HEAVY MACHINING

Heavy turning

Parting and grooving

Bar peeling

Railway wheel re-turning

General information

Heavy turning

Coromant Capto cutting units and conventional shank holders in two insert clamping systems are used for heavy turning; the CoroTurn RC rigid clamping system and the T-Max P lever clamping systems. Both systems use negative, single or double sided T-Max P big size basic shape inserts and are mainly used for external turning operations, from roughing to finishing.

The inserts used in heavy machining are T-Max P inserts having a negative basic shape which gives them very strong cutting edges. We also offer a positive round insert RCMT to be used in our T-Max P holders.
To effectively meet the requirements in costly heavy operations, use T-Max P inserts in CoroTurn RC Coromant Capto and shank holders.

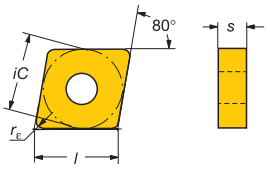
Sandvik Coromant engineered inserts

In addition to our extensive standard programme we can also offer a wide range of engineered inserts.
These inserts are not available from stock and have to be quoted for price and delivery. Delivery time is about 4 to 6 weeks after order.
For quotation please contact your Sandvik Coromant representative.

One example of heavy machining is turning of rolls weighing many tons, in machines having power ratings of 70 kW (90Hp) or more.

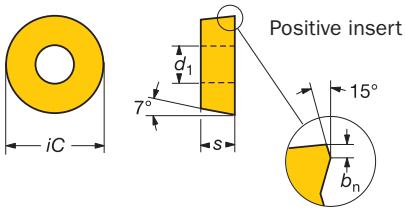
T-Max P

Rhombic inserts

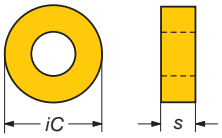


Round inserts

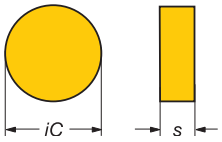
RCMX, RCMT



RNMG



RNGN



		Ordering code, ISO	Ordering code, ANSI	Dimensions, mm / inch				P					M				K			
			iC	iC	l	s	r_ε	GC 4205	GC 4215	GC 4225	4235		GC 2025	GC 2035	GC 235	– S6	GC 3205	GC 3210	GC 3215	– H13A
 -PR	For light roughing of steel. Double sided insert.	25 CNMG 25 09 24-PR	1 CNMG 866-PR	25.4 1	25.4 1	9.52 3/8	2.4 3/32		☆	★	☆									
 -MR	First choice for roughing of stainless steel. Single sided insert.	25 CNMM 25 09 24-MR	1 CNMM 866-MR	25.4 1	25.4 1	9.52 3/8	2.4 3/32						★							
		CNMM 25 09 32-MR	CNMM 868-MR	25.4 1	25.4 1	9.52 3/8	3.2 1/8						★							
 -HM	Medium turning to roughing of steel and stainless steel. Double sided insert.	19 CNMG 19 06 12-HM [1]	3/4 CNMM 643-HM [1]	19.05 3/4	19.05 3/4	6.35 1/4	1.2 3/64		☆	☆	☆		☆							
		CNMG 19 06 16-HM [1]	CNMM 644-HM [1]	19.05 3/4	19.05 3/4	6.35 1/4	1.6 1/16		☆	☆	☆		☆							
 -HR	First choice for heavy roughing of steel. Single sided insert.	25 CNMM 25 09 24-HR	1 CNMM 866-HR	25.4 1	25.4 1	9.52 3/8	2.4 3/32		☆	☆	☆									
		CNMM 25 09 32-HR	CNMM 868-HR	25.4 1	25.4 1	9.52 3/8	3.2 1/8		☆	☆	☆									
 -QR	Roughing in mixed production. Single sided insert.	25 CNMM 25 09 24-QR	1 CNMM 866-QR	25.4 1	25.4 1	9.52 3/8	2.4 3/32		☆	☆										
				iC	s	b_n														
	For finishing to roughing. Single sided insert.	25 RCMX 25 07 00	1 RCMX 25 07 00	25.4 1	7.94 5/16	0.1 .004		☆	☆	★	☆									★
		32 RCMX 32 09 00	1 1/4 RCMX 32 09 00	31.75 1.250	9.52 3/8	0.2 .008		☆	☆	★	☆									
	Single sided insert for medium machining. Single sided insert.	25 RCMT 25 07 M0	1 RCMT 25 07 M0	25 .984	7.74 5/16	0.1 .004		☆	☆	★	☆				★					★
		32 RCMT 32 09 M0	1 1/4 RCMT 32 09 M0	32 1.260	9.52 3/8	0.2 .008		☆	☆	★	☆				★					★
	For finishing to roughing. Double sided insert.	25 RNMG 25 09 00	1 RNMG 86	25.4 1	9.52 3/8	0.1 .004				☆	☆							☆		
								P15	P25	P35			M25	M35	M35	M40	K05	K10	K15	K20

[1] For holders, see main catalogue.

T-Max ceramic inserts

		Ordering code, ISO	Ordering code, ANSI	Dimensions, mm / inch		K					S			H			
			iC	iC	s	CC 650					CC 650	CC 670		CC 650	CC 670		
	For finishing to roughing. Double sided insert.	25 RNGN 25 07 00K20015	1 RNG 85K8015	25.4 1	9.52 3/8	☆					☆	☆		☆	☆		
		RNGN 25 07 00T20015	RNG 85T8015	25.4 1	9.52 3/8	☆					☆			☆			
						K01					S05	S15		H05	H10		

T Negative land

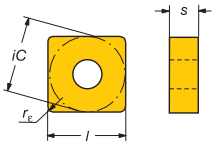
K Double negative land

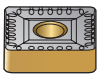
★ = First choice

8, 14, 9, 15 23 24 60

T-Max P

Square inserts



		Ordering code, ISO	iC	Ordering code, ANSI	Dimensions, mm / inch iC	l	s	r_ε	P GC4215	P GC4225	P GC4235	P GC	P GC	P GC	P GC	M GC2025	M GC2035	M GC235	M – S6	K GC3205	K GC3210	K GC3215	K – H13A
	25	**SNMG 25 07 16-PR**	1	***SNMG 854-PR***	25.4 1	25.4 1	7.94 5/16	1.6 1/16		★	☆												
For light roughing of steel. Double sided insert. **-PR**		**SNMG 25 07 24-PR**		***SNMG 856-PR***	25.4 1	25.4 1	7.94 5/16	2.4 3/32	☆	★	☆												
	25	**SNMG 25 09 24-PR**	1	***SNMG 866-PR***	25.4 1	25.4 1	9.52 3/8	2.4 3/32	☆	★	☆												
	25	**SNMM 25 07 24-MR**	1	***SNMM 856-MR***	25.4 1	25.4 1	7.94 5/16	2.4 3/32	☆	☆	☆					★	☆						
First choice for roughing of stainless steel. Single sided insert. **-MR**		**SNMM 25 07 32-MR**	1	***SNMM 858-MR***	25.4 1	25.4 1	7.94 5/16	3.2 1/8	☆	☆						★	☆						
	25	**SNMM 25 09 24-MR**	1	***SNMM 866-MR***	25.4 1	25.4 1	9.52 3/8	2.4 3/32		☆	☆					★							
		SNMM 25 09 32-MR		***SNMM 868-MR***	25.4 1	25.4 1	9.52 3/8	3.2 1/8		☆						★	☆						
	25	**SNMG 25 07 24-KR**	1	***SNMG 856-KR***	25.4 1	25.4 1	7.94 5/16	2.4 3/32											☆	★	☆		
Roughing of cast iron. Double sided insert. **-KR**																							
	25	**SNMA 25 07 24-KR**	1	***SNMA 856-KR***	25.4 1	25.4 1	7.94 5/16	2.4 3/32											★		☆		
First choice for cast iron roughing. Double sided insert. **-KR**																							
	19	**SNMG 19 06 12-HM** [1]	3/4	***SNMG 643-HM*** [1]	19.05 3/4	19.05 3/4	6.35 1/4	1.2 3/64	☆	☆	☆					☆							
Medium turning to roughing of steel and stainless steel. Double sided insert. **-HM**		**SNMG 19 06 16-HM** [1]		***SNMG 644-HM*** [1]	19.05 3/4	19.05 3/4	6.35 1/4	1.6 1/16	☆	☆	☆					☆							
	25	**SNMM 25 07 24-HR**	1	***SNMM 856-HR***	25.4 1	25.4 1	7.94 5/16	2.4 3/32	☆	☆	☆							☆					
First choice for heavy roughing. Single sided insert. **-HR**		**SNMM 25 07 32-HR**		***SNMM 858-HR***	25.4 1	25.4 1	7.94 5/16	3.2 1/8	☆	☆	☆												
	25	**SNMM 25 09 24-HR**	1	***SNMM 866-HR***	25.4 1	25.4 1	9.52 3/8	2.4 3/32	☆	☆	☆							☆					
		SNMM 25 09 32-HR		***SNMM 868-HR***	25.4 1	25.4 1	9.52 3/8	3.2 5/16	☆	☆	☆												
	25	**SNMM 25 07 24-QR**	1	***SNMM 856-QR***	25.4 1	25.4 1	7.94 5/16	2.4 3/32	☆	☆													
Roughing in mixed production. Single sided insert. **-QR**																							
	25	**SNMG 25 07 24-MR**	1	***SNMG 856-MR***	25.4 1	25.4 1	7.94 5/16	2.4 3/32										☆					
Dedicated geometry for roughing. Double sided insert. **-MR**	25	**SNMG 25 09 24-MR**	1	***SNMG 866-MR***	25.4 1	25.4 1	9.52 3/8	2.4 3/32										☆					
	25	**SNMM 25 07 24**	1	***SNMM 856***	25.4 1	25.4 1	7.94 5/16	2.4 3/32			☆												
Single sided insert for heavy duty machining.									P15	P25	P35					M25	M35	M35	M40	K05	K10	K15	K20

[1] For holders, see main catalogue.

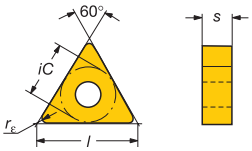
★ = First choice

10, 16 23 24 60

SANDVIK Coromant

T-Max P

Triangular inserts

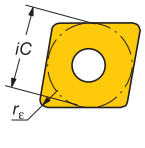


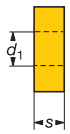
		Ordering code, ISO	iC	Ordering code, ANSI	Dimensions, mm / inch iC	l	s	r_ε	P GC 4215	P GC 4225	P GC 4235	M GC 2025	M GC 2035	M GC 235	M – S6	K GC 3205	K GC 3210	K GC 3215	K – H13A
 **-PR** For light roughing of steel. Double sided insert.	27	**TNMG 27 06 08-PR**	5/8	***TNMG 542-PR***	15.87 5/8	27 1.063	6.35 1/4	0.8 1/32	☆	★	☆								
		TNMG 27 06 12-PR		***TNMG 543-PR***	15.87 5/8	27 1.063	6.35 1/4	1.2 3/64	☆	★	☆								
		TNMG 27 06 16-PR		***TNMG 544-PR***	15.87 5/8	27 1.063	6.35 1/4	1.6 1/16	☆	★	☆								
	33	**TNMG 33 07 16-PR**	3/4	***TNMG 654-PR***	19.05 3/4	33 1.299	7.94 5/16	1.6 1/16		★	☆								
		TNMG 33 09 24-PR	3/4	***TNMG 666-PR***	19.05 3/4	33 1	9.52 3/8	2.4 3/32	☆	★	☆								
 **-MR** First choice for roughing of stainless steel. Single sided insert.	27	**TNMM 27 06 12-MR**	5/8	***TNMM 543-MR***	15.87 5/8	27 1.063	6.35 1/4	1.2 3/64		☆			☆						
		TNMM 27 06 16-MR		***TNMM 544-MR***	15.87 5/8	27 1.063	6.35 1/4	1.6 1/16		☆		★	☆						
		TNMM 27 06 24-MR		***TNMM 546-MR***	15.87 5/8	27 1.063	6.35 1/4	2.4 3/32					☆						
 **-KR** Roughing of cast iron. Double sided insert.	27	**TNMG 27 06 16-KR**	5/8	***TNMG 544-KR***	15.87 5/8	27 1.063	6.35 1/4	1.6 1/16								☆	★	☆	
 **-KR** First choice for cast iron roughing. Double sided insert.	27	**TNMA 27 06 16-KR**	5/8	***TNMA 544-KR***	15.87 5/8	27 1.063	6.35 1/4	1.6 1/16								★		☆	
 **-HR** First choice for heavy roughing. Single sided insert.	27	**TNMM 27 06 16-HR**	5/8	***TNMM 544-HR***	15.87 5/8	27 1.063	6.35 1/4	1.6 1/16	☆	☆	☆								
		TNMM 27 06 24-HR		***TNMM 546-HR***	15.87 5/8	27 1.063	6.35 1/4	1.6 3/32	☆	☆	☆								
 **-QR** Roughing in mixed production. Single sided insert.	27	**TNMM 27 06 12-QR**	5/8	***TNMM 543-QR***	15.87 5/8	27 1.06	6.35 1/4	1.2 3/64			☆								
		TNMM 27 06 16-QR	5/8	***TNMM 544-QR***	15.875 1.063	27 1/4	6.35 1/16	1.6		☆									
 **-MR** Dedicated geometry for roughing. Double sided insert.	27	**TNMG 27 06 08-MR**	5/8	***TNMG 542-MR***	15.875 5/8	27 1.063	6.35 1/4	0.8 1/32		☆	☆			☆					
		TNMG 27 06 12-MR		***TNMG 543-MR***	15.87 5/8	27 1.063	6.35 1/4	3/64	☆	☆	☆			☆					
		TNMG 27 06 16-MR		***TNMG 544-MR***	15.87 5/8	27 1.063	6.35 1/4	1.6 3/64	☆	☆	☆			☆					
	33	**TNMG 33 09 24-MR**	3/4	***TNMG 666-PR***	19.05 5/8	33 1.063	9.52 1/4	2.4 1/16		☆				☆					
 **-QM** For semi-finishing, medium to light roughing in mixed production. Double sided insert.	27	**TNMG 27 06 08-QM**	5/8	***TNMG 542-QM***	15.87 5/8	27 1.063	6.35 1/4	0.8 1/32		☆				☆					
		TNMG 27 06 12-QM		***TNMG 543-QM***	15.875 5/8	27 1.063	6.35 1/4	1.2 3/64	☆	☆				☆					
 For semi-finishing, medium to light roughing in mixed production. Double sided insert.	27	**TNMG 27 06 16**	5/8	***TNMG 544***	15.87 5/8	27 1.063	6.35 1/4	1.6 1/16	☆						☆				
 Single sided insert for heavy duty machining.	27	**TNMM 27 06 32**	5/8	***TNMM 548***	15.87 5/8	27 1.063	6.35 1/4	2.4 1/8		☆									
									P15	P25	P35	M25	M35	M35	M40	K05	K10	K15	K20

13, 19 23 24 60

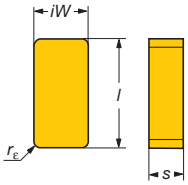
★ = First choice

Engineered inserts



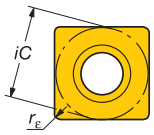


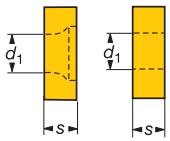
CNMM



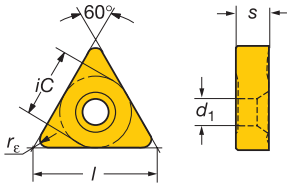
LNUN/LNUR

RCMT/RCMX





SNMT SNMX **SNMM**



S-TNMH

Code key
(ISO or Coromant code)

Corresponds to existing standard geometry

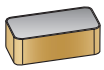
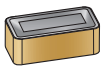
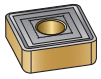
S – SNMM 25 09 24 – MM / – R1

Engineered inserts

F = Finishing
M = Medium
R = Roughing

Chip-breaker version

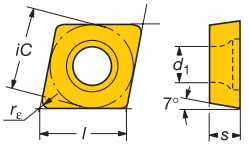
TO BE QUOTED

Negative basic shape inserts	Ordering code	Dimensions, mm *inch* iC	d_1	l	iW	s	r_ε	Grades P	M	K
 S-CNMM	**S-CNMM 25 09 24-R1**	25.4 *1*	9.12 *.359*	–	–	9.52 *.375*	2.38 *.094*			
 S-LNUN  S-LNUR	**S-LNUN 38 12 32-R1**	–	–	38.10 *1.500*	19.05 *.750*	12.7 *.500*	3.2 *.125*			
	S-LNUR 38 12 32-R1	–	–	38.10 *1.500*	19.05 *.750*	12.7 *.500*	3.2 *.125*			
 S-SNMM 25 07	**S-SNMM 25 07 24-R1**	25.4 *1*	9.12 *.359*	–	–	7.938 *.313*	2.4 *.094*			
 S-SNMT	**S-SNMT 25 09 24-R1**	25.4 *1*	9.12 *.359*	–	–	9.525 *.375*	2.4 *.094*			
	S-SNMM 25 09 24-R1	25.4 *1*	9.12 *.359*	–	–	9.525 *.375*	2.4 *.094*			
 S-SNMM	**S-SNMM 25 09 24-R2**	25.4 *1*	9.12 *.359*	–	–	9.525 *.375*	2.4 *.094*			
	S-SNMM 25 09 24-R3	25.4 *1*	9.12 *.359*	–	–	9.525 *.375*	2.4 *.094*			
 S-SNMX	**S-SNMX 32 09 24-R1**	31.75 *1 1/4*	8.75 *.344*	–	–	9.525 *.375*	2.4 *.094*			
 S-TNMH	**S-TNMH 44 11 32-HR**	25.4 *1*	9.19 *.362*	43.99 *1.732*	–	11.13 *.438*	3.18 *.125*			

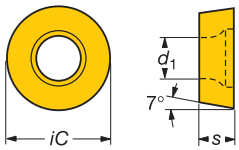
Various applications and machining conditions require different grades.

For grade choice, see general grade information on page 60, and contact your Sandvik Coromant representative for an offer.

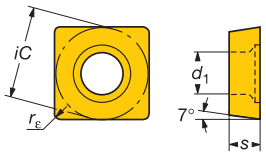
Engineered inserts



CCMT



RCMT/RCMX



SCMT

Code key
(ISO or Coromant code)

Corresponds to existing standard geometry

S – CCMT 38 09 32 – MM / – R1

Engineered inserts

F = Finishing
M = Medium
R = Roughing

Chip-breaker version

TO BE QUOTED

Positive basic shape inserts	Ordering code	Dimensions, mm *inch* iC	d_1	s	r_ε	Grades P	M	K
 S-CCMT	**S-CCMT 38 09 32-R1**	38.1 *1 1/2*	9.12 *.359*	9.52 *.375*	3.16 *.124*			
 S-RCMT	**S-RCMT 25 07 M0-R1**	25.0 *.984*	7.60 *.299*	7.938 *.313*				
 S-RCMX	**S-RCMX 32 09 M0-R1**	32.0 *1.260*	9.70 *.382*	9.525 *.375*				
 S-SCMT	**S-SCMT 25 09 24-R1**	25.4 *1*	9.12 *.359*	9.525 *.375*	2.4 *.094*			
	S-SCMT 38 09 32-R1	38.1 *1 1/2*	9.12 *.359*	9.525 *.375*	3.2 *.125*			

Various applications and machining conditions require different grades.

For grade choice, see general grade information on page 60, and contact your Sandvik Coromant representative for an offer.

Coromant Capto®

CNMM

CNMG

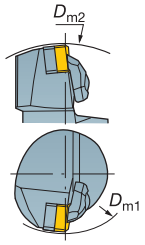
Entering angle κ_r 93°
Lead angle –3°

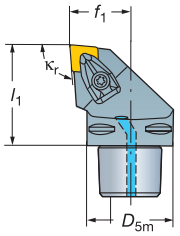
CoroTurn® RC rigid clamping design

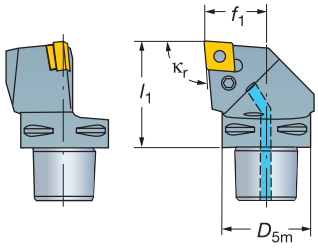
DCLNR/L

T-Max P lever clamping design

PCLNR/L

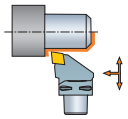
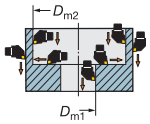




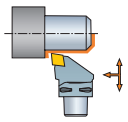


Right hand style shown when nothing else is stated

CoroTurn® RC rigid clamping design

κ_r	*Lead angle*	Main application	Alternative use	iC	*iC*	Ordering code	Dimensions, mm/*inch* D_{5m}	D_{m1} min 4)	D_{m2} min 4)	f_1	l_1	γ 1)	λ_s 2)	Gauge inserts ISO / *ANSI*	Nm 3) / *ft/lbs*
93°	–3°			25	*1*	**C8-DCLNR/L-55080-25**	80 *3.150*	150 *5.906*	250 *9.842*	55.0 *2.165*	80.0 *3.150*	–6° *–6°*	–6° *–6°*	CNMG 25 09 24 *CNMG 866*	9.5 *7.0*

T-Max P lever clamping design

κ_r	*Lead angle*	Main application	iC	*iC*	Ordering code	Dimensions, mm/*inch* D_{5m}	f_1	l_1	γ 1)	λ_s 2)	Gauge inserts
93°	–3°		25	*1*	**C8-PCLNR/L-55080-25**	80 *3.150*	55.0 *2.165*	80.0 *3.150*	–6° *–6°*	–6° *–6°*	CNMG 25 09 24 *CNMG 866*

1) γ = Rake angle (valid with flat insert).
2) λ_s = Angle of inclination.
3) Insert tightening torque Nm / ft/lbs.
4) Valid in combination with clamping unit R/LC2090.

R = Right hand, L = Left hand

Spare parts

CoroTurn® RC rigid clamping design

Insert size iC	*iC*	Shim screw	Shim (For insert thickness, mm / *inch*)	Key (Torx Plus)	Complete clamp set	Key (Torx Plus)	Nozzle
25	*1*	5513 020-08	5322 234-05 (9.52 / *.374*)	5680 043-15 (25IP)	5412 028-051 1)	5680 043-15 (25IP)	5691 045-01

1) For CoroTurn RC clamp set parts, see page 22.

T-Max P lever clamping design

Insert size iC	*iC*	Lever	Screw	Key (mm)	Shim (For radius mm/inch)	Shim	Shim pin punch
25	1	174.3-844M	174.3-827	3021 010-050 (5.0)	5322 230-01 (2.4-3.2 / *.094-.126*)	174.3-865	174.3-874


3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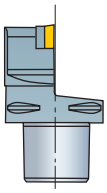
Coromant Capto®

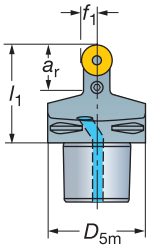
T-Max P lever clamping design

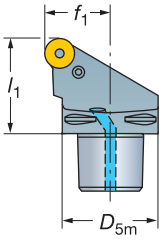
PRDCN **PRSCR/L**

RCMX

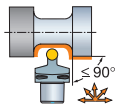
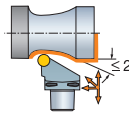
Right hand style shown
when nothing else is stated







(neutral)

Main application	iC	Ordering code	Dimensions, mm / *inch* a_r	D_{5m}	f_1	l_1	$\gamma^{1)}$	$\lambda_s{}^{2)}$	Gauge inserts ISO / *ANSI*
	25 *1*	**C6-PRDCN-00065-25A**	40 *1.575*	63 *2.480*	12.5 *.492*	65.0 *2.559*	0° *0°*	0° *0°*	RCMX 25 07 00 *RCMX 25 07 00*
		C8-PRDCN-00080-25A	40 *1.575*	80 *3.150*	12.5 *.492*	80.0 *3.150*	0° *0°*	0° *0°*	RCMX 25 07 00 *RCMX 25 07 00*
	32 *1.250*	**C8-PRDCN-00080-32A**	45 *1.772*	80 *3.150*	16.0 *.630*	80.0 *3.150*	0° *0°*	0° *0°*	RCMX 32 09 00 *RCMX 32 09 00*
	25 *1*	**C6-PRSCR/L-45065-25**		63 *2.480*	45.0 *1.772*	65.0 *2.559*	0° *0°*	0° *0°*	RCMX 25 07 00 *RCMX 25 07 00*
		C8-PRSCR/L-55080-25		80 *3.150*	55.0 *2.165*	80.0 *3.150*	0° *0°*	0° *0°*	RCMX 25 07 00 *RCMX 25 07 00*
	32 *1.250*	**C8-PRSCR/L-55080-32**		80 *3.150*	55.0 *2.165*	80.0 *3.150*	0° *0°*	0° *0°*	RCMX 32 09 00 *RCMX 32 09 00*

[1] γ = Rake angle (valid with flat insert).
[2] λ_s = Angle of inclination.

N = Neutral, R = Right hand, L = Left hand

Spare parts

Insert size iC	Lever	Screw	Key (mm)	Shim (For insert thickness, mm/*inch*)	Shim pin	Shim pin punch
25 *.984*	176.39-844	174.3-832	3021 010-040 (4.0)	176.39-854 (7.94 / *.313*)	174.3-862	174.3-874
32 *1.260*	176.39-845	174.3-827	3021 010-050 (5.0)	176.39-855 (9.52 / *.374*)	174.3-865	174.3-874


3


15

Coromant Capto®

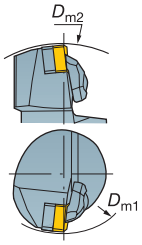
CoroTurn® RC rigid clamping design

SNMM

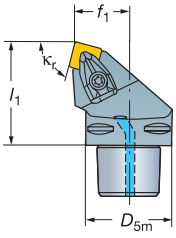
SNMG

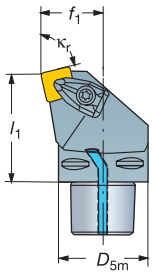
SNMA

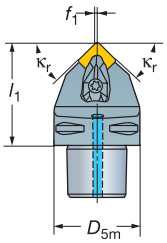
Right hand style shown when nothing else is stated

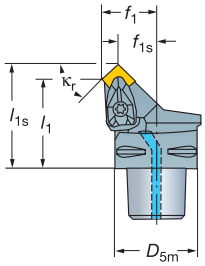


	DSRNR/L	DSKNR/L	DSDNN	DSSNR/L
Entering angle	κ_r 75°	κ_r 75°	κ_r 45°	κ_r 45°
Lead angle	*15°*	*15°*	*45°*	*45°*

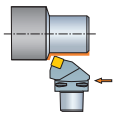
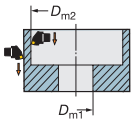
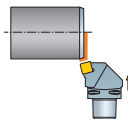
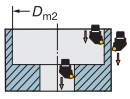
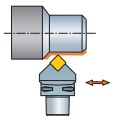
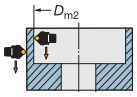
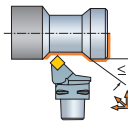
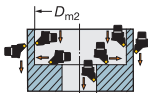








(neutral)

κ_r	*Lead angle*	Main application	Alternative use	□	*iC*	Ordering code	Dimensions, mm / *inch* D_{5m}	D_{m1} min 4)	D_{m2} min 4)	f_1	f_{1s}	l_1	l_{1s}	γ 1)	λ_s 2)	Gauge inserts ISO / *ANSI*	Nm 3) / *ft/lbs*
75°	*15°*			25	*1*	**C8-DSRNR/L-45080-25**	80 *3.150*		250 *9.842*	45.0 *1.772*		80.0 *3.150*		–6° *–6°*	–6° *–6°*	SNMG 25 07 24 *SNMG 856*	9.5 *7.0*
75°	*15°*			25	*1*	**C8-DSKNR/L-55080-25**	80 *3.150*	150 *5.906*		55.0 *2.165*		80.0 *3.150*		–6° *–6°*	–6° *–6°*	SNMG 25 07 24 *SNMG 856*	9.5 *7.0*
45°	*45°*			25	*1*	**C8-DSDNN-00080-25**	80 *3.150*		250 *9.842*	1.0 *.039*		80.0 *3.150*		–6° *–6°*	–6° *–6°*	SNMG 25 07 24 *SNMG 856*	9.5 *7.0*
45°	*45°*			25	*1*	**C8-DSSNR/L-55070-25**	80 *3.150*	150 *5.906*	256 *10.07*	55.0 *2.165*	39.0 *1.535*	70.0 *2.756*	86.0 *3.386*	–6° *–8°*	–6° *0°*	SNMG 25 07 24 *SNMG 856*	9.5 *7.0*

N = Neutral, R = Right hand, L = Left hand

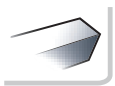
1) γ = Rake angle (valid with flat insert).
2) λ_s = Angle of inclination.
3) Insert tightening torque Nm / ft/lbs.
4) Valid in combination with clamping unit R/LC2090.

Spare parts

Insert size □	*iC*	Shim screw	Shim (For insert thickness, mm/*inch*)	Key (Torx Plus)	Complete clamp set	Key (Torx Plus)	Nozzle
25	*1*	5513 020-08	5322 425-07 (7.94 / *.313*) 5322 425-08 (9.52 / *.374*) 2)	5680 043-15 (25IP)	5412 028-051 1)	5680 043-15 (25IP)	5691 045-01

1) For CoroTurn RC clamp set parts, see page 22.
2) Optional part delivered to separate order.


4


16

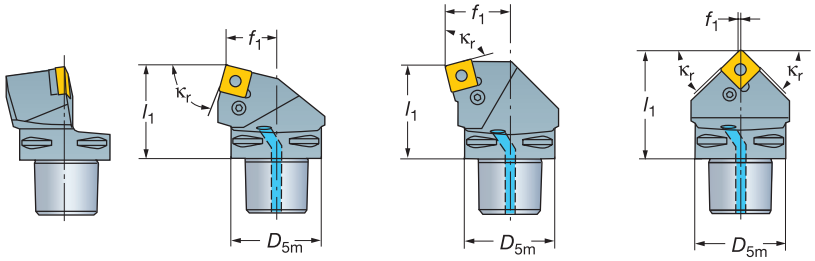
Coromant Capto®

T-Max P lever clamping design

SNMM
SNMG
SNMA

Right hand style shown when nothing else is stated

	PSRNR/L	PSKNR/L	PSDNN
Entering angle	κ_r **75°**	κ_r **75°**	κ_r **45°**
Lead angle	*15°*	*15°*	*45°*



(neutral)

κ_r	*Lead angle*	Main application		*iC*	Ordering code	Dimensions, mm / *inch* D_{5m}	f_1	l_1	γ [1]	λ_s [2]	Gauge inserts ISO *ANSI*
75°	*15°*		25	*1*	**C8-PSRNR/L-45080-25**	80 *3.150*	45.0 *1.772*	80.0 *3.150*	–6° *–6°*	–6° *–6°*	SNMG 25 07 24 *SNMG 856*
75°	*15°*		25	*1*	**C8-PSKNR/L-55080-25**	80 *3.150*	55.0 *2.165*	80.0 *3.150*	–6° *–6°*	–6° *–6°*	SNMG 25 07 24 *SNMG 856*
45°	*45°*		25	*1*	**C6-PSDNN-00065-25**	63 *2.480*	1.0 *.039*	65.0 *2.559*	–6° *–6°*	–6° *–6°*	SNMG 25 07 24 *SNMG 856*
					C8-PSDNN-00080-25	80 *3.150*	1.0 *.039*	80.0 *3.150*	–6° *–6°*	–6° *–6°*	SNMG 25 07 24 *SNMG 856*

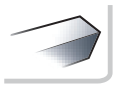
[1] γ = Rake angle (valid with flat insert).
[2] λ_s = Angle of inclination.

N = Neutral, R = Right hand, L = Left hand

Spare parts

Insert size *iC*	Lever	Screw	Key (mm)	Shim (For insert thickness, mm/*inch*)	For radius mm/*inch*	Shim pin	Shim pin punch
25 *1*	174.3-844M	174.3-827	3021 010-050 (5.0)	174.3-853M (7.94) (*.313*)	1.6-3.2 *.063-.126*	174.3-865	174.3-874


4


17

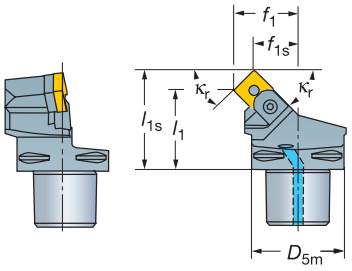
Coromant Capto®

T-Max P wedge clamping design

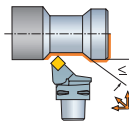
SNMM
SNMG
SNMA

MSSNR/L

Entering angle κ_r **45°**
Lead angle *45°*



Right hand style shown when nothing else is stated

κ_r	*Lead angle*	Main application	⬚	*iC*	Ordering code	Dimensions, mm / *inch* D_{5m}	f_1	f_{1s}	l_1	l_{1s}	γ [1]	λ_s [2]	Gauge inserts ISO / *ANSI*
45°	*45°*		25	*1*	**C8-MSSNR/L-50070-25**	80 *3.150*	55.0 *2.165*	39.0 *1.535*	80.0 *3.150*	86.0 *3.386*	–6° *–6°*	–6° *–6°*	SNMG 25 07 24 *SNMG 856*

[1] γ = Rake angle (valid with flat insert).
[2] λs = Angle of inclination.

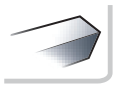
R = Right hand, L = Left hand

Spare parts

Insert size ⬚	*iC*	Wedge clamp set	Key (mm)	Shim (For insert thickness, mm/*inch*)	For radius mm/*inch*	Pin	Screw	Key (mm)
25	*1*	181.38-826-1	3021 010-050 (5.0)	181.38-852 (7.94 /*.313*) 181.38-853 (9.52 /*.374*) [1]	1.6-2.4 /*.063-.095* 2.4 -3.2/*.095-.126* [1]	181.38-842	3212 100-357	3021 010-040 (4.0)

[1] Optional part delivered to separate order.


4


18

Coromant Capto®

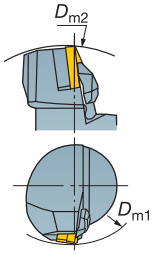
CoroTurn® RC rigid clamping design

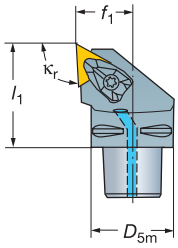
TNMM
TNMG
TNMA

Right hand style shown when nothing else is stated

DTJNR/L

Entering angle κ_r **93°**
Lead angle *–3°*

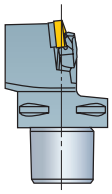


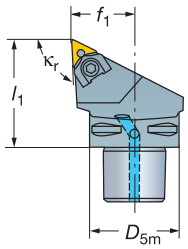


T-Max P wedge clamping design

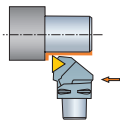
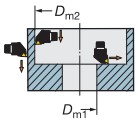
MTJNR/L

Entering angle κ_r **93°**
Lead angle *–3°*





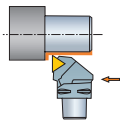
CoroTurn® RC rigid clamping design

κ_r	*Lead angle*	Main application	Alternative use	iC	Ordering code	Dimensions, mm / *inch* D_{5m}	D_{m1} min [4]	D_{m2} min [4]	f_1	l_1	γ [1]	λ_s [2]	Gauge inserts ISO / *ANSI*	Nm [3] / *ft-lbs*
93°	*–3°*			27 *5/8*	**C6-DTJNR/L-45065-27**	63 *2.480*	110 *4.331*	190 *7.480*	45.0 *1.772*	65.0 *2.559*	–6° *–6°*	–6° *–6°*	TNMG 27 06 12 *TNMG 543*	6.4 *4.7*

[1] γ = Rake angle (valid with flat insert).
[2] λ_s = Angle of inclination.
[3] Insert tightening torque Nm / ft/lbs
[4] Valid in combination with clamping unit R/LC2090.

R = Right hand, L = Left hand

T-Max P wedge clamping design

κ_r	Lead angle	Main application	iC	Ordering code	Dimensions, mm / *inch* D_{5m}	f_1	l_1	γ [1]	λ_s [2]	Gauge inserts ISO / *ANSI*
93°	*–3°*		27 *5/8*	**C6-MTJNR/L-45065-27**	63 *2.480*	45.0 *1.772*	65.0 *2.559*	–6° *–6°*	–6° *–6°*	TNMG 27 06 12 *TNMG 543*

[1] γ = Rake angle (valid with flat insert).
2) λ_s = Angle of inclination.

R = Right hand, L = Left hand

Spare parts

CoroTurn® RC rigid clamping design

Insert size iC	Shim screw	Shim (For insert thickness, mm/*inch*)	Key (Torx Plus)	Complete clamp set	Key (Torx Plus)	Nozzle
27 *5/8*	5513 020-07	5322 315-05 (6.35 / *.250*)	5680 043-14 (20IP)	5412 028-031 [1]	5680 043-14 (20IP)	5691 045-01

[1] For CoroTurn RC clamp set parts, see page 22.

T-Max P wedge clamping design

Insert size iC	Wedge clamp set	Key (mm)	Shim (For insert thickness, mm/*inch*)	For radius mm/*inch*	Pin	Screw	Key (mm)
27 *5/8*	170.38-822-1	174.1-864 (3.0)	170.3-854 (6.35 /*.250*) 170.3-857 (6.35 /*.250*) [2]	0.8-1.6 / *.032-.063* 2.4 / *.095* [2]	5313 021-04	3212 100-307	3021 010-040 (4.0)

[2] Optional part delivered to separate order.


5


19, 20

Shank tools

CNMM

CNMG

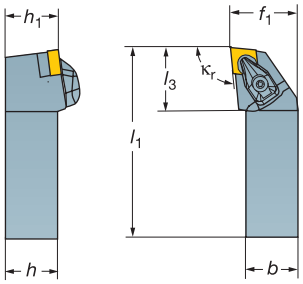
Right hand style shown when nothing else is stated

CoroTurn® RC rigid clamping design

DCLNR/L

Entering angle κ_r **93°**

Lead angle *–3°*

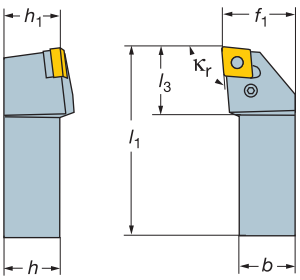


T-Max P lever clamping design

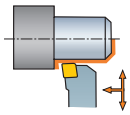
PCLNR/L

κ_r **93°**

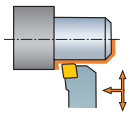
–3°



CoroTurn® RC rigid clamping design

κ_r	*Lead angle*	Main application	iC	Ordering code	Dimensions, mm / *inch* b	f_1	h	h_1	l_1	l_3	$\gamma^{1)}$	$\lambda_s{}^{2)}$	Gauge inserts ISO / *ANSI*	Nm 3) / *ft-lbs*
				Metric design										
93°	*–3°*		25	**DCLNR/L 4040S 25**	40	50.0	40	40	250	53.2	–6°	–6°	CNMG 25 09 24	9.5
				DCLNR/L 5050T 25	50	60.0	50	50	300	53.2	–6°	–6°	CNMG 25 09 24	9.5
				Inch design										
			1	***DCLNR/L 24 8E***	*1.500*	*2.000*	*1.500*	*1.500*	*7.000*	*2.090*	*–6°*	*–6°*	*CNMG 866*	*7.0*

T-Max P lever clamping design

κ_r	*Lead angle*	Main application	iC	Ordering code	Dimensions, mm / *inch* b	f_1	h	h_1	l_1	l_3	$\gamma^{1)}$	$\lambda_s{}^{2)}$	Gauge inserts
				Metric design									
93°	*–3°*		25	**PCLNR/L 4040S 25**	40	50.0	40	40	250	47	–6°	–6°	CNMG 25 09 24
				PCLNR/L 5050T 25	50	60.0	50	50	300	47	–6°	–6°	CNMG 25 09 24

1) γ = Rake angle (valid with flat insert).
2) λ_s = Angle of inclination.
3) Insert tightening torque Nm / *ft/lbs.*

R = Right hand, L = Left hand

Spare parts

CoroTurn® RC rigid clamping design

Insert size iC	Shim screw	Shim (For insert thickness, mm/*inch*)	Key (Torx Plus)	Complete clamp set	Key (Torx Plus)
25 / *1*	5513 020-08	5322 234-05 (9.52/*.374*)	5680 043-15 (25IP)	5412 028-051 1)	5680 043-15 (25IP)

1) For CoroTurn RC clamp set parts, see page 22.

T-Max P lever clamping design

Insert size iC	Lever	Screw	Key (mm)	Shim (For insert thickness, mm/*inch*)	For radius mm/*inch*	Shim pin	Shim pin punch
25 / *1*	174.3-844M	174.3-827	3021 010-050 (5.0)	5322 230-01 (9.52) (*.374*)	2.4-3.2 *.063-.126*	174.3-865	174.3-874


3


8

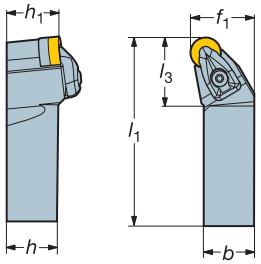
Shank tools

Negative

RNMG

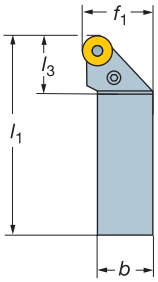
CoroTurn RC rigid clamping design

DRSNR/L



T-Max P lever clamping design

PRGNR/L

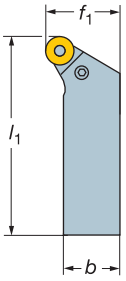


Positive

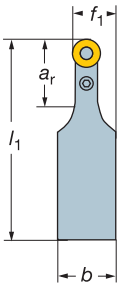
RCMX

T-Max P lever clamping design

PRGCR/L



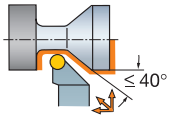
N176.39



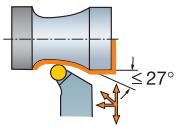
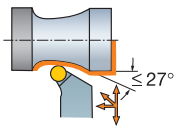
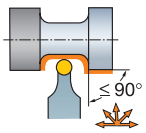
Right hand style shown when nothing else is stated

(neutral)

CoroTurn RC rigid clamping design

Main application	⬭	Ordering code	Dimensions, mm b	f_1	h	h_1	l_1	l_3	γ 1)	λ_s 2)	Gauge inserts ISO	Nm 3)
		***Metric design***										
	25	**DRSNR/L 4040S 25**	40	50.0	40	40	250	50	–6°	–6°	RNMG 25 09 00	9.5

T-Max P lever clamping design

Main application	⬭	Ordering code	Dimensions, mm a_r	b	f_1	h	h_1	l_1	l_3	γ 1)	λ_s 2)	Gauge inserts ISO
		***Metric design***										
	25	**PRGNR/L 4040S 25**		40	50.0	40	40	250	41.9	–6°	–6°	RNMG 25 09 00
	25	**PRGCR/L 4040S 25**		40	50.0	40	40	250		0°	0°	RCMX 25 07 00
	32	**PRGCR/L 5050T 32**		50	63.0	50	50	300		0°	0°	RCMX 32 09 00
	25	**N176.39-4040-25**	50	40	32.5	40	40	300		–0°	–0°	RCMX 25 07 00
	32	**N176.39-5050-32**	55	50	41.0	50	50	350		–0°	–0°	RCMX 32 09 00

1) γ = Rake angle (valid with flat insert).
2) λ_s = Angle of inclination.
3) Insert tightening torque Nm / *ft/lbs.*

N = Neutral, R = Right hand, L = Left hand

Spare parts

CoroTurn® RC rigid clamping design

Insert size ⬭	*iC*	Insert type	Shim screw	Shim (For insert tickness, mm / *inch*)	Key (Torx Plus)	Complete clamp set	Key (Torx Plus)
25	*1*	RNMG	5513 020-08	5322 155-07 (9.52 / *.375*)	5680 043-15 (25IP)	5412 028-051 1)	5680 043-15 (25IP)

1) For CoroTurn RC clamp set parts, see page 22.

T-Max P lever clamping design

Insert size ⬭	*iC*	Insert type	Lever	Screw	Key (mm)	Shim (For Insert thickness, mm/*inch*)	Shim pin	Shim pin punch
25	*1.000*	RNMG	174.3.844M	174.3-827	3021 010-050 (5.0)	176.3-853M (9.52 / *.375*)	174.3-865	174.3-874
25	*.984*	RCMX	174.39.844	174.3-832	3021 010-040 (4.0)	176.39-854 (7.94 / *.312*)	174.3-862	174.3-872
32	*1.260*	RCMX	174.39.845	174.3-827	3021 010-050 (5.0)	176.39-855 (9.52 / *.375*)	174.3-865	174.3-874


3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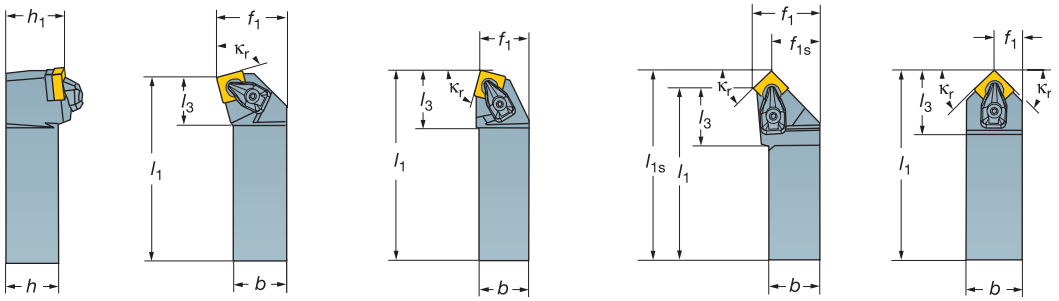
Shank tools

CoroTurn® RC rigid clamping design

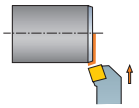
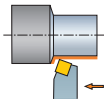
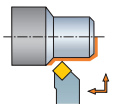
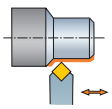
SNMM
SNMG
SNMA

	DSKNR/L	DSBNR/L	DSSNR/L	DSDNN
Entering angle	κ_r **75°**	κ_r **75°**	κ_r **45°**	κ_r **45°**
Lead angle	*15°*	*15°*	*45°*	*45°*



Right hand style shown when nothing else is stated

(neutral)

κ_r	Lead angle	Main application	iC	Ordering code	b	f_1	f_{1s}	h	h_1	l_1	l_{1s}	l_3	$\gamma^{1)}$	$\lambda_s^{2)}$	Gauge inserts ISO / ANSI	Nm 3) / ft-lbs
75°	*15°*			***Metric design***												
			25	**DSKNR/L 5050T 25**	50	60.0		50	50	300		35.2	–6°	–6°	SNMG 25 07 24	9.5
				Inch design												
			1	***DSKNR/L 32 8F***	*2.000*	*2.500*		*2.000*	*2.000*	*8.000*		*1.390*	*–6°*	*–6°*	*SNMG 856*	*7.0*
75°	*15°*			***Metric design***												
			25	**DSBNR/L 4040S 25**	40	35.0		40	40	250		56.6	–6°	–6°	SNMG 25 07 24	9.5
			25	**DSBNR/L 5050T 25**	50	43.0		50	50	300		56.6	–6°	–6°	SNMG 25 07 24	9.5
				Inch design												
			1	***DSRNR/L 24 8E***	*1.500*	*1.697*		*1.500*	*1.500*	*7.000*		*2.220*	*–6°*	*–6°*	*SNMG 856*	*7.0*
				DSRNR/L 32 8F	*2.000*	*2.268*		*2.000*	*2.000*	*8.000*		*2.230*	*–6°*	*–6°*	*SNMG 856*	*7.0*
45°	*45°*			***Metric design***												
			25	**DSSNR/L 4040S 25**	40	50.0	34.0	40	40	250.	266	41.1	–8°	–0°	SNMG 25 07 24	9.5
45°	*45°*			***Metric design***												
			25	**DSDNN 4040S 25**	40.0	21.0		40.0	40.0	250.0		57.2	–6°	–6°	SNMG 25 07 24	9.5
				Inch design												
			1	***DSDNN 24 8D***	*1.500*	*.791*		*1.500*	*1.500*	*6.000*		*2.260*	*–6°*	*–6°*	*SNMG 856*	*7.0*

1) γ = Rake angle (valid with flat insert).
2) λ_s = Angle of inclination.
3) Insert tightening torque Nm / ft/lbs.

N = Neutral, R = Right hand, L = Left hand

Spare parts

Insert size iC	Shim screw	Shim (For insert thickness, mm/*inch*)	Key (Torx Plus)	Complete clamp set	Key (Torx Plus)
25 *1*	5513 020-08	5322 425-07 (7.94 / *.312*) 5322 425-08 (9.52 / *.375*) 1)	5680 043-15 (25IP)	5412 028-051 2)	5680 043-15 (25IP)

1) Optional spare part delivered to separate order.

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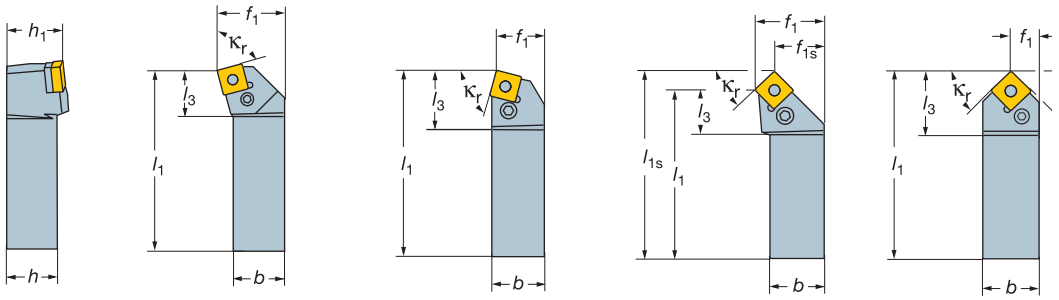
Shank tools

T-Max P lever clamping design

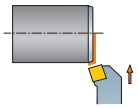
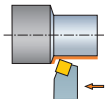
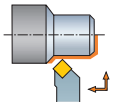
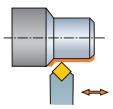
SNMM
SNMG
SNMA

	PSKNR/L	PSBNR/L	PSSNR/L	PSDNN
Entering angle	κ_r **75°**	κ_r **75°**	κ_r **45°**	κ_r **45°**
Lead angle	*15°*	*15°*	*45°*	*45°*



Right hand style shown when nothing else is stated

(neutral)

κ_r	*Lead angle*	Main application	□	Ordering code	Dimensions, mm *b*	*f*1	*f*1s	*h*	*h*1	*l*1	*l*1s	*l*3	γ1)	λs2)	Gauge inserts ISO
75°	*15°*		25	***Metric design*** **PSKNR/L 5050T 25**	50	60.0		50	50	300		37.5	–6°	–6°	SNMG 25 07 24
75°	*15°*		25	***Metric design*** **PSBNR/L 4040S 25**	40	35.0		40	40	250		47.5	–6°	–6°	SNMG 25 07 24
				PSBNR/L 5050T 25	50	43.0		50	50	300		47.5	–6°	–6°	SNMG 25 07 24
45°	*45°*		25	***Metric design*** **PSSNR/L 4040S 25**	40	50.0	34	40	40	250	266	41.1	–8°	–0°	SNMG 25 07 24
45°	*45°*		25	***Metric design*** **PSDNN 4040S 25**	40	21.0		40	40	250		48.8	–6°	–6°	SNMG 25 07 24

1) γ = Rake angle (valid with flat insert).
2) λ_s = Angle of inclination.

N = Neutral, R = Right hand, L = Left hand

Spare parts

Insert size □ *iC*	Lever	Screw	Key (mm)	Shim (For Insert thickness, mm/*inch*)	Shim pin	Shim pin punch
25	174.3-844M	174.3-827	3021 010-050 (5.0)	174.3-853M (7.94) (*.313*)	174.3-865	174.3-874

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 11

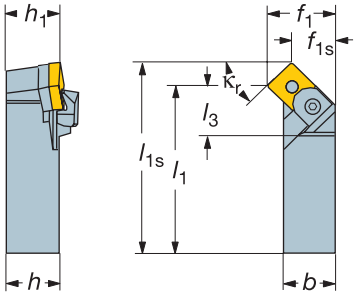
Shank tools

T-Max P wedge clamping design

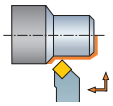
SNMM
SNMG
SNMA

MSSNR/L

Entering angle κ_r **45°**
Lead angle *45°*



Right hand style shown when nothing else is stated

κ_r	*Lead angle*	Main application	□	Ordering code	Dimensions, mm									Gauge inserts ISO *ANSI*
					b	f_1	f_{1s}	*h*	h_1	l_1	l_{1s}	l_3	γ[1] λ_s[2]	
45°	*45°*		25	***Metric design*** **MSSNR/L 4040S 25**	40	50.0	34	40	40	250	266	34	–0° 0°	SNMG 25 07 24

[1] γ = Rake angle (valid with flat insert).
[2] λ_s = Angle of inclination.

R = Right hand, L = Left hand

Spare parts

Insert size □	*iC*	Wedge clamp set	Key (mm)	Shim (For insert thickness, mm/*inch*)	For radius mm/*inch*	Pin	Screw	Key (mm)
25	*1*	181.38-826-1	3021 010-050 (5.0)	181.38-852 (7.94 /.313) 181.38-853 (9.52 /.374)[1]	1.6-2.4 /.063-.095 2.4 -3.2/.095-.126[1]	181.38-842	3212 100-357	3021 010-040 (4.0)

[1] Optional part delivered to separate order.


4

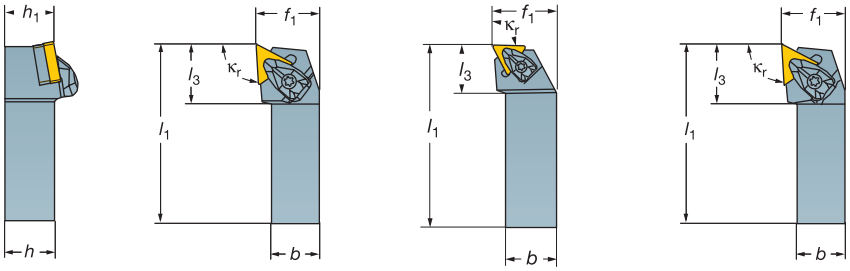

12

Shank tools

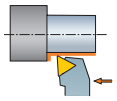
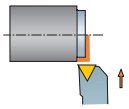
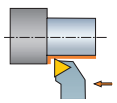
CoroTurn® RC rigid clamping design

TNMM
TNMG
TNMA

	DTJNR/L	DTFNR/L	DTGNR/L
Entering angle	κ_r **93°**	κ_r **91°**	κ_r **91°**
Lead angle	*-3°*	*-1°*	*-1°*



Right hand style shown when nothing else is stated

κ_r	*Lead angle*	Main application	iC	Ordering code	Dimensions, mm / *inch* b	f_1	h	h_1	l_1	l_3	$\gamma^{1)}$	λ_s 2)	Gauge inserts ISO / *ANSI*	Nm 3) / *ft-lbs*
93°	*-3°*			***Metric design***										
			27	**DTJNR/L 3232P 27**	32	49.0	32	32	170	49.8	–6°	–6°	TNMG 27 06 12	6.4
				DTJNR/L 4040S 27	40	50.0	40	40	250	38.4	–6°	–6°	TNMG 27 06 12	6.4
				Inch design										
			5/8	***DTJNR/L 20 5D***	*1.250*	*1.500*	*1.250*	*1.250*	*6.000*	*1.570*	*–6°*	*–6°*	*TNMG 543*	*4.7*
				DTJNR/L 24 5D	*1.500*	*2.000*	*1.500*	*1.500*	*6.000*	*1.520*	*–6°*	*–6°*	*TNMG 543*	*4.7*
91°	*-1°*			***Metric design***										
			27	**DTFNR/L 3232P 27**	32	40.0	32	32	170	38.1	–6°	–6°	TNMG 27 06 12	6.4
				DTFNR/L 4040S 27	40	50.0	40	40	250	37.4	–6°	–6°	TNMG 27 06 12	6.4
			33	**DTFNR/L 4040S 33**	40	50.0	40	40	250	41.4	–6°	–6°	TNMG 33 07 12	6.4
				Inch design										
			5/8	***DTFNR 20 5D***	*1.250*	*1.500*	*1.250*	*1.250*	*6.000*	*1.500*	*–6°*	*–6°*	*TNMG 543*	*4.7*
				DTFNR 24 5D	*1.500*	*2.000*	*1.500*	*1.500*	*6.000*	*1.470*	*–6°*	*–6°*	*TNMG 543*	*4.7*
			3/4	***DTFNR 24 6D***	*1.500*	*2.000*	*1.500*	*1.500*	*6.000*	*1.630*	*–6°*	*–6°*	*TNMG 653*	*4.7*
91°	*-1°*			***Metric design***										
			27	**DTGNR/L 3232P 27**	32	40.0	32	32	170	40.6	–6°	–6°	TNMG 27 06 12	6.4
				DTGNR/L 4040S 27	40	50.0	40	40	250	39.3	–6°	–6°	TNMG 27 06 12	6.4
				Inch design										
			5/8	***DTGNR/L 20 5D***	*1.250*	*1.500*	*1.250*	*1.250*	*6.000*	*1.590*	*–6°*	*–6°*	*TNMG 543*	*4.7*
				DTGNR/L 24 5D	*1.500*	*2.000*	*1.500*	*1.500*	*6.000*	*1.550*	*–6°*	*–6°*	*TNMG 543*	*4.7*
			3/4	***DTGNR/L 24 6D***	*1.500*	*2.000*	*1.500*	*1.500*	*6.000*	*1.740*	*–6°*	*–6°*	*TNMG 653*	*4.7*

1) γ = Rake angle (valid with flat insert).
2) λ_s = Angle of inclination.
3) Insert tightening torque Nm / *ft/lbs.*

N = Neutral, R = Right hand, L = Left hand

Spare parts

Insert size iC	Shim screw	Shim (For insert thickness, mm/*inch*)	Key (Torx Plus)	Complete clamp set	Key (Torx Plus)
27 *5/8*	5513 020-07	5322 315-05 (6.35 / *.250*)	5680 043-14 (20IP)	5412 028-031 1)	5680 043-14 (20IP)
33 *3/4*	5513 020-07	5322 315-06 (7.94 / *.313*)	5680 043-14 (20IP)	5412 028-041 1)	5680 043-14 (20IP)

1) For CoroTurn RC clamp set parts, see page 22.


4

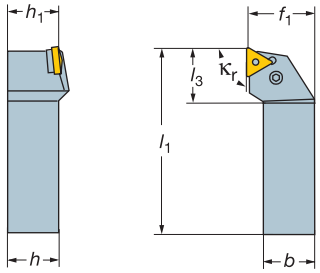

13

Shank tools

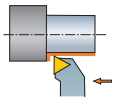
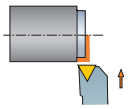
T-Max P lever clamping design

TNMM
TNMG
TNMA

	PTGNR/L	PTFNR/L
Entering angle	κ_r **91°**	κ_r **91°**
Lead angle	*-1°*	*-1°*



Right hand style shown when nothing else is stated

κ_r	*Lead angle*	Main application		Ordering code	Dimensions, mm / *inch* b	f_1	h	h_1	l_1	l_3	γ [1]	λ_s [2]	Gauge inserts ISO *ANSI*
91°	*-1°*			***Metric design***									
			27	**PTGNR/L 3232P 27**	32	40.0	32	32	170	35.2	–6°	–6°	TNMG 27 06 12
				PTGNR/L 4040S 27	40	50.0	40	40	250	34.0	–6°	–6°	TNMG 27 06 12
91°	*-1°*			***Metric design***									
			27	**PTFNR/L 3232P 27**	32	40.0	32	32	170	34.4	–6°	–6°	TNMG 27 06 12
				PTFNR/L 4040S 27	40	50.0	40	40	250	33.2	–6°	–6°	TNMG 27 06 12
			33	**PTFNR/L 4040S 33**	40	50.0	40	40	250	38.2	–6°	–6°	TNMG 33 07 12

[1] γ = Rake angle (valid with flat insert).
[2] λ_s = Angle of inclination.

R = Right hand, L = Left hand

Spare parts

Insert size		Lever	Screw	Key (mm)	Shim (For Insert thickness, mm/*inch*)	Shim pin	Shim pin punch
iC							
27	5/8	174.3-843M	174.3-825	174.1-864 (3.0)	179.3-854M (6.35/*.250*) 179.3-857M (6.35/*.250*) [1]	174.3-864	174.3-873
33	3/4	174.3-842M	174.3-822M	3021 010-040 (4.0)	179.3-855M (7.94/*.313*)	174.3-865	174.3-874

[1] Optional part delivered to separate order.


4


13

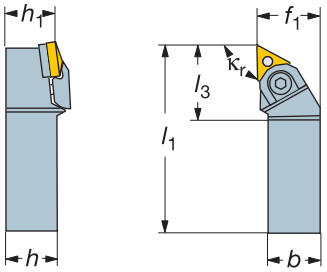
Shank tools

T-Max P wedge clamping design

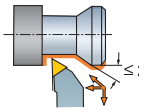
TNMM
TNMG
TNMA

WTJNR/L

Entering angle κ_r **93°**
Lead angle -3°



Right hand style shown when nothing else is stated

κ_r	*Lead angle*	Main application		Ordering code	**Dimensions,** *inch* b	f_1	h	h_1	l_1	l_3	$\gamma^{1)}$	$\lambda_s{}^{2)}$	Gauge inserts
93°	–3°		27	***Inch design***									
				WTJNR/L 20 05D	*1.250*	*1.500*	*1.250*	*1.250*	*6.000*	*1.750*	*–4°*	*–13°*	*TNMG 543*
				WTJNR/L 24 05D	*1.500*	*2.000*	*1.500*	*1.500*	*6.000*	*1.750*	*–4°*	*–13°*	*TNMG 543*

[1] γ = Rake angle (valid with flat insert).
[2] $\lambda\sigma$ = Angle of inclination.

R = Right hand, L = Left hand

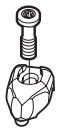
Spare parts

Insert size iC	Wedge clamp set	Key (inch)	Shim (For insert thickness, mm/*inch*)	For radius mm/*inch*	Pin	Key (mm)
27 *5/8*	A170.38-822-1	174.1-871 (*1/8*)	170.3-858 (6.35 /*.250*)	0.8-1.6 /*.031-.063*	170.3-848M-1	3021 010-040 (4.0)

 4

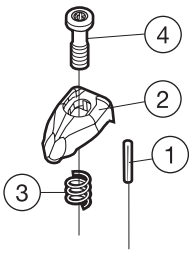
 13

CoroTurn® RC clamp sets

Insert type/size ISO *ANSI*				 Standard clamp set for carbide inserts	 Clamp set for ceramic inserts with hole	 Clamp set for ceramic inserts without hole	Optional clamp for carbide inserts  Clamp for heavy machining
CNM. 25 *CNM. 86*	SNM. 25 *SNM. 86*		RNM. 25 *RNM. 86*	5412 028-041	–	–	–
		TNM. 27 *TNM 54*		5412 028-031	5412 032-031	5412 034-031	5412 029-03
		TNM. 33 *TNM 66*		5412 028-041	–	–	5412 029-04

Note!
Going from one insert thickness to another means that the cutting edge height also changes.
In order to compensate for this the shim must be replaced.

CoroTurn® RC clamp set parts



Complete clamp set	1 Pin	2 Clamp	3 Compression spring	4 Screw
5412 028-031	3113 030-307	5412 028-03	5561 001-59	5512 086-03
5412 028-041	3113 030-307	5412 028-04	5561 001-59	5512 086-03
5412 028-051	3113 030-307	5412 028-05	5561 001-61	5512 086-04

Recommended depth of cut and cutting speed

Insert, ISO/*ANSI*		Rec. depth of cut a_p, mm / *inch*			Rec. cutting feed f_n, mm/r *inch/r*		
		Rec	Min	Max	Rec	Min	Max
	CNMG 25 09 24-PR	6.00	2.00	15.0	0.60	0.40	1.00
	CNMG 866-PR	*.236*	*.079*	*.591*	*.024*	*.016*	*.039*
-PR	SNMG 25 07 16-PR	6.00	2.00	15.0	0.80	0.40	1.00
	CNMG 854-PR	*.236*	*.079*	*.591*	*.031*	*.016*	*.039*
P 1)	SNMG 25 07 24-PR	6.00	2.00	15.0	1.00	0.40	1.20
	CNMG 856-PR	*.236*	*.079*	*.591*	*.039*	*.016*	*.047*
	SNMG 25 09 24-PR	6.00	2.00	15.0	1.00	0.40	1.20
	SNMG 866-PR	*.236*	*.079*	*.591*	*.039*	*.016*	*.047*
	TNMG 27 06 08-PR	6.00	*1.50*	*12.0*	0.50	*0.35*	*0.55*
	TNMG 542-PR	*.236*	*.059*	*.472*	*.020*	*.014*	*.022*
	TNMG 27 06 12-PR	6.00	2.00	12.0	0.60	0.35	0.75
	TNMG 543-PR	*.236*	*.079*	*.472*	*.024*	*.014*	*.030*
	TNMG 27 06 16-PR	6.00	2.00	12.0	0.60	0.35	0.70
	TNMG 544-PR	*.236*	*.079*	*.472*	*.024*	*.014*	*.028*
	TNMG 33 07 16-PR	7.00	3.00	15.0	0.60	0.40	0.75
	TNMG 654-PR	*.276*	*.118*	*.591*	*.024*	*.016*	*.030*
	TNMG 33 09 24-PR	7.00	3.00	15.0	0.60	0.45	0.90
	TNMG 666-PR	*.276*	*.118*	*.591*	*.024*	*.018*	*.035*
	CNMM 25 09 24-MR	9.00	2.50	15.0	0.65	0.45	1.20
	CNMM 866-MR	*.354*	*.098*	*.591*	*.026*	*.018*	*.047*
-MR	CNMM 25 09 32-MR	9.00	3.50	15.0	0.65	0.45	1.20
	CNMM 868-MR	*.354*	*.138*	*.591*	*.026*	*.018*	*.047*
M 1)	SNMM 25 07 24-MR	9.00	2.80	18.0	0.70	0.45	1.40
	SNMM 856-MR	*.354*	*.110*	*.709*	*.028*	*.018*	*.055*
P	SNMM 25 07 32-MR	8.00	2.00	15.0	0.60	0.45	1.40
	SNMM 858-MR	*.315*	*.079*	*.591*	*.024*	*.018*	*.055*
	SNMM 25 09 24-MR	9.00	2.80	18.0	0.70	0.45	1.20
	SNMM 866-MR	*.354*	*.110*	*.709*	*.028*	*.018*	*.047*
	TNMM 27 06 12-MR	6.00	1.00	9.0	0.50	0.32	0.70
	TNMM 543-MR	*.236*	*.039*	*.354*	*.020*	*.013*	*.028*
	TNMM 27 06 16-MR	6.00	1.50	9.0	0.55	0.40	0.90
	TNMM 544-MR	*.236*	*.059*	*.354*	*.022*	*.016*	*.035*
	TNMM 27 06 24-MR	6.00	2.00	9.0	0.55	0.40	1.00
	TNMM 546-MR	*.236*	*.079*	*.354*	*.022*	*.016*	*.039*
	SNMG 25 07 24-MR	8.00	2.00	12.0	0.60	0.40	1.02
	SNMG 856-MR	*.315*	*.079*	*.472*	*.024*	*.016*	*.040*
-MR	SNMG 25 09 24-MR	6.00	2.00	12.0	0.60	0.40	1.00
	SNMG 866-MR	*.236*	*.079*	*.472*	*.024*	*.016*	*.039*
M 1)	TNMG 27 06 08-MR	5.00	2.00	12.0	0.35	0.30	0.47
	TNMG 542-MR	*.197*	*.079*	*.472*	*.014*	*.012*	*.018*
	TNMG 27 06 12-MR	5.00	2.00	12.0	0.40	0.30	0.64
	TNMG 543-MR	*.197*	*.079*	*.472*	*.016*	*.012*	*.025*
	TNMG 27 06 16-MR	5.00	2.00	12.0	0.50	0.40	0.77
	TNMG 544-MR	*.197*	*.079*	*.472*	*.020*	*.016*	*.030*
	TNMG 33 09 24-MR	7.00	3.00	15.0	0.65	0.50	0.90
	TNMG 666-MR	*.276*	*.118*	*.591*	*.026*	*.020*	*.035*
	SNMA 25 07 24-KR	6.00	0.40	12.0	0.60	0.20	1.19
	SNMA 856-KR	*.236*	*.016*	*.472*	*.024*	*.008*	*.047*
NMA-KR	TNMA 27 06 16-KR	5.00	0.30	12.0	0.50	0.20	1.00
	TNMA 544-KR	*.197*	*.012*	*.472*	*.020*	*.008*	*.039*
K 1)							
	SNMG 25 07 24-KR	7.00	2.00	14.0	0.86	0.43	1.19
	SNMG 856-KR	*.276*	*.079*	*.551*	*.034*	*.017*	*.047*
KR	TNMG 27 06 16-KR	4.40	0.94	8.8	0.66	0.33	0.92
	TNMG 544-KR	*.173*	*.037*	*.346*	*.026*	*.013*	*.036*
K 1)							
	CNMG 19 06 12-HM	4.00	1.00	10.00	0.50	0.25	0.80
	CNMG 643-HM	*.157*	*.039*	*.394*	*.020*	*.010*	*.031*
HM	CNMG 19 06 16-HM	4.00	1.50	10.00	0.60	0.30	0.90
	CNMG 644-HM	*.157*	*.059*	*.394*	*.025*	*.012*	*.035*
P 1) M	SNMG 19 06 12-HM	4.00	1.00	10.00	0.50	0.25	0.80
	SNMG 643-HM	*.157*	*.039*	*.394*	*.020*	*.010*	*.031*
	SNMG 19 06 16-HM	4.00	1.50	10.00	0.60	0.30	0.9
	SNMG 644-HM	*.157*	*.059*	*.394*	*.025*	*.012*	*.035*

Insert, ISO/*ANSI*		Rec. depth of cut a_p, mm / *inch*			Rec. cutting feed f_n, mm/r *inch/r*		
		Rec	Min	Max	Rec	Min	Max
	SNMG 19 06 16-HM	4.00	1.50	10.00	0.60	0.30	0.90
	SNMG 644-HM	*.157*	*.059*	*.394*	*.025*	*.012*	*.035*
HR	CNMM 25 09 24-HR	10.00	3.20	17.0	*1.00*	0.60	1.60
	CNMM 866-HR	*.394*	*.126*	*.669*	*.039*	*.024*	*.063*
P 1)	CNMM 25 09 32-HR	10.00	4.00	17.0	1.00	0.60	1.80
	CNMM 868-HR	*.394*	*.157*	*.669*	*.039*	*.024*	*.071*
M	SNMM 25 07 24-HR	10.00	3.20	17.0	*1.00*	0.60	1.60
	SNMM 856-HR	*.394*	*.126*	*.669*	*.039*	*.024*	*.063*
	SNMM 25 07 32-HR	10.00	4.00	17.0	1.00	0.60	1.80
	SNMM 858-HR	*.394*	*.157*	*.669*	*.039*	*.024*	*.071*
	SNMM 25 09 24-HR	10.00	3.20	17.0	1.00	0.60	1.60
	SNMM 866-HR	*.394*	*.126*	*.669*	*.039*	*.024*	*.063*
	SNMM 25 09 32-HR	10.00	4.00	17.0	1.00	0.60	1.80
	SNMM 868-MR	*.394*	*.157*	*.669*	*.039*	*.024*	*.071*
	TNMM 27 06 16-HR	10.00	2.40	13.0	0.80	0.50	1.10
	TNMM 544-HR	*.394*	*.094*	*.512*	*.031*	*.020*	*.043*
	TNMM 27 06 24-HR	10.00	3.20	13.0	1.00	0.60	1.60
	TNMM 546-HR	*.394*	*.126*	*.512*	*.039*	*.024*	*.063*
	TNMG 27 06 08-QM	3.00	1.00	8.0	0.35	0.20	0.50
	TNMG 542-QM	*.118*	*.039*	*.315*	*.014*	*.008*	*.020*
-QM	TNMG 27 06 12-QM	3.00	1.00	8.0	0.35	0.25	0.60
	TNMG 543-QM	*.118*	*.039*	*.315*	*.014*	*.010*	*.024*
P 1) M							
	CNMM 25 09 24-QR	8.00	2.50	15.0	0.65	0.40	1.30
	CNMM 866-QR	*.315*	*.098*	*.591*	*.026*	*.016*	*.051*
-QR	SNMM 25 07 24-QR	8.00	2.50	15.0	0.65	0.40	1.30
	SNMM 856-QR	*.315*	*.098*	*.591*	*.026*	*.016*	*.051*
P 1)	TNMM 27 06 12-QR	6.00	2.00	11.0	0.60	0.35	0.9
	TNMM 543-QR	*.236*	*.079*	*.433*	*.024*	*.014*	*.035*
	TNMM 27 06 16-QR	6.00	2.00	11.0	0.60	0.35	1.20
	TNMM 544-QR	*.236*	*.079*	*.433*	*.024*	*.014*	*.047*
	SNMM 25 07 24	6.00	2.00	12.0	0.60	0.35	1.20
	SNMM 856	*.236*	*.079*	*.472*	*.024*	*.014*	*.047*
P 1)							
	TNMM 27 06 32	6.00	2.00	12.0	0.65	0.40	1.50
	TNMM 546	*.236*	*.079*	*.472*	*.026*	*.016*	*.059*
P 1)							
	TNMG 27 06 16	6.00	2.00	12.0	0.6	0.35	0.90
	TNMM 546	*.024*	*.079*	*.472*	*.024*	*.014*	*.035*
P 1)							
	RCMX 25 07 00	6.30	2.50	10.0	0.79	0.25	2.50
		.246	*.098*	*.394*	*.031*	*.01*	*.098*
	RCMX 32 09 00	8.00	3.20	12.8	1.01	0.32	3.20
P 1)		*.315*	*.126*	*.504*	*.040*	*.013*	*.126*
M K							
	RCMT 25 07 M0	5.00	2.50	10.0	1.25	0.25	2.50
		.197	*.098*	*.394*	*.049*	*.010*	*.098*
	RCMT 32 09 M0	6.00	3.20	12.8	1.60	0.32	3.20
P 1)		*.236*	*.126*	*.504*	*.063*	*.013*	*.126*
M K							
	RNMG 25 09 00	6.30	2.50	10.0	0.79	0.25	2.50
	RNMG 86	*.246*	*.098*	*.394*	*.031*	*.010*	*.098*
P 1)							
	RNGN 25 07 00K20015	7.50	0.16	10.0	0.74	0.10	9.56
	RNG 85K8015	*.295*	*.004*	*.394*	*.029*	*.006*	*.376*
K 1)							
S H							

1) Above recommendations are valid for first choice grade in main ISO area.

Nominal cutting speed and feed values

ISO	CMC No.	Material	Specific cutting force k_c 0,4	Specific cutting force k_c .016 lbs/in²	Hardness Brinell HB	Feed f_n, mm/r / inch/r Min Max Cutting speed vc, m/min ft/min
P		**Non-alloy carbon steel**				
	01.1	C=0,15%	1500	290,000	125	120 — 30
	01.2	C=0,35%	1600	304,500	150	394 — 98
	01.4	C=0,70%	1700	316,100	180–250	
		Alloy steel				
	02.1	Annealed	1600	304,500	125–200	
	02.2	Hardened and tempered	1800	345,600	200–275	120 — 30
	02.2	Hardened and tempered	2100	402,300	220–325	394 — 98
	02.2	Hardened and tempered	2250	430,000	325–450	
		Steel castings				
	06.1	Non-alloy	1350	261,000	150	
	06.2	Low-alloy	1550	304,500	150–250	120 — 30
	06.3	High-alloy	1800	362,500	160–200	394 — 98
ISO	CMC No.	Material	Specific cutting force k_c 0,4	Specific cutting force k_c .016 lbs/in²	Hardness Brinell HB	Feed f_n, mm/r / inch/r Min Max Cutting speed v_c, m/min ft/min
M		**Stainless steel**				
	05.11	Bars, forged, non-hardened	1800	333,500	150–270	100 — 15
	05.21	Bars, forged austenitic	1950	355,200	150–220	328 — 49
	15.11/ 15.12	Cast ferritic/martensitic	1600	464,000	200	
ISO	CMC No.	Material	Specific cutting force k_c 0,4	Specific cutting force k_c .016 lbs/in²	Hardness Brinell HB	Feed f_n, mm/r / inch/r Min Max Cutting speed v_c, m/min ft/min
K	04	**Extra hard steel** [1) 2) 3)]	3400	681,500	***59 HRC***	50 — 15
	10	**Chilled cast iron** [2)]	2050	398,700	400	.164 — .49
		Malleable cast iron				
	07.1	Ferritic	850	137,700	110–145	100 — 50
	07.2	Pearlitic	1750	159,500	200–250	.328 — .164
		Grey cast iron				
	08.1	Low tensile	600	159,500	180	100 — 50
	08.2	High tensile	1150	203,000	260	.328 — .164
		Nodular SG iron				
	09.1	Ferritic	850	152,200	160	100 — 50
	09.2	Pearlitic	1400	252,200	250	.328 — .164

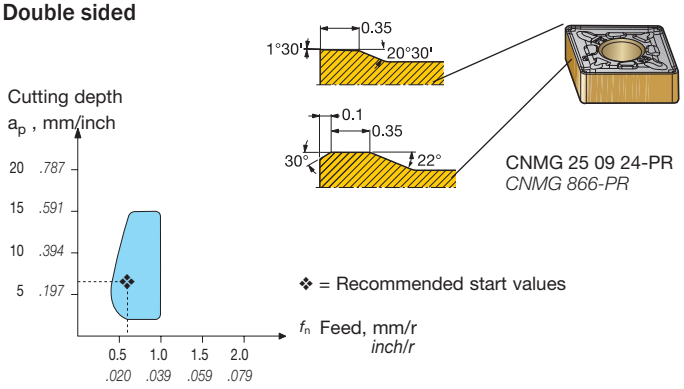
[1)] Negative rake should be used.

[2)] 75° entering angle, *15° lead angle*, and feed rate of 0.5–1 mm/r, *.020–.039 in/rev*, may often be used.

[3)] Negative primary land may be necessary.

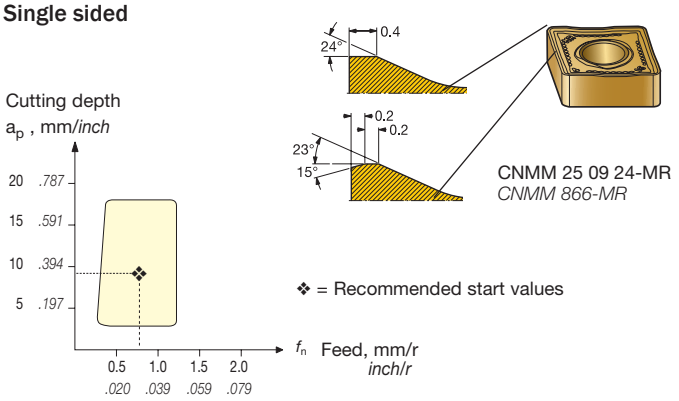
Insert geometries for heavy turning

PR
Double sided



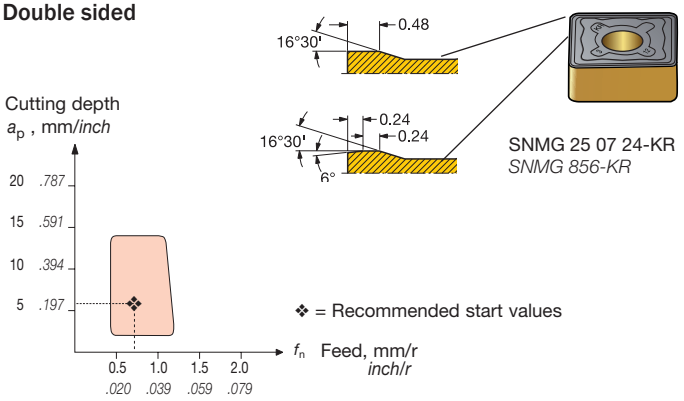
CNMG 25 09 24-PR
CNMG 866-PR

.NMM-MR
Single sided



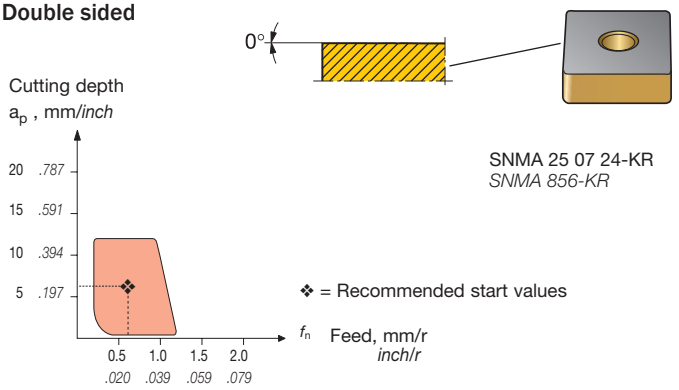
CNMM 25 09 24-MR
CNMM 866-MR

KR
Double sided



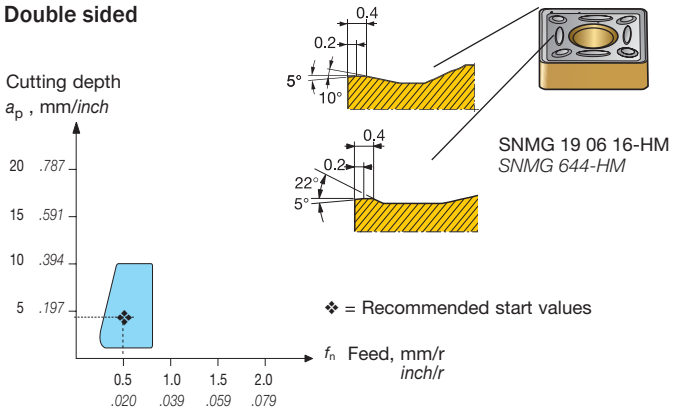
SNMG 25 07 24-KR
SNMG 856-KR

KR
Double sided



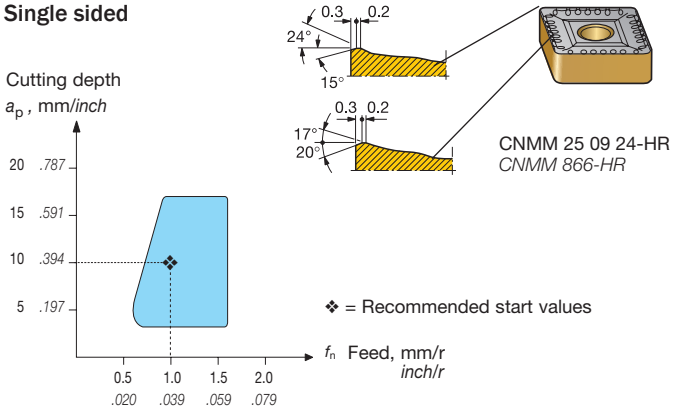
SNMA 25 07 24-KR
SNMA 856-KR

HM
Double sided



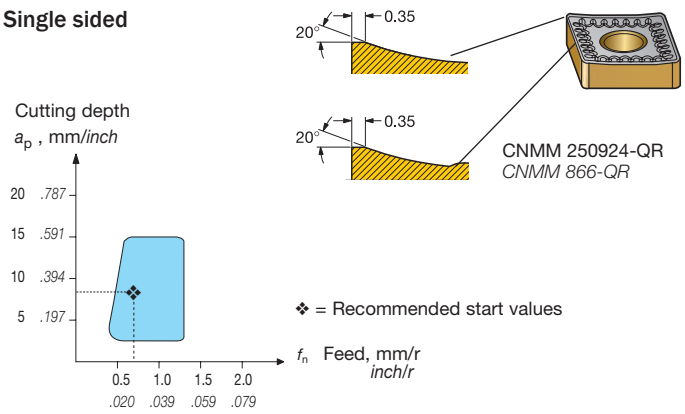
SNMG 19 06 16-HM
SNMG 644-HM

HR
Single sided



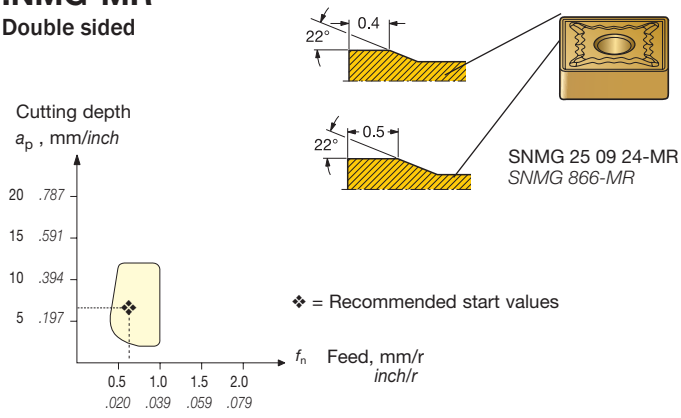
CNMM 25 09 24-HR
CNMM 866-HR

QR
Single sided



CNMM 250924-QR
CNMM 866-QR

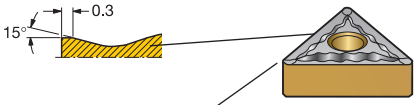
.NMG-MR
Double sided



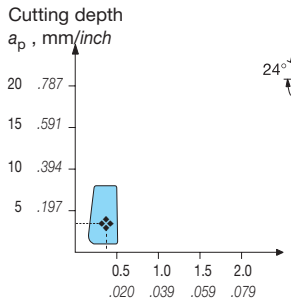
SNMG 25 09 24-MR
SNMG 866-MR

Insert geometries for heavy turning

QM
Double sided

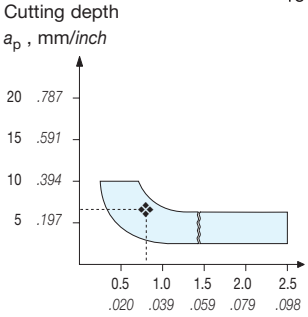


TNMG 27 06 12-QM
TNMG 543-QM

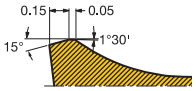


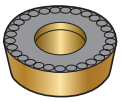
RCMX
Positive, single sided

RCMX 25 07 00

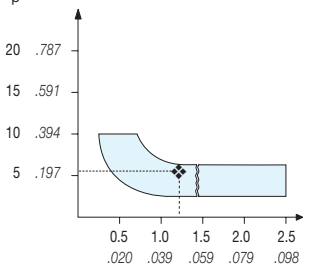


RCMT
Positive, single sided



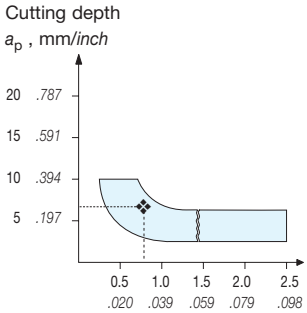


RCMT 25 07 M0

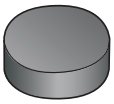


RNMG
Double sided

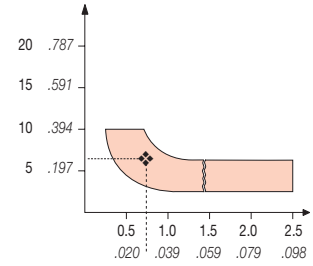
RNMG 25 09 00
RNMG 86



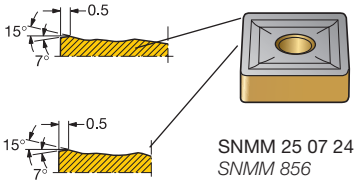
RNMG (Ceramic)
Double sided



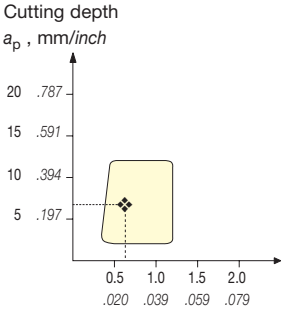
RNGN 25 07 00K20015
RNG 85K8015



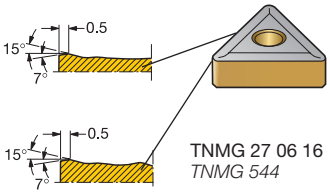
.NMM
Single sided



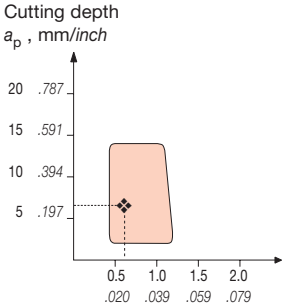
SNMM 25 07 24
SNMM 856



.NMG
Double sided

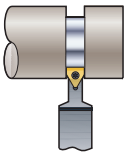


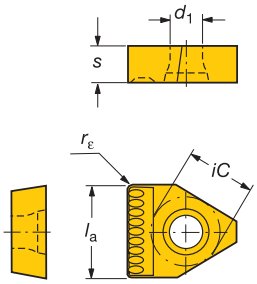
TNMG 27 06 16
TNMG 544



Bear Paw inserts

External grooving

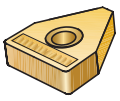




	iC	Ordering code	Dimensions, *inch* / mm l_a	d_1	s	r_ε	P GC 235	P P45	M GC 235	M M35	S GC 235	S S30
 BP	*.625*	***Inch design*** ***BP-750 030***	*.750* 19.05	*.216* 5.49	*.250* 6.35	*.030* 0.76	★		★		★	

★ = First choice

Feed recommendations and geometry description

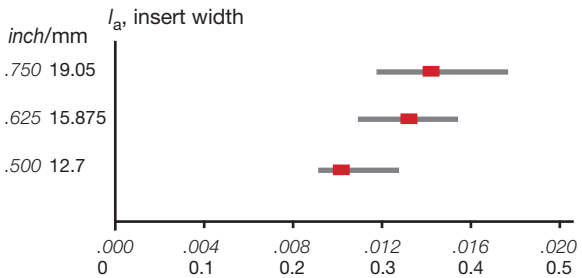


Width tolerance,
l_a = ±.001 *inch*
±0.025 mm

For heavy duty external grooving
Excellent accuracy and repeatability.
Chip breaker that performs well in most materials at moderate to heavy feeds.

= Feed starting value
= Feed, approx, range

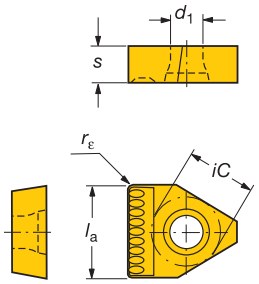
Radial feed
Starting values



29, 30

Bear Paw inserts

Engineered inserts for external grooving



BP

Code key
(Coromant code)

Insert width, l_a
Example: 500 = .500 inch

BP - 500 010

Bear Paw

Insert radii, r_ε
Example: 010 = .010 inch

TO BE QUOTED

	Ordering code	Dimensions, *inch*/mm										Grades		
		iC		l_a		d_1		*s*		r_ε		P	M	K
 BP	***Inch design***													
	BP-476 050	*.375*	9.525	*.476*	12.09	*.173*	4.39	*.188*	4.77	*.050*	1.27			
	BP-500 010	*.375*	9.525	*.500*	12.7	*.173*	4.39	*.188*	4.77	*.010*	0.25			
	BP-500 030	*.375*	9.525	*.500*	12.7	*.173*	4.39	*.188*	4.77	*.030*	0.76			
	BP-500 060	*.375*	9.525	*.500*	12.7	*.173*	4.39	*.188*	4.77	*.060*	1.51			
	BP-503 118	*.375*	9.525	*.503*	12.78	*.173*	4.39	*.188*	4.77	*.118*	3.00			
	BP-512 118	*.375*	9.525	*.512*	13.00	*.173*	4.39	*.188*	4.77	*.118*	3.00			
	BP-530 080	*.375*	9.525	*.530*	13.46	*.173*	4.39	*.188*	4.77	*.080*	1.51			
	BP-580 090	*.375*	9.525	*.580*	14.73	*.173*	4.39	*.188*	4.77	*.090*	2.29			
	BP-592 080	*.375*	9.525	*.592*	15.04	*.173*	4.39	*.188*	4.77	*.080*	1.51			
	BP-594 060	*.375*	9.525	*.594*	15.09	*.173*	4.39	*.188*	4.77	*.060*	1.51			
	BP-601 030	*.375*	9.525	*.601*	15.27	*.173*	4.39	*.188*	4.77	*.030*	0.76			
	BP-604 060	*.375*	9.525	*.604*	15.34	*.173*	4.39	*.188*	4.77	*.060*	1.51			
	BP-620 090	*.500*	12.7	*.620*	15.75	*.173*	4.39	*.188*	4.77	*.090*	2.29			
	BP-625 010	*.500*	12.7	*.625*	15.875	*.173*	4.39	*.188*	4.77	*.010*	0.25			
	BP-625 030	*.500*	12.7	*.625*	15.875	*.173*	4.39	*.188*	4.77	*.030*	0.76			
	BP-645 075	*.500*	12.7	*.645*	16.38	*.173*	4.39	*.188*	4.77	*.075*	1.91			
	BP-650 080	*.500*	12.7	*.650*	16.51	*.173*	4.39	*.188*	4.77	*.080*	2.03			
	BP-655 125	*.500*	12.7	*.655*	16.64	*.173*	4.39	*.188*	4.77	*.125*	3.18			
	BP-660 090	*.500*	12.7	*.660*	16.76	*.173*	4.39	*.188*	4.77	*.090*	2.29			
	BP-670 090	*.500*	12.7	*.670*	17.02	*.173*	4.39	*.188*	4.77	*.090*	2.29			
	BP-685 060	*.500*	12.7	*.685*	17.40	*.173*	4.39	*.188*	4.77	*.060*	1.51			
	BP-708 075	*.500*	12.7	*.708*	17.98	*.173*	4.39	*.188*	4.77	*.090*	2.29			
	BP-750 010	*.625*	15.875	*.750*	19.05	*.217*	5.51	*.250*	6.35	*.010*	0.25			
	BP-750 030	*.625*	15.875	*.750*	19.05	*.217*	5.51	*.250*	6.35	*.030*	0.76			
	BP-840 080	*.625*	15.875	*.840*	21.34	*.217*	5.51	*.250*	6.35	*.080*	2.03			
	BP-893 080	*.750*	19.05	*.893*	22.68	*.256*	6.50	*.250*	6.35	*.080*	2.03			
	BP-919 060	*.875*	22.225	*.919*	23.34	*.299*	7.59	*.250*	6.35	*.060*	1.51			
	BP-1429 080	*1.000*	25.4	*1.429*	36.30	*.305*	7.75	*.375*	9.525	*.080*	2.03			

Various applications and machining conditions require different grades.

For grade choice, see general grade information on page 60, and contact your Sandvik Coromant representative for an offer.

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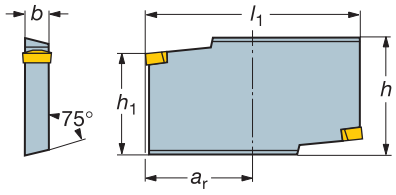
Bear Paw

Double ended grooving blade for tool block

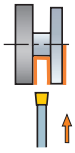
Screw clamp

Grooving

BP

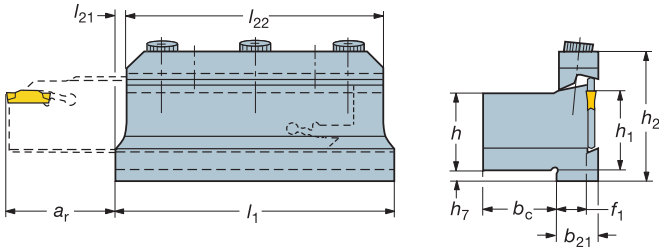


Right hand style shown

	Blade size	iC	a_r	Ordering code	Dimensions, *inch* / mm				Gauge insert	Spare parts	
					b	h	h_1	l_1		Insert screw	Key (Torx Plus)
	45	*.375*	*3.937* 100	***Inch design*** ***BPR/L 151.2-45 500***	*.435* 11.05	*2.067* 52.5	*1.772* 45.0	*10.236* 260.0	*BP-500 030*	5513 020-29	5680 043-13 (9IP)

R = right hand, L = left hand

Tool blocks for parting blades

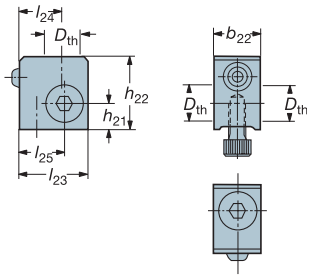


Blade size	a_r max	Ordering code	Dimensions, *inch* / mm									
			b_{21}	b_c	f_1	h	h_1	h_2	h_7	l_1	l_{21}	l_{22}
		Inch design										
45	*3.930*	**151.2-20-45**	*.800*	*1.230*	*.530*	*1.250*	*1.250*	*3.250*	*1.182*	*6.299*	*.197*	*5.906*
45	*3.930*	**151.2-24-45**	*.800*	*1.480*	*.530*	*1.500*	*1.500*	*3.250*	*1.929*	*6.299*	*.197*	*5.906*
		Metric design										
45	100	**151.2-3232-45**	20.4	33	13.4	32	32	82.5	29.7	160	5	150
45	100	**151.2-4040-45**	20.4	40	13.4	40	40	82.5	21.7	160	5	150

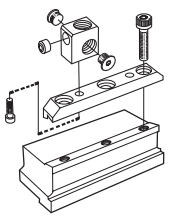
Spare parts for tool blocks

Tool blade size	Clamp	Clamp screw	Key (mm)
45	5412 120-03	3212 010-412	3021 010-060 (6.0)

Coolant adaptor for tool blocks, optional



Ordering code	Dimensions, mm / *inch*						
	b_{22}	h_{21}	h_{22}	l_{23}	l_{24}	l_{25}	D_{th}
5691 050-011	17 *.669*	10 *.394*	28 *1.102*	26 *1.024*	16.2 *.638*	17.1 *.673*	G1/4” G1/4”



Spare parts coolant adaptor

Nozzle	Mounting screw	Plug	Key (mm)	Key (mm)
5691 029-02	3212 010-358	5519 055-01	3021 010-050 (5.0)	3021 010-060 (6.0)

27, 28

Bear Paw

Shank tools for grooving

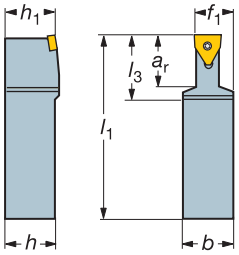
Screw design

Grooving

BP

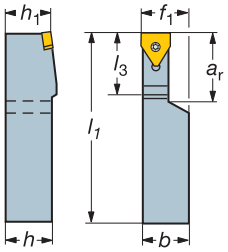
Right hand style shown when nothing else is stated

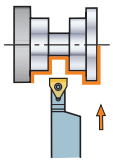
BPGN



(neutral)

BPGR/L



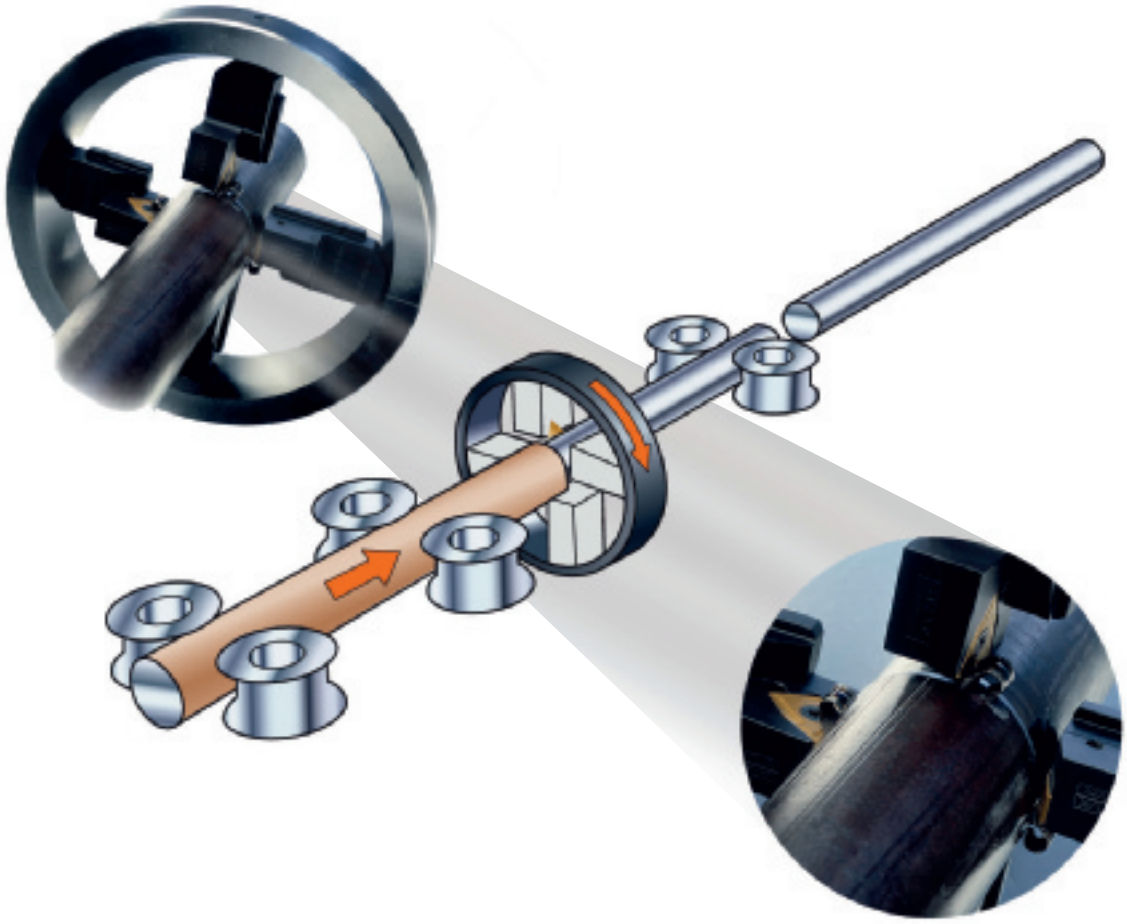
	iC	a_r max inch	mm	Ordering code	Dimensions, inch b	f_1	h	h_1	l_1	l_3	Gauge inserts
				***Inch design***							
	.375	1.120	28.5	***BPGN 50020***	1.250	.875	1.250	1.250	6.000	1.380	BP-500 030
	.500	1.380	30.05	***BPGN 62520***	1.250	.937	1.250	1.250	6.000	1.630	BP-625 030
	.625	1.630	41.4	***BPGN 75024***	1.500	1.125	1.500	1.500	7.500	1.870	BP-750 030
	.375	1.250	31.75	***BPGR/L 50024***	1.468	1.500	1.500	1.500	6.000	1.140	BP-500 030
	.500	1.500	38.1	***BPGR/L 62524***	1.468	1.500	1.500	1.500	6.000	1.420	BP-625 030
	.625	1.750	44.45	***BPGR/L-75024***	1.468	1.500	1.500	1.500	7.000	1.650	BP-750 030

R = right hand, L = left hand, N = Neutral

Spare parts

Insert type	Insert screw	Key (Torx Plus)	
BP-500 030	5513 020-29	5680 049-01	(15IP)
BP-625 030	5513 020-29	5680 049-01	(15IP)
BP-750 030	5513 020-26	5680 043-14	(20IP)

27, 28



Bar peeling

Bar peeling is a method used to remove oxide scale, mill scale, surface cracks, etc. from hot-rolled and forged blanks. The size of blank can vary from 4 mm (*.157 inch*) to over 400 mm (*15.75 inch)* in diameter. Bar peeling is also applied to thick walled tubes.

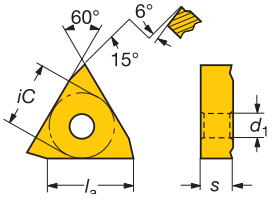
The most common materials which are peeled are carbon steel, spring steel and stainless steels. Bar peeling is also applied to other materials, such as high-temperature steel, titanium, aluminium and uranium.

Application areas vary, but bar peeled blanks are often used as an intermediate stage in the production of products which are to be processed further. Examples of these are extrusion blanks for tube manufacturing and axle components for the automobile industry.

Compared to conventional turning, bar peeling is a method of machining which provides high productivity and low production costs due to the shorter throughput times. The surface quality and dimensional tolerances are also high, which in turn leads to less machining at later stages.

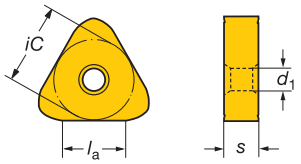
For screw clamping

Single sided



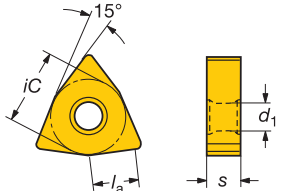
TNMX 24 07-1
TNMT 33 09 31-PF
TNMX 33 09 32-PF
TNMX 33 09 31-MF

Double sided



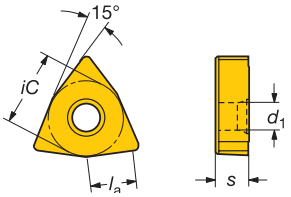
TNMX 49 10 51-MF

Double sided



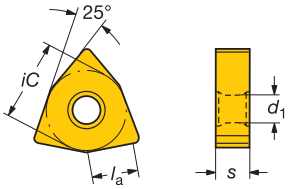
TNMX 11 06-2

Single sided



WNMT 15 09 31-PM
WNMX 15 09 31-MM

Double sided



WNMX 21 12 51-MM
TNMX 15 09-2

Finishing and medium inserts have support chamfer, for example:

TNMX11 06-2 — *1 = single sided, 2 = double sided*

WNMX15 09 31-MM — 3° angle of support chamfer (3 = 3° and 5 = 5°.); *Chip-breaker version*

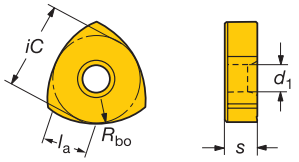
				iC	Ordering code	Dimensions, mm / inch iC	d_1	l_a	s	Max a_p	P GC3005	P GC4215	P GC4225	P GC4235	M GC2015	M GC2025	M GC2135	M GC235	K GC3005
FINISHING			11	5/8	**TNMX 11 06-2** [1]	15.875 / 5/8	6.35 / .250	8.0 / .315	6.35 / .250	2.0 / .079			☆						
			24	3/4	**TNMX 24 07-1** [1]	19.05 / 3/4	7.93 / .312	22.0 / .866	7.94 / .313	1.2 / .047			☆						
		PF	33	3/4	**TNMT 33 09 31-PF**	19.05 / 3/4	7.93 / .312	21.0 / .827	9.52 / .375	1.3 / .051		☆	☆						
		PF	33	3/4	**TNMX 33 09 32-PF**	19.05 / 3/4	7.93 / .312	21.0 / .827	9.52 / .375	1.3 / .051	☆		☆						☆
		MF			**TNMX 33 09 31-MF**	19.05 / 3/4	7.93 / .312	21.0 / .827	9.52 / .375	1.3 / .051					☆		☆		
		MF	49	1 1/4	**TNMX 49 10 51-MF**	28.575 / 1 1/4	7.93 / .312	21.0 / .827	10.0 / .394	2.5 / .098			☆						
MEDIUM		PM	15	7/8	**WNMT 15 09 31-PM**	22.225 / 7/8	7.93 / .312	13.0 / .512	9.52 / .375	3.0 / .118	☆		☆						☆
		MM			**WNMX 15 09 31-MM**	22.225 / 7/8	7.93 / .312	13.0 / .512	9.52 / .375	3.0 / .118				☆	☆	☆	☆		
			15	7/8	**TNMX 15 09-2** [1)2)]	22.225 / 7/8	7.93 / .312	13.0 / .512	9.52 / .375	3.0 / .118	☆	☆	☆		☆	☆			☆
		MM	21	1 1/4	**WNMX 21 12 51-MM**	31.75 / 1 1/4	9.12 / .359	15.0 / .591	12.7 / .500	5.0 / .197			☆	☆	☆	☆	☆		
											P10	P15	P25	P35	M15	M25	M35	M40	K05

[1] Can also be used for lever clamping .
[2] Double sided insert, can be used in the same holder as WNMT 150931-PM and WNMX 150931-MM.

35, 36 45-46 60

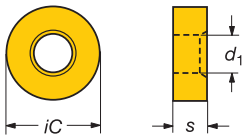
For screw clamping

Single sided



TNMT 44 09 01-PR
TNMX 44 09 01-MR

Single sided



RNMX 38 12 00-MR
RNMX 50 18 M0-MR
190.1-38 12 00

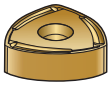
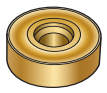
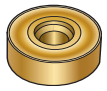
Roughing inserts have no support chamfer.

Corresponds to existing standard geometry

TNMT 44 09 01 -PR

Chip-breaker version

No support chamfer.

				iC	Ordering code	Dimensions, mm *inch* iC	d_1	l_a	R_{bo}	s	Max a_p	P GC3005	P GC4215	P GC4225	P GC4235	M GC2015	M GC2025	M GC2135	M GC235	K GC3005
ROUGHING		**MR**	44	*1*	**TNMX 44 09 01-MR**	25.4 *1*	7.93 *.312*	14.0 *.551*	25.4 *1*	9.52 *.375*	5.0 *.197*						☆	☆		
		**MR**	38	*1 1/2*	**RNMX 38 12 00-MR**	38.1 *1 1/2*	12.8 *.504*	–	–	12.0 *472*	8.0 *.315*						☆	☆		
		**MR**	50	*2*	**RNMX 50 18 M0-MR**	50.8 *2*	12.8 *.504*	–	–	18.0 *.709*	12.0 *.472*							☆		
			38	*1 1/2*	**190.1- 38 12 00**	38.1 *1 1/2*	12.7 *.500*	–	–	12.7 *.500*	8.0 *.315*						☆		☆	

P10 P15 P25 P35 M15 M25 M35 M40 K05

35, 36 45-46 60

Engineered inserts

TO BE QUOTED

Code key
(ISO or Coromant code)

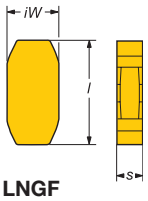
Corresponds to existing standard geometry

S – LNGF 30 08 51 – MM / – F1

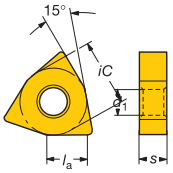
Engineered inserts

F = Finishing
M = Medium
R = Roughing

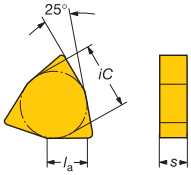
Chip-breaker version

Double sided


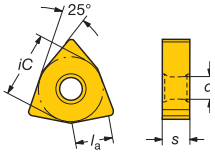
LNGF

Double sided


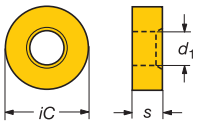
WNGX

Double sided


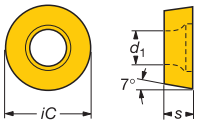
WNGF / WNMF

Double sided


TNMX

Single sided


RNMX

Single sided, positive insert


RCMT

			iC	Ordering code	Dimensions, mm *inch* iC	d_1	l	l_a	iW	Max s	Max a_p	Grades P	Grades M	Grades K
FINISHING	 S-LNGF	30	-	S-LNGF 30 08 51-F1	–	–	30.5 *1.200*	–	12.0 *.472*	8.0 *.315*	1.3 *.051*			
	 S-LNGF	40	-	S-LNGF 40 10 51-F1	–	–	40.0 *1.575*	–	20.0 *.787*	10.0 *.394*	2.5 *.098*			
		40	-	S-LNGF 40 12 51-F1	–	–	40.0 *1.575*	–	20.0 *.787*	12.0 *.472*	2.5 *.098*			
	 S-TNMX	49	1 1/8	S-TNMX 49 10 61-MF	28.575 *1 1/8*	7.93 *.312*	–	21.0 *.827*	–	10.0 *.394*	2.5 *.098*			
		15	7/8	TNMX 15 09-2	22.225 *7/8*	7.93 *.312*	–	13.0 *.512*	–	9.52 *.375*	3.0 *.118*			
		15	7/8	TNMX 15 09-2 MOD	22.225 *7/8*	7.93 *.312*	–	13.0 *.512*	–	9.52 *.375*	3.0 *.118*			
		33	3/4	S-TNMX 33 09 31-F1	19.05 *3/4*	7.93 *.312*	–	21.0 *.827*	–	9.52 *.375*	1.3 *.051*			
		33	3/4	S-TNMX 33 09 31-F2	19.05 *3/4*	7.93 *.312*	–	21.0 *.827*	–	9.52 *.375*	1.3 *.051*			
		06	3/8	S-TNMX 06 03 -1 [1]	9.525 *3/8*	3.81 *.150*	–	5.0 *.197*	–	3.18 *.125*	1.3 *.051*			
MEDIUM	 S-WNGX	15	7/8	S-WNGX 15 09 31-MM	22.225 *7/8*	7.93 *.312*	–	13 *.512*	–	9.525 *.375*	3.0 *.118*			
		15	7/8	S-WNGX 15 09 31-M1	22.225 *7/8*	7.93 *.312*	–	13 *.512*	–	9.525 *.375*	3.0 *.118*			
	 S-WNGF	21	1 1/4	S-WNGF 21 13 51-MM	31.75 *1 1/4*	–	–	15 *.591*	–	13.0 *.512*	5.0 *.197*			
		21	1 1/4	S-WNGF 21 13 51-M1	31.75 *1 1/4*	– –	–	15 *.591*	– –	13.0 *.512*	5.0 *.197*			
	 WNMF		1 1/8	WNMF 96	28.58 *1 1/8*	–	–	14.78 *.582*	–	8.885 *.375*	6.6 *.259*			
ROUGHING	 S-RCMT	25	.984	S-RCMT 25 07 M0-R [1]	25.0 *.984*	7.6 *.299*	–	–	–	7.94 *.312*	– –			
				S-RCMT 25 07 M0-R1	25.0 *.984*	7.6 *.299*	–	–	–	7.94 *.312*	– –			
	 S-RNMX	38	1 1/2	S-RNMX 38 12 00-MR	38.1 *1 1/2*	12.8 *.504*	–	–	–	12.0 *.472*	8.0 *.315*			

Grades

P **M** **K**

Various applications and machining conditions require different grades.

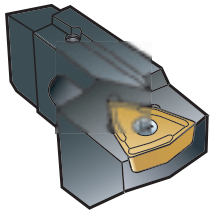
For grade choice, see general grade information on page 60, and contact your Sandvik Coromant representative for an offer.

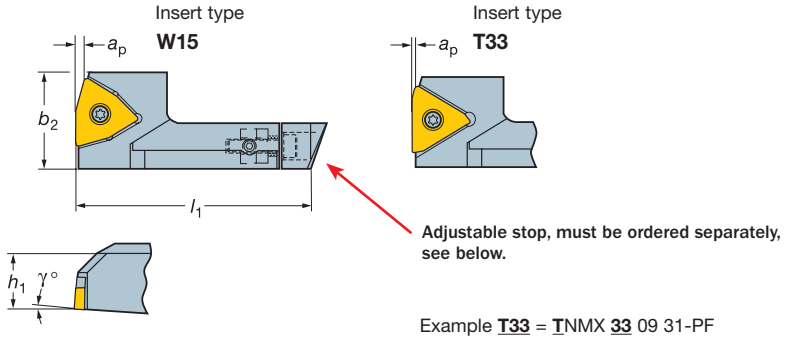
[1] Only for lever clamping

GC 60

Precision bar peeling holders

Suitable for Kieserling machine types WDH..75, WDH..80 and 35

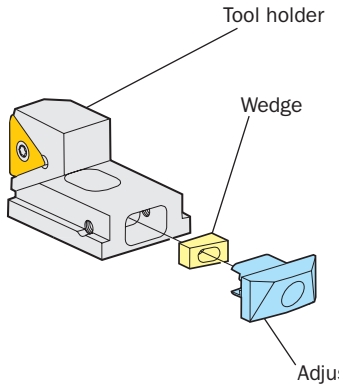




Example **T33** = **T**NMX **33** 09 31-PF

Ordering code	Bar. diameter, mm / *inch*	Dimensions, mm / *inch* h_1	b_2	γ°	Max a_p	Adjustable stop To be ordered separately Ordering code	l_1	Adjustment range ±0.5 mm *±.020 inch*
WDH..75								
L190.1-K075J008-T33	8–20 *.315-.787*	24.5 *.965*	40.0 *1.575*	3°	1.3 *.051*	**5331 050-04**	106.6 *4.197*	
	19–32 *.748–1.260*	24.5 *.965*	40.0 *1.575*	3°	1.3 *.051*	**-03**	100.6 *3.961*	
-K075J055-W15	55–68 *2.165–2.677*	24.5 *.965*	42.5 *1.673*	3°	3 *.118*	**5331 050-04**	82.6 *3.252*	
	67–80 *2.638–3.150*	24.5 *.965*	42.5 *1.673*	3°	3 *.118*	**-03**	76.6 *3.016*	
WDH..80 and 35								
L190.1-K080J008-T33	8–20 *.315-.787*	34 *1.339*	40.0 *1.575*	3°	1.3 *.051*	**5331 050-02**	106.6 *4.197*	
	19–32 *.748–1.260*	34 *1.339*	40.0 *1.575*	3°	1.3 *.051*	**-01**	100.6 *3.961*	
-K080J031-W15	31–44 *1.220–1-732*	34 *1.339*	42.5 *1.673*	3°	3 *.118*	**5331 050-02**	94.6 *3.724*	
	43–56 *1.693–2.205*	34 *1.339*	42.5 *1.673*	3°	3 *.118*	**-01**	88.6 *3.488*	

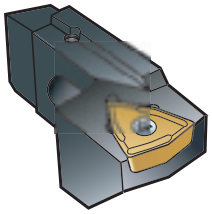
Ordering example: 4 pieces L190.1-K075J008-T33
Ordering example: 4 pieces 5331 050-04

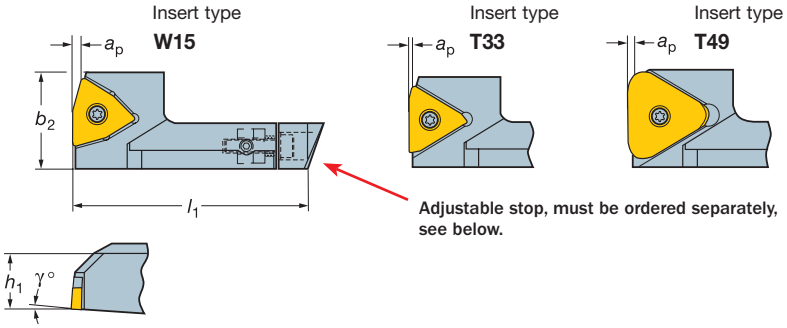


All tool holders can be adjusted to the same length by using an adjustable stop.
1 holder + 2 adjustable stops cover 2 dimension areas in the machine.
Other types of tool holders can be ordered as specials.

Precision bar peeling holders

Suitable for Kieserling machine types WDH..75, WDH..80 and 35



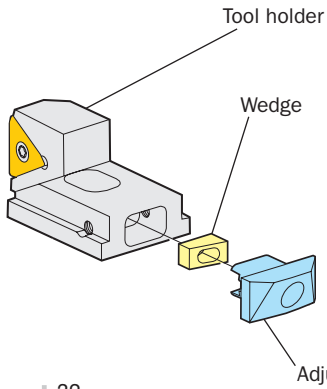


Adjustable stop, must be ordered separately, see below.

TO BE QUOTED

Example **T33** = **T**NMX **33** 09 31-PF

Ordering code	Bar. diameter, mm / *inch*	h_1	b_2	γ°	Max a_p	Adjustable stop To be ordered separately Ordering code	l_1	Adjustment range ±0.5 mm ±.020 inch
WDH..75								
L190.1 -K075J008-W15	8–20 *.315–.787*	24.5 *.965*	42.5 *1.673*	3°	3 *.118*	**5331 050-04**	106.6 *4.197*	
	19–32 *.748–1.260*	24.5 *.965*	42.5 *1.673*	3°	3 *.118*	**-03**	100.6 *3.961*	
-K075J031-W15	31–44 *1.220–1-732*	24.5 *.965*	42.5 *1.673*	3°	3 *.118*	**5331 050-04**	94.6 *3.724*	
	43–56 *1.693–2.205*	24.5 *.965*	42.5 *1.673*	3°	3 *.118*	**-03**	88.6 *3.488*	
-K075J031-T33	31–44 *1.220–1-732*	24.5 *.965*	40.0 *1.575*	3°	1.3 *.051*	**5331 050-04**	94.6 *3.724*	
	43–56 *1.693–2.205*	24.5 *.965*	40.0 *1.575*	3°	1.3 *.051*	**-03**	88.6 *3.488*	
-K075J055-T33	55–68 *2.165–2.677*	24.5 *.965*	40.0 *1.575*	3°	1.3 *.051*	**5331 050-04**	82.6 *3.252*	
	67–80 *2.638–3.150*	24.5 *.965*	40.0 *1.575*	3°	1.3 *.051*	**-03**	76.6 *3.016*	
L190.1 -K075L008-T49	8–20 *.315-.787*	24.5 *.965*	43.0 *1.693*	5°	2.5 *.098*	**5331 050-04**	106.6 *4.197*	
	19–32 *.748–1.260*	24.5 *.965*	43.0 *1.693*	5°	2.5 *.098*	**-03**	100.6 *3.061*	
-K075L031-T49	31–44 *1.220–1-732*	24.5 *.965*	43.0 *1.693*	5°	2.5 *.098*	**5331 050-04**	94.6 *3.724*	
	43–56 *1.693–2.205*	24.5 *.965*	43.0 *1.693*	5°	2.5 *.098*	**-03**	88.6 *3.488*	
-K075L055-T49	55–68 *2.165–2.677*	24.5 *.965*	43.0 *1.693*	5°	2.5 *.098*	**5331 050-04**	82.6 *3.252*	
	67–80 *2.638–3.150*	24.5 *.965*	43.0 *1.693*	5°	2.5 *.098*	**-03**	76.6 *3.016*	
WDH..80 and 35								
L190.1 -K080J008-W15	8–20 *.315-.787*	34 *1.339*	42.5 *1.673*	3°	3 *.118*	**5331 050-02**	106.6 *4.197*	
	19–32 *.748–1.260*	34 *1.339*	42.5 *1.673*	3°	3 *.118*	**-01**	100.6 *3.961*	
-K080J055-W15	55–68 *2.165–2.677*	34 *1.339*	42.5 *1.673*	3°	3 *.118*	**5331 050-02**	82.6 *3.252*	
	67–80 *2.638–3.150*	34 *1.339*	42.5 *1.673*	3°	3 *.118*	**-01**	76.6 *3.016*	
L190.1 -K080J031-T33	31–44 *1.220–1-732*	34 *1.339*	40.0 *1.575*	3°	1.3 *.051*	**5331 050-02**	94.6 *3.724*	
	43–56 *1.693–2.205*	34 *1.339*	40.0 *1.575*	3°	1.3 *.051*	**-01**	88.6 *3.488*	
-K080J055-T33	55–68 *2.165–2.677*	34 *1.339*	40.0 *1.575*	3°	1.3 *.051*	**5331 050-02**	82.6 *3.252*	
	67–80 *2.638–3.150*	34 *1.339*	40.0 *1.575*	3°	1.3 *.051*	**-01**	76.6 *3.016*	
L190.1 -K080L008-T49	8–20 *.315-.787P*	34 *1.339*	43.0 *1.693*	5°	2.5 *.098*	**5331 050-02**	106.6 *4.197*	
	19–32 *.748–1.260*	34 *1.339*	43.0 *1.693*	5°	2.5 *.098*	**-01**	100.6 *3.961*	
-K080L031-T49	31–44 *1.220–1-732*	34 *1.339*	43.0 *1.693*	5°	2.5 *.098*	**5331 050-02**	94.6 *3.724*	
	43–56 *1.693–2.205*	34 *1.339*	43.0 *1.693*	5°	2.5 *.098*	**-01**	88.6 *3.488*	
-K080L055-T49	55–68 *2.165–2.677*	34 *1.339*	43.0 *1.693*	5°	2.5 *.098*	**5331 050-02**	82.6 *3.252*	
	67–80 *2.638–3.150*	34 *1.339*	43.0 *1.693*	5°	2.5 *.098*	**-01**	76.6 *3.016*	



To order, please contact your Sandvik Coromant representative.

All tool holders can be adjusted to the same length by using an adjustable stop.
1 holder + 2 adjustable stops cover 2 dimension areas in the machine.
Other types of tool holders can be ordered as specials.

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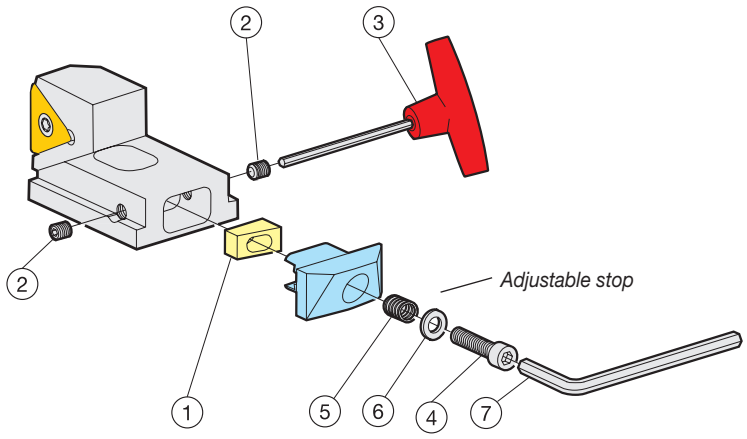
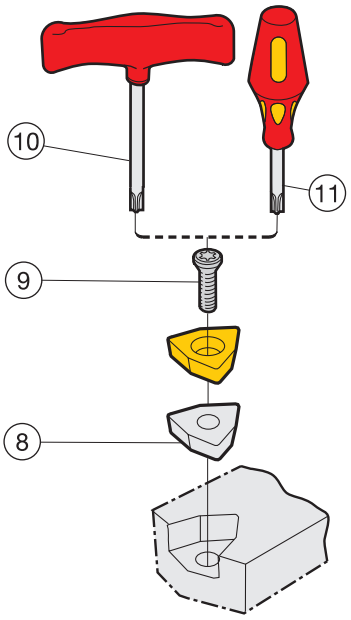
Spare parts for precision bar peeling holders

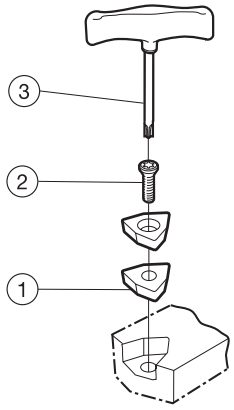




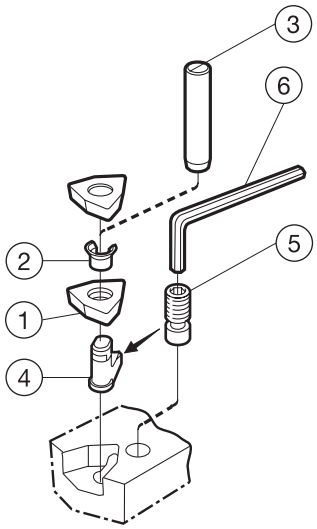
Holder	Standard parts Delivered with the tool						
	1	2	3	8	9	10	11
	Wedge	Adjustment screw	Key (mm)	Shim	Insert screw	Key (Torx)	Key (Torx)
L190.1-Kxxxxxxx-W15	5332 055-01	3214 010-355	265.2-817 (3.0)	5322 333-03	5513 021-02	5680 048-05 (25IP)	5680 046-07 (25IP)
L190.1-Kxxxxxxx-T33	5332 055-01	3214 010-355	265.2-817 (3.0)	5322 338-02	5513 021-02	5680 048-05 (25IP)	5680 046-07 (25IP)
L190.1-Kxxxxxxx-T49	5332 055-01	3214 010-355	265.2-817 (3.0)	5322 354-01	5513 021-06	5680 048-05 (25IP)	5680 046-07 (25IP)

Adjustable stop	Standard parts Delivered with the stop			
	4	5	6	7
	Locking screw	Spring	Washer	Key (mm)
5331 050-01	3212 010-361	5561 001-48	3411 011-064	3021 010-050 (5.0)
5331 050-02	3212 010-361	5561 001-48	3411 011-064	3021 010-050 (5.0)
5331 050-03	3212 010-361	5561 001-48	3411 011-064	3021 010-050 (5.0)
5331 050-04	3212 010-361	5561 001-48	3411 011-064	3021 010-050 (5.0)

Spare parts for machine related holders



Screw clamping tool



Lever clamping tool

Screw clamping tools	**Standard parts** Delivered with the tool			
	1	2	3	
Insert	Shim	Insert screw	Key (Torx Plus/mm)	Torque Nm, *ft-lbs*
TNMT 33 09 31-PF	5322 338-02	5513 021-02	5680 048-05 (25IP)	9.5 *7.0*
33 09 31-MF	5322 338-02	5513 021-02	5680 048-05 (25IP)	9.5 *7.0*
49 10 51-MF	5322 354-01	5513 021-06	5680 048-05 (25IP)	9.5 *7.0*
WNMT 15 09 31-PM	5322 333-03	5513 021-02	5680 048-05 (25IP)	9.5 *7.0*
WNMX 15 09 31-MM	5322 333-03	5513 021-02	5680 048-05 (25IP)	9.5 *7.0*
21 12 51-MM	5322 352-01	5513 023-01	3021 010-050 (5.0)	
TNMT 44 09 01-PR	5322 345-01	5513 021-02	5680 048-05 (25IP)	9.5 *7.0*
TNMX 44 09 01-MR	5322 345-01	5513 021-02	5680 048-05 (25IP)	9.5 *7.0*
RNMX 38 12 00-MR	190.1-850	5513 019-01	3021 010-060 (6.0)	
50 18 M0-MR	5322 120-09	3213 010-463	3021 010-060 (6.0)	
TNMX 11 06-2	5322 333-01	5513 021-01	5680 043-15 (25IP)	9.5 *7.0*
15 09-2	5322 333-03	5513 021-02	5680 043-15 (25IP)	9.5 *7.0*
24 07-2	5322 338-01	5513 021-02	5680 043-15 (25IP)	9.5 *7.0*
190.1- 38 12 00	190.1-850	3213 010-462	3021 010-060 (6.0)	
RNMG 25 09 00	5322 120-08	5513 021-03	5680 043-17 (30IP)	

Lever clamping tools	**Standard parts** Delivered with the tool					
	1	2	3	4	5	6
Insert	Shim	Shim pin	Shim pin punch	Lever	Clamping screw	Key (mm/Torx Plus)
TNMX 06 03-01	–	–	–	174.3-845-1	174.3-829	174.1-870 (1.98)
	179.3-840	174.3-863	174.3-870	174.3-840M	174.3-820	174.1-863 (2.5)
TNMX 11 06-2	179.3-841	174.3-864	174.3-872	174.3-843M	174.3-821	174.1-864 (3.0)
15 09-2	179.3-842	174.3-866	174.3-872	174.3-842M	174.3-822M	3021 010-040 (4.0)
24 07-1	179.3-843	174.3-866	174.3-872	174.3-842M	174.3-822M	3021 010-040 (4.0)
RNMG 25 09 00	176.3-853M	174.3-865	174.3-874	174.3-844M	174.3-827	5680 043-17 (30IP)

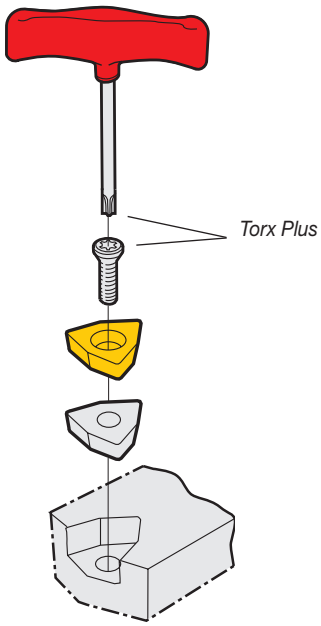
Clamping

A prerequisite for increasing surface quality is ensuring that the insert is firmly clamped in the holder in a stable and safe manner. This is achieved by screw clamping the insert. Screw clamping involves first drawing the insert against the tip seat and then into the tip seat.

Screw clamping provides:

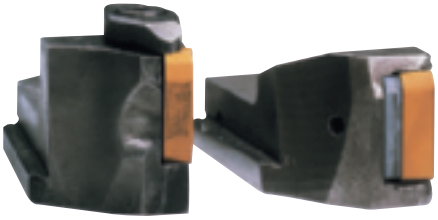
- Axial and radial clamping
- Few spare parts
- Economic solution
- No problems with chip removal

Other methods of clamping, such as lever clamps or similar, have the advantage that it is easy to index the insert since it is not necessary to unscrew the clamp screw fully to free the insert. However, the disadvantage is that the resulting clamping force is only in one direction, which is far too unstable bearing in mind the cutting forces which arise during bar peeling.
Utilizing screw clamping avoids the problem of chips getting caught on protruding parts such as top clamps or chip-breaking clamps.



Shims

An important component is the shim on which the insert rests in the tip seat. The shim protects the insert holder against chip wear under the insert which is very common in a bar peeling operation. The shim also ensures that deformation does not occur in the tip seat and provides protection when there is insert breakage. It also provides protection against indentations caused by a double sided insert geometry.



A shim in the tip seat will protect the insert holder and ensure that deformation does not occur. See the right hand tool.

Turning on the centre line of the machine often provides the best cutting conditions. If the cutting edge lies below the centre there is a risk of vibration. Turning carried out above the centre results in high cutting pressure, a hardened surface and deformation of the insert.
One way to find the centre line of the machine is to try different thicknesses of shim to see where on the insert wear occurs. No wear on the support chamfer, edge chipping or substantial wear on the chip-breaker can mean that you are turning below the centre line. Extensive wear on the support chamfer but no wear on the chip-breaker can mean that you are turning above the centre line.

Choosing inserts

When choosing an insert for an operation, there are a large number of options to choose from and it is important to take the following points into account to determine which inserts are best suited to the operation: material composition, hardness, size, cutting depth and surface quality of the finished bar.

Material

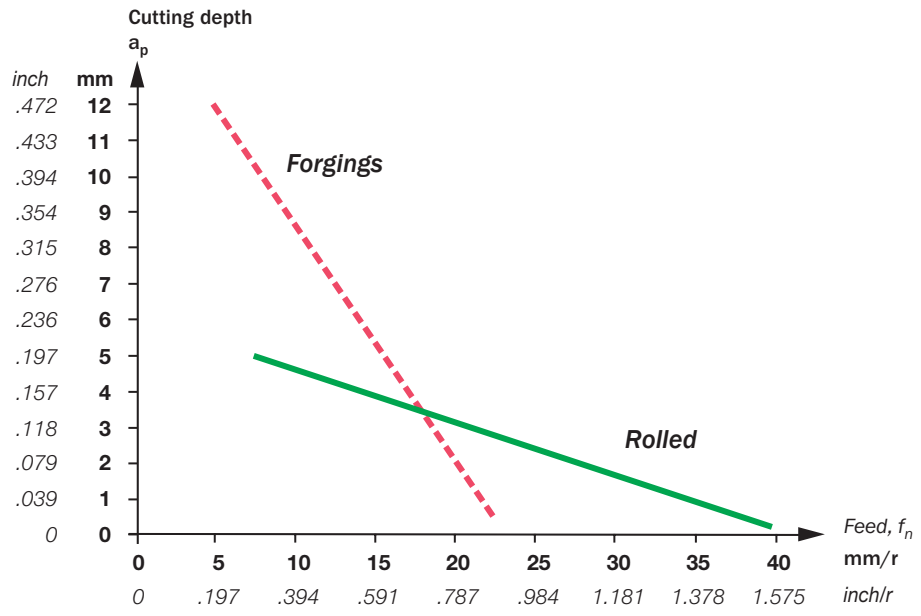
The material has a considerable effect on the choice of insert geometry and grade.

There are specially developed geometries and grades for carbon steel and stainless steels. Geometries and grades should primarily be chosen according to the respective group of materials, but consideration should also be given to the great variations in material composition. It may, therefore, be necessary to deviate from the recommendations.

Just as the material composition and hardness are related, so are the size and cutting depth. The most frequently worked materials in sizes of less than 150 mm (*5.906 inch*) diameter are those in rolled versions. The material can be rolled down close to dimensional tolerances, which means smaller cutting depths than with forgings. Therefore, in these cases, insert geometries are required which can work at small cutting depths and relatively high bar feeds.

Forgings

Forgings are often encountered in materials measuring over 150 mm *(5.906 inch)* in diameter. Forgings have a more uneven surface structure, which often entails a larger cutting depth than with rolled materials. Therefore insert geometries are required which can work at large cutting depths and relatively low bar feeds.



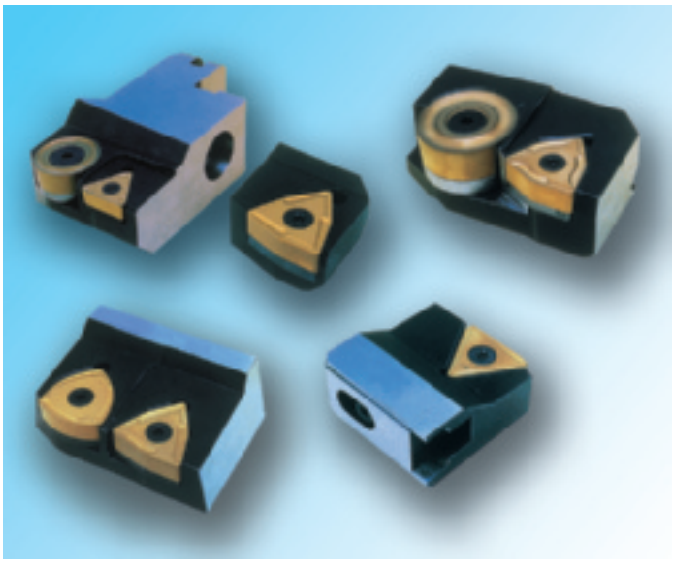
The relationship between cutting depth and feed for forged and rolled materials respectively.

Bar peeling holders

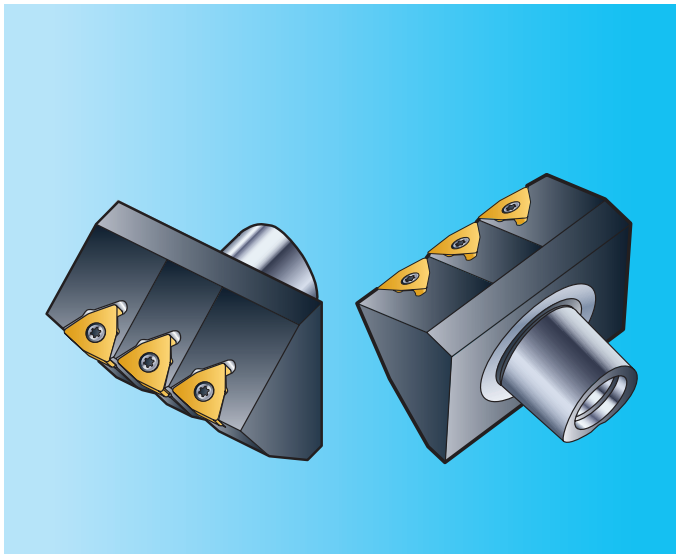
Bar peeling holders can be supplied to special order to suit the machines of individual machine tool manufacturers. In order to improve handling, adjustable holders and cassettes are also available. In this way the surface finish and dimensional tolerances are improved and higher cutting data can be used. When turning wire,10–40 mm, *(.394- 1.575 inch)*, diameter), dimensional tolerances of between h10–h8 are common and the surface finish has an R_a value of 1 µm. It has been found from experience that adjustable holders and cassettes are most suitable for turning bars and wires of less than 150 mm *(5.906 inch)* in diameter.
The setting of the adjustable holder is done by displacing an internal wedge in the holder with the aid of two adjustable screws. This enables the holders to be set radially very accurately. It is important that the dimension between holders is as accurate as possible.

This enables the feed speed to be increased while maintaining quality.
Precision is high and a tolerance of ±0.01 mm *(±.0004 inch)* can be obtained. When the length l_1 has been set (the whole setting area is ±0.5 mm *(±.020 inch)* the adjustable stop is locked in position with the locking screw.

Examples of exchangeable holders



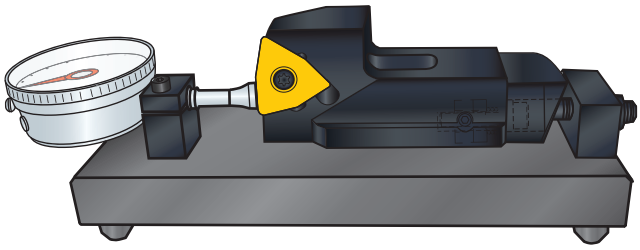
Specially designed machine related holders: Farmer Norton, Kieserling, Daisho, Hetran, Calow.



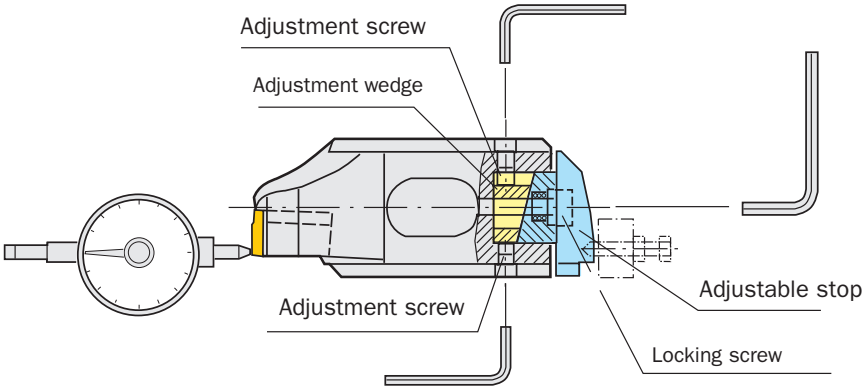
Bar peeling machines can easily be converted to Coromant Capto, the quick change system, which makes fast and accurate tool change possible with insert changing done outside the machine.

Presetting of l_1 dimension

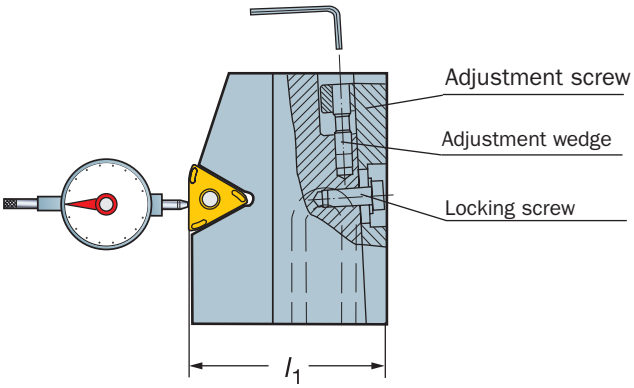
Adjustable standard toolholder for Kieserling WDH 75, 80 and 35 lathes.

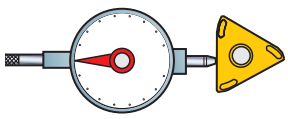


Fixture for presetting of a bar peeling holder



Adjustable specially designed machine related holders





When setting the length, it is important to bear in mind that the tip of the dial indicator must be positioned at the centre of the insert´s ground support chamfer. Measuring below the support chamfer, or at some other point in the centre of the insert, means that the reciprocal length between holders can be different.
Corresponding measurement points on the adjustable stop should be the same on each holder.

Bar peeling productivity

When planning to invest in a new bar peeling lathe, it is necessary to take into account the maximum stock removal, the demands that will be made on surface finish and dimensional tolerances. Also how much capacity you want to have in reserve in order to be able to increase productivity in the future.
The following formula for calculating the power output in the machine can be a great asset in determining how many cutting edges the machine can be equipped with. It has to be taken into account that the cutting depth (a_p) is the total radial cutting depth. That is, if a holder contains both a roughing insert and a finishing insert, then the cutting depth of the roughing insert and finishing insert is added together. The feed is calculated in accordance with the surface requirements of the finishing insert, i.e. feed (f_n). The power which is then calculated applies for just one of the machines' holders. If the machine is equipped with four holders, the power output required will be four times greater. By calculating the power output in this way the margin of error will only be 10%.

Formula for calculating power:

Metric

$$P_c = \frac{(v_c \times a_p \times f_n \times k_{c0.4})}{60\,000} \times \left(\frac{0.4}{f_n}\right)^{0.29} \quad \text{(kW)}$$

Inch

$$P_c = \frac{(v_c \times a_p \times f_n \times k_{c016})}{33{,}000} \times \left(\frac{.016}{f_n}\right)^{0.29} \quad \text{(Hp)}$$

	Metric	Inch
v_c = cutting speed	m/min	ft/min
a_p = cutting depth	mm	inch
f_n = feed	mm/r	inch/r
k_c = specific cutting force	$k_{c\,0.4}$ N/mm^2	$k_{c\,.016}$ lbs/in^2

Feed

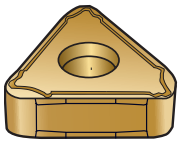
Feed has a direct bearing on productivity. Therefore it is important to know how high a feed the bar peeling lathe can cope with in routine production. If the power is known then, with the help of the known maximum cutting depth, the feed speed can be calculated.
To obtain high quality surface finish on the bar, the finishing insert has a surface generating cutting edge. The clearance side of this edge is ground to form a support chamfer which runs parallel with the surface of the bar and stabilizes the cutting process. A long, surface-generating cutting edge offers a high bar feed which provides increased productivity and good machining economy.
When a high level of surface finish is required, the feed per revolution (f_n) should not exceed the surface-generating cutting edge of the insert. When a combination of roughing insert and finishing insert is used, it is the finishing insert that governs which feed can be used.

Cutting depth

Insert geometries are developed for optimal chip-breaking within a specific field of materials and cutting depth intervals. When choosing a cutting depth, a rule of thumb is that a cutting depth should be chosen in the centre of the range for which the geometry has been developed. In this way both the most favourable chip-breaking and the most suitable distribution of cutting forces are obtained. When using a roughing insert in combination with a finishing insert, it is recommended that the finishing insert should have a radial cutting depth of 0.2–1.3 mm (*.008–.051 inch)*.

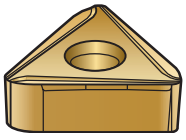
Double sided inserts

Double sided inserts are ground to 3° support chamfer.



Single sided inserts

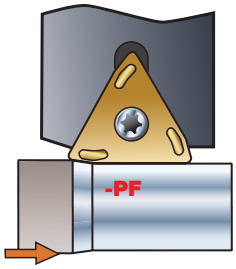
A single sided insert has the advantage that the geometry can be optimized to provide the best chip-breaking. In addition, the insert must also be firmly fixed in the tip seat. Single sided inserts, with a flat base, provide stability in the tip seat.



Machining examples

Finishing

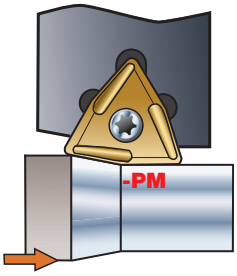
Max a_p = 1.3 mm / *.051 inch*
Bar dia. = 25 mm / *.984 inch*
Material: CMC 01.2
Specific cutting force:
metric $k_{c\ 0.4}$ = 1600 N/mm^2
inch $k_{c\ .016}$ = 304,500 *lbs/in*^{2}
Insert: TNMT 33 09 31-PF
f_n= 25 mm/r / *.984 inch/r*
v_c = 125 m/min / *410 ft/min*
➔ P_c = 41 kW / *55 HP*



Bar direction

Medium machining

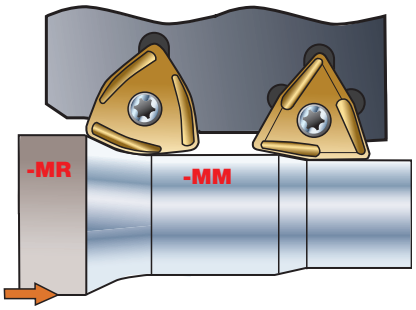
Max a_p = 3 mm / *.118 inch*
Bar dia. = 80 mm / *3.150 inch*
Material: CMC 02.1
Specific cutting force:
metric $k_{c\ 0.4}$ = 2150 N/mm^2
inch $k_{c\ .016}$ = *308,000 lbs/in*^{2}
Insert: WNMT 15 09 31-PM
f_n = 15 mm/r / *.591 inch/r*
v_c = 125 m/min / *410 ft/min*
➔ P_c = 69 kW / *93 HP*



Bar direction

Roughing / medium machining

Rec. a_p = 3.5 + 1.5 = 5 mm / *.138 + .059 inch = .197 inch*
Bar dia. = 170 mm / *6.693 inch*
Material: CMC 05.51
Specific cutting force
metric $k_{c\ 0.4}$ = 3050 N/mm^2
inch $k_{c\ .016}$ = 445,500 *lbs/in*^{2}
Insert: TNMX 44 09 01-MR
WNMX 15 09 31-MM
f_n = 12 mm/r. / *472 inch/r*
v_c = 50 m/min / *164 ft/min*
➔ P_c = 56 kW / *75 HP*

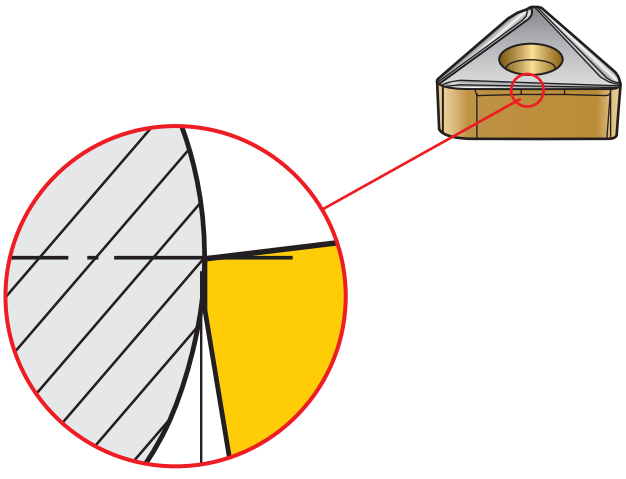


Bar direction

The power calculated applies for just one of the machine´s holders.

Support chamfer

Support chamfers are ground in two versions, 3° and 5°.
The insert is inclined in the holder at the same angle.

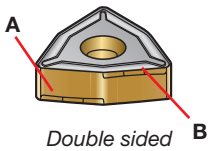


Finishing and medium inserts have support chamfer, for example:
3 = 3° and 5 = 5°.

TNMX 33 09 32-PF
Chip-breaker version
3° angle of support chamfer.

Insert geometries for bar peeling

FINISHING

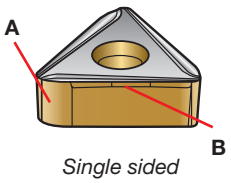


Double sided

P K

TNMX 11 06-2

Cutting depth (a_p)	0.2–1.3 mm *.008–.051 inch*
Max feed/insert (f_n)	6.0 mm/r *.236 inch/r*
Cutting speed (v_c)	40–200 m/min *130–650 ft/min*

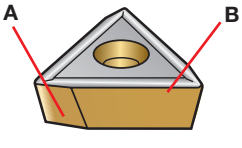


Single sided

P K

TNMX 33 09 32-PF

Cutting depth (a_p)	0.2–1.3 mm *.008–.051 inch*
Max feed/insert (f_n)	16.0 mm/r *.630 inch/r*
Cutting speed (v_c)	40–200 m/min *130–650 ft/min*

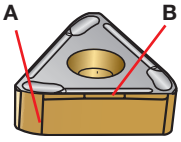


Single sided

P

TNMX 24 07-1

Cutting depth (a_p)	0.2–1.3 mm *.008–.051 inch*
Max feed/insert (f_n)	16.5 mm/r *.650 inch/r*
Cutting speed (v_c)	40–200 m/min *130–650 ft/min*

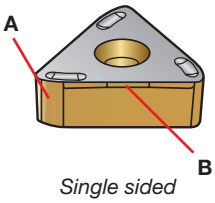


Single sided

M

TNMX 33 09 31-MF

Cutting depth (a_p)	0.2–1.3 mm *.008–.051 inch*
Max feed/insert (f_n)	16.0 mm/r *.630 inch/r*
Cutting speed (v_c)	40–200 m/min *130–650 ft/min*

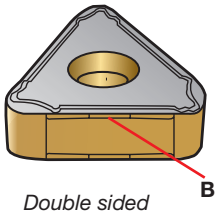


Single sided

P

TNMT 33 09 31-PF

Cutting depth (a_p)	0.2–1.3 mm *.008–.051 inch*
Max feed/insert (f_n)	16.0 mm/r *.630 inch/r*
Cutting speed (v_c)	40–200 m/min *130–650 ft/min*



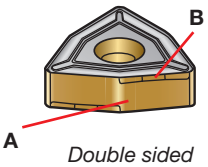
Double sided

M P

TNMX 49 10 51-MF

Cutting depth (a_p)	0.3–2.5 mm *.012–.098 inch*
Max feed/insert (f_n)	16.0 mm/r *.630 inch/r*
Cutting speed (v_c)	40–150 m/min *130–490 ft/min*

MEDIUM

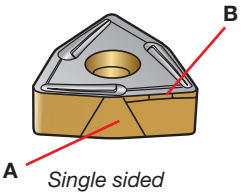


Double sided

P M K

TNMX 15 09-2

Cutting depth (a_p)	0.5–5.0 mm *.020–.197 inch*
Feed/insert (f_n)	10.0 mm/r *.394 inch/r*
Cutting speed (v_c)	40–150 m/min *130–490 ft/min*

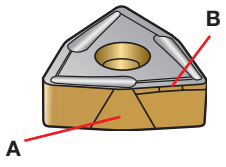


Single sided

M P

WNMX 15 09 31-MM

Cutting depth (a_p)	0.5–5.0 mm *.020–.197 inch*
Feed/insert (f_n)	10.0 mm/r *.394 inch/r*
Cutting speed (v_c)	40–150 m/min *130–490 ft/min*

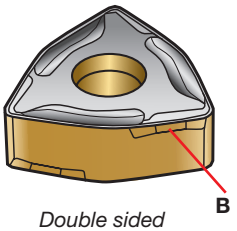


Single sided

P K

WNMT 15 09 31-PM

Cutting depth (a_p)	0.5–3.0 mm *.020–.118 inch*
Max feed/insert (f_n)	10.0 mm/r *.394 inch/r*
Cutting speed (v_c)	40–150 m/min *130–490 ft/min*



Double sided

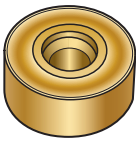
M P

WNMX 21 12 51-MM

Cutting depth (a_p)	0.5–5.0 mm *.020–.197 inch*
Max feed/insert (f_n)	11.0 mm/r *.433 inch/r*
Cutting speed (v_c)	40–150 m/min *130–490 ft/min*

Insert geometries for bar peeling

ROUGHING

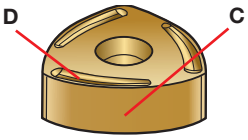


Ø 38.1 mm
1.500 inch

M

RNMX 38 12 00-MR/
190.1-38 12 00

Cutting depth (a_p) 1.5–8.0 mm
.059–.315 inch
Max feed/insert (f_n) 16 mm/r
.276–.709 inch/r
Cutting speed (v_c) 40–120 m/min
130–390 ft/min

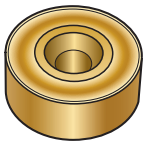


Single sided

M

TNMX 44 09 01-MR

Cutting depth (a_p) 0.7–5.0 mm
.028–.197 inch
Max feed/insert (f_n) 11 mm/r
.433 inch/r
Cutting speed (v_c) 40–120 m/min
130–390 ft/min



Ø 50 mm
2.000 inch

M

RNMX 50 18 MO-MR

Cutting depth (a_p) 2.0–12.0 mm
.079–.472 inch
Max feed/insert (f_n) 7–18 mm/r
.276–.709 inch/r
Cutting speed (v_c) 40–120 m/min
130–390 ft/min

A Positive clearance in cutting part of the edge.

B Negative support chamfer along the support edge eliminates vibration.

C Polygon shape 25 mm, *.984 inch*, radius.

D Chip-breaker width increases with depth of cut.

Railway wheel re-turning

Sandvik Coromant's tool system for the re-turning of railway wheels consists of holders with replaceable tip seats for tangential mounted inserts. This type of insert withstands the stresses which large cutting depths at high temperatures produce.

When choosing tools and inserts, it is important to bear in mind the type of wheel to be turned, the condition of the predominant part of the worn wheel, as well as the machine stability and power which is available.

It is desirable to be able to choose as large a cutting depth as possible in order to achieve short machining times. This is not always possible.

In certain cases the profile can be turned in one single pass. With other machines it may be necessary to divide the machining into several stages in order to produce the right profile and diameter dimensions for the wheel.

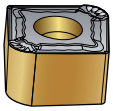
Two machines are used: an underfloor type with friction drives and portal machines with facedrives. Cutting depth (a_p) for underfloor machines is 3–5 mm, *.118–.197 inch*, and for portal machines 10–12 mm, *.394–.472 inch.*

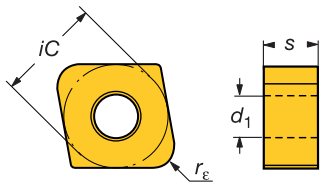
Depending on the type of machining, there are various options of insert geometries and grades.

Turning of new railway wheels, see page 55.

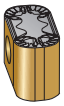
Inserts for railway wheel re-turning

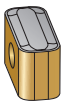
CNMX Double sided

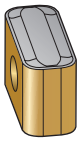


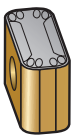


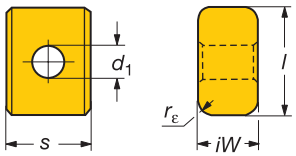
LNUX Double sided

PF 

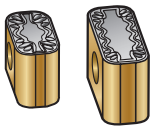
PM 

PR 

175.32 



LNMX Double sided

PM 

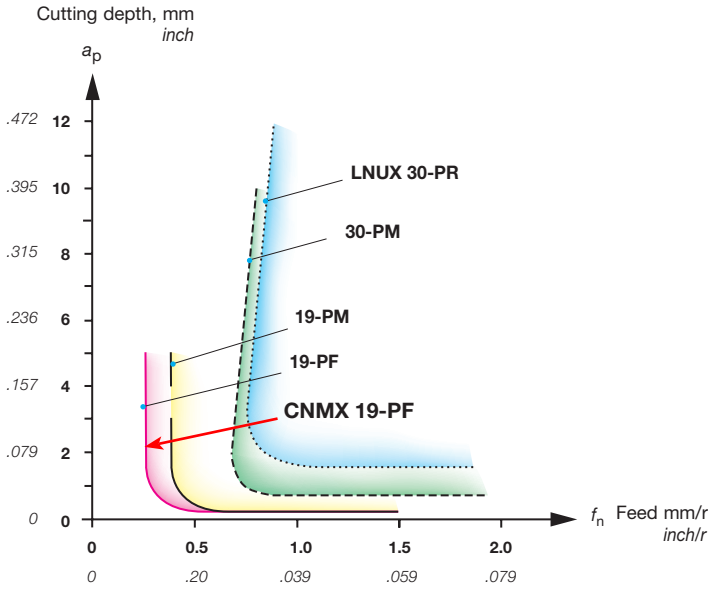
PR 

	iC	Size	Ordering code	Dimensions, mm / *inch* l (iC)	s	iW	d_1	r_ε	P GC 3015	GC 4215	GC 4225	– SH
FINISHING	19 *1*		**CNMX 19 11 40-PF**	19.05 *.750*	11 *.433*	– –	7.8 *.307*	4.0 *.157*		★	☆	
		19 *.750*	**LNUX 19 19 40-PF**	19.05 *.750*	19.05 *.750*	10.0 *.394*	6.35 *.250*	4.0 *.157*		★	☆	☆
MEDIUM		19 *.750*	**LNUX 19 19 40-PM**	19.05 *.750*	19.05 *.750*	10.0 *.394*	6.35 *.250*	4.0 *.157*		★	☆	☆
		19 *.750*	**LNMX 19 19 40-PM**	19.05 *.750*	19.05 *.750*	10.0 *.394*	6.35 *.250*	4.0 *.157*		★	☆	☆
		30 *1.181*	**LNMX 30 19 40-PM**	30.00 *1.181*	19.05 *.750*	12.0 *.394*	6.35 *.250*	4.0 *.157*		★	☆	☆
		19 *.750*	**175.32-19 19 40-25**	19.05 *.750*	19.05 *.750*	10 *.394*	6.35 *.250*	4.0 *.157*	☆		☆	☆
ROUGHING		30 *1.181*	**LNUX 30 19 40-PR**	30.00 *1.181*	19.05 *.750*	12.0 *.394*	6.35 *.250*	4.0 *.157*		★	☆	☆
		30 *1.181*	**LNMX 30 19 40-PR**	30.00 *1.181*	19.05 *.750*	12 *.394*	6.35 *.250*	4.0 *.157*		★	☆	☆
									P10	P15	P25	P20

★ = First choice

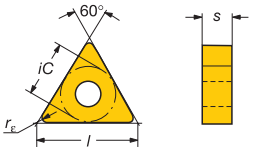
Cutting data

Material: Alloy steel
Cutting speed: v_c = 25–90 m/min
82–300 ft/min



51 53 60

Inserts for railway wheel re-turning



	Ordering code, ISO	iC	Ordering code, *ANSI*	Dimensions, mm *inch* iC	l	s	r_ε	P GC 4205	GC 4215	GC 4225	GC 4235
 **-PR** For light roughing of steel. Double sided insert.	22 **TNMG 22 04 12-PR**	1/2	***TNMG 433-PR***	12.7 1/2	22 .866	4.76 3/16	1.2 3/64	☆	★	☆	☆
	TNMG 22 04 16-PR		***TNMG 434-PR***	12.7 1/2	22 .866	4.76 3/16	1.6 1/16	☆	★	☆	☆
 **-PM** For steel medium machining. Double sided insert.	22 **TNMG 22 04 12-PM**	1/2	***TNMG 433-PM***	12.7 1/2	22 .866	4.76 3/16	1.2 3/64	☆	★	☆	☆
	TNMG 22 04 16-PM		***TNMG 434-PM***	12.7 1/2	22 .866	4.76 3/16	1.6 1/16	☆	★	☆	☆
 **-PR** First choice for roughing. Single sided insert.	22 **TNMM 22 04 12-PR**	1/2	***TNMM 433-PR***	12.7 1/2	22 .866	4.76 3/16	1.2 3/64		★	☆	☆
	TNMM 22 04 16-PR		***TNMM 434-PR***	12.7 1/2	22 .866	4.76 3/16	1.6 1/16		★	☆	☆
								P05	P15	P25	P35

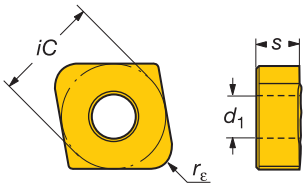
★ = First choice

51 53 60

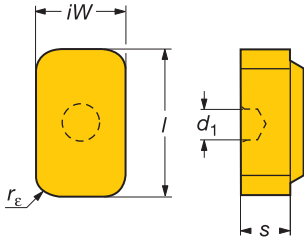
Engineered inserts

TO BE QUOTED

CNMX Single sided



LNUX Single sided



Code key
(ISO or Coromant code)

Corresponds to existing standard geometry

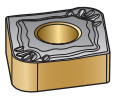
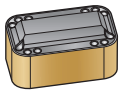
S – CNMX 19 07 40 – MM

S – CNMX 19 07 40 – M1

Engineered inserts

Chip-breaker version

F = Finishing
M = Medium
R = Roughing

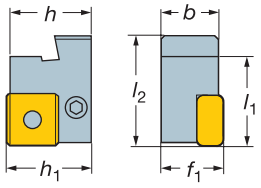
				Dimensions, mm / *inch*							Grades
				iC	d_1	*l*	*iW*	*s*	r_ε	Max a_p	P
Medium	 S-CNMX	19	S-CNMX 19 07 40-M1	19.05 *.750*	7.93 *.312*	– –	– –	7.94 *.313*	4.0 *.157*	1.3 *.051*	
Roughing	 S-LNUX	32	S-LNUX 32 12 48-R1	– –	7.92 *.312*	31.75 *1.250*	19.05 *.750*	12.7 *.500*	4.75 *.187*	2.5 *.098*	

Various applications and machining conditions require different grades.

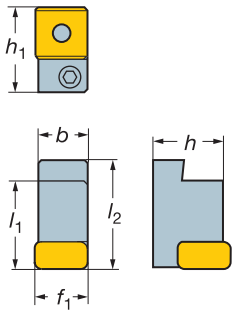
For grade choice, see general grade information on page 60, and contact your Sandvik Coromant representative for an offer.

T-MAX P cutting units

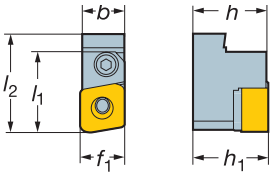
R/L175.32-3223-19
R/L175.32-3223-30
Inserts:
LNUX, LNMX



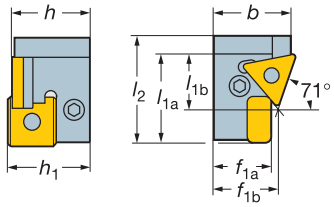
R/L177.32-3219-19
(Left hand)
Inserts:
LNUX, LNMX



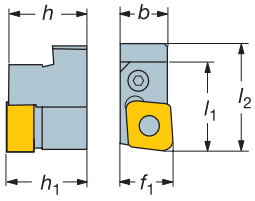
R/L177.32-3219-1911
(Left hand)
Inserts:
CNMX 19 11 40-PF



R/L175.32-3223-1922
Inserts:
LNUX, LNMX
TNMG
TNMM



R/L175.32-3223-19
Inserts:
CNMX 19 11 40-PF



Right hand style shown when nothing else is stated

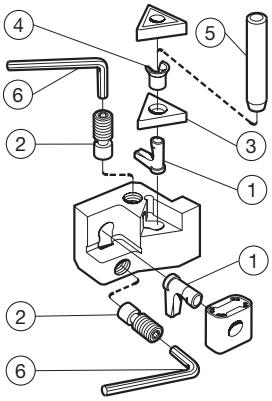
			Ordering code	Dimensions, mm / *inch*										Gauge inserts
				h_1	h	b	l_2	l_1	l_{1a}	l_{1b}	f_1	f_{1a}	f_{1b}	
	19		**R/L175.32-3223-19**	32	31	22.6	42.2	35	–	–	23	–	–	LN.X 19 19 40
	.748			*1.260*	*1.220*	*.890*	*1.661*	*1.378*	–	–	*.906*	–	–	
19			**R/L175.32-3223-1911**	32	31.5	20.5	43.5	35.9	–	–	19.1	–	–	CNMX 19 11 40
.748				*1.260*	*1.240*	*.807*	*1.713*	*1.413*	–	–	*.752*	–	–	
	30		**R/L175.32-3223-30**	32	31	22.6	42.2	35	–	–	23	–	–	LN.X 30 19 40
	1.181			*1.260*	*1.220*	*.890*	*1.661*	*1.378*	–	–	*.906*	–	–	
	19	**22**	**R/L175.32-3223-1922**	32	31.4	31.5	42.2	–	35	20.5	–	23	25.4	LN.X 19 19 40 TNM. 22 04 08
	.748	*1/2*		*1.260*	*1.236*	*1.240*	*1.661*	–	*1.378*	*.807*	–	*.906*	*1.000*	
	19		**R/L177.32-3219-19**	32	31	18.6	42.2	35	–	–	19.1	–	–	LN.X 19 19 40
	.748			*1.260*	*1.220*	*.732*	*1.661*	*1.378*	–	–	*.752*	–	–	
19			**R/L177.32-3219-1911**	32	31.5	18.1	42.2	35	–	–	19.1	–	–	CNMX 19 11 40
.748				*1.260*	*1.240*	*.713*	*1.661*	*1.378*	–	–	*.752*	–	–	

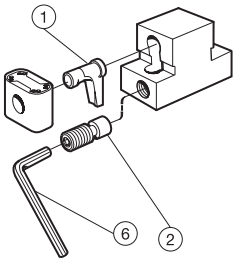
For tool holders, see next page.

R = Right hand, L = Left hand

Spare parts

T-MAX P cutting units



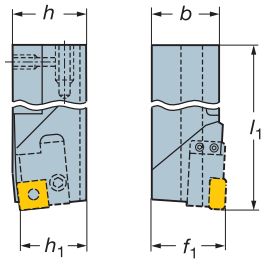


Cutting edge length		1 Lever	2 Screw	3 Shim	4 Shim pin	5 Shim pin punch	6 Key (mm)
	19 **30**	174.3-843M	174.3-825	-	-	-	265.2-817 (3.0)
	22	174.3-841M	174.3-821	179.3-852M	174.3-861	174.3-871	265.2-817 (3.0)
	19	5432 005-02	5516 020-01	5322 230-03	174.3-862	174.3-872	5680 010-06 (4.0)

48, 49

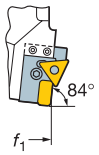
Toolholders for T-MAX P cutting units R/L 175.32 and R/L 177.32

For one cutting unit

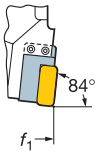


Cuttting units:

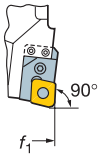
R/L175.32 -3223-1922



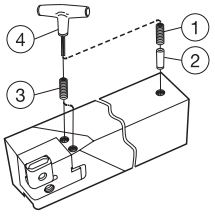
R/L175.32 -3223-19 -3223-30



R/L175.32 -3223-1911



Spare parts

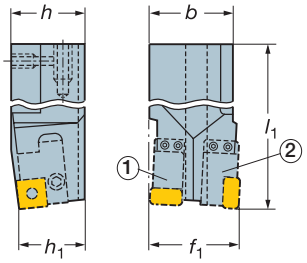


Right hand style shown when nothing else is stated

Ordering code	Dimensions, mm / *inch*						Spare parts 1	2	3	4
	h	h_1	*b*	l_1	f_1	r_ε	Screw	Locking pin	Screw	Key (mm)
R/L175.32-5047M	50 *1.969*	44 *1.732*	47 *1.850*	275 *10.827*	44 *1.732*	4.0 *.157*	3214 010-359	175.32-820	174.32-831	265.2-817 (3.0)

R = Right hand, L = Left hand

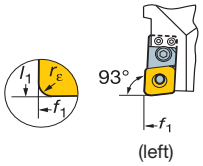
For two cutting units



①

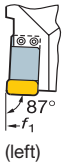
Cuttting units:

R/L177.32 -3219-1911



(left)

R/L177.32 -3219-19



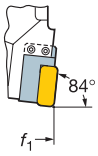
(left)

②

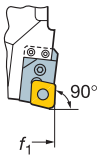
Cuttting units:

R/L175.32 -3223-1922

R/L175.32 -3223-19 -3223-30



R/L175.32 -3223-1911

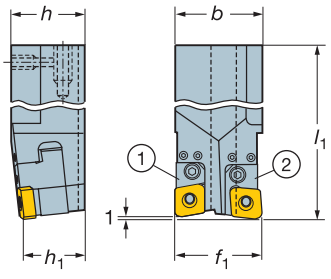


Right hand style shown when nothing else is stated

Ordering code	Dimensions, mm / *inch*						Spare parts 1	2	3	4
	h	h_1	*b*	l_1	f_1	r_ε	Screw	Locking pin	Screw	Key (mm)
R/L175.32-5055M	50 *1.969*	44 *1.732*	55 *2.165*	210 *8.268*	55 *2.165*	4.0 *.157*	3214 010-359	175.32-820	174.32-831	265.2-817 (3.0)

R = Right hand, L = Left hand

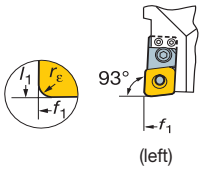
For two cutting units



①

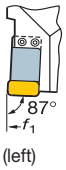
Cuttting units:

R/L177.32 -3219-1911



(left)

R/L177.32 -3219-19

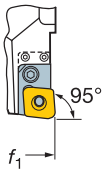


(left)

②

Cuttting units:

R/L175.32-3223-1911

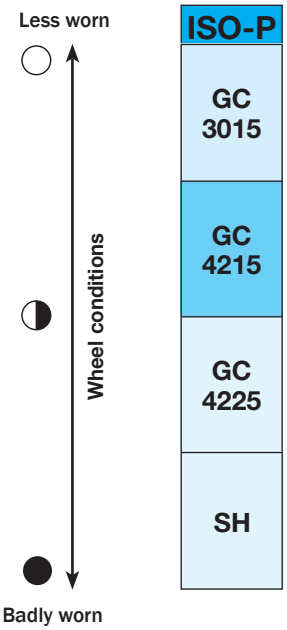


Right hand style shown when nothing else is stated

Ordering code	Dimensions, mm / *inch*						Spare parts 1	2	3	4
	h	h_1	*b*	l_1	f_1	r_ε	Screw	Locking pin	Screw	Key (mm)
R/L175.33-5055	50 *1.969*	44 *1.732*	55 *2.165*	210 *8.268*	55 *2.165*	4.0 *.157*	3214 010-359	175.32-820	174.32-831	265.2-817 (3.0)

R = Right hand, L = Left hand

Grades



Wheel condition

Various tough wheel conditions require effective grades.

Wheel condition 1: Wheels with less worn out profiles are machined with higher cutting data for maximum productivity. Use the harder grade GC3015.
Wheel condition 2: The majority of worn out wheels with some skid flats, shelled tread or thermal cracks are machined with the overall first choice grade GC4215.
Wheel condition 3: Wheels with heavier damage as well as low speed machines that require a tougher tool shall be machined with grade GC4225.
Wheel condition 4: Badly damaged wheels are machined at low cutting speed. Use the uncoated grade SH.

First choice

GC4215 – The universal grade for railway wheel re-turning is recommended as the first choice for all types of re-turning operations.
The choice of cutting speed is always a combination of the type of grade you choose to work with and the condition of the wheel. However, it is recommended that you choose a lower cutting speed when turning hard wheels with brake plates and similar, plus a higher cutting speed with softer wheels in better condition.

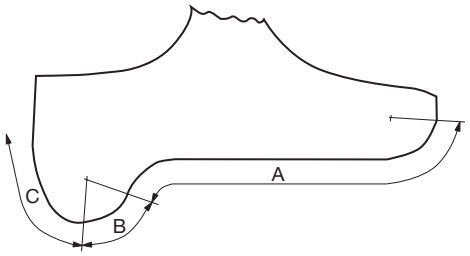
Cutting data

The chip-breaking performance is dependent on many factors such as material quality, cutting speed and entering angle. The cutting data table only gives a general indication of how and where different geometries can be used.
The cutting data shown is recommended for the type of material normally used for railway wheels.
This cutting data is valid for the grades SH, GC4215, GC4225 and GC3015.

When extreme skid flats, shelled tread, or heavy build-up on the tread has occurred, the lower cutting speeds are recommended. Lower cutting speeds (v_{c1}) are also recommended when re-turning wheels with a high carbon content. If any adjustment in the feed rate is necessary, it should be kept to a minimum.

Machine type	**Cutting speed, m/min,** *ft/min*		**Feed, mm/r,** *inch /r*	
	v_{c1}	v_{c2}	f_n	
Under-floor lathe [1] Portal lathe	50 *164*	90 *295*	0.3—1.5 *.012–.059*	GC4215/ GC4225
	50 *164*	90 *295*	0.5—2.0 *.020–.079*	GC4215/ GC4225
—	50 *164*	90 *295*	0.3—2.0 *.012–.079*	GC3015
—	50 *164*	70 *295*	0.5—2.0 *.012–.079*	SH
Cutting depth (a_p) mm, inch, and chip-breaking capacity	-PF 0.3 —3.0 mm, *.012–.118 inch* -PM 1.5 —6.0 mm, *.059–.236 inch* -PR 2.0 —12.0 mm, *.079–.472 inch*			

[1] Restricted by power supply and friction drive installed.



The cutting speed recommendations (v_{c1}) in the table are valid when turning the tread (section A of the wheel profile). The flange copying operation will normally be made with the higher cutting speeds (v_{c2}) and feeds given (section B and C of the wheel profile).

Practical tips

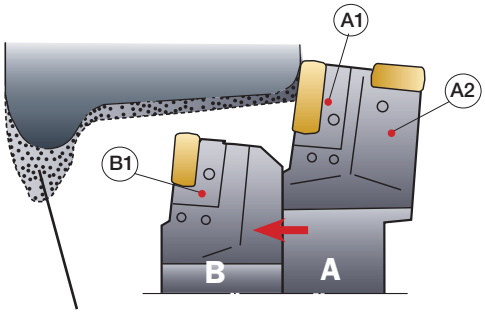
The illustration below are one example of re-turning of a worn wheel with skid flats, shelled tread or thermal cracks.

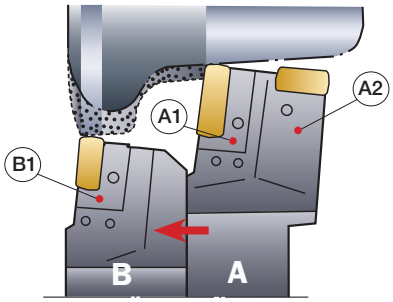
Re-turning of badly damaged railway wheels

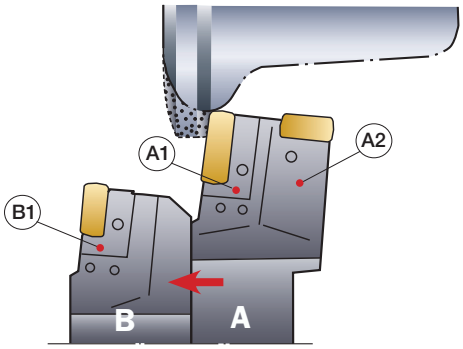
Copy machining of tread

Cutting speed v_c: 40 m/min, *130 ft/min*
Feed f_n: 0.3 – 1.5 mm/r, *.012 – .059 inch/r*

Lower v_c when:
- extreme skid flats
- shelled tread
- high carbon content



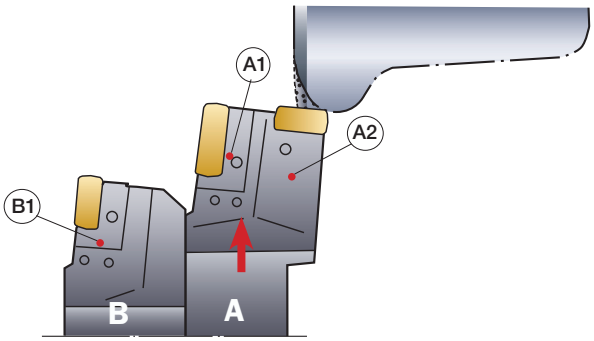




Material to be removed

Copy machining of back side of flange

Less worn with higher cutting speed (v_c) and feed (f_n)
v_c = *70–90 m/min, 230–300 ft/min*
f_n = *2 mm/r, .080 inch/r*



Cutting units/insert used

Tool holder A: R175.32-5055M

Cutting unit A1: R175.32-3223-30
Insert: LNMX 30 19 40-PM

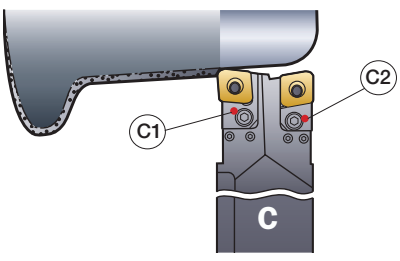
Cutting unit A2: L177.32-3219-19
Insert: LNMX 19 19 40-PM

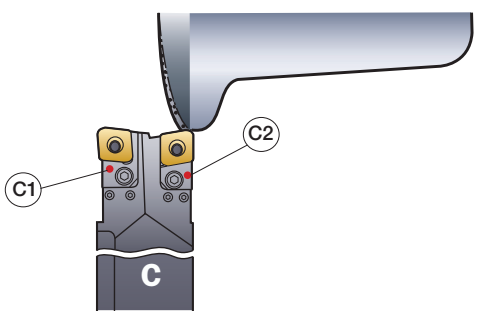
Tool holder B: R175.32-5047M

Cutting unit B1: R175.32-3223-19
Insert: LNMX 19 19 40-PM

Re-turning of less worn railway wheels

v_c = 70–90 m/min, *230–300 ft/min*
f_n = 1-2 mm/r, *.039–.080 inch/r*





Cutting units/insert used

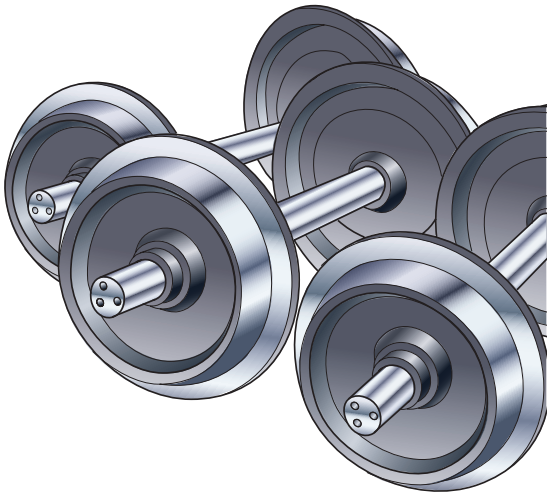
Tool holder C: R175.33-5050

Cutting unit C1: R175.32-3223-1911
Insert: CNMX 19 11 40-PF

Cutting unit C2: R177.32-3219-1911
Insert: CNMX 19 11 40-PF

Turning of new railway wheels

TO BE QUOTED



Sandvik Coromant, with many years of experience with re-turning of worn railway wheels, can also offer tooling and machining solutions for turning of new wheels.

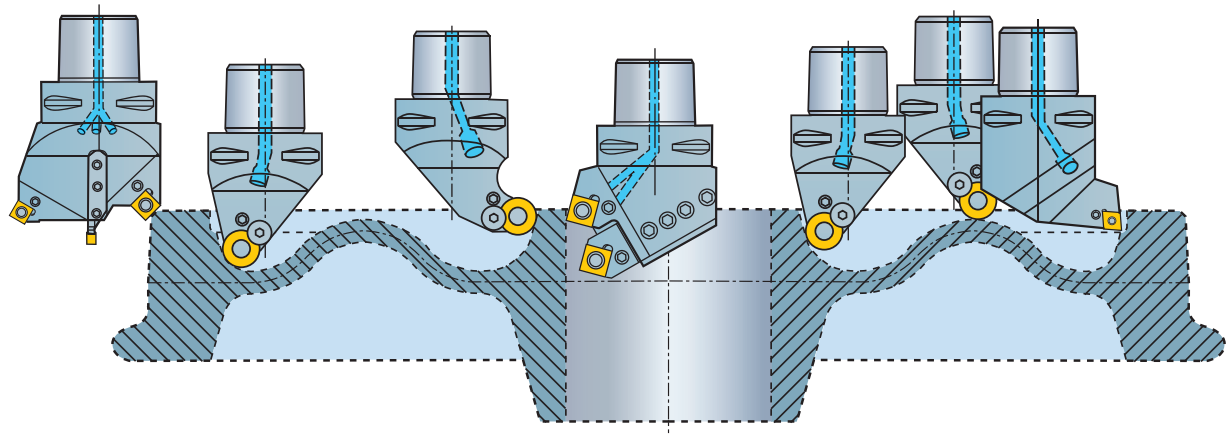
Most of the tools are unique solutions, based on machining conditions such as design of the wheel and type of machine used. One common factor is that the tools are based on Coromant Capto, the most flexible and rigid modular clamping system on the market.

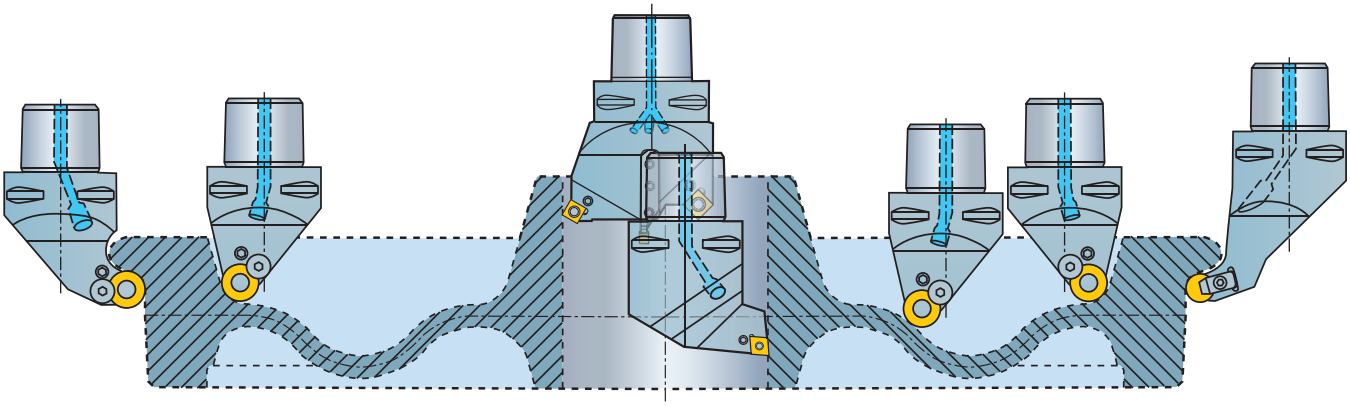
As clamping system for the insert in the Coromant Capto cutting unit, a combination of lever and top clamping is used in order to achieve an undisturbed evacuation of the large volumes of chips.

Inserts and insert geometries are standard and together with modern carbide grades, Sandvik Coromant can offer a highly productive machining solution.

Please contact your local Sandvik Coromant representative for more information.

Tooling example





ISO	Coromant Material Classification (CMC)	Country									
		USA	Great Britain		Sweden	Germany		France	Italy	Spain	Japan
		Standard									
		AISI/SAE	BS	EN	SS	W.-nr.	DIN	AFNOR	UNI	UNE	JIS
P STEEL	**Unalloyed steel**										
	01.1	A570.36	4360 40 C		1311	1.0038	RSt.37-2	E 24-2 Ne			STKM 12A;C
	01.1	1115	030A04	1A	1325	1.0038	GS-CK16	-	-	-	-
	01.1	A573-81 65	4360 40 B		1312	1.0116	St.37-3	E 24-U	Fe37-3		
	01.1	1015	080M15	-	1350	1.0401	C15	CC12	C15C16	F.111	-
	01.1	1020	050A20	2C/2D	1450	1.0402	C22	CC20	C20C21	F.112	-
	01.1	1213	230M07	-	1912	1.0715	9SMn28	S250	CF9SMn28	11SMn28	SUM22
	01.1	12L13	-	-	1914	1.0718	9SMnPb28	S250Pb	CF9SMnPb28	11SMnPb28	SUM22L
	01.1	-	-	-	-	1.0722	10SPb20	10PbF2	CF10SPb20	10SPb20	-
	01.1	1215	240M07	1B	-	1.0736	9SMn36	S 300	CF9SMn36	12SMn35	-
	01.1	12L14	-	-	1926	1.0737	9SMnPb36	S300Pb	CF9SMnPb36	12SMnP35	-
	01.1	1015	080M15	32C	1370	1.1141	Ck15	XC12	C16	C15K	S15C
	01.1	1025	-	-	-	1.1158	Ck25	-	-	-	S25C
	01.1	A572-60	4360 55 E		2145	1.8900	StE 380	-	FeE390KG		
	01.1	A572-60	4360 55 E		2142	-	17 MnV 6	NFA 35-501 E 36	-	-	
	01.2	1035	060A35	-	1550	1.0501	C35	CC35	C35	F.113	-
	01.2	1045	080M46	-	1650	1.0503	C45	CC45	C45	F.114	-
	01.2	1140	212M36	8M	1957	1.0726	35S20	35MF4	-	F210G	-
	01.2	1039	150M36	15	-	1.1157	40Mn4	35M5	-	-	-
	01.2	1335	-	-	2120	1.1167	36MN5	40M5	-	36Mn5	SMn438(H)
	01.2	1330	150M28	14A	-	1.1170	28Mn6	20M5	C28Mn	-	SCMn1
	01.2	1035	060A35	-	1572	1.1183	Cf35	XC38TS	C36	-	S35C
	01.2	1045	080M46	-	1672	1.1191	Ck45	XC42	C45	C45K	S45C
	01.2	1050	060A52	-	1674	1.1213	Cf53	XC48TS	C53	-	S50C
	01.3	1055	070M55	-	1655	1.0535	C55	-	C55	-	-
	01.3	1060	080A62	43D	-	1.0601	C60	CC55	C60	-	-
	01.3	1055	070M55	-	-	1.1203	Ck55	XC55	C50	C55K	S55C
	01.3	1060	080A62	43D	1678	1.1221	Ck60	XC60	C60	-	S58C
	01.4	1095	060 A 96		1870	1.1274	Ck 101	XC 100	-	F-5117	
	01.4	W 1	BW 1A		1880	1.1545	C 105 W1	Y105	C36KU	F-5118	SK 3
	01.4	W210	BW2	-	2900	1.1545	C105W1	Y120	C120KU	F.515	SUP4
	Low-alloy steel *(02.1 = Non-hardened, 02.2 = Hardened and tempered)*										
	02.1	A573-81	4360 43C		1412	1.0144	St.44-2	E 28-3	-	-	SM 400A;B;C
	02.1	-	4360 50B		2132	1.0570	St.52-3	E36-3	Fe52BFN/Fe52CFN	-	SM490A;B;C;YA;YB
	02.1	5120	150 M 19		2172	1.0841	St.52-3	20 MC 5	Fe52	F-431	
	02.1	9255	250A53	45	2085	1.0904	55Si7	55S7	55Si8	56Si7	-
	02.1	9262	-	-	-	1.0961	60SiCr7	60SC7	60SiCr8	60SiCr8	-
	02.1	52100	534A99	31	2258	1.3505	100Cr6	100C6	100Cr6	F.131	SUJ2
	02.1	ASTM A204Gr.A	1501-240	-	2912	1.5415	15Mo3	15D3	16Mo3KW	16Mo3	-
	02.1	4520	1503-245-420	-	-	1.5423	16Mo5	-	16Mo5	16Mo5	-
	02.1	ASTM A350LF5	-	-	-	1.5622	14Ni6	16N6	14Ni6	15Ni6	-
	02.1	8620	805M20	362	2506	1.6523	21NiCrMo2	20NCD2	20NiCrMo2	20NiCrMo2	SNCM220(H)
	02.1	8740	311-Type 7	-	-	1.6546	40NiCrMo22	-	40NiCrMo2(KB)	40NiCrMo2	SNCM240
	02.1	-	820A16	-	-	1.6587	17CrNiMo6	18NCD6	-	14NiCrMo13	-
	02.1	5015	523M15	-	-	1.7015	15Cr3	12C3	-	-	SCr415(H)
	02.1	5140	-	-	2245	1.7045	42Cr4	-	-	42Cr4	SCr440
	02.1	5155	527A60	48	-	1.7176	55Cr3	55C3	-	-	SUP9(A)
	02.1	-	-	-	2216	1.7262	15CrMo5	12CD4	-	12CrMo4	SCM415(H)
	02.1	ASTM A182 F11;F12	1501-620Gr27	-	-	1.7335	13CrMo4 4	15CD3.5 15CD4.5	14CrMo4 5	14CrMo45	-
	02.1	ASTM A182 F.22	1501-622 Gr.31;45	- -	2218	1.7380	10CrMo9 10	12CD9, 10 -	12CrMo9, 10	TU.H - -	- -
	02.1	-	1503-660-440	-	-	1.7715	14MoV6 3	-	-	13MoCrV6	-
	02.1	-	722 M 24		2240	1.8515	31 CeMo 12	30 CD 12	30CrMo12	F-1712	
	02.1	-	897M39	40C	-	1.8523	39CrMoV13 9	-	36CrMoV12	-	-
	02.1	L1	524A14	-	2092	1.7039	34MoCrS4 G	-	105WCR 5	-	-
	02.1	8620	605A32	-	2108	1.5419	20MoCrS4	-	-	F520.S	-
	02.1	-	823M30	33	2512	1.7228	55NiCrMoV6G	-	653M31	-	-
	02.1	-	-	-	2127	1.7139	16MnCr5	-	-	-	-
	02.1	-	830 M 31		2534	-	31NiCrMo134	-	-	F-1270	
	02.1	L6	-		2550	1.2721	50NiCr13	55NCV6	-	F-528	
	02.2	3135	640A35	111A	-	1.5710	36NiCr6	35NC6	-	-	SNC236
	02.2	3415	-	-	-	1.5732	14NiCr10	14NC11	16NiCr11	15NiCr11	SNC415(H)
	02.2	3415;3310	655M13; A12	36A	-	1.5752	14NiCr14	12NC15	-	-	SNC815(H)
	02.2	9255	-	-	2090	1.0904	55Si7	55S7	-	-	-

ISO	Coromant Material Classification (CMC)	Country									
		USA	Great Britain		Sweden	Germany		France	Italy	Spain	Japan
		Standard									
		AISI/SAE	BS	EN	SS	W.-nr.	DIN	AFNOR	UNI	UNE	JIS
P	02.1/02.2	9840	816M40	110	-	1.6511	36CrNiMo4	40NCD3	38NiCrMo4(KB)	35NiCrMo4	-
	02.1/02.2	4340	817M40	24	2541	1.6582	35CrNiMo6	35NCD6	35NiCrMo6(KB)	-	-
	02.1/02.2	5132	530A32	18B	-	1.7033	34Cr4	32C4	34Cr4(KB)	35Cr4	SCr430(H)
	02.1/02.2	5140	530A40	18	-	1.7035	41Cr4	42C4	41Cr4	42Cr4	SCr440(H)
	02.1/02.2	5115	(527M20)	-	2511	1.7131	16MnCr5	16MC5	16MnCr5	16MnCr5	-
	02.1/02.2	4130	1717CDS110	-	2225	1.7218	25CrMo4	25CD4	25CrMo4(KB)	55Cr3	SCM420;SCM430
	02.1/02.2	4137;4135	708A37	19B	2234	1.7220	34CrMo4	35CD4	35CrMo4	AM26CrMo4 34CrMo4	SCM432;SCCRM3
	02.1/02.2	4140;4142	708M40	19A	2244	1.7223	41CrMo4	42CD4TS	41CrMo4	42CrMo4	SCM 440
	02.1/02.2	4140	708M40	19A	2244	1.7225	42CrMo4	42CD4	42CrMo4	42CrMo4	SCM440(H)
	02.1/02.2	-	722M24	40B	2240	1.7361	32CrMo12	30CD12	32CrMo12	F.124.A	-
	02.1/02.2	6150	735A50	47	2230	1.8159	50CrV4	50CV4	50CrV4	51CrV4	SUP10
	02.1/02.2	-	905M39	41B	2940	1.8509	41CrAlMo7	40CAD6, 12	41CrAlMo7	41CrAlMo7	-
	02.1/02.2	L3	BL3	-	-	1.2067	100Cr6	Y100C6	-	100Cr6	-
	02.1/02.2	-	-	-	2140	1.2419	105WCr6	105WC13	10WCr6 107WCr5KU	105WCr5	SKS31 SKS2, SKS3
	02.1/02.2	L6	-	-	-	1.2713	55NiCrMoV6	55NCDV7	-	F.520.S	SKT4
STEEL	**High-alloy steel**										
	03.11	ASTM A353	1501-509;510	-	-	1.5662	X8Ni9	-	X10Ni9	XBNi09	-
	03.11	2515	-	-	-	1.5680	12Ni19	Z18N5	-	-	-
	03.11	-	832M13	36C	-	1.6657	14NiCrMo134	-	15NiCrMo13	14NiCrMo131	-
	03.11	D3	BD3	-	-	1.2080	X210Cr12	Z200C12	X210Cr13KU X250Cr12KU	X210Cr12	SKD1
	03.11				2314	1..2083					
	03.11	H13	BH13	-	2242	1.2344	X40CrMoV5 1	Z40CDV5	X35CrMoV05KU X40CrMoV511KU	X40CrMoV5	SKD61
	03.11	A2	BA2	-	2260	1.2363	X100CrMoV5 1	Z100CDV5	X100CrMoV51KU	X100CrMoV5	SKD12
	03.11	-	-	-	2312	1.2436	X210CrW12	-	X215CrW12 1KU	X210CrW12	SKD2
	03.11	S1	BS1	-	2710	1.2542	45WCrV7	-	45WCrV8KU	45WCrSi8	-
	03.11	H21	BH21	-	-	1.2581	X30WCrV9 3	Z30WCV9	X28W09KU	X30WCrV9	SKD5
	03.11	-	-	-	2310	1.2601	X30WCrV9 3KU X165CrMoV 12	-	X30WCrV9 3KU X165CrMoW12KU	X160CrMoV12	-
	03.11	HW3	401S45	52	-	1.4718	X45GrSi93	Z45CS9	X45GrSi8	F322	SUH1
	03.11	D3	4959BA2	-	2715	1.3343	S6-5-2	Z40CSD10	15NiCrMo13	-	SUH3
	03.13	M 2	BM 2		2722	1.3343	S6/5/2	Z 85 WDCV	HS 6-5-2-2	F-5603.	SKH 51
	03.13	M 35	BM 35		2723	1.3243	S6/5/2/5	6-5-2-5	HS 6-5-2-5	F-5613	SKH 55
	03.13	M 7	-		2782	1.3348	S2/9/2	-	HS 2-9-2	F-5607	-
	03.21	HNV3	-	-	2736	1.2379	X210Cr12 G	-	-	-	-
	Steel castings										
	06.2	-	-	-	2223	-	-	-			
	06.33	-	Z120M12	-	-	1.3401	G-X120Mn12	Z120M12	XG120Mn12	X120Mn12	SCMnH/1
	06.33		BW 10		2183	1.3401		2120 M12	GX120 Mn12	F-8251	SEMn H1

Trade names

02.1	OVAKO 520M (Ovako Steel)
02.1	FORMAX (Uddeholm Tooling)
02.1	IMACRO NIT (Imatra Steel)
02.2	INEXA 482 (XM) (Inexa Profil)
	S355J2G3(XM)
	C45(XM)D
	16MnCrS5(XM)
	INEXA280(XM)
	070M20(XM)
02.2	HARDOX 500 (SSAB - Swedish Steel Corp.)
02.2	WELDOX 700 (SSAB - Swedish Steel Corp.)

ISO	Coromant Material Classification (CMC)	Country									
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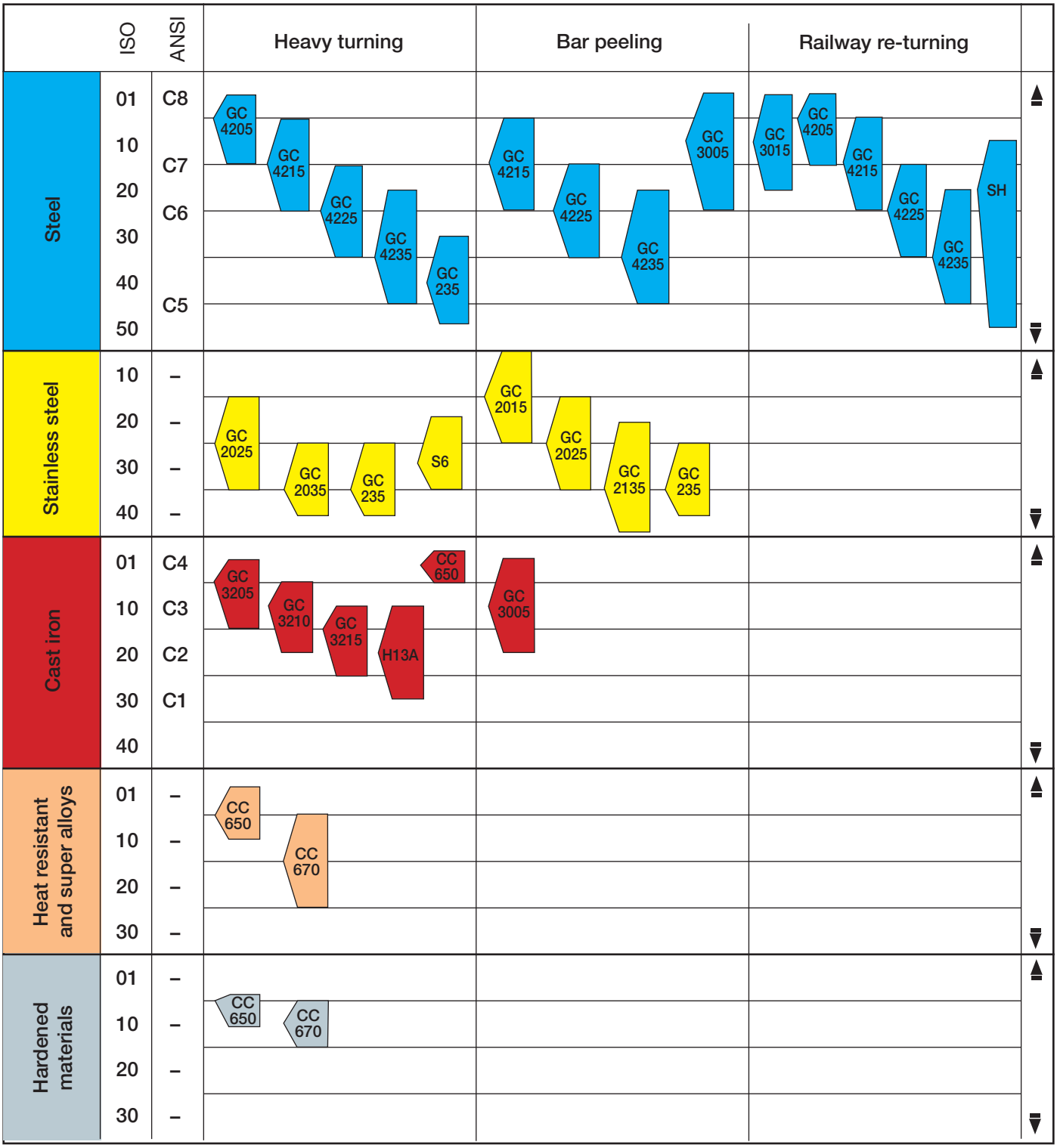
		Standard									
		AISI/SAE	BS	EN	SS	W.-nr.	DIN	AFNOR	UNI	UNE	JIS
M	**Stainless steels**										
	Ferritic / martensitic materials *(05.11, 12 = Forged, 15.11, 12 = Cast)*										
	05.11/15.11	403	403S17	-	2301	1.4000	X7Cr13	Z6C13	X6Cr13	F.3110	SUS403
						1.4001	X7Cr14	-	-	F.8401	-
	05.11/15.11	416	416 S 21		2380	1.4005	X12CrS13	Z11CF13	X12 CrS 13	F-3411	SUS 416
	05.11/15.11	430	430S15	960	2320	1.4016	X8Cr17	Z8C17	X8Cr17	F3113	SUS430
	05.11/15.11	410	410S21	56A	2302	1.4006	X10Cr13	Z10C14	X12Cr13	F.3401	SUS410
	05.11/15.11	430	430S17	60	2320	-	X8Cr17	Z8C17	X8Cr17	F.3113	SUS430
	05.11/15.11	-	420S45	56D	2304	1.4034	X46Cr13	Z40CM Z38C13M	X40Cr14	F.3405	SUS420J2
	05.11/15.11	405	405S17	-	-	1.4002	-	Z8CA12	X6CrAl13	-	-
	05.11/15.11	420	420S37	-	2303	1.4021	-	Z20C13	X20Cr13	-	-
	05.11/15.11	431	431S29	57	2321	1.4057	X22CrNi17	Z15CNi6.02	X16CrNi16	F.3427	SUS431
	05.11/15.11	430F	-	-	2383	1.4104	X12CrMoS17	Z10CF17	X10CrS17	F.3117	SUS430F
	05.11/15.11	434	434S17	-	2325	1.4113	X6CrMo17	Z8CD17.01	X8CrMo17	-	SUS434
	05.11/15.11	CA6-NM	425C11	-	2385	1.4313	X5CrNi13 4	Z4CND13.4M	(G)X6CrNi304	-	SCS5
	05.11/15.11	405	403S17	-	-	1.4724	X10CrA113	Z10C13	X10CrA112	F.311	SUS405
	05.11/15.11	430	430S15	60	-	1.4742	X10CrA118	Z10CAS18	X8Cr17	F.3113	SUS430
	05.11/15.11	HNV6	443S65	59	-	1.4747	X80CrNiSi20	Z80CSN20.02	X80CrSiNi20	F.320B	SUH4
	05.11/15.11	446	-	-	2322	1.4762	X10CrA124	Z10CAS24	X16Cr26	-	SUH446
	05.11/15.11	EV8	349S54	-	-	1.4871	X53CrMnNiN21 9	Z52CMN21.09	X53CrMnNiN21 9	-	SUH35, SUH36
	05.11/15.11	S44400	-		2326	1.4521	X1CrMoTi18 2		-	-	-
	05.11/15.11	-	-		2317	1.4922	X20CrMoV12-1	-	X20CrMoNi 12 01	-	-
	05.12/15.12	630	-	-	-	1.4542/ 1.4548	-	Z7CNU17-04	-	-	-
	Austenitic materials *(05.21, 22, 23 = Forged, 15.21, 22, 23 = Cast)*										
	05.21/15.21	304L	304S11	-	2352	1.4306	-	Z2CN18-10	X2CrNi18 11	-	-
	05.21/15.21	304	304S31	58E	2332/2333	1.4350	X5CrNi189	Z6CN18.09	X5CrNi18 10	F.3551 F.3541 F.3504	SUS304
	05.21/15.21	303	303S21	58M	2346	1.4305	X12CrNiS18 8	Z10CNF 18.09	X10CrNiS 18.09	F.3508	SUS303
	05.21/15.21	304	304S15 304C12	58E	2332 2333	1.4301	X5CrNi189	Z6CN18.09 Z3CN19.10	X5CrNi18 10 -	F.3551 -	SUS304 SUS304L
	05.21/15.21	304L	304S12	-	2352	1.4306	X2CrNi18 9	Z2CrNi18 10	X2CrNi18 11	F.3503	SCS19
	05.21/15.21	301	-	-	2331	1.4310	X12CrNi17 7	Z12CN17.07	X12CrNi17 07	F.3517	SUS301
	05.21/15.21	304LN	304S62	-	2371	1.4311	X2CrNiN18 10	Z2CN18.10	-	-	SUS304LN
	05.21/15.21	316	316S16	58J	2347	1.4401	X5CrNiMo18 10	Z6CND17.11	X5CrNiMo17 12	F.3543	SUS316
	05.21/15.21	316LN	-	-	2375	1.4429	X2CrNiMoN18 13	Z2CND17.13	-	-	SUS316LN
	05.21/15.21	316L	316S13		2348	1.4404	-	Z2CND17-12	X2CrNiMo1712	-	-
	05.21/15.21	316L	316S13	-	2353	1.4435	X2CrNiMo18 12	Z2CND17.12 -	X2CrNiMo17 12 -	- -	SCS16 SUS316L
	05.21/15.21	316	316S33	-	2343 2347	1.4436	-	Z6CND18-12-03	X8CrNiMo1713	-	-
	05.21/15.21	317L	317S12	-	2367	1.4438	X2CrNiMo18 16	Z2CND19.15	X2CrNiMo18 16	-	SUS317L
	05.21/15.21	UNS V 0890A	-		2562	1.4539	X1NiCrMo	Z2 NCDU25-20	-	-	-
	05.21/15.21	321	321S12	58B	2337	1.4541	X10CrNiTi18 9	Z6CNT18.10	X6CrNiTi18 11	F.3553 F.3523	SUS321
	05.21/15.21	347	347S17	58F	2338	1.4550	X10CrNiNb18 9	Z6CNNb18.10	X6CrNiNb18 11	F.3552 F.3524	SUS347
	05.21/15.21	316Ti	320S17	58J	2350	1.4571	X10CrNiMoTi18 10	Z6NDT17.12	X6CrNiMoTi17 12	F.3535	-
	05.21/15.21	318	-	-	-	1.4583	X10CrNiMoNb 18 12	Z6CNDNb17 13B	X6CrNiMoNb17 13	-	-
	05.21/15.21	309	309S24	-	-	1.4828	X15CrNiSi20 12	Z15CNS20.12	-	-	SUH309
	05.21/15.21	310S	310S24	-	2361	1.4845	X12CrNi25 21	Z12CN25 20	X6CrNi25 20	F.331	SUH310
	05.21/15.21	308	301S21	58C	2370	1.4406	X10CrNi18.08	Z1NCDU25.20	-	F.8414	SCS17
	15.21	-	-		2387	1.4418	X4 CrNiMo16 5	Z6CND16-04-01			
	05.22/15.22	17-7PH	316S111	-	-	1.4568/ 1.4504	-	Z8CNA17-07	X2CrNiMo1712	-	-
	05.23/15.23	NO8028	-	-	2584	1.4563	-	Z1NCDU31-27-03	-	-	-
	05.23/15.23	S31254	-	-	2378	-	-	Z1CNDU20-18-06AZ	-	-	-
	Austenitic / ferritic materials (Duplex) *(05.51, 52 = Forged, 15.51, 52 = Cast)*										
	05.51/15.51	S31500	-	-	2376	1.4417	X2CrNiMoSi19 5	-	-	-	-
	05.51/15.51	S32900	-	-	2324	-	X8CrNiMo27 5	-	-	-	-
	05.52/15.52	S32304	-	-	2327	-	X2CrNiN23 4	Z2CN23-04AZ	-	-	-
	05.52/15.52	-	-	-	2328	-	-	-	-	-	-
	05.52/15.52	S31803	-	-	2377	-	X2CrNiMoN22 53	Z2CND22-05-03	-	-	- -

STAINLESS STEEL

ISO	Coromant Material Classification (CMC)	Country									
		USA	Great Britain		Sweden	Germany		France	Italy	Spain	Japan
		Standard									
		AISI/SAE	BS	EN	SS	W.-nr.	DIN	AFNOR	UNI	UNE	JIS
M		**Trade names**									
		Stainless steels									
	05.21/15.21	SANMAC 304 (Sandvik Steel)									
	05.21/15.21	SANMAC 304L (Sandvik Steel)									
	05.21/15.21	SANMAC 316 (Sandvik Steel)									
	05.21/15.21	SANMAC 316L (Sandvik Steel)									
	05.23/15.23	254 SMO									
	05.23/15.23	654 SMO									
	05.23/15.23	SANMAC SANICRO (Sandvik Steel)									
	05.52/15.52	SANMAC SAF 2205 (Sandvik Steel)									
	05.52/15.52	SANMAC SAF 2507 (Sandvik Steel)									
K		**Malleable cast iron**									
	07.1		8 290/6		0814		-	MN 32-8			FCMB310
	07.1	32510	B 340/12		0815		GTS-35	MN 35-10			FCMW330
	07.2	40010	P 440/7		0852	0.8145	GTS-45	Mn 450	GMN 45		FCMW370
	07.2	50005	P 510/4		0854	0.8155	GTS-55	MP 50-5	GMN 55		FCMP490
		70003	P 570/3		0858		GTS-65	MP 60-3			FCMP540
	07.2	A220-70003	P570/3		0856	0.8165	GTS-65-02	Mn 650-3	GMN 65	-	FCMP590
	07.3	A220-80002	P690/2		0862	0.8170	GTS-70-02	Mn700-2	GMN 70		FCMP690
		Grey cast iron									
	08.1				0100						
	08.1	No 20 B			0110		GG 10	Ft 10 D			FC100
	08.1	No 25 B	Grade 150		0115	0.6015	GG 15	Ft 15 D	G 15	FG 15	FC150
	08.1	No 30 B	Grade 220		0120	0.6020	GG 20	Ft 20 D	G 20		FC200
	08.2	No 35 B	Grade 260		0125	0.6025	GG 25	Ft 25 D	G 25	FG 25	FC250
		No 40 B									
	08.2	No 45 B	Grade 300		0130	0.6030	GG 30	Ft 30 D	G 30	FG 30	FC300
	08.2	No 50 B	Grade 350		0135	0.6035	GG 35	Ft 35 D	G 35	FG 35	FC350
	08.2	No 55 B	Grade 400		0140	0.6040	GG 40	Ft 40 D			
	08.3	A436 Type 2	L-NiCuCr202		0523	0.6660	GGL-NiCr202	L-NC 202	-	-	
		Nodular cast iron									
	09.1	60-40-18	SNG 420/12		0717-02	0.7040	GGG 40	FCS 400-12	GS 370-17	FGE 38-17	FCD400
	09.1	-	SNG 370/17		0717-12		GGG 40.3	FGS 370-17			
	09.1	-	-		0717-15	0.7033	GGG 35.3	-			
	09.1	80-55-06	SNG 500/7		0727-02	0.7050	GGG 50	FGS 500-7	GS 500	FGE 50-7	FCD500
	09.1	A43D2	Grade S6		0776	0.7660	GGG-NiCr202	S-NC 202	-	-	
	09.2	-	SNG 600/3		0732-03		GGG 60	FGS 600-3			FCD600
	09.2	100-70-03	SNG 700/2		0737-01	0.7070	GGG 70	FGS 700-2	GS 700-2	FGS 70-2	FCD700

CAST IRON

Grades for heavy machining



The position and form of the grade symbol indicate thew suitable field of application.

Centre of the field of application

Recommended field of application

= Basic grade

= Complementary grade

Letter symbols specifying the designation of hard cutting materials:

Hardmetals:
HW Uncoated hardmetal containing primarily tungsten carbide (WC).
HC Hardmetals as above, but coated.

Ceramics:
CC Coated oxide ceramics containing primarily aluminium oxide (Al_2O_3)

Wear resistance ▲

Toughness ▼

Grades for heavy machining

Heavy turning

P **GC4205 (HC)** – P05 (P01–P15)
CVD-coated carbide grade for finishing to roughing in applications with continuous cut to light intermittence of steel and steel castings. A gradient substrate optimized in hardness and toughness with a wear resistant coating. Is able to withstand high temperatures without sacrificing edge line security in wet and dry applications.

GC4215 (HC) – P15 (P05–P25)
CVD-coated carbide grade for finishing to roughing in applications with continuous cut to light intermittence of steel and steel castings. A gradient substrate optimized in hardness and toughness with a wear resistant coating. Is able to withstand high temperatures without sacrificing edge line security in wet and dry applications.

GC4225 (HC) – P25 (P15–P35)
CVD-coated carbide grade for finishing to roughing of steel and steel castings. A gradient substrate with optimized hardness and toughness for steel turning in combination with a thick wear resistant coating. This grade can handle continuous cuts as well as interrupted cuts at high metal removal rates. A grade for a broad application area.

GC4235 (HC) – P35 (P20–P45)
CVD-coated carbide grade for roughing of steel and steel castings under unfavorable conditions. A gradient substrate with optimized hardness and toughness for steel turning in combination with a thick wear resistant coating. The edge line security enables the grade to handle interrupted cuts at high metal removal rates.

GC235 (HC) – P45 (P30–P50)
CVD-coated carbide grade for roughing of steel and steel castings under the most unfavorable conditions. The tough substrate provides extremely good edge security which allows the grade to handle heavy interrupted cuts at low speeds.

M **GC2025 (HC)** – M25 (M15–M35)
CVD-coated carbide optimized for semi-finishing to roughing of austenitic stainless and duplex stainless steels at moderate cutting speeds. Good resistance to thermal shock and mechanical shock provides excellent edge security also for interrupted cuts.

GC2035 (HC) – M35 (M25–M40)
PVD-coated carbide. Recommended for semi-finishing to roughing of austenitic stainless and duplex stainless steels at low to moderate cutting speeds. Great resistance to thermal shock makes it ideal for applications with fast intermittent cuts.

GC235 (HC) – M35 (M25–M40)
CVD-coated carbide grade for roughing of stainless steels and stainless steel castings with difficult skin. The tough substrate provides extremely good edge security which allows the grade to handle heavy interrupted cuts at low to moderate speeds.

S6 (HW) – M30 (M20–M35)
Roughing of steel, stainless steel and steel castings. Difficult conditions. Low cutting speeds, heavy feeds.

K **GC3205 (HC)** – K05 (K01–K15)
CVD-coated carbide consisting of a thick, smooth, wear resistant coating and a very hard substrate. Recommended for high speed turning of Grey Cast Iron (GCI).

GC3210 (HC) – K10 (K05–K20)
CVD-coated carbide consisting of a thick, smooth, wear resistant coating and a very hard substrate. Recommended for high speed turning of Nodular Cast Iron (NCI).

GC3215 (HC) – K15 (K10–K25)
CVD-coated carbide consisting of a smooth, wear resistant coating and a hard substrate, capable of withstanding demanding interrupted cutting conditions. Recommended as general choice for roughing of all cast irons at low to medium cutting speeds.

H13A (HW) – K20 (K10–K30)
Uncoated carbide grade. Combines good abrasive wear resistance and toughness. For moderate to low speeds and high feeds in cast iron.

CC650 (CC) – K01 (K01–K05)
Mixed Al_2O_3-based ceramic. Recommended for high speed finishing of grey cast irons and hardened cast irons under stable conditions.

S **CC650 (CC)** – S05 (S01–S10)
Mixed Al_2O_3-based ceramic. Could be used in semi-finishing operations of high-temp alloys in applications with low demand on edge security.

CC670 (CC) – S15 (S05–S25)
A silicon carbide whisker reinforced aluminium oxide based ceramic with excellent bulk toughness. Primarily recommended for heat resistant alloys under unfavourable conditions.

H **CC650 (CC)** – H05 (H05–H10)
Mixed Al_2O_3-based ceramic. Good thermal properties and wear resistance. Primarily recommended for light continuous finishing.

CC670 (CC) – H10 (H05–H15)
A silicon carbide whisker reinforced aluminium oxide based ceramic with excellent bulk toughness. Recommended for hard part turning under unfavourable conditions

Bar peeling

P **GC4215 (HC)** – P15 (P05–P25)
CVD-coated carbide grade for finishing to roughing in applications with continuous cut to light intermittence of steel and steel castings. A gradient substrate optimized in hardness and toughness with a wear resistant coating. Is able to withstand high temperatures without sacrificing edge line security in wet and dry applications.

GC4225 (HC) – P25 (P15–P35)
CVD-coated carbide grade for finishing to roughing of steel and steel castings. A gradient substrate with optimized hardness and toughness for steel turning in combination with a thick wear resistant coating. This grade can handle continuous cuts as well as interrupted cuts at high metal removal rates. A grade for a broad application area.

GC4235 (HC) – P35 (P20–P45)
CVD-coated carbide grade for roughing of steel and steel castings under unfavorable conditions. A gradient substrate with optimized hardness and toughness for steel turning in combination with a thick wear resistant coating. The edge line security enables the grade to handle interrupted cuts at high metal removal rates.

GC3005 (HC) – P10 (P01–P25)
CVD-coated carbide consisting of a wear resistant coating with very good adhesion to a hard substrate and capable of withstanding high cutting speed. For finishing and semi-finishing at high cutting speed of high alloy steels with high surface demands.

M **GC2015 (HC)** – M15 (M05–M25)
CVD-coated carbide grade for finishing and light roughing of stainless steels. A substrate, which can handle high temperatures, combined with a wear resistant coating makes this grade a first choice for continuous cuts at moderate to high cutting speeds.

GC2025 (HC) – M25 (M15–M35)
CVD-coated carbide optimized for semi-finishing to roughing of austenitic stainless and duplex stainless steels at moderate cutting speeds. Good resistance to thermal shock and mechanical shock provides excellent edge security also for interrupted cuts.

GC2035 (HC) – M35 (M25–M40)
First choice CVD-coated carbide grade for stainless steel and other toughnes demanding operations. Very good bulk and edge-line toughness. To be used at low to medium cutting speeds.

GC235 (HC) – M35 (M25–M40)
CVD-coated carbide grade for roughing of stainless steels and stainless steel castings with difficult skin. The tough substrate provides extremely good edge security which allows the grade to handle heavy interrupted cuts at low to moderate speeds.

K **GC3005 (HC)** – K10 (K01–K20)
CVD-coated carbide consisting of a wear resistant coating with very good adhesion to a hard substrate, capable of withstanding high temperatures. For finishing to roughing of nodular iron, high strength malleable iron and “gummy” (alloyed) grey iron.

Railway wheel re-turning

P **GC3015 (HC)** – P10 (P01–P20)
CVD-coated carbide consisting of a thick, wear resistant coating and a hard substrate, capable of withstanding high temperatures. For finishing and light roughing at high cutting speeds under favorable conditions.

GC4205 (HC) – P05 (P01–P15)
A CVD coated grade with excellent resistance against crater wear and plastic deformation. A very good choice when higher metal removal rate is needed in medium to rough steel applications. Is able to withstand high temperatures without sacrificing edge line security in wet and dry machining.

GC4215 (HC) – P15 (P05–P25)
CVD-coated carbide grade for finishing to roughing in applications with continuous cut to light intermittence of steel and steel castings. A gradient substrate optimized in hardness and toughness with a wear resistant coating. Is able to withstand high temperatures without sacrificing edge line security in wet and dry applications.

GC4225 (HC) – P25 (P15–P35)
CVD-coated carbide grade for finishing to roughing of steel and steel castings. A gradient substrate with optimized hardness and toughness for steel turning in combination with a thick wear resistant coating. This grade can handle continuous cuts as well as interrupted cuts at high metal removal rates. A grade for a broad application area.

GC4235 (HC) – P35 (P20–P45)
CVD-coated carbide grade for roughing of steel and steel castings under unfavorable conditions. A gradient substrate with optimized hardness and toughness for steel turning in combination with a thick wear resistant coating. The edge line security enables the grade to handle interrupted cuts at high metal removal rates.

SH (HW) – P20 (P10–P50)
A tough, uncoated grade for re-machining of badly damaged wheels at low cutting speed.

Safety information in connection with grinding of cemented carbide

Ingredients

Hard metal products contain tungsten carbide and cobalt and may also include titanium carbide, tantalum carbide, niobium carbide, chromium carbide, molybdenum carbide or vanadium carbide. Some grades contain titanium carbonitride and/or nickel.

Routes of exposure

Grinding or heating a hard metal blank or a hard metal product will produce dust or fumes with dangerous ingredients that can be inhaled, swallowed or come in contact with the skin or eyes.

Acute toxicity

The dust is toxic by inhalation. Inhalation may cause irritation and inflammation in the airways. A significantly higher acute inhalation toxicity has been reported during simultaneous inhalation of cobalt and tungsten carbide compared to inhalation of cobalt alone.

Skin contact can cause irritation and rash. Persons who have sensitive skin may experience an allergic reaction.

Chronic toxicity

Repeated inhalation of aerosols containing cobalt may cause obstruction in the airways. Prolonged inhalation of increased concentrations may cause lung fibrosis or lung cancer. Epidemiological studies indicate that workers exposed in the past to high concentrations of tungsten carbide/cobalt carried an increased risk of developing lung cancer.

Cobalt and nickel are potent skin sensitizers. Repeated or prolonged contact can cause irritation.

Risk phrases

Toxic: danger of serious damage to health by prolonged exposure through inhalation
Toxic by inhalation
Possible risks of irreversible effects
May cause sensitization by inhalation and skin contact

Preventive measures

- Avoid formation and inhalation of dust. Use local exhaust ventilation that is adequate to limit personal exposure well below the nationally authorised limits.
- If ventilation is not available or adequate, use respirators nationally approved for the purpose.
- Use safety goggles or glasses with side shields when necessary.
- Avoid repeated skin contact. Wear suitable gloves. Wash skin thoroughly after handling.
- Use suitable protective clothing. Launder clothing as needed.
- Do not eat, drink or smoke in the working area. Wash skin thoroughly before eating, drinking or smoking.

Safety information in connection with grinding of cemented carbide (US market)

Most grades of hardmetal contain cobalt, a substance classified as hazardous by OSHA and the present threshold limit (TLV) for cobalt metal from dust in the air is 0.02[1)] mg/m^3. The products described in this catalog also contain one or more of the following: Tungsten Carbide, Titanium Carbide, Tantalum Carbide, Chromium Cadmium and Nickel. These materials are also classified as hazardous by OSHA. Before using any of the products described in this catalog, read the appropriate Material Safety Data sheet for the product.

It is necessary when grinding advanced cutting tool materials that dust, mist or sludge from the process be collected and disposed of properly. Exposure to dust or mist containing metallic particles can be hazardous to health. This is particularly true if exposure continues over an extended period of time. Exposure may cause eye, skin and mucous membrane irritation and temporary or permanent respiratory disease. Existing pulmonary and skin conditions may be aggravated.

Wet grinding is strongly recommended. Adequate ventilation, respiratory protection and eye protection should be provided when grinding and workers should avoid breathing of and prolonged skin contact with dust or mist. General Industry Safety and Health Regulations, Part 1910, U.S. Department of Labor, published in Title 29 of the Code of Federal Regulations should be consulted.

Hardmetal is frequently brazed with silver solder. When it is brazed or debrazed fumes of cadmium oxide, zinc oxide and other substances may be given off from the brazing material and suitable precautions must be taken to prevent inhalation of these fumes.

You are advised to consult your Factory Inspector regarding future amendments to the ceiling vaules and threshold limit values (TLV) given above as they are always subject to further reduction.

Precautions are necessary in handling hardmetal because of its inherently brittle nature. It can be fractured by shock or impact which may cause pieces to be detached at high velocity. Tools and components containing hardmetal should not be hammered or fitted with undue force, and when such operations must be carried out, suitable eye protection must be used by the workers. Such eye protection must also be used in normal operations because there is a danger of breakage of tools or components during normal usage.

Further copies of this information and appropriate material safety data sheets are available on request and can be obtained directly from Sandvik Coromant Co.

[1)] Threshold values established by the American Conference of Government Industrial Hygienists (ACGH).