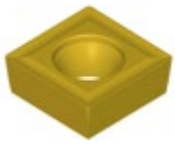
For Toolholders see pages 69 / 79

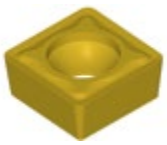
● Available from stock

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW		HC				
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
SCGT ... MR	SCGT 120408-MR	12,70	12,70													●	●						
SCMT ...	SCMT 120404	12,70	12,70			●																	
SCMT ... M2	SCMT 09T308-M2	9,52	9,52	●	●																		
	SCMT 120408-M2	12,70	12,70	●	●								●										





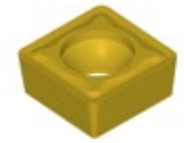
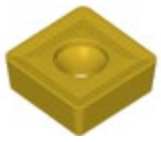


Order Example: 10 pieces SCGT 120408-MR-AL D21-K1

For Toolholders see pages 80–81

● Available from stock

For cutting data standard values see from page 109

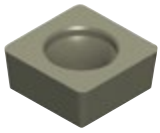
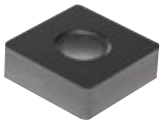
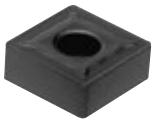
	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW	HC						
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
SCMT ... R3	SCMT 250924-R3	25,40	25,40	●	●	●																		
																								
SCMT ... MR1	SCMT 120408-MR1	12,70	12,70						●															
																								
SCMT ... R1	SCMT 250916-R1	25,40	25,40	●	●	●							●											
	SCMT 250924-R1	25,40	25,40	●	●	●							●											
																								
SCMT ... F	SCMT 09T304-F	9,52	9,52	●	●																			
	SCMT 09T308-F	9,52	9,52	●	●																			
	SCMT 120404-F	12,70	12,70	●	●																			
																								
SCMT ... M	SCMT 09T308-M	9,52	9,52	●	●																			
	SCMT 120408-M	12,70	12,70	●	●																			
	SCMT 120412-M	12,70	12,70	●	●																			
																								

Order Example: 10 pieces SCMT 250924-R3-HS A31-A1

● Available from stock

For Toolholders see pages 80–81

For cutting data standard values see from page 109

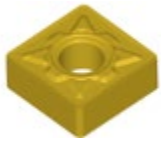
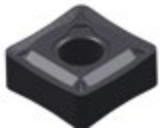
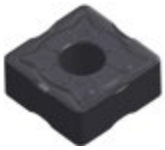
	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW		HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
SCMW ...	SCMW 09T304	9,52	9,52											●										
	SCMW 120404	12,70	12,70											●										
																								
SNMA ...	SNMA 120408	12,70	12,70									●	●											
	SNMA 120412	12,70	12,70									●	●											
	SNMA 120416	12,70	12,70									●	●											
	SNMA 190616	19,05	19,05										●											
	SNMA 250724	25,40	25,40										●											
																								
SNMG ... MF	SNMG 090304-MF	9,52	9,52						●	●														
																								
SNMG ... MR	SNMG 120408-MR	12,70	12,70									●	●											
	SNMG 120412-MR	12,70	12,70									●	●											
	SNMG 190612-MR	19,05	19,05									●												
	SNMG 190616-MR	19,05	19,05									●	●											
	SNMG 250924-MR	25,40	25,40		●																			
																								
SNMG ... MR	SNMG 120408-MR	12,70	12,70						●															
	SNMG 120412-MR	12,70	12,70						●		●													
	SNMG 190612-MR	19,05	19,05						●		●													
	SNMG 190616-MR	19,05	19,05								●													
																								

Order Example: 10 pieces SCMW 09T304 C21-Q1

For Toolholders see pages 63 / 65 / 70–71 / 80–81 / 91

● Available from stock

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW	HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
SNMG ... M	SNMG 120408-M	12,70	12,70						●														
	SNMG 120412-M	12,70	12,70						●														
																							
SNMG ... MF	SNMG 090304-MF	9,52	9,52	●	●																		
																							
SNMG ... M1	SNMG 120408-M1	12,70	12,70																	●			
	SNMG 120412-M1	12,70	12,70																	●			
																							
SNMG ... F	SNMG 120404-F	12,70	12,70	●	●																		
																							
SNMG ... M1	SNMG 120408-M1	12,70	12,70							●													
	SNMG 120412-M1	12,70	12,70							●													
	SNMG 150612-M1	15,87	15,87					●		●	●												
	SNMG 150616-M1	15,87	15,87					●		●	●												
	SNMG 190612-M1	19,05	19,05					●			●												
	SNMG 190616-M1	19,05	19,05					●			●												
																							

Order Example: 10 pieces SNMG 120408-M B71-G1

● Available from stock

For Toolholders see pages 63/ 65 / 70 / 71 / 91

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW	HC						
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
SNMG ... M	SNMG 120408-M	12,70	12,70	●	●	●																		
	SNMG 120412-M	12,70	12,70	●	●	●																		
	SNMG 150608-M	15,87	15,87	●	●	●																		
	SNMG 190612-M	19,05	19,05	●	●	●																		
																								
SNMG ... MR	SNMG 120408-MR	12,70	12,70	●	●	●																		
	SNMG 120412-MR	12,70	12,70	●	●	●																		
	SNMG 190612-MR	19,05	19,05	●	●	●																		
	SNMG 190616-MR	19,05	19,05	●	●	●																		
																								
SNMG ... MR	SNMG 120408-MR	12,70	12,70																	●				
	SNMG 120412-MR	12,70	12,70																	●				
																								
SNMM ... R4	SNMM 190616-R4	19,05	19,05	●	●	●																		
	SNMM 190624-R4	19,05	19,05	●	●	●																		
	SNMM 250724-R4	25,40	25,40		●	●																		
	SNMM 250924-R4	25,40	25,40		●	●																		
																								
SNMM ... R2	SNMM 250724-R2	25,40	25,40	●	●	●							●											
	SNMM 250732-R2	25,40	25,40	●	●	●																		
	SNMM 250924-R2	25,40	25,40	●	●	●							●											
	SNMM 250932-R2	25,40	25,40	●	●	●																		
																								

Order Example: 10 pieces SNMG 120408-M-HS A31-A1

● Available from stock

For Toolholders see pages 63/ 65 / 70 / 71 / 91

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																						
				HC										HW	HC		HW	HC								
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
SNMM ... R	SNMM 120408-R	12,70	12,70	●	●	●																				
	SNMM 120412-R	12,70	12,70	●	●	●																				
	SNMM 150612-R	15,87	15,87	●	●	●																				
	SNMM 150616-R	15,87	15,87	●	●	●																				
	SNMM 190612-R	19,05	19,05	●	●	●																				
	SNMM 190616-R	19,05	19,05	●	●	●																				
	SNMM 190624-R	19,05	19,05	●	●	●																				
	SNMM 190632-R	19,05	19,05	●	●	●																				
	SNMM 250724-R	25,40	25,40		●																					
SNMM ...	SNMM 250716	25,40	25,40			●																				
	SNMM 250724	25,40	25,40		●	●																				

Order Example: 10 pieces SNMM 120408-M-HS A31-A1

For Toolholders see pages 63 / 65 / 70 / 71 /91

For cutting data standard values see from page 109

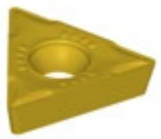
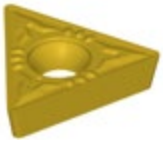
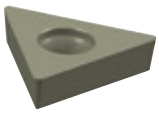
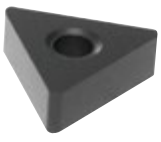
	Ordering Code	l	d	Grade																						
				HC										HW	HC		HW	HC								
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
TCGT ... MR	TCGT 110204-MR	11,00	6,35													●	●									
	TCGT 16T304-MR	16,50	9,52													●	●									
TCGT ... E.-M1	TCGT 110204 EL-M1	11,00	6,35		●	●			●																	
	TCGT 110204 ER-M1	11,00	6,35		●	●			●																	
	TCGT 16T304 EL-M1	16,50	9,52		●	●			●																	
	TCGT 16T304 ER-M1	16,50	9,52		●	●			●																	
	TCGT 16T308 EL-M1	16,50	9,52		●	●			●																	
	TCGT 16T308 ER-M1	16,50	9,52		●	●			●																	

Order Example: 10 pieces TCGT 110204-MR-AL D21-K1

For Toolholders see pages 82-83 / 95

For cutting data standard values see from page 109

● Available from stock

	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW		HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
TCMT ... MR1	TCMT 110204-MR1	11,00	6,35						●															
	TCMT 110208-MR1	11,00	6,35						●															
	TCMT 16T304-MR1	16,50	9,52						●															
	TCMT 16T308-MR1	16,50	9,52						●															
																								
TCMT ... F	TCMT 110202-F	11,00	6,35	●	●																			
	TCMT 110204-F	11,00	6,35	●	●																			
																								
TCMT ... M	TCMT 110204-M	11,00	6,35	●	●																			
	TCMT 110208-M	11,00	6,35	●	●																			
	TCMT 16T304-M	16,50	9,52	●	●																			
	TCMT 16T308-M	16,50	9,52	●	●																			
																								
TCMW ...	TCMW 110204	11,00	6,35											●										
	TCMW 16T304	16,50	9,52											●										
																								
TNMA ...	TNMA 160408	16,50	9,52									●	●											
	TNMA 160412	16,50	9,52									●	●											
	TNMA 220416	22,00	12,70									●	●											
																								

Order Example: 10 pieces TCMT 110204-MR1 B71-G1

● Available from stock

For Toolholders see pages 64-65 / 72 / 82-83/ 91/ 95

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																					
				HC											HW	HC		HW		HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
TNMG ... MF	TNMG 160404-MF	16,50	9,52						●	●															
	TNMG 160408-MF	16,50	9,52						●	●															
																									
TNMG ... M	TNMG 160408-M	16,50	9,52						●	●															
	TNMG 160412-M	16,50	9,52						●	●															
	TNMG 220408-M	22,00	12,70						●	●															
	TNMG 220412-M	22,00	12,70						●	●															
TNMG ... E.-M1	TNMG 160404 EL-M1	16,50	9,52	●	●	●			●																
	TNMG 160404 ER-M1	16,50	9,52	●	●	●			●																
	TNMG 160408 EL-M1	16,50	9,52	●	●	●			●																
	TNMG 160408 ER-M1	16,50	9,52	●	●	●			●																
TNMG ... MF	TNMG 160404-MF	16,50	9,52	●	●	●																			
	TNMG 160408-MF	16,50	9,52	●	●	●																			
	TNMG 160412-MF	16,50	9,52		●	●																			
																									
TNMG ... F	TNMG 160404 F	16,50	9,52	●	●																				
	TNMG 160408 F	16,50	9,52	●	●																				
																									

Order Example: 10 pieces TNMG 160404-MF B71-G1

● Available from stock

For Toolholders see pages 64–65 / 72 / 91

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW		HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
TNMG ... M	TNMG 160408-M	16,50	9,52	●	●	●																		
	TNMG 160412-M	16,50	9,52	●	●	●																		
	TNMG 160416-M	16,50	9,52	●	●	●																		
	TNMG 220408-M	22,00	12,70	●	●	●																		
	TNMG 220412-M	22,00	12,70	●	●																			
TNMM ... R	TNMM 160408-R	16,50	9,52	●	●	●																		
	TNMM 220408-R	22,00	12,70	●	●	●																		
	TNMM 220412-R	22,00	12,70	●	●	●																		
TPMR ... F	TPMR 110304-F	11,00	6,35	●	●	●																		
	TPMR 110308-F	11,00	6,35	●	●	●																		
	TPMR 160304-F	16,50	9,52	●	●	●																		
	TPMR 160308-F	16,50	9,52	●	●	●																		
TPUN ...	TPUN 160308	16,50	9,52														●							

Order Example: 10 pieces TNMG 160408-M-HS A31-A1

● Available from stock

For Toolholders see pages 64–65 / 72 / 91 /98

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW		HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
VBMT ...	VBMT 160404	16,60	9,52	●	●																			
	VBMT 160408	16,60	9,52	●	●																			
	VBMT 160412	16,60	9,52	●	●																			
	VBMT 160404-M1	16,60	9,52						●															
	VBMT 160408-M1	16,60	9,52						●															
VCGT ... M	VCGT 070202-M	6,85	3,97														●							
	VCGT 070204-M	6,85	3,97														●							
	VCGT 110302-M	11,10	6,37														●							
	VCGT 110304-M	11,10	6,37														●							
VCGT ...	VCGT 1103008	11,10	6,35																●					
	VCGT 1103015	11,10	6,35																●					
VCGT ... MR	VCGT 110302-MR	11,10	6,35													●	●							
	VCGT 110304-MR	11,10	6,35													●	●							
	VCGT 160402-MR	16,60	9,52													●	●							
	VCGT 160404-MR	16,60	9,52													●	●							
	VCGT 160408-MR	16,60	9,52													●	●							
	VCGT 160412-MR	16,60	9,52													●	●							
	VCGT 220530-MR	22,10	12,70													●	●							
VCMT ... MR1	VCMT 160404-MR1	16,60	9,52						●															
	VCMT 160408-MR1	16,60	9,52						●															
	VCMT 160412-MR1	16,60	9,52						●															

Order Example: 10 pieces VBMT 160404 HS A31-A1

● Available from stock

For Toolholders see pages 84–86 / 95–96

For cutting data standard values see from page 109

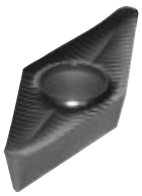
	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW		HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
VCMT ... F	VCMT 110304-F	11,10	6,35	●	●																			
	VCMT 160404-F	16,60	9,52	●	●																			
	VCMT 160408-F	16,60	9,52	●	●																			
																								
VCMT ... M.	VCMT 160404-M	16,60	9,52	●	●																			
	VCMT 160408-M	16,60	9,52	●	●																			
																								
	VCMT 160404-M1	16,60	9,52							●														
	VCMT 160408-M1	16,60	9,52							●														
	VCMT 160412-M1	16,60	9,52							●														
VNMG ... F	VNMG 160404-F	16,60	9,52	●	●																			
	VNMG 160408-F	16,60	9,52	●	●																			
																								
VNMG ... MF	VNMG 160408-MF	16,60	9,52	●	●																			
																								
VNMG ... M1	VNMG 160404-M1	16,60	9,52																	●				
	VNMG 160408-M1	16,60	9,52																	●				
																								

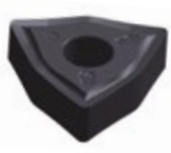
Order Example: 10 pieces VCMT 110304-F-HS A31-A1

● Available from stock

For Toolholders see pages 84–86 / 95–96

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW		HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
VNMG ... M	VNMG 160408-M	16,60	9,52	●	●	●																		
	VNMG 160412-M	16,60	9,52	●	●	●																		
																								
VPGT ... MR	VPGT 220516-MR	22,10	12,70														●							
																								

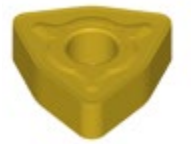
	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW		HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
WCGT ... MR	WCGT 06T302-MR	6,50	9,52														●							
	WCGT 06T304-MR	6,50	9,52													●	●							
	WCGT 06T308-MR	6,50	9,52													●	●							
	WCGT 080404-MR	8,60	12,70														●							
	WCGT 080408-MR	8,60	12,70													●	●							
WNGG ... M1	WNGG 060408-M1	6,50	9,52																	●				
	WNGG 080404-M1	8,60	12,70																	●				
	WNGG 080408-M1	8,60	12,70																	●				
	WNGG 080412-M1	8,60	12,70																	●				
WNGG ... M	WNGG 080404-M	8,60	12,70																	●				
	WNGG 080408-M	8,60	12,70																	●				
	WNGG 080412-M	8,60	12,70																	●				

Order Example: 10 pieces VNMG 160408-F-HS A31-A1

For Toolholders see pages 64 / 66 / 73 / 92

● Available from stock

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW	HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
WNMA ...	WNMA 080408	8,60	12,70									●	●											
	WNMA 080412	8,60	12,70									●	●											
																								
WNMG ... MF	WNMG 060404-MF	6,50	9,52						●															
	WNMG 080404-MF	8,60	12,70						●	●														
	WNMG 080408-MF	8,60	12,70						●	●														
																								
WNMG ... MR	WNMG 080408-MR	8,60	12,70									●	●											
	WNMG 080412-MR	8,60	12,70										●											
																								
WNMG ... MR	WNMG 080408-MR	8,60	12,70						●															
	WNMG 080412-MR	8,60	12,70						●															
																								
WNMG ... M	WNMG 060408-M	6,50	9,52						●															
	WNMG 080408-M	8,60	12,70						●															
	WNMG 080412-M	8,60	12,70						●															
	WNMG 080416-M	8,60	12,70						●															
																								

Order Example: 10 pieces WNMA 080408 C21-I1

● Available from stock

For Toolholders see pages 64 / 66 / 73 / 92

For cutting data standard values see from page 109

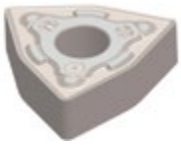
	Ordering Code	l	d	Grade																				
				HC										HW	HC		HW		HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
WNMG ... E.-M1	WNMG 080404 ER-M1	8,60	12,70	●	●	●			●															
	WNMG 080408 EL-M1	8,60	12,70	●	●	●			●															
	WNMG 080408 ER-M1	8,60	12,70	●	●	●			●															
	WNMG 080412 EL-M1	8,60	12,70		●	●			●															
	WNMG 080412 ER-M1	8,60	12,70		●	●			●															
																								
WNMG ... MF	WNMG 060404-MF	6,50	9,52	●	●	●																		
	WNMG 060408-MF	6,50	9,52	●	●	●																		
	WNMG 080404-MF	8,60	12,70	●	●	●																		
	WNMG 080408-MF	8,60	12,70	●	●	●																		
	WNMG 080412-MF	8,60	12,70		●																			
																								
WNMG ... MR1	WNMG 080408-MR1	8,60	12,70	●	●																			
	WNMG 080412-MR1	8,60	12,70	●	●																			
																								
WNMG ... M1	WNMG 060404-M1	6,50	9,52							●														
	WNMG 080408-M1	8,60	12,70					●		●														
	WNMG 080412-M1	8,60	12,70					●		●														
	WNMG 080416-M1	8,60	12,70							●														
																								
WNMG ... M	WNMG 060408-M	8,60	9,52	●	●	●																		
	WNMG 080408-M	8,60	12,70	●	●	●																		
	WNMG 080412-M	8,60	12,70	●	●	●																		
	WNMG 080416-M	8,60	12,70	●	●	●																		
																								

Order Example: 10 pieces WNMG 080404 ER-F-HS A31-A1

● Available from stock

For Toolholders see pages 64 / 66 / 73 / 92

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW		HC				
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
WNMG ... MR	WNMG 080408-MR	8,60	12,70	●	●	●																		
	WNMG 080412-MR	8,60	12,70	●	●	●																		
	WNMG 080416-MR	8,60	12,70	●	●	●																		
																								
WNMG ... M	WNMG 080404-M	8,60	12,70																	●				
	WNMG 080408-M	8,60	12,70																	●				
	WNMG 080412-M	8,60	12,70																	●				
																								
WNMG ... M2	WNMG 080408-M2	8,60	12,70																		●	●		
																								

Order Example: 10 pieces WNMG 080408-MR-HS A31-A1

● Available from stock

For Toolholders see pages 64 / 66 / 73 / 92

For cutting data standard values see from page 109

	Ordering Code	l	d	Grade																			
				HC										HW	HC		HW	HC					
				HS A31-A1	A51-B1	IC A81-C1		B41-D1	B71-G1	B51-E1	B81-F1	C21-I1	HS C31-J1	C21-Q1		AL D21-K1	D21-P1		E31-M1	T E31-N1	T E21-L1	E41-O1		
XCGT ... M	XCGT 260407-M		9,52														●							
	XCGT 260410-M		9,52														●							
	XCGT 280408-M		9,45														●							

Order Example: 10 pieces XCGT 260407-M D21-P1

● Available from stock

For Toolholders see pages 88

For cutting data standard values see from page 109

Tool Holder

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Tool Holder

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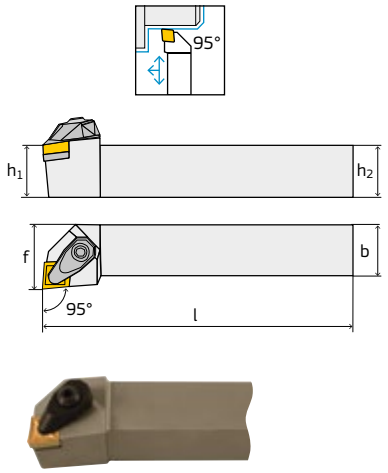
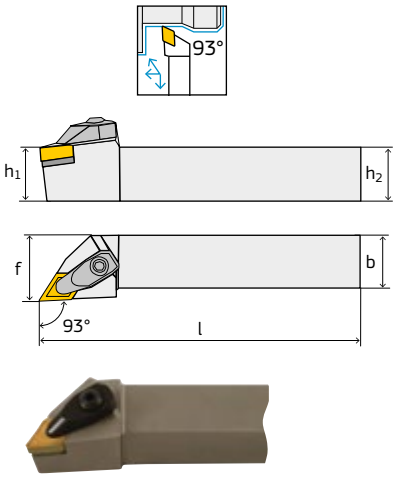
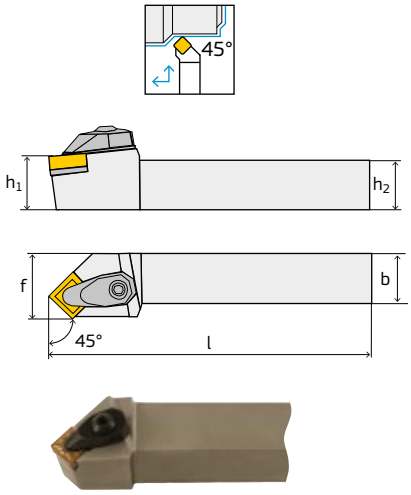
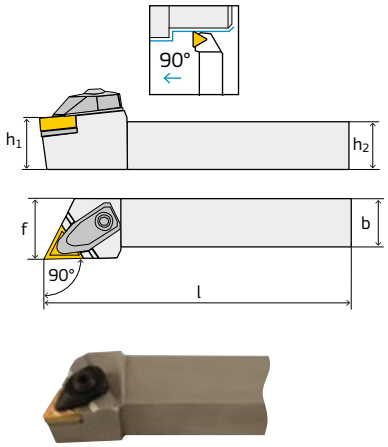
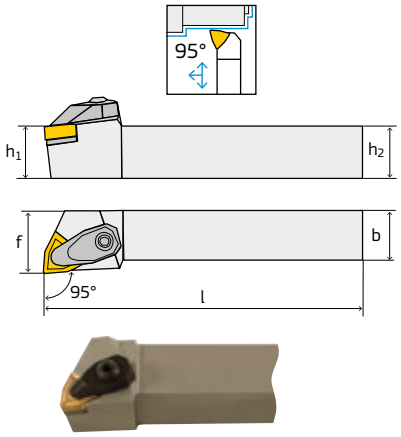
Technical Hints

	Ordering Code	$h_1 = h_2$	b	f	l	Suitable Inserts	Page
DCLN-R/L	DCLNR/L 2020 K12	20	20	25	125	CN ... 1204 ...	34–38
	DCLNR/L 2525 M12	25	25	25	125		
							
DDJN-R/L	DDJNR/L 2020 K15	20	20	25	125	DN ... 1506 ...	40–44
	DDJNR/L 2525 M15	25	25	25	125		
							
DSSN-R/L	DSSNR/L 2020 K12	20	20	25	125	SN ... 1204 ...	47–50
	DSSNR/L 2525 M12	25	25	25	125		
							

Righthand version as shown, lefthand version mirrorlike

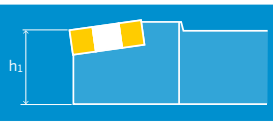
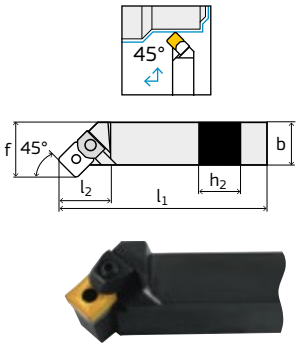
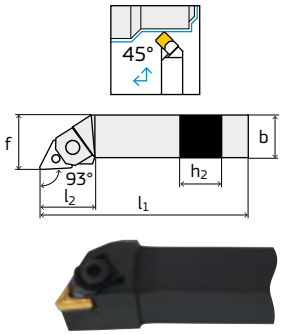
Order Example: 1 piece DCLNR 2020 K12

	Ordering Code	$h_1 = h_2$	b	f	l	Suitable Inserts	Page
DTJNR 	DTJNR/L 2020 K16	20	20	25	125	TN ... 1604 ...	51–53
	DTJNR/L 2525 M16	25	25	25	125		
DWLNR 	DWLNR/L 2020 K08	20	20	25	125	WN ... 0804 ...	56–59
	DWLNR/L 2525 M08	25	25	25	125		

Righthand version as shown, lefthand version mirrorlike

Spare Parts	Ordering Code								
			 M6210	 V6020	 V01-A0030				
DCLNR/L 2020 K12	5013589	DT01N	5013609	5013595	5013610	5013607	VD0408	5013600	S8012P
DCLNR/L 2525 M12	5013589	DT01N	5013609	5013595	5013610	5013607	VD0408	5013600	S8012P
DDJNR/L 2020 K15	5013591	DT02N	5013609	5013595	5013610	5013607	VD0408	5013601	S5515P
DDJNR/L 2525 M15	5013591	DT02N	5013609	5013595	5013610	5013607	VD0408	5013601	S5515P
DSSNR/L 2020 K12	5013589	DT01N	5013609	5013595	5013610	5013607	VD0408	5013604	S9012P
DSSNR/L 2525 M12	5013589	DT01N	5013609	5013595	5013610	5013607	VD0408	5013604	S9012P
DTJNR/L 2020 K16	5013594	DT03N	5013609	5013595	5013610	5013608	VD0308	5013602	S6016D
DTJNR/L 2525 M16	5013594	DT03N	5013609	5013595	5013610	5013608	VD0308	5013602	S6016D
DWLNR/L 2020 K08	5013589	DT01N	5013609	5013595	5013610	5030344	VD0408B	5013603	S8008P
DWLNR/L 2525 M08	5013589	DT01N	5013609	5013595	5013610	5030344	VD0408B	5013603	S8008P

Order Example: 1 piece DTJNR 2020 K16

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
MSSN-R/L 	MSSNR/L 3232P19	32	32	170	44	40	SN ... 19 ...	47–50
MTJN-R/L 	MTJNR/L 2020K16	20	20	125	34	25	TN ... 16 ...	51–53
	MTJNR/L 2525M16	25	25	150	34	32		
	MTJNR/L 2525M22	25	25	150	35	32	TN ... 22 ...	51–53
	MTJNR/L 3225P22	32	25	170	35	32		

Righthand version as shown, lefthand version mirrorlike

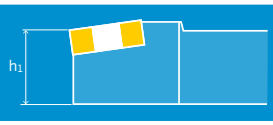
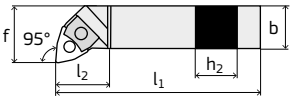
Spare Parts		Ordering Code					
Cutting edge length	Shank size	Shim	Clampset	Screw	Pin	Key	
19	3232	B08-S1847	D08-S19SP	A11-05008	E08-07925	V01-A0040	

Spare Parts		Ordering Code					
Cutting edge length	Shank size	Shim	Clampset	Threadpin	Pin	Key	
16	2020 – 2525	B08-13416	D08-12016*	–	E08-11645	V01-A0050	
22	2525 – 3225	B08-T2047	D08-T22SP	A01-06100	E08-051K8	V01-A0030	

Order Example: 1 piece MSSNR 3232P19

Delivery without key

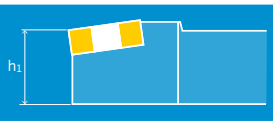
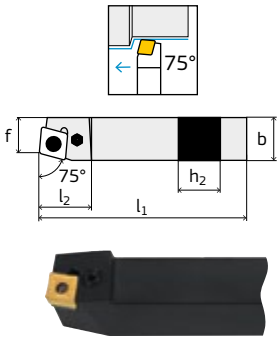
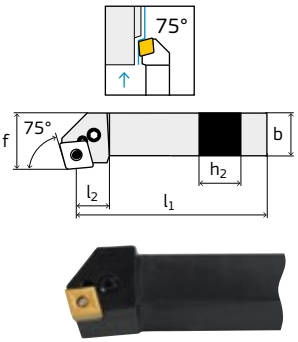
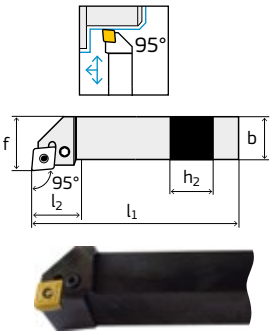
* Clampset with screw special edition

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
MWLN-R/L	MWLNR/L 2020K06	20	20	125	26	25	WN ... 06 ...	51–53
	MWLNR/L 2525M06	25	25	150	26	32		
	MWLNR/L 3225P06	32	25	170	26	32		
	MWLNR/L 2020K08	20	20	125	34	25	WN ... 08 ...	56–59
	MWLNR/L 2525M08	25	25	150	34	32		
	MWLNR/L 3225P08	32	25	170	34	32		
								
								

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	 Shim	 Clampset	 Screw	 Pin	 Key	
06	2020 – 3225	B08-W0632	D08-W06SP	A14-30006	E08-05610	V01-A0020	
08	2020 – 3225	B01-W0831	D08-12008*	–	E08-11662	V01-A0025	

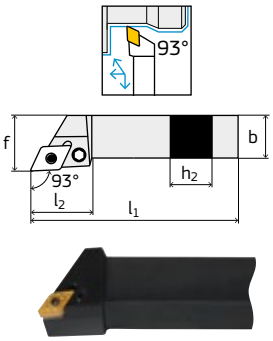
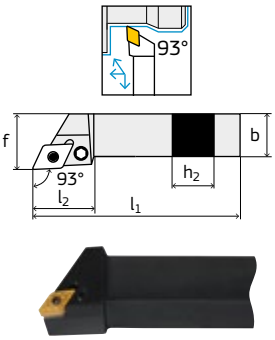
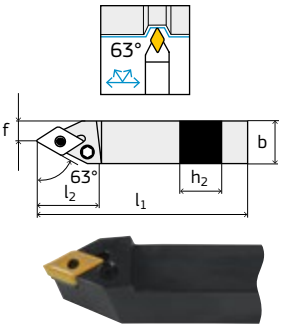
Order Example: 1 piece MWLNR 2020K06 Delivery without key * Clampset with screw special edition

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
PCBN-R/L 	PCBNR/L 2525M12	25	25	150	27,7	22	CN ... 12 ...	34–38
	PCBNR/L 2525M16	25	25	150	31,7	22	CN ... 16 ...	34–38
	PCBNR/L 3232P19	32	32	170	37,9	27	CN ... 19 ...	34–38
PCKN-R/L 	PCKNR/L 2525M12	25	25	150	28	32	CN ... 12 ...	34–38
	PCKNR/L 3232P19	32	32	170	36	40	CN ... 19 ...	34–38
PCLN-R/L 	PCLNR/L 1616H09	16	16	100	23	20	CN ... 09 ...	34–38
	PCLNR/L 1616H12	16	16	100	26,1	20	CN ... 12 ...	34–38
	PCLNR/L 2020K12	20	20	125	27,4	25		
	PCLNR/L 2525M12	25	25	150	28	32		
	PCLNR/L 3225P12	32	25	170	32,6	32		
	PCLNR/L 2525M16	25	25	150	28	32	CN ... 16 ...	34–38
	PCLNR/L 3232P16	32	32	170	32,6	40		
	PCLNR/L 2525M19	25	25	150	38	32	CN ... 19 ...	34–38
	PCLNR/L 3232P19	32	32	170	38	40		
	PCLNL 3225P19	32	25	170	38	40		
	PCLNR/L 4040S19	40	40	250	38	50		

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	Shim	Lever	Fixation screw	Shim pin	Assembly punch	Key
09	1616	B01-C0931	D02-09120	A03-06170	E01-05405	V10-10000	V01-A0025
12	1616 – 3225	B01-C1231	D02-12130	A03-08210	E01-07205	V10-20000	V01-A0030
16	2525 – 3232	B01-C1547	D02-15173	A03-08235	E01-09008	V10-40000	V01-A0030
19	2525 – 4040	B01-C1847	D02-19210	A03-10270	E01-11011	V10-30000	V01-A0040

Order Example: 1 piece PCBNR 2525M12 Delivery without key * Clampset with screw special edition

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
PDJN-R/L 	PDJNR/L 1616H11	16	16	100	30	20	DN ... 11 ...	34–38
	PDJNR/L 2020K11	20	20	125	30	25		
	PDJNR/L 2525M11	25	25	150	30	32		
	PDJNR/L 2020K15	20	20	125	34,7	25	DN ... 15 ...	41–44
	PDJNR/L 2525M15	25	25	150	34,7	32		
	PDJNR/L 3225P15	32	25	170	34,7	32		
	PDJNR/L 3232P15	32	32	170	34,7	40		
PDJN-R/L 	PDJNR/L 2020K14	20	20	125	34,7	25	DN ... 14 ...	43
	PDJNR/L 2525M14	25	25	150	34,7	32	DN ... 14 ...	43
	PDJNR/L 3225P14	32	25	170	34,7	32		
	PDJNL 4025R14	40	25	200	34,7	32		
PDNN-R/L 	PDNNR/L 2525M11	25	25	150	30	12,5	DN ... 11 ...	41–42
	PDNNR/L 2525M15	25	25	150	36,5	12,5	DN ... 15 ...	40–44
	PDNNR/L 3225P15	32	25	170	36,5	12,5		
	PDNNR/L 4025P15	40	25	170	36,5	12,5		

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	Shim	Lever	Fixation screw	Shim pin	Assembly punch	Key
11	1616–2525	B01-D1131	D02-10120	A03-06170	E01-05405	V10-10000	V01-A0025
14	2020–4025	B01-D1331	D02-15145	A03-08210	E01-07205	V10-20000	V01-A0030
15[1)]	2020–4025	B01-D1448	D02-15145	A03-08210	E01-07205	V10-20000	V01-A0030
15[2)]	2020–4025	B01-D1447	D02-15145	A03-08210	E01-07205	V10-20000	V01-A0030
15[3)]	2020–4025	B01-D1432	D02-15145	A03-08210	E01-07205	V10-20000	V01-A0030
15[4)]	2020–4025	B01-D1431	D02-15145	A03-08210	E01-07205	V10-20000	V01-A0030

Order Example: 1 piece PDJNR 1616H11

Delivery without key

For insert DNMG 1504 ...

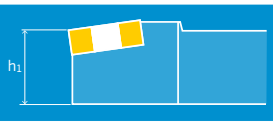
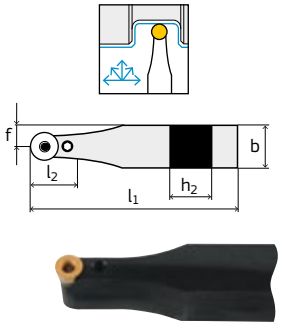
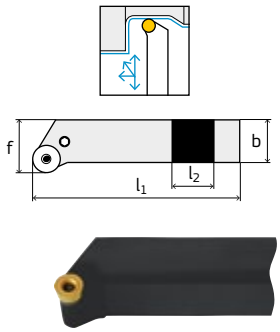
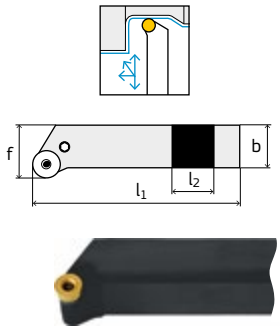
[1)] s = 4,76 mm; r = 0,4, 0,8 mm

[2)] s = 4,76 mm; r = 1,2, 1,6 mm

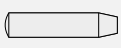
For insert DNMG 1506 ...

[3)] s = 6,35 mm; r = 0,4, 0,8 mm

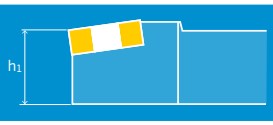
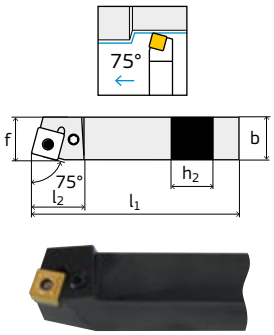
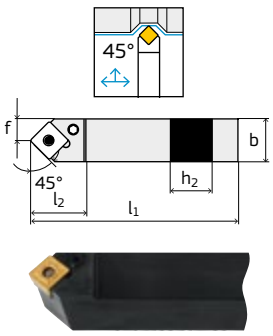
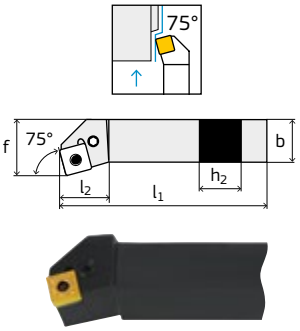
[4)] s = 6,35 mm; r = 1,2, 1,6 mm

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
PRDC-N	PRDCN 2020M10	20	20	150	22	10	RCMX 10 ...	45
	PRDCN 2525M10	25	25	150	22	12,5		
	PRDCN 2525M12	25	25	150	24	12,5	RCMX 12 ...	45
	PRDCN 3225P12	32	25	170	24	12,5		
	PRDCN 3225P16	32	25	170	28	12,5	RCMX 16 ...	45
	PRDCN 3232P20	32	32	170	32	16	RCMX 20 ...	45
	PRDCN 4040S25	40	40	250	42	20	RCMX 25 ...	45
PRGC-R/L	PRGCR/L 2525M12	25	25	150		32	RCMX 12 ...	45
	PRGCR/L 3225P12	32	25	170		32		
	PRGCR/L 3225P16	32	25	170		32	RCMX 16 ...	45
	PRGCR/L 3232P16	32	32	170		40		
	PRGCR/L 3232P20	32	32	170		40	RCMX 20 ...	45
	PRGCR/L 4040S25	40	40	250		50	RCMX 25 ...	45
PRSC-R/L	PRSCR 2020K10	20	20	125		25	RC ... 10 ...	44–45
	PRSCR 2020K12	20	20	125		25	RC ... 12 ...	45
	PRSCR/L 2525M10	25	25	150		32	RC ... 10 ...	44–45
	PRSCL 2525M12	25	25	150		32	RC ... 12 ...	45
	PRSCR/L 2525M16	25	25	150		32	RC ... 16 ...	44–45
	PRSCR/L 3225P12	32	25	170		32	RC ... 12 ...	45
	PRSCR 3225P16	32	25	170		32	RC ... 16 ...	44–45
	PRSCR 3232P20	32	32	170		40	RC ... 20 ...	44–45

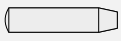
Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	 Shim	 Lever	 Fixation screw	 Shim pin	 Assembly punch	 Key
10	2020 – 2525	B05-R0831	D05-10118	A03-05140	E01-05405	V10-10000	V01-A0020
12	2525 – 3225	B05-R0931	D05-12133	A03-06170	E01-05405	V10-10000	V01-A0025
16	2525 – 3225	B05-R1347	D05-17178	A03-06210	E01-07409	V10-20000	V01-A0025
20	3232	B05-R1747	D05-19189	A03-08235	E01-09008	V10-40000	V01-A0030
25	4040	B05-R2263	D05-23235	A03-10305	E01-11011	V10-30000	V01-A0040

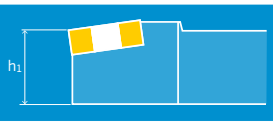
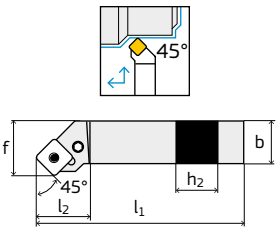
Order Example: 1 piece PCBNR 2525M12 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
PSBN-R/L 	PSBNR/L 2020K12	20	20	125	27,5	17	SN ... 12 ...	47–50
	PSBNR/L 2525M12	25	25	150	27,5	22		
	PSBNR/L 3225P12	32	25	170	32	22		
	PSBNR/L 3232P15	32	32	170	32	27	SN ... 15 ...	47–50
	PSBNR/L 3232P19	32	32	170	39,2	27	SN ... 19 ...	47–50
	PSBNR/L 4040S19	40	40	250	38,5	35		
	PSBNR/L 4040S25	40	40	250	47,5	35	SN ... 25 ...	47–50
	PSBNR/L 5050T25	50	50	300	49	43		
PSDN-N 	PSDNN 1616H09	16	16	100	21	8,3	SN ... 09 ...	47–48
	PSDNN 2020K12	20	20	125	27,6	10,3	SN ... 12 ...	47–50
	PSDNN 2525M12	25	25	150	27,6	12,8		
	PSDNN 3225P19	32	25	170	40,4	13	SN ... 19 ...	47–50
	PSDNN 3232P19	32	32	170	40,4	12,5		
PSKN-R/L 	PSKNR/L 1616H09	16	16	100	18,7	20	SN ... 09 ...	47–49
	PSKNR/L 2020K12	20	20	125	22,7	25	SN ... 12 ...	47–50
	PSKNR/L 2525M12	25	25	150	22,7	32		
	PSKNR/L 3225P12	32	25	170	32	32		
	PSKNR/L 2525M15	25	25	150	22,7	32	SN ... 15 ...	48–50
	PSKNR/L 3232P19	32	32	170	33,7	40	SN ... 19 ...	47–50
	PSKNR/L 4040S19	40	40	250	37,6	50		

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	 Shim	 Lever	 Fixation screw	 Shim pin	 Assembly punch	 Key
09	1616	B01-S0931	D02-09120	A03-05095	E01-05405	V10-10000	V01-A0025
12	2020 – 3225	B01-S1231	D02-12130	A03-08210	E01-07205	V10-20000	V01-A0030
15	2525 – 3232	B01-S1547	D02-15173	A03-08235	E01-09008	V10-40000	V01-A0030
19	3232 – 4040	B01-S1847	D02-19210	A03-10270	E01-11011	V10-30000	V01-A0040
25	4040 – 5050	B01-S2463	D02-23250	A03-12360	E01-15212	V10-50000	V01-A0050

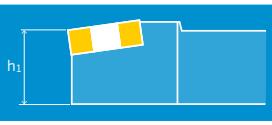
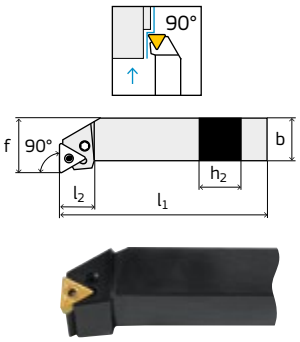
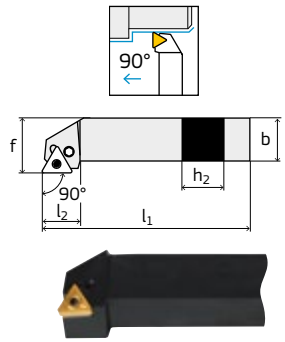
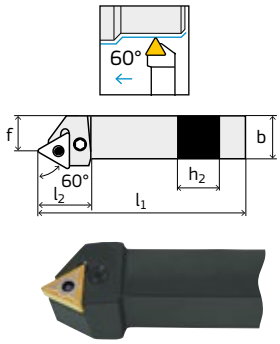
Order Example: 1 piece PSBNR 2020K12 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
PSSN-R/L	PSSNR/L 1616H09	16	16	100	21,2	20	SN ... 09 ...	47–48
	PSSNR/L 2020K12	20	20	125	29,3	25	SN ... 12 ...	47–50
	PSSNR/L 2525M12	25	25	150	29,3	32		
	PSSNR/L 3225P12	32	25	170	32	32		
	PSSNR/L 2525M15	25	25	150	29,3	32	SN ... 15 ...	58–50
	PSSNR/L 3232P19	32	32	170	40,2	40	SN ... 19 ...	47–50
	PSSNR/L 4040S19	40	40	250	39,5	50	SN ... 19 ...	47–50

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	Shim	Lever	Fixation screw	Shim pin	Assembly punch	Key
09	1616	B01-S0931	D02-09120	A03-05096	E01-05405	V10-10000	V01-A0025
12	2020 – 3225	B01-S1231	D02-12130	A03-08210	E01-07205	V10-20000	V01-A0030
15	2525	B01-S1547	D02-15173	A03-08235	E01-09008	V10-40000	V01-A0030
19	3232 – 4040	B01-S1847	D02-19210	A03-10270	E01-11011	V10-30000	V01-A0040

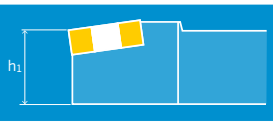
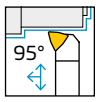
Order Example: 1 piece PSSNR 1616H09 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
PTFN-R/L 	PTFNR/L 1616H16	16	16	100	19,7	20	TN ... 16 ...	51–53
	PTFNR/L 2020K16	20	20	125	20,2	25		
	PTFNR/L 2525M16	25	25	150	20,2	32		
	PTFNR/L 2525M22	25	25	150	25,2	32	TN ... 22 ...	51–53
	PTFNR/L 3225P22	32	25	170	25,2	32		
PTGN-R/L 	PTGNR/L 1616H16	16	16	100	20	20	TN ... 16 ...	51–53
	PTGNR/L 2020K16	20	20	125	20	25		
	PTGNR/L 2525M16	25	25	150	22,2	32		
	PTGNR/L 3225P16	32	25	170	22,2	32		
	PTGNR/L 2525M22	25	25	150	25,2	32	TN ... 22 ...	51–53
	PTGNR/L 3232P22	32	32	170	28,7	40	TN ... 22 ...	51–53
PTTN-R/L 	PTTNR/L 2020K16	20	20	125	25,9	17	TN ... 16 ...	51–53
	PTTNR/L 2525M22	25	25	150	31,9	22	TN ... 22 ...	51–53

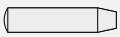
Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	Shim	Lever	Fixation screw	Shim pin	Assembly punch	Key
16	1616 – 3225	B01-T1527	D02-09120	A03-06170	E01-05405	V10-10000	V01-A0025
22	2525 – 3232	B01-T2031	D02-12130	A03-08210	E01-07205	V10-20000	V01-A0030

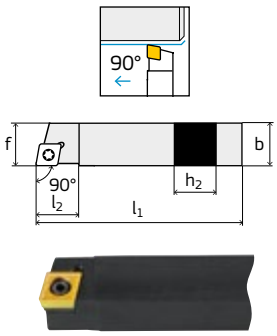
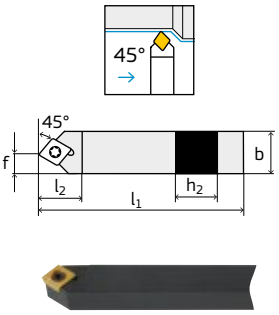
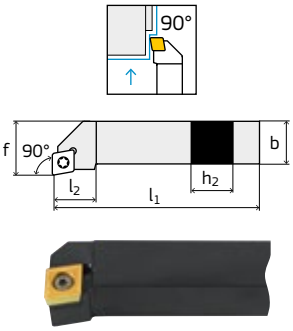
Order Example: 1 piece PTFNR 1616H16 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
PWLN-R/L	PWLNR/L 1616H06	16	16	100	20	20	WN ... 06 ...	56–58
	PWLNR/L 2020K06	20	20	125	25	25		
	PWLNR/L 2525M06	25	25	150	25	32		
	PWLNR/L 2020K08	20	20	125	25	25	WN ... 08 ...	56–59
	PWLNR/L 2525M08	25	25	150	25	32		
								

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	 Shim	 Lever	 Fixation screw	 Shim pin	 Assembly punch	 Key
06	1616–2525	B01-W0627	D02-09120	A03-06170	E01-05807	V10-10000	V01-A0025
08	2020–3225	B01-W0831	D02-12130	A03-08210	E01-07205	V10-20000	V01-A0030

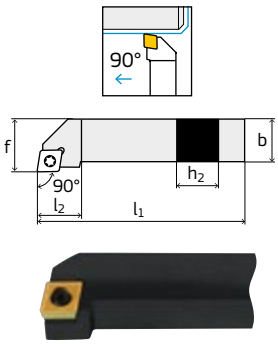
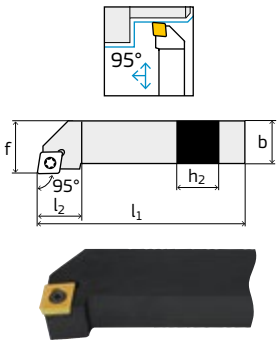
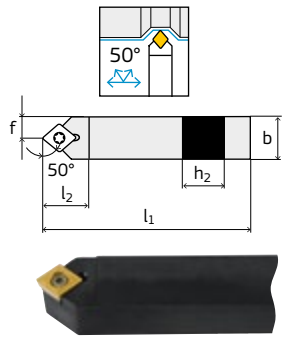
Order Example: 1 piece PWLNR 1616H06 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
SCAC-R/L	SCACR/L 0808D06	8	8	60	9	8	CC ... 06 ...	32–33
	SCACR/L 0808K06	8	8	125	9	8		
	SCACR/L 1010E06	10	10	70	9	10		
	SCACR/L 1010M06	10	10	150	9	10		
	SCACR/L 1212F09	12	12	80	13	12	CC ... 09 ...	32–33
	SCACR/L 1212M09	12	12	150	13	12		
	SCACR/L 1414M09	14	14	150	13	14		
	SCACR/L 1616H09	16	16	100	13	16		
	SCACR/L 2020K12	20	20	125	17	20	CC ... 12 ...	32–33
SCDC-L	SCDCL 0808K06	8	8	125	13	4	CC ... 06 ...	32–33
	SCDCL 1010M06	10	10	150	13	5		
	SCDCL 1212M09	12	12	150	18	6	CC ... 09 ...	32–33
	SCDCL 1414M09	14	14	150	18	7		
SCFC-R/L	SCFCR/L 0808D06	8	8	60	10	8	CC ... 06 ...	32–33
	SCFCR/L 1010E06	10	10	70	10	10		
	SCFCR/L 1212F09	12	12	80	13	12	CC ... 09 ...	32–33
	SCFCR/L 1616H09	16	16	100	13	16		
	SCFCR/L 2020K12	20	20	125	17	20	CC ... 12 ...	32–33

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	 Shim	 Shim screw	 Fixation screw	 Key		
06	0808 – 1010	–	–	A02-25059	V02-T0800		
09	1212 – 1414	–	–	A02-35082	V02-T1500		
09	1616 – 2020	B09-C0923	E09-F5035	A02-35096	V05-T1534		
12	1616 – 2020	B09-C1231	E09-F6045	A02-45102	V05-T1534		

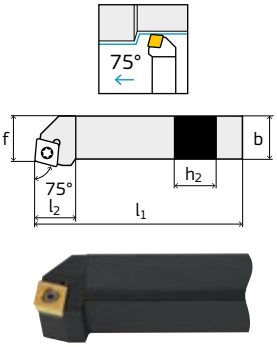
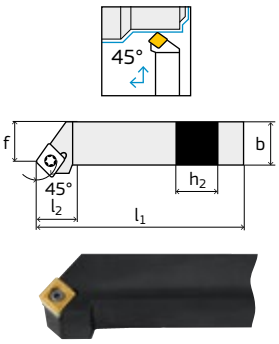
Order Example: 1 piece SCACR 0808D06 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
SCGC-R/L	SCGCR/L 2020K12	20	20	125	17	25	CC ... 12 ...	32–33
								
SCLC-R/L	SCLCR/L 0808D06	8	8	60	9	8	CC ... 06 ...	32–33
	SCLCR 1010E06	10	10	70	9	12		
	SCLCR/L 1212F09	12	12	80	15	16	CC ... 09 ...	32–33
	SCLCR/L 1616H09	16	16	100	17	20		
	SCLCR/L 2020K09	20	20	125	17	25		
	SCLCR/L 1616H12	16	16	100	20	20	CC ... 12 ...	32–33
	SCLCR/L 2020K12	20	20	125	20	25		
	SCLCR/L 2525M12	25	25	150	20	32		
	SCLCR/L 3225P12	32	25	170	20	32		
SCMC-N	SCMCN 1616H12	16	16	100	25	8	CC ... 12 ...	32–33
	SCMCN 2020K12	20	20	125	25	10		
	SCMCN 2525M12	25	25	150	25	12,5		
	SCMCN 3225P12	32	25	170	25	12,5		

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	Shim	Shim screw	Fixation screw	Key		
06	0808 – 1010	–	–	A02-25059	V02-T0800		
09	1212	–	–	A02-35082	V02-T1500		
09	1616 – 2020	B09-C0923	E09-F5035	A02-35096	V05-T1534		
12	1616 – 3225	B09-C1231	E09-F6045	A02-45102	V05-T1534		

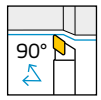
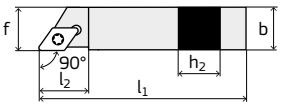
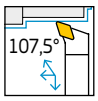
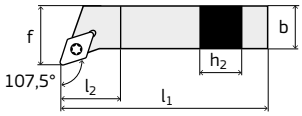
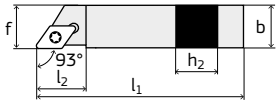
Order Example: 1 piece SCGCR 2020K12 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
SCRC-R/L	SCRCR/L 0808D06	8	8	60	10	9	CC ... 06 ...	32–33
	SCRCR/L 1010E06	10	10	70	10	11		
	SCRCR/L 1212F09	12	12	80	16	13	CC ... 09 ...	32–33
	SCRCR/L 1616H09	16	16	100	17	17		
	SCRCR/L 2020K09	20	20	125	17	22		
	SCRCR/L 1616H12	16	16	100	20	17	CC ... 12 ...	32–33
	SCRCR/L 2020K12	20	20	125	20	22		
	SCRCR/L 2525M12	25	25	150	20	27		
	SCRCR/L 3225P12	32	25	170	20	27		
SCSC-R/L	SCSCR/L 1616H12	16	16	100	20	20	CC ... 12 ...	32–33
	SCSCR/L 2020K12	20	20	125	20	25		
	SCSCR/L 2525M12	25	25	150	20	32		
	SCSCR/L 3225P12	32	25	170	20	32		

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	Shim	Shim screw	Fixation screw	Key		
06	0808 – 1010	–	–	A02-25059	V02-T0800		
09	1212	–	–	A02-35082	V02-T1500		
09	1616 – 2020	B09-C0923	E09-F5035	A02-35096	V05-T1534		
12	1616 – 3225	B09-C1231	E09-F6045	A02-45102	V05-T1534		

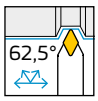
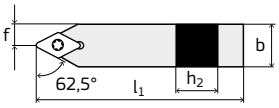
Order Example: 1 piece SCRCR 0808D06 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
SDAC-R/L	SDACR/L 0808K07	8	8	125	14	8	DC ... 07...	38–40
	SDACR/L 1010M07	10	10	150	14	10		
	SDACR/L 1212M07	12	12	150	14	12		
	SDACR/L 1212M11	12	12	150	21	12	DC ... 11 ...	38–40
	SDACR/L 1414M11	14	14	150	21	14		
	SDACR/L 1010X07-D	10	10	150	15	10	DC ... 07 ...	38–40
	SDACR/L 1212X07-D	12	12	150	15	12		
								
SDHC-R/L	SDHCR/L 1010E07	10	10	70	5,5	12	DC ... 07 ...	38–40
	SDHCR/L 1212F07	12	12	80	12	16		
	SDHCR/L 1616H11	16	16	100	10,4	20	DC ... 11 ...	38–40
	SDHCR/L 2020K11	20	20	125	14	25		
	SDHCR/L 2525M11	25	25	150	20	32		
								
SDJC-R/L	SDJCR/L 0808D07	8	8	60	13	10	DC ... 07 ...	38–40
	SDJCR/L 1010E07	10	10	70	13	12		
	SDJCR/L 1212F07	12	12	80	14,5	16		
	SDJCR/L 1212F11	12	12	80	22	16	DC ... 11 ...	38–40
	SDJCR/L 1616H11	16	16	100	20	20		
	SDJCR/L 2020K11	20	20	125	20,5	25		
	SDJCR/L 2525M11	25	25	150	21,5	32		
	SDJCR/L 3225P11	32	25	150	21,25	32		
	SDJCR/L 2525M15	25	25	150	26	32	DC ... 15 ...	40
	SDJCR/L 1010X07-D	10	10	115	15	10	DC ... 07 ...	38–40
	SDJCR/L 1212X07-D	12	12	130	15	12		
	SDJCR/L 1212X11-D	12	12	130	15	12	DC ... 11 ...	38–40
	SDJCR/L 1616X11-D	16	16	130	20	16		

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	 Shim	 Shim screw	 Fixation screw	 Key		
07	0808 – 1012	–	–	A02-25059	V02-T0800		
11	1212 – 1414	–	–	A02-35082	V02-T1500		
11	1616 – 3225	B09-D1131	E09-F5035	A02-35096	V05-T1534		
15	2525	B02-D1431	E02-60045	A02-45102	V05-T1534		

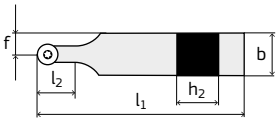
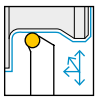
Order Example: 1 piece SDACR 0808K07 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
SDNC-N	SDNCN 0808D07	8	8	60		4	DC ... 07...	38–40
	SDNCN 0808K07	8	8	125		4		
	SDNCN 1010E07	10	10	70		5		
	SDNCN 1010M07	10	10	150		5		
	SDNCN 1212F07	12	12	80		6		
	SDNCN 1212M07	12	12	150		6		
	SDNCN 1212F11	12	12	80		6	DC ... 11 ...	38–40
	SDNCN 1212M11	12	12	150		6		
	SDNCN 1414M11	14	14	150		7		
	SDNCN 1616H11	16	16	100		8		
	SDNCN 2020K11	20	20	125		10		
	SDNCN 2525M11	25	25	150		12,5		

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	 Shim	 Shim screw	 Fixation screw	 Key		
07	0808 – 1212	–	–	A02-25059	V02-T0800		
11	1212 – 1414	–	–	A02-35082	V02-T1500		
11	1616 – 2525	B09-D1131	E09-F5035	A02-35096	V05-T1534		

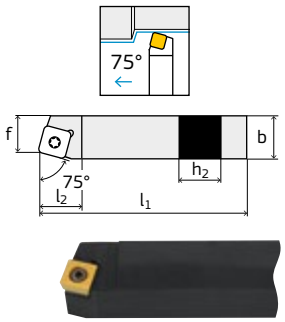
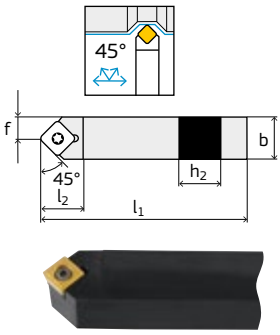
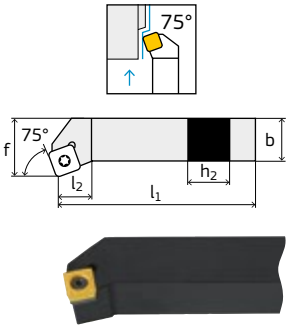
Order Example: 1 piece SDNCN 0808D07 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
SRDC-N	SRDCN 1212F06	12	12	80	12,4	6	RCGT 06 ...	44
	SRDCN 1616H06	16	16	100	12,4	8	RCMT 06 ...	44
	SRDCN 2020K06	20	20	125	12,4	10		
	SRDCN 2525M06	25	25	150	12,4	12,5		
	SRDCN 1616H08	16	16	100	16,4	8	RCGT 08 ...	44
	SRDCN 2020K08	20	20	125	16,4	10		
	SRDCN 2525M08	25	25	150	16,4	12,5		
	SRDCN 1616H10	16	16	100	20,3	8	RCGT 10 ...	44
	SRDCN 2020K10	20	20	125	20,3	10		
	SRDCN 2525M10	25	25	150	20,3	12,5		
SRGC-R/L	SRGCR/L 1212F06	12	12	80	10	16	RCGT 06 ...	44
	SRGCR/L 1616H06	16	16	100	10	20	RCMT 06 ...	44
	SRGCR/L 2020K06	20	20	125	11,5	25		
	SRGCR/L 2525M06	25	25	150	15	32		
	SRGCR/L 1616H08	16	16	100	11	20	RCGT 08 ...	44
	SRGCR/L 2020K08	20	20	125	12	25		
	SRGCR/L 2525M08	25	25	150	16,4	32		
	SRGCR/L 1616H10	16	16	100	12	20	RCGT 10 ...	44
	SRGCR/L 2020K10	20	20	125	13,5	25		
	SRGCR/L 2525M10	25	25	150	17	32		

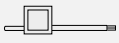
Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	 Shim	 Shim screw	 Fixation screw	 Key		
06	1212 – 2525	–	–	A02-25059	V02-T0800		
08	1616 – 2525	–	–	A13-30073	V02-T1500		
10	1616 – 2525	B09-R1025	E09-F5035	A13-35110	V05-T1534		

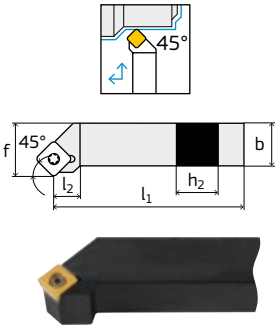
Order Example: 1 piece SRDCN 1212F06 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
SSBC-R/L 	SSBCR/L 1616H09	16	16	100	20	13	SC ... 09 ...	45–47
	SSBCR/L 2020K09	20	20	125	20	17		
	SSBCR/L 2020K12	20	20	125	20	17	SC ... 12 ...	45–47
	SSBCR/L 2525M12	25	25	150	20	22		
SSDC-N 	SSDCN 1212F09	12	12	80	16	6	SC ... 09 ...	45–47
	SSDCN 1616H09	16	16	100	20	8		
	SSDCN 2020K09	20	20	125	20	10	SC ... 12 ...	45–47
	SSDCN 1616H12	16	16	100	25	8	SC ... 09 ...	45–47
	SSDCN 2020K12	20	20	125	25	10	SC ... 12 ...	45–47
	SSDCN 2525M12	25	25	150	25	12,5		
SSKC-R/L 	SSKCR/L 1616H09	16	16	100	22	20	SC ... 09 ...	45–47
	SSKCR/L 2020K09	20	20	125	22	25		
	SSKCR/L 1616H12	16	16	100	23	20	SC ... 12 ...	45–47
	SSKCR/L 2020K12	20	20	125	23	25		
	SSKCR/L 2525M12	25	25	150	23	32		

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	 Shim	 Shim screw	 Fixation screw	 Key		
09	1212	–	–	A02-35082	V02-T1500		
09	1616–2020	B09-S0923	E09-F5035	A02-35096	V05-T1534		
12	1616–2525	B09-S1231	E09-F6045	A02-45102	V05-T1534		

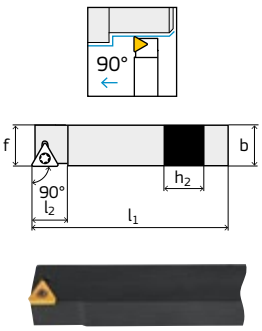
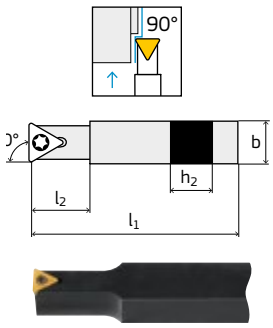
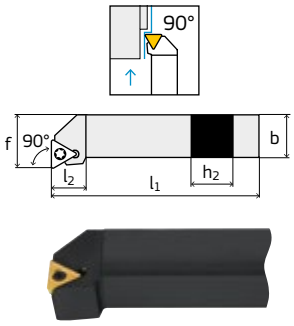
Order Example: 1 piece SSBCR 1616H09 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
SSSC-R/L	SSSCR/L 1212F09	12	12	80	18	16	SC ... 09 ...	45–47
	SSSCR/L 1616H09	16	16	100	20	20		
	SSSCR/L 2020K09	20	20	125	20	25		
	SSSCR/L 1616H12	16	16	100	25	20	SC ... 12 ...	45–47
	SSSCR/L 2020K12	20	20	125	25	25		
	SSSCR/L 2525M12	25	25	150	25	32		
	SSSCR/L 3225P12	32	25	170	25	32		

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	 Shim	 Shim screw	 Fixation screw	 Key		
09	1212	–	–	A02-35082	V02-T1500		
09	1616 – 2020	B09-S0923	E09-F5035	A02-35096	V05-T1534		
12	1616 – 3225	B09-S1231	E09-F6045	A02-45102	V05-T1534		

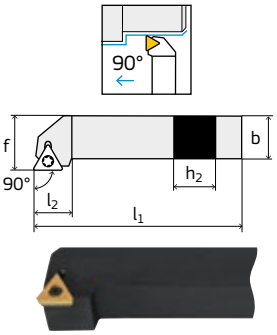
Order Example: 1 piece SSSCR 1212F09 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
STAC-R/L	STACR/L 1212K11	12	12	125	15	12	TC ... 11 ...	50–51
	STACR/L 1414K11	14	14	125	15	14		
	STACR/L 1616K11	16	16	125	15	16		
								
STCC-N	STCCN 1010K11	10	10	125	15	–	TC ... 11 ...	50–51
	STCCN 1212K11	12	12	125	15	–		
	STCCN 1414K11	14	14	125	21	–		
	STCCN 1616K11	16	16	125	24	–		
								
STFC-R/L	STFCR/L 1212F11	12	12	80	15	16	TC ... 11 ...	50–51
	STFCR/L 1616H16	16	16	100	20	20	TC ... 16 ...	50–51
	STFCR/L 2020K16	20	20	125	20	25		
	STFCR/L 2525M16	25	25	150	20	32		
								

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	 Shim	 Shim screw	 Fixation screw	 Key		
11	1010–1616	–	–	A02-25059	V02-T0800		
16	1616–2525	B09-T1631	E09-F5035	A02-35096	V05-T1534		

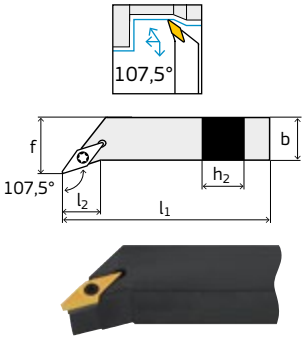
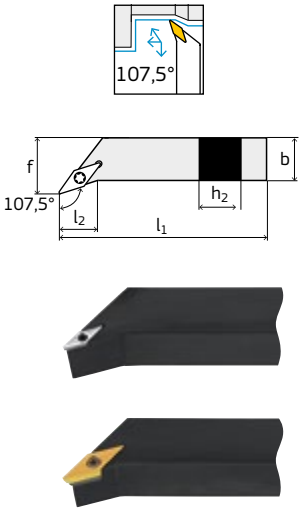
Order Example: 1 piece STACR 1212K11 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
STGC-R/L	STGCR/L 1212F11	12	12	80	15	16	TC ... 11 ...	50–51
	STGCR/L 1616H16	16	16	100	22	20	TC ... 16 ...	50–51
	STGCR/L 2020K16	20	20	125	22	25		
	STGCR/L 2525M16	25	25	150	22	32		

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	 Shim	 Shim screw	 Fixation screw	 Key		
11	1212	–	–	A02-25059	V02-T0800		
16	1616 – 2525	B09-T1631	E09-F5035	A02-35096	V05-T1534		

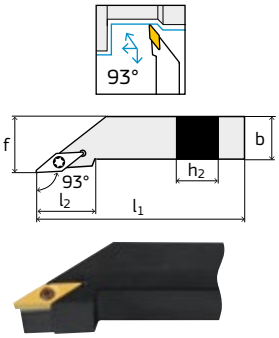
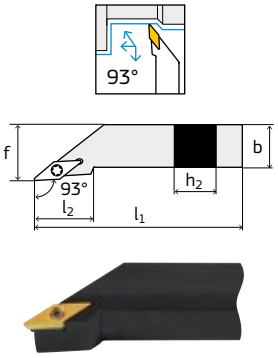
Order Example: 1 piece STGCR 1212F11 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
SVHB-R/L 	SVHBR/L 2020K16	20	20	125	17	25	VB ... 16 ...	54
	SVHBR/L 2525M16	25	25	150	26	32		
SVHC-R/L 	SVHCR/L 1212F11	12	12	80	11,4	16	VC ... 11 ...	54–55
	SVHCR/L 1616H11	16	16	100	11,4	20		
	SVHCR/L 2020K11	20	20	125	14,6	25		
	SVHCR/L 2525M11	25	25	150	20,9	32		
	SVHCR/L 2020K16	20	20	125	13,2	25	VC ... 16 ...	54–55
	SVHCR/L 2525M16	25	25	150	19,6	32		
	SVHCR/L 3225P16	32	25	170	19,6	32		
	SVHCR/L 2020K22	20	20	125	13,2	25	VC ... 22 ...	54–55
	SVHCR/L 2525M22	25	25	150	19,6	32		
	SVHCR/L 3225P22	32	25	170	19,6	32		

Righthand version as shown, lefthand version mirrorlike

Spare Parts			Ordering Code					
Cutting edge length	Indexable insert	Shank size	 Shim	 Shim screw	 Fixation screw	 Key		
11	VC ...	1212 – 2525	–	–	A02-25059	V02-T0800		
16	VC ...	2020 – 3225	B09-V1602	E09-F5035	A02-35096	V05-T1534		
r = 0,4 – 0,8	VB ...	2020 – 2525	B02-V1431	E02-F5035	A02-35096	V05-T1534		
16	VC ...	2020 – 3225	B09-V1606	E09-F5035	A02-35096	V05-T1534		
r = 1,2	VB ...	2020 – 2525	B02-V1431	E02-F5035	A02-35096	V05-T1534		
22	VC ...	2020 – 3225	B09-V2222	E09-F6045	A02-45102	V05-T1534		

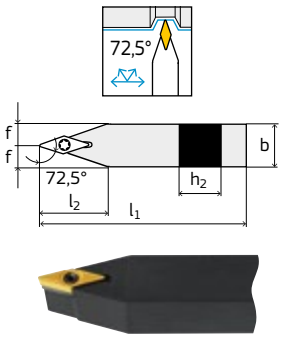
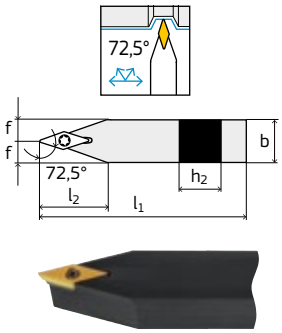
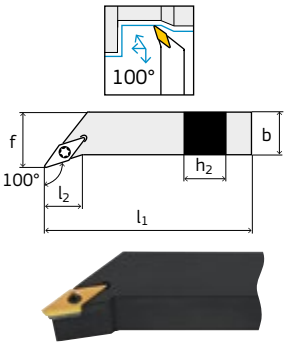
Order Example: 1 piece SVHBR 2020K16 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
SVJB-R/L 	SVJBR/L 2020K16	20	20	125	34	25	VB ... 16 ...	54
	SVJBR/L 2525M16	25	25	150	34	32		
	SVJBR/L 3225P16	32	25	170	34	32		
SVJC-R/L 	SVJCR/L 1212F11	12	12	80	21,5	16	VC ... 11 ...	54–55
	SVJCR/L 1616H11	16	16	100	21,5	20		
	SVJCR/L 2020K11	20	20	125	23	25		
	SVJCR/L 2525M11	25	25	150	25,5	32		
	SVJCR/L 2020K16	20	20	125	29,5	25	VC ... 16 ...	54–55
	SVJCR/L 2525M16	25	25	150	32,5	32		
	SVJCR/L 3225P16	32	25	170	32,5	32		
	SVJCR/L 1010X11-D	10	10	115	21,5	10	VC ... 11 ...	54–55
	SVJCR/L 1212X11-D	12	12	130	21,5	12		
	SVJCR/L 1616X11-D	16	16	130	21,5	16		

Righthand version as shown, lefthand version mirrorlike

Spare Parts			Ordering Code					
Cutting edge length	Indexable insert	Shank size	 Shim	 Shim screw	 Fixation screw	 Key		
11	VC ...	1212 – 2525	–	–	A02-25059	V02-T0800		
16	VC ...	2020 – 3225	B09-V1602	E09-F5035	A02-35096	V05-T1534		
r = 0,4 – 0,8	VB ...	2020 – 3225	B02-V1431	E02-F5035	A02-35096	V05-T1534		
16	VC ...	2020 – 3225	B09-V1606	E09-F5035	A02-35096	V05-T1534		
r = 1,2	VB ...	2020 – 3225	B02-V1431	E02-F5035	A02-35096	V05-T1534		
18	VO ...	2020 – 3225	B02-V1431	E02-F5035	A02-35135	V05-T1534		

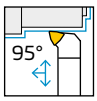
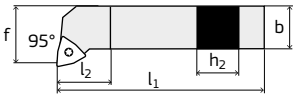
Order Example: 1 piece SVJBR 2020K16 Delivery without key

	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
SVVB-N	SVVBN 2020K16	20	20	125	32	10	VB ... 16 ...	54
	SVVBN 2525M16	25	25	150	40	12,5		
	SVVBN 3225P16	32	25	170	40	12,5		
SVVC-N l **SVVO-N**	SVVCN 1212F11	12	12	80	19	6	VC ... 11 ...	54–55
	SVVCN 1616H11	16	16	100	25	8		
	SVVCN 2020K11	20	20	125	32	10		
	SVVCN 2525M11	25	25	150	40	12,5		
	SVVCN 2020K16	20	20	125	32	10	VC ... 16 ... 04	54–55
	SVVCN 2525M16	25	25	150	40	12,5	VC ... 16 ... 08	
	SVVCN 3225P16	32	25	170	40	12,5	VC ... 16 ... 12	
SVZC-R/L	SVZCR/L 2525M16	25	25	150	28,5	32	VC ... 16 ... 04	54–55
							VC ... 16 ... 08	
							VC ... 16 ... 12	

Righthand version as shown, lefthand version mirrorlike

Spare Parts			Ordering Code					
Cutting edge length	Indexable insert	Shank size	 Shim	 Shim screw	 Fixation screw	 Key		
11	VC ...	1212 – 2525	–	–	A02-25059	V02-T0800		
16	VC ...	2020 – 3225	B09-V1602	E09-F5035	A02-35096	V05-T1534		
r = 0,4 – 0,8	VB ...	2020 – 3225	B02-V1431	E02-F5035	A02-35096	V05-T1534		
16	VC ...	2020 – 3225	B09-V1606	E09-F5035	A02-35096	V05-T1534		
r = 1,2	VB ...	2020 – 3225	B02-V1431	E02-F5035	A02-35096	V05-T1534		
18	VO ...	2020 – 3225	B02-V1431	E02-F5035	A02-35135	V05-T1534		

Order Example: 1 piece SVVBN 2020K16 Delivery without key

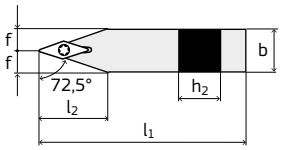
	Ordering Code	$h_1 = h_2$	b	l_1	l_2	f	Suitable inserts	Page
SWLC-R/L	SWLCR/L 1212F06	12	12	80	14	16	WC ... 06 ...	56
	SWLCR/L 1616H06	16	16	100	16	20		
	SWLCR/L 2020K06	20	20	125	16	25		
	SWLCR/L 1616H08	16	16	100	17	20	WC ... 08 ...	56
	SWLCR/L 2020K08	20	20	125	18	25		
	SWLCR/L 2525M08	25	25	150	21	32		

Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank size	 Shim	Shim screw	Fixation screw	Key		
06	1212	–	–	A02-35082	V02-T1500		
06	1616 – 2020	B09-W0623	E09-F5035	A02-35082	V05-T1534		
08	1616 – 2525	B09-W0831	E09-F6045	A02-45102	V05-T1534		

Order Example: 1 piece SWLCR 1212F06 Delivery without key

	Ordering Code	h_1	b	l_1		Suitable inserts	Page
BM51576	BM51576	20	20	130		XCGT26	59
						XCGT28	59



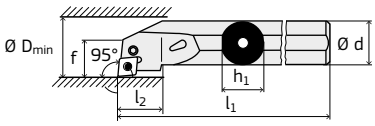
Righthand version as shown, lefthand version mirrorlike

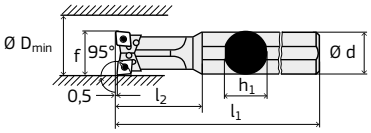
Spare Parts		Ordering Code					
Cutting edge length	Shank size	Shim	Shim screw	Fixation screw	Key		
	–	–	A02-35096	V04-T1500			
	–	–	A02-35096	–			

Order Example: 1 piece BM51576

Delivery without key

	Ordering Code	d	h_1	l_1	l_2	f	D_{min}	Suitable inserts	Page
PCLN-R/L	A25R-PCLNR/L 12	25	24	200	21	17	31,5	CN ... 12 ...	34–37
	S25T-PCLNR/L 12	25	23	300	22	17	32		
	A32S-PCLNR/L 12	32	31	250	24,1	22	40		
	S32U-PCLNR/L 12	32	30	350	24,1	22	40		
	A40T-PCLNR/L 12	40	39	300	24,1	27	49		
	S40V-PCLNR/L 12	40	37	400	24,1	27	49		
	S50W-PCLNR/L 16	50	47	450	31	35	62	CN ... 16 ...	34–38
29629 / 29529	S40S-29629 12	40	–	250	80	40	45	CN ... 12 ...	34–37
	S50S-29529 12	50	–	250	100	50	55		



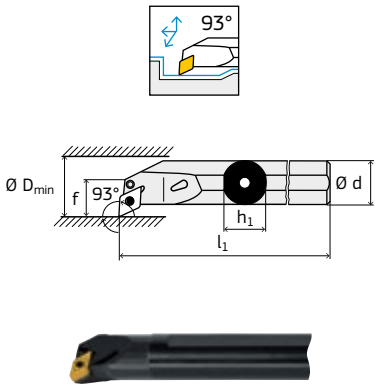


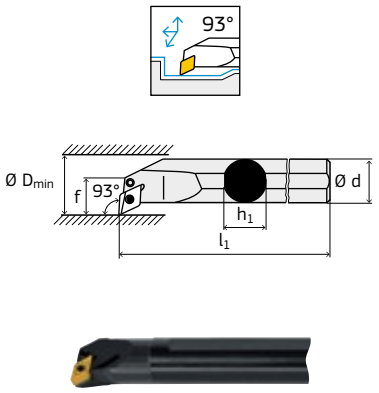
Righthand version as shown, lefthand version mirrorlike

Spare Parts		Ordering Code					
Cutting edge length	Shank diameter Ø d	Shim	Lever	Fixation screw	Shim pin	Assembly punch	Key
12	25–32	B01-C1231	D02-12130	A03-08170	E01-07205	V10-20000	V01-A0030
12	40–50	B01-C1231	D02-12130	A03-08210	E01-07205	V10-20000	V01-A0030
16	50	B01-C1547	D02-15173	A03-08235	E01-09008	V10-40000	V01-A0030

Order Example: 1 piece A25R-PCLNR 12 Delivery without key

	Ordering Code	d	h_1	l_1	l_2	f	D_{min}	Suitable inserts	Page
PDUN-R/L	A20Q-PDUNR/L 11	20	19	180	–	16	27	DN ... 11 ...	41–42
	A25R-PDUNR/L 11	25	24	200	–	18,5	32		
	A32S-PDUNR/L 11	32	31	250	–	22	40		
	A32S-PDUNR/L 15	32	31	250	–	22	40	DN ... 15 ...	41–44
	A40T-PDUNR/L 15	40	39	300	–	27	49		
	S40V-PDUNR/L 15	40	37	400	–	27	49		
	S50W-PDUNR/L 15	50	47	450	–	35	62		
PDUN-R/L 14	S32T-PDUNR/L 14	32	30	300	–	22	40	DNMG 14 ...	43
	S40U-PDUNR/L 14	40	38	350	–	27	50		





Righthand version as shown, lefthand version mirrorlike

A = Steel shank with coolant hole

S = Steel shank

Spare Parts		Ordering Code					
Cutting edge length	Shank diameter Ø d	Shim	Lever	Fixation screw	Shim pin	Assembly punch	Key
11	20	–	D02-11105	A03-06135	–	V10-10000	V01-A0025
11	25 – 32	B01-D1131	D02-10120	A03-06170	E01-05405	V10-10000	V01-A0025
14	32 – 40	B01-D1331	D02-15145	A03-08210	E01-07205	V10-20000	V01-A0030
15[1)]	32 – 50	B01-D1448	D02-15145	A03-08210	E01-07205	V10-20000	V01-A0030
15[2)]	32 – 50	B01-D1447	D02-15145	A03-08210	E01-07205	V10-20000	V01-A0030
15[3)]	32 – 50	B01-D1432	D02-15145	A03-08210	E01-07205	V10-20000	V01-A0030
15[4)]	32 – 50	B01-D1431	D02-15145	A03-08210	E01-07205	V10-20000	V01-A0030

Order Example: 1 piece A20Q-PDUNR 11

Delivery without key

For insert DNMG 1504 ...

[1)] s = 4,76 mm, r = 0,4; 0,8 mm

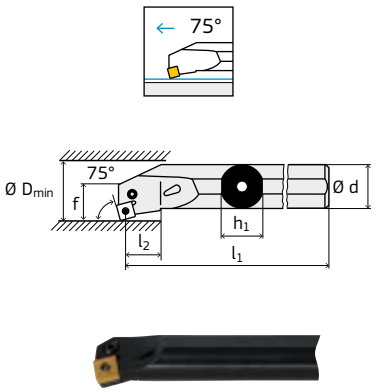
[2)] s = 4,76 mm, r = 1,2; 1,6 mm

For insert DNMG 1506 ...

[3)] s = 6,35 mm, r = 0,4; 0,8 mm

[4)] s = 6,35 mm, r = 1,2; 1,6 mm

	Ordering Code	d	h_1	l_1	l_2	f	D_{min}	Suitable inserts	Page
PSKN-R/L	A25R-PSKNR/L 12	25	24	200	15,5	17	31,5	SN ... 12 ...	47–50
	A32S-PSKNR/L 12	32	31	250	16	22	40		
	A40T-PSKNR/L 12	40	39	300	23	27	49		
	S50W-PSKNR/L 15	50	47	450	30	35	62	SN ... 15 ...	48–50
PTFN-R/L	A25R-PTFNR/L 16	25	24	200	17,5	17	31,5	TN ... 16 ...	51–53
	S25T-PTFNR/L 16	25	23	300	17,5	17	32		
	A32S-PTFNR/L 16	32	31	250	18	22	40		
	A40T-PTFNR/L 22	40	39	300	27	27	49	TN ... 22 ...	51–53
	S50W-PTFNR/L 22	50	47	450	35	35	62		



Righthand version as shown, lefthand version mirrorlike

A = Steel shank with coolant hole

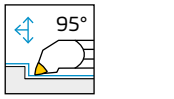
S = Steel shank

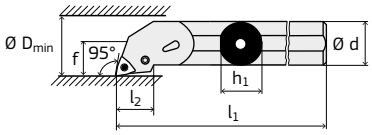
Spare Parts		Ordering Code					
Cutting edge length	Shank diameter Ø d	Shim	Lever	Fixation screw	Shim pin	Assembly punch	Key
12	25–32	B01-S1231	D02-12130	A03-08170	E01-07205	V10-20000	V01-A0030
12	40	B01-S1231	D02-12130	A03-08210	E01-07210	V10-20000	V01-A0030
15	50	B01-S1547	D02-15173	A03-08235	E01-09008	V10-40000	V01-A0030
16	25 – 32	B01-T1527	D02-09120	A03-06170	E01-05405	V10-10000	V01-A0025
22	40 – 50	B01-T2031	D02-12130	A03-08210	E01-07205	V10-20000	V01-A0030

Order Example: 1 piece A25R-PSKNR 12

Delivery without key

	Ordering Code	d	h_1	l_1	l_2	f	D_{min}	Suitable inserts	Page
PWLN-R/L	A16M-PWLNR/L 06	16	15,25	150	17,5	11	21	WN ... 06 ...	56–58
	A20Q-PWLNR/L 06	20	19	180	19,5	13	25		
	A25R-PWLNR/L 06	25	24	200	19,5	17	32		
	A32S-PWLNR/L 08	32	31	250	26	22	40	WN ... 08 ...	56–59
	A40T-PWLNR/L 08	40	38,5	300	26	27	49		





Righthand version as shown, lefthand version mirrorlike

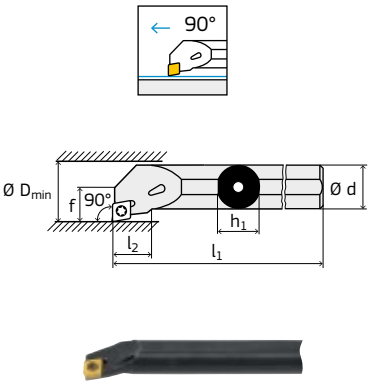
A = Steel shank with coolant hole

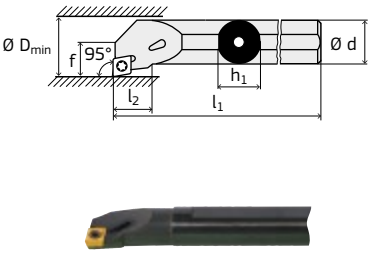
Spare Parts		Ordering Code					
Cutting edge length	Shank diameter Ø d	Shim	Lever	Fixation screw	Shim pin	Assembly punch	Key
06	16 – 20	–	D02-09093	A03-05120	–	–	V01-A0020
06	25	B01-W0627	D02-09120	A03-06170	E01-05405	V10-10000	V01-A0025
08	32 – 40	B01-W0831	D02-12130	A03-08210	E01-07205	V10-20000	V01-A0030

Order Example: 1 piece A16M-PWLNR 06

Delivery without key

	Ordering Code	d	h_1	l_1	l_2	f	D_{min}	Suitable inserts	Page
SCFC-R/L	A08F-SCFCR/L 06	8	7,5	80	–	5	11	CC ... 06 ...	32–33
	A10H-SCFCR/L 06	10	9,5	100	9	7	14		
	A12K-SCFCR/L 06	12	11,5	125	14	9	17		
SCLC-R/L	A08F-SCLCR/L 06	8	7,5	80	–	5	11	CC ... 06 ...	32–33
	E08H-SCLCR/L 06	8	7,5	100	–	5	11		
	S08H-SCLCR/L 06	8	7	100	–	5	11		
	A10H-SCLCR/L 06	10	9,5	100	10	7	13		
	E10K-SCLCR/L 06	10	9,5	125	10	7	14		
	S10K-SCLCR/L 06	10	9	125	10	7	13		
	A12K-SCLCR/L 06	12	11,5	125	10	9	16		
	E12Q-SCLCR/L 06	12	11,5	180	10	9	17		
	S12Q-SCLCR/L 06	12	11	180	10	9	16		
	A16M-SCLCR/L 09	16	15,5	150	16	11	20	CC ... 09 ...	32–33
	E16R-SCLCR/L 09	16	15,5	200	16	11	21		
	S16R-SCLCR/L 09	16	15	200	16	11	20		
	A20Q-SCLCR/L 09	20	19	180	16	13	25		
	E20S-SCLCR/L 09	20	19	250	16	13	25		
	S20S-SCLCR/L 09	20	18	250	16	13	25		
	A25R-SCLCR/L 09	25	24	200	16	17	31,5		
	E25T-SCLCR/L 09	25	24	300	16	17	31,5		
	S25T-SCLCR/L 09	25	23	300	16	17	31,5		
	A32S-SCLCR/L 12	32	31	250	22	22	40	CC ... 12 ...	32–33
	A40T-SCLCR/L 12	40	38,5	300	22	27	49		
	S25T-SCLCR/L 12	25	23	300	16	17	31,5		





Righthand version as shown, lefthand version mirrorlike

A = Steel shank with coolant hole

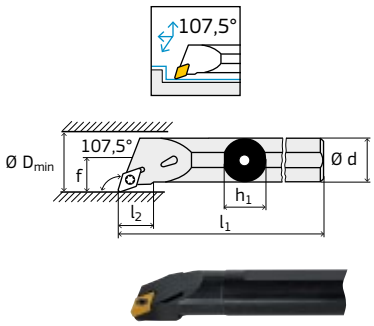
S = Steel shank

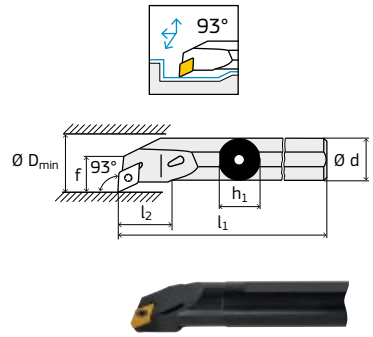
Spare Parts		Ordering Code					
Cutting edge length	Shank diameter Ø d	Shim	Shim screw	Fixation screw	Key		
06	08 – 12	–	–	A02-25059	V02-T0800		
09	16 – 20	–	–	A02-35082	V02-T1500		
09	25	–	–	A02-35096	V02-T1500		
12	32 – 40	B09-C1231	E09-F6045	A02-45102	V05-T1534		

Order Example: 1 piece SWLCR 1212F06

Delivery without key

	Ordering Code	d	h_1	l_1	l_2	f	D_{min}	Suitable inserts	Page
SDQC-R/L	A10H-SDQCR/L 07	10	9	100	10	7	14	DC ... 07...	38–40
	A12K-SDQCR/L 07	12	11,5	125	12,5	9	17		
	A16M-SDQCR/L 07	16	15,5	150	16,5	11	21		
	A20Q-SDQCR/L 07	20	19	180	20,5	13	25		
	A25R-SDQCR/L 11	25	24	200	26,5	17	31,5	DC ... 11 ...	38–40
	A32S-SDQCR/L 11	32	31	250	33,5	22	40		
	A40T-SDQCR/L 11	40	38,5	300	41,5	27	49		
SDUC-R/L	A12K-SDUCR/L 07	12	11,5	125	12,5	9	17	DC ... 07 ...	38–40
	E12Q-SDUCR/L 07	12	11,5	180	12,5	9	17		
	S12Q-SDUCR/L 07	12	11	180	12,5	9	17		
	A16M-SDUCR/L 07	16	15,5	150	16,5	11	21		
	E16R-SDUCR/L 07	16	15,5	200	16,5	11	21		
	S16R-SDUCR/L 07	16	15	200	16,5	11	21		
	A20Q-SDUCR/L 07	20	19	180	20,5	13	25		
	S20S-SDUCR/L 07	20	18	250	20,5	13	25		
	A20Q-SDUCR/L 11	20	19	180	21	13	25	DC ... 11 ...	38–40
	E20S-SDUCR/L 11	20	19	250	20,5	13	25		
	S20S-SDUCR/L 11	20	18	250	21	13	25		
	A25R-SDUCR/L 11	25	24	200	26	17	31,5		
	E25T-SDUCR/L 11	25	24	300	26	17	31,5		
	S25T-SDUCR/L 11	25	23	300	26	17	31,5		
	A32S-SDUCR/L 11	32	31	250	50	22	40		
	S32U-SDUCR/L 11	32	30	350	33	22	40		
	A40T-SDUCR/L 11	40	38,5	300	33	27	49		





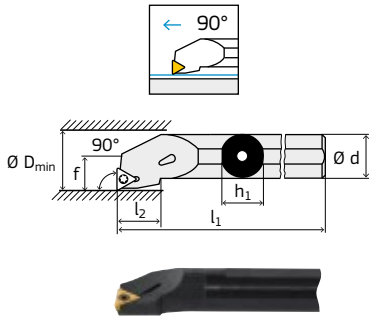
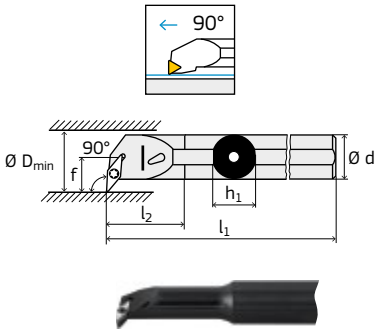
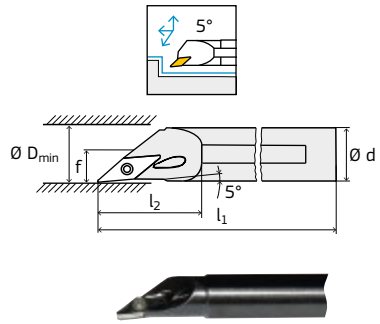
Righthand version as shown, lefthand version mirrorlike

A = Steel shank with coolant hole
S = Steel shank
E = Carbide shank with steel head and coolant hole

Spare Parts		Ordering Code					
Cutting edge length	Shank diameter Ø d	Shim	Shim screw	Fixation screw	Key		
07	12 – 20	–	–	A02-25059	V02-T0800		
11	20	–	–	A02-35072	V02-T1500		
11	25 – 40	B09-D1131	E09-F5035	A02-35096	V05-T1534		

Order Example: 1 piece A10H-SDQCR 07

Delivery without key

	Ordering Code	d	h_1	l_1	l_2	f	D_{min}	Suitable inserts	Page
STFC-R/L 	A12K-STFCR/L 11	12	11,5	125	13	9	17	TC ... 11 ...	50–51
	S12Q-STFCR/L 11	12	11	180	13	9	17		
	A16M-STFCR/L 11	16	15,5	150	13	11	21		
	S16R-STFCR/L 11	16	15	200	13	11	21		
	A20Q-STFCR/L 11	20	19	180	13	13	25		
	S20S-STFCR/L 11	20	18	250	13	13	25		
	A25R-STFCR/L 16	25	24	200	21	17	31,5	TC ... 16 ...	50–51
	S25T-STFCR/L 16	25	23	300	21	17	31,5		
	A32S-STFCR/L 16	32	31	250	21	22	40		
	S32U-STFCR/L 16	32	30	350	21	22	40		
	A40T-STFCR/L 16	40	38,5	300	21	27	49		
	S40V-STFCR/L 16	40	37	400	21	27	49		
SVLC-R/L 	A10H-SVLCR/L 07	10	–	100	22	7	12,5	VC ... 07...	54–55
	A12K-SVLCR/L 07	12	–	125	28	9	15,5		
	A16M-SVLCR/L 07	16	–	150	36	11	19,5		
SVOC-R/L 	A10H-SVOCR/L 07	10	–	100	–	5,4	11	VC ... 07...	54–55
	A12K-SVOCR/L 07	12	–	125	–	5,4	11		
	A16M-SVOCR/L 11	16	–	150	16	11	20	VC ... 11 ...	54–55

Righthand version as shown, lefthand version mirrorlike

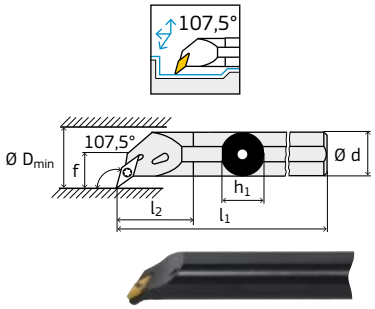
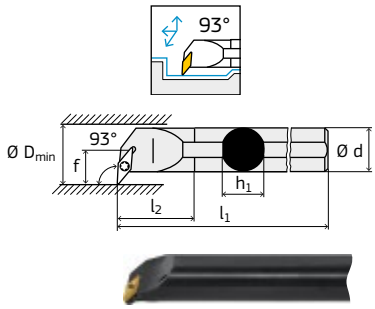
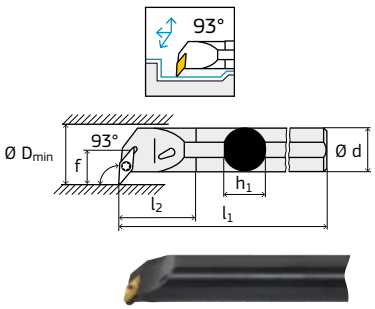
A = Steel shank with coolant hole

S = Steel shank

Spare Parts		Ordering Code					
Cutting edge length	Shank diameter Ø d	Shim	Shim screw	Fixation screw	Key		
11	12 – 20	–	–	A02-25059	V02-T0800		
16	25 – 40	B09-T1631	E09-F5035	A02-35082	V05-T1534		

Order Example: 1 piece SA12K-STFCR 11

Delivery without key

	Ordering Code	d	h_1	l_1	l_2	f	D_{min}	Suitable inserts	Page
SVQC-R/L 	A16M-SVQCR/L 11	16	15,5	150	16,5	11	21	VC ... 11 ...	54–55
	A20Q-SVQCR/L 11	20	19	180	20,5	13	25		
	A25R-SVQCR/L 11	25	24	200	25,5	17	31,5		
	A32S-SVQCR/L 16	32	31	250	33,5	22	40	VC ... 16 ...	54–55
	A40T-SVQCR/L 16	40	38,5	300	40	27	49		
SVUB-R/L 	S32T-SVUBR/L 16	32	30	300	60	22	40	VB ... 16 ...	54
SVUC-R/L 	A16M-SVUCR/L 11	16	15,5	150	16,5	11	21	VC ... 11 ...	54–55
	E16R-SVUCR/L 11	16	15,5	200	16,5	11	21		
	A20Q-SVUCR/L 11	20	19	180	20,5	13	25		
	E20S-SVUCR/L 11	20	19	250	20,5	13	25		
	A25R-SVUCR/L 11	25	24	200	25,5	17	31,5		
	E25T-SVUCR/L 11	25	24	300	25,5	17	31,5		
	A32S-SVUCR/L 16	32	31	250	33,5	22	40	VC ... 16 ...	54–55
	A40T-SVUCR/L 16	40	38,5	300	40	27	49		

Righthand version as shown, lefthand version mirrorlike

A = Steel shank with coolant hole

S = Steel shank

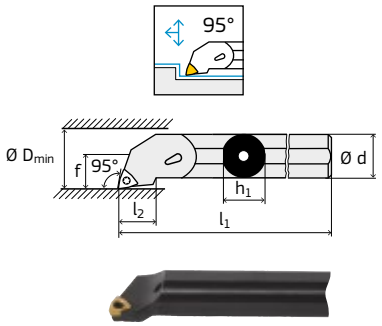
E = Carbide shank with steel head and coolant hole

Spare Parts			Ordering Code					
Cutting edge length	Indexable insert	Shank diameter Ø d	Shim	Shim screw	Fixation screw	Key		
11	VC ...	16 – 25	–	–	A02-25059	V02-T0800		
16	VC ...	32 – 40	B09-V1602	E09-F5035	A02-35096	V05-T1534		
r = 0,4 – 0,8	VB ...	32	B02-V1431	E02-F5035	A02-35096	V05-T1534		
16	VC ...	32 – 40	B09-V1606	E09-F5035	A02-35096	V05-T1534		
r = 1,2	VB ...	32	B02-V1431	E02-F5035	A02-35096	V05-T1534		

Order Example: 1 piece A16M-SVQCR 11

Delivery without key

	Ordering Code	d	h_1	l_1	l_2	f	D_{min}	Suitable inserts	Page
SWLC-R/L	A16M-SWLCR/L 06	16	15,5	150	–	11	21	WC ... 06T3 ...	56
	E16R-SWLCR/L 06	16	15	200	–	11	21	WCGT 06T3 ...	
	S16R-SWLCR/L 06	16	15	200	–	11	21	WC ... 06T3 ...	56
	A20Q-SWLCR/L 06	20	19	180	–	13	25		
	E20S-SWLCR/L 06	20	19	250	–	13	25		
	S20S-SWLCR/L 06	20	18	250	–	13	25		
	A25R-SWLCR/L 06	25	24	200	–	17	31,5		
	E25T-SWLCR/L 06	25	24	300	–	17	31,5		
	S25T-SWLCR/L 06	25	23	300	–	17	31,5		
	A32S-SWLCR/L 08	32	31	250	–	22	40	WC ... 08 ...	56
	S32U-SWLCR/L 08	32	30	350	–	22	40		
	A40T-SWLCR/L 08	40	38,5	300	–	27	49		
	S40V-SWLCR/L 08	40	37	400	–	27	49		



Righthand version as shown, lefthand version mirrorlike

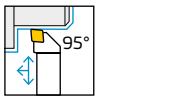
A = Steel shank with coolant hole
S = Steel shank
E = Carbide shank with steel head and coolant hole

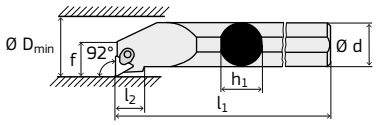
Spare Parts		Ordering Code					
Cutting edge length	Shank diameter Ø d	Shim	Shim screw	Fixation screw	Key		
06	16 – 25	–	–	A02-35082	V02-T1500		
08	32 – 40	B09-W0831	E09-F6045	A02-45102	V05-T1534		

Order Example: 1 piece A16M-SWLCR 06

Delivery without key

	Ordering Code	d	h_1	l_1	l_2	f	D_{min}	Suitable inserts	Page
S74P	S74P-16R/LTP 11	16	14	180	14	10,7	20	TPMR 11 ...	53
	S74P-20R/LTP 11	20	18	250	14	13,8	27		
	S74P-25R/LTP 16	25	23	300	20	17,7	34	TPMR 16 ...	53
	S74P-32R/LTP 16	32	30	350	20	22,2	43		
	S74P-40RTP 16	40	37	350	20	27,7	58		





Righthand version as shown, lefthand version mirrorlike

S = Steel shank

Spare Parts		Ordering Code				
Cutting edge length	Shank diameter Ø d	Shim	Shim pin	Clamp	Key	
09	16 – 20	–	–	33.01.05	V02-T1000	
12	25 – 32	33.03.54	33.04.04	33.01.06	V02-T2000	
09	12	–	–	33.01.04	V02-T0800	
11	16 – 20	–	–	33.01.05	V02-T1000	
16	25 – 40	33.03.04	33.04.04	33.01.06	V02-T2000	

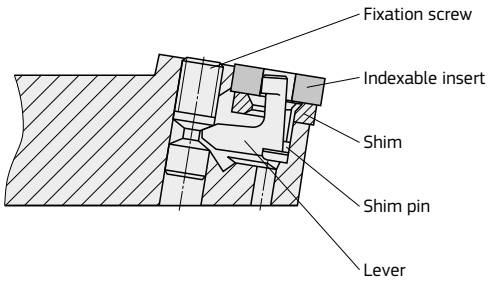
Order Example: 1 piece S74P-16RTR 11

Delivery without key

Tool holder – Clamping systems

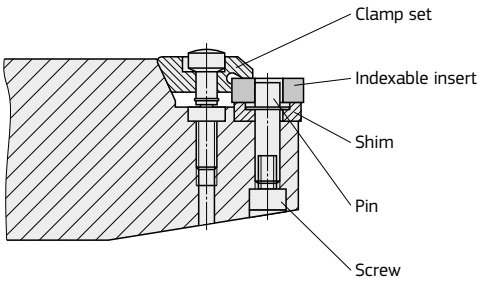
P-lever clamping system

- Suitable for all indexable inserts in compliance with DIN 4988
- Few replacement parts, no loose parts
- Unimpeded chip removal as there is no troublesome build-up
- Perfect insert removal thanks to forced release mechanism
- Fast and secure clamping of indexable insert



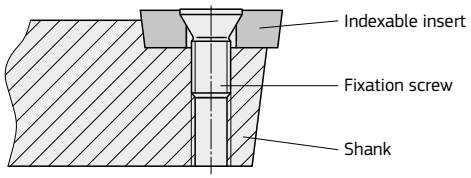
M-wedge clamp system

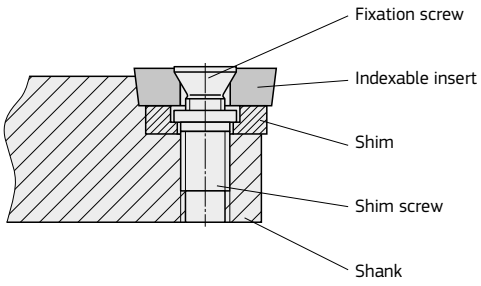
- Fast and secure clamping using wedges and clamps
- Insert is free around the primary and secondary cutting edges
- Especially well-suited to copy machining
- Specially shaped clamping wedge provides ideal chip flow



S-screw clamp system

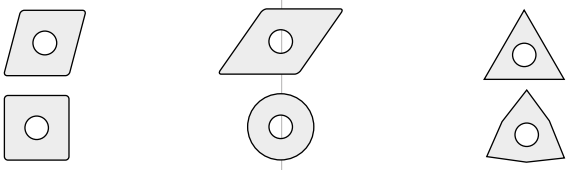
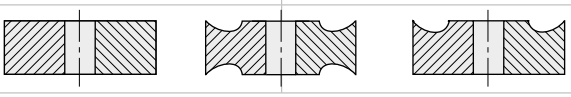
- Simple and secure fixing of the indexable insert using a tapered positioning screw
- Flow of chips is not obstructed
- Maximum of 3 replacement parts



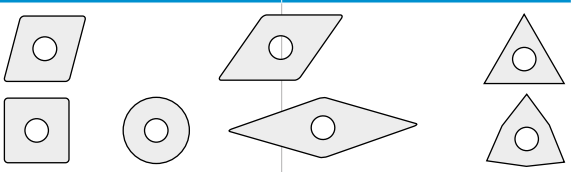
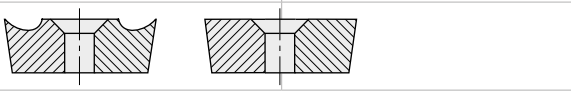


Selecting a clamping system

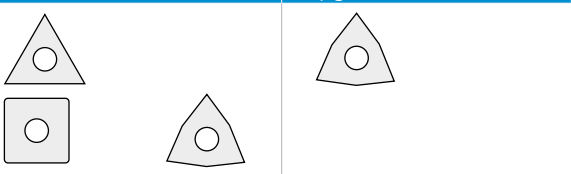
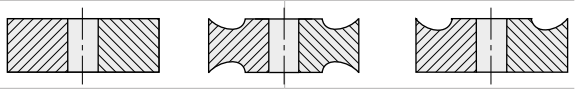
P-type tool holders

Process type	External	Internal
Roughing	Very good	Very good
Finishing	Good	Good
Shape of the indexable insert		
Type of the indexable insert		

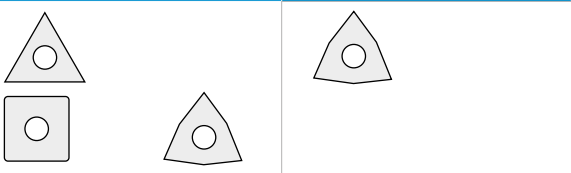
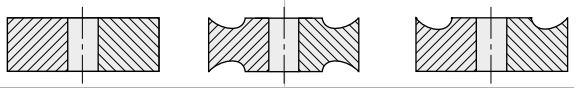
S-type tool holders

Process type	External	Internal
Roughing	Suitable	Suitable
Finishing	Very good	Very good
Shape of the indexable insert		
Type of the indexable insert		

M-type tool holders

Process type	External	Internal
Roughing	Suitable	Suitable
Finishing	Good	Very good
Shape of the indexable insert		
Type of the indexable insert		

D-type tool holders

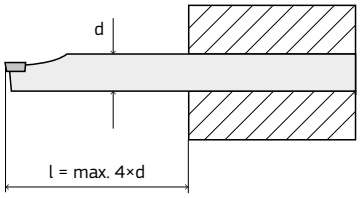
Process type	External	Internal
Roughing	Suitable	Suitable
Finishing	Good	Very good
Shape of the indexable insert		
Type of the indexable insert		

Selecting tools for internal machining

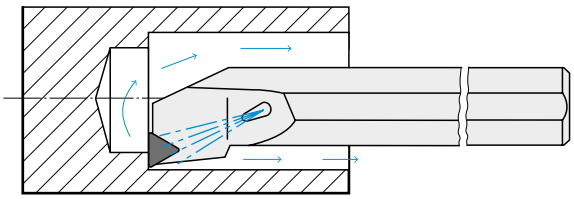
General recommendations

- Use the largest possible shank diameter.
- Use the smallest possible overhang.
- Use the correct, stable clamping method for the boring bar.
- Cooling lubricant (or compressed air) can improve chip transport and the surface quality, particularly with deep bores or blind holes.

Solid boring bars



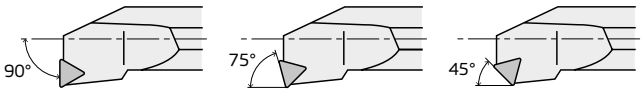
Smallest possible overhang

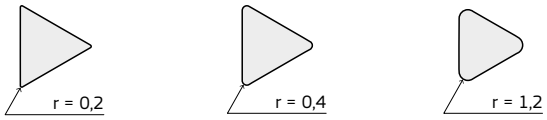


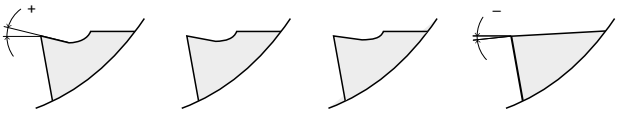
Factors to consider when selecting boring bars for work susceptible to vibration

- The approach angle should be as close as possible to 90° and not be below 75°.
- Select a small corner radius.
- Use positive holders (S-clamp holder) and indexable inserts.
- Uncoated grades generally have sharper cutting edges and therefore generate less cutting force.

Less vibration — More vibration



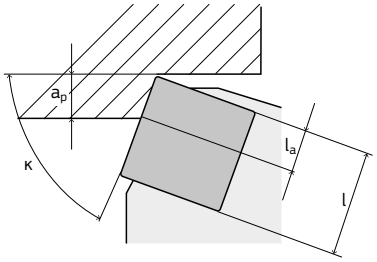




Selecting the indexable insert size

Depth of cut

- Determine the largest depth of cut a_p.
- Determine the effective length of cutting edge (l_a) required. The setting angle (κ) and the depth of cut (a_p) should be taken into consideration.
- The smallest length of cutting edge (l_a) required can be found in the table to the left.



l_a = effective cutting length

l = length of the cutting edge

Angle of approach (κ)		Depth of cut (a_p) mm										
		1	2	3	4	5	6	7	8	9	10	15
		Required effective length of the cutting edge (l_a) mm										
	90	1	2	3	4	5	6	7	8	9	10	15
105	75	1,1	2,1	3,1	4,1	5,2	6,2	7,3	8,3	9,3	11	16
120	60	1,2	2,3	3,5	4,7	5,8	7	8,2	9,3	11	12	18
135	45	1,4	2,9	4,3	5,7	7,1	8,5	10	12	13	15	22
150	30	2	4	6	8	10	12	14	16	18	20	30
165	15	4	8	12	16	20	24	27	31	35	39	58

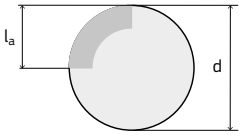
The effective length of the cutting edge

The point angle of an indexable insert has a great influence on the stability of the cutting edges. Every indexable insert has a maximum effective cutting edge length. The maximum values given in the table are designed for working safety when rough cutting with a continuous cut.

If the effective length of the cutting edges is lower than the depth of cut, a larger indexable insert should be used or the depth of cut should be reduced.

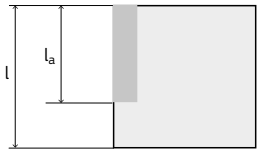
For additional safety during difficult cutting jobs, a larger or thicker indexable insert should be used. When turning against a shoulder, the depth of cut can be increased considerably. So that no problems arise here, a larger indexable insert should be used or an additional face turning operation should be performed.

R



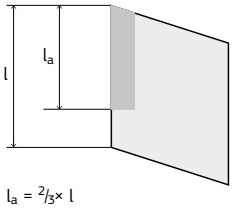
l_a = 0,4× d (depth of cut)

S



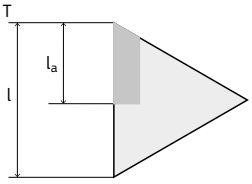
l_a = $^2/_3$× l

C



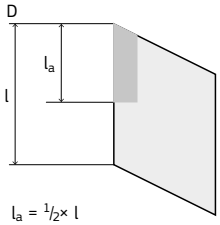
l_a = $^2/_3$× l

T



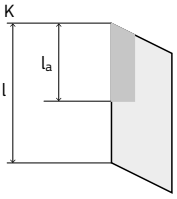
l_a = $^1/_2$× l

D



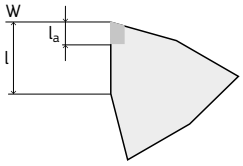
l_a = $^1/_2$× l

K



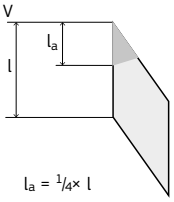
l_a = $^1/_2$× l

W



l_a = $^1/_4$× l

V



l_a = $^1/_4$× l

Selecting the indexable insert shape

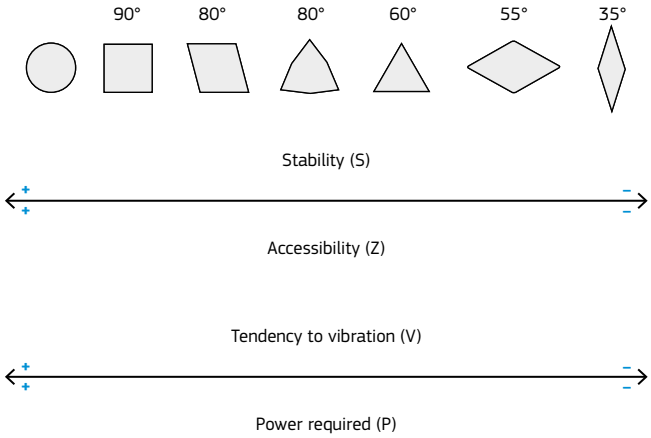
Indexable insert shape

The diagram shows the most common indexable insert shapes from round tips right down to 35° indexable inserts.

The arrow on the scale shows that the stability of the cutting edge (S) grows with increasing point angle, Whereas the accessibility (Z) becomes improved by smaller point angles.

Tendency to vibration (V) and power requirement (P) rise with larger point angles.

When turning shapes the maximum copy angle must not be exceeded for inward copying. The angle between the secondary cutting edge and the workpiece shape produced should be at least 2°.



Selecting the indexable insert shape

Corner radius and feed

The corner radius of the indexable insert is a key factor with regard to:

- Stability during rough cutting.
- Surface quality during finishing.

Roughing

- Use the largest possible corner radius to ensure the greatest degree of stability for the cutting edge.
- A large corner radius permits a greater feed rate.
- Use a smaller corner radius if there is a risk of vibration.

When selecting the feed rate for rough turning work, the maximum feed rates given above must not be exceeded in any circumstances.
The basic rule is: **f_n Roughing = 0,5× Corner radius**

Maximum feed rate for various corner radii

The most frequently used radii for rough machining are between 1.2–1.6 mm.

The table is based on the max. recommended feed rate of $^2/_3$ of the corner radius.

Greater feed rates are possible in the following cases:

- Indexable inserts have a stable cutting edge and a point angle of at least 60°.
- Single-sided indexable inserts.
- Indexable inserts which are used with a setting angle less than 90°.
- Working easily machineable workpiece materials at moderate cutting speeds.

Corner radius r [mm]	Recommended max. feed rate f_n [mm/rev]
0,4	0,25–0,35
0,8	0,4–0,7
1,2	0,5–1,0
1,6	0,7–1,3
2,4	1,0–1,8

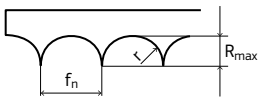
Finishing

The surface quality and accuracy of the tolerance is greatly influenced by the interaction of the feed rate and corner radius. The stability of the clamping system and the machine are other decisive factors.

General recommendation

- The surface quality can be improved by using higher cutting speeds and positive rake angles.
- Use a smaller corner radius if there is a risk of vibration.
- Especially high quality surfaces can be achieved using uncoated hard metals (sharper cutting edges than coated grades).

Theoretical maximum roughness height (R_{max})



R_{max} = Roughness height

r = Corner radius [mm]

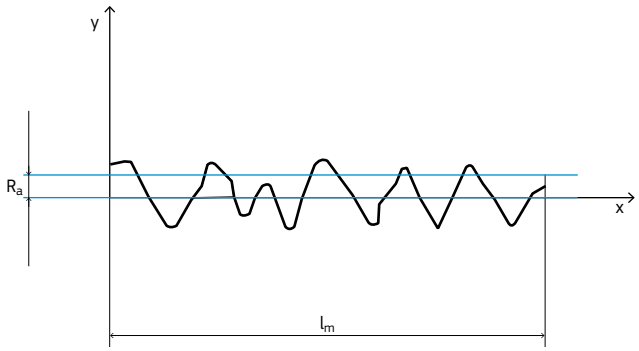
$$R_{max} = \frac{f_n^2}{8r} \cdot 1000\ [\mu m]$$

f_n = Feed [mm/rev]

Feed

$$f_n = \sqrt{\frac{R_{max} \cdot 8r}{1000}}$$

Mean roughness figure (R_a)



Selecting the indexable insert shape

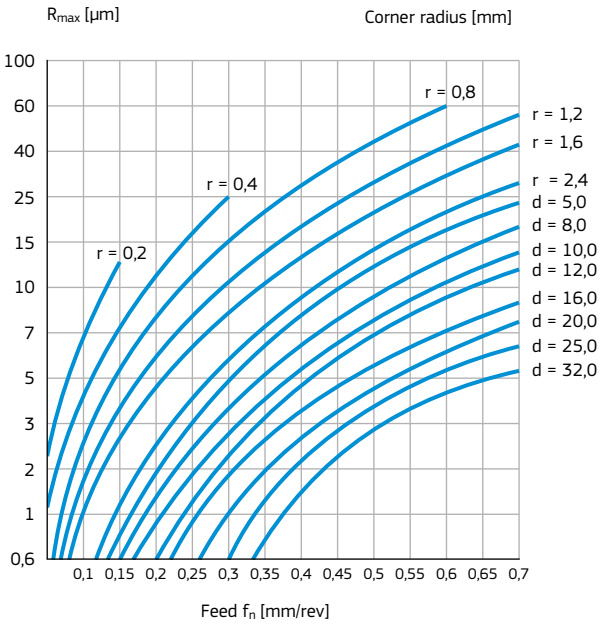
Procedure

Conversion table for various measurement systems. This cannot be used to calculate a mathematical relationship between the R_{max} roughness height and the figure for R_a.

Look up the appropriate R_{max} value in the conversion table. Then read off the correct combination of corner radius and feed rate.

R_{max}	R_a = CLA = AA		RMS		Value for roughness
µm	µm	µinch	µm	µinch	
1,6	0,30	11,8	0,33	13,1	
1,8	0,35	13,8	0,39	15,3	
2,0	0,40	15,7	0,44	17,4	N5
2,2	0,44	17,5	0,49	19,4	
2,4	0,49	19,2	0,54	21,3	
2,6	0,53	20,8	0,59	23,1	
2,8	0,58	22,7	0,64	25,2	
3,0	0,63	24,6	0,70	27,3	
3,5	0,71	27,8	0,79	30,9	
4,0	0,80	31,4	0,89	34,8	N6
4,5	0,90	35,2	1,00	39,1	
5,0	0,99	38,8	1,10	43,1	
6,0	1,20	47,2	1,30	52,4	
7,0	1,40	55,1	1,50	61,2	
8,0	1,60	63,0	1,80	70,0	N7
9,0	1,80	71,0	2,00	78,8	
10,0	2,00	97,0	2,20	87,7	
15,0	3,20	126,0	3,10	140,0	N8
20,0	4,40	173,0	4,90	192,0	
25,0	5,80	238,0	6,40	264,0	
27,0	6,30	247,0	7,00	274,0	N9
30,0	7,40	292,0	8,20	324,0	
35,0	8,80	346,0	9,80	384,0	
40,0	10,70	422,0	11,90	468,0	
45,0	12,50	485,0	13,90	538,0	N10

The diagram shows theoretical R_{max} values for specific feed/corner radius combinations.



Formulas for turning

Units		
Code	**Description**	**Unit**
D_m	Machining diameter	mm
v_c	Cutting speed	m/min
n	No. of spindle revolutions	r.p.m.
T_c	Working time	min
Q	Metal removal volume	cm^3/min
l_m	Working length	mm
P_c	Net power consumption	kW
$k_{c\,0,4}$	Specific cutting force for chip thickness of 0.4 mm	N/mm^2
f_n	Feed per revolution	mm/rev
κ_r	Approach angle	degrees
R_{max}	Profile depth	µm
r_ε	Indexable insert corner radius	mm
a_p	Cutting depth	mm

Cutting speed [m/min]	$v_c = \frac{D_m \cdot \pi \cdot n}{1000}$
No. of spindle revolutions r.p.m.	$n = \frac{v_c \cdot 1000}{D_m \cdot \pi}$
Metal removal volume [cm^3/min]	$Q = v_c \cdot a_p \cdot f_n$
Power consumption [kW]	$Pc = \frac{Q \cdot k_{c\,0,4}}{60 \cdot 1000} \cdot \left[\frac{0,4}{f_n \cdot \sin\kappa_r}\right]^{0,29}$
Working time [min]	$T_c = \frac{l_m}{f_n \cdot n}$
Profile depth [µm]	$R_{max} = \frac{f_n^2}{r_\varepsilon} \cdot 125$

Options against turning

Option	Problem											
	Wear of free areas	Extreme crater wear	Formation of built-up edge	Chips in cutting edge	Notch sensibility	Broken indexable insert	Heat cracks	Pöastic deformation	Interrupted cut	Poor workpiece surface	Band/snarl chips (not coloured)	Chip shape too narrow (blueing)
T/C wear resistance	↑				↑			↑				
T/C roughness				↑		↑	↑		↑			
Cutting speed	↓	↓	↑		↓			↓	↑	↑		
Feed	↔	↓	↓					↓	↓	↓	↑	↓
Depth of cut					↔				↑		↔	↔
Chip angle		↑	↑	↓		↓			↔			
Chip breaker geometry				↔		↔					↔	↔
Condition of cutting edge				↔					↔			
Corner radius						↑			↑	↑		
Approach angle				↓								
Stability				↑								
Cooling		↑	↑				↑	↑		↑		

↑ Increase ↓ Reduce ↔ Optimize

Turning data recommendations for HS A31-A1

Material Group	Material		Brinell Hardness HB	Cutting speed v_c [m/min] HS A31-A1 f [mm/rev] 0,4 – 0,8	0,25 – 0,4	0,05 – 0,25
P	Unalloyed steel[1)]	≈ 0,15 % Cannealed	125	140 – 200	230 – 300	290 – 360
		≈ 0,45 % Cannealed	190	110 – 180	180 – 260	250 – 320
		≈ 0,45 % Chardened and temp.	250	90 – 180	110 – 180	140 – 210
		≈ 0,75 % Cannealed	270	120 – 180	170 – 240	230 – 300
		≈ 0,75 % Chardened and temp.	300	130 – 150	80 – 150	140 – 210
	Low–alloy steel[1)]	annealed	180	100 – 170	150 – 220	220 – 300
		hardened and temp.	275	100 – 150	110 – 180	140 – 210
		hardened and temp.	300	100 – 140	100 – 170	130 – 200
		hardened and temp.	350	100 – 140	80 – 150	110 – 180
	High–alloy steel and high alloy tool steel[1)]	annealed	200	100 – 180	80 – 220	180 – 260
		hardened and temp.	325	100 – 160	80 – 140	100 – 170
	Stainless steel[1)]	ferritic/martensitic annealed	200	100 – 170	130 – 200	180 – 260
		martensitic hardened and temp.	240	100 – 140	80 – 150	150 – 210
K	Grey cast iron	perlitic/ferritic	180	100 – 180	170 – 240	250 – 320
		perlitic (martensitic)	260	90 – 120	80 – 150	110 – 180
	Nodular graphite cast iron	ferritic	160	100 – 150	110 – 180	140 – 210
		perlitic	250	90 – 140	90 – 160	110 – 180
	Malleable cast iron	ferritic	130	90 – 140	120 – 190	150 – 210
		perlitic	230	90 – 120	100 – 150	110 – 180

1) and cast steel

Dry machining

Wet machining

Turning data recommendations for A51-B1

Material Group	Material		Brinell Hardness HB	Cutting speed v_c [m/min] A51-B1 f [mm/rev] 0,4 – 0,8	0,25 – 0,4	0,05 – 0,25
P	Unalloyed steel[1)]	≈ 0,15 % Cannealed	125	120 – 190	170 – 250	170 – 250
		≈ 0,45 % Cannealed	190	100 – 180	150 – 200	150 – 220
		≈ 0,45 % Chardened and temp.	250	80 – 150	100 – 170	120 – 200
		≈ 0,75 % Cannealed	270	100 – 170	80 – 140	140 – 200
		≈ 0,75 % Chardened and temp.	300	70 – 140	100 – 160	100 – 170
	Low-alloy steel[1)]	annealed	180	90 – 160	140 – 200	140 – 200
		hardened and temp.	275	90 – 140	100 – 160	100 – 180
		hardened and temp.	300	85 – 130	100 – 150	100 – 170
		hardened and temp.	350	80 – 120	80 – 140	90 – 170
	High-alloy steel and high alloy tool steel[1)]	annealed	200	90 – 150	80 – 170	130 – 170
		hardened and temp.	325	50 – 110	70 – 130	80 – 130
	Stainless steel[1)]	ferritic/martensitic annealed	200	90 – 140	120 – 180	140 – 180
		martensitic hardened and temp.	240	85 – 120	80 – 140	100 – 140
M	Stainless steel[1)]	austenitic[2)], quenched	180	90 – 110	100 – 130	100 – 130

1) and cast steel

2) and austenitic/ferritic

Dry machining

Wet machining

Turning data recommendations for IC A81-C1

Material Group	Material		Brinell Hardness HB	Cutting speed v_c [m/min] IC A81-C1 f [mm/rev] 0,4 – 0,8	0,25 – 0,4	0,05 – 0,25
P	Unalloyed steel[1]	≈ 0,15 % Cannealed	125	60 – 100	70 – 110	90 – 170
		≈ 0,45 % Cannealed	190	60 – 100	70 – 110	90 – 170
		≈ 0,45 % Chardened and temp.	250	60 – 100	70 – 110	90 – 170
		≈ 0,75 % Cannealed	270	60 – 100	70 – 110	90 – 170
		≈ 0,75 % Chardened and temp.	300	60 – 100	70 – 110	90 – 170
	Low-alloy steel[1]	annealed	180	60 – 100	70 – 110	90 – 170
		hardened and temp.	275	70 – 110	70 – 110	90 – 170
			300	60 – 100	70 – 110	90 – 170
			350	55 – 80	70 – 110	90 – 170
	High-alloy steel and high alloy tool steel[1]	annealed	200	80 – 110	70 – 110	90 – 170
		hardened and temp.	325	60 – 90	70 – 110	90 – 170
	Stainless steel[1]	ferritic/martensitic annealed	200	90 – 130	70 – 110	90 – 170
		martensitic hardened and temp.	240	70 – 110	70 – 110	90 – 170
M	Stainless steel[1]	austenitic[2], quenched	180	70 – 100	90 – 140	110 – 170

[1] and cast steel

[2] and austenitic/ferritic

Dry machining

Wet machining

Turning data recommendations for B41-D1

Material Group	Material		Brinell Hardness HB	B41-D1									
				Negative indexable inserts ISO-P-System					Positive indexable inserts ISO-S-System				
				Geometry	Corner radius	Recommended a_p [mm]	Recommended f_n [mm/rev]	Cutting speed v_c [m/min]	Geometry	Corner radius	Recommended a_p [mm]	Recommended f_n [mm/rev]	Cutting speed v_c [m/min]
M	Ferritic	1.4000, 1.4002, 1.4003, 1.4006, 1.4016, 1.4104, 1.4113, 1.4313, 1.4742, 1.4762	180	M1	08	2	0,20	180 – 230	M1	04	1	0,15	180 – 230
					12	3	0,30	180 – 230		08	2	0,25	180 – 230
	Martensitic	1.4006, 1.4014, 1.4021, 1.4024, 1.4027, 1.4028, 1.4031, 1.4034, 1.4057, 1.4122, 1.4724	320	M1	08	2	0,20	180 – 230	M1	04	1	0,15	180 – 230
					12	3	0,30	180 – 230		08	2	0,25	180 – 230
	Austenitic	1.4300, 1.4301, 1.4303, 1.4305, 1.4306, 1.4308, 1.4310, 1.4311	180	M1	08	2	0,2	150 – 200	M1	04	1	0,15	150 – 200
					12	3	0,3	150 – 200		08	2	0,20	150 – 200
		1.4321, 1.4401, 1.4404, 1.4406, 1.4428, 1.4435, 1.4436, 1.4438, 1.4449, 1.4571	180	M1	08	2	0,2	150 – 200	M1	04	0,4	1	150 – 200
					12	3	0,3	150 – 200		08	0,8	2	150 – 200

The above recommendations are given for wet machining. For dry machining the recommended values for the cutting speed have to be reduced by approx. 20 %.

Turning data recommendations for B51-E1

Material Group	Material		Brinell Hardness HB	B51-E1										
				Negative indexable inserts ISO-P-System					Positive indexable inserts ISO-S-System					
				Geometry	Corner radius	Recommended a_p [mm]	Recommended f_n [mm/rev]	Cutting speed v_c [m/min]	Geometry	Corner radius	Recommended a_p [mm]	Recommended f_n [mm/rev]	Cutting speed v_c [m/min]
M	Ferritic	1.4000, 1.4002, 1.4003, 1.4006, 1.4016, 1.4104, 1.4113, 1.4313, 1.4742, 1.4762	180	M1	08	2	0,2	130 – 200	M1	04	1	0,15	130 – 200
					12	3	0,3	130 – 200		08	2	0,25	130 – 200
					16	3,5	0,3	130 – 200					
				FM	04	1	0,15	130 – 200					
					08	2,5	0,25	130 – 200					
					12	3	0,3	130 – 200					
				M	08	2	0,2	130 – 200					
					12	3	0,3	130 – 200					
	Martensitic	1.4006, 1.4014, 1.4021, 1.4024, 1.4027, 1.4028, 1.4031, 1.4034, 1.4057, 1.4122, 1.4724	320	M1	08	2	0,2	130 – 200	M1	04	1	0,15	130 – 200
					12	3	0,3	130 – 200		08	2	0,25	130 – 200
					16	3,5	0,3	130 – 200					
				FM	04	1	0,15	130 – 200					
					08	2,5	0,25	130 – 200					
					12	3	0,3	130 – 200					
				M	08	2	0,2	130 – 200					
					12	3	0,3	130 – 200					
	Austenitic	1.4300, 1.4301, 1.4303, 1.4305, 1.4306, 1.4308, 1.4310, 1.4311	180	M1	08	2	0,2	100 – 180	M1	04	1	0,15	100 – 180
					12	3	0,3	100 – 180		08	2	0,20	100 – 180
					16	3,5	0,3	100 – 180					
				FM	04	1	0,15	100 – 180					
					08	2,5	0,25	100 – 180					
					12	3	0,3	100 – 180					
				M	08	2	0,2	100 – 180					
					12	3	0,3	100 – 180					
		1.4321, 1.4401, 1.4404, 1.4406, 1.4428, 1.4435, 1.4436, 1.4438, 1.4449, 1.4571	180	M1	08	2	0,2	100 – 180	M1	04	1	0,15	100 – 180
					12	3	0,3	100 – 180		08	2	0,2	100 – 180
					16	3,5	0,3	100 – 180					
				FM	04	1	0,15	100 – 180					
					08	2,5	0,25	100 – 180					
					12	3	0,3	100 – 180					
				M	08	2	0,2	100 – 180					
					12	3	0,3	100 – 180					

The above recommendations are given for wet machining. For dry machining the recommended values for the cutting speed have to be reduced by approx. 20 %.

Turning data recommendations for B81-F1

Material Group	Material		Brinell Hardness HB	B81-F1										
				Negative indexable inserts ISO-P-System					Positive indexable inserts ISO-S-System					
				Geometry	Corner radius	Recommended a_p [mm]	Recommended f_n [mm/rev]	Cutting speed v_c [m/min]	Geometry	Corner radius	Recommended a_p [mm]	Recommended f_n [mm/rev]	Cutting speed v_c [m/min]
M	Ferritic	1.4000, 1.4002, 1.4003, 1.4006, 1.4016, 1.4104, 1.4113, 1.4313, 1.4742, 1.4762	180	M1	08	2	0,2	100 – 180					
					12	3	0,3	100 – 180					
					16	3,5	0,3	100 – 180					
				MR	12	4	0,45	100 – 180					
					16	5	0,5	100 – 180					
	Martensitic	1.4006, 1.4014, 1.4021, 1.4024, 1.4027, 1.4028, 1.4031, 1.4034, 1.4057, 1.4122, 1.4724	320	M1	08	2	0,2	100 – 180					
					12	3	0,3	100 – 180					
					16	3,5	0,3	100 – 180					
				MR	12	4	0,45	100 – 180					
					16	5	0,5	100 – 180					
	Austenitic	1.4300, 1.4301, 1.4303, 1.4305, 1.4306, 1.4308, 1.4310, 1.4311	180	M1	08	2	0,2	70 – 150					
					12	3	0,3	70 – 150					
					16	3,5	0,3	70 – 150					
				MR	12	4	0,45	100 – 180					
					16	5	0,5	100 – 180					
		1.4321, 1.4401, 1.4404, 1.4406, 1.4428, 1.4435, 1.4436, 1.4438, 1.4449, 1.4571	180	M1	08	2	0,2	70 – 150					
					12	3	0,3	70 – 150					
					16	3,5	0,3	70 – 150					
				MR	12	4	0,45	100 – 180					
					16	5	0,5	100 – 180					

The above recommendations are given for wet machining. For dry machining the recommended values for the cutting speed have to be reduced by approx. 20 %.

Turning data recommendations for B71-G1

Material Group	Material		Brinell Hardness HB	B71-G1										
				Negative indexable inserts ISO-P-System					Positive indexable inserts ISO-S-System					
				Geometry	Corner radius	Recommended a_p [mm]	Recommended f_n [mm/rev]	Cutting speed v_c [m/min]	Geometry	Corner radius	Recommended a_p [mm]	Recommended f_n [mm/rev]	Cutting speed v_c [m/min]
M	Ferritic	1.4000, 1.4002, 1.4003, 1.4006, 1.4016, 1.4104, 1.4113, 1.4313, 1.4742, 1.4762	180	MF	04	0,5	0,15	150 – 180					
					08	1	0,20	150 – 180					
					12	2	0,25	120 – 180					
				M	08	2	0,25	150 – 180	MR1	04	0,4	0,15	120 – 180
					12	3	0,30	150 – 180		08	1	0,20	140 – 180
					16	4	0,35	120 – 180					
				MR	08	3	0,35	140 – 180					
					12	4	0,45	140 – 180					
					16	5	0,50	120 – 160					
	Martensitic	1.4006, 1.4014, 1.4021, 1.4024, 1.4027, 1.4028, 1.4031, 1.4034, 1.4057, 1.4122, 1.4724	320	MF	04	0,5	0,15	140 – 180					
					08	1	0,20	120 – 180					
					12	2	0,25	110 – 160					
				M	08	2	0,25	120 – 180	MR1	04	0,4	0,15	140 – 180
					12	3	0,30	110 – 160		08	1	0,20	120 – 180
					16	4	0,35	100 – 140					
				MR	08	3	0,35	110 – 160					
					12	4	0,45	100 – 140					
					16	5	0,50	90 – 130					
	Austenitic	1.4300, 1.4301, 1.4303, 1.4305, 1.4306, 1.4308, 1.4310, 1.4311	180	MF	04	0,5	0,15	150 – 180					
					08	1	0,20	150 – 180					
					12	2	0,25	120 – 180					
				M	08	2	0,25	120 – 180	MR1	04	0,4	0,15	120 – 150
					12	3	0,30	120 – 180		08	1	0,20	150 – 180
					16	4	0,35	140 – 180					
				MR	08	3	0,35	150 – 180					
					12	4	0,45	140 – 180					
					16	5	0,50	120 – 160					
		1.4321, 1.4401, 1.4404, 1.4406, 1.4428, 1.4435, 1.4436, 1.4438, 1.4449	180	MF	04	0,5	0,15	150 – 180					
					08	1	0,20	140 – 180					
					12	2	0,25	130 – 180					
				M	08	2	0,25	140 – 180	MR1	04	0,4	0,15	150 – 180
					12	3	0,30	130 – 180		08	1	0,20	120 – 180
					16	4	0,35	120 – 160					
				MR	08	3	0,35	130 – 180					
					12	4	0,45	120 – 160					
					16	5	0,50	100 – 140					

The above recommendations are given for wet machining. For dry machining the recommended values for the cutting speed have to be reduced by approx. 20 %.

Turning data recommendations for C21-I1 and HS C31-J1

Material Group	Material		Brinell Hardness HB	Cutting speed v_c [m/min] C21-I1, HS C31-J1 f [mm/rev] 0,4 – 0,8	0,25 – 0,4	0,05 – 0,25
				💧	💧	💧
K	Grey cast iron	perlitic/ferritic	180	210 – 300	300 – 450	350 – 500
		perlitic (martensitic)	260	140 – 200	170 – 240	190 – 270
	Nodular graphite cast iron	ferritic	160	150 – 210	180 – 260	210 – 300
		perlitic	250	110 – 160	130 – 190	150 – 200
	Malleable cast iron	ferritic	130	200 – 280	220 – 300	240 – 330
		perlitic	230	100 – 150	140 – 220	170 – 240

💧 Wet machining

Turning data recommendations for B91-H1

Material Group	Main workpiece material groups and their characteristic letters Material		Brinell Hardness HB	Turning v_c [m/min] B91-H1
P	Unalloyed steel[1)]	≈0,15 % C annealed	125	120 – 250
		≈0,45 % C annealed	190	100 – 200
		≈0,45 % C hardened and temp.	250	70 – 180
		≈0,75 % C annealed	270	70 – 180
		≈0,75 % C hardened and temp.	300	50 – 150
	Low-alloy steel[1)]	annealed	180	80 – 200
		hardened and temp.	275	70 – 180
			300	100 – 185
			350	70 – 150
	High-alloy steel and high alloy tool steel[1)]	annealed	200	70 – 180
		hardened and temp.	325	50 – 120
		ferritic/martensitic annealed	200	70 – 150
		martensitic hardened and temp.	240	70 – 120
M	Stainless steel[1)]	austenitic[2)], quenched	180	50 – 150

[1)] and cast steel

[2)] and austenitic/ferritic

Turning data recommendations for AL D21-K1

Material Group	Material		Brinell Hardness HB	Cutting speed v_c [m/min] AL D21-K1 f [mm/rev] 0,4 – 0,8	0,25 – 0,4	0,05 – 0,25
M	Stainless steel[1]	austenitic[2], quenched				120 – 300[3]
K	Grey cast iron	perlitic/ferritic	180			80 – 250[4]
		perlitic (martensitic)	180			
	Nodular graphite cast iron	ferritic	260			70 – 200[4]
		perlitic	160			
	Malleable cast iron	ferritic	250			80 – 220[4]
		perlitic	130			
N	Aluminium wrought alloys	unhardenable	230	500 – 2000	600 – 2500	700 – 3000
		hardenable, hardened	60	200 – 1000	300 – 1500	400 – 2000
	Aluminium cast alloys	ca. 12 % Si. unhardenable	100	400 – 800	500 – 1200	600 – 1500
		ca. 12 % Si. hardenable, harden	75	300 – 600	400 – 900	500 – 1200
		> 12 % Si. unhardenable	90	200 – 600	300 – 800	400 – 1000
	Copper and copper alloys (Bronze/Brass)	Free cutting alloys Pb > 1 %	130	250 – 400	250 – 500	450 – 650
		Brass, Red bronze	110	250 – 600	250 – 800	450 – 1000
		Bronze, non leaded copper and electrolitic copper	90 100	150 – 250	180 – 300	200 – 400
	Nonmetallic materials	Duroplastics		60 – 70	80 – 100	90 – 120
		Fibre reinforced plastics				
		Hard rubber				

1) and cast steel
2) and austenitic/ferritic
3) Only for finishing: f_{max} 0,1 mm/rev, a_{pmax} 0.5 mm
4) Only for hardness approx. 200 HB

Wet machining

Turning data recommendations for D21-P1 and C21-Q1

Material Group	Material		Brinell Hardness HB	Cutting speed v_c [m/min] D21-P1, C21-Q1 f [mm/rev] 0,1 – 0,4
K	Grey cast iron	perlitic/ferritic	180	150 – 250
		perlitic (martensitic)	260	100 – 150
	Nodular graphite cast iron	ferritic	160	130 – 180
		perlitic	250	100 – 150
	Malleable cast iron	ferritic	130	120 – 180
		perlitic	230	100 – 160
N	Aluminium wrought alloys	unhardenable	60	400 – 2400
		hardenable, hardened	100	160 – 1600
	Aluminium cast alloys	ca. 12 % Si. unhardenable	75	320 – 1200
		ca. 12 % Si. hardenable, harden	90	240 – 950
		> 12 % Si. unhardenable	130	160 – 800
	Copper and copper alloys (Bronze/Brass)	Free cutting alloys Pb > 1 %	110	200 – 520
		Brass, Red bronze	90	200 – 800
		Bronze, non leaded copper and electrolitic copper	100	120 – 320
	Nonmetallic materials	Duroplastics		
		Fibre reinforced plastics		
		Hard rubber		

Dry machining

Wet machining

Turning data recommendations for E31-M1

Material Group	Material	Brinell Hardness HB	Cutting speed v_c [m/min]	Feed f [mm/rev]
			D21-P1, C21-Q1	
P	Machining steel	125 – 300	100 – 220	0,01 – 0,15
P	Steel <600 N/mm²	180 – 380	100 – 180	0,01 – 0,20
P	Steel <800 N/mm²	200 – 350	60 – 130	0,01 – 0,15
M	Stainless steel	180 – 300	60 – 140	0,01 – 0,20
N	Aluminium	30 – 130	200 – 800	0,01 – 0,30
N	Bronze, Brass, Copper	100 – 500	100 – 500	0,01 – 0,30
S	Titanium	180 – 400 180 – 400	40 – 90 30 – 70	0,01 – 0,15 0,2 – 0,45

Cutting data recommendations for T E31-N1 and E41-O1

Material Group	Material			Brinell Hardness HB	Cutting speed v_c [m/min]
					T E31-N1, E41-O1
					f [mm/rev] 0,15 – 0,5
M	Stainless steel[1]	austenitic[2], quenched		180	80 – 180
S	Heat resistant alloys	Fe-based	annealed	200	40 – 100
S			hardened	280	30 – 70
S		Ni- or Co-based	annealed	250	50 – 85
S			hardened	350	20 – 50
S			cast	320	30 – 50

Cutting data recommendations for T E21-L1

Material Group	Material		Brinell Hardness HB	Cutting speed v_c [m/min]
				T E21-L1
				f [mm/rev] 0,2 – 0,45
S	Heat resistant alloys	Titanium and Titanium alloys	150 – 450	30 – 70

1) and cast steel

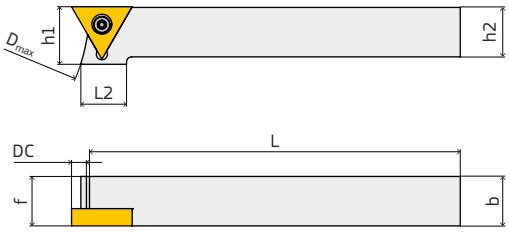
2) and austenitic/ferritic

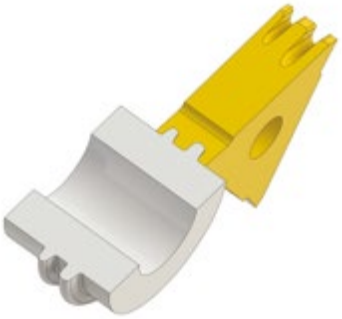
Special Tools

Grooving system for radial or axial application. Insert with 3 cutting edges, four insert sizes. Groove width from 0,5 to 7 mm. Groove depth up to 6 mm. Custom solution (specific shapes) on request

External radial holder

M3C	R/L	H	2020	J	S / X
Multi3 Cut	Right-hand or Left-hand version	Holder	Shank height × shank width [mm]	Length (ISO)	Type of blank / Depth of place for blank [mm] × 100



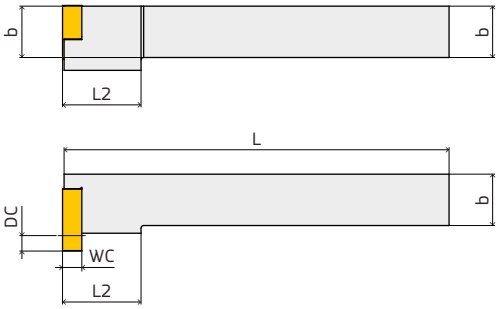


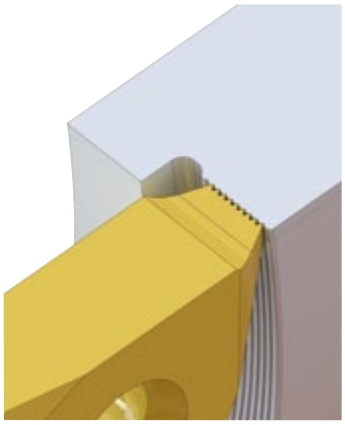
Ordering Code	Ident No.	DC	h = b	h1	b	L	f	L2	D_{max}	Suitable Blanks
M3C R/L H 1212 MFS	M3C R/L H 1212 MFS	2,5	12	12	12	127	12	17	120	B-M3CFS ...
M3C R/L H 1616 MFS	M3C R/L H 1616 MFS	2,5	16	16	16	150	16	–	120	B-M3CFS ...
M3C R/L H 2020 MFS	M3C R/L H 2020 MFS	2,5	20	20	20	152	20	–	120	B-M3CFS ...
M3C R/L H 2525 MFS	M3C R/L H 2525 MFS	2,5	25	25	25	152	25	–	120	B-M3CFS ...
M3C R/L H 1616 MFB	M3C R/L H 1616 MFB	6,0	16	19	16	155	16	18	150	B-M3CFB ...
M3C R/L H 2020 MFB	M3C R/L H 2020 MFB	6,0	20	23	20	155	20	18	150	B-M3CFB ...
M3C R/L H 2525 MFB	M3C R/L H 2525 MFB	6,0	25	28	25	155	25	18	150	B-M3CFB ...

Spare Parts	Ordering Code				
Holder	Screw	Key			
M3C R/L H ... FS ...	TS 1007	KK 0107			
M3C R/L H ... FB ...	TS 1002	KK 0102			

External axial holder

M3C	R/L	A	H	2020	J	FB / X
Multi3 Cut	Right-hand or Left-hand version	Axial holder	Holder	Shank height × shank width [mm]	Length (ISO)	Type of blank / Depth of place for blank [mm] ×100

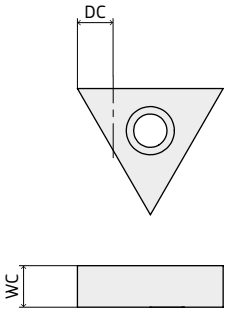




Ordering Code	Ident No.	WC	DC	h=b	L	L2	Suitable Blanks
M3C R/L AH 2020 MFB	M3C R/L AH 2020 MFB	7	6	20	150	30	B-M3CFB ...

Blanks for Multi3 Cut F

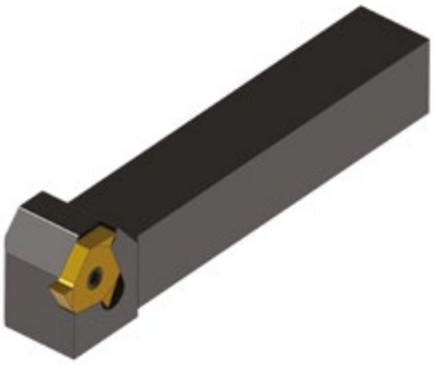
B	–	M3C	B	46	N	C2
Blank		Multi3 Cut	Type of blank	Width of blank [mm] ×10	Neutral-hand version	Grade code

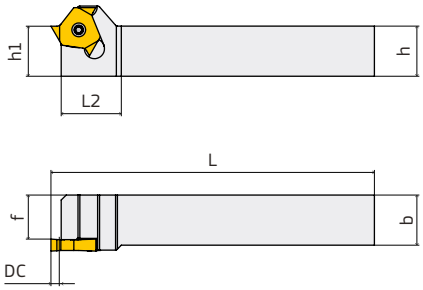


Ordering Code	Ident No.	WC +0,05	DC	Grade		
				C22	C42	G2
B-M3CFS35 N	B-M3CFS35 N	3,5	2,5	●	●	
B-M3CFB70 N	B-M3CFB70 N	7	6	●	●	

External radial holder

M3C	R/L	H	2020	J	S / X
Multi3 Cut	Right-hand or Left-hand version	Holder	Shank height × shank width [mm]	Length (ISO)	Type of blank	Depth of place for blank [mm] × 100



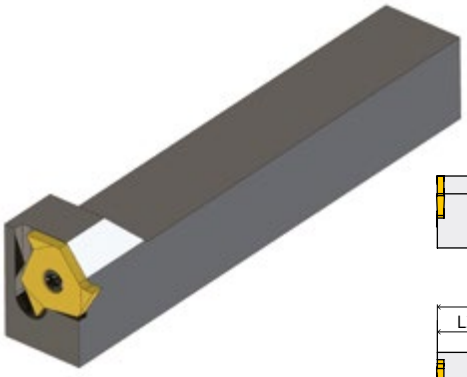


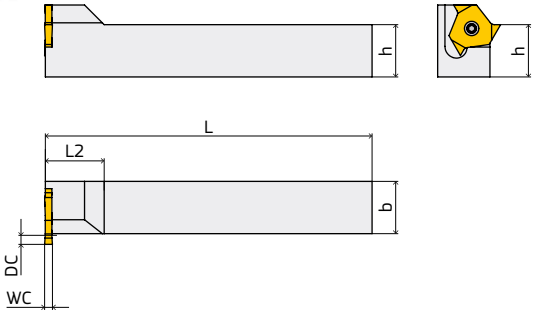
Ordering Code	Ident No.	DC	h = b	h1	b	L	f	L2	D_{max}	Suitable Blanks
M3C R/L H 1010 ES	M3C R/L H 1010 ES	2	10	10	10	72,5	10	17,5	–	B-M3CS 16-26 ...
M3C R/L H 1212 FS	M3C R/L 1212 FS	2	12	12	12	82,5	12	17,5	–	B-M3CS 16-26 ...
M3C R/L H 1616 JS	M3C R/L 1616 JS	2	16	16	16	112,5	16	17,5	–	B-M3CS 16-26 ...
M3C R/L H 1616 JS/300	M3C R/L H 1616 JS/300	2	16	16	16	112,5	14,8	17,5	–	B-M3CS 31-46 ...
M3C R/L H 2020 KS	M3C R/L H 2020 KS	2	20	20	20	127,5	20	17,5	–	B-M3CS 16-26 ...
M3C R/L H 2020 KS/300	M3C R/L H 2020 KS/300	2	20	20	20	127,5	18,8	17,5	–	B-M3CS 31-46 ...
M3C R/L H 2525 MS	M3C R/L H 2525 MS	2	25	25	25	152,5	25	17,5	–	B-M3CS 16-26 ...
M3C R/L H 2525 MS/300	M3C R/L H 2525 MS/300	2	25	25	25	152,5	23,8	17,5	–	B-M3CS 31-46 ...
M3C R/L H 1616 JB	M3C L/R H 1616 JB	3,5	16	16	16	114	16	22,5	–	B-M3CB 26-38 ...
M3C R/L H 1616 JB/400	M3C L/R H 1616 JB/400	3,5	16	16	16	114	13,8	22,5	–	B-M3CB 46-72 ...
M3C R/L H 2020 KB	M3C L/R H 2020 KB	3,5	20	20	20	129	20	22,5	–	B-M3CB 26-38 ...
M3C R/L H 2020 KB/400	M3C R/L H 2020 KB/400	3,5	20	20	20	129	17,8	22,5	–	B-M3CB 46-72 ...
M3C R/L H 2525 MB	M3C R/L H 2525 MB	3,5	25	25	25	154	25	22,5	–	B-M3CB 26-38 ...
M3C R/L H 2525 MB/400	M3C R/L H 2525 MB/400	3,5	25	25	25	154	22,8	22,5	–	B-M3CB 46-72 ...

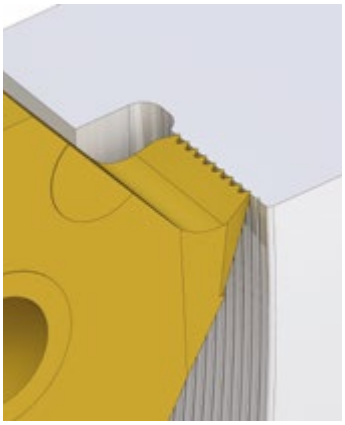
Spare Parts	Ordering Code				
Holder	Screw	Key			
M3C R/L H ... S ...	TS 0007	KK 1751			
M3C R/L H ... B ...	TS 0002	KK 1111			

External axial holder

M3C	R/L	A	H	2020	J	K
Multi3 Cut	Right-hand or Left-hand version	Axial holder	Holder	Shank height × shank width [mm]	Length (ISO)	Type of blank





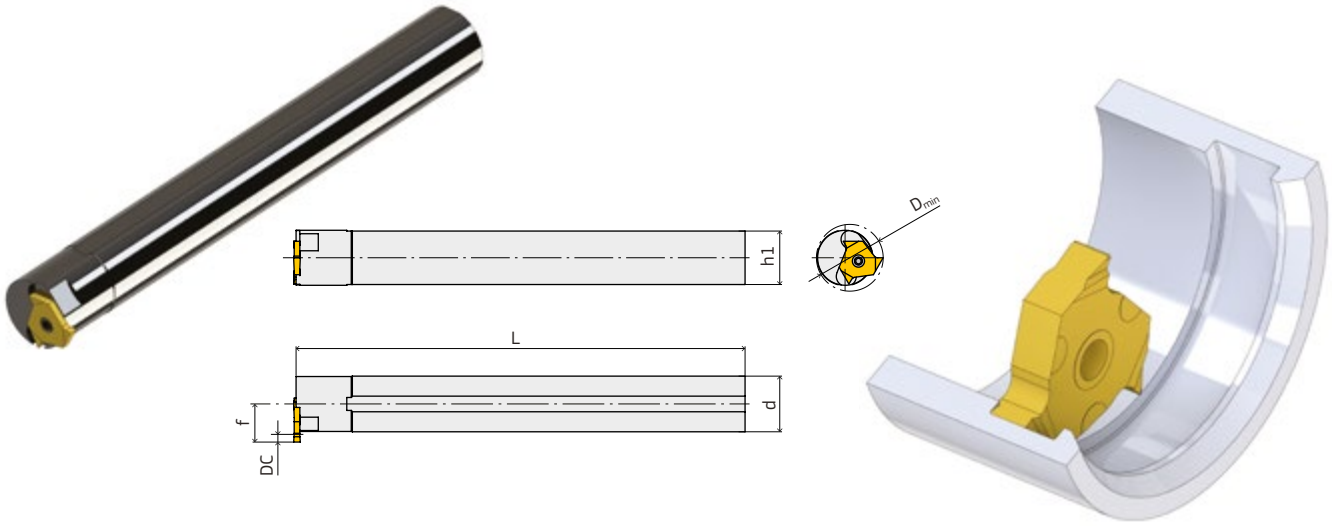


Ordering Code	Ident No.	WC	DC	h = b	L	L2	Suitable Blanks
M3C R/L AH 2020 KS	M3C R/L AH 2020 KS	1,0–4,7	1,5–2,0	20	125	17,5	B-M3CS ...
M3C R/L AH 2020 KB	M3C R/L AH 2020 KB	1,5–7,0	2,0–3,0	20	125	22,5	B-M3CB ...

Spare Parts	Ordering Code				
Holder	Screw	Key			
M3C R/L H ... S ...	TS 0007	KK 1751			
M3C R/L H ... B ...	TS 0002	KK 1111			

Internal holder

A	20	K	–	M3C	R/L	H	S / X
Internal holder with IK	Diameter of shank [mm]	Length (ISO)		Multi3 Cut	Right-hand or Left-hand version	Holder	Type of blank / Depth of place for blank [mm] × 100

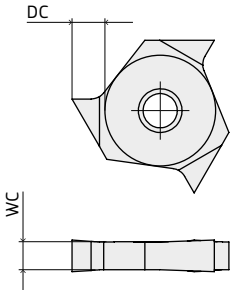


Ordering Code	Ident No.	D_{min}	DC	d	h1	L	f	Suitable Blanks
A12K-M3C R/L H S	A12K-M3C R/L H S	16	2	12	11	127	8,5	B-M3CS 16-21 ...
A12K-M3C R/L H S/300	A12K-M3C R/L H S/300	16	2	12	11	128	8,5	B-M3CS 31-46 ...
A16M-M3C R/L H S	A16M-M3C R/L H S	16	2	16	15	152	8,5	B-M3CS 16-21 ...
A16M-M3C R/L H S/300	A16M-M3C R/L H S/300	16	2	16	15	153	8,5	B-M3CS 31-46 ...
A20Q-M3C R/L H S	A20Q-M3C R/L H S	16	2	20	19	182	8,5	B-M3CS 16-21 ...
A20Q-M3C R/L H S/300	A20Q-M3C R/L H S/300	23	2	20	19	183	12,5	B-M3CS 31-46 ...
A25R-M3C R/L H B	A25R-M3C R/L H B	30	4	25	24	202	17	B-M3CB 26-38 ...
A25R-M3C R/L H B/400	A25R-M3C R/L H B/400	30	4	25	24	204	17	B-M3CB 46-72 ...
A32S-M3C R/L H B	A32S-M3C R/L H B	37	4	32	30	252	20,5	B-M3CB 26-38 ...
A32S-M3C R/L H B/400	A32S-M3C R/L H B/400	37	4	32	30	254	20,5	B-M3CB 46-72 ...

Spare Parts	Ordering Code				
Holder	Screw	Key			
M3C R/L H ... S ...	TS 0007	KK 1751			
M3C R/L H ... B ...	TS 0002	KK 1111			

Blanks for Multi3 Cut

B	–	M3C	B	46	R/L	C2
Blank		Multi3 Cut	Type of blank	Width of blank [mm] ×10	Right-hand or Left-hand version	Grade code



Ordering Code	Ident No.	WC +0,05	DC	Grade		
				C22	C42	G2
B-M3CS16 R/L	B-M3CS16 R/L	1,65	2	●	●	●
B-M3CS18 R/L	B-M3CS18 R/L	1,9	2	●	●	●
B-M3CS21 R/L	B-M3CS21 R/L	2,2	2	●	●	●
B-M3CS26 R/L	B-M3CS26 R/L	2,7	2	●	●	●
B-M3CS31 R/L	B-M3CS31 R/L	3,2	2	●	●	●
B-M3CS46 R/L	B-M3CS46 R/L	4,7	2	●		
B-M3CB26 R/L	B-M3CB26 R/L	2,7	3,5	●	●	●
B-M3CB31 R/L	B-M3CB31 R/L	3,2	3,5	●	●	●
B-M3CB38 R/L	B-M3CB38 R/L	3,9	3,5	●	●	●
B-M3CB46 R/L	B-M3CB46 R/L	4,7	3,5	●	●	●
B-M3CB51 R/L	B-M3CB51 R/L	5,2	3,5	●		
B-M3CB72 R/L	B-M3CB72 R/L	7,3	3,5	●		

External radial holder

M3C	R/L	H	2020	J	S / X
Multi3 Cut	Right-hand or Left-hand version	Holder	Shank height × shank width [mm]	Length (ISO)	Type of blank	Depth of place for blank [mm] ×100

Fig. 1

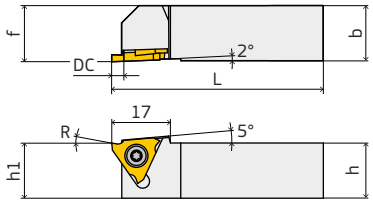
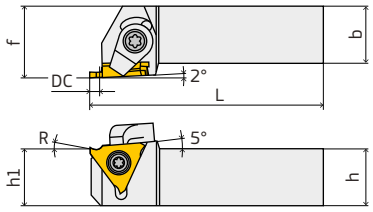


Fig. 2



R = Rake angle

Ordering Code	Ident No.	DC	h=b	h1	b	L	f	Fig.	Suitable Blanks
M3C R/L H 1616 KJS	M3C R/L H 1616 KJS	2,5	16	16	16	125	16	1	B-M3CJS ...
M3C R/L H 2020 KJS	M3C R/L H 2020 KJS	2,5	20	20	20	125	20	2	B-M3CJS ...
M3C R H 2020 MJB	M3C R H 2020 MJB	5	20	20	20	150	20	2	B-M3CJB ...
M3C R H 2525 MJB	M3C R H 2525 MJB	5	25	25	25	150	25	2	B-M3CJB ...

Spare Parts	Ordering Code				
Holder	Screw	Key	Clamp		
M3C R/L H 1616...JS	KT 0409N	KK 1111	–		
M3C R/L H 2020...JS	KT 0409N	KK 1112	KT M6B R/L		
M3C R ... JB	KT 0511N	KK 2525	KT M8U R		

Blanks for Multi3 Cut J

B	–	M3C	B	46	R/L	C2
Blank		Multi3 Cut	Type of blank	Width of blank [mm] ×10	Right-hand or Left-hand version	Grade code

Fig. 1

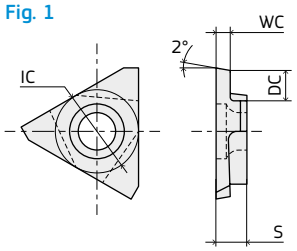
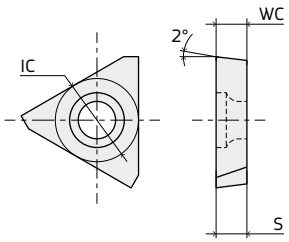


Fig. 2

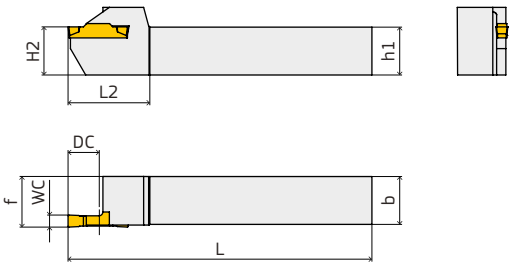


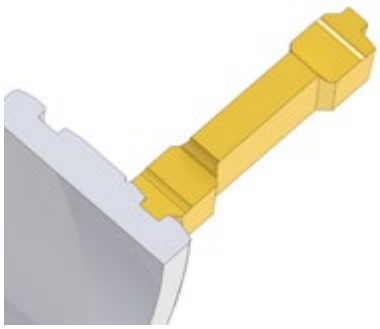
Ordering Code	Ident No.	WC	S	DC	IC	Fig.	Grade	
							C22	G2
B-M3CJS23 R/L	B-M3CJS23 R/L	2,35	3,18	3,4	9,525	1		●
B-M3CJS31 R	B-M3CJS31 R	3,18	3,18	3,4	9,525	2	●	
B-M3CJB47 R	B-M3CJB47 R	4,76	4,76	6,2	12,7	2	●	●

Grooving system for radial application. Active insert clamping with fixed stop – very stable and accurate insert positioning – pulling out the insert is not possible. Insert with 2 cutting edges. Custom solution (specific shapes) on request.

External holder

DC	R/L	H	2020	K	06
Duo Cut	Right-hand or Left-hand version	Holder	Shank height × shank width [mm]	Length (ISO)	Width of blank [mm]



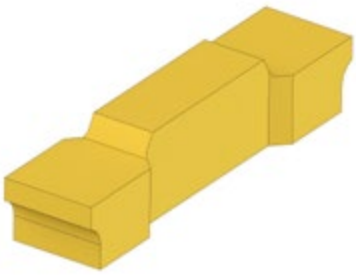


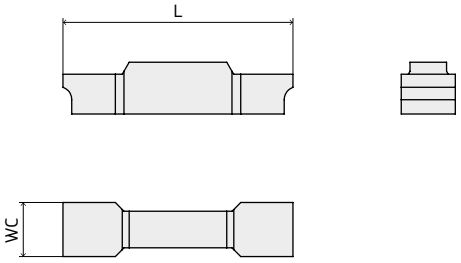
Ordering Code	Ident No.	WC	DC	h1 = b	L	L2	H2	f	Suitable Blanks
DC R/L H 2020 K06	DC R/L H 2020 K06	6	13	20	125	34	20	21	B-DC0626
DC R/L H 2525 M06	DC R/L H 2525 M06	6	13	25	150	34	25	26	B-DC0626

Spare Parts	Ordering Code				
Holder	Screw	Key			
DC R/L H... 06	TT 5512 044-01	KK 5680 043-17			

Blanks for Duo Cut

B	–	DC	06	26	C4
Blank		Deep Groove	Width of blank [mm]	Insert length [mm] ×10	Grade code





Ordering Code	Ident No.	WC	L	Grade
				C69
B-DC0626	B-DC0626	6	26	●

External radial holder

DC	R/L	H	2020	H	J	035
Duo Cut	Right-hand or Left-hand version	Holder	Shank height × shank width [mm]	Length (ISO)	Type of blank	Width of blank [mm]

Fig. 1

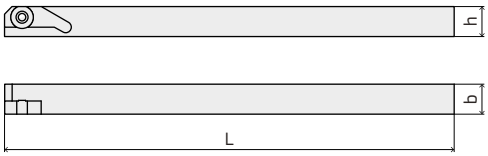
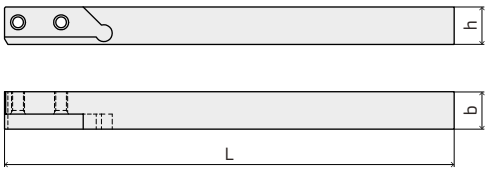


Fig. 2



Ordering Code	Ident No.	h=b	L	Fig.	Suitable blanks
DC R/L H 0808 KA035	DC R/L H 0808 KA035	8	124	1	B-DCA035 ...
DC R/L H 1212 KA035	DC R/L H 1212 KA035	12	124	1	B-DCA035 ...
DC R/L H 1616 HA035	DC R/L H 1616 HA035	16	100	1	B-DCA035 ...
DC R/L H 2020 HA035	DC R/L H 2020 HA035	20	100	1	B-DCA035 ...
DC R H 1212 KA060	DC R H 1212 KA060	12	125	2	B-DCA060 ...
DC R H 1616 KA060	DC R H 1616 KA060	16	125	2	B-DCA060 ...

Spare Parts	Ordering Code				
Holder	Screw	Key			
DC ... H ...	M2,5 × 7,5	KK 1751			

Blanks for Duo Cut A

B	–	DC	A	06	26	C4
Blank		Deep Groove	Type of blank	Width of blank [mm]	Insert length [mm] ×10	Grade code

Fig. 1

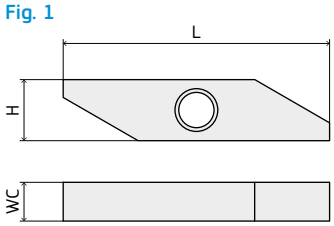
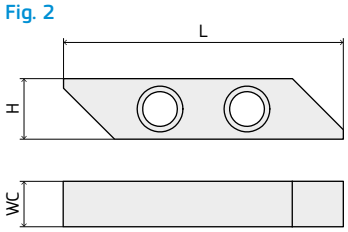


Fig. 2

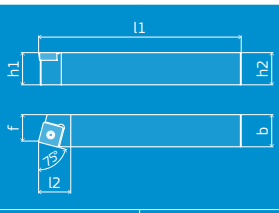


Ordering Code	Ident No.	WC	H	L	Fig.	Grade
						C41
B-DCA03524	B-DCA03524	3,5	24	5,5	1	●
B-DCA06037	B-DCA06037	6	37	8	2	●

Solution for grooving or turning. Insert with four cutting edges, completely grinded. Very used for producing of grooves of bearings. Custom solution (specific shapes) on request.

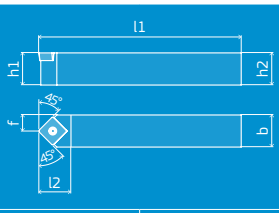
External holder

S	S	B	C	R/L	2020	K	12
Clamping method screw clamping	Insert shape	Style	Clearance angle	Right-hand or Left-hand version	Shank height × shank width [mm]	Length (ISO)	Size of blank [mm]



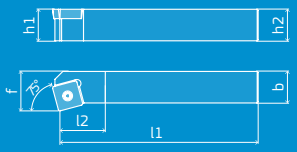
Approach angle 75°

Ordering Code	Ident No.	h1 = h2 = b	l1	l2	f	Suitable Blanks
SSBC R/L 2020 K12	SSBC R/L 2020 K12	20	125	20	17	SCGW 12 ...
SSBC R/L 2525 M12	SSBC R/L 2525 M12	25	150	20	17	SCGW 12 ...



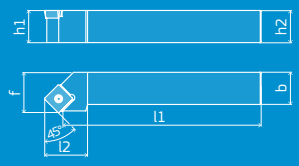
Approach angle 45°

Ordering Code	Ident No.	h1 = h2 = b	l1	l2	f	Suitable Blanks
SSDC N 1616 H12	SSDC N 1616 H12	16	100	25	8	SCGW 12 ...
SSDC N 2020 K12	SSDC N 2020 K12	20	125	25	10	SCGW 12 ...
SSDC N 2525 M12	SSDC N 2525 M12	25	150	25	12,5	SCGW 12 ...



Approach angle 75°

Ordering Code	Ident No.	h1 = h2 = b	l1	l2	f	Suitable Blanks
SSKC R/L 1616 H12	SSKC R/L 1616 H12	16	100	23	20	SCGW 12...
SSKC R/L 2020 K12	SSKC R/L 2020 K12	20	125	23	25	SCGW 12...
SSKC R/L 2525 M12	SSKC R/L 2525 M12	25	150	23	32	SCGW 12...

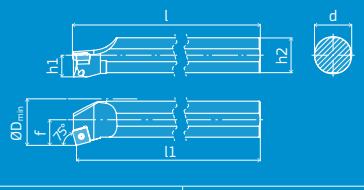


Approach angle 45°

Ordering Code	Ident No.	h1 = h2 = b	l1	l2	f	Suitable Blanks
SSSC R/L 1616 H12	SSSC R/L 1616 H12	16	100	25	20	SCGW 12...
SSSC R/L 2020 K12	SSSC R/L 2020 K12	20	125	25	25	SCGW 12...
SSSC R/L 2525 M12	SSSC R/L 2525 M12	25	150	25	32	SCGW 12...

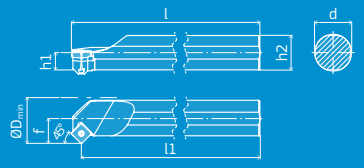
Spare Parts		Ordering Code				
Holder	Support Pad	Bush	Srew	Key		
SS ... R/L ... 12	SP 4221	KTB 1221	TT 1221	KK 1115		

Internal holder



Approach angle 75°

Ordering Code	Ident No.	d	h1	h2	l	l1	f	D_{min}	Suitable Blanks
A32U SSKC R/L 12	A32U SSKC R/L 12	32	15	30	353,1	350	22	40	SCGW 12 ...
A40V SSKC R/L 12	A40V SSKC R/L 12	40	18,5	37	403,1	400	27	49	SCGW 12 ...



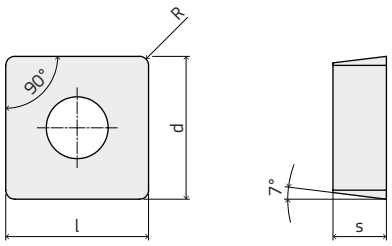
Approach angle 45°

Ordering Code	Ident No.	d	h1	h2	l	l1	f	D_{min}	Suitable Blanks
A32U SSSC R/L 12	A32U SSSC R/L 12	32	15	30	358,3	350	22	40	SCGW 12 ...
A40V SSSC R/L 12	A40V SSSC R/L 12	40	18,5	37	408,3	400	27	49	SCGW 12 ...

Spare Parts		Ordering Code				
Holder	Support Pad	Bush	Srew	Key		
A ... SS ... R/L 12	SP 4221	KTB 1221	TT 1221	KK 1115		

Blanks for SCGW

SCGW	12	04	01	C3
SCGW blank	Edge length [mm]	Insert thickness [mm]	Corner radius [mm]	Grade code

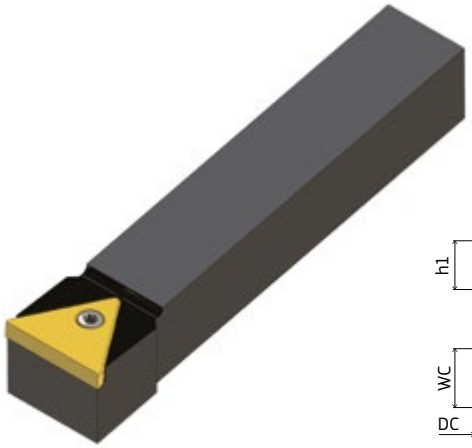


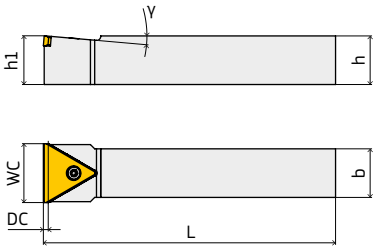
Ordering Code	Ident No.	l	d	s	R	Grade	
						C31	G
SCGW 120401	SCGW 120401	12,7	12,7	4,76	0	●	●

Grooving system for one plunge groove cutting. Different blanks for special profile grooves. Special profiles up to a width of 30 mm. Custom solution (specific shapes) on request.

Holder

CG	N	H	2020	M	12
Cotour Groove	Neutral holder	Holder	Shank height × shank width [mm]	Length (ISO)	Size of blank [mm]





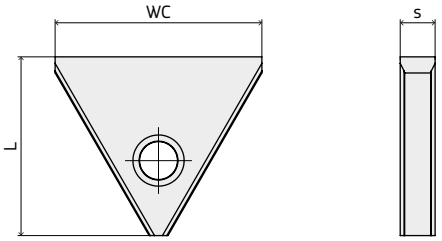
Ordering Code	Ident No.	WC	DC*	h1 = h = b	L	γ	Suitable Blanks
CGNH 2525 M30	CGNH 2525 M30	30	9,5	25	150	5°	B-CG 30 ...

* Possible depth of the profile on insert

Spare Parts	Ordering Code				
Holder	Screw	Key			
CGNH ... 30	TT 9990	KK 2530			

Blanks for Contour Groove 30

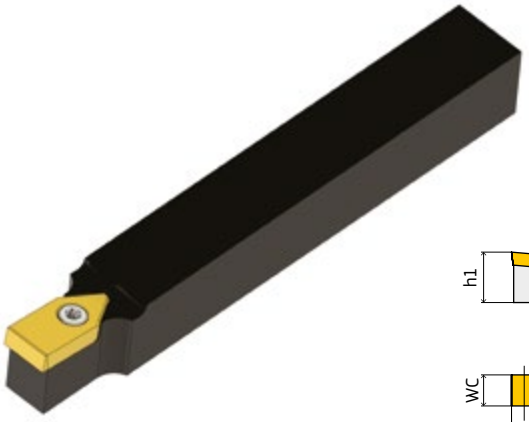
B	–	CG	12	20	C4
Blank		Contour Groove	Width of blank [mm]	Length of blank [mm]	Grade code

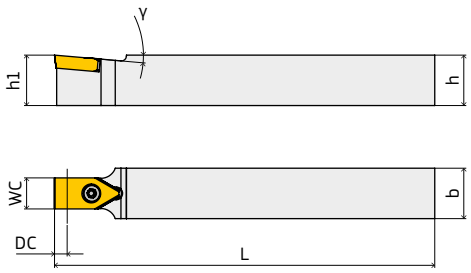


Ordering Code	Ident No.	WC	L	s	Grade		
					C42	G2	A82
B-CG3026	B-CG3026	30	26	5	●		●

Holder

CG	N	H	2020	M	12
Cotour Groove	Neutral holder	Holder	Shank height × shank width [mm]	Length (ISO)	Size of blank [mm]





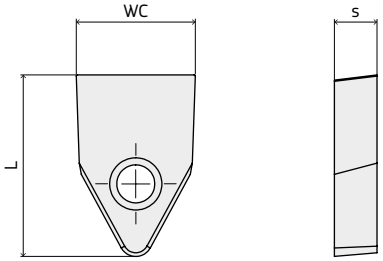
Ordering Code	Ident No.	WC	DC*	h1 = h = b	L	γ	Suitable Blanks
CGNH 1212 K12	CGNH 1212 K12	12	5	12	125	5°	B-CG 12 ...
CGNH 1414 K12	CGNH 1414 K12	12	5	14	125	5°	B-CG 12 ...
CGNH 1414 K16	CGNH 1414 K16	16	6,5	14	125	5°	B-CG 16 ...
CGNH 1616 K12	CGNH 1616 K12	12	5	16	125	5°	B-CG 12 ...
CGNH 1616 K16	CGNH 1616 K16	16	6,5	16	125	5°	B-CG 16 ...
CGNH 1616 K21	CGNH 1616 K21	21	9,5	16	125	5°	B-CG 21 ...
CGNH 2020 M12	CGNH 2020 M12	12	5	20	150	5°	B-CG 12 ...
CGNH 2020 M16	CGNH 2020 M16	16	6,5	20	150	5°	B-CG 16 ...
CGNH 2020 M21	CGNH 2020 M21	21	9,5	20	150	5°	B-CG 21 ...
CGNH 2525 M12	CGNH 2525 M12	12	5	25	150	5°	B-CG 12 ...
CGNH 2525 M16	CGNH 2525 M16	16	6,5	25	150	5°	B-CG 16 ...
CGNH 2525 M21	CGNH 2525 M21	21	9,5	25	150	5°	B-CG 21 ...
CGNH 2525 M25	CGNH 2525 M25	25	9,5	25	150	8°	B-CG 25 ...

* Possible depth of the profile on insert

Spare Parts	Ordering Code				
Holder	Screw	Key			
CGNH ... 12	TT 1221	KK 1111			
CGNH ... 16	TT 9950	KK 2520			
CGNH ... 21	TT 9980	KK 2525			
CGNH ... 25	TT 9980	KK 2525			

Blanks for Contour Groove

B	–	CG	12	20	C4
Blank		Contour Groove	Width of blank [mm]	Length of blank [mm]	Grade code

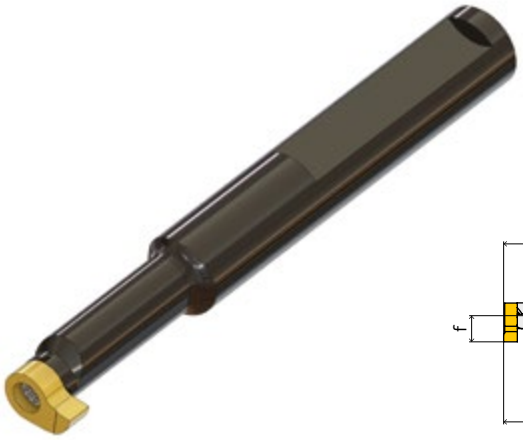


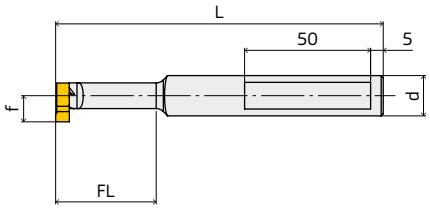
Ordering Code	Ident No.	WC	L	s	Grade		
					C42	G2	A82
B-CG1220	B-CG1220	12	20	5	●	●	●
B-CG1625	B-CG1625	16	25	6,5	●	●	●
B-CG2132	B-CG2132	21	32	7,5	●	●	●
B-CG2532	B-CG2532	25	32	5	●	●	●

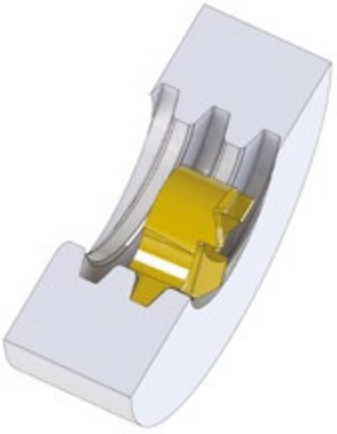
Mini system for minimum bore diameter from 9,7 mm. Insert with one cutting edge. 3-point location in holder guarantees high repeatability and positioning of the insert. Custom solution (specific shapes) on request.

Holder

MMS	R/L	H	15	12	A
Mini Modular System	Right-hand or Left-hand version	Holder	Maximum work depth [mm]	Shank diameter [mm]	Type of blank





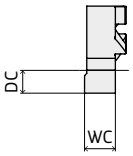


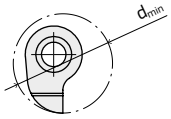
Ordering Code	Ident No.	d	FL	L	f	Suitable Blanks
MMS R/L H 1212 A	MMS R/L H 1212 A	12	12	80	6,35	R-MMS A ...
MMS R/L H 1512 A	MMS R/L H 1512 A	12	15	83	6,35	R-MMS A ...
MMS R/L H 2412 A	MMS R/L H 2412 A	12	24	92	6,35	R-MMS A ...
MMS R/L H 3212 A	MMS R/L H 3212 A	12	32	100	6,35	R-MMS A ...
MMS R/L H 4812 A	MMS R/L H 4812 A	12	48	115	6,35	R-MMS A ...
MMS R/L H 1412 B	MMS R/L H 1412 B	12	14	80	7,6	R-MMS B ...
MMS R/L H 2912 B	MMS R/L H 2912 B	12	29	95	7,6	R-MMS B ...
MMS R/L H 4212 B	MMS R/L H 4212 B	12	42	110	7,6	R-MMS B ...
MMS R/L H 5612 B	MMS R/L H 5612 B	12	56	120	7,6	R-MMS B ...
MMS R/L H 1616 C	MMS R/L H 1616 C	16	16	82	8,85	R-MMS C ...
MMS R/L H 3416 C	MMS R/L H 3416 C	16	34	100	8,85	R-MMS C ...
MMS R/L H 4516 C	MMS R/L H 4516 C	16	45	110	8,85	R-MMS C ...
MMS R/L H 6416 C	MMS R/L H 6416 C	16	64	130	8,85	R-MMS C ...
MMS R/L H 1816 D	MMS R/L H 1816 D	16	18	108	10,1	R-MMS D ...
MMS R/L H 4016 D	MMS R/L H 4016 D	16	40	130	10,1	R-MMS D ...
MMS R/L H 5616 D	MMS R/L H 5616 D	16	56	130	10,1	R-MMS D ...
MMS R/L H 8016 D	MMS R/L H 8016 D	16	80	150	10,1	R-MMS D ...

Spare Parts	Ordering Code				
Holder	Screw	Key			
MMS ... A	TS 0031	TK5108-IP			
MMS ... B	TS 0032	TK5109-IP			
MMS ... C	TS 0033	TK5110-IP			
MMS ... D	TS 0034	TK5115-IP			

Blanks for Mini Modular System

B	–	MMS	C	040	–	137	R/L	C24
Blank		Mini Modular System	Type of blank	Maximum work length [mm] ×10		Minimum diameter of workpiece [mm] ×10	Right-hand or Left-hand version	Grade code



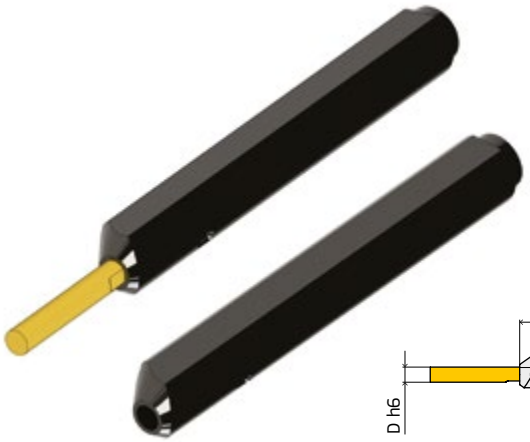


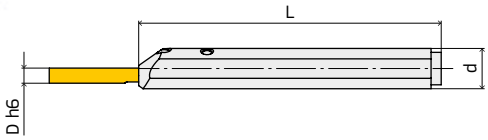
Ordering Code	Ident No.	WC	DC	d_{min}	Grade
					C242
B-MMSA030-097 R/L	B-MMSA030-097 R/L	3	3,0	9,7	●
B-MMSB035-117 R/L	B-MMSB035-117 R/L	3	3,5	11,7	●
B-MMSC040-137 R/L	B-MMSC040-137 R/L	3	4,0	13,7	●
B-MMSD045-157 R/L	B-MMSD045-157 R/L	4	4,5	15,7	●

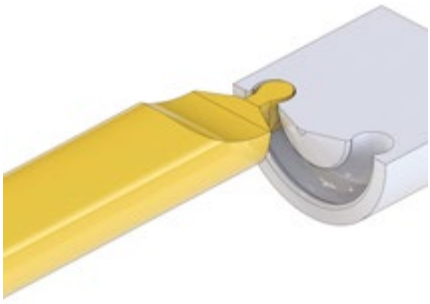
Mini system for minimum bore diameter from 2,5 mm. Insert with one cutting edge. With the ground taper on the tool shank and the fixed stop in the sleeve the length remains accurately constant and guaranteed cutting edge repeatability is achieved.
The cone of the threaded pin ensures secure tool locking and reduces cutting edge vibrations. Many of application areas. Custom solution (specific shapes) on request.

Holder

MCS	R/L	H	12	04
Mini Cut System	Right-hand or Left-hand version	Holder	Shank diameter [mm]	Diameter of blank [mm]





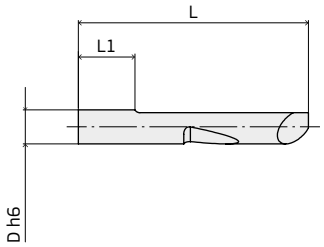


Ordering Code	Ident No.	D	d	L	Suitable Blanks
MCS R/L H 1204	MCS R/L H 1204	4	12	100	MCS- ... 40 R/L
MCS R/L H 1204	MCS R/L H 1204	4	12	100	R-MCS- ... 40 R/L
MCS R/L H 1206	MCS R/L H 1206	6	12	100	MCS- ... 40 R/L
MCS R/L H 1206	MCS R/L H 1206	6	12	100	R-MCS- ... 40 R/L
MCS R/L H 1606	MCS R/L H 1606	6	16	120	MCS- ... 60 R/L
MCS R/L H 1606	MCS R/L H 1606	6	16	120	R-MCS- ... 60 R/L
MCS R/L H 1608	MCS R/L H 1608	8	16	120	MCS- ... 80 R/L
MCS R/L H 1608	MCS R/L H 1608	8	16	120	R-MCS- ... 80 R/L
MCS R H 2010	MCS R H 2010	10	20	120	MCS- ... 100 R
MCS R H 2010	MCS R H 2010	10	20	120	R-MCS-... 100 R

Spare Parts	Ordering Code				
Holder	Screw				
MCS R/L 12 ...	TS 0043				
MCS R/L 16 ...	TS 0044				
MCS R 20 ...	TS 0044				

Blanks for Mini Cut System

B	–	MCS	–	150	:	40	R/L	C8
Blank		Mini Cut System		Maximum work length [mm] ×10		Shank diameter [mm] ×10	Right-hand or Left-hand version	Grade code

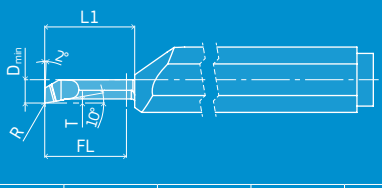


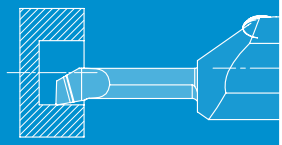
Ordering Code	Ident No.	D h6	L	L1	Grade		
					C25	C86	H27
B-MCS-100.40 R/L	B-MCS-100.40 R/L	4	34,4	10	●	●	●
B-MCS-100.60 R/L	B-MCS-100.60 R/L	6	40,6	10	●	●	●
B-MCS-100.80 R/L	B-MCS-100.80 R/L	8	40,4	10	●	●	●
B-MCS-100.100 R	B-MCS-100.100 R	10	40,4	10	●	●	●
B-MCS-150.40 R/L	B-MCS-150.40 R/L	4	39,4	15	●	●	●
B-MCS-150.60 R/L	B-MCS-150.60 R/L	6	45,6	15	●	●	●
B-MCS-150.80 R/L	B-MCS-150.80 R/L	8	45,4	15	●	●	●
B-MCS-150.100 R	B-MCS-150.100 R	10	45,4	15	●	●	●
B-MCS-200.40 R/L	B-MCS-200.40 R/L	4	44,4	20	●	●	●
B-MCS-200.60 R/L	B-MCS-200.60 R/L	6	50,6	20	●	●	●
B-MCS-200.80 R/L	B-MCS-200.80 R/L	8	50,4	20	●	●	●
B-MCS-200.100 R	B-MCS-200.100 R	10	50,4	20	●	●	●
B-MCS-250.40 R/L	B-MCS-250.40 R/L	4	49,4	25	●	●	●
B-MCS-250.60 R/L	B-MCS-250.60 R/L	6	55,6	25	●	●	●
B-MCS-250.80 R/L	B-MCS-250.80 R/L	8	55,4	25	●	●	●
B-MCS-250.100 R	B-MCS-250.100 R	10	55,4	25	●	●	●
B-MCS-300.40 R/L	B-MCS-300.40 R/L	4	54,4	30	●	●	●
B-MCS-300.60 R/L	B-MCS-300.60 R/L	6	60,6	30	●	●	●
B-MCS-300.80 R/L	B-MCS-300.80 R/L	8	60,4	30	●	●	●
B-MCS-300.100 R	B-MCS-300.100 R	10	60,4	30	●	●	●
B-MCS-350.40 R/L	B-MCS-350.40 R/L	4	60,4	35	●	●	●
B-MCS-350.60 R/L	B-MCS-350.60 R/L	6	65,6	35	●	●	●
B-MCS-350.80 R/L	B-MCS-350.80 R/L	8	65,4	35	●	●	●
B-MCS-350.100 R	B-MCS-350.100 R	10	65,4	35	●	●	●
B-MCS-400.40 R/L	B-MCS-400.40 R/L	4	64,4	40	●	●	●
B-MCS-400.60 R/L	B-MCS-400.60 R/L	6	70,6	40	●	●	●
B-MCS-400.80 R/L	B-MCS-400.80 R/L	8	70,4	40	●	●	●
B-MCS-400.100 R	B-MCS-400.100 R	10	70,4	40	●	●	●
B-MCS-450.60 R/L	B-MCS-450.60 R/L	6	75,6	45	●	●	●

Ordering Code	Ident No.	D h6	L	L1	Grade		
					C25	C86	H27
B-MCS-450.80 R/L	B-MCS-450.80 R/L	8	75,4	45	●	●	●
B-MCS-450.100 R	B-MCS-450.100 R	10	75,4	45	●	●	●
B-MCS-500.60 R/L	B-MCS-500.60 R/L	6	80,6	50	●	●	●
B-MCS-500.80 R/L	B-MCS-500.80 R/L	8	80,4	50	●	●	●
B-MCS-500.100 R	B-MCS-500.100 R	10	80,4	50	●	●	●
B-MCS-550.60 R/L	B-MCS-550.60 R/L	6	85,6	55	●	●	●
B-MCS-550.80 R/L	B-MCS-550.80 R/L	8	85,4	55	●	●	●
B-MCS-550.100 R	B-MCS-550.100 R	10	85,4	55	●	●	●
B-MCS-600.60 R/L	B-MCS-600.60 R/L	6	90,6	60	●	●	●
B-MCS-600.80 R/L	B-MCS-600.80 R/L	8	90,4	60	●	●	●
B-MCS-600.100 R	B-MCS-600.100 R	10	90,4	60	●	●	●
B-MCS-650.80 R/L	B-MCS-650.80 R/L	8	95,4	65	●	●	●
B-MCS-650.100 R	B-MCS-650.100 R	10	95,4	65	●	●	●
B-MCS-700.80 R/L	B-MCS-700.80 R/L	8	100,4	70	●	●	●
B-MCS-700.100 R	B-MCS-700.100 R	10	100,4	70	●	●	●
B-MCS-750.100 R	B-MCS-750.100 R	10	105,4	75	●	●	●
B-MCS-800.100 R	B-MCS-800.100 R	10	110,4	80	●	●	●

Standard inserts for Mini Cut System

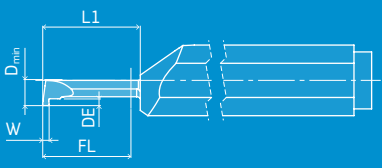
Turning 95°

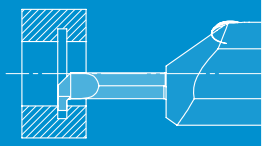




Ordering Code	Ident No.	D_{min}	FL	R	T	L1	Grade		
							C86	C25	H27
MCS-D-250401-200.40R	MCS-D-250401-200.40R	2,5	20	0,1	0,4	22	●	●	●
MCS-D-300401-200.40R	MCS-D-300401-200.40R	3,0	20	0,1	0,4	22	●	●	●
MCS-D-390602-150.40R	MCS-D-390602-150.40R	3,9	15	0,2	0,6	17	●	●	●
MCS-D-590802-200.60R	MCS-D-590802-200.60R	5,9	20	0,2	0,8	22	●	●	●
MCS-D-590801-150.60R	MCS-D-590801-150.60R	5,9	15	0,1	0,8	17	●	●	●
MCS-D-6005015-420.60R	MCS-D-6005015-420.60R	6,0	42	0,15	0,8	44	●	●	●

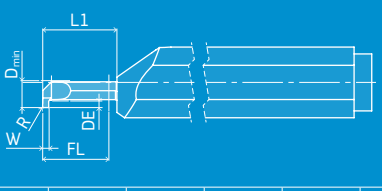
Grooving

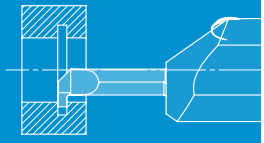




Ordering Code	Ident No.	D_{min}	W	DE	FL	L1	Grade		
							C86	C25	H27
MCS-S-39100800-100.40R	MCS-S-39100800-100.40R	3,6	1	0,8	10	12	●	●	●
MCS-S-59151800-100.60R	MCS-S-59151800-100.60R	5,9	1,5	1,8	10	12	●	●	●
MCS-S-69202500-150.80R	MCS-S-69202500-150.80R	6,9	2	2,5	15	17	●	●	●
MCS-S-79182500-250.80R	MCS-S-79182500-250.80R	7,9	1,8	2,6	25	27	●	●	●

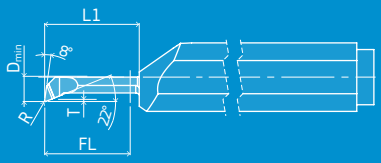
CIR-CLIP DIN471/472

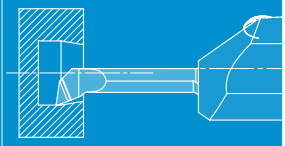




Ordering Code	Ident No.	D_{min}	W	DE	R	FL	L1	Grade		
								C86	C25	H27
MCS-472-41139110-150.40R	MCS-472-41139110-150.40R	4,1	1,36	1,1	0,05	15	17	●	●	●
MCS-472-84119200-200.80R	MCS-472-84119200-200.80R	8,4	1,19	2	0,05	20	22	●	●	●
MCS-472-84169250-200.80R	MCS-472-84169250-200.80R	8,4	1,69	2,5	0,05	20	22	●	●	●

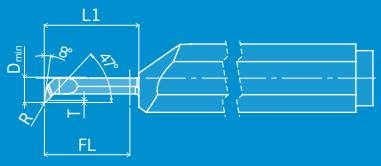
Copying

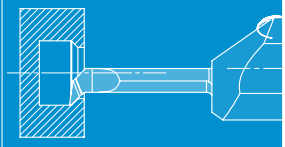




Ordering Code	Ident No.	D_{min}	FL	R	T	L1	Grade		
							C86	C25	H27
MCS-K-390802-150.40R	MCS-K-390802-150.40R	3,9	15	0,2	0,8	17	●	●	●
MCS-K-500502-250.60R	MCS-K-500502-250.60R	5	25	0,2	0,5	27	●	●	●
MCS-K-591802-200.60R	MCS-K-591802-200.60R	5,9	20	0,2	0,5	22	●	●	●

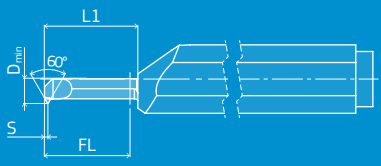
Copying 45°

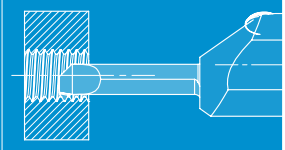




Ordering Code	Ident No.	D_{min}	FL	R	T	L1	Grade		
							C86	C25	H27
MCS-K45-391304-200.40R	MCS-K45-391304-200.40R	3,9	20	0,4	1,3	22	●	●	●
MCS-K45-400604-150.40R	MCS-K45-400604-150.40R	4	15	0,4	0,6	17	●	●	●

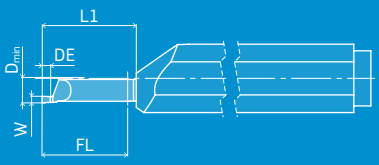
Threading 60°, metric partial profile

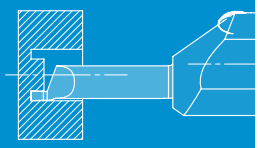




Ordering Code	Ident No.	D_{min}	Th	P	S	FL	L1	Grade		
								C86	C25	H27
MCS-G-M5-150.40R	MCS-G-M5-150.40R	4	M5	0,5–1,0	0,7	15	17	●	●	●
MCS-G-M8-200.60R	MCS-G-M8-200.60R	6	M6	0,5–1,5	0,8	20	22	●	●	●

Axial grooving





Ordering Code	Ident No.	D_{min}	W	DE	FL	L1	Grade		
							C86	C25	H27
MCS-A-70152000-200.60R	MCS-A-70152000-200.60R	7	1,5	2	20	22	●	●	●
MCS-A-90152000-250.80R	MCS-A-90152000-250.80R	9	1,5	2	25	27	●	●	●

B	4	X
Grade code: Material group	Grade code: Application range	Interal code: Number 0–99

ISO	KONRAD TOOLS
P	A
M	B
K	C
N	D
S	E
H	F
Cermet	G
CBN	H
PCD	I

ISO	KONRAD TOOLS
10	2
15	3
20	4
25	5
30	6
35	7
40	8
45	9
50	0

A	X
Designation of coating	Place for internal information: Number 0–99

Compo-sition	KONRAD TOOLS
TiAlN	A
AlTiN	B
TiB2	C
Diamant	D
TiN	E
AlCrN	F

The most commonly used coatings

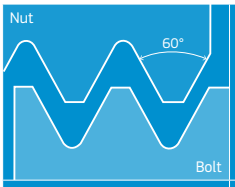
TiAlN	Universal solution, for steel, stainless steel, and cast iron
AlTiN	For all types of cast iron and steel up to 60HRC
TiB2	This sputtered coating composition has nearly no affinity to non-ferrous materials, especially aluminium
Diamant	For the demanding machining of highly abrasive materials
TiN	For less demanding applications, low cutting speeds
AlCrN	Universal coating for superb results in dry and wet machining at high cutting speeds

Type of coating	Application area					
	Steel	Stainless steel	Iron casting	Non-ferrous metals	High temperature alloys	Hardened materials
	P	M	K	N	S	H
TiAlN	●	●	●		●	
AlTiN	○	●	○		●	●
TiB2				●		
Diamant				●	●	
TiN	○	●				
AlCrN	●	●	○		○	

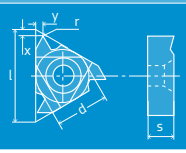
● Main application ○ Secondary application

We are able to advise customers with suitable coating on the basis the application and workpiece.

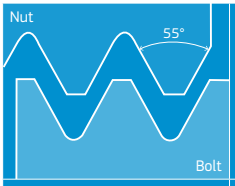
Thread Turning



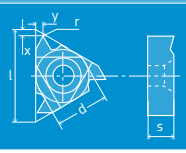
Partial Profile 60°



	Ordering Code	Pitch mm	Pitch tpi	l	d	s	r	x	y	Grade A41-R1	Grade B51-S1	Grade D41-T1	Anvil	Suitable Tool Holder	Page
Right hand	11ERA60	0,5–1,5	48–16	11	6,35	3,0	0,05	0,8	0,9	●	●	○	–	NL ... -11	172
	16ERA60	0,5–1,5	48–16	16	9,52	3,4	0,05	0,8	0,9	●	●	○	YE16	AL ... -16	172
	16ERAG60	0,5–3,0	48–8	16	9,52	3,4	0,06	1,2	1,7	●	●	○	YE16		
	16ERG60	1,75–3,0	14–8	16	9,52	3,4	0,25	1,2	1,7	●	●	○	YE16	AL ... -22	172
	22ERN60	3,5–5,0	7–5	22	12,70	4,6	0,51	1,7	2,5	●	●	○	YE22		
Left hand	11ELA60	0,5–1,5	48–16	11	6,35	3,0	0,05	0,8	0,9	●	●	○	–	NL ... -11	172
	16ELA60	0,5–1,5	48–16	16	9,52	3,4	0,05	0,8	0,9	●	●	○	YI16	AL ... -16	172
	16ELAG60	0,5–3,0	48–8	16	9,52	3,4	0,06	1,2	1,7	●	●	○	YI16		
	16ELG60	1,75–3,0	14–8	16	9,52	3,4	0,25	1,2	1,7	●	●	○	YI16	AL ... -22	172
	22ELN60	3,5–5,0	7–5	22	12,70	4,6	0,51	1,7	2,5	●	●	○	YI22		



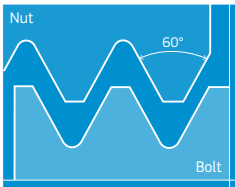
Partial Profile 55°



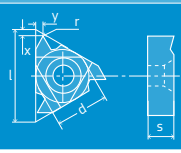
	Ordering Code	Pitch mm	Pitch tpi	l	d	s	r	x	y	Grade A41-R1	Grade B51-S1	Grade D41-T1	Anvil	Suitable Tool Holder	Page
Right hand	11ERA55	0,5–1,5	48–16	16	9,52	3,0	0,05	0,8	0,9	●	●	○	–	NL ... -11	172
	16ERA55	0,5–1,5	48–16	16	9,52	3,4	0,05	0,8	0,9	●	●	○	YE16	AL ... -16	172
	16ERG55	1,75–3,0	14–8	16	9,52	3,4	0,20	1,2	1,7	●	●	○	YE16		
	16ERAG55	0,5–3,0	48–8	16	9,52	3,4	0,07	1,2	1,7	●	●	○	YE16	AL ... -22	172
	22ERN55	3,5–5,0	7–5	22	12,70	4,6	0,43	1,7	2,5	●	●	○	YE22		
Left hand	11ELA55	0,5–1,5	48–16	16	9,52	3,0	0,05	0,8	0,9	●	●	○	–	NL ... -11	172
	16ELA55	0,5–1,5	48–16	16	9,52	3,4	0,05	0,8	0,9	●	●	○	YI16	AL ... -16	172
	16ELG55	1,75–3,0	14–8	16	9,52	3,4	0,20	1,2	1,7	●	●	○	YI16		
	16ELAG55	0,5–3,0	48–8	16	9,52	3,4	0,07	1,2	1,7	●	●	○	YI16	AL ... -22	172
	22ELN55	3,5–5,0	7–5	22	12,70	4,6	0,43	1,7	2,5	●	●	○	YI22		

Order Example: 10 pieces 11ERA60 A41-R1

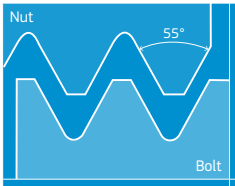
● Available from stock
○ Upon Request



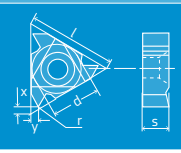
Partial Profile 60°



	Ordering Code	Pitch mm	Pitch tpi	l	d	s	r	x	y	Grade A41-R1	Grade B51-S1	Grade D41-T1	Anvil	Suitable Tool Holder	Page
Right hand	11IRA60	0,5–1,5	48–16	11	6,35	3,0	0,05	0,8	0,9	●	●	○	–	NVR ... -11	172
	16IRA60	0,5–1,5	48–16	16	9,52	3,4	0,05	0,8	0,9	●	●	○	YI16	AVR ... -16	172
	16IRG60	1,75–3,0	14–8	16	9,52	3,4	0,15	1,2	1,7	●	●	○	YI16	NVR ... -16	172
	16IRAG60	0,5–3,0	48–8	16	9,52	3,4	0,05	1,2	1,7	●	●	○	YI16		
	22IRN60	3,5–5,0	7–5	22	12,70	4,6	0,28	1,7	2,5	●	●	○	YI22	AVR ... -22	172
														NVR ... -22	172
Left hand	11ILA60	0,5–1,5	48–16	11	6,35	3,0	0,05	0,8	0,9	●	●	○	–	NVR ... -11	172
	16ILA60	0,5–1,5	48–16	16	9,52	3,4	0,05	0,8	0,9	●	●	○	YE16	AVR ... -16	172
	16ILG60	1,75–3,0	14–8	16	9,52	3,4	0,15	1,2	1,7	●	●	○	YE16	NVR ... -16	172
	16ILAG60	0,5–3,0	48–8	16	9,52	3,4	0,05	1,2	1,7	●	●	○	YE16		
	22ILN60	3,5–5,0	7–5	22	12,70	4,6	0,28	1,7	2,5	●	●	○	YE22	AVR ... -22	172
														NVR ... -22	172



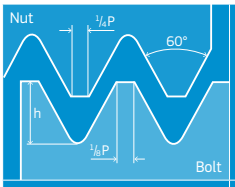
Partial Profile 55°



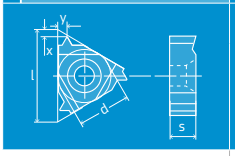
	Ordering Code	Pitch mm	Pitch tpi	l	d	s	r	x	y	Grade A41-R1	Grade B51-S1	Grade D41-T1	Anvil	Suitable Tool Holder	Page
Right hand	11IRA55	0,5–1,5	48–16	11	6,35	3,0	0,05	0,8	0,9	●	●	○	–	NVR-11	172
	16IRA55	0,5–1,5	48–16	16	9,52	3,4	0,05	0,8	0,9	●	●	○	YI16	AVR-16	172
	16IRG55	1,75–3,0	14–8	16	9,52	3,4	0,20	1,2	1,7	●	●	○	YI16	NVR-16	172
	16IRAG55	0,5–3,0	48–8	16	9,52	3,4	0,07	1,2	1,7	●	●	○	YI16		
	22IRN55	3,5–5,0	7–5	22	12,70	4,6	0,43	1,7	2,5	●	●	○	YI22	AVR-22 NVR-22	172
Left hand	11ILA55	0,5–1,5	48–16	11	6,35	3,0	0,05	0,8	0,9	●	●	○	–	NVR ... -11	172
	16ILA55	0,5–1,5	48–16	16	9,52	3,4	0,05	0,8	0,9	●			YE16	AVR ... -16	172
	16ILG55	1,75–3,0	14–8	16	9,52	3,4	0,20	1,2	1,7	●		○	YE16	NVR ... -16	172
	16ILAG55	0,5–3,0	48–8	16	9,52	3,4	0,07	1,2	1,7	●			YE16		
	22ILN55	3,5–5,0	7–5	22	12,70	4,6	0,43	1,7	2,5	●		○	YE22	AVR ... -22 NVR ... -22	172

Order Example: 10 pieces 11IRA60 A41-R1

● Available from stock
○ Upon Request



ISO-Metric Full Profile

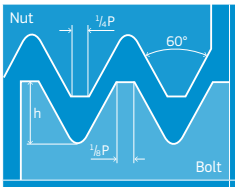


	Ordering Code	Pitch		l	d	s	r	x	y	Grade			Anvil	Suitable Tool Holder	Page
		mm	tpi							A41-R1	B51-S1	D41-T1			
Right hand	11ER0,35ISO	0,35	–	11	6,35	3,0	–	0,8	0,4	●	●	○		NL ... -11	172
	11ER0,4ISO	0,40	–	11	6,35	3,0	–	0,7	0,4	●	●	○			
	11ER0,45ISO	0,45	–	11	6,35	3,0	–	0,7	0,4	●	●				
	11ER0,5ISO	0,5	–	11	6,35	3,0	–	0,6	0,4	●	●	○			
	11ER0,6ISO	0,6	–	11	6,35	3,0	–	0,6	0,6	●	●	○			
	11ER0,7ISO	0,7	–	11	6,35	3,0	–	0,6	0,6	●	●	○			
	11ER0,75ISO	0,75	–	11	6,35	3,0	–	0,6	0,6	●	●	○			
	11ER0,8ISO	0,8	–	11	6,35	3,0	–	0,6	0,6	●	●	○			
	11ER1,0ISO	1,0	–	11	6,35	3,0	–	0,7	0,7	●	●	○			
	11ER1,25ISO	1,25	–	11	6,35	3,0	–	0,8	0,9	●	●	○			
	11ER1,5ISO	1,5	–	11	6,35	3,0	–	0,8	1,0	●	●	○			
	16ER0,5ISO	0,5	–	16	9,52	3,4	–	0,6	0,4	●	●	○	YE16	AL ... -16	172
	16ER0,75ISO	0,75	–	16	9,52	3,4	–	0,6	0,6	●	●	○	YE16		
	16ER1,0ISO	1,0	–	16	9,52	3,4	–	0,7	0,7	●	●	○	YE16		
	16ER1,25ISO	1,25	–	16	9,52	3,4	–	0,8	0,9	●	●	○	YE16		
	16ER1,5ISO	1,5	–	16	9,52	3,4	–	0,8	1,0	●	●	○	YE16		
	16ER1,75ISO	1,75	–	16	9,52	3,4	–	0,9	1,2	●	●	○	YE16		
	16ER2,0ISO	2,0	–	16	9,52	3,4	–	1,0	1,3	●	●	○	YE16		
	16ER2,5ISO	2,5	–	16	9,52	3,4	–	1,1	1,5	●	●	○	YE16		
	16ER3,0ISO	3,0	–	16	9,52	3,4	–	1,2	1,6	●	●	○	YE16		
	16ER3,5ISO	3,5	–	16	9,52	3,4	–	1,2	1,6	●	●		YE16		
	22ER3,5ISO	3,5	–	22	12,70	4,6	–	1,6	2,3	●	●	○	YE22	AL ... -22	172
	22ER4,0ISO	4,0	–	22	12,70	4,6	–	1,6	2,3	●	●	○	YE22		
	22ER4,5ISO	4,5	–	22	12,70	4,6	–	1,7	2,4	●	●	○	YE22		
	22ER5,0ISO	5,0	–	22	12,70	4,6	–	1,7	2,5	●	●	○	YE22		
	27ER6,0ISO	6,0	–	27	15,88	6,2	–	1,8	2,5	●	●	○	YE27	AL ... -27	172
Left hand	11EL0,35ISO	0,35	–	11	6,35	3,0	–	0,8	0,4	●		○		NL ... -11	172
	11EL0,45ISO	0,45	–	11	6,35	3,0	–	0,7	0,4	●		○			
	11EL0,5ISO	0,5	–	11	6,35	3,0	–	0,6	0,4	●	●	○			
	11EL0,7ISO	0,7	–	11	6,35	3,0	–	0,6	0,6	●					
	11EL0,75ISO	0,75	–	11	6,35	3,0	–	0,6	0,6	●		○			
	11EL0,8ISO	0,8	–	11	6,35	3,0	–	0,6	0,6	●					
	11EL1,0ISO	1,0	–	11	6,35	3,0	–	0,7	0,7	●	●	○			
	11EL1,25ISO	1,25	–	11	6,35	3,0	–	0,8	0,9	●		○			
	11EL1,5ISO	1,5	–	11	6,35	3,0	–	0,8	1,0	●		○			
	16EL0,5ISO	0,5	–	16	9,52	3,4	–	0,6	0,4	●	●	○	YI16	AL ... -16	172
	16EL0,75ISO	0,75	–	16	9,52	3,4	–	0,6	0,6	●	●	○	YI16		
	16EL1,0ISO	1,0	–	16	9,52	3,4	–	0,7	0,7	●	●	○	YI16		
	16EL1,25ISO	1,25	–	16	9,52	3,4	–	0,8	0,9	●	●	○	YI16		
	16EL1,5ISO	1,5	–	16	9,52	3,4	–	0,8	1,0	●	●	○	YI16		
	16EL1,75ISO	1,75	–	16	9,52	3,4	–	0,9	1,2	●	●	○	YI16		
	16EL2,0ISO	2,0	–	16	9,52	3,4	–	1,0	1,3	●	●	○	YI16		
	16EL2,5ISO	2,5	–	16	9,52	3,4	–	1,1	1,5	●	●	○	YI16		
	16EL3,0ISO	3,0	–	16	9,52	3,4	–	1,2	1,6	●	●	○	YI16		
	22EL3,5ISO	3,5	–	22	12,70	4,6	–	1,6	2,3	●	●	○	YI22	AL ... -22	172
	22EL4,0ISO	4,0	–	22	12,70	4,6	–	1,6	2,3	●	●	○	YI22		
	22EL4,5ISO	4,5	–	22	12,70	4,6	–	1,7	2,4	●	●	○	YI22		
	22EL5,0ISO	5,0	–	22	12,70	4,6	–	1,7	2,5	●	●		YI22		
	27EL6,0ISO	6,0	–	27	15,88	6,2	–	1,7	2,5	●			YI27	AL ... -27	172

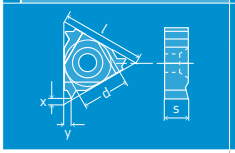
Order Example: 10 pieces 11ER0,35ISO A41-R1

● Available from stock

○ Upon Request



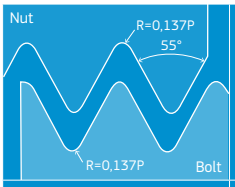
ISO-Metric Full Profile



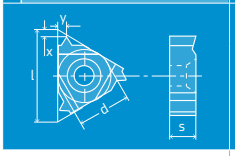
	Ordering Code	Pitch		l	d	s	r	x	y	Grade			Anvil	Suitable Tool Holder	Page
		mm	tpi							A41-R1	B51-S1	D41-T1			
Right hand	11IR0,35ISO	0,35	–	11	6,35	3,0	–	0,8	0,3	●	●	○	–	NVR ... -11	172
	11IR0,45ISO	0,45	–	11	6,35	3,0	–	0,8	0,4	●		○			
	11IR0,6ISO	0,6	–	11	6,35	3,0	–	0,6	0,6	●		○			
	11IR0,7ISO	0,7	–	11	6,35	3,0	–	0,6	0,6	●	●	○			
	11IR0,75ISO	0,75	–	11	6,35	3,0	–	0,6	0,6	●	●	○			
	11IR0,8ISO	0,8	–	11	6,35	3,0	–	0,6	0,6	●	●	○			
	11IR1,0ISO	1,0	–	11	6,35	3,0	–	0,6	0,7	●	●	○	–		
	11IR1,25ISO	1,25	–	11	6,35	3,0	–	0,8	0,9	●	●	○			
	11IR1,5ISO	1,5	–	11	6,35	3,0	–	0,8	1,0	●	●	○	–		
	16IR1,0ISO	1,0	–	16	9,52	3,4	–	0,6	0,7	●	●	○	YI16	AVR ... -16	172
	16IR1,25ISO	1,25	–	16	9,52	3,4	–	0,8	0,9	●	●	○	YI16	NVR ... -16	172
	16IR1,50ISO	1,50	–	16	9,52	3,4	–	0,8	1,0	●	●	○	YI16		
	16IR1,75ISO	1,75	–	16	9,52	3,4	–	0,9	1,2	●	●	○	YI16		
	16IR2,0ISO	2,0	–	16	9,52	3,4	–	1,0	1,3	●	●	○	YI16		
	16IR2,5ISO	2,5	–	16	9,52	3,4	–	1,1	1,5	●	●	○	YI16		
	16IR3,0ISO	3,0	–	16	9,52	3,4	–	1,1	1,5	●	●	○	YI16		
	16IR3,5ISO	3,5	–	16	9,52	3,4	–	1,2	1,5	●	●	○	YI16		
	22IR3,5ISO	3,5	–	22	12,7	4,6	–	1,6	2,3	●	●	○	YI16	AVR ... -22	172
	22IR4,0ISO	4,0	–	22	12,7	4,6	–	1,6	2,3	●	●	○	YI16	NVR ... -22	172
	22IR4,5ISO	4,5	–	22	12,7	4,6	–	1,6	2,4	●	●	○	YI16		
	22IR5,0ISO	5,0	–	27	12,7	4,6	–	1,6	2,3	●	●	○	YI16		
	27IR6,0ISO	6,0	–	27	15,88	6,2	–	1,8	2,5	●	●	○	YI27	AVR ... -27	172
														NVR ... -27	172
Left hand	11IL0,35ISO	0,35	–	11	6,35	3,0	–	0,8	0,3	●			–	NVR ... -11	172
	11IL0,7ISO	0,7	–	11	6,35	3,0	–	0,6	0,6		●				
	11IL0,8ISO	0,8	–	11	6,35	3,0	–	0,6	0,6	●					
	11IL1,0ISO	1,0	–	11	6,35	3,0	–	0,6	0,7	●	●	○	–		
	16IL1,0ISO	1,0	–	16	9,52	3,4	–	0,6	0,7	●	●	○	YE16	AVR ... -16	172
	16IL1,25ISO	1,25	–	16	9,52	3,4	–	0,8	0,9	●	●	○	YE16	NVR ... -16	172
	16IL1,50ISO	1,50	–	16	9,52	3,4	–	0,8	1,0	●	●	○	YE16		
	16IL1,75ISO	1,75	–	16	9,52	3,4	–	0,9	1,2	●	●	○	YE16		
	16IL2,0ISO	2,0	–	16	9,52	3,4	–	1,0	0,6	●	●	○	YE16		
	16IL0,8ISO	0,8	–	16	9,52	3,4	–	0,6	1,3	●	●	○	YE16		
	16IL2,5ISO	2,5	–	16	9,52	3,4	–	1,1	1,5	●	●	○	YE16		
	16IL3,0ISO	3,0	–	16	9,52	3,4	–	1,2	1,5	●	●	○	YE16		
	16IL3,5ISO	3,5	–	16	9,52	3,4	–	1,1	1,5	●			YE16		
	22IL3,5ISO	3,5	–	22	12,7	4,6	–	1,6	2,3	●	●		YE22	AVR ... -22	172
	22IL4,0ISO	4,0	–	22	12,7	4,6	–	1,6	2,3	●	●	○	YE22	NVR ... -22	172
	22IL4,5ISO	4,5	–	22	12,7	4,6	–	1,6	2,4	●	●		YE22		
	22IL5,0ISO	5,0	–	22	12,7	4,6	–	1,6	2,3	●	●		YE22		
	27IL6,0ISO	6,0	–	27	15,88	6,2	–	1,8	2,5	●			YE27	AVR ... -27	172
														NVR ... -27	172

Order Example: 10 pieces 11IR0,35ISO B51-S1

● Available from stock
○ Upon Request

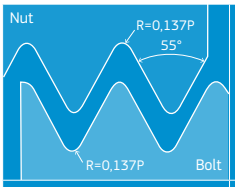


BSP Full Profile

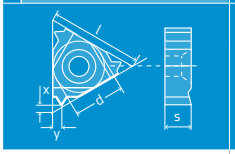


	Ordering Code	Pitch		l	d	s	r	x	y	Grade			Anvil	Suitable Tool Holder	Page
		mm	tpi							A41-R1	BS1-S1	D41-T1			
Right hand	11ER28W	–	28	11	6,35	3,0	–	0,6	0,7	●	●			NL. ...-11	172
	11ER19W	–	19	11	6,35	3,0	–	0,8	1,0	●	●	○			
	11ER14W	–	14	11	6,35	3,0	–	1,0	1,2	●	●	○			
	16ER28W	–	28	16	9,52	3,4	–	0,6	0,7	●	●	○	YE16	AVR ... -16	172
	16ER19W	–	19	16	9,52	3,4	–	0,8	1,0	●	●	○	YE16	NVR ... -16	172
	16ER14W	–	14	16	9,52	3,4	–	1,0	1,2	●	●	○	YE16		
	16ER11W	–	11	16	9,52	3,4	–	1,1	1,5	●	●	○	YE16		

Indexable Inserts - Internal Threads



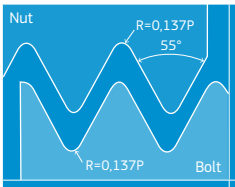
BSP Full Profile



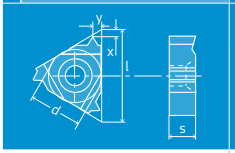
	Ordering Code	Pitch		l	d	s	r	x	y	Grade			Anvil	Suitable Tool Holder	Page
		mm	tpi							A41-R1	BS1-S1	D41-T1			
Right hand	11IR28W	–	28	11	6,35	3,0	–	0,6	0,7	●	●	○	–	NVR ... -11	172
	11IR19W	–	19	11	6,35	3,0	–	0,8	1,0	●	●	○	–		
	11IR14W	–	14	11	6,35	3,0	–	0,9	1,1	●	●	○	–		
	16IR28W	–	28	16	9,52	3,4	–	0,6	0,7	●	●	○	YI16	AVR ... -16	172
	16IR19W	–	19	16	9,52	3,4	–	0,8	1,0	●	●	○	YI16	NVR ... -16	172
	16IR14W	–	14	16	9,52	3,4	–	1,0	1,2	●	●	○	YI16		
	16IR11W	–	11	16	9,52	3,4	–	1,1	1,5	●	●	○	YI16		

Order Example: 10 pieces 16ER28W A41-R1

● Available from stock
○ Upon Request

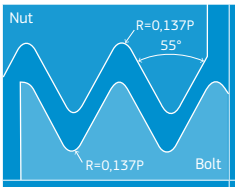


BSP Full Profile

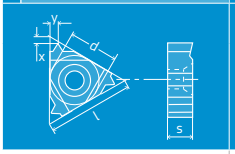


	Ordering Code	Pitch		l	d	s	r	x	y	Grade			Anvil	Suitable Tool Holder	Page
		mm	tpi							A41-R1	BS1-S1	D41-T1			
Right hand	16EL28W	–	28	16	9,52	3,4	–	0,6	0,7	●	●		YI16	AL ... -16	172
	16EL19W	–	19	16	9,52	3,4	–	0,8	1,0	●	●	○	YI16		
	16EL14W	–	14	16	9,52	3,4	–	1,0	1,2	●	●	○	YI16		
	16EL11W	–	11	16	9,52	3,4	–	1,1	1,5	●	●	○	YI16		

Indexable Inserts - Internal Threads



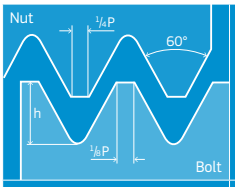
BSP Full Profile



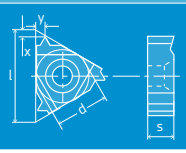
	Ordering Code	Pitch		l	d	s	r	x	y	Grade			Anvil	Suitable Tool Holder	Page
		mm	tpi							A41-R1	BS1-S1	D41-T1			
Left hand	11IL19W	–	19	11	6,35	3,0	–	0,8	1,0	○	○	○	–	NVR ... -11	172
	11IL14W	–	14	11	6,35	3,0	–	0,9	1,1	○	○	○	–		
	16IL28W	–	28	16	9,52	3,4	–	0,6	0,7		○		YE16	AVR ... -16	172
	16IL19W	–	19	16	9,52	3,4	–	0,8	1,0	○	○	○	YE16	NVR ... -16	172
	16IL14W	–	14	16	9,52	3,4	–	1,0	1,2	○	○	○	YE16		
	16IL11W	–	11	16	9,52	3,4	–	1,1	1,5	○	○		YE16		

Order Example: 10 pieces 16EL28W A41-R1

● Available from stock
○ Upon Request



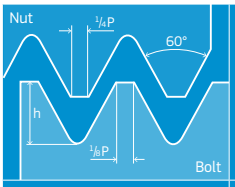
American UN Full Profile



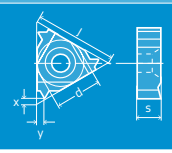
	Ordering Code	Pitch		l	d	s	r	x	y	Grade			Anvil	Suitable Tool Holder	Page
		mm	tpi							A41-R1	B51-S1	D41-T1			
Right hand	6ER72UN	–	72	16	9,52	3,4	–	0,8	0,4	○	○	○	YE16	AL ... -16	172
	16ER64UN	–	64	16	9,52	3,4	–	0,8	0,4			○	YE16		
	16ER56UN	–	56	16	9,52	3,4	–	0,7	0,4	○		○	YE16		
	16ER48UN	–	48	16	9,52	3,4	–	0,6	0,6	○	○	○	YE16		
	16ER44UN	–	44	16	9,52	3,4	–	0,6	0,6	○	○	○	YE16		
	16ER40UN	–	40	16	9,52	3,4	–	0,6	0,6	○	○	○	YE16		
	16ER36UN	–	36	16	9,52	3,4	–	0,6	0,6	○	○	○	YE16		
	16ER32UN	–	32	16	9,52	3,4	–	0,6	0,6	○	○	○	YE16		
	16ER28UN	–	28	16	9,52	3,4	–	0,6	0,7	○	○	○	YE16		
	16ER27UN	–	27	16	9,52	3,4	–	0,7	0,8	○	○	○	YE16		
	16ER24UN	–	24	16	9,52	3,4	–	0,7	0,8	○	○	○	YE16		
	16ER20UN	–	20	16	9,52	3,4	–	0,8	0,9	○	○	○	YE16		
	16ER18UN	–	18	16	9,52	3,4	–	0,8	1	○	○	○	YE16		
	16ER16UN	–	16	16	9,52	3,4	–	0,9	1,1	○	○	○	YE16		
	16ER14UN	–	14	16	9,52	3,4	–	1	1,2	○	○	○	YE16		
	16ER13UN	–	13	16	9,52	3,4	–	1	1,3	○	○	○	YE16		
	16ER12UN	–	12	16	9,52	3,4	–	1,1	1,4	○	○	○	YE16		
	16ER11UN	–	11	16	9,52	3,4	–	1,1	1,5	○	○	○	YE16		
	16ER10UN	–	10	16	9,52	3,4	–	1,1	1,5	○	○	○	YE16		
	16ER9UN	–	9	16	9,52	3,4	–	1,2	1,7	○	○	○	YE16		
	16ER8UN	–	8	16	9,52	3,4	–	1,2	1,6	○	○	○	YE16		
	22ER7UN	–	7	22	12,70	4,6	–	1,6	2,3	○	○	○	YE22	AL ... -22	172
	22ER6UN	–	6	22	12,70	4,6	–	1,6	2,3	○	○	○	YE22		
	22ER5UN	–	5	22	12,70	4,6	–	1,7	2,5	○	○	○	YE22		

Order Example: 10 pieces 16ER72UN A41-R1

● Available from stock
○ Upon Request



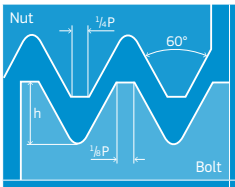
American UN Full Profile



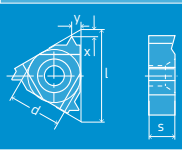
	Ordering Code	Pitch		l	d	s	r	x	y	Grade			Anvil	Suitable Tool Holder	Page
		mm	tpi							A41-R1	BS1-S1	D41-T1			
Right hand	11IR72UN	–	72	11	6,35	3,0	–	0,8	0,3			○	–	NVR ... -11	172
	11IR64UN	–	64	11	6,35	3,0	–	0,8	0,4	○		○	–		
	11IR56UN	–	56	11	6,35	3,0	–	0,7	0,4	○		○	–		
	11IR48UN	–	48	11	6,35	3,0	–	0,6	0,6			○	–		
	11IR40UN	–	40	11	6,35	3,0	–	0,6	0,6	○		○	–		
	11IR36UN	–	36	11	6,35	3,0	–	0,6	0,6	○		○	–		
	11IR32UN	–	32	11	6,35	3,0	–	0,6	0,6	○	○	○	–		
	11IR28UN	–	28	11	6,35	3,0	–	0,6	0,7	○	○	○	–		
	11IR27UN	–	27	11	6,35	3,0	–	0,7	0,8	○		○	–		
	11IR24UN	–	24	11	6,35	3,0	–	0,7	0,8	○	○	○	–		
	11IR20UN	–	20	11	6,35	3,0	–	0,8	0,9	○	○	○	–		
	11IR18UN	–	18	11	6,35	3,0	–	0,8	1,0	○	○	○	–		
	11IR16UN	–	16	11	6,35	3,0	–	0,9	1,1	○	○	○	–		
	11IR14UN	–	14	11	6,35	3,0	–	0,9	1,1	○	○	○	–		
	16IR56UN	–	56	16	9,52	3,4	–	0,7	0,4			○	YI16	AVR ... -16	172
	16IR48UN	–	48	16	9,52	3,4	–	0,6	0,6	○	○	○	YI16	NVR ... -16	172
	16IR44UN	–	44	16	9,52	3,4	–	0,6	0,6	○	○		YI16		
	16IR40UN	–	40	16	9,52	3,4	–	0,6	0,6	○	○	○	YI16		
	16IR36UN	–	36	16	9,52	3,4	–	0,6	0,6	○	○	○	YI16		
	16IR32UN	–	32	16	9,52	3,4	–	0,6	0,6	○	○	○	YI16		
	16IR28UN	–	28	16	9,52	3,4	–	0,6	0,7	○	○	○	YI16		
	16IR27UN	–	27	16	9,52	3,4	–	0,7	0,8	○	○		YI16		
	16IR24UN	–	24	16	9,52	3,4	–	0,7	0,8	○	○	○	YI16		
	16IR20UN	–	20	16	9,52	3,4	–	0,8	0,9	○	○	○	YI16		
	16IR18UN	–	18	16	9,52	3,4	–	0,8	1,0	○	○	○	YI16		
	16IR16UN	–	16	16	9,52	3,4	–	0,9	1,1	○	○	○	YI16		
	16IR14UN	–	14	16	9,52	3,4	–	0,9	1,2	○	○	○	YI16		
	16IR13UN	–	13	16	9,52	3,4	–	1,0	1,3	○	○	○	YI16		
	16IR12UN	–	12	16	9,52	3,4	–	1,1	1,4	○	○	○	YI16		
	16IR11,5UN	–	11,5	16	9,52	3,4	–	1,1	1,5	○		○	YI16		
	16IR11UN	–	11	16	9,52	3,4	–	1,1	1,5	○	○	○	YI16		
	16IR10UN	–	10	16	9,52	3,4	–	1,1	1,5	○	○	○	YI16		
	16IR9UN	–	9	16	9,52	3,4	–	1,2	1,7	○	○	○	YI16		
	16IR8UN	–	8	16	9,52	3,4	–	1,1	1,5	○	○	○	YI16		
	22IR7UN	–	7	22	12,70	4,6	–	1,6	2,3	○	○	○	YI22	AVR ... -22	172
	22IR6UN	–	6	22	12,70	4,6	–	1,6	2,3	○	○	○	YI22	NVR ... -22	172
	22IR5UN	–	5	22	12,70	4,6	–	1,6	2,3	○	○	○	YI22		

Order Example: 10 pieces 16ER72UN A41-R1

● Available from stock
○ Upon Request



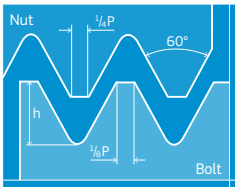
American UN Full Profile



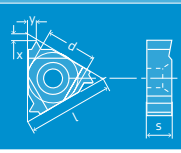
	Ordering Code	Pitch		l	d	s	r	x	y	Grade			Anvil	Suitable Tool Holder	Page
		mm	tpi							A41-R1	B51-S1	D41-T1			
Left hand	16EL56UN	–	56	16	9,52	3,4	–	0,7	0,4			○	YI16	AL ... -16	172
	16EL48UN	–	48	16	9,52	3,4	–	0,6	0,6	○	○	○	YI16		
	16EL44UN	–	44	16	9,52	3,4	–	0,6	0,6	○	○		YI16		
	16EL40UN	–	40	16	9,52	3,4	–	0,6	0,6	○	○	○	YI16		
	16EL36UN	–	36	16	9,52	3,4	–	0,6	0,6	○	○		YI16		
	16EL32UN	–	32	16	9,52	3,4	–	0,6	0,6	○	○	○	YI16		
	16EL28UN	–	28	16	9,52	3,4	–	0,6	0,7	○	○	○	YI16		
	16EL27UN	–	27	16	9,52	3,4	–	0,7	0,8	○	○		YI16		
	16EL24UN	–	24	16	9,52	3,4	–	0,7	0,8	○	○	○	YI16		
	16EL20UN	–	20	16	9,52	3,4	–	0,8	0,9	○	○	○	YI16		
	16EL18UN	–	18	16	9,52	3,4	–	0,8	1,0	○	○	○	YI16		
	16EL16UN	–	16	16	9,52	3,4	–	0,9	1,1	○	○	○	YI16		
	16EL14UN	–	14	16	9,52	3,4	–	1,0	1,2	○	○		YI16		
	16EL13UN	–	13	16	9,52	3,4	–	1,0	1,3	○	○		YI16		
	16EL12UN	–	12	16	9,52	3,4	–	1,1	1,4	○	○	○	YI16		
	16EL11UN	–	11	16	9,52	3,4	–	1,1	1,5	○	○		YI16		
	16EL10UN	–	10	16	9,52	3,4	–	1,1	1,5	○	○		YI16		
	16EL9UN	–	9	16	9,52	3,4	–	1,2	1,7	○	○		YI16		
	16EL8UN	–	8	16	9,52	3,4	–	1,2	1,6	○	○		YI16		
	22EL7UN	–	7	22	12,70	4,6	–	1,6	2,3	○	○		YI22	AL ... -22	172
	22EL6UN	–	6	22	12,70	4,6	–	1,6	2,3	○	○		YI22		
	22EL5UN	–	5	22	12,70	4,6	–	1,7	2,5		○	○	YI22		

Order Example: 10 pieces 16EL72UN A41-R1

● Available from stock
○ Upon Request



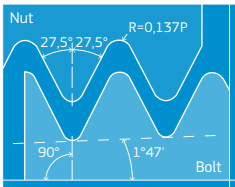
American UN Full Profile



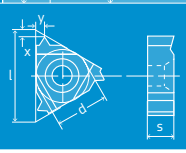
	Ordering Code	Pitch		l	d	s	r	x	y	Grade			Anvil	Suitable Tool Holder	Page
		mm	tpi							A41-R1	B51-S1	D41-T1			
Left hand	11IL32UN	–	32	11	6,35	3,0	–	0,6	0,6	○		○	–	NVR ... -11	172
	11IL28UN	–	28	11	6,35	3,0	–	0,6	0,7	○		○	–		
	11IL24UN	–	24	11	6,35	3,0	–	0,7	0,8	○	○	○	–		
	11IL20UN	–	20	11	6,35	3,0	–	0,8	0,9		○		–		
	11IL18UN	–	18	11	6,35	3,0	–	0,8	1,0	○	○		–		
	11IL16UN	–	16	11	6,35	3,0	–	0,9	1,1	○			–		
	11IL14UN	–	14	11	6,35	3,0	–	0,9	1,1	○		○	–		
	16IL48UN	–	48	16	9,52	3,4	–	0,6	0,6	○	○		YE16	AVR ... -16	172
	16IL44UN	–	44	16	9,52	3,4	–	0,6	0,6	○	○		YE16	NVR ... -16	172
	16IL40UN	–	40	16	9,52	3,4	–	0,6	0,6	○	○		YE16		
	16IL36UN	–	36	16	9,52	3,4	–	0,6	0,6	○	○		YE16		
	16IL32UN	–	32	16	9,52	3,4	–	0,6	0,6	○	○		YE16		
	16IL28UN	–	28	16	9,52	3,4	–	0,6	0,7	○	○		YE16		
	16IL27UN	–	27	16	9,52	3,4	–	0,7	0,8	○	○		YE16		
	16IL24UN	–	24	16	9,52	3,4	–	0,7	0,8	○	○	○	YE16		
	16IL20UN	–	20	16	9,52	3,4	–	0,8	0,9	○	○	○	YE16		
	16IL18UN	–	18	16	9,52	3,4	–	0,8	1,0	○	○	○	YE16		
	16IL16UN	–	16	16	9,52	3,4	–	0,9	1,1	○	○	○	YE16		
	16IL14UN	–	14	16	9,52	3,4	–	0,9	1,2	○	○	○	YE16		
	16IL13UN	–	13	16	9,52	3,4	–	1,0	1,3	○	○		YE16		
	16IL12UN	–	12	16	9,52	3,4	–	1,1	1,4	○	○		YE16		
	16IL11UN	–	11	16	9,52	3,4	–	1,1	1,5	○	○	○	YE16		
	16IL10UN	–	10	16	9,52	3,4	–	1,1	1,5	○	○	○	YE16		
	16IL9UN	–	9	16	9,52	3,4	–	1,2	1,7	○	○		YE16		
	16IL8UN	–	8	16	9,52	3,4	–	1,1	1,5	○	○	○	YE16		
	22IL7UN	–	7	22	12,70	4,6	–	1,6	2,3	○	○		YE22	AVR ... -22	172
	22IL6UN	–	6	22	12,70	4,6	–	1,6	2,3	○	○		YE22	NVR ... -22	172
	22IL5UN	–	5	22	12,70	4,6	–	1,6	2,3	○	○		YE22		

Order Example: 10 pieces 11IL72UN A41-R1

● Available from stock
○ Upon Request

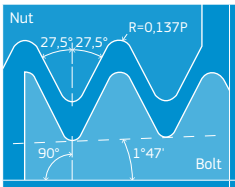


BSPT - Full Profile

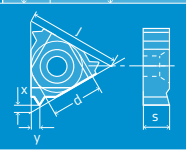


	Ordering Code	Pitch mm	Pitch tpi	l	d	s	r	x	y	Grade A41-R1	Grade BS1-S1	Grade D41-T1	Anvil	Suitable Tool Holder	Page
Right hand	16ER28BSPT	–	28	16	9,52	3,4	–	0,6	0,6	○	○	○	YE16	AL ... -16	172
	16ER19BSPT	–	19	16	9,52	3,4	–	0,8	0,9	○	○	○	YE16		
	16ER14BSPT	–	14	16	9,52	3,4	–	1,0	1,2	○	○	○	YE16	AL ... -16	172
	16ER11BSPT	–	11	16	9,52	3,4	–	1,1	1,5	○	○	○	YE16		
Left hand	16EL14BSPT	–	14	16	9,52	3,4	–	1,0	1,2	○			YI16	AL ... -16	172
	16EL11BSPT	–	11	16	9,52	3,4	–	1,1	1,5	○			YI16		

Indexable Inserts - Internal Threads



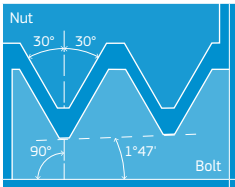
BSPT - Full Profile



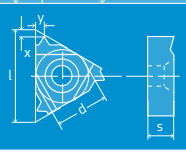
	Ordering Code	Pitch mm	Pitch tpi	l	d	s	r	x	y	Grade A41-R1	Grade BS1-S1	Grade D41-T1	Anvil	Suitable Tool Holder	Page
Right hand	11IR19BSPT	–	19	11	6,35	3,0	–	0,8	0,9	○	○	○	–	NVR ... -11	172
	11IR14BSPT	–	14	11	6,35	3,0	–	0,9	1,0	○	○	○	–		
	16IR28BSPT	–	28	16	9,52	3,4	–	0,6	0,6	○			YI16	AVR ... -16	172
	16IR19BSPT	–	19	16	9,52	3,4	–	0,8	0,9	○			YI16	NVR ... -16	172
	16IR14BSPT	–	14	16	9,52	3,4	–	1,0	1,2	○	○	○	YI16		
	16IR11BSPT	–	11	16	9,52	3,4	–	1,1	1,5	○	○	○	YI16		
Left hand	11IL14BSPT	–	14	11	6,35	3,0	–	0,9	1,0		○		–	NVR ... -11	172
	16IL14BSPT	–	19	16	9,52	3,4	–	0,8	0,9	○			YE16	AVR ... -16	172
	16IL11BSPT	–	28	16	9,52	3,4	–	0,6	0,6	○			YE16	NVR ... -16	172

Order Example: 10 pieces 16ER28BSPT A41-R1

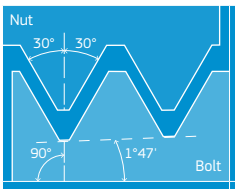
● Available from stock
○ Upon Request



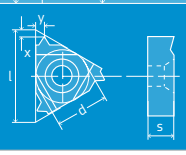
NPT - Full Profile



	Ordering Code	Pitch		l	d	s	r	x	y	Grade			Anvil	Suitable Tool Holder	Page
		mm	tpi							A41-R1	B51-S1	D41-T1			
Right hand	16ER27NPT	–	27	16	9,52	3,4	–	0,7	0,8	○	○	○	YE16	AL ... -16	172
	16ER18NPT	–	18	16	9,52	3,4	–	0,8	1,0	○	○	○	YE16		
	16ER14NPT	–	14	16	9,52	3,4	–	0,9	1,2	○	○	○	YE16		
	16ER11,5NPT	–	11,5	16	9,52	3,4	–	1,1	1,5	○	○	○	YE16		
	16ER8NPT	–	8	16	9,52	3,4	–	1,3	1,8	○	○	○	YE16		
Left hand	16EL27NPT	–	27	16	9,52	3,4	–	0,7	0,8			○	YI16	AL ... -16	172
	16EL18NPT	–	18	16	9,52	3,4	–	0,8	1,0	○	○	○	YI16		
	16EL14NPT	–	14	16	9,52	3,4	–	0,9	1,2	○	○	○	YI16		
	16EL11,5NPT	–	11,5	16	9,52	3,4	–	1,1	1,5	○	○	○	YI16		
	16EL8NPT	–	8	16	9,52	3,4	–	1,3	1,8	○			YI16		



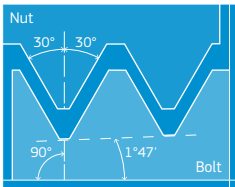
NPTF - Full Profile



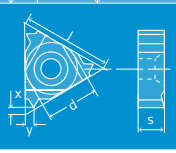
	Ordering Code	Pitch		l	d	s	r	x	y	Grade			Anvil	Suitable Tool Holder	Page
		mm	tpi							A41-R1	B51-S1	D41-T1			
Right hand	16ER27NPTF	–	8	16	9,52	3,4	–	1,3	1,8	○	○	○	YE16	AL ... -16	172
	16ER18NPTF	–	11,5	16	9,52	3,4	–	1,1	1,5	○	○	○	YE16		
	16ER14NPTF	–	14	16	9,52	3,4	–	0,9	1,2	○	○	○	YE16		
	16ER11,5NPTF	–	18	16	9,52	3,4	–	0,8	1,0	○	○	○	YE16		
	16ER8NPTF	–	27	16	9,52	3,4	–	0,7	0,8	○		○	YE16		
Left hand	16EL18NPTF	–	11,5	16	9,52	3,4	–	1,1	1,5	○			YI16	AL ... -16	172

Order Example: 10 pieces 16ER27NPT A41-R1

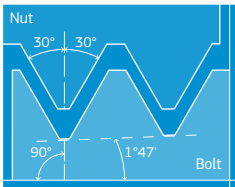
● Available from stock
○ Upon Request



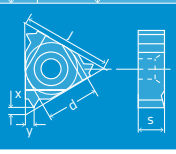
NPT - Full Profile



	Ordering Code	Pitch mm	Pitch tpi	l	d	s	r	x	y	Grade A41-R1	Grade B51-S1	Grade D41-T1	Anvil	Suitable Tool Holder	Page
Right hand	11IR27NPT	–	14	11	6,35	3,0	–	0,8	1,0	○	○		–	NVR ... -11	172
	11IR18NPT	–	18	11	6,35	3,0	–	0,8	1,0	○	○	○	–		
	11IR14NPT	–	27	11	6,35	3,0	–	0,7	0,8	○	○	○	–		
	16IR27NPT	–	8	16	9,52	3,4	–	1,3	1,8	○	○		YI16	AVR ... -16	172
	16IR18NPT	–	11,5	16	9,52	3,4	–	1,1	1,5	○	○	○	YI16	NVR ... -16	172
	16IR14NPT	–	14	16	9,52	3,4	–	0,9	1,2	○	○	○	YI16		
	16IR11,5NPT	–	18	16	9,52	3,4	–	0,8	1,0	○	○	○	YI16		
	16IR8NPT	–	27	16	9,52	3,4	–	0,7	0,8	○	○	○	YI16		
Left hand	11IL27NPT	–	27	11	6,35	3,0	–	0,7	0,8	○			–	NVR ... -11	172
	11IL18NPT	–	18	11	6,35	3,0	–	0,8	1,0		○		–		
	11IL14NPT	–	14	11	6,35	3,0	–	0,8	1,0	○	○		–		
	16IL14NPT	–	14	16	9,52	3,4	–	0,9	1,2	○	○		YE16	AVR ... -16	172
	16IL11,5NPT	–	11,5	16	9,52	3,4	–	1,1	1,5	○			YE16	NVR ... -16	172
	16IL8NPT	–	8	16	9,52	3,4	–	1,3	1,8	○			YE16		



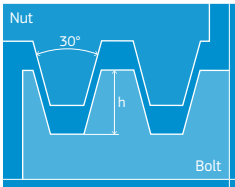
NPTF - Full Profile



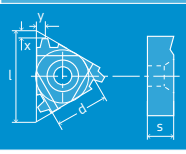
	Ordering Code	Pitch mm	Pitch tpi	l	d	s	r	x	y	Grade A41-R1	Grade B51-S1	Grade D41-T1	Anvil	Suitable Tool Holder	Page
Right hand	11IR18NPTF	–	18	11	6,35	3,0	–	0,8	1,0	○	○		–	NVR ... -11	172
	11IR14NPTF	–	14	11	6,35	3,0	–	0,8	1,0	○	○	○	–		
	16IR18NPTF	–	27	16	9,52	3,4	–	0,7	0,8		○		YI16	AVR ... -16	172
	16IR14NPTF	–	18	16	9,52	3,4	–	0,8	1,0	○	○	○	YI16	NVR ... -16	172
	16IR11,5NPTF	–	14	16	9,52	3,4	–	0,9	1,2	○	○	○	YI16		
	16IR8NPTF	–	11,5	16	9,52	3,4	–	1,1	1,5	○	○	○	YI16		

Order Example: 10 pieces 11IR27NPT A41-R1

● Available from stock
○ Upon Request

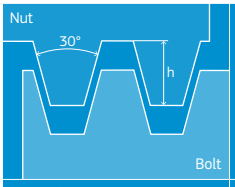


Trapezoidal DIN 103 - Full Profile

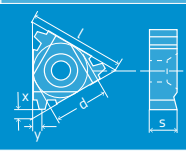


	Ordering Code	Pitch mm	Pitch tpi	l	d	s	r	x	y	Grade A41-R1	Grade B51-S1	Grade D41-T1	Anvil	Suitable Tool Holder	Page
Right hand	11ER1,5TR	1,5	–	11	6,35	3,0	–	0,8	0,9	●	●			NL ... -11	172
	16ER1,5TR	1,5	–	16	9,52	3,4	–	1,0	1,1	●	●	○	YE16	AL ... -16	172
	16ER2,0TR	2,0	–	16	9,52	3,4	–	1,1	1,3	●	●	○	YE16		
	16ER3,0TR	3,0	–	16	9,52	3,4	–	1,3	1,5	●	●	○	YE16		
	22ER4,0TR	4,0	–	22	12,70	4,6	–	1,7	1,9	●	●	○	YE22	AL ... -22	172
	22ER5,0TR	5,0	–	22	12,70	4,6	–	2,1	2,5	●	●	○	YE22		
	22ER6,0TR	6,0	–	22	12,70	4,6	–	2,3	2,7	●	●		YE22		
	27ER6,0TR	6,0	–	27	15,88	6,2	–	2,3	2,7	●	●	○	YE27	AL ... -27	
Left hand	16EL1,5TR	1,5	–	16	9,52	3,4	–	1,0	1,1	●		○	YI16	AL ... -16	172
	16EL2,0TR	2,0	–	16	9,52	3,4	–	1,1	1,3	●	●	○	YI16		
	16EL3,0TR	3,0	–	16	9,52	3,4	–	1,3	1,5	●	●	○	YI16		
	22EL4,0TR	4,0	–	22	12,70	4,6	–	1,7	1,9	●	●	○	YI22	AL ... -22	172
	22EL5,0TR	5,0	–	22	12,70	4,6	–	2,1	2,5	●	●	○	YI22		
	22EL6,0TR	6,0	–	22	12,70	4,6	–	2,3	2,7	●		○	YI22		
	27EL6,0TR	6,0	–	27	15,88	6,2	–	2,3	2,7	●	●		YI27	AL ... -27	172

Indexable Inserts - Internal Threads



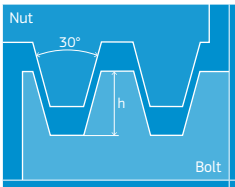
Trapezoidal DIN 103 - Full Profile



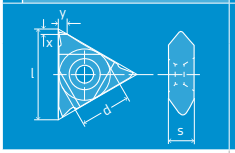
	Ordering Code	Pitch mm	Pitch tpi	l	d	s	r	x	y	Grade A41-R1	Grade B51-S1	Grade D41-T1	Anvil	Suitable Tool Holder	Page
Right hand	11IR1,5TR	1,5	–	11	6,35	3,0	–	0,8	0,9	●		○	–	NVR ... -11	172
	16IR1,5TR	1,5	–	16	9,52	3,4	–	1,0	1,1	●	●	○	YI16	AVR ... -16	172
	16IR2,0TR	2,0	–	16	9,52	3,4	–	1,1	1,3	●	●	○	YI16	NVR ... -16	172
	16IR3,0TR	3,0	–	16	9,52	3,4	–	1,3	1,5	●	●	○	YI16		
	22IR4,0TR	4,0	–	22	12,70	4,6	–	1,7	1,9	●	●	○	YI22	AVR ... -22	172
	22IR5,0TR	5,0	–	22	12,70	4,6	–	2,1	2,5	●	●	○	YI22	NVR ... -22	172
Left hand	11IL1,5TR	1,5	–	11	6,35	3,0	–	0,8	0,9	●		○	–	NVR ... -11	172
	16IL1,5TR	1,5	–	16	9,52	3,4	–	1,0	1,1	●		○	YE16	AVR ... -16	172
	16IL2,0TR	2,0	–	16	9,52	3,4	–	1,1	1,3	●		○	YE16	NVR ... -16	172
	16IL3,0TR	3,0	–	16	9,52	3,4	–	1,3	1,5	●	●	○	YE16		
	22IL4,0TR	4,0	–	22	12,70	4,6	–	1,7	1,9	●	●		YE22	AVR ... -22	172
	22IL5,0TR	5,0	–	22	12,70	4,6	–	2,1	2,5	●		○	YE22	NVR ... -22	172

Order Example: 10 pieces 11ER1,5TR A41-R1

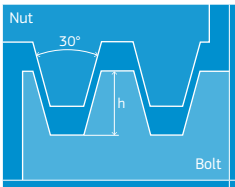
● Available from stock
○ Upon Request



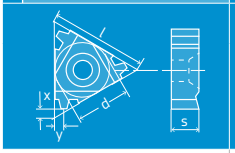
Trapezoidal DIN 103 - Full Profile, Form V



	Ordering Code	Pitch mm	Pitch tpi	l	d	s	r	x	y	Grade A41-R1	Grade B51-S1	Grade D41-T1	Anvil	Suitable Tool Holder	Page
Right hand	27VER6,0TR	6,0	–	27	15,88	6,0	–	1,0	3,3		●			NL ... -27...V	173
	27VER7,0TR	7,0	–	27	15,88	6,0	–	1,0	3,3		●				
	27VER8,0TR	8,0	–	27	15,88	6,0	–	1,0	3,3		●				
	27VER12,0TR	12,0	–	27	15,88	10,0	–	1,0	5,2		●				
Left hand	27VEL6,0TR	6,0	–	27	15,88	6,0	–	1,0	3,3		●			NL ... -27...V	173
	27VEL7,0TR	7,0	–	27	15,88	6,0	–	1,0	3,3		●				
	27VEL8,0TR	8,0	–	27	15,88	6,0	–	1,1	3,3		●				
	27VEL10,0TR	10,0	–	27	15,88	8,0	–	1,7	4,3		●				



Trapezoidal DIN 103 - Full Profile, Form U

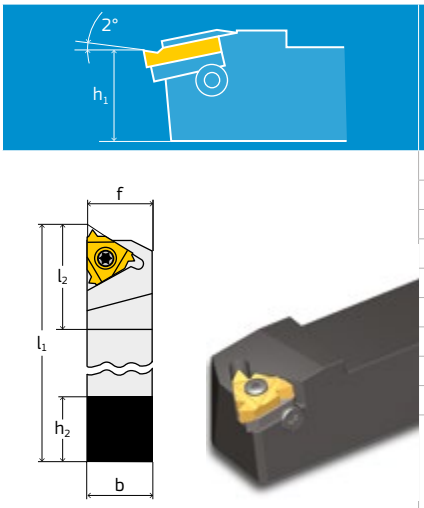


	Ordering Code	Pitch mm	Pitch tpi	l	d	s	r	x	y	Grade A41-R1	Grade B51-S1	Grade D41-T1	Anvil	Suitable Tool Holder	Page
U-Typ	**Right hand**														
	22UE6,0TR	6,0	–	22	12,70	6,0	–	1,0	11,0	●	●		YE22U	AL ... -22...U	173
	22UE7,0TR	7,0	–	22	12,70	6,0	–	1,0	11,0	●			YE22U		
	22UE8,0TR	8,0	–	22	12,70	6,0	–	1,0	11,0	●			YE22U		
	27UE8,0TR	8,0	–	27	15,88	8,0	–	1,0	13,7	●	●		YE27U	AL ... -27...U	173
	27UE9,0TR	9,0	–	27	15,88	8,0	–	1,0	13,7	●	●		YE27U		
Usable for right and left side	**Left hand**														
	22UE6,0TR	6,0	–	22	12,70	6,0	–	1,0	11,0	●	●		YI22U	AL ...-22...U	173
	22UE7,0TR	7,0	–	22	12,70	6,0	–	1,0	11,0	●			YI22U		
	22UE8,0TR	8,0	–	22	12,70	6,0	–	1,0	11,0	●			YI22U		
	27UE8,0TR	8,0	–	27	15,88	8,0	–	1,0	13,7	●	●		YI27U	AL ... -27...U	173
	27UE9,0TR	9,0	–	27	15,88	8,0	–	1,0	13,7	●	●		YI27U		

Order Example: 10 pieces 27VER6,0TR A41-R1

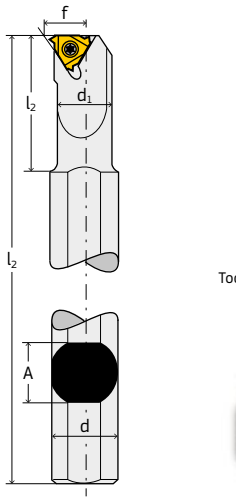
● Available from stock

○ Upon Request



Ordering Code	b =h_2 =h_1	f	l_1	l_2	Insert Size
NL12-11	12	12	80	17,5	11
AL16-16	16	16	100	22	16
AL20-16	20	20	128,6	30	16
AL25-16	25	25	153,6	30	16
AL32-16	32	32	173,6	30	16
AL25-22	25	25	155,7	36	22
AL32-22	32	32	175,7	36	22
AL32-27	32	32	175,9	40	27
AL40-27	40	40	205,9	40	27

Tool holder, internal machining



Tool holder with coolant

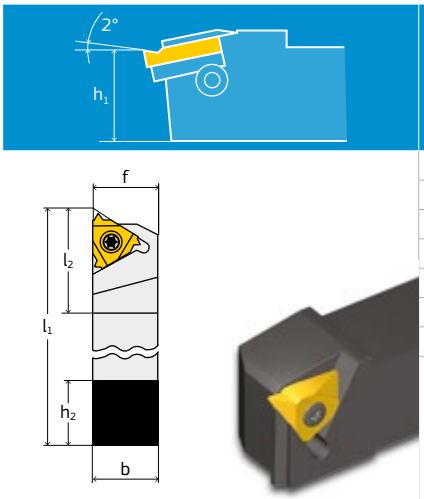
Ordering Code	A	l_1	l_2	d	d_1	f	D_{min}	Insert Size
NVRC10-11	18,0	180	25	20	10,0	7,3	13	11
NVRC13-11	18,0	180	32	20	13,0	8,9	16	11
NVRC13-16	18,0	180	32	20	12,7	10,3	17	16
NVRC16-16	18,0	180	40	20	16,0	11,5	20	16
NVRC16D-16	15,2	150	32	16	16,0	11,3	20	16
AVRC20-16	18,0	180	40	20	20,0	13,4	24	16
AVRC25-16	29,0	250	60	32	25,0	16,3	29	16
AVRC25D-16	22,6	200	45	25	24,6	16,1	29	16
AVRC32-16	29,0	250	60	32	32,0	19,6	36	16
AVRC40-16	36,0	300	60	40	40,0	23,8	44	16
NVRC20-22	18,0	180	50	20	20,0	15,6	27	22
AVRC25-22	29,0	250	60	32	25,0	17,4	32	22
AVRC32-22	29,0	250	60	32	32,0	21,5	39	22
AVRC40-22	36,0	300	60	40	40,0	25,8	47	22
AVRC50-27	45	350	75	50	50,0	31,4	58	27
AVRC60-27	54	400	75	60	60,0	36,4	69	27

The above holders are right hand execution. To obtain left hand execution, please add LH to the ordering code.

All holders have a 1,5 helix angle. Using AL... and AVRC...-holders helix angle can by varied by changing the anvil (please refer to page 174).

NVRC. holders are without anvil.

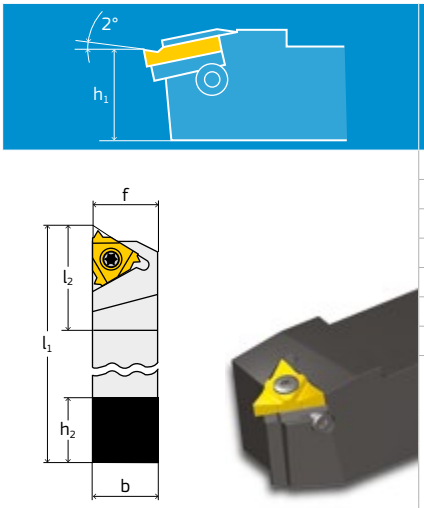
Notice: external and internal holder also with clamping finger "type C",available on demand (e.g. NVRC16-16C)



Ordering Code	b =h2 =h1	f	l1	l2	Insert Size
NL32-27V-6	32	32	170	40	27
NL32-27V-8	32	34,1	170	40	27
NL32-27V-10	32	35,8	170	40	27
NL40-27V-6	40	40,0	200	40	27
NL40-27V-8	40	42,1	200	40	27
NL40-27V-10	40	43,8	200	40	27

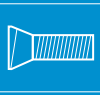
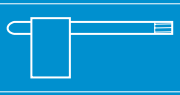
Insert see page 171 Form U

Tool holder, external machining



Ordering Code	b =h2 =h1	f	l1	l2	Insert Size
AL25-22U	25	25	178,4	38	22
AL32-22U	32	32	178,4	38	22
AL40-22U	40	40	208,4	38	22
AL25-27U	25	25	179,1	40	27
AL32-27U	32	32	179,1	40	27
AL40-27U	40	40	209,1	40	27
AL50-27U	50	50	259,1	40	27

Insert see page 171 Form U

Tool holder	Insert Size	Clamp Screw	Screw + Washer	Key	Anvil	
						
		Ordering Code			RH/in LH	LH/in RH
NVRC	11	SN11T	–	V02-T-0800	–	–
NVRC	16	SN16T	–	V02-T-1000	–	–
NVRC	22	SN22T	–	V02-T-2000	–	–
"Standard"	16	SA16T	SY16T	V02-T-1000	YE16	YI16
(AL..., AV...)	22	SA22T	SY22T	V02-T-2000	YE22	YI22
	27	SA27T	SY27T	V02-T-2500	YE27	YI27
Standardmit	16	SA16T/C3	SY16T	V02-T-1000	YE16	YI16
Klemmfinger	22	SA22T/C4	SY22T	V02-T-2000	YE22	YI22
	27	SA27T/C5	SY27T	V02-T-2500	YE27	YI27
U-Type	22	SA22T	SY22T	V02-T-2000	YE22U	YI22U
	27	SA27T	SY27T	V02-T-2500	YE27U	YI27U
V-Type	27V	SN27T	–	V02-T-3000	–	–

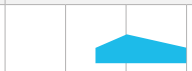
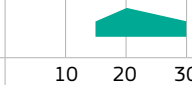
Anvil sets

We recommend you to buy these kits in order to have on hand the right anvil for any job at any time.

Anvil	Ordering Code	The set includes 1 of each
16	ABY16	YE16-2P, 1P, 1N, 2N, 3N, YI16-2P, 1P, 1N, 2N, 3N
22	ABY22	YE22-2P, 1P, 1N, 2N, 3N, YI22-2P, 1P, 1N, 2N, 3N
27	ABY27	YE27-2P, 1P, 1N, 2N, 3N, YI27-2P, 1P, 1N, 2N, 3N
22U	ABY22U	YE22U-2P, 1P, 1N, 2N, 3N, YI22-2P, 1P, 1N, 2N, 3N
27U	ABY27U	YE27U-2P, 1P, 1N, 2N, 3N, YI22-2P, 1P, 1N, 2N, 3N

Order Example: 1 piece AL25-16 (... right hand execution), 1 piece AL25-16LH (... left hand execution)

Thread Turning Grades Overview

Grade	ISO	Application Range	Material Group						Application					
		10 20 30 40	P Steel	M Stainless	K Grey cast iron	N Nonferrous metals	S High temperature materials	H Hard materials	T Turning	M Milling	D Drilling	S Threading	G Grooving	P Parting
A41-R1	HC-P20		■	□								●		
B51-S1	HC-M20		□	■								●		
	HC-K20				■							●		
D41-T1	HC-P40					■	□					●		
Application peak  Full range to ISO 513		10 20 30 40	■ Main application □ Further applications						● Standard grade					

Main grade coated

- A41-R1 (HC-P20)

Main grade for steel machining. High breaking strength. Also on bad conditions. Micro grain substrate with thin TiAlN coating.

- B51-S1 (HC-M20, HC-K20)

Main grade for stainless machining. Extremely good applicable for the machining of acid proofed materials.

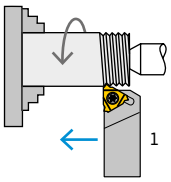
- D41-T1 (HC-N20)

Uncoated K 20 fine grain grade for the machining of non ferrous metals, aluminium, titanium and heat resistant alloys.

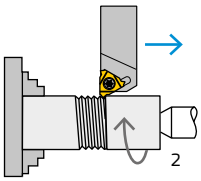
Thread Turning methods

External thread right hand

Insert and holder right hand,
b: regular

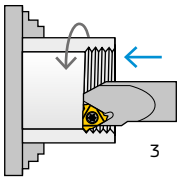


Insert and holder left hand,
b: reverse

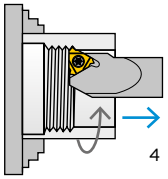


Internal thread right hand

Insert and holder right hand,
b: regular

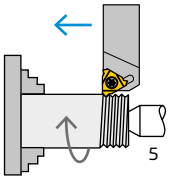


Insert and holder left hand,
b: reverse

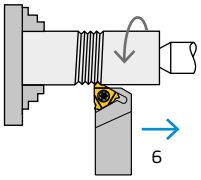


External thread left hand

Insert and holder left hand,
b: regular

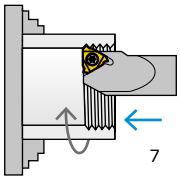


Insert and holder right hand,
b: reverse

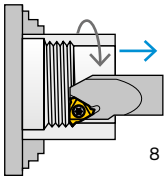


Internal thread left hand

Insert and holder left hand,
b: regular

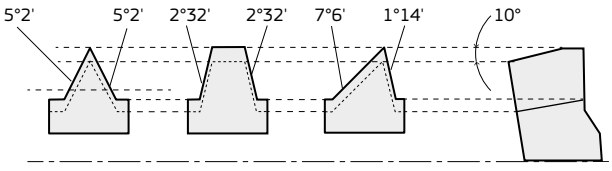


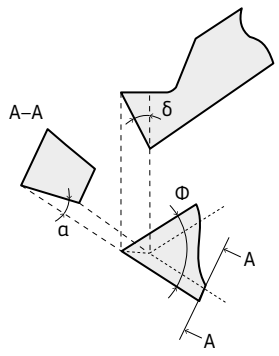
Insert and holder right hand,
b: reverse



Flank clearance angle α

The toolholders are designed to tilt the insert when seated in the holder, (10° for external, 15° for internal tooling).
As the flank clearance angle α varies depending on the enclosed flank angle Φ, we give here a formula to calculate α and on page 178 some examples which show the importance of a correct ajustment of the helix angle by the help of anvils, especially in profiles with small enclosed flank angles to avoid rubbing of the insert cutting edge on the workpiece.





$\alpha = \arctan(\sin \alpha/2 \cdot \tan \delta)$

Where
α = Flank clearance angle

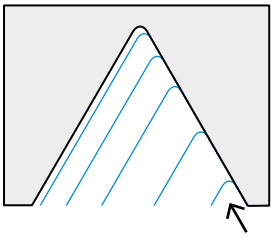
δ = Tilt angle
Φ = Enclosed flanck angle

Infeed methods

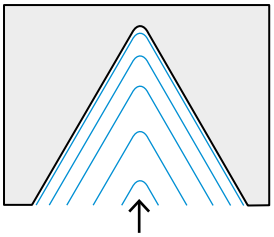
Radial infeed

Radial infeed is the simplest and quickest method. The feed is perpendicular to the turning axis, and both flanks on the insert perform the cutting operation. Radial infeed is recommended:
- when the pitch is smaller than 1.0 mm
- for material with short chips
- for materials having cold hardening tendency

Radial infeed



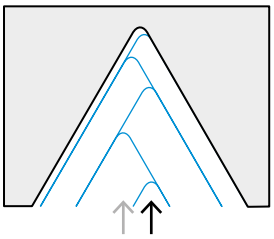
Flank infeed



Flank infeed

Flank infeed is recommended
- when the thread pitch is more than 1.0 mm. Using the radial method, the effective cutting edge length is too large, resulting in chatter
- for TRAPEZOIDAL and ACME. The radial method result in three cutting edge, making chip flow very difficult

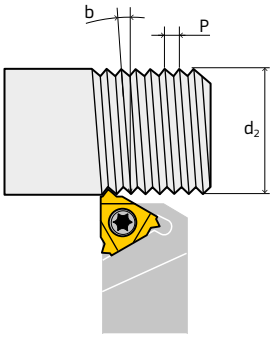
Alternating flank infeed method



Alternating flank infeed method

Use of the alternate flank infeed method is recommended especially in large pitches, and for materials with long chips. This method divedes the work equally on both flanks, resulting in equal wear along the cutting edges. Alternate flank infeed requires more complicated programming and is not available on all lathes.

Choosing the correct Anvil



The Helix Angle[1)]

Formula for it's calculation:

$$\beta = \arctan\frac{P}{\pi \cdot d_2} \qquad \text{(simplified: } \beta = \frac{P}{d_2} \cdot 20\text{)}$$

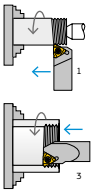
Where: β = Helix angle [o]
P = pitch [mm] (use lead for multi-start threads)
d_2 = pitch diameter [mm]

[1)] The helix angle can also be found from the graph on page 178.

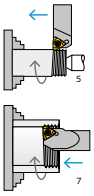
To determine the correct anvil use the table on page 178.

Helix angle

Right hand thread
Right hand toolholder

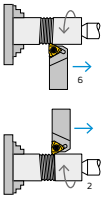


Left hand thread
Left hand toolholder

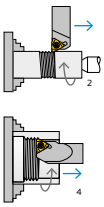


Feed towards the chuck

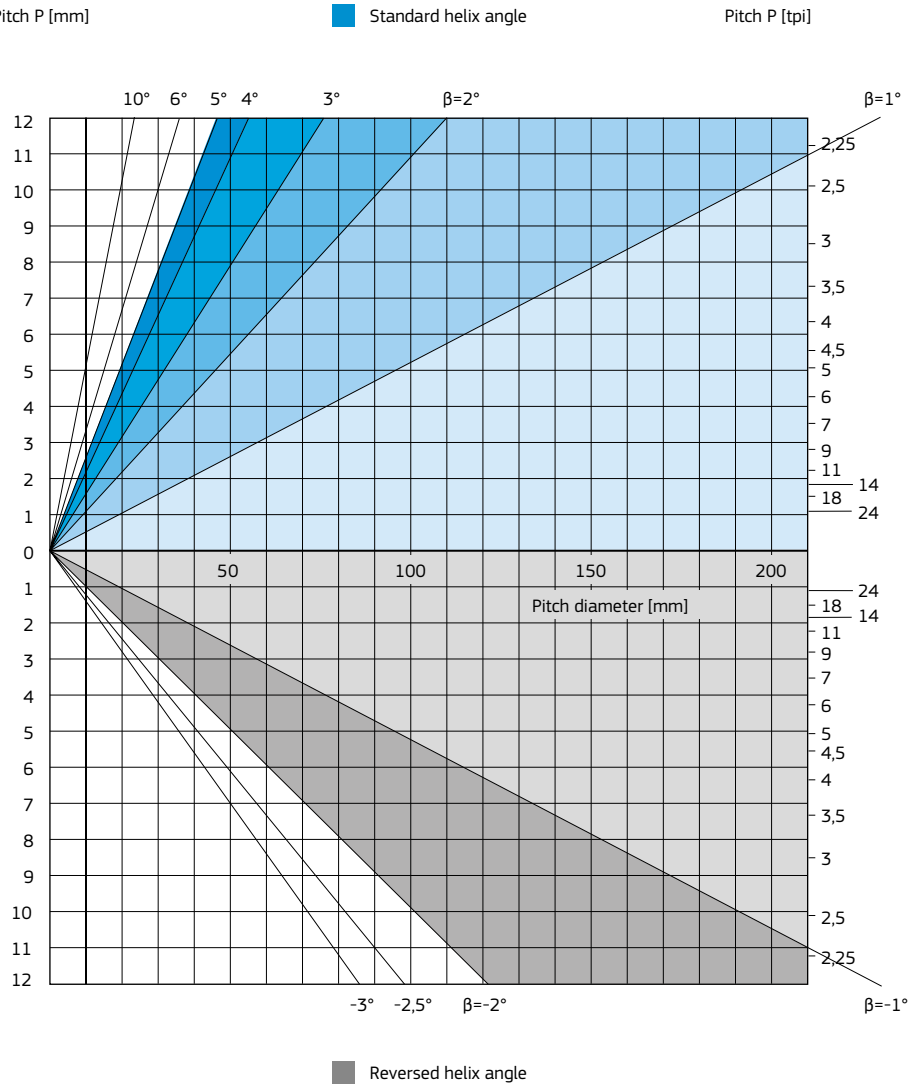
Left hand thread
Right hand toolholder



Right hand thread
Left hand toolholder



Feed towards the tailstock

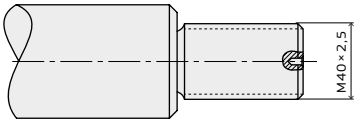


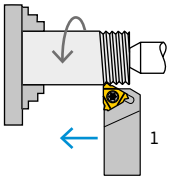
Anvils

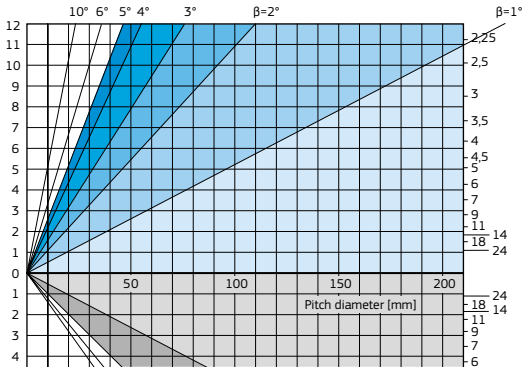
Helix Angle		4,5	3,5	2,5	1,5	0,5	0	-0,5	-1,5
Insert I	Holder	Ordering Code							
16	ER/IL	YE16-3P	YE16-2P	YE16-1P	YE16	YE16-1N	YE16-1,5N	YE16-2N	YE16-3N
16	EL/IR	YI16-3P	YI16-2P	YI16-1P	YI16	YI16-1N	YI16-1,5N	YI16-2N	YI16-3N
22	ER/IL	YE22-3P	YE22-2P	YE22-1P	YE22	YE22-1N	YE22-1,5N	YE22-2N	YE22-3N
22	EL/IR	YI22-3P	YI22-2P	YI22-1P	YI22	YI22-1N	YI22-1,5N	YI22-2N	YI22-3N

Machining Examples

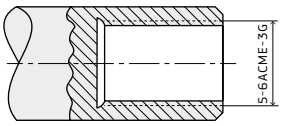
Thread: ISO-metric M40×2,5, external right hand
Material: 42CrMo4
Choosen working method: Nr. 1, feed towards the chuck
Tool holder: AL25-16
Insert: 16ER2,5ISO
Grade: A41-R1
Determination of the helix angle and choice of the correct anvil:
From the diagram on page 177 a helix angle β between 1° and 2° is found. To this helix angle corresponds anvil YE16 in the table on page 178. Cutting speed and number of passes are taken from the tables on page 180:
V_c: 120 m/min, number of passes: 10

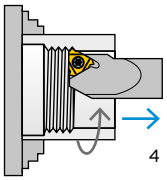


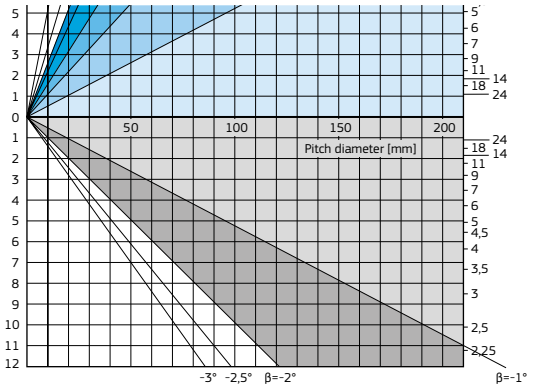




Thread: ACME internal right hand
Pitch: 6 tpi
Diameter of hole: 5“
Material: Stainless austenitic
Choosen working method: No. 4, feed off the chuck (for better evacuation of the chips)
Tool holder: AVR40-22LH
Insert: 22IL6ACME
Grade: A51-B1
Determination of the helix angle and choice of the correct anvil:
From the diagram on page 177 a helix angle β between 0° and 1° is found. To this helix angle corresponds anvil YE22-2N in the table.on page 178. Cutting speed and number of passes are taken from the tables on page 180:
V_c: 150 m/min, number of passes: 18







Options against machining problems, Thread Turning

Option	Problem						
	Increased insert flank wear	Uneven cutting edge wear	Extreme plastisc deformation	Cutting edge breakage	Built-up edge	Thread profile is to shallow	Poor surface quality
Carbide wear resistance	↑		↑		↑		
Carbide toughness				↑			
Cutting speed	↓		↓		↑		↓
Feed			↓	↓			
Number of passes			↑	↑			
Flank infeed method		↔					↔
Anvil		↔					↔
Height of cutting edge						↔	
Fixation					↔		
Size of the blank						↔	
Cooling	↑		↑	↔			
Change of the cutting edge						↔	

↑ Increase ↓ Reduce ↔ Optimize

Number of passes

Pitch																
	mm	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,50	4,00	4,50	5,00	5,50	6,00	8,00
	tpi	48	32	24	20	16	14	12	10	8	7	6	5,5	5	4,5	4	3
Number of passes		4–6	4–7	4–8	5–9	6–10	7–12	7–12	8–14	9–16	10–18	11–18	11–19	12–20	12–20	12–20	15–24

Cutting data standard value, Thread Turning

Material Group	Mainworkpiece material groups and their characteristics letters			Brinell Hardness HB	Cutting speed v_c [m/min]		
	Material				A41-R1	B51-S1	D41-T1
P	Unalloyed steel[1)]	ca. 0,15 %C annealed		125	115 – 190		
		ca. 0,45 %C annealed		150	100 – 175		
		ca. 0,75 %C hardened and temp.		170	90 – 165		
	Low-alloy steel[1)]	annealed		180	100 – 180		
		heat treated		275	75 – 140		
				350	70 – 135		
	High-alloy steel and high alloy tool steel[1)]	annealed		200	80 – 120		
		hardened and temp.		325	50 – 100		
	Steel cast[1)]	ferritic/martensitic annealed		200	70 – 130		
		martensitic hardened and temp.		225	60 – 120		
M	Stainless steel[1)] ferritic	unhardenable		200	70 – 130	70 – 150	
		hardened		300	60 – 115	60 – 125	
	Stainless steel[1)] austenitic	austenitic		180	90 – 140	90 – 160	
		Duplex		200	40 – 110	40 – 120	
	Special steel cast[1)] ferritic	unhardenable		200	90 – 120	90 – 150	
		hardened		330	65 – 110	65-120	
	Special steel cast[1)] austenitic	austenitic		200	85 – 110	85 – 120	
		hardened		330	60 – 100	60 – 110	
K	Grey cast iron	perlitic/ferritic/ferritic		180	70 – 130		
		perlitic (martensitic)		260	60 – 115		
	Nodular graphite cast iron	ferritic		160	125 – 160		
		perlitic		260	90 – 120		
	Malleable cast iron	ferritic		130	60 – 70		
		perlitic		230	60 – 145		
N	Aluminium alloys forge ironed	rolled, not hardenable		60	100 – 365		100 – 250
	Aluminium alloys	casted not hardenable		75	200 – 400		80 – 120
		cast Si 13–22 %		130	60 – 180		50 – 120
	Copper and copper alloys (Bronze/Brass)	Brass		90	80 – 225		70 – 170
		Bronze, non leaded copper		100	80 – 225		70 – 170
S	Heat resistant alloys	Fe-based	heat treated	200	45 – 60		30 – 50
			aged	280	30 – 50		25 – 40
		Ni- or Co-based	heat treated	250	20 – 30		20 – 30
			aged	350	15 – 25		15 – 25
	Titanium alloys	Pure titanium		400 Rm			
		Alpha- and Beta-alloys hardened		1050 Rm	50 – 70		40 – 60
H	Hardened steel	hardened and tempered		45 – 50 HRC	45 – 60		
				51 – 55 HRC	45 – 60		

[1)] and cast steel

Colour Identification System

Increase your efficiency with colorguide, the perfect colour identification system for finding the right indexable insert.
This guide through the variety which you will find on the label of each indexable inserts box informs you quickly and reliably about the suitability of this indexable insert for the intended machining operation. Colorguide saves time and helps to avoid wrong applications.

Symbols printed in a grid which is vertically organized into six main material groups represented by colours (acc. to VDI 3323) and horizontally by three levels of machining (Rough–Medium–Finishing) define the field(s) of application of the indexable insert.
For example, the above label tells you: CNMG 120412-M in grade A51-B1 is primarily suitable for medium turning of steels but also for turning of stainless steels, both in continuous cut.

Material Groups	Rough	Medium	Finish
Steel			
Stainless steel			
Iron casting			
Non-ferrous metals			
High temperature alloys			
Hardened materials			

The main material groups include the following materials:
- **Steel:** Free cutting steels, case hardening steels, heat treatment steels, constructional steels, white malleable cast iron
- **Stainless steels:** Ferritic Cr-steels, martensitic CrNi-steels, austenitic CrNi-steels
- **Cast iron:** Grey cast iron, malleable cast iron, spheroidal cast iron, sintered iron
- **Non-ferrous metal:** Al wrought and Al cast alloys, also soft plastics and fiber-reinforced plastics
- **High-temperature alloys:** Heat resistant steels, alloys on Ni/Co basis, Ti alloys
- **Hardened materials:** Hardened steels (45 HRC), case hardened steels, clear chill castings.

Machining Mode	Rough	Medium	Finish
Feed f_n [mm]	0,6 – 1,2	0,25 – 0,6	0,05 – 0,25
Depth of cut a_p [mm]	5 – 15	1,5 – 5	0,1 – 1,5

Application Area	Continuous Cut	Interrupted Cut
Main application	●	▶
Other application	○	▷

Comparison table of materials to be machined

Material Group	Germany		Great Britain		France	Italy
	W-Nr.	DIN	BS	EN	AFNOR	UNI
P	Constructional steels					
	1.0401	C15	080M15	–	CC12	C15C16
	1.0402	C22	050A20	2C	CC20	C20C21
	1.0501	C35	060A35	–	CC35	C35
	1.0503	C45	080M46	–	CC45	C45
	1.0535	C55	070M55	–	–	C55
	1.0601	C60	080A62	43D	CC55	C60
	1.0715	9SMn28	230M07	–	S250	CF9SMn28
	1.0718	9SMnPb28	–	–	S250Pb	CF9SMnPb28
	1.0722	10SPb20	–	–	10PbF2	CF10SPb20
	1.0726	35S20	212M36	8M	35MF4	–
	1.0736	9SMn36	240M07	1B	S300	CF9SMn36
	1.0737	9SMnPb36	–	–	S300Pb	CF9SMnPb36
	1.0904	55Si7	250A53	45	55S7	55Si8
	1.0961	60SiCr7	–	–	60SC7	60SiCr8
	1.1141	Ck15	080M15	32C	XC12	C16
	1.1157	40Mn4	150M36	15	35M5	–
	1.1158	Ck25	–	–	–	–
	1.1167	36Mn5	–	–	40M5	–
	1.1170	28Mn6	150M28	14A	20M5	C28Mn
	1.1183	Cf35	060A35	–	XC38TS	C36
	1.1191	Ck45	080M46	–	XC42	C45
	1.1203	Ck55	070M55	–	XC55	C50
	1.1213	Cf53	060A52	–	XC48TS	C53
	1.1221	Ck60	080A62	43D	XC60	C60
	1.1274	Ck101	060A96	–	–	–
	1.3401	X120Mn12	Z120M12	–	Z120M12	XG120Mn12
	1.3505	100Cr6	534A99	31	100C6	100Cr6
	1.5415	15Mo3	1501-240	–	15D3	16Mo3KW
	1.5423	16Mo5	1503-245-420	–	–	16Mo5
	1.5622	14Ni6	–	–	16N6	14Ni6
	1.5662	X8Ni9	1501-509; 510	–	–	X10Ni9
	1.5680	12Ni19	–	–	Z18N5	–
	1.5710	36NiCr6	640A35	111A	35NC6	–
	1.5732	14NiCr10	–	–	14NC11	16NiCr11
	1.5752	14NiCr14	655M13; 655A12	36A	12NC15	–
	1.6511	36CrNiMo4	816M40	110	40NCD3	38NiCrMo4(KB)
	1.6523	21NiCrMo2	805M20	362	20NCD2	20NiCrMo2
	1.6546	40NiCrMo22	311 – Type 7	–	–	40NiCrMo2(KB)
	1.6582	34CrNiMo6	817M40	24	35NCD6	35NiCrMo6(KB)
	1.6587	17CrNiMo6	820A16	–	18NCD6	–
	1.6657	14NiCrMo134	832M13	36C	–	15NiCrMo13
	1.7015	15Cr3	523M15	–	12C3	–
	1.7033	34Cr4	530A32	18B	32C4	34Cr4(KB)
	1.7035	41Cr4	530M40	18	42C4	41Cr4
	1.7045	42Cr4	–	–	–	–
	1.7131	16MnCr5	(527M20)	–	16MC5	16MnCr5
	1.7176	55Cr3	527A60	48	55C3	–
	1.7218	25CrMo4	1717CDS110	–	25CD4	25CrMo4(KB)
	1.7220	34CrMo4	708A37	19B	35CD4	35CrMo4
	1.7223	41CrMo4	708M40	19A	42CD4TS	41CrMo4
	1.7225	42CrMo4	708M40	19A	42CD4	42CrMo4

Belgium	Sweden	Spain	USA	Russia
NBN	SS	UNE	AISI/SAE	
–	1350	F.111	1015	15
C25-1	1450	F.112	1020	20
C35-1	1550	F.113	1035	35
C45-1	1650	F.114	1045	45
C55-1	1655	–	1055	55
C60-1	–	–	1060	60
–	1912	11SMn28	1213	
–	1914	11SMnPb28	12L13	
–	–	10SPb20	–	A12
–	1957	F210G	1140	A30
–	–	12SMn35	1215	
–	1926	12SMn35	12L14	
55Si7	2085	56Si7	9255	55C2
60SiCr8	–	60SiCr8	9262	60C2
C16-2	1370	C15K	1015	
–	–	–	1039	40Г
C25-2	–	–	1025	25
–	2120	36Mn5	1335	35ГЛ
28Mn6	–	–	1330	35Г2
C36	1572	–	1035	
C45-2	1672	C45K	1045	45
C55-2	–	C55K	1055	55
C53	1674	–	1050	50
C60-2	1678	–	1060	60Г
–	1870	–	1095	
–	–	XG120Mn12	–	
–	2258	F.131	52100	ШХ15
16Mo3	2912	16Mo3	ASTM A204Gr.A	15НМ
16Mo5	–	16Mo5	4520	
18Ni6	–	15Ni6	ASTM A350LF5	15ГНЛ
10Ni36	–	XBNi09	ASTM A353	
12Ni20	–	–	2515	15Г4М
–	–	–	3135	35ХН2МЛ
–	–	15NiCr11	3415	12ХН3А
13NiCr12	–	–	3415; 3310	20ХН4ФА
–	–	35NiCrMo4	9840	40ХН2МА
–	2506	20NiCrMo2	8620	20ХГНМ
40NiCrMo2	–	40NiCrMo2	8740	
35CrNiMo6	2541	–	4340	38Х2Н2МА
17CrNiMo7	–	14NiCrMo13	–	18Х2Н4ВА
14NiCrMo132	–	14NiCrMo131	–	18Х2Н4МА
15Cr2	–	–	5015	15Х
34Cr4	–	35Cr4	5132	35Х
42Cr4	–	42Cr4	5140	40Х
–	2245	42Cr4	5140	
16MnCr5	2511	16MnCr5	5115	18ХГ
55Cr3	–	–	5155	50ХГА
25CrMo4	2225	55Cr3	4130	20ХМ
		AM26CrMo4		
34CrMo4	2234	34CrMo4	4137;4135	35ХМ
41CrMo4	2244	42CrMo4	4140;4142	38ХМА
42CrMo4	2244	42CrMo4	4140	40ХН2МА

Comparison table of materials to be machined

Material Group	Germany		Great Britain		France	Italy
	W-Nr.	DIN	BS	EN	AFNOR	UNI
P	Constructional steels					
	1.7262	15CrMo5	–	–	12CD4	–
	1.7335	13CrMo4 4	1501-620Gr27	–	15CD3.5	14CrMo4 5
					15CD4.5	
	1.7361	32CrMo12	722M24	40B	30CD12	32CrMo12
	1.7380	10CrMo9 10	1501-622	–	12CD9,10	12CrMo9,10
			Gr.31;45	–	–	
	1.7715	14MoV6 3	1503-660-440	–	–	–
	1.8159	50CrV4	735A50	47	50CV4	50CrV4
	1.8509	41CrAlMo7	905M39	41B	40CAD6,12	41CrAlMo7
	1.8523	39CrMoV13 9	897M39	40C	–	36CrMoV12
	Tool steels					
	1.1545	C105W1	–	–	Y1 105	C98KU
						C100KU
	1.1663	C125W	–	–	Y2 120	C120KU
	1.2067	100Cr6	BL3	–	Y100C6	–
	1.2080	X210Cr12	BD3	–	Z200C12	X210Cr13KU
						X250Cr12KU
	1.2344	X40CrMoV51	BH13	–	Z40CDV5	X35CrMoV05KU
						X40CrMoV511KU
	1.2363	X100CrMoV51	BA2	–	Z100CDV5	X100CrMoV51KU
	1.2419	105WCr6	–	–	105WC13	10WCr6
					107WCr5KU	
	1.2436	X210CrW12	–	–	-	X215CrW121KU
	1.2542	45WCrV7	BS1	–	–	45WCrV8KU
	1.2581	X30WCrV9 3	BH21	–	Z30WCV9	X28W09KU
		X30WCrV9 3KU				X30WCrV9 3KU
	1.2601	X165CrMoV12	–	–	–	X165CrMoW12KU
	1.2713	55NiCrMoV6	–	–	55NCDV7	–
	1.2833	100V1	BW2	–	Y1 105V	–
	High speed steels					
	1.3243	S 6-5-2-5	–	–	Z85WDKCV	HS 6-5-2-5
					06-05-04-02	
	1.3255	S 18-1-2-5	BT4	-	Z80WKCV	X78WCo1805KU
				–	18-05-04-01	
	1.3343	S 6-5-2	BM2	–	Z85WDCV	X82WMo0605KU
					06-05-04-02	
	1.3348	S 2-9-2	–	–	Z100WCWV	HS 2-9-2
					09-04-02-02	
	1.3355	S 18-0-1	BT1	–	Z80WCV	X75W18KU
					18-04-01	

Belgium	Sweden	Spain	USA	Russia
NBN	SS	UNE	AISI/SAE	
–	2216	12CrMo4	–	15XM
14CrMo45	-	14CrMo45	ASTM A182	12XM
			F11;F12	
32CrMo12	2240	F.124.A	–	30X3BA
–	2218	TU.H	ASTM A182	12X2MΦA
		–	F.22	
13MoCrV6	–	13MoCrV6	–	12X1MΦ
50CrV4	2230	51CrV4	6150	50ΧΦA
41CrAlMo7	2940	41CrAlMo7	–	38ΧΜЮA
39CrMoV13	–	–	–	40X5MΦ
–	1880	F.515	W.110	
		F.516		
–	–	(C120)	W.112	
–	–	100Cr6	L3	9X2
–	–	X210Cr12	D3	X12
–	2242	X40CrMoV5	H13	4X5MΦ1C
–	2260	X100CrMoV5	A2	X6BΦ
–	2140	105WCr5	–	ХВГ
–	2312	X210CrW12	-	X12BM
–	2710	45WCrSi8	S1	5XB2C
–	–	X30WCrV9	H21	3X2B8Φ
–				
–	2310	X160CrMoV12	–	X12MΦ
–	–	F.520.S	L6	5XHM
C98KU	–	–	W210	
102V2KU				
–	2723	HS 6-5-2-5	–	P6M5K5
–	–	HS 18-1-1-5	T4	P18K5Φ
–	2722	HS 6-5-2	M2	P6M5
–	2782	HS 2-9-2	M7	
–	–	HS 18-0-1	T1	P18

Comparison table of materials to be machined

Material Group	Germany		Great Britain		France	Italy
	W-Nr.	DIN	BS	EN	AFNOR	UNI
M	Stainless and heat resisting steels					
	1.4000	X6Cr13	403S17	–	Z6C13	X6Cr13
	1.4001	X7Cr14				
	1.4006	X10Cr13	410S21	56A	Z10C14	X12Cr13
	1.4016	X6Cr17	430S15	60	Z8C17	X8Cr17
	1.4027	G-X200Cr14	420C29	56B	Z20C13M	–
	1.4034	X46Cr13	420S45	56D	Z40CM	X40Cr14
					Z38C13M	
	1.4057	X20CrNi172	431S29	57	Z15CNi6.02	X16CrNi16
	1.4104	X12CrMoS17	–	–	Z10CF17	X10CrS17
	1.4113	X6CrMo171	434S17	–	Z8CD17.01	X8CrMo17
	1.4313	X5CrNi134	425C11	–	Z4CND13.4M	–
	1.4408	G-X6CrNiMo1810	316C16	–	–	–
	1.4718	X45CrSi93	401S45	52	Z45Cs9	X45CrSi8
	1.4724	X10CrAl13	403S17	–	Z10C13	X10CrA112
	1.4742	X10CrAl18	430S15	60	Z10CAS18	X8Cr17
	1.4747	X80CrNiSi20	443S05	59	Z80CSN20.02	X8CrSiNi20
	1.4762	X10CrAl24	–	–	Z10CAS24	X16Cr26
	1.4301	X5CrNi1810	304S15	58E	Z6CN18.09	X5CrNi1810
	1.4305	X10CrNiS189	303S21	58M	Z10CNF 18.09	X10CrNiS18.09
	1.4306	X2CrNi1911	304S12	–	Z2CN 18.10	X2CrNi18.11
			304C12		Z3CN 19.10	
	1.4308	G-X6CrNi18 9	304C15	–	Z6CN18.10M	–
	1.4310	X12CrNi177	–	–	Z12CN17.07	X12CrNi1707
	1.4311	X2CrNiN1810	304S26	–	Z2CN18.10	–
	1.4401	X5CrNiMo17122	316S16	58J	Z6CND17.11	X5CrNiMo1712
	1.4429	X2CrNiMoN17133	–	–	Z2CND17.13	–
	1.4435	X2CrNiMo18143	316S12	–	Z2CND17.13	X2CrNiMo1713
	1.4438	X2CrNiMo17133	317S12	–	Z2CND1915	X2CrNiMo1816
	1.4460	X8CrNiMo275	–	–	–	–
	1.4541	X6CrNiTi1810	2337	312S12	Z6CNT18.10	X6CrNiTi1811
	1.4550	X6CrNiNb1810	347S17	58F	Z6CNNb18.10	X6CrNiNb1811
	1.4571	X6CrNiMoTi17122	320S17	58J	Z6NDT17.12	X6CrNiMoTi1712
	1.4581	G-X5CrNi	318C17	–	Z4CNDNb	XG8CrNiMo1811
		MoNb1810			18 12M	
	1.4583	X10CrNi	–	–	Z6CNDNb	X6CrNiMoNb1713
		MoNb1812			17 13B	
	1.4828	X15CrNiSi2012	309S24	–	Z15CNS20.12	–
	1.4845	X12CrNi25 21	310S24	–	Z12CN2520	X6CrNi2520
	1.4864	X12NiCrSi3616	–	–	Z12NCS35.16	–
	1.4865	G-X40NiCrSi3818	330C11	–	–	XG50NiCr3919
	1.4871	X53CrMnNiN219	349S54	–	Z52CMN21.09	X53CrMnNiN219
			321S12	58B		
	1.4878	X12CrNiTi189	321S20	58C	Z6CNT18.12B	X6CrNiTi1811

Belgium	Sweden	Spain	USA	Russia
NBN	SS	UNE	AISI/SAE	
–	2301	F.3110	403	
		F.8401		
–	2302	F.3401	410	
–	2320	F.3113	430	12X17
–	–	–	–	
–	2304	F.3405	–	40X13
–	2321	F.3427	431	
–	2383	F.3117	430F	
–	2325	–	434	
–	–	–	–	
	F.8414			
	–	F.322	HW3	
–	–	F.311	405	10X13Cl0
–	–	F.3113	430	
	–	F.320B	HNV6	
–	2322	–	446	
–	2332	F.3551	304	08X18H10
		F.3541		
		F.3504		
–	2346	F.3508	303	
–	2352	F.3503	304L	03X18H11
	2333			
–	–	–	–	
–	2331	F.3517	301	07X16H6
–	2371	–	304LN	
–	2347	F.3543	316	
–	2375	–	316LN	
–	2353	–	316L	03X17H14M3
–	2367	–	317L	
–	2324	–	329	
–	58B	F.3553, F.3523	321	
–	2338	F.3552, F.3524	347	08X18H12Б
–	2350	F.3535	316Ti	
–	–	–	–	
–	–	–	318	
–				
–	–	–	309	
–	2361	F.331	310S	10X23H18
–	–	–	330	
–	–	–	–	
–	–	–	EV8	
–	–	F.3523	321	

Comparison table of materials to be machined

Material Group	Germany		Great Britain		France	Italy
	W-Nr.	DIN	BS	EN	AFNOR	UNI
K	Unalloyed grey cast iron					
		GG 10			Ft 10 D	
		GG 15	Grade 150		Ft 15 D	
		GG 20	Grade 220		Ft 20 D	
		GG 25	Grade 260		Ft 25 D	
		GG 30	Grade 300		R 30 D	
		GG 35	Grade 350		Ft 35 D	
		GG 40	Grade 400		Ft 40 D	
	Alloyed grey cast iron					
		DIN4694	3468; 1974			
		GGL-			A32-301	
		NiCr 20 2	L-NiCr 20 2		L-NC 20 2	
	Unalloyed nodular cast					
			2789; 1973		NF A32-201	
		GGG 40	SNG 420/12		FCS 400-12	
		GGG 40.3	SNG 370/17		FGS 370-17	
		GGG 35.3	–		–	
		GGG 50	SNG 500/7		FGS 500-7	
		GGG 60	SNG 600/3		FGS 600-3	
		GGG 70	SNG 700/2		FGS 700-2	
	Alloyed cast steels					
		DIN 1694				
		GGG NiMn 13 7	L-NiMn 13 7		L-NM 13 7	
		GGG NiCr 20 2	L-NiMn 20 2		L-NC 20 2	
	Malleable cast iron					
		–	8 290/6		MN 32-8	
		GTS-35	B 340/12		MN 35-10	
		GTS-45	P 440/7			
		GTS-55	P 510/4		MP 50-5	
		GTS-65	P 570/3		MP 60-3	
		GTS-70	P 690/2		IP 70-2	

Belgium	Sweden	Spain	USA	Russia
NBN	SS	UNE	AISI/SAE	
			ASTM A48-76	
	01 00			Сч10
	01 10		No 20 B	Сч15
	01 15		No 25 B	Сч20
	01 20		No 30 B	Сч25
	01 25		No 35 B	
			No 40 B	Сч30
	01 30		No 45 B	Сч35
	01 35		No 50 B	Сч40
	01 40		No 55 B	
	MB		ASTM	
	ISO-215		A436-72	
	05 23		Type 2	
			A536-72	
	07 17-02		60-40-18	Вч42-12
	07 17-12		–	
	07 17-15		–	
	07 27-02		80-55-06	Вч50-2
	07 32-03		–	Вч60-2
	07 37-01		100-70-03	Вч70-2
	07 72		–	
	07 76		Type 2	
			ASTM A47-74	
			A 220-762)	
	08 14			
	08 15		32510	Кч35-10
	08 52		40010	Кч45-6
	08 54		50005	Кч55-4
	08 58		70003	Кч60-3
	08 62		(002)	

Designation of indexable inserts: Comparison ISO and ANSI

ISO	ANSI
CCGT 060202	CCGT 2 (1.5) (.5)
CCGT 060204	CCGT 2 (1.5) 1
CCGT 09T302	CCGT 3 (2.5) (.5)
CCGT 09T304	CCGT 3 (2.5) 1
CCGT 120404	CCGT 431
CCGT 120408	CCGT 432
CCGW 060202	CCGW 2 (1.5) (.5)
CCGW 060204	CCGW 2 (1.5) 1
CCGW 09T302	CCGW 3 (2.5) (.5)
CCGW 09T304	CCGW 3 (2.5) 1
CCGW 120404	CCGW 431
CCGW 120408	CCGW 432
CCMT 060202	CCMT 2 (1.5) (.5)
CCMT 060204	CCMT 2 (1.5) 1
CCMT 060208	CCMT 2 (1.5) 2
CCMT 09T302	CCMT 3 (2.5) (.5)
CCMT 09T304	CCMT 3 (2.5) 1
CCMT 09T308	CCMT 3 (2.5) 2
CCMT 120404	CCMT 431
CCMT 120408	CCMT 432
CCMT 250924	CCMT 866
CCMW 09T304	CCMW 3 (1.5) 1
CCMW 120404	CCMW 431
CCMW 120408	CCMW 432
CNGA 120404	CNGA 431
CNGA 120408	CNGA 432
CNGA 120412	CNGA 433
CNMA 120404	CNMA 431
CNMA 120408	CNMA 432
CNMA 120412	CNMA 433
CNMG 090304	CNMG 321
CNMG 090308	CNMG 322
CNMG 120402	CNMG 430
CNMG 120404	CNMG 431
CNMG 120408	CNMG 432
CNMG 120412	CNMG 433
CNMG 120416	CNMG 434
CNMG 160608	CNMG 542
CNMG 160612	CNMG 543
CNMG 160616	CNMG 544
CNMG 190608	CNMG 642
CNMG 190612	CNMG 643
CNMG 190616	CNMG 644
CNMM 120408	CNMM 432
CNMM 120412	CNMM 433
CNMM 120416	CNMM 434
CNMM 160612	CNMM 543
CNMM 160616	CNMM 544
CNMM 190612	CNMM 643
CNMM 190616	CNMM 644
CNMM 190624	CNMM 645
CNMX 120408	CNMX 432
CNMX 190612	CNMX 643
CNMX 190616	CNMX 644
DCGT 070202	DCGT 2 (1.5) (.5)
DCGT 070204	DCGT 2 (1.5) 1
DCGT 11T302	DCGT 3 (2.5) (.5)
DCGT 11T304	DCGT 3 (2.5) 1
DCGT 11T308	DCGT 3 (2.5) 2

ISO	ANSI
DCGW 070202	DCGW 2 (1.5) (.5)
DCGW 070204	DCGW 2 (1.5) 1
DCGW 11T304	DCGW 3 (2.5) 1
DCGW 11T308	DCGW 3 (2.5) 2
DCMT 070202	DCMT 2 (1.5) (.5)
DCMT 070204	DCMT 2 (1.5) 1
DCMT 070208	DCMT 2 (1.5) 2
DCMT 11T302	DCMT 3 (2.5) (.5)
DCMT 11T304	DCMT 3 (2.5) 1
DCMT 11T308	DCMT 3 (2.5) 2
DCMT 150408	DCMT 432
DCMT 150412	DCMT 433
DCMW 11T304	DCMW 3 (2.5) 1
DCMW 11T308	DCMW 3 (2.5) 2
DNGA 150404	DNGA 431
DNGA 150408	DNGA 432
DNGA 150604	DNGA 441
DNGA 150608	DNGA 442
DNMA 150608	DNM 442
DNMG 110402	DNMG 330
DNMG 110404	DNMG 331
DNMG 110408	DNMG 332
DNMG 110412	DNMG 333
DNMG 140405TL20	–
DNMG 140405TL25	–
DNMG 140405TR20	–
DNMG 140405TR25	–
DNMG 140410TL25	–
DNMG 140410TL32	–
DNMG 140410TR25	–
DNMG 140410TR32	–
DNMG 150404	DNMG 431
DNMG 150408	DNMG 432
DNMG 150412	DNMG 433
DNMG 150416	DNMG 434
DNMG 150604	DNMG 441
DNMG 150608	DNMG 442
DNMG 150612	DNMG 443
DNMG 150616	DNMG 444
DNMM 150408	DNMM 432
DNMM 150412	DNMM 433
DNMM 150608	DNMM 442
DNMM 150612	DNMM 443
RCGT 0602M0	–
RCGT 0803M0	–
RCGT 1003M0	–
RCMT 0602M0	–
RCMX 1003M0	–
RCMX 1204M0	–
RCMX 1606M0	–
RCMX 2006M0	–
RCMX 2507M0	–
RCMX 3209M0	–
SCGT 120408	SCGT 432
SCGW 09T304	SCGW 3 (2.5) 1
SCGW 09T308	SCGW 3 (2.5) 2
SCGW 120404	SCGW 431
SCGW 120408	SCGW 432

Designation of indexable inserts: Comparison ISO and ANSI

ISO	ANSI
SCMT 09T304	SCMT 3 (2.5) 1
SCMT 09T308	SCMT 3 (2.5) 2
SCMT 120404	SCMT 431
SCMT 120408	SCMT 432
SCMT 120412	SCMT 433
SCMW 09T304	SCMW 3 (2.5) 1
SCMW 120404	SCMW 431
SNGA 120404	SNGA 431
SNGA 120408	SNGA 432
SNMA 120408	SNMA 432
SNMA 120412	SNMA 433
SNMA 190612	SNMA 643
SNMA 190616	SNMA 644
SNMG 090304	SNMG 321
SNMG 120404	SNMG 431
SNMG 120408	SNMG 432
SNMG 120412	SNMG 433
SNMG 120416	SNMG 434
SNMG 150608	SNMG 542
SNMG 150612	SNMG 543
SNMG 150616	SNMG 544
SNMG 190612	SNMG 643
SNMG 190616	SNMG 644
SNMM 120408	SNMM 432
SNMM 120412	SNMM 433
SNMM 150612	SNMM 543
SNMM 190612	SNMM 643
SNMM 190616	SNMM 644
SNMM 190624	SNMM 646
SNMM 250716	SNMM 854
SNMM 250724	SNMM 856
SNMX 120408	SNMX 432
SNMX 120412	SNMX 433
SNUN 120412	SNUN 433
SPMR 090304	SPMR 321
SPMR 090308	SPMR 322
SPMR 120304	SPMR 421
SPMR 120308	SPMR 422
SPMR 120312	SPMR 423
SPUN 090308	SPUN 322
SPUN 120304	SPUN 421
SPUN 120308	SPUN 422
SPUN 120312	SPUN 423
SPUN 150412	SPUN 533
SPUN 190400	–
SPUN 250620	SPUN 845
TCGT 110204	TCGT 2 (1.5) 1
TCGT 16T304	TCGT 3 (1.5) 1
TCGW 110204	TCGW 2 (1.5) 1
TCMT 110202	TCMT 2 (1.5) (.5)
TCMT 110204	TCMT 2 (1.5) 1
TCMT 110208	TCMT 2 (1.5) 2
TCMT 16T304	TCMT 3 (2.5) 1
TCMT 16T308	TCMT 3 (2.5) 2
TCMW 110202	TCMW 2 (1.5) (.5)
TCMW 110204	TCMW 2 (1.5) 1
TCMW 16T304	TCMW 3 (2.5) 1
TCMW 16T308	TCMW 3 (2.5) 2

ISO	ANSI
TNMA 160404	TNMA 331
TNMA 160408	TNMA 332
TNMA 160412	TNMA 333
TNMA 220412	TNMA 433
TNMG 160404	TNMG 331
TNMG 160408	TNMG 332
TNMG 160412	TNMG 333
TNMG 220408	TNMG 432
TNMG 220412	TNMG 433
TNMG 220416	TNMG 434
TNMM 160408	TNMM 332
TNMM 160412	TNMM 333
TNMM 220408	TNMM 432
TNMM 220412	TNMM 433
TNMX 220412	TNMX 433
TNUN 160408	TNUN 332
TNUN 160412	TNUN 333
TPGR 110304	TPGR 221
TPGR 160308	TPGR 322
TPMR 090204	TPMR 1.8 (1.5) 1
TPMR 110304	TPMR 221
TPMR 110308	TPMR 222
TPMR 160304	TPMR 321
TPMR 160308	TPMR 322
TPMX 220412	–
TPUN 110304	TPUN 221
TPUN 110308	TPUN 222
TPUN 160304	TPUN 321
TPUN 160308	TPUN 322
TPUN 160312	TPUN 323
TPUN 220408	TPUN 432
TPUN 220412	TPUN 433
VBMT 160404	VBMT 331
VBMT 160408	VBMT 332
VBMT 160412	VBMT 333
VCGT 110302	VCGT 220
VCGT 110304	VCGT 221
VCGT 160402	VCGT 330
VCGT 160404	VCGT 331
VCGT 160408	VCGT 332
VCGT 160412	VCGT 333
VCGT 220530	–
VCMT 110302	VCMT 220
VCMT 110304	VCMT 221
VCMT 160404	VCMT 331
VCMT 160408	VCGT 332
VCMT 160412	VCMT 333
VNMG 160404	VNMG 331
VNMG 160408	VNMG 332
VNMG 160408	VNMG 332
VNMG 160412	VNMG 333
VPGT 110304	VPGT 221
VPGT 160412	VPGT 333
VPGT 220516	–
WCGT 06T302	WCGT 3 (2.5) (.5)
WCGT 06T304	WCGT 3 (2.5) 1
WCGT 06T308	WCGT 3 (2.5) 2
WCGT 080404	WCGT 431
WCGT 080408	WCGT 432

Designation of indexable inserts: Comparison ISO and ANSI

ISO	ANSI
WCMT 06T302	WCMT 3 (2.5) (.5)
WCMT 06T304	WCMT 3 (2.5) 1
WCMT 06T304	WCMT 3 (2.5) 1
WCMT 06T308	WCMT 3 (2.5) 2
WCMT 080404	WCMT 431
WCMT 080408	WCMT 432
WNMG 06T302	WNMG 3 (2.5) (.5)
WNMG 06T304	WNMG 3 (2.5) 1
WNMG 06T304	WNMG 3 (2.5) 1
WNMG 06T308	WNMG 3 (2.5) 2
WNMG 060404	WNMG 331
WNMG 060408	WNMG 332
WNMG 060412	WNMG 333
WNMG 080404	WNMG 431
WNMG 080408	WNMG 432
WNMG 080412	WNMG 433
WNMG 080416	WNMG 434

ISO	ANSI

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