METALWORKING PRODUCTS

Small Part Machining

in automatic sliding head machines

SANDVIK
Coromant

Introduction

External Turning

Internal Turning

Milling

Drilling

General Information

AB Sandvik Coromant
Not only a tool supplier

Sandvik Coromant is the world's leading manufacturer of cutting tools for the metalworking industry, with more than 25 000 products. But that's only one side of the coin!

In 60 countries around the world, around the clock, thousands of specialists deliver solutions to our customers.

Our mission is simple:

To help our customers improve their productivity and profitability. Our products, know-how and services shall give maximum value to our customers in terms of performance, quality, security, flexibility and total economy.

Full control from powder...

With the most advanced production system and the latest technology we control the entire process from raw material to final product.

... to recycling

And we also play our part when it comes to the future of our world – by collecting used carbide for recycling in an eco-friendly way.

Sandvik Coromant is certified according to ISO 9001.

No limits
with Sandvik Coromant

Tailor Made options ...

Tools to your dimensions on standard tool terms. With our Tailor Made Service you are free to specify your own dimensions without paying the price of a special tool.

- Prompt delivery of drawing and quote.
- Tools within 10 to 20 days.

and engineered solutions

When standard and Tailor Made solutions do not fulfill your needs you can depend on Sandvik Coromant's wide experience in engineered tool solutions to cope with particularly demanding criteria.

More
information?

Useful information and application techniques are found in our special catalogues, application guides and handbooks.

CoroGuide Web is an internet based catalogue, including a cutting data module (also available on CD) where you can find cutting data recommendations for your specific application.

Visit our web site for the latest news! And you will also find many applicable functions and services.

www.sandvik.com

Shop**Online**

ShopOnline is our ordering service on the Internet – an easy way to order products. By using this service you will get online information about net prices and the stock situation.

ShopOnline is now available to customers on about 30 markets.

How to register? See our web site www.sandvik.com

Productivity
– how can we improve it?

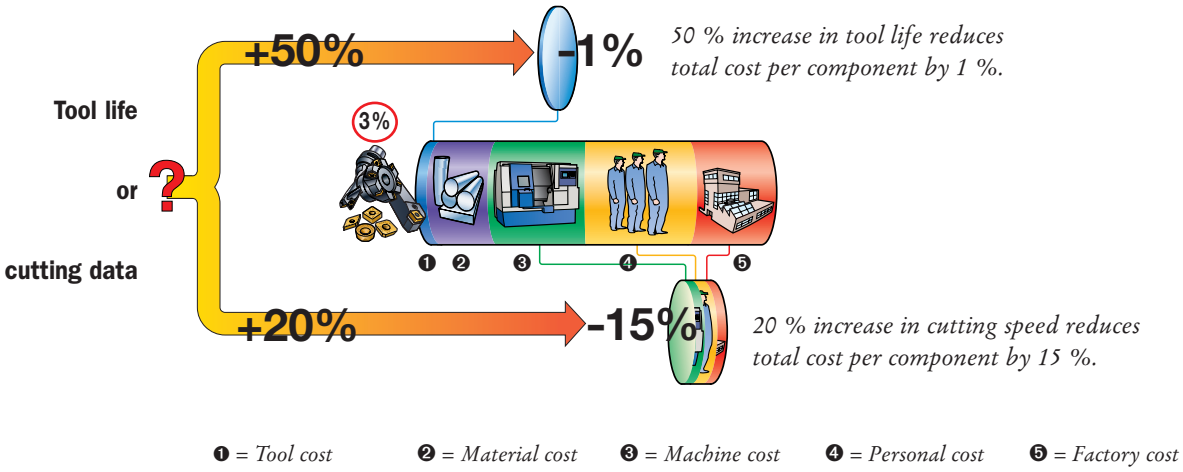
Output

Input

In machining, productivity is defined as the ratio between output and input.

Input is the resources made available for production, for example: operator, machinery, equipment, workpiece material, toolroom, inventory and overheads.

Output is basically what gets done during the available production time.



50 % increase in tool life reduces total cost per component by 1 %.

20 % increase in cutting speed reduces total cost per component by 15 %.

❶ = *Tool cost* ❷ = *Material cost* ❸ = *Machine cost* ❹ = *Personal cost* ❺ = *Factory cost*

Cost saving effects

Modern cutting tools correctly applied and with optimised cutting data have a major cost saving effect!

Only three percent of the total production costs is related to the cost of cutting tools.

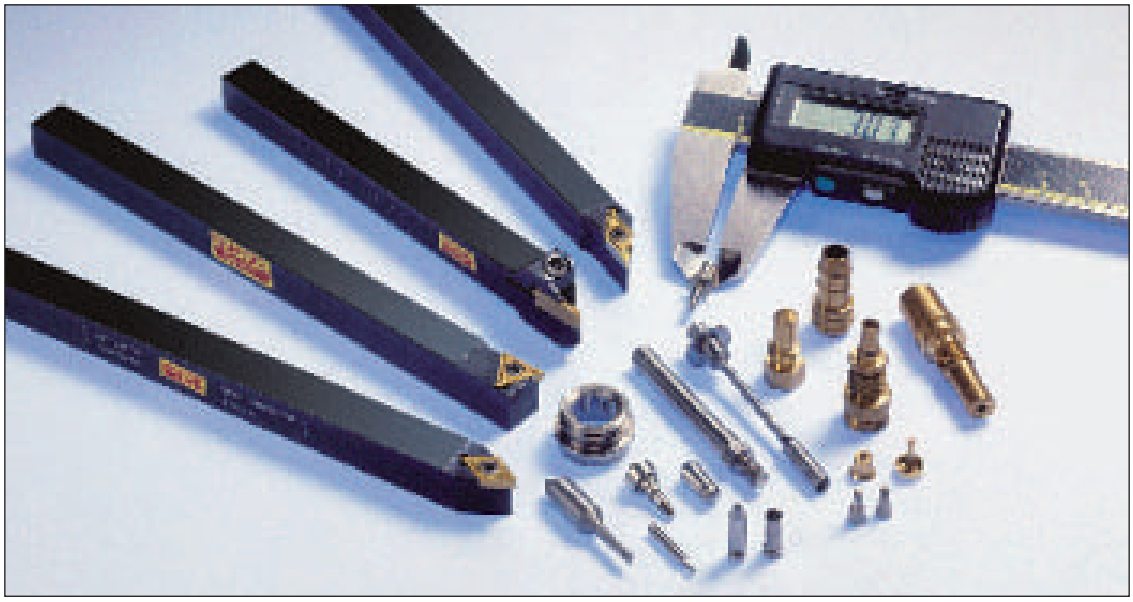
Savings on tool costs will therefore only have a marginal effect and cannot compare with the savings that can be achieved by lowering the production costs through increased output.

As our customer you will always be close to personal expertise and support. You will never be left to tackle problems on your own — we will solve them together.

SANDVIK Coromant

Fine mechanical engineering in automatic sliding head machines

Swiss tools are designed for high precision machining in automatic sliding head machines within the automotive, watch, connector and medical industry.



Precision inserts

CoroTurn 107 G and E-tolerance inserts are designed to give secure machining when there is a demand on precision, with small component tolerances. Ground VCEX inserts with E-tolerance enables excellent indexing, superb surface finish due to wiper effect and good chip control.

High precision holders

The holders – all laser marked – are designed with a zero offset to achieve a closer set-up to the collet. This minimizes vibration. Correct centre height is easily obtained when setting up the holder in the machine due to ground high precision shanks.

Swiss toolholders with screw clamping are available in shank sizes 0808-1616 with length 150 mm. For identification they are marked with -S.

Maximise with wiper inserts

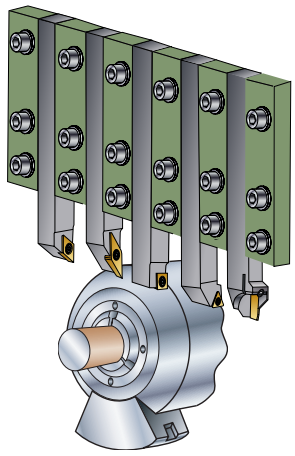
The use of Wiper inserts is an option to maximise productivity and increase machine utilization. Double the feed reduces machine time and improves chip control, the same feed improves surface quality.

Parting and grooving with CoroCut Swiss

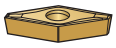
For high precision parting and grooving the CoroCut swiss holder is optimized for swiss machines. Angled screw for easy access when changing the insert in the machine and a reinforced blade for extra stability.

Inserts for Swiss machining

– CoroTurn 107 inserts, 7°
– E, G and M tolerance inserts
– Wiper inserts



VCEX inserts



For turning and back-turning operations with high demands on precision. For excellent chip breaking, surface finish and high edge strength, use VCEX E-tolerance insert with 0 and 01 nose radii.

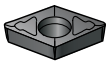
CoroTurn 107 – G tolerance

For copying and longitudinal turning with high demands on performance, choose UM (G-tolerance) inserts with small nose radii ground inserts with sharp edges for best performance.

Wiper inserts

For high productivity, improved chipbreaking and excellent surface finish choose positive wiper inserts.

CoroTurn 107 – Al Geometry

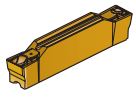


For Aluminiuim, Titanium and other non-ferrous materials, choose -AL geometry. The G-tolerance ensures high indexing security.

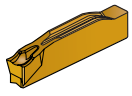
CoroTurn 107 – M tolerance

For finishing and medium operations where a sharp edge is not a necessity. CoroTurn 107 is available in a wide range of nose radii 02–1.2 and in the latest grades for all materials.

CoroCut



Geometry -GF for high precision parting and grooving. Good chip control in most materials.



Geometry -CM is an all-round geometry which generates low cutting forces.

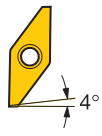
Q-Cut

Geometry -5F for parting and grooving with a wide range of front angles to minimize pips and burrs.

All inserts are available in modern grades for the machining of most materials.

VCEX inserts

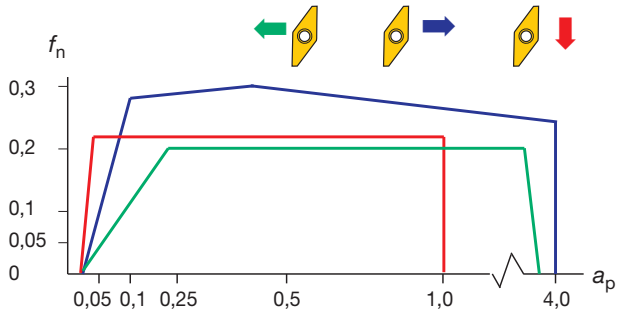
– Strong and sharp insert for turning and back-turning operations
– Polished for better chip flow
– Sharp edges for easy cutting action
– Height and IC tolerance of ± 0,025 mm (E-tolerance) for better indexing
– 0 and 01 nose radii
To be used in standard CoroTurn 107 holders

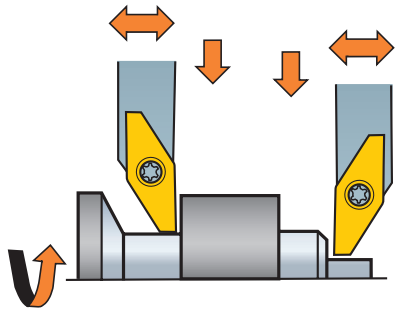


VCEX insert in holder
SVABR/L = angle 4°
SVJBR/L = angle 1°

For back turning, holder SVABR/L with 90° entering angle is recommended for best chip flow.

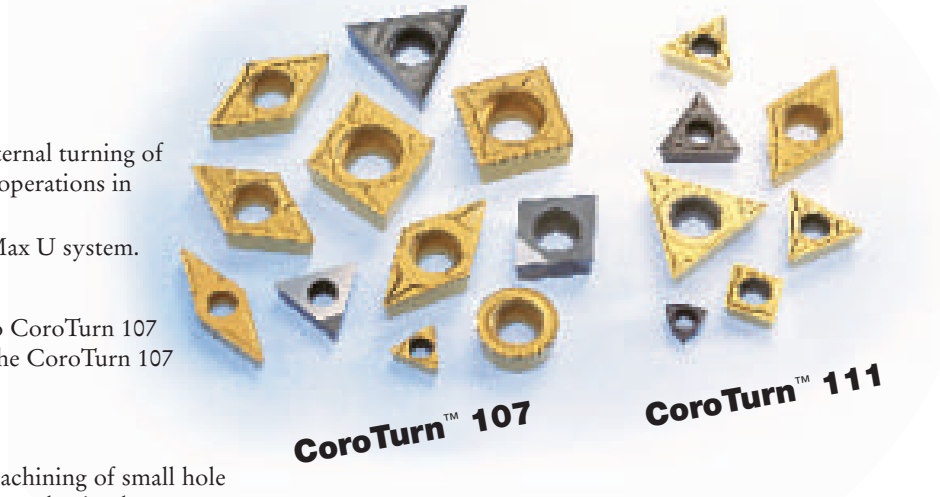
VCEX working area





Positive CoroTurn™ 107 / 111 positive style inserts

CoroTurn represents Sandvik Coromant's new product range of positive inserts and holders. The positive insert shape combines low cutting forces with good edge strength. The screw clamping ensures stability and an unobstructed chip flow.



CoroTurn™ 107

The CoroTurn 107 system is mainly used for external turning of small, long or slender components, and internal operations in hole diameters 16–75 mm.

CoroTurn 107 will progressively replace the T-Max U system.

Interchangeablity

Both CoroTurn 107 and T-Max U inserts fit into CoroTurn 107 holders. If you already have a T-Max U holder the CoroTurn 107 insert will fit into this.

CoroTurn™ 111

CoroTurn 111 is dedicated to high productive machining of small hole diameters (7-32 mm). The system consists of inserts, boring bars, exchangeable cutting heads as well as EasyFix sleeves for easy clamping of cylindrical bars. All bars have internal coolant holes with a coolant connector as an option.

Productivity in turning

CoroTurn inserts dedicated for each material group

The CoroTurn products are all designed to cope with the specific machining conditions within each material group (P, M, K, N, S and H) that enables optimized cutting data and increased productivity.

Because of the positive clearance angle and the fact that the inserts are optimized to have peak performance in their respective areas, they have a softer cutting action. This counteracts vibration, gives better surface finish and enables to hold close tolerances. The inserts also have optimized chip breaking capabilities to ensure unobstructed chip flow.

Grades for all materials

P	**Steel**
M	**Stainless steel**
K	**Cast iron**
N	**Non-ferrous materials**
S	**Super alloys and titanium**
H	**Hard materials**

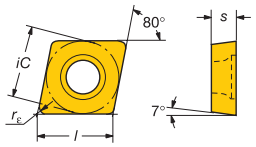
High feed machining

Coromant's productivity boosters, the high-productivity Wiper inserts for semi-finish and finish turning will half your cycle time and give twice as good surface finish.

Read more about Wiper inserts on page A 12.

Positive inserts - CoroTurn™ 107

Rhombic 80°

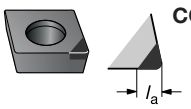


Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CD = Polycerystalline diamond (ISO = DP)
CB = Boron nitride (ISO=BN)
CT = Cermet (ISO = HT)
– = Uncoated cemented carbide (ISO = HW)

For dimensions, see code key on page A 10.

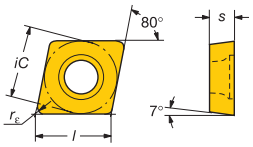
				P				M			K			N			S			H			
				CT	GC	GC	GC	GC	GC	GC	GC	GC	–	CD	CD	–	–	GC	GC	CB			
				5015	1525	4015	4025	1025	2015	2025	3005	3025	H13A	CD10	1810	H10	H13A	1025	1005	CB20		l_a	Max. d.o.c.
Finishing	 **WF** **Wiper insert** High feed machining for best surface finish. See page A 12.	CCMT	06 02 04-WF	☆	★	☆		☆	★		★							★					
			06 02 08-WF	☆	★	☆		☆	★		★							★					
			09 T3 04-WF	☆	★	☆		☆	★		★							★					
			09 T3 08-WF	☆	★	☆		☆	★		★							★					
	 **PF** **P-Line** First choice for steel finishing.	CCMT	06 02 02-PF	☆			★																
			06 02 04-PF	☆		★																	
			09 T3 02-PF	☆			★																
			09 T3 04-PF	☆		★	☆																
			09 T3 08-PF	☆		★	☆																
			12 04 04-PF	☆		★	☆																
	 **MF** **M-Line** First choice for stainless steel finishing.	CCMT	06 02 02-MF					★											★					
			06 02 04-MF					☆	★										☆	★				
			09 T3 02-MF					★											★					
			09 T3 04-MF					☆	★	☆									☆	★				
			09 T3 08-MF					☆	★	☆									☆	★				
			12 04 04-MF					☆	★	☆									★					
	 **KF** **K-Line** First choice for cast iron finishing.	CCMT	06 02 02-KF										★					★						
			06 02 04-KF								★		☆					★						
			09 T3 02-KF										★					★						
			09 T3 04-KF								★	☆	☆					★						
			09 T3 08-KF								★	☆	☆					★						
			12 04 04-KF								★	☆	☆					★						
	Aluminium																							
	 **AL** First choice for aluminium machining.	CCGX	06 02 02-AL												★	☆								
			06 02 04-AL												★	☆								
			09 T3 04-AL												★	☆								
			09 T3 08-AL												★	☆								
			12 04 04-AL												★	☆								
			12 04 08-AL												★	☆								
	Polycrystalline diamond tipped																							
		CCMW	06 02 04FP											☆								2,9	2,3
			09 T3 04FP											☆								4,3	3,4
			09 T3 08FP											☆								4,2	3,4
				P05	P15	P15	P25	M15	M15	M25	K10	K20	K15	N01	N10	N10	S15	S15	S15	H01			

Ordering example: 10 pieces CCMT 06 02 04-WF 1525

★ = First choice

Positive inserts - CoroTurn™ 107

Rhombic 80°



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For grade descriptions, see section K.

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CD = Polycerystalline diamond (ISO = DP)
CT = Cermet (ISO = HT)
– = Uncoated cemented carbide (ISO = HW)

				P					M				K				N		S			
				CT	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	–	CD	–	–	–	GC	GC
				5015	1525	4015	4025	4035	1025	2015	2025	2035	3005	3015	3025	H13A	1810	H10	H10A	H13A	1005	1025
Medium	WM **Wiper insert** High feed machining with best productivity. See page A 12.	CCMT	09 T3 04-WM		☆	★	☆		☆	★			★									★
			09 T3 08-WM		☆	★	☆		☆	★			★									★
			12 04 04-WM		☆	★	☆		☆	★			★									★
			12 04 08-WM		☆	★	☆		☆	★			★									★
	PM **P-Line** First choice for steel medium machining.	CCMT	06 02 04-PM	☆	☆	★																
			06 02 08-PM	☆	☆	★																
			09 T3 04-PM	☆	☆	☆	★	☆														
			09 T3 08-PM	☆	☆	☆	★	☆														
			12 04 04-PM	☆	☆	☆	★	☆														
			12 04 08-PM	☆	☆	☆	★	☆														
			12 04 12-PM	☆	☆	☆	★	☆														
	MM **M-Line** First choice for stainless steel medium machining.	CCMT	06 02 04-MM						☆	★											★	☆
			06 02 08-MM						☆	★											★	☆
			09 T3 04-MM						☆	☆	★	☆									★	☆
			09 T3 08-MM						☆	☆	★	☆									★	☆
			12 04 04-MM						☆	☆	★	☆									★	☆
			12 04 08-MM						☆	☆	★	☆									★	☆
			12 04 12-MM						☆	☆	★	☆										★
	KM **K-Line** First choice for cast iron medium machining.	CCMT	06 02 04-KM										★			☆				★		
			06 02 08-KM										★			☆				★		
			09 T3 04-KM										★		☆	☆				★		
			09 T3 08-KM										★		☆	☆				★		
			12 04 04-KM										★		☆	☆				★		
			12 04 08-KM										★		☆	☆				★		
			12 04 12-KM										★		☆	☆				★		
	UM Medium geometry. Periphery ground insert.	CCGT	06 02 01-UM						☆							☆				☆		☆
			06 02 02-UM						☆							☆				☆		☆
			06 02 04-UM	☆					☆	☆		☆				☆			☆	☆		☆
			09 T3 01-UM	☆					☆		☆					☆			☆	☆		☆
			09 T3 02-UM	☆					☆		☆					☆			☆	☆		☆
			09 T3 04-UM	☆					☆	☆	☆					☆			☆	☆	☆	☆
			09 T3 08-UM	☆					☆	☆	☆					☆			☆	☆	☆	☆
			12 04 04-UM							☆									☆			
			12 04 08-UM							☆									☆			
	Flat insert	CCMW	06 02 04	☆												☆						
			09 T3 04	☆										☆		☆						
Aluminium																						
	AL First choice for aluminium machining.	CCGX	06 02 02-AL														★	☆				
			06 02 04-AL														★	☆				
			09 T3 04-AL														★	☆				
			09 T3 08-AL														★	☆				
			12 04 04-AL														★	☆				
			12 04 08-AL														★	☆				
				P05	P15	P15	P25	P35	M15	M15	M25	M35	K10	K10	K20	K15	N10	N10	S10	S15	S15	S15

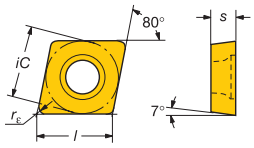
Ordering example: 10 pieces CCMT 09 T3 04-WM 4015

★ = First choice

SANDVIK Coromant

Positive inserts - CoroTurn™ 107

Rhombic 80°



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– = Uncoated cemented carbide (ISO = HW)

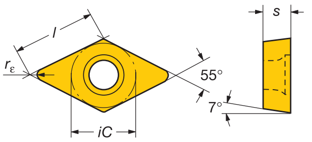
				P			M			K				N		S				
				GC	GC	GC	GC	GC	GC	GC	GC	GC	–	CD	–	–	GC	GC		
				4015	4025	4035	2015	2025	2035	3005	3015	3025	H13A	1810	H10	H13A	1005	1025		
				P15	P25	P35	M15	M25	M35	K10	K10	K20	K15	N10	N10	S15	S15	S15		
Roughing																				
 **PR** **P-Line** First choice for roughing in steel.	CCMT	06 02 08-PR		★		☆														
		09 T3 08-PR		☆	★	☆														
		09 T3 12-PR		☆	★	☆														
		12 04 08-PR		☆	★	☆														
		12 04 12-PR		☆	★	☆														
 **MR** **M-Line** First choice for roughing in stainless steel.	CCMT	06 02 08-MR					★		☆								★			
		09 T3 08-MR					☆	★	☆								★			
		09 T3 12-MR					☆	★	☆											
		12 04 08-MR					☆	★	☆								★			
		12 04 12-MR					☆	★	☆								★			
 **KR** **K-Line** First choice for roughing in cast iron.	CCMT	06 02 08-KR								★		☆	☆			★				
		09 T3 08-KR								☆	★	☆	☆			★				
		09 T3 12-KR								☆	★	☆	☆			★				
		12 04 08-KR								☆	★	☆	☆			★				
		12 04 12-KR								☆	★	☆	☆			★				
Aluminium																				
 **AL** First choice for aluminium machining.	CCGX	06 02 02-AL												★	☆					
		06 02 04-AL												★	☆					
		09 T3 04-AL												★	☆					
		09 T3 08-AL												★	☆					
		12 04 04-AL												★	☆					
		12 04 08-AL												★	☆					

Ordering example: 10 pieces CCMT 06 02 08-PR 4015

★ = First choice

Positive inserts - CoroTurn™ 107

Rhombic 55°



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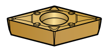
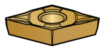
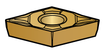
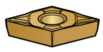
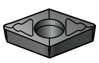
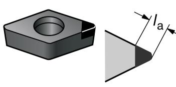
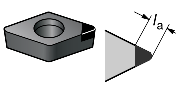
Finishing

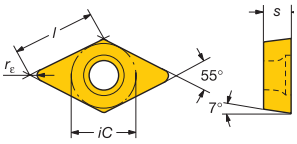
Insert	Code	P CT 5015	P GC 1525	P GC 4015	P GC 4025	M GC 1025	M GC 2015	M GC 2025	K GC 3005	K GC 3025	K – H13A	N CD CD10	N CD 1810	N – H10	S – H13A	S GC 1025	S GC 1005	H CB CB20	l_a	Max. d.o.c.
 **WF** **Wiper insert** High feed machining for best surface finish. See page A 12.	DCMX 07 02 04-WF	☆	★	☆		☆	★		★							★				
	07 02 08-WF	☆	★	☆		☆	★		★							★				
	11 T3 04-WF	☆	★	☆		☆	★		★							★				
	11 T3 08-WF		★	☆		☆	★		★							★				
 **PF** **P-Line** First choice for finishing in steel.	DCMT 07 02 02-PF	☆			★															
	07 02 04-PF	☆		★	☆															
	11 T3 02-PF	☆			★															
	11 T3 04-PF	☆		★	☆															
	11 T3 08-PF	☆		★	☆															
 **MF** **M-Line** First choice for stainless steel finishing.	DCMT 07 02 02-MF					★										★				
	07 02 04-MF					☆	★	☆								☆	★			
	11 T3 02-MF					★										★				
	11 T3 04-MF					☆	★	☆								☆	★			
	11 T3 08-MF					☆	★	☆								★				
 **KF** **K-Line** First choice for cast iron finishing.	DCMT 07 02 02-KF										★				★					
	07 02 04-KF								★	☆	☆				★					
	11 T3 02-KF										★				★					
	11 T3 04-KF								★	☆	☆				★					
	11 T3 08-KF								★	☆	☆				★					
Aluminium  **AL** First choice for aluminium machin-ing.	DCGX 07 02 02-AL												★	☆						
	07 02 04-AL												★	☆						
	11 T3 02-AL												★	☆						
	11 T3 04-AL												★	☆						
	11 T3 08-AL												★	☆						
Polycrystalline diamond tipped 	DCMW 11 T3 04FP											☆							4,1	3,3
	11 T3 08FP											☆							3,8	3,0
Cubic boron nitride 	DCMW 11 T3 04 S01020E																	☆	3,65	0,8
	11 T3 08 S01020E																	☆	3,36	0,8
		P05	P15	P15	P25	M15	M15	M25	K10	K20	K15	N01	N10	N10	S15	S15	S15	H01		

Ordering example: 10 pieces DCMX 07 02 04-WF 1525

★ = First choice

Positive inserts - CoroTurn™ 107

Rhombic 55°



For dimensions, see code key on page A 10.

Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CD = Polycerystalline diamond (ISO = DP)
CT = Cermet (ISO = HT)
– = Uncoated cemented carbide (ISO = HW)

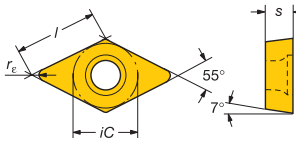
				P					M				K				N		S			
				CT	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	–	CD	–	–	–	GC	GC
				5015	1525	4015	4025	4035	1025	2015	2025	2035	3005	3015	3025	H13A	1810	H10	H10A	H13A	1005	1025
Medium	WM **Wiper insert** High feed machining for best productivity. See page A 12.	DCMX	11 T3 04-WM		☆	★	☆		☆	★			★									★
			11 T3 08-WM		☆	★	☆		☆	★			★									★
	PM **P-Line** First choice for steel medium machining.	DCMT	07 02 04-PM	☆	☆	☆	★	☆														
			07 02 08-PM	☆	☆	☆	★	☆														
			11 T3 04-PM	☆	☆	☆	★	☆														
			11 T3 08-PM	☆	☆	☆	★	☆														
			11 T3 12-PM	☆	☆	☆	★	☆														
	MM **M-Line** First choice for stainless steel medium machining.	DCMT	07 02 04-MM						☆	☆	★	☆									★	☆
			07 02 08-MM						☆	☆	★	☆									★	☆
			11 T3 04-MM						☆	☆	★	☆									★	☆
			11 T3 08-MM						☆	☆	★	☆									★	☆
			11 T3 12-MM						☆	☆	★	☆									★	☆
	KM **K-Line** First choice for cast iron medium machining.	DCMT	07 02 04-KM										★		☆	☆				★		
			07 02 08-KM										★		☆	☆				★		
			11 T3 04-KM										★		☆	☆				★		
			11 T3 08-KM										★		☆	☆				★		
			11 T3 12-KM										★		☆	☆				★		
	UM Medium geometry. Periphery ground insert.	DCGT	07 02 01-UM						☆							☆				☆		☆
			07 02 02-UM						☆							☆				☆		☆
			07 02 04-UM	☆					☆	☆		☆				☆			☆	☆		☆
			07 02 08-UM	☆					☆	☆		☆				☆				☆		☆
			11 T3 01-UM	☆					☆			☆				☆			☆	☆		☆
			11 T3 02-UM	☆					☆			☆				☆			☆	☆		☆
			11 T3 04-UM	☆					☆	☆		☆				☆			☆	☆	☆	☆
			11 T3 08-UM	☆					☆	☆		☆				☆			☆	☆	☆	☆
	Flat insert	DCMW	11 T3 04											☆		☆						
Aluminium																						
	AL First choice for aluminium machining.	DCGX	07 02 02-AL														★	☆				
			07 02 04-AL														★	☆				
			11 T3 02-AL														★	☆				
			11 T3 04-AL														★	☆				
			11 T3 08-AL														★	☆				
				P05	P15	P15	P25	P35	M15	M15	M25	M35	K10	K10	K20	K15	N10	N10	S10	S15	S15	S15

Ordering example: 10 pieces DCMX 11 T3 04-WM 4015

★ = First choice

Positive inserts - CoroTurn™ 107

Rhombic 55°

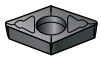


For dimensions, see code key on page A 10.

Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CD = Polycerystalline diamond (ISO = DP)
– = Uncoated cemented carbide (ISO = HW)

				P			M			K				N		S				
				GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	CD	–	–	GC	GC		
				4015	4025	4035	2015	2025	2035	3005	3015	3025	H13A	1810	H10	H13A	1005	1025		
Roughing																				
	 **PR** **P-Line** First choice for roughing in steel.	DCMT	11 T3 08-PR	☆	★	☆														
			11 T3 12-PR	☆	★	☆														
	 **MR** **M-Line** First choice for roughing in stainless steel.	DCMT	11 T3 08-MR				☆	★	☆											
			11 T3 12-MR				☆	★	☆											
	 **KR** **K-Line** First choice for roughing in cast iron.	DCMT	11 T3 08-KR							☆	★	☆	☆			★				
			11 T3 12-KR							☆	★	☆	☆			★				
	Aluminium																			
	 **AL** First choice for aluminium machining.	DCGX	07 02 02-AL											★	☆					
			07 02 04-AL											★	☆					
			11 T3 02-AL											★	☆					
			11 T3 04-AL											★	☆					
			11 T3 08-AL											★	☆					
				P15	P25	P35	M15	M25	M35	K10	K10	K20	K15	N10	N10	S15	S15	S15		

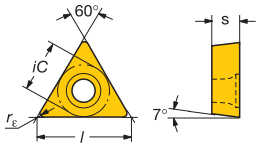
Ordering example: 10 pieces DCMT 11 T3 08-PR 4025

★ = First choice

SANDVIK Coromant

Positive inserts - CoroTurn™ 107

Triangular

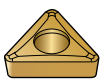


For dimensions, see code key on page A 10.

Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CD = Polycerystalline diamond (ISO = DP)
CB = Boron nitride (ISO=BN)
CT = Cermet (ISO = HT)
– = Uncoated cemented carbide (ISO = HW)

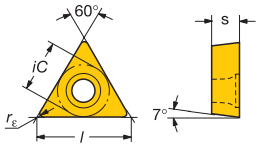
			P					M				K			N			S			H	
			CT	CT	GC	GC	GC	GC	GC	GC	GC	GC	GC	–	CD	CD	–	–	GC	GC	CB	
			515	5015	1525	4015	4025	4035	1025	2015	2025	2035	3005	3025	H13A	CD10	1810	H10	H13A	1025	1005	CB20	
Finishing	 **WF** **Wiper insert** High feed machining for best surface finish. See page A 12.	TCMX	09 02 04-WF		☆	★	☆			☆	★			★						★			
			11 03 04-WF		☆	★	☆			☆	★			★						★			
			11 03 08-WF		☆	★	☆			☆	★			★						★			
			16 T3 08-WF		☆	★	☆			☆	★			★						★			
	 **WK** **Knife edge Wiper insert** High feed machining for best surface finish. See page A 12.	TCGX	06 T1 04R-WK						☆											☆			
			06 T1 04L-WK						☆											☆			
			09 02 04R-WK		☆				☆											☆			
			09 02 04L-WK		☆				☆											☆			
			11 02 04R-WK		☆				☆											☆			
			11 02 04L-WK		☆				☆											☆			
	 **PF** **P-Line** First choice for steel finishing.	TCMT	06 T1 02-PF		☆		★																
			06 T1 04-PF		☆		★																
			06 T1 08-PF		☆		★																
			09 02 02-PF		☆		★																
			09 02 04-PF		☆		★	☆															
			11 03 02-PF		☆		★																
			11 03 04-PF		☆		★	☆															
			11 03 08-PF		☆		★	☆															
			16 T3 04-PF		☆		★	☆															
	 **MF** **M-Line** First choice for stainless steel finishing.	TCMT	06 T1 02-MF						★											★			
			06 T1 04-MF						☆	★										★			
			06 T1 08-MF						☆	★										★			
			09 02 02-MF						★											★			
			09 02 04-MF						☆	★	☆									★			
			11 03 02-MF						★											★			
			11 03 04-MF						☆	★	☆									☆	★		
			11 03 08-MF						☆	★	☆									★			
			16 T3 04-MF						☆	★	☆									☆	★		
	 **KF** **K-Line** First choice for cast iron finishing.	TCMT	06 T1 02-KF												★				★				
			06 T1 04-KF										★		☆				★				
			06 T1 08-KF										★		☆				★				
			09 02 02-KF												★				★				
			09 02 04-KF										★	☆	☆				★				
			11 03 02-KF												★				★				
			11 03 04-KF										★	☆	☆				★				
			11 03 08-KF										★	☆	☆				★				
			16 T3 04-KF										★	☆	☆				★				
	 **UF** Finishing geometry	TCMT	11 02 02-UF		☆			★	☆	★				★		☆								
			11 02 04-UF	☆	☆		★	☆	☆	★				★	☆	☆								
			11 02 08-UF	☆	☆		★	☆	☆															
				P05	P05	P15	P15	P25	P35	M15	M15	M25	M35	K10	K20	K15	N01	N10	N10	S15	S15	S15	H01	

Ordering example: 10 pieces TCMX 09 02 04-WF 1525

★ = First choice

Positive inserts - CoroTurn™ 107

Triangular



Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CD = Polycerystalline diamond (ISO = DP)
CB = Boron nitride (ISO=BN)
CT = Cermet (ISO = HT)
– = Uncoated cemented carbide (ISO = HW)

For dimensions, see code key on page A 10.

			P				M			K			N			S			H			
			CT	GC	GC	GC	GC	GC	GC	GC	GC	–	CD	CD	–	–	GC	GC	CB			
			5015	1525	4015	4025	1025	2015	2025	3005	3025	H13A	CD10	1810	H10	H13A	1025	1005	CB20		l_a	Max. d.o.c.
	TCGT	06 T1 02 R-K					☆										☆					
		06 T1 02 L-K					☆										☆					
		06 T1 04 R-K					☆										☆					
		06 T1 04 L-K					☆										☆					
		09 02 02 R-K					☆										☆					
		09 02 02 L-K	☆	☆			☆										☆					
		09 02 04 R-K					☆										☆					
		09 02 04 L-K	☆	☆			☆										☆					
		11 02 02 R-K					☆					☆				☆	☆					
		11 02 02 L-K	☆	☆			☆					☆				☆	☆					
		11 02 04 R-K					☆					☆				☆	☆					
		11 02 04 L-K	☆	☆			☆					☆				☆	☆					
Finishing	*Aluminium*																					
	TCGX	06 T1 04-AL													★							
		09 02 02-AL												★	☆							
		09 02 04-AL												★	☆							
		11 02 02-AL												★	☆							
		11 02 04-AL												★	☆							
		11 02 08-AL													★							
		16 T3 04-AL												★	☆							
		16 T3 08-AL												★	☆							
	Polycrystalline diamond tipped																					
	TCMW	09 02 04FP											☆								2,7	2,2
		11 02 04FP											☆								2,7	2,2
		11 02 08FP											☆								2,4	1,9
		16 T3 04FP											☆								4,2	3,4
		16 T3 08FP											☆								3,9	3,1
	TCMW	16 T3 04 FRP											☆								7,4	7,0
		16 T3 04 FLP											☆								7,4	7,0
	Cubic boron nitride																					
	TCMW	09 02 04 S01020E																	☆		3,0	0,8
		11 02 04 S01020E																	☆		3,0	0,8
		11 02 08 S01020E																	☆		3,0	0,8
			P05	P15	P15	P25	M15	M15	M25	K10	K20	K15	N01	N10	N10	S15	S15	S15	H01			

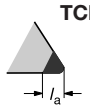
R/L-K

Knife edge insert

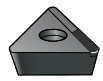
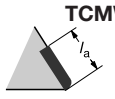
Right (R) hand style shown

AL

First choice for aluminium machining.

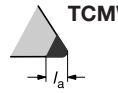



FP

FRP/FLP

Right (R) hand style shown

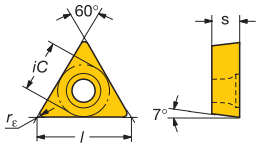
Ordering example: 10 pieces TCGT 06 T1 02 R-K 1025

★ = First choice

SANDVIK Coromant

Positive inserts - CoroTurn™ 107

Triangular



For dimensions, see code key on page A 10.

Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CD = Polycerystalline diamond (ISO = DP)
CT = Cermet (ISO = HT)
– = Uncoated cemented carbide (ISO = HW)

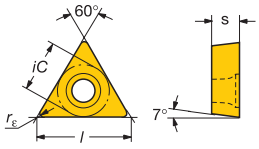
				P					M				K				N		S				
				CT	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	–	CD	–	–	–	GC	GC
				5015	1525	4015	4025	4035	1025	2015	2025	2035	3005	3015	3025	H13A	1810	H10	H10A	H13A	1005	1025
Medium	WM Wiper insert. High feed machining with best productivity.	TCMX	11 03 08-WM		☆	★	☆		☆	★			★									★
			16 T3 08-WM		☆	★	☆		☆	★			★									★
	PM P-Line. First choice for steel medium machining.	TCMT	09 02 04-PM	☆	☆	☆	★	☆														
			09 02 08-PM	☆	☆	☆	★	☆														
			11 03 04-PM	☆	☆	☆	★	☆														
			11 03 08-PM	☆	☆	☆	★	☆														
			11 03 12-PM	☆	☆	☆	★	☆														
			16 T3 04-PM	☆	☆	☆	★	☆														
			16 T3 08-PM	☆	☆	☆	★	☆														
			16 T3 12-PM	☆	☆	☆	★	☆														
			22 04 08-PM					★														
	MM M-Line. First choice for stainless steel medium machining.	TCMT	09 02 04-MM						☆	☆	★	☆									★	☆
			09 02 08-MM						☆	☆	★	☆									★	☆
			11 03 04-MM						☆	☆	★	☆									★	☆
			11 03 08-MM						☆	☆	★	☆									★	☆
			11 03 12-MM						☆	☆	★	☆										★
			16 T3 04-MM						☆	☆	★	☆									★	☆
			16 T3 08-MM						☆	☆	★	☆									★	☆
			16 T3 12-MM						☆	☆	★	☆										★
			22 04 08-MM									★										
	KM K-Line. First choice for cast iron medium machining.	TCMT	09 02 04-KM										★		☆	☆				★		
			09 02 08-KM										★		☆	☆				★		
			11 03 04-KM										★		☆	☆				★		
			11 03 08-KM										★		☆	☆				★		
			11 03 12-KM										★		☆	☆				★		
			16 T3 04-KM										★		☆	☆				★		
			16 T3 08-KM										★		☆	☆				★		
			16 T3 12-KM										★		☆	☆				★		
			22 04 08-KM												★	☆				★		
	Medium geometry	TCMT	11 02 04-UM	☆	☆	☆	★	☆	☆	☆	★		☆		★	☆			★	☆		☆
			11 02 08-UM	☆	☆	☆	★	☆	☆	☆	★		☆		★				★	☆		
	UM Medium geometry. Periphery ground insert.	TCGT	09 02 04-UM	☆						☆									☆			
			11 02 01-UM	☆					☆			☆				☆				☆		☆
			11 02 02-UM	☆					☆			☆				☆				☆		☆
			11 02 04-UM	☆					☆	☆		☆				☆			☆	☆		☆
			11 02 08-UM	☆					☆	☆		☆				☆			☆	☆		☆
			16 T3 04-UM	☆						☆									☆		☆	
			16 T3 08-UM							☆									☆		☆	
	Flat insert.	TCMW	11 02 04	☆										☆		☆						
			16 T3 04	☆										☆		☆						
			16 T3 08	☆										☆		☆						
Aluminium																						
	AL First choice for aluminium machining.	TCGX	06 T1 04-AL															★				
			09 02 02-AL														★	☆				
			09 02 04-AL														★	☆				
			11 02 02-AL														★	☆				
			11 02 04-AL														★	☆				
			11 02 08-AL															★				
			16 T3 04-AL														★	☆				
			16 T3 08-AL														★	☆				
				P05	P15	P15	P25	P35	M15	M15	M25	M35	K10	K10	K20	K15	N10	N10	S10	S15	S15	S15

Ordering example: 10 pieces TCMX 11 03 08-WM 4015

★ = First choice

Positive inserts - CoroTurn™ 107

Triangular



For dimensions, see code key on page A 10.

Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CD = Polycerystalline diamond (ISO = DP)
– = Uncoated cemented carbide (ISO = HW)

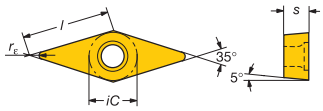
						P					M			K				N		S		
						CT	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	–	CD	–	–	GC	GC
						5015	1525	4015	4025	4035	2015	2025	2035	3005	3015	3025	H13A	1810	H10	H13A	1005	1025
Roughing	 **PR** **P-Line** First choice for roughing in steel.	TCMT	**11 03 08-PR**					☆	★	☆												
			11 03 12-PR					☆	★	☆												
			16 T3 08-PR					☆	★	☆												
			16 T3 12-PR					☆	★	☆												
			22 04 08-PR							★												
			22 04 12-PR							★												
	 **MR** **M-Line** First choice for roughing in stainless steel.	TCMT	**11 03 08-MR**								☆	★	☆									★
			11 03 12-MR								☆	★	☆									★
			16 T3 08-MR								☆	★	☆									★
			16 T3 12-MR								☆	★	☆									★
			22 04 08-MR										★									
			22 04 12-MR										★									
	 **KR** **K-Line** First choice for roughing in cast iron.	TCMT	**11 03 08-KR**											☆	★	☆	☆			★		
			11 03 12-KR											☆	★	☆	☆			★		
			16 T3 08-KR											☆	★	☆	☆			★		
			16 T3 12-KR											☆	★	☆	☆			★		
			22 04 08-KR													★	☆			★		
			22 04 12-KR													★	☆			★		
	 **UR** Roughing geometry	TCMT	**11 02 04-UR**					☆	★	☆							☆			★		
			11 02 08-UR				☆	☆	★	☆	☆	★		☆	☆	★	☆			★		
Aluminium	 **AL** First choice for aluminium machining.	TCGX	**06 T1 04-AL**																★			
			09 02 02-AL															★	☆			
			09 02 04-AL															★	☆			
			11 02 02-AL															★	☆			
			11 02 04-AL															★	☆			
			11 02 08-AL																★			
			16 T3 04-AL															★	☆			
			16 T3 08-AL															★	☆			
							P05	P15	P15	P25	P35	M15	M25	M35	K10	K10	K20	K15	N10	N10	S15	S15	S15

Ordering example: 10 pieces TCMT 11 03 08-PR 4025

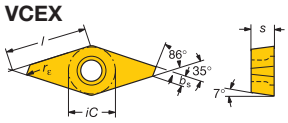
★ = First choice

Positive inserts - CoroTurn™ 107

Rhombic 35°



VCEX

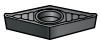
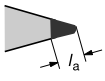
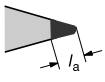


For dimensions, see code key on page A 10.

Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CD = Polycerystalline diamond (ISO = DP)
CB = Boron nitride (ISO=BN)
CT = Cermet (ISO = HT)
– = Uncoated cemented carbide (ISO = HW)

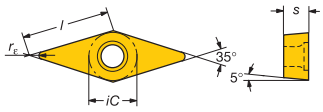
					P				M				K			N			S			H			
					CT	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	–	CD	CD	–	–	GC	GC	CB			
					5015	1525	4015	4025	4035	1025	2015	2025	1020	3005	3025	H13A	CD10	CD1810	H10	H13A	1025	1020	CB20		l_a	Max. b_s d.o.c.
Finishing	 **PF**	VBMT	11 03 02-PF		☆	☆		★																		
			11 03 04-PF		☆	☆	★	☆																		
			11 03 08-PF		☆		★	☆																		
			11 03 12-PF				★																			
	P-Line First choice for steel finishing.		16 04 02-PF		★																					
			16 04 04-PF		☆		★	☆																		
			16 04 08-PF		☆		★	☆																		
			16 04 12-PF				★																			
	 **MF**	VBMT	11 03 02-MF							★											★					
			11 03 04-MF							☆	★	☆									★					
			11 03 08-MF							☆	★	☆									★					
			11 03 12-MF								★															
	M-Line First choice for stainless steel finishing.		16 04 02-MF							★											★					
			16 04 04-MF							☆	★	☆									★					
			16 04 08-MF							☆	★	☆									★					
			16 04 12-MF								★															
	 **KF**	VBMT	11 03 02-KF											★		★				★						
			11 03 04-KF											★	☆	☆				★						
			11 03 08-KF											★	☆	☆				★						
			11 03 12-KF											★												
	K-Line First choice for cast iron finishing.		16 04 02-KF											★		★				★						
			16 04 04-KF											★	☆	☆				★						
			16 04 08-KF											★	☆	☆				★						
			16 04 12-KF											★												
	 **UF**	VBMT	11 02 02-UF		☆	☆		★	☆	★						☆										
			11 02 04-UF		☆	☆		★	☆	★						☆										
			11 02 08-UF		☆	☆		★	☆							☆										
	Finishing geometry																									
	 **R/L F**	VCEX	11 03 00 R-F		☆								☆			☆				☆		☆			1,38	
			11 03 00 L-F		☆								☆			☆				☆		☆			1,38	
	Super finishing geometry. Periphery ground insert. E-tolerance		11 03 01 R-F		☆								☆			☆				☆		☆			1,22	
			11 03 01 L-F		☆								☆			☆				☆		☆			1,22	
	Aluminium																									
	 **AL**	VCGX	11 02 02-AL															★	☆							
			11 02 04-AL															★	☆							
	First choice for aluminium machining.		16 04 04-AL															★	☆							
			16 04 08-AL															★	☆							
			16 04 12-AL															★	☆							
			22 05 20-AL																★							
			22 05 30-AL															★	☆							
	Polycrystalline diamond tipped																									
	 	VCMW	11 02 04FP														☆								4,4	3,5
			16 04 04FP														☆								4,4	3,5
			16 04 08FP														☆								3,5	2,8
			16 04 12FP														☆								2,7	2,1
	Cubic boron nitride																									
	 	VBMW	16 04 04 S01020E																				☆		4,69	0,8
			16 04 08 S01020E																				☆		4,12	0,8
					P05	P15	P15	P25	P35	M15	M15	M25	M15	K10	K20	K15	N01	N10	N10	S15	S15	S15	H01			

Ordering example: 10 pieces VBMT 11 03 02-PF 4025

★ = First choice

Positive inserts - CoroTurn™ 107

Rhombic 35°

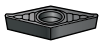


For dimensions, see code key on page A 10.

Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CD = Polycerystalline diamond (ISO = DP)
CT = Cermet (ISO = HT)
– = Uncoated cemented carbide (ISO = HW)

				P					M				K				N		S			
				CT	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	–	CD	–	–	–	GC	GC
				5015	1525	4015	4025	4035	1025	2015	2025	2035	3005	3015	3025	H13A	1810	H10	H10A	H13A	1005	1025
Medium	 **PM** **P-Line** First choice for steel medium machining.	VBMT	16 04 04-PM	☆	☆	☆	★	☆														
			16 04 08-PM	☆	☆	☆	★	☆														
			16 04 12-PM	☆	☆	☆	★	☆														
	 **MM** **M-Line** First choice for stainless steel medium machining.	VBMT	16 04 04-MM						☆	☆	★	☆									★	☆
			16 04 08-MM						☆	☆	★	☆									★	☆
			16 04 12-MM						☆	☆	★	☆										★
	 **KM** **K-Line** First choice for cast iron medium machining.	VBMT	16 04 04-KM										★		☆	☆				★		
			16 04 08-KM										★		☆	☆				★		
			16 04 12-KM										★		☆	☆				★		
	 **UM** Medium geometry. Periphery ground insert.	VBGT	16 04 01-UM						☆							☆				☆		☆
			16 04 02-UM						☆							☆				☆		☆
			16 04 04-UM						☆			☆				☆			☆	☆		☆
			16 04 08-UM						☆			☆				☆			☆	☆		☆
	 **UM** Medium geometry. Periphery ground insert.	VCGT	11 03 01-UM						☆							☆				☆		☆
			11 03 02-UM						☆							☆				☆		☆
			11 03 04-UM						☆							☆				☆		☆
	 Flat insert	VBMW	16 04 04											☆		☆						
Aluminium																						
	 **AL** First choice for aluminium machining.	VCGX	11 02 02-AL														★	☆				
			11 02 04-AL														★	☆				
			16 04 04-AL														★	☆				
			16 04 08-AL														★	☆				
			16 04 12-AL														★	☆				
			22 05 20-AL															★				
			22 05 30-AL														★	☆				
				P05	P15	P15	P25	P35	M15	M15	M25	M35	K10	K10	K20	K15	N10	N10	S10	S15	S15	S15

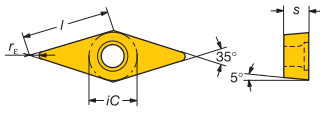
Ordering example: 10 pieces VBMT 16 04 04-PM 4025

★ = First choice

SANDVIK Coromant

Positive inserts - CoroTurn™ 107

Rhombic 35°

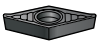


For dimensions, see code key on page A 10.

Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CD = Polycerystalline diamond (ISO = DP)
– = Uncoated cemented carbide (ISO = HW)

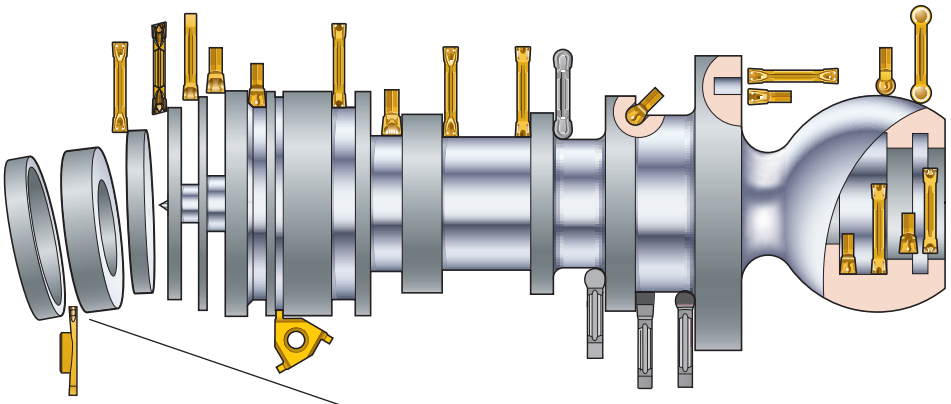
				P			M			K				N		S				
				GC	GC	GC	GC	GC	GC	GC	GC	GC	–	CD	–	–	GC	GC		
				4015	4025	4035	2015	2025	2035	3005	3015	3025	H13A	1810	H10	H13A	1005	1025		
Roughing	 **PR** **P-Line** First choice for roughing in steel.	VBMT	16 04 08-PR	☆	★	☆														
			16 04 12-PR	☆	★	☆														
	 **MR** **M-Line** First choice for roughing in stainless steel.	VBMT	16 04 08-MR				☆	★	☆								★			
			16 04 12-MR				☆	★	☆								★			
	 **KR** **K-Line** First choice for roughing in cast iron.	VBMT	16 04 08-KR							☆	★	☆	☆			★				
			16 04 12-KR							☆	★	☆	☆			★				
	Aluminium																			
	 **AL** First choice for aluminium machining.	VCGX	11 02 02-AL											★	☆					
			11 02 04-AL											★	☆					
			16 04 04-AL											★	☆					
			16 04 08-AL											★	☆					
			16 04 12-AL											★	☆					
			22 05 20-AL											★	★					
			22 05 30-AL											★	☆					
				P15	P25	P35	M15	M25	M35	K10	K10	K20	K15	N10	N10	S15	S15	S15		

Ordering example: 10 pieces VBMT 16 04 08-PR 4025

★ = First choice

CoroCut®3, the newest member of CoroCut®

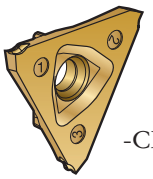
the productive system for parting and grooving



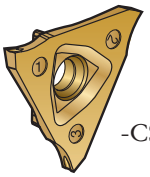
CoroCut®
– a system to rely on

CoroCut is the most stable and secure parting and grooving system on the market, a very strong and competitive productivity package thanks to insert geometries dedicated for specific applications and a strong grade chain.

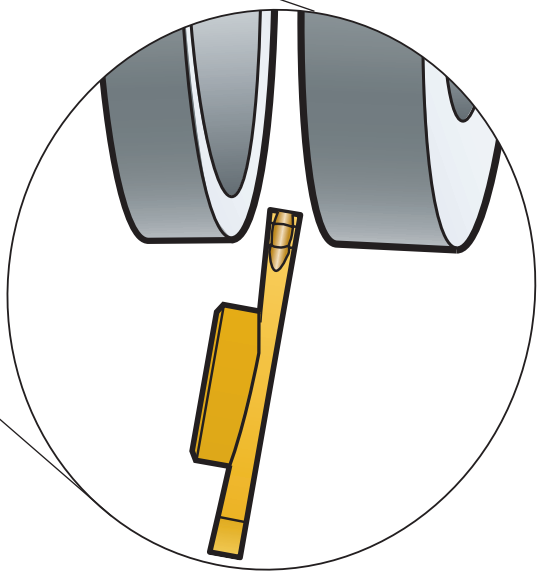
CoroCut now includes the unique system CoroCut3 for productive shallow parting of tubes and grooving in mass production.



-CM



-CS



Unique CoroCut®3
for shallow parting and grooving

CoroCut3 inserts bring a third cutting edge to your operation so with each insert you can keep on cutting longer. The inserts are available in a chip breaking geometry -CM and a chip forming geometry -CS, in widths from 1,0 mm up to 2,0 mm.

CoroCut®3 insert geometries:

The chip breaking geometry -CM

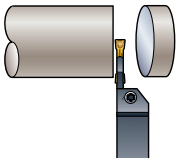
The chip forming geometry -CS

The tool holder assortment includes both Coromant Capto® cutting units and shank holders.

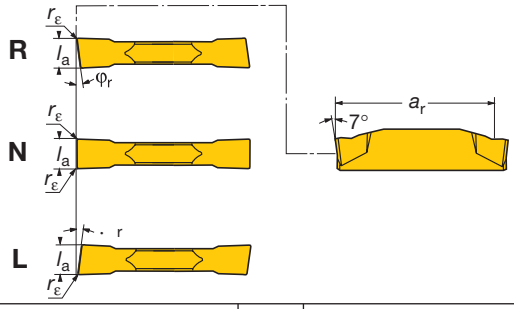
Insert seat T is for right hand cutting and U for left hand cutting. Note that the insert seat must correspond between insert and toolholder.

SANDVIK Coromant

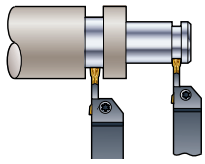
Parting



Tolerances, mm:
l_a = $^{+\ 0,10}_{\ \ 0}$
r_ε = ± 0,10



Grooving

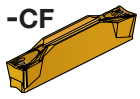
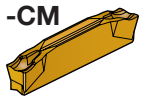
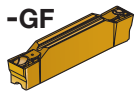


Tolerances, mm:
l_a = ± 0,02
r_ε = ± 0,05

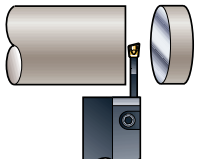
Coromant grades

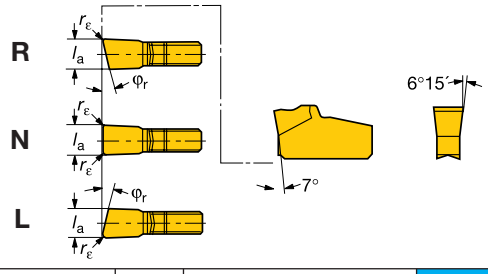
For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
– = Uncoated cemented carbide (ISO = HW)

CoroCut®		Selection criteria, mm *(inch)* l_a · r r_ε a_r	Seat size[1]	Ordering code CoroCut 2-edge	P					M					K				N	S				
					GC	GC	GC	GC	GC	GC	GC	GC	GC	–	GC	GC	GC	–	–	GC	GC	GC	GC	–
					2135	2145	3115	4025	4125	1005	2135	2145	4125	H13A	3115	4025	4125	H13A	H13A	1005	2135	2145	4125	H13A
Low feed	**-CF**  Recommended feed: 0,02–0,18 mm/r	**Parting**																						
		2,50 0° 0,10 18,4	F	N123F2-0250-0001-CF	☆	☆	☆	☆	★		★	☆	☆		☆	☆	★							
		2,50 5° 0,15 18,4		R/L123F2-0250-0501-CF	☆	☆			★		★	☆	☆				★							
		3,00 0° 0,10 18,4	G	N123G2-0300-0001-CF	☆	☆	☆	☆	★		★	☆	☆		☆	☆	★							
		3,00 5° 0,15 18,3		R/L123G2-0300-0501-CF	☆	☆			★		★	☆	☆				★							
Medium feed	**-CM**  Recommended feed: 0,05–0,24 mm/r																							
		1,50 0° 0,20 12,9	D	N123D2-0150-0002-CM	★	☆			☆		★	☆	☆				★				☆	☆	★	
		2,00 0° 0,20 19,0	E	N123E2-0200-0002-CM	★	☆	☆	☆	☆		★	☆	☆		☆	★	☆				☆	☆	★	
		2,00 5° 0,20 19,0		R/L123E2-0200-0502-CM	★	☆			☆		★	☆	☆				★				☆	☆	★	
		2,50 0° 0,20 18,9	F	N123F2-0250-0002-CM	★	☆	☆	☆	☆		★	☆	☆		☆	★	☆				☆	☆	★	
		2,50 5° 0,20 18,9		R/L123F2-0250-0502-CM	★	☆			☆		★	☆	☆				★				☆	☆	★	
		3,00 0° 0,20 18,9	G	N123G2-0300-0002-CM	★	☆	☆	☆	☆		★	☆	☆		☆	★	☆				☆	☆	★	
		3,00 5° 0,20 18,8		R/L123G2-0300-0502-CM	★	☆	☆	☆	☆		★	☆	☆		☆	★	☆				☆	☆	★	
Low feed	**-GF**  Recommended feed: 0,03–0,25 mm/r	**Parting and Grooving**																						
		1,98*(.078)* – 0,20 19,2	E	N123E2 -0198-0002-GF					★				★				★						★	
		2,00 – 0,20 19,2		-0200-0002-GF	☆				★	☆	☆		★	☆			★	☆	★	★			☆	☆
		2,24*(.088)* – 0,20 19,2		-0224-0002-GF					★				★				★						★	
		2,39*(.094)* – 0,20 19,2	F	N123F2 -0239-0002-GF					★	☆			★	☆			★	☆	★	★			☆	☆
		2,46*(.097)* – 0,30 19,1		-0246-0003-GF					★				★	☆			★	☆	★				★	☆
		2,67*(.105)* – 0,20 19,2		-0267-0002-GF					★				★				★						★	
		2,79*(.110)* – 0,30 19,1		-0279-0003-GF					★				★				★						★	
		3,00 – 0,20 19,2	G	N123G2-0300-0002-GF	☆				★	☆	☆		★	☆			★	☆	★	★			☆	☆
		3,10*(.122)* – 0,20 19,2		-0310-0002-GF					★				★				★						★	
		3,18*(.125)* – 0,20 19,2		-0318-0002-GF					★	☆			★	☆			★	☆	★	★			☆	☆
		3,61*(.142)* – 0,30 19,1		-0361-0003-GF					★				★	☆			★	☆	★				★	☆
					P35	P45	P15	P20	P30	M10	M30	M40	M25	M15	K15	K25	K30	K20	N20	S15	S30	S40	S25	S15

Parting

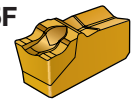




Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
– = Uncoated cemented carbide (ISO = HW)

T-Max Q-Cut®		Selection criteria, mm l_a · r r_ε	Seat size[1]	Ordering code	P						M						K				S				
					GC	GC	GC	GC			GC	GC	GC	GC	GC		GC	GC				GC	GC	GC	GC
					235	2135	2145	4125			235	1015	2135	2145	4125		1015	4125				1015	2135	2145	4125
	-5F  Tolerances, mm: l_a = $^{+\ 0,25}_{\ \ 0}$ r_ε = ± 0,05	2,00 0° 0,20	20	N151.2 -200-5F	☆	☆	☆	★			☆	☆	★	☆	☆		☆	★				☆	☆	☆	★
		5° 0,10		R/L151.2 -200 05-5F	☆	☆	☆	★			☆	☆	★	☆	☆		☆	★				☆	☆	☆	★
		8° 0,10		-200 08-5F	☆	☆	☆	★			☆	☆	★	☆	☆		☆	★				☆	☆	☆	★
		12° 0,10		-200 12-5F	☆	☆	☆	★			☆	☆	★	☆	☆		☆	★				☆	☆	☆	★
		15° 0,10		-200 15-5F	☆	☆	☆	★			☆	☆	★	☆	☆		☆	★				☆	☆	☆	★
		20° 0,10		-200 20-5F	☆	☆	☆	★			☆	☆	★	☆	☆		☆	★				☆	☆	☆	★
		2,50 0° 0,20	25	N151.2 -250-5F	☆	☆	☆	★			☆	☆	★	☆	☆		☆	★				☆	☆	☆	★
		5° 0,10		R/L151.2 -250 05-5F	☆	☆	☆	★			☆	☆	★	☆	☆		☆	★				☆	☆	☆	★
		8° 0,10		-250 08-5F	☆	☆	☆	★			☆	☆	★	☆	☆		☆	★				☆	☆	☆	★
		12° 0,10		-250 12-5F	☆	☆	☆	★			☆	☆	★	☆	☆		☆	★				☆	☆	☆	★
		15° 0,10		-250 15-5F	☆	☆	☆	★			☆	☆	★	☆	☆		☆	★				☆	☆	☆	★
					P45	P35	P45	P30			M35	M15	M30	M40	M25		K15	K30				S15	S30	S40	S25

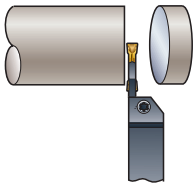
[1] To correspond with seat size on holder.

★ = First choice

Ordering example: 10 pieces N123F2-0250-0001-CF 2135
N = Neutral, R = Right hand, L = Left hand

Parting and grooving

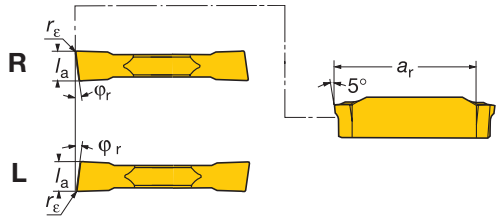
CoroCut® inserts



Tolerances, mm:

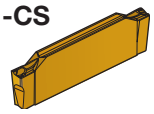
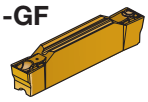
l_a = ± 0,02

r_ε = ± 0,05



Coromant grades

GC = Coated carbide/Cermet

	Selection criteria, mm				Seat size[1]	Ordering code	P					M					K					S				
							GC					GC					GC					GC				
	l_a	φ_r	r_ε	a_r		CoroCut 2-edge	4125					4125					4125					4125				
-CS  **Low feed** Recommended feed: 0,02–0,15 mm/rev	1,5	10°	0,10	13	**D**	**R/L123D2-0150-1001-CS**	★					★					★					★				
	1,5	15°	0,10	13		**R/L123D2-0150-1501-CS**	★					★					★					★				
	2,0	10°	0,10	19	**E**	**R/L123E2-0200-1001-CS**	★					★					★					★				
	2,0	15°	0,10	19		**R/L123E2-0200-1501-CS**	★					★					★					★				
	2,5	10°	0,10	19	**F**	**R/L123F2-0250-1001-CS**	★					★					★					★				
	2,5	15°	0,10	19		**R/L123F2-0250-1501-CS**	★					★					★					★				
	3,0	10°	0,10	19	**G**	**R/L123G2-0300-1001-CS**	★					★					★					★				
	3,0	15°	0,10	19		**R/L123G2-0300-1501-CS**	★					★					★					★				
-GF  **Low feed** Recommended feed: 0,03–0,25 mm/rev	1,5	0°	0,10	13	**D**	**N123D2-0150-0001-GF**	★					★					★					★				
	For the complete programme of geometry -GF for grooving, see Turning tools catalogue, C-1000:8, page B 12.						P30					M25					K30					S25				

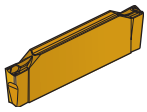
[1] To correspond with seat size on holder.

Ordering example: 10 pieces R123D2-0150-1001-CS 4125

R = Right hand, L = Left hand

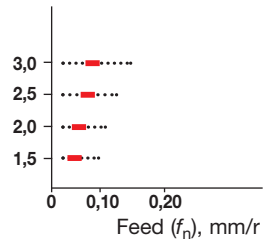
Parting

-CS



Radial feed

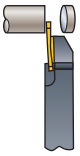
Insert width (l_a), mm



- Optimiser to minimise pips and burrs on components thanks to the sharp cutting edge and front angles of 10° and 15°.
- Recommended for small components.
- Suitable for free cutting steel.

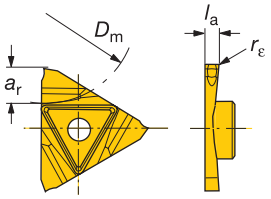
Shallow parting

CoroCut®3 inserts

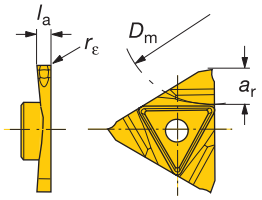


Tolerances mm:
l_a = ± 0,03
r_ε = ± 0,05

Right hand insert seat (T)



Left hand insert seat (U)



Coromant grades

GC = Coated carbide

	Selection criteria, mm				Insert seat[1]	Ordering code	P						M						N						S					
							GC						GC						GC						GC					
	l_a	r_ε	Max a_r	Max D_m		CoroCut3	4125						4125						4125						4125					
-CM  **Medium feed** Recommended feed: 0,02– 0,15 mm/r	**Right hand insert seat**																													
	1,00	0,1	4,3	50	T	N123T3-0100-0001-CM	★						★						★						★					
	1,50	0,1	6,4	100		N123T3-0150-0001-CM	★						★						★						★					
	2,00	0,1	6,4	100		N123T3-0200-0001-CM	★						★						★						★					
	Left hand insert seat																													
	1,00	0,1	4,3	50	U	N123U3-0100-0001-CM	★						★						★						★					
	1,50	0,1	6,4	100		N123U3-0150-0001-CM	★						★						★						★					
	2,00	0,1	6,4	100		N123U3-0200-0001-CM	★						★						★						★					
-CS  **Medium feed** Recommended feed: 0,02– 0,15 mm/r	**Right hand insert seat**																													
	1,00	–	4,3	50	T	N123T3-0100-0000-CS	★						★						★						★					
	1,50	–	6,4	100		N123T3-0150-0000-CS	★						★						★						★					
	2,00	–	6,4	100		N123T3-0200-0000-CS	★						★						★						★					
	Left hand insert seat																													
	1,00	–	4,3	50	U	N123U3-0100-0000-CS	★						★						★						★					
	1,50	–	6,4	100		N123U3-0150-0000-CS	★						★						★						★					
	2,00	–	6,4	100		N123U3-0200-0000-CS	★						★						★						★					
							P30						M25						N25						S25					

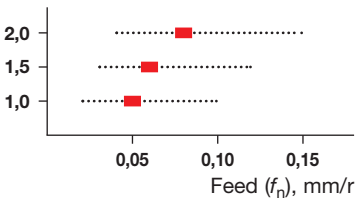
[1] To correspond with insert seat on holder.
T = Right hand cutting insert, **U** = Left hand cutting insert.

Ordering example: 10 pieces N123T3-0100-0001-CM 4125

-CM

Radial feed

Insert width (l_a), mm



First choice for shallow parting and grooving

First choice in most materials

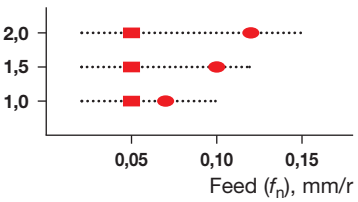
Sharp edge line, chip breaking geometry

To be used at normal cutting speeds 100 – 250 m/min

-CS

Radial feed

Insert width (l_a), mm



First choice for shallow parting and grooving at low speeds

For sticky materials and ball bearing materials

Extremely sharp edge line with an open chip former

To be used in multi-spindle machines at low cutting speeds ≈ 50 m/min

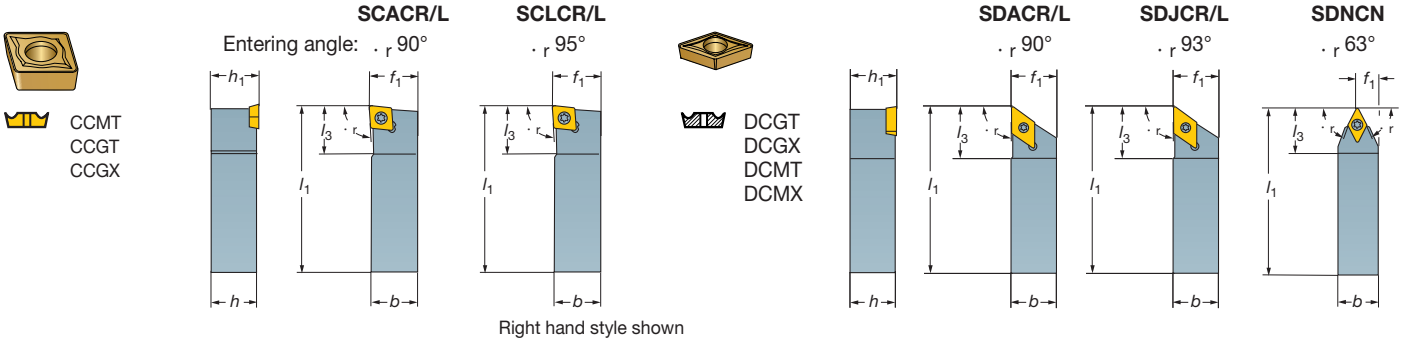
To be used for non-ferrous materials at normal cutting speeds 100 – 250 m/min

▬ = Recommended starting value at normal speeds

⬭ = Recommended starting value at low speeds

Shank tools

Screw clamp design



Right hand style shown

	Ordering code		Dimensions, mm								Gauge inserts	Torque Nm
		L R	*b*	f_1	*h*	h_1	l_1	l_3	. 1)	. 2)		
· r 90°	06	SCACR/L 0808M06-S	8	8	8	8	150	8,0	0°	0°	CCM. 06 02 04	0,9
		1010M06-S	10	10	10	10	150	10,0	0°	0°		
		1212M06-S	12	12	12	12	150	12,0	0°	0°		
		1616M06-S	16	16	16	16	150	16,0	0°	0°		
	09	SCACR/L 1212M09-S	12	12	12	12	150	12,0	0°	0°	CCM. 09 T3 08	3,9
		1616M09-S	16	16	16	16	150	16,0	0°	0°		
· r 95°	06	SCLCR/L 0808M06-S	8	8	8	8	150	8,0	0°	0°	CCM. 06 02 04	0,9
		1010M06-S	10	10	10	10	150	10,0	0°	0°		
		1212M06-S	12	12	12	12	150	12,0	0°	0°		
		1616M06-S	16	16	16	16	150	16,0				
	09	SCLCR/L 1212M09-S	12	12	12	12	150	12,0	0°	0°	CCM. 09 T3 08	3,9
		1616M09-S	16	16	16	16	150	16,0	0°	0°		

	Ordering code		Dimensions, mm								Gauge inserts	Torque Nm
		L N R	*b*	f_1	*h*	h_1	l_1	l_3	. 1)	. 2)		
≤33° · r 90°	07	SDACR/L 0808M07-S	8	8	8	8	150	12,7	0°	0°	DCM. 07 02 04	0,9
		1010M07-S	10	10	10	10	150	15,0	0°	0°		
		1212M07-S	12	12	12	12	150	15,0	0°	0°		
		1616M07-S	16	16	16	16	150	16,0	0°	0°		
	11	SDACR/L 1212M11-S	12	12	12	12	150	18,0	0°	0°	DCM. 11 T3 08	3,9
		1616M11-S	16	16	16	16	150	20,0	0°	0°		
≤30° · r 93°	07	SDJCR/L 0808M07-S	8	10	8	8	150	12,7	0°	0°	DCM. 07 02 04	0,9
		1010M07-S	10	10	10	10	150	15,0	0°	0°		
		1212M07-S	12	12	12	12	150	15,0	0°	0°		
		1616M07-S	16	16	16	16	150	16,0	0°	0°		
	11	SDJCR/L 1212M11-S	12	12	12	12	150	18,0	0°	0°	DCM. 11 T3 08	3,9
		1616M11-S	16	16	16	16	150	20,0	0°	0°		
≤60° · r 63°	07	SDNCN 1010M07-S	10	5,2	10	10	150	15	0°	0°	DCM. 07 02 04	0,9
	11	SDNCN 1212M11-S	12	6,2	12	12	150	21	0°	0°	DCM. 11 T3 08	3,9
		1616M11-S	16	8,5	16	16	150	21	0°	0°		

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

Ordering example: 2 pieces SDACR 0808M07-S
N = Neutral, R = Right hand, L = Left hand

Main spare parts

Insert size		Insert screw (thread)	Key (Torx plus)
06		5513 020-03 (M2,5)	5680 051-02 (7IP)
09		5513 020-09 (M3,5)	5680 049-01 (15IP)
	07	5513 020-03 (M2,5)	5680 051-02 (7IP)
	11	5513 020-09 (M3,5)	5680 049-01 (15IP)

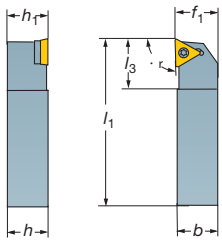
Shank tools

Screw clamp design

TCGT
TCMT
TCGX

STJCR/L

Entering angle: κ_r 93°

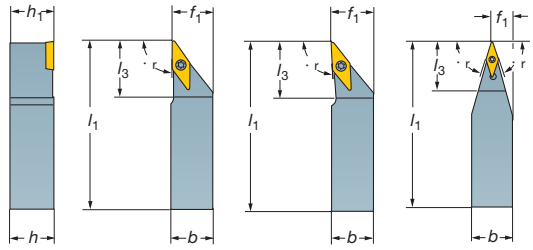


VCEX
VBGT
VCGT
VCGX
VBMT

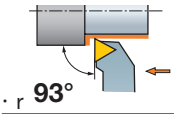
SVABR/L κ_r 90°

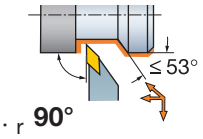
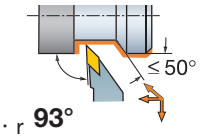
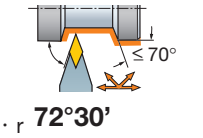
SVJBR/L κ_r 93°

SVVBN κ_r 72°30’



Right hand style shown

	Ordering code		Dimensions, mm								Gauge inserts	Torque Nm
			b	f_1	h	h_1	l_1	l_3	γ [1]	λ [2]		
 κ_r 93°	**11**	**STJCR/L 1010M11-S**	10	10	10	10	150	16	0°	0°	TCM. 11 02 04	0,9
		1212M11-S	12	12	12	12	150	16	0°	0°		
		1616M11-S	16	16	16	16	150	16	0°	0°		

	Ordering code		Dimensions, mm								Gauge inserts	Torque Nm
			b	f_1	h	h_1	l_1	l_3	γ [1]	λ [2]		
 κ_r 90°	**11**	**SVABR/L 0810M11-S**	10	10	8	8	150	26,0	0°	0°	VBM. 11 02 04	0,9
		1010M11-S	10	10	10	10	150	26,0	0°	0°		
		1212M11-S	12	12	12	12	150	26,0	0°	0°		
		1616M11-S	16	16	16	16	150	26,0	0°	0°		
	11	**SVABR/L 0810M11-S-B1**	10	10	8	8	150	20,0	0°	0°	VBM. 11 03 04	0,9
		1010M11-S-B1	10	10	10	10	150	20,0	0°	0°		
		1212M11-S-B1	12	12	12	12	150	20,0	0°	0°		
		1616M11-S-B1	16	16	16	16	150	20,0				
	16	**SVABR/L 1212M16-S**	12	12	12	12	150	40,0	0°	0°	VBM. 16 04 08	3,9
		1616M16-S	16	16	16	16	150	40,0	0°	0°		
 κ_r 93°	**11**	**SVJBR/L 0810M11-S**	10	10	8	8	150	26,0	0°	0°	VBM. 11 02 04	0,9
		1010M11-S	10	10	10	10	150	26,0	0°	0°		
		1212M11-S	12	12	12	12	150	26,0	0°	0°		
		1616M11-S	16	16	16	16	150	26,0	0°	0°		
	11	**SVJBR/L 0810M11-S-B1**	10	10	8	8	150	20,0	0°	0°	VBM. 11 03 04	0,9
		1010M11-S-B1	10	10	10	10	150	20,0	0°	0°		
		1212M11-S-B1	12	12	12	12	150	20,0	0°	0°		
		1616M11-S-B1	16	16	16	16	150	20,0	0°	0°		
	16	**SVJBR/L 1212M16-S**	12	12	12	12	150	40,0	0°	0°	VBM. 16 04 08	3,9
		1616M16-S	16	16	16	16	150	40,0	0°	0		
 κ_r 72°30’		**SVVBN 0808M11-S**	8	4,3	8	8	150	21	0°	0°	VBM. 11 03 04	0,9
		1010M11-S	10	5,3	10	10	150	21	0°	0°		
		1212M11-S	12	6,3	12	12	150	21	0°	0°		
		1616M11-S	16	8,3	16	16	150	21	0°	0°		

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

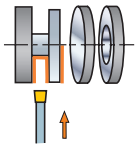
Ordering example: 2 pieces SDACR 0808M07-S
N = Neutral, R = Right hand, L = Left hand

Main spare parts

Insert size		Insert screw (thread)	Key (Torx plus)
11		5513 020-03 (M2,5)	5680 051-02 (7IP)
	11	5513 020-03 (M2,5)	5680 051-02 (7IP)
	16	5513 020-09 (M3,5)	5680 049-01 (15IP)

CoroCut® Swiss parting and grooving

Screw clamp design



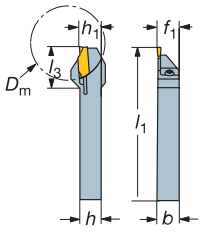
Parting off

123-CF
123-CM

Grooving

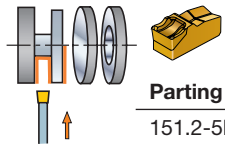
123-GF

R/LF123 -S



Q-Cut® parting

Spring clamp

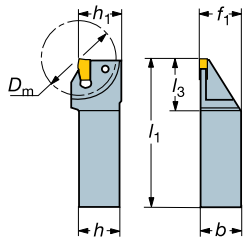


Parting off

151.2-5F

Right hand style shown

R/L151.20



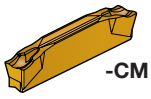
CoroCut®			Ordering code	Dimensions, mm									
D_m max	a_r max. for holder[1]	Seat size[2]	L R	b	f_1	h	h_1	l_1	l_3	Gauge inserts	Spare parts Screw	Spare parts Key (Torx Plus)	Torque Nm
20 22	10 11	D	R/LF123D10-1010B-S R/LF123D11-1212B-S	10 12	10,15 10,25	10 12	10 12	125 125	18,0 20,0	N123D2-CM	5513 021-07 5513 021-04	5680 043-13 (15IP) 5680 043-13 (15IP)	2,5
20	10	E	R/LF123E10-1010B-S	10	10,15	10	10	125	21,0	N123E2-CM N123F2-CM N123G2-CM	5513 021-07	5680 043-13 (15IP)	2,5
22	11	E	R/LF123E11-1212B-S	12	12,15	12	12	125	21,0	N123E2-CM N123F2-CM N123G2-CM	5513 021-04	5680 043-13 (15IP)	2,5
34	17	E	R/LF123E17-1616B-S	16	16,15	16	16	125	26,0	N123E2-CM N123F2-CM N123G2-CM	5513 021-04	5680 043-13 (15IP)	2,5
34	17	F	R/LF123F17-1616B-S	16	16,15	16	16	125	26,0	N123F2-CM	5513 021-04	5680 043-13 (15IP)	2,5

Q-Cut®			Ordering code	Dimensions, mm							Optional part To be ordered separately
D_m max	a_r max. for holder[1]	Seat size[2]	L R	b	f_1	h	h_1	l_1	l_3	Gauge inserts	
13	6	20	R/L151.20-0808-20	8	8,25	8	12	120	11,0	N151.2-200-5E	5680-057-021
20,6	10		-1010-20	10	10,25	10	12	120	13,0		
30	15		-1212-20	12	12,25	12	12	150	20,5		
30	15		-1612-20	12	12,25	16	16	150	20,5		
30	15		-1616-20	16	16,25	16	16	150	20,5		
30	15	25	R/L151.20-1212-25	12	12,25	12	12	150	20,5	N151.2-250-5E	5680-057-021
30	15		-1612-25	12	12,25	16	12	150	20,5		
30	15		-1616-25	16	16,25	16	16	150	20,5		

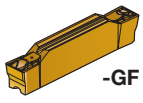
[1] For max stability choose a holder with shortest possible a_r.
[2] To correspond with seat size on insert.

Ordering example: 2 pieces RF123D10-1010B-S

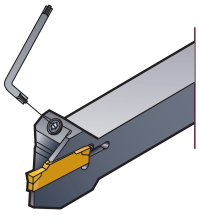
CoroCut® Swiss holder



-CM



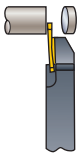
-GF



- Angled mounting of screw for easier access when changing the insert in Swiss machines
- Reinforced blade for better stability and precise parting and grooving
- Shank sizes from 1010 to 1616
- Parting/grooving with all-round -CM geometry
- Precision parting/grooving with -GF geometry
- Various inserts in modern grades for diffenent appllications
- Insert width from 1,5 to 3 mm.
- Various insert combinations including the choice of different front angles are available as Tailor Made. See page B 17.

Coromant Capto® cutting units and shank tools

CoroCut®3 external tools, screw clamp design

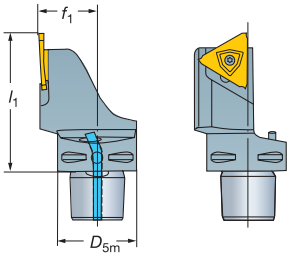


Shallow parting and grooving

123-CM
123-CS

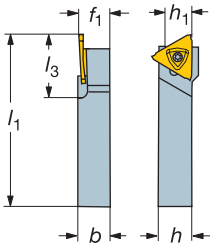
Right hand tool with right hand insert seat (T) shown.

Cx-R/LF123



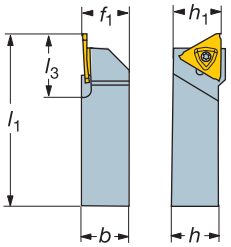
R/LF123

Shank size 1010 – 1616 mm



R/LF123

Shank size 2020 – 3232 mm



Ordering code			Dimensions, mm Dimensions valid with gauge insert									Spare parts	
a_r max. for holder	Insert seat [1]		D_{5m}	b	f_1	h	h_1	l_1	l_3	Gauge insert	Torque Nm	Screw	Key Torx Plus
		Right hand insert seat											
		Coromant Capto®											
6,0	T	**C3-RF123T06-22045B**	32	–	22	–	–	45	–	N123T3 -0150-0001	3,0	5513 020-32	5680 049-02 (15IP)
		C4-RF123T06-27060B	40	–	27	–	–	60	–				
		Shank											
6,0	T	**RF123T06 -1010B**	–	10	10	10	10	125	23	N123T3 -0150-0001	3,0	5513 020-09	5680 049-02 (15IP)
		-1212B	–	12	12	12	12	125	23			5513 020-32	5680 049-02 (15IP)
		-1616B	–	16	16	16	16	125	23				
		-2020B	–	20	20	20	20	125	23				
		-2525B	–	25	25	25	25	150	23				
		-3232B	–	32	32	32	32	170	23				
		Left hand insert seat											
		Coromant Capto®											
6,0	U	**C3-LF123U06-22045B**	32	–	22	–	–	45	–	N123U3 -0150-0001	3,0	5513 020-32	5680 049-02 (15IP)
		C4-LF123U06-27060B	40	–	27	–	–	60	–				
		Shank											
6,0	U	**LF123U06 -1010B**	–	10	10	10	10	125	23	N123U3 -0150-0001	3,0	5513 020-09	5680 049-02 (15IP)
		-1212B	–	12	12	12	12	125	23			5513 020-32	5680 049-02 (15IP)
		-1616B	–	16	16	16	16	125	23				
		-2020B	–	20	20	20	20	125	23				
		-2525B	–	25	25	25	25	150	23				
		-3232B	–	32	32	32	32	170	23				

[1] To correspond with insert seat on insert.
T = Right hand cutting insert, **U** = Left hand cutting insert.

Ordering example: 2 pieces C3-RF123T06-22045B

Note!
When using CoroCut3 inserts, the a_r of the insert gives the maximum depth of cut.

Code key for CoroCut®3 inserts and holders

Inserts

N	123	T*	3	-	0100	-	00	01	-	CM
1	2	3	4		5		6	7		8
Hand of tool	Main code	Insert seat	Edges		Insert width		Front angle	Corner radius		Geometry

*) **Insert seat**
T = Right hand cutting
U = Left hand cutting

Coromant Capto® cutting units

C3	-	R	F	123	T*	06	-	22045	B
1		2	3	4	5	6		7	8
Coupling		Hand of tool	Style	Main code	Insert seat	Max a_r		Dimensions	Clamping system

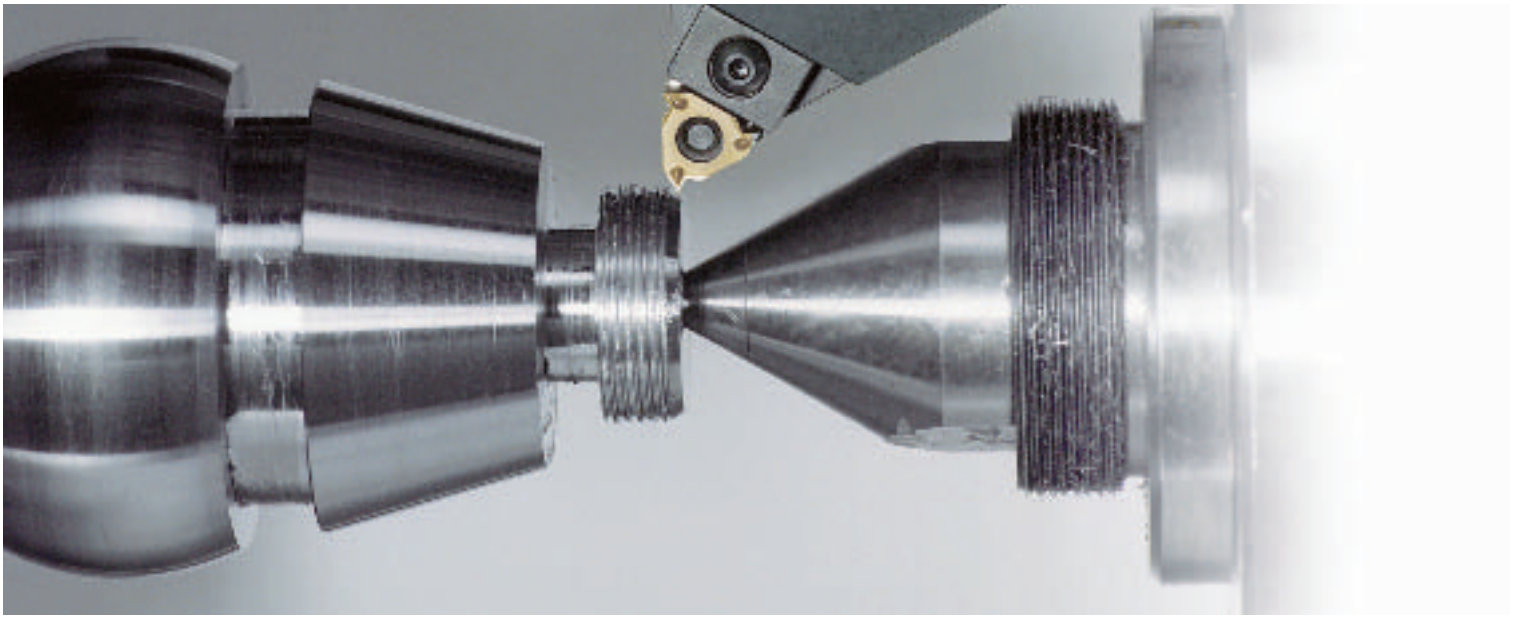
Shank tools

R	F	123	T*	06	-	1010	B
2	3	4	5	6		7	8
Hand of tool	Style	Main code	Insert seat	Max a_r		Dimensions	Clamping system

Note!
For complete code key description, see Turning tools C-1000:8 section B.

New Threading holders

for increased flexibility



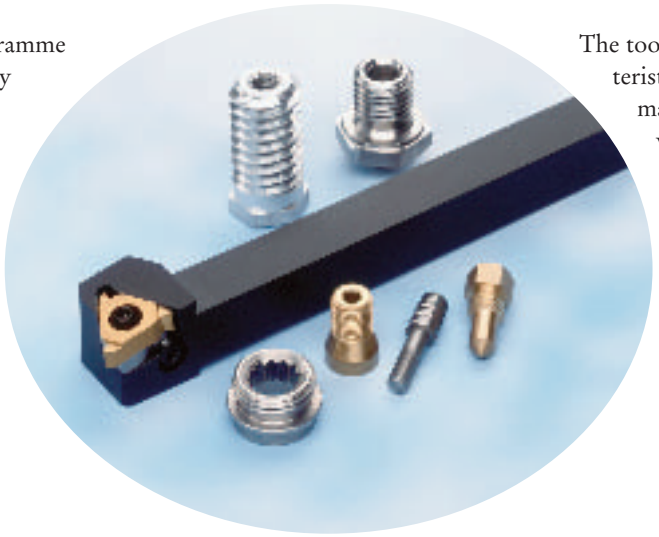
Threading close to the centre

When threading small diameter workpieces the accessibility close to the centre is an obstacle, especially in Multi-Task machines where space is scarce. The Coromant Capto assortment is extended with cutting units in wedge clamp design for T-Max U-Lock threading insert, designated 166.5FA that are specially designed to enable machining close to the centre.

The cutting units are available from size C3 up to C6 in both right and left hand design, right hand cutting units are also available for up side down mounting. All T-Max U-Lock threading insert in size 16 mm (IC = 3/8") can be used.

New tool holder for small part machining – sliding head machines

Our competitive tool holder programme for small part machining, especially sliding head machines, is now further strengthened with a tool holder specially adapted for threading. The tool holder is designed for all T-Max U-Lock threading inserts in size 16 mm (IC = 3/8"), both full-profile and V-profile inserts.



The tool holder is made to suit the characteristic conditions that reign in small part machining, i.e. small machines and work pieces, and is above all suitable for dimensions between work piece diameters 8 and 32 mm.

SANDVIK Coromant

T-MAX U-Lock threading

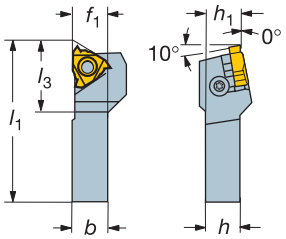
Tool holders for Swiss machines

166.0G
154.0G[1)]

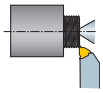
Threading of slender components and against centre

x and z, see infeed tables in turning tools catalogue C-1000:8

R/L166.4FA



Right hand style shown

	Pitch range		Ordering code	Dimensions, mm						Torque Nm
		mm (t.p.i.)	L / R	b	f_1	h	h_1	l_1	l_3	
	**16**	0,5-3,0 (32-8)	**R/L 166.4FA -1010-16-S**	10	10	10	10	125	23,3	1,7
			R/L 166.4FA -1212-16-S	12	12	12	12	125	23,3	
			R/L 166.4FA -1616-16-S	16	16	16	16	125	23,3	

= New item

Ordering example: 2 pieces 166.4FA 1010-16-S

1) When using T-Max U-Lock circlip grooving inserts, type R/L 154.0G, a shim giving 0° inclination must be used, see turning tools catalogue C-1000:8

Main spare parts

Insert size

	Insert screw	Key (Torx Plus)	Shim	Shim screw
16	5513 026-01	5680 051-03	5322 361-11	5512 032-01

Cutting speed recommendations

The recommendations are valid for use with cutting fluid.

ISO	CMC No.	Material		Specific cutting force k_c 0,4 N/mm²	Hardness Brinell HB	WEAR RESISTANCE CT5015	GC1525	GC1025
						h_{ex}, mm feed, f_n mm/r at $_r$ 90°-95°		
						0,05– 0,1 – 0,2	0,05– 0,1 – 0,2	0,1– 0,3 – 0,5
						Cutting speed, v_c m/min		
P Steel	01.1	Unalloyed steel	C = 0,1–0,25 %	2000	125	650 – 540 – 440	560 – 465 – 380	310 – 255 – 195
	01.2		C = 0,25–0,55 %	2100	150	570 – 480 – 385	495 – 415 – 335	280 – 225 – 180
	01.3		C = 0,55–0,80 %	2200	170	510 – 425 – 340	430 – 365 – 295	260 – 210 – 170
	02.1	Low-alloy steel, (alloying elements = 5 %)	Non-hardened	2150	180	480 – 400 – 320	375 – 320 – 255	- - -
	02.12		Ball bearing steel	2300	210	- - -	- - -	- - -
	02.2		Hardened and tempered	2550	275	285 – 235 – 190	200 – 165 – 135	- - -
	02.2		Hardened and tempered	2850	350	230 – 190 – 150	160 – 135 – 110	- - -
	03.11	High-alloy steel (alloying elements > 5 %)	Annealed	2500	200	395 – 330 – 250	260 – 215 – 175	- - -
	03.21		Hardened tool steel	3900	325	195 – 165 – 130	145 – 115 – 90	- - -
	06.1	Steel castings	Unalloyed	2000	180	260 – 215 – 175	225 – 185 – 145	- - -
	06.2		Low-alloy (alloying elements = 5 %)	2100	200	270 – 225 – 170	175 – 145 – 105	- - -
	06.3		High-alloy, alloying elements > 5 %)	2650	225	200 – 165 – 125	140 – 115 – 85	- - -

ISO	CMC No.	Material		Specific cutting force k_c 0,4 N/mm²	Hardness Brinell HB	WEAR RESISTANCE GC1525	GC1005	GC1025
						h_{ex}, mm feed, f_n mm/r at $_r$ 90°-95°		
						0,1 – 0,2	0,1 – 0,2 – 0,3	0,1 – 0,2 – 0,3
						Cutting speed, v_c m/min		
M Stainless steel	05.11	Stainless steel – Bars/forged Ferritic/martensitic	Non-hardened	2300	200	290 – 240	380 – 305 – 245	280 – 215 – 170
	05.12		PH-hardened	3550	330	170 – 150	350 – 280 – 225	155 – 125 – 100
	05.13		Hardened	2850	330	170 – 150	245 – 195 – 160	165 – 135 – 120
	05.21	Stainless steel – Bars/forged Austenitic	Austenitic	2300	180	220 – 195	410 – 330 – 265	265 – 220 – 170
	05.22		PH-hardened	3550	330	195 – 170	220 – 175 – 145	155 – 125 – 100
	05.23		Super austenitic	2950	200	145 – 130	245 – 200 – 160	185 – 160 – 130
	05.51	Stainless steel – Bars/forged Austenitic-ferritic (Duplex)	Non-weldable = 0,05%C	2550	230	- -	315 – 255 – 205	210 – 170 – 130
	05.52		Weldable <0,05%C	3050	260	- -	280 – 225 – 185	190 – 140 – 110
	15.11	Stainless steel – Cast Ferritic/martensitic	Non-hardened	2100	200	- -	- -	265 – 220 – 170
	15.12		PH-hardened	3150	330	- -	- -	135 – 110 – 80
	15.13		Hardened	2650	330	- -	- -	145 – 120 – 90
	15.21	Stainless steel – Cast Austenitic	Austenitic	2200	180	- -	- -	235 – 180 – 150
	15.22		PH-hardened	3150	330	- -	- -	135 – 110 – 80
	15.23		Super austenitic	2700	200	- -	- -	175 – 150 – 125
	15.51	Stainless steel – Cast Austenitic-ferritic (Duplex)	Non-weldable = 0,05%C	2250	230	- -	- -	190 – 140 – 100
	15.52		Weldable <0,05%C	2750	260	- -	- -	170 – 130 – 90

ISO	CMC No.	Material		Specific cutting force k_c 0,4 N/mm²	Hardness Brinell HB	WEAR RESISTANCE CB7050/CB50	CC620	CC650
						h_{ex}, mm feed, f_n mm/r at $_r$ 90°-95°		
						0,1 – 0,25– 0,4	0,1 – 0,25– 0,4	0,1 – 0,25– 0,4
						Cutting speed, v_c m/min		
K Cast iron	07.1	Malleable cast iron	Ferritic (short chipping)	940	130	- - -	800 – 700 – 600	800 – 700 – 600
	07.2		Pearlitic (long chipping)	1100	230	- - -	700 – 590 – 500	700 – 600 – 500
	08.1	Grey cast iron	Low tensile strength	1100	180	1700 –1450 –1200	800 – 700 – 600	800 – 700 – 600
	08.2		High tensile strength	1150	220	1450 –1250 –1050	760 – 650 – 540	760 – 650 – 540
	09.1	Nodular SG iron	Ferritic	1050	160	- - -	- - -	610 – 550 – 450
	09.2		Pearlitic	1750	250	- - -	- - -	510 – 450 – 350
	09.3		Martensitic	2700	380	- - -	- - -	350 – 305 – 260

TOUGHNESS

GC4015	GC4025	GC2015	GC4035	GC2025	GC235				
h_{ex}, mm feed, f_n mm/r at κ_r 90°-95°									
0,1 – 0,4 – 0,8	0,1 – 0,4 – 0,8	0,1 – 0,4 – 0,8	0,1 – 0,4 – 0,8	0,1 – 0,4 – 0,8	0,1 – 0,4 – 0,8				
Cutting speed, v_c m/min									
540 – 390 – 285 485 – 350 – 255 460 – 330 – 240	485 – 330 – 230 430 – 290 – 205 405 – 275 – 195	440 – 300 – 210 390 – 265 – 185 370 – 250 – 175	405 – 260 – 190 365 – 235 – 170 345 – 220 – 160	295 – 200 – 145 265 – 180 – 130 250 – 170 – 120	185 – 135 – 95 165 – 120 – 85 155 – 115 – 80				
530 – 355 – 245 460 – 305 – 215 285 – 200 – 150 230 – 160 – 120	435 – 290 – 205 380 – 255 – 180 285 – 200 – 155 230 – 160 – 125	395 – 265 – 185 345 – 230 – 160 255 – 180 – 140 205 – 145 – 115	285 – 175 – 130 250 – 155 – 110 175 – 115 – 80 140 – 90 – 65	220 – 145 – 100 195 – 125 – 85 145 – 95 – 65 115 – 75 – 50	155 – 110 – 70 - - - 110 – 70 – 50 85 – 55 – 39				
385 – 255 – 190 190 – 120 – 90	285 – 195 – 145 130 – 90 – 70	260 – 180 – 130 115 – 85 – 65	225 – 145 – 100 105 – 65 – 45	185 – 125 – 85 85 – 55 – 38	145 – 100 – 65 65 – 45 – 30				
285 – 205 – 160 250 – 175 – 135 195 – 130 – 100	230 – 170 – 125 200 – 135 – 95 175 – 120 – 85	210 – 155 – 110 180 – 120 – 85 160 – 110 – 75	175 – 130 – 95 155 – 95 – 65 135 – 90 – 65	140 – 105 – 80 125 – 80 – 55 110 – 75 – 50	100 – 80 – 60 95 – 65 – 45 80 – 60 – 39				

TOUGHNESS

GC4025	GC2015	GC4035	GC2025	GC2035	GC235				
h_{ex}, mm feed, f_n mm/r at κ_r 90°-95°									
0,2 – 0,4 – 0,6	0,2 – 0,4 – 0,6	0,2 – 0,4 – 0,6	0,2 – 0,4 – 0,6	0,2 – 0,4 – 0,6	0,2 – 0,4 – 0,6				
Cutting speed, v_c m/min									
265 – 225 – 200 125 – 100 – 75 150 – 125 – 90	240 – 205 – 185 115 – 90 – 70 135 – 115 – 80	225 – 190 – 170 85 – 65 – 50 100 – 70 – 50	210 – 175 – 135 100 – 70 – 50 110 – 80 – 55	180 – 160 – 130 85 – 65 – 45 95 – 70 – 50	130 – 110 – 90 70 – 55 – 45 75 – 60 – 50				
280 – 225 – 190 125 – 95 – 80 170 – 150 – 110	255 – 205 – 175 115 – 90 – 75 155 – 135 – 100	195 – 155 – 120 95 – 70 – 55 130 – 105 – 80	200 – 160 – 120 100 – 70 – 55 120 – 100 – 75	170 – 145 – 115 85 – 65 – 45 100 – 90 – 70	115 – 100 – 85 70 – 55 – 45 85 – 70 – 60				
240 – 205 – 160 200 – 165 – 130	220 – 185 – 145 180 – 150 – 120	180 – 140 – 110 130 – 115 – 105	190 – 150 – 110 150 – 120 – 90	160 – 135 – 105 130 – 110 – 85	105 – 95 – 80 95 – 80 – 70				
255 – 215 – 175 105 – 75 – 60 115 – 95 – 65	230 – 195 – 160 95 – 70 – 55 105 – 85 – 60	195 – 160 – 150 75 – 55 – 40 85 – 60 – 45	200 – 160 – 120 80 – 55 – 40 90 – 60 – 45	170 – 145 – 115 70 – 50 – 40 75 – 60 – 50	115 – 100 – 85 60 – 45 – 35 65 – 50 – 40				
220 – 180 – 150 105 – 75 – 60 160 – 125 – 105	200 – 165 – 135 95 – 70 – 55 145 – 115 – 95	155 – 120 – 95 75 – 55 – 40 115 – 90 – 70	175 – 135 – 100 80 – 55 – 40 120 – 90 – 65	150 – 120 – 95 70 – 50 – 40 100 – 80 – 60	100 – 90 – 75 65 – 45 – 33 80 – 65 – 55				
205 – 165 – 145 175 – 155 – 115	185 – 150 – 135 160 – 140 – 105	165 – 125 – 100 115 – 100 – 95	150 – 120 – 90 125 – 105 – 80	130 – 110 – 85 105 – 95 – 75	95 – 80 – 70 90 – 75 – 65				

TOUGHNESS

CC6090	GC1690	CT5015	GC3015	GC4015	GC3005	GC3025	H13A		
h_{ex}, mm feed, f_n mm/r at κ_r 90°-95°									
0,2 – 0,4 – 0,6	0,2 – 0,4 – 0,6	0,1 – 0,2 – 0,3	0,1 – 0,3 – 0,6	0,1 – 0,3 – 0,6	0,1 – 0,3 – 0,6	0,1 – 0,3 – 0,6	0,1 – 0,3 – 0,5		
Cutting speed, v_c m/min									
740 – 600 – 500 640 – 500 – 400	740 – 600 – 500 640 – 500 – 400	200 – 165 – 135 140 – 115 – 95	340 – 280 – 215 265 – 230 – 175	340 – 280 – 215 265 – 230 – 175	270 – 230 – 185 240 – 215 – 150	240 – 185 – 125 180 – 140 – 100	140 – 125 – 110 125 – 110 – 90		
740 – 600 – 500 690 – 540 – 435	740 – 600 – 500 690 – 540 – 435	320 – 260 – 220 280 – 235 – 205	380 – 320 – 250 300 – 250 – 210	380 – 320 – 250 300 – 250 – 210	290 – 260 – 225 280 – 240 – 200	235 – 180 – 120 215 – 155 – 110	180 – 145 – 110 140 – 115 – 95		
- - - - - - - - -	580 – 450 – 345 480 – 350 – 250 325 – 260 – 220	255 – 200 – 160 230 – 195 – 170 115 – 95 – 85	305 – 240 – 185 270 – 220 – 165 210 – 170 – 120	305 – 240 – 185 270 – 220 – 165 210 – 170 – 120	300 – 235 – 180 260 – 215 – 160 200 – 160 – 110	230 – 175 – 115 200 – 150 – 100 150 – 110 – 80	135 – 125 – 95 125 – 115 – 90 100 – 85 – 65		

Cutting speed recommendations

The recommendations are valid for use with cutting fluid.

ISO	CMC No.	Material		Specific cutting force k_c 0,4 N/mm²	Hardness Brinell HB	WEAR RESISTANCE CD10	CD1810	H10
						h_{ex}, mm feed, f_n mm/r at κ_r 90°-95°		
						0,05 – 0,4	0,15 – 0,8	0,15 – 0,8
						Cutting speed, v_c m/min		
N Non-ferrous metals	30.11	Aluminium alloys	Wrought or wrought and coldworked, non-aging	500	60	2000 (2500 – 250)[1]	2000 (2500 – 250)[1]	2000 (2500 – 250)[1]
	30.12		Wrought or wrought and aged	800	100	2000 (2500 – 250)[1]	2000 (2500 – 250)[1]	2000 (2500 – 250)[1]
	30.21	Aluminium alloys	Cast, non-aging	750	75	2000 (2500 – 250)[1]	2000 (2500 – 250)[1]	2000 (2500 – 250)[1]
	30.22		Cast or cast and aged	900	90	2000 (2500 – 250)[1]	2000 (2500 – 250)[1]	2000 (2500 – 250)[1]
	30.41	Aluminium alloys	Cast, 13–15% Si	950	130	1550 (1950 – 195)[1]	770 (960 – 95)[1]	450 - (560 – 55)[1]
	30.42		Cast, 16–22% Si	950	130	770 (960 – 95)[1]	510 (640 – 65)[1]	300 - (375 – 38)[1]
	33.1	Copper and copper alloys	Free cutting alloys, =1 % Pb	700	110	500 (630 – 65)[1]	500 (630 – 65)[1]	500 (630 – 65)[1]
	33.2		Brass, leaded bronzes, =1% Pb	700	90	500 (630 – 65)[1]	500 (630 – 65)[1]	500 (630 – 65)[1]
	33.3		Bronze and non-leadad copper incl. electrolytic copper	1750	100	300 (375 – 38)[1]	300 (375 – 38)[1]	300 (375 – 38)[1]
ISO	CMC No.	Material		Specific cutting force k_c 0,4 N/mm²	Hardness Brinell HB	WEAR RESISTANCE CC650	CC6080	CC670
						h_{ex}, mm feed, f_n mm/r at κ_r 90°-95°		
						0,1 – 0,2	0,1 – 0,2 – 0,3	0,1 – 0,2 – 0,3
						Cutting speed, v_c m/min		
S Heat resistant material		Heat resistant super alloys						
	20.11	Iron base	Annealed or solution treated	3000	200	- -	- - -	- - -
	20.12		Aged or solution treated and aged	3050	280	- -	- - -	- - -
	20.21	Nickel base	Annealed or solution treated	3300	250	400 – 320	420 – 350 – 295	385 – 315 – 270
	20.22		Aged or solution treated and aged	3600	350	340 – 265	355 – 295 – 250	325 – 270 – 230
	20.24		Cast or cast and aged	3700	320	220 – 160	325 – 270 – 230	295 – 245 – 210
	20.31	Cobalt base	Annealed or solution treated	3300	200	345 – 260	- - -	345 – 255 – 205
	20.32		Solution treated and aged	3700	300	300 – 225	- - -	300 – 225 – 175
	20.33		Cast or cast and aged	3800	320	285 – 225	- - -	285 – 225 – 170
						H10	H10A	H13A
		Titanium alloys[2]			Rm[3]	0,1 – 0,2 – 0,3	0,1 – 0,3 – 0,5	0,1 – 0,3 – 0,5
	23.1	Commercial pure (99,5% Ti)		1550	400	205 – 170 – 145	195 – 160 – 135	180 – 150 – 125
	23.21	α, near α and α+⇓ alloys, annealed		1700	950	85 – 70 – 55	80 – 65 – 55	75 – 60 – 50
	23.22	α+⇓ alloys in aged cond., ⇓ alloys, annealed or aged		1700	1050	80 – 60 – 50	80 – 60 – 50	70 – 55 – 45
ISO	CMC No	Material		Specific cutting force k_c 0,4 N/mm²	Hardness Brinell HB	WEAR RESISTANCE CB7020/CB20	CB7050/CB50	CC650
						h_{ex}, mm feed, f_n mm/r at κ_r 90°-95°		
						0,05– 0,15– 0,25	0,1– 0,25– 0,4	0,1 – 0,25– 0,4
						Cutting speed, v_c m/min		
H Hardened material	04.1	Hard steel Extra hard steel	Hardened and tempered Hardened and tempered	3250 5550	*45 HRC* *60 HRC*	- - - 180 – 150 – 120	- - - 150 – 120 – 100	140 – 105 – 70 120 – 90 – 60
	10.1	Chilled cast iron	Cast or cast and aged	2800	400	- - -	180 – 150 – 120	120 – 90 – 60

[1] The cutting speeds, shown in the table, are valid for all feeds within the feed range.
[2] 45–60° entering angle, positive cutting geometry and coolant should be used.
[3] Rm = ultimate tensile strength measured in MPa.

Non-ferrous materials

Choosing polycrystalline diamond tipped inserts (PCD) or carbide inserts?

The PCD grade CD10 and diamond coated grade CD1810 could be a useful alternative to cemented carbide for finishing and semi-finishing in non-ferrous metals and non-metallic materials.

Use diamond for

- exceptionally long tool life
- excellent surface finishes
- machining economy
- stable conditions

Use cemented carbide for

- chip control
- edge security
- low cost per edge
- setting up of new jobs
- unstable conditions

TOUGHNESS

H13A									
h_{ex}, mm feed, f_n mm/r at κ_r 90°-95°									
0,15 – 0,8									
Cutting speed, v_c m/min									
1900 (2400 –240)[1)] 1900 (2400 –240)[1)]									
1900 (2400 –240)[1)] 1900 (2400 –240)[1)]									
400 (500 – 50)[1)] 250 (315 – 31)[1)]									
450 (560 – 55)[1)] 450 (560 – 55)[1)] 270 (340 – 34)[1)]									

TOUGHNESS

S05F	GC1005	H10A	H13A	GC1025	H10F				
h_{ex}, mm feed, f_n mm/r at κ_r 90°-95°									
0,1 – 0,2 – 0,3	0,1 – 0,3 – 0,5	0,1 – 0,3 – 0,5	0,1 – 0,3 – 0,5	0,1 – 0,3 – 0,5	0,1 – 0,3 – 0,5				
Cutting speed, v_c m/min									
160 – 135 – 110 125 – 105 – 85	175 – 120 – 80 150 – 100 – 70	85 – 70 – 55 65 – 55 – 40	80 – 65 – 50 60 – 50 – 40	75 – 60 – 45 55 – 45 – 35	70 – 55 – 40 50 – 40 – 30				
100 – 85 – 70 90 – 75 – 60 80 – 65 – 55	90 – 55 – 30 80 – 50 – 27 70 – 45 – 24	55 – 40 – 32 40 – 32 – 21 26 – 21 – 16	50 – 40 – 30 40 – 30 – 20 25 – 20 – 15	45 – 35 – 25 35 – 25 – 15 23 – 17 – 12	40 – 30 – 20 30 – 20 – 10 20 – 15 – 10				
100 – 85 – 70 90 – 75 – 60 80 – 65 – 55	90 – 60 – 30 80 – 50 – 27 70 – 45 – 24	55 – 40 – 32 40 – 32 – 21 26 – 21 – 16	50 – 40 – 30 40 – 30 – 20 25 – 20 – 15	45 – 35 – 25 35 – 25 – 15 23 – 17 – 12	40 – 30 – 20 30 – 20 – 10 20 – 15 – 10				

H10F	GC1025								
0,1 – 0,3 – 0,5	0,1 – 0,3 – 0,5								
160 – 135 – 115 65 – 55 – 45 65 – 50 – 40	160 – 135 – 115 65 – 55 – 45 65 – 50 – 40								

TOUGHNESS

CC670	H13A	GC4015							
h_{ex}, mm feed, f_n mm/r at κ_r 90°-95°									
0,1 – 0,25 – 0,4	0,1 – 0,3 – 0,6	0,1 – 0,3 – 0,6							
Cutting speed, v_c m/min									
140 – 120 – 95 120 – 100 – 80	45 – 30 – 23 - - -	60 – 40 – 25 - - -							
120 – 90 – 60	35 – 20 – 11	45 – 25 – 14							

CBN in cast iron, hardened and heat resistant materials

Cubic boron nitride grades CB7020, CB20, CB7050 and CB50

CBN inserts can increase productivity in many difficult metal cutting operations — up to 100 times better than carbide or ceramics in terms of longer tool life and/or higher metal removal rate.

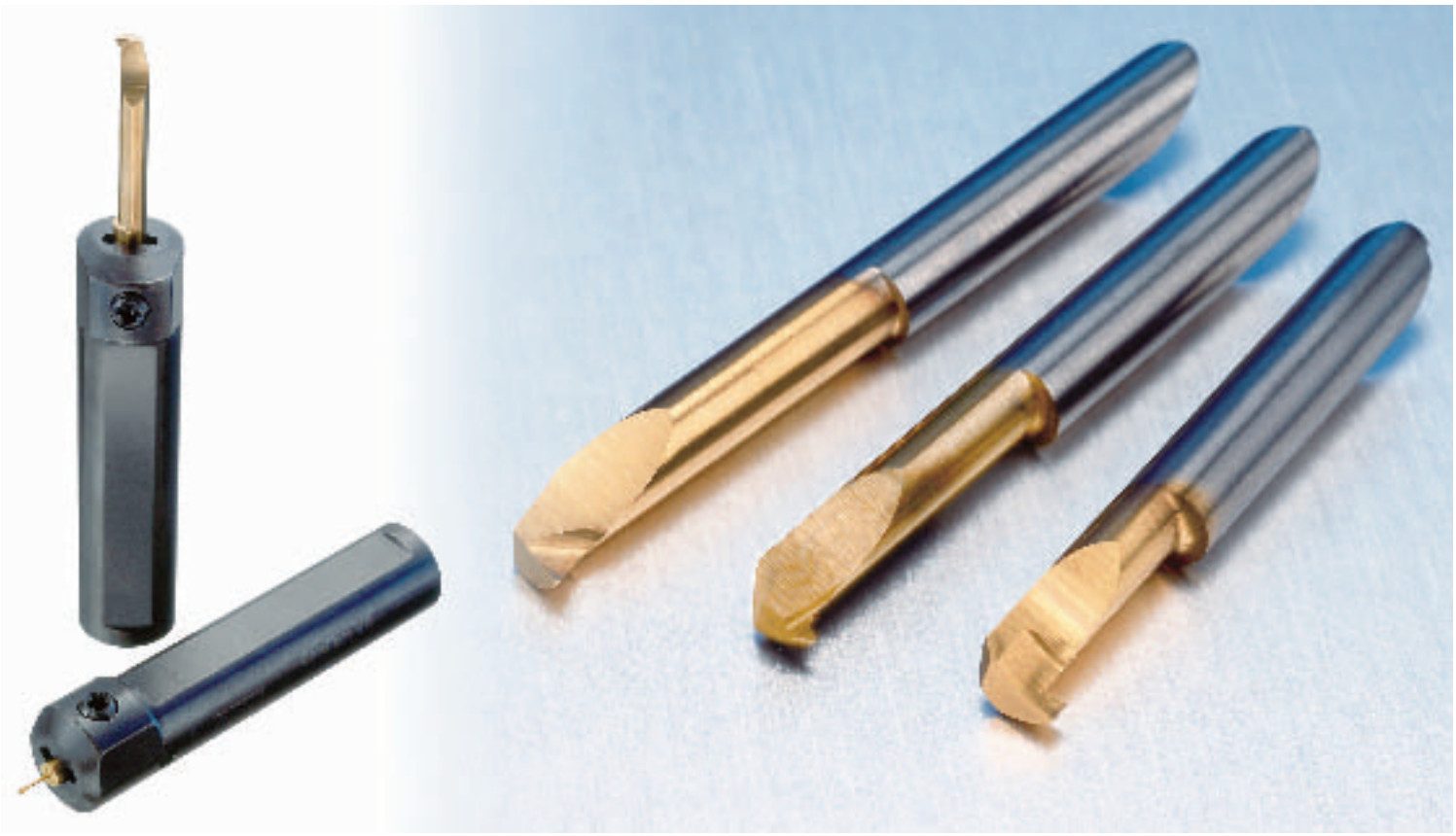
CBN is recommended primarily for finishing operations:

CB7050/CB50 for cast iron and heat resistant materials.

CB7020/CB20 for continuous and light interrupted cuts in hardened parts.

CoroTurn® XS

when there's no room for compromise



CoroTurn XS tooling solutions for internal turning, grooving and threading bring all the performance of CoroTurn down to smaller bores than ever, in a design conceived with small part machining in mind.

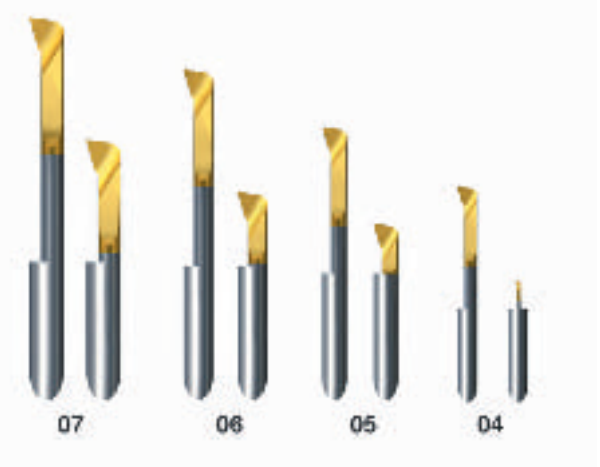
CoroTurn XS tooling consists of a two-part assembly:
Cutting inserts precisely engineered to machine holes down to 1 mm diameter are available, and fit into boring bars ranging from 10 to 25.4 mm (½ to 1 inch) outer diameter.

Mix and match cutting tool and boring bar to suit your requirements.

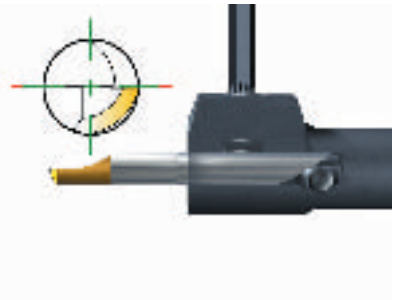
Sandvik Coromant tooling solutions for small part machining focus on the details.

Inserts are available in GC1025 grade, a proven performer for cutting steel, stainless steel and non-ferrous materials, across a range of operations and cutting conditions.

CoroTurn XS assortment
The programme covers four insert sizes, CXS-04, -05, -06, and -07, each including inserts for a range of hole diameters, and available in different lengths to suit different applications.



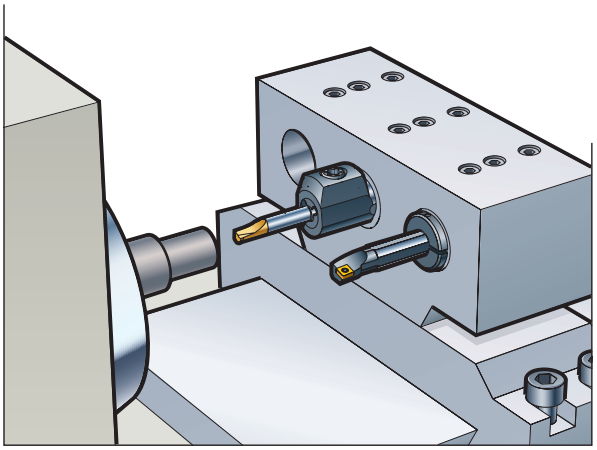
CoroTurn XS precision
The inserts locate precisely into the boring bars thanks to a locating pin, which locks the insert into the correct orientation. Guaranteed precise positioning of the cutting edge, and repeatable accuracy you can rely on every time.



CoroTurn XS coolant supply
The boring bars are designed with internal cutting fluid supply, directed at the cutting edge via two nozzles to ensure chip evacuation and sufficient cooling.

CoroTurn XS grooving
All CoroTurn XS grooving inserts produce grooves with flat bottom and sharp corner radii.

Clamping bars in sliding head machine
For even greater flexibility, new sizes of EasyFix sleeves allow metric boring bars to be fitted into inch tool posts, and provide a positive locating action to ensure correct centre height.
See page 88.
For the complete assortment of EasyFix sleeves, see page A 216 in Turning tools catalogue.



Code key for CoroTurn XS

Insert for turning

CXS	04	T	098	-	10	-	22	06	R
1	2	3	4		5		9	10	12

Insert for grooving

CXS	06	F	100	-	62	15	A	R
1	2	3	6		9	10	11	12

Insert for threading

CXS	04	TH	050	VM	-	42	15	R
1	2	3	7	8		9	10	12

Boring bars

CXS	A	10	-	04
1	13	14		2

1 Main code

CXS = CoroTurn XS

2 Insert size mm

04 = 4 mm
05 = 5 mm
06 = 6 mm
07 = 7 mm

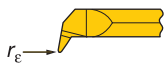
3 Type of operation

T = Turning
TE = Turning copying, extended f_1-dimension
F = Face grooving
G = Grooving
GX = Pre-parting
R = Profiling full radiius
TH = Threading

4 Entering angle (Turning)

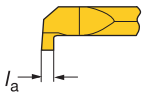
E.g.: 098 = 98°

5 Nose radius, r_ε mm (Turning)



E.g.: 10 = 0,1 mm

6 Insert witdh, l_a mm (Grooving)



E.g.: 100 = 1,00 mm

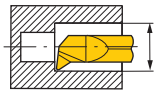
7 Pitch, mm (Threading)

mm: pitch x 100
inch: No. of threads per inch x 10

8 Thread profile (Threading)

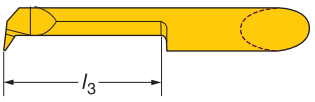
VM = V profile 60°
WH = Withworth 55°
NT = NPT 60°

9 Min hole diameter, D_m min. mm



E.g.: 22 = 2,2 mm

10 Penetration depth, l_3 mm



E.g.: 06 = 6 mm

11 Type of curve (Facegrooving)

A = A-curved

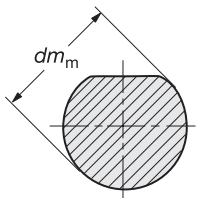
12 Hand of insert

R = Right hand style
L = Left hand style

13 Type of bar

A = Steel bar with internal coolant supply

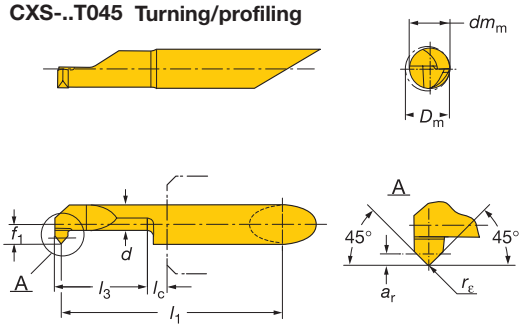
14 Bar dia, dm_m mm



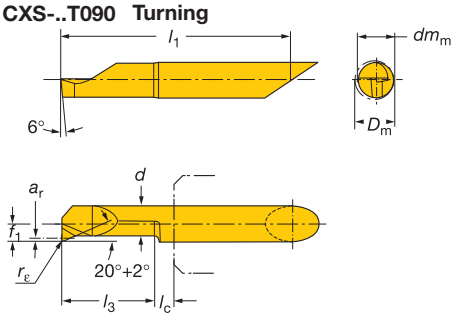
CoroTurn XS inserts

Turning and turning/copying

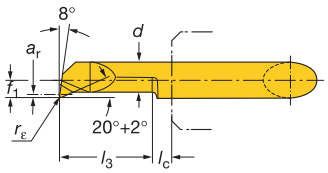
CXS-..T045 Turning/profiling



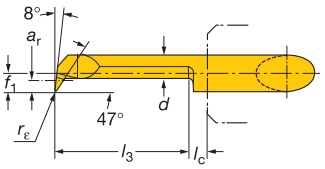
CXS-..T090 Turning



CXS-..T098 Turning

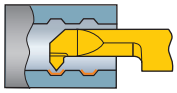
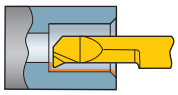
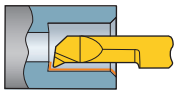
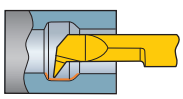


CXS-..TE98 Copying



Coromant grades

GC = Coated carbide/Cermet

Entering angle	Insert size[1] dm_m	Ordering code	a_r max	d	D_m min	f_1	l_c	l_1	l_3	r_ε	P GC 1025	M GC 1025	N GC 1025	S GC 1025
45° Turning/ profiling 	05	CXS-05T 045-20-5215R	0,7	3,75	5,2	2,45	3	37,25	15	0,20	★	★	★	★
		045-20-5220R/L	0,7	3,75	5,2	2,45	3	42,25	20	0,20	★	★	★	★
	06	CXS-06T 045-20-6220R	0,7	3,95	6,2	2,95	3	42,25	20	0,20	★	★	★	★
		045-20-6225R/L	0,7	3,95	6,2	2,95	3	47,25	25	0,20	★	★	★	★
	07	CXS-07T 045-20-7220R/L	0,7	4,25	7,2	3,45	3	62,25	20	0,20	★	★	★	★
		045-20-7240R/L	0,7	4,25	7,2	3,45	3	62,25	40	0,20	★	★	★	★
90° Turning 	04	CXS-04T 090-15-3212R	0,2	2,55	3,2	1,45	3	29,26	12	0,15	★	★	★	★
		090-15-4215R/L	0,3	3,45	4,2	1,95	3	39,26	15	0,15	★	★	★	★
	05	CXS-05T 090-20-5210R/L	0,5	4,20	5,2	2,45	3	32,25	10	0,20	★	★	★	★
		090-20-5215R/L	0,5	4,20	5,2	2,45	3	37,25	15	0,20	★	★	★	★
		090-20-5220R/L	0,5	4,20	5,2	2,45	3	42,25	20	0,20	★	★	★	★
98° Turning 	04	CXS-04T 098-10-1004R/L	0,1	0,65	1,0	0,45	3	21,26	4	0,10	★	★	★	★
		098-10-1006R	0,1	0,65	1,0	0,45	3	23,26	6	0,10	★	★	★	★
		098-10-1706R/L	0,2	1,05	1,7	0,70	3	23,26	6	0,10	★	★	★	★
		098-10-1709R/L	0,2	1,05	1,7	0,70	3	26,26	9	0,10	★	★	★	★
		098-10-2206R/L	0,2	1,55	2,2	0,95	3	23,26	6	0,10	★	★	★	★
		098-10-2209R/L	0,2	1,55	2,2	0,95	3	26,26	9	0,10	★	★	★	★
		098-10-2213R/L	0,2	1,55	2,2	0,95	3	30,26	13	0,10	★	★	★	★
		098-15-2710R/L	0,2	2,05	2,7	1,20	3	27,26	10	0,15	★	★	★	★
		098-15-2715R/L	0,2	2,05	2,7	1,20	3	32,26	15	0,15	★	★	★	★
		098-15-3210R/L	0,2	2,55	3,2	1,45	3	27,26	10	0,15	★	★	★	★
		098-15-3215R/L	0,2	2,55	3,2	1,45	3	32,26	15	0,15	★	★	★	★
		098-15-3220R/L	0,2	2,55	3,2	1,45	3	37,26	20	0,15	★	★	★	★
		098-15-4210R/L	0,3	3,45	4,2	1,95	3	27,26	10	0,15	★	★	★	★
		098-15-4215R/L	0,3	3,45	4,2	1,95	3	32,26	15	0,15	★	★	★	★
		098-15-4220R/L	0,3	3,45	4,2	1,95	3	37,26	20	0,15	★	★	★	★
		098-15-4225R/L	0,3	3,45	4,2	1,95	3	43,26	25	0,15	★	★	★	★
	05	CXS-05T 098-20-5210R/L	0,5	4,25	5,2	2,45	3	32,25	10	0,20	★	★	★	★
		098-20-5220R/L	0,5	4,25	5,2	2,45	3	42,25	20	0,20	★	★	★	★
		098-20-5225R/L	0,5	4,25	5,2	2,45	3	47,25	25	0,20	★	★	★	★
		098-20-5230R/L	0,5	4,25	5,2	2,45	3	57,25	30	0,20	★	★	★	★
	06	CXS-06T 098-20-6215R/L	0,5	5,25	6,2	2,95	3	37,25	15	0,20	★	★	★	★
		098-20-6220R/L	0,5	5,25	6,2	2,95	3	42,25	20	0,20	★	★	★	★
		098-20-6225R/L	0,5	5,25	6,2	2,95	3	47,25	25	0,20	★	★	★	★
		098-20-6230R/L	0,5	5,25	6,2	2,95	3	52,25	30	0,20	★	★	★	★
		098-20-6235R/L	0,5	5,25	6,2	2,95	3	57,25	35	0,20	★	★	★	★
		098-20-6240R	0,5	5,25	6,2	2,95	3	62,25	40	0,20	★	★	★	★
	07	CXS-07T 098-20-7225R/L	0,5	6,25	7,2	3,45	3	47,25	25	0,20	★	★	★	★
		098-20-7230R	0,5	6,25	7,2	3,45	3	57,25	30	0,20	★	★	★	★
		098-20-7240R/L	0,5	6,25	7,2	3,45	3	62,25	40	0,20	★	★	★	★
		098-20-7245R/L	0,5	6,25	7,2	3,45	3	67,25	45	0,20	★	★	★	★
		098-20-7250R	0,5	6,25	7,2	3,45	3	72,25	50	0,20	★	★	★	★
98° Copying 		**Insert with extended f_1 dimension**												
	04	CXS-04TE98-15-4220R/L	0,8	2,95	4,2	1,95	3	37,26	20	0,15	★	★	★	★
	05	CXS-05TE98-15-5225R/L	1,0	3,75	5,2	2,45	3	47,25	25	0,15	★	★	★	★
	06	CXS-06TE98-15-6230R/L	1,8	3,95	6,2	2,95	3	52,25	30	0,15	★	★	★	★
											P25	M15	N15	S15

= New item

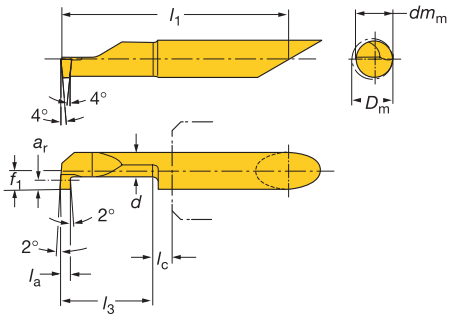
[1] To correspond with insert size on boring bar.

Ordering example: 10 pieces CXS-05T045-20-5220R 1025
CXS-05T045-20-5220L 1025
R = Right hand, L = Left hand

CoroTurn XS inserts

Grooving

CXS-..G



Coromant grades

GC = Coated carbide/Cermet

	Selection criteria, mm *(inch)*				Insert size[1]	Ordering code	Dimensions, mm				P			M			N			S		
											GC			GC			GC			GC		
	a_r max	D_m min	l_a	l_3	dm_m		d	f_1	l_c	l_1	1025			1025			1025			1025		
Grooving	0,80	4,2	0,78 *(.031)*	10	**04**	**CXS-04G078-4210R**	2,95	1,95	3	27,4	★			★			★			★		
	0,80	4,2	0,78 *(.031)*	15		**078-4215R/L**	2,95	1,95	3	32,5	★			★			★			★		
	0,80	4,2	0,78 *(.031)*	20		**078-4220R**	2,95	1,95	3	37,6	★			★			★			★		
	0,80	4,2	1,00	10		**100-4210R/L**	2,95	1,95	3	27,3	★			★			★			★		
	0,80	4,2	1,00	15		**100-4215R/L**	2,95	1,95	3	32,3	★			★			★			★		
	0,80	4,2	1,00	20		**100-4220R/L**	2,95	1,95	3	37,3	★			★			★			★		
	1,00	5,2	0,78 *(.031)*	10	**05**	**CXS-05G078-5210R**	3,75	2,45	3	32,4	★			★			★			★		
	1,00	5,2	0,78 *(.031)*	20		**078-5220R/L**	3,75	2,45	3	42,5	★			★			★			★		
	1,00	5,2	0,78 *(.031)*	30		**078-5230R**	3,75	2,45	3	52,7	★			★			★			★		
	1,00	5,2	1,00	10		**100-5210R**	3,75	2,45	3	32,3	★			★			★			★		
	1,00	5,2	1,00	20		**100-5220R/L**	3,75	2,45	3	42,3	★			★			★			★		
	1,00	5,2	1,00	30		**100-5230R**	3,75	2,45	3	52,3	★			★			★			★		
	1,00	5,2	1,17 *(.046)*	10		**117-5210R**	3,75	2,45	3	32,4	★			★			★			★		
	1,00	5,2	1,17 *(.046)*	20		**117-5220R/L**	3,75	2,45	3	42,5	★			★			★			★		
	1,00	5,2	1,17 *(.046)*	30		**117-5230R**	3,75	2,45	3	52,7	★			★			★			★		
	1,00	5,2	1,50	10		**150-5210R/L**	3,75	2,45	3	32,3	★			★			★			★		
	1,00	5,2	1,50	15		**150-5215R/L**	3,75	2,45	3	37,3	★			★			★			★		
	1,00	5,2	1,50	20		**150-5220R/L**	3,75	2,45	3	42,3	★			★			★			★		
	1,00	5,2	1,50	30		**150-5230R**	3,75	2,45	3	52,3	★			★			★			★		
	1,00	5,2	1,57 *(.062)*	10		**157-5210R**	3,75	2,45	3	32,4	★			★			★			★		
	1,00	5,2	1,57 *(.062)*	20		**157-5220R/L**	3,75	2,45	3	42,5	★			★			★			★		
	1,00	5,2	1,57 *(.062)*	30		**157-5230R**	3,75	2,45	3	52,7	★			★			★			★		
	1,00	5,2	1,98 *(.078)*	10		**198-5210R**	3,75	2,45	3	32,4	★			★			★			★		
	1,00	5,2	1,98 *(.078)*	20		**198-5220R/L**	3,75	2,45	3	42,5	★			★			★			★		
	1,00	5,2	1,98 *(.078)*	30		**198-5230R**	3,75	2,45	3	52,7	★			★			★			★		
	1,00	5,2	2,00	10		**200-5210R**	3,75	2,45	3	32,3	★			★			★			★		
	1,00	5,2	2,00	20		**200-5220R/L**	3,75	2,45	3	42,3	★			★			★			★		
	1,00	5,2	2,00	30		**200-5230R**	3,75	2,45	3	52,3	★			★			★			★		
	1,80	6,2	0,78 *(.031)*	10	**06**	**CXS-06G078-6210R**	3,95	2,95	3	32,4	★			★			★			★		
	1,80	6,2	0,78 *(.031)*	15		**078-6215R/L**	3,95	2,95	3	37,5	★			★			★			★		
	1,80	6,2	0,78 *(.031)*	25		**078-6225R**	3,95	2,95	3	47,6	★			★			★			★		
	1,80	6,2	0,78 *(.031)*	35		**078-6235R/L**	3,95	2,95	3	57,8	★			★			★			★		
	1,80	6,2	1,00	10		**100-6210R**	3,95	2,95	3	32,3	★			★			★			★		
	1,80	6,2	1,00	15		**100-6215R/L**	3,95	2,95	3	37,3	★			★			★			★		
	1,80	6,2	1,00	25		**100-6225R/L**	3,95	2,95	3	47,3	★			★			★			★		
	1,80	6,2	1,00	35		**100-6235R**	3,95	2,95	3	57,3	★			★			★			★		
	1,80	6,2	1,17 *(.046)*	10		**117-6210R**	3,95	2,95	3	32,4	★			★			★			★		
	1,80	6,2	1,17 *(.046)*	15		**117-6215R/L**	3,95	2,95	3	37,5	★			★			★			★		
	1,80	6,2	1,17 *(.046)*	25		**117-6225R**	3,95	2,95	3	47,6	★			★			★			★		
	1,80	6,2	1,17 *(.046)*	35		**117-6235R/L**	3,95	2,95	3	57,8	★			★			★			★		
	1,80	6,2	1,50	10		**150-6210R**	3,95	2,95	3	32,3	★			★			★			★		
	1,80	6,2	1,50	15		**150-6215R/L**	3,95	2,95	3	37,3	★			★			★			★		
	1,80	6,2	1,50	25		**150-6225R/L**	3,95	2,95	3	47,3	★			★			★			★		
	1,80	6,2	1,50	35		**150-6235R**	3,95	2,95	3	57,3	★			★			★			★		
	1,80	6,2	1,57 *(.062)*	10		**157-6210R**	3,95	2,95	3	32,4	★			★			★			★		
	1,80	6,2	1,57 *(.062)*	15		**157-6215R/L**	3,95	2,95	3	37,5	★			★			★			★		
	1,80	6,2	1,57 *(.062)*	25		**157-6225R**	3,95	2,95	3	47,6	★			★			★			★		
	1,80	6,2	1,57 *(.062)*	35		**157-6235R/L**	3,95	2,95	3	57,8	★			★			★			★		
	1,80	6,2	1,98 *(.078)*	10		**198-6210R**	3,95	2,95	3	32,4	★			★			★			★		
	1,80	6,2	1,98 *(.078)*	15		**198-6215R/L**	3,95	2,95	3	37,5	★			★			★			★		
	1,80	6,2	1,98 *(.078)*	25		**198-6225R**	3,95	2,95	3	47,6	★			★			★			★		
	1,80	6,2	2,00	10		**200-6210R**	3,95	2,95	3	32,3	★			★			★			★		
	1,80	6,2	2,00	15		**200-6215R/L**	3,95	2,95	3	37,3	★			★			★			★		
	1,80	6,2	2,00	25		**200-6225R/L**	3,95	2,95	3	47,3	★			★			★			★		
											P25			M15			N15			S15		

= New item

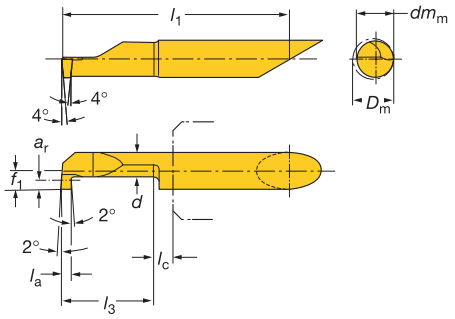
[1] To correspond with insert size on boring bar.

Ordering example: 10 pieces CXS-04G078-4215RL 1025
CXS-04G078-4215RL 1025
R = Right hand, L = Left hand

CoroTurn XS inserts

Grooving

CXS-..G



Coromant grades

GC = Coated carbide/Cermet

	Selection criteria, mm *(inch)*				Insert size[1]	Ordering code	Dimensions, mm				P			M			N			S		
											GC			GC			GC			GC		
	a_r max	D_m min	l_a	l_3	dm_m		d	f_1	l_c	l_1	1025			1025			1025			1025		
Grooving	2,50	7,2	0,78 *(.031)*	10	**07**	**CXS-07G078-7210R**	4,25	3,45	3	32,4	★			★			★			★		
	2,50	7,2	0,78 *(.031)*	15		**078-7215R/L**	4,25	3,45	3	37,5	★			★			★			★		
	2,50	7,2	0,78 *(.031)*	25		**078-7225R**	4,25	3,45	3	47,6	★			★			★			★		
	2,50	7,2	0,78 *(.031)*	35		**078-7235R/L**	4,25	3,45	3	57,8	★			★			★			★		
	2,50	7,2	1,00	10		**100-7210R/L**	4,25	3,45	3	32,3	★			★			★			★		
	2,50	7,2	1,00	15		**100-7215R/L**	4,25	3,45	3	37,3	★			★			★			★		
	2,50	7,2	1,00	25		**100-7225R/L**	4,25	3,45	3	47,3	★			★			★			★		
	2,50	7,2	1,00	35		**100-7235R**	4,25	3,45	3	57,3	★			★			★			★		
	2,50	7,2	1,17 *(.046)*	10		**117-7210R**	4,25	3,45	3	32,4	★			★			★			★		
	2,50	7,2	1,17 *(.046)*	15		**117-7215R/L**	4,25	3,45	3	37,5	★			★			★			★		
	2,50	7,2	1,17 *(.046)*	25		**117-7225R**	4,25	3,45	3	47,6	★			★			★			★		
	2,50	7,2	1,17 *(.046)*	35		**117-7235R/L**	4,25	3,45	3	57,8	★			★			★			★		
	2,50	7,2	1,50	10		**150-7210R**	4,25	3,45	3	32,3	★			★			★			★		
	2,50	7,2	1,50	15		**150-7215R/L**	4,25	3,45	3	37,3	★			★			★			★		
	2,50	7,2	1,50	25		**150-7225R/L**	4,25	3,45	3	47,3	★			★			★			★		
	2,50	7,2	1,50	35		**150-7235R**	4,25	3,45	3	57,3	★			★			★			★		
	2,50	7,2	1,57 *(.062)*	10		**157-7210R**	4,25	3,45	3	32,4	★			★			★			★		
	2,50	7,2	1,57 *(.062)*	15		**157-7215R/L**	4,25	3,45	3	37,5	★			★			★			★		
	2,50	7,2	1,57 *(.062)*	25		**157-7225R**	4,25	3,45	3	47,6	★			★			★			★		
	2,50	7,2	1,57 *(.062)*	35		**157-7235R/L**	4,25	3,45	3	57,8	★			★			★			★		
	2,50	7,2	1,98 *(.078)*	10		**198-7210R**	4,25	3,45	3	32,4	★			★			★			★		
	2,50	7,2	1,98 *(.078)*	15		**198-7215R/L**	4,25	3,45	3	37,5	★			★			★			★		
	2,50	7,2	1,98 *(.078)*	25		**198-7225R**	4,25	3,45	3	47,6	★			★			★			★		
	2,50	7,2	1,98 *(.078)*	35		**198-7235R/L**	4,25	3,45	3	57,8	★			★			★			★		
	2,50	7,2	2,00	10		**200-7210R**	4,25	3,45	3	32,3	★			★			★			★		
	2,50	7,2	2,00	15		**200-7215R/L**	4,25	3,45	3	37,3	★			★			★			★		
	2,50	7,2	2,00	25		**200-7225R/L**	4,25	3,45	3	47,3	★			★			★			★		
	2,50	7,2	2,00	35		**200-7235R**	4,25	3,45	3	57,3	★			★			★			★		
											P25			M15			N15			S15		

= New item

[1] To correspond with insert size on boring bar.

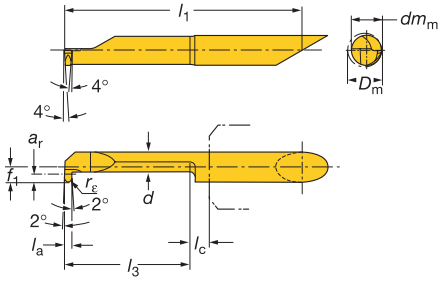
Ordering example: 10 pieces CXS-07G078-7215R 1025
CXS-07G078-7215L 1025

R = Right hand, L = Left hand

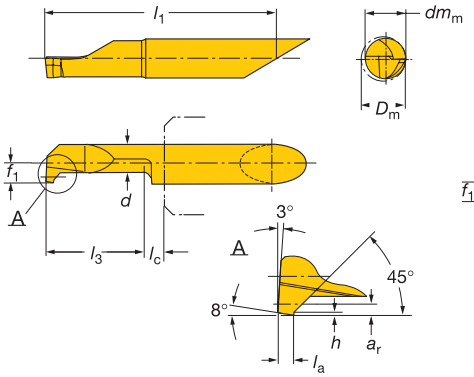
CoroTurn XS inserts

Profiling, facegrooving and pre-parting

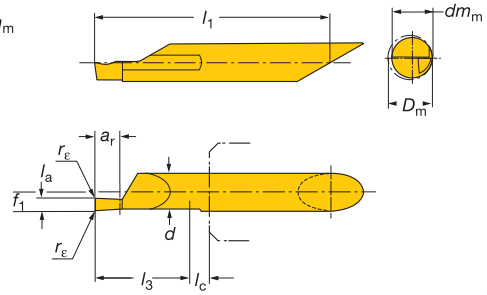
CXS-..R Profiling



CXS-..GX Pre-parting



CXS-..F Face grooving



Coromant grades

GC = Coated carbide/Cermet

	Selection criteria, mm *(inch)*				Insert size[1]	Ordering code	Dimensions, mm						P			M			N			S		
													GC			GC			GC			GC		
	a_r max	D_m min	l_a	l_3	dm_m		d	f_1	h	l_c	l_1	r_ε	1025			1025			1025			1025		
Profiling	0,8	4,2	1,0	15	04	CXS-04R 100-4215R/L	2,95	1,95	-	3	32,3	0,50	★			★			★			★		
	0,8	4,2	1,17*(.046)*	15		058-4215R	2,95	2,45	–	3	32,5	0,58	★			★			★			★		
	1,0	5,2	1,0	20	05	CXS-05R 100-5220R/L	3,75	2,45	-	3	42,3	0,50	★			★			★			★		
	1,0	5,2	1,17*(.046)*	20		058-5220R/L	3,75	2,45	–	3	42,5	0,58	★			★			★			★		
	1,0	5,2	1,5	20		150-5220R	3,75	2,45	-	3	42,3	0,75	★			★			★			★		
	1,0	5,2	1,63*(.064)*	20		081-5220R/L	3,75	2,45	–	3	42,5	0,81	★			★			★			★		
	1,0	5,2	1,98*(.078)*	20		099-5220R/L	3,75	2,45	–	3	42,5	0,99	★			★			★			★		
	1,0	5,2	2,0	20		200-5220R	3,75	2,45	-	3	42,3	1,00	★			★			★			★		
	1,8	6,2	1,0	25	06	CXS-06R 100-6225R/L	3,95	2,95	-	3	47,3	0,50	★			★			★			★		
	1,8	6,2	1,17*(.046)*	25		058-6225R/L	3,95	2,95	–	3	47,6	0,58	★			★			★			★		
	1,8	6,2	1,5	25		150-6225R/L	3,95	2,95	-	3	47,3	0,75	★			★			★			★		
	1,8	6,2	1,63*(.064)*	25		081-6225R/L	3,95	2,95	–	3	47,6	0,81	★			★			★			★		
	1,8	6,2	1,98*(.078)*	25		099-6225R/L	3,95	2,95	–	3	47,6	0,99	★			★			★			★		
	1,8	6,2	2,0	25		200-6225R/L	3,95	2,95	-	3	47,3	1,00	★			★			★			★		
	2,5	7,2	1,0	30	07	100-7230R/L	4,25	3,45	-	3	52,3	0,50	★			★			★			★		
	2,5	7,2	1,17*(.046)*	30		CXS-07R 058-7230R/L	4,25	3,45	–	3	52,7	0,58	★			★			★			★		
	2,5	7,2	1,5	30		150-7230R/L	4,25	3,45	-	3	52,3	0,75	★			★			★			★		
	2,5	7,2	1,63*(.064)*	30		081-7230R/L	4,25	3,45	–	3	52,7	0,81	★			★			★			★		
	2,5	7,2	1,98*(.078)*	30		099-7230R/L	4,25	3,45	–	3	52,7	0,99	★			★			★			★		
	2,5	7,2	2,0	30		200-7230R/L	4,25	3,45	-	3	52,3	1,00	★			★			★			★		
Face grooving	2,0	6,2	1,0	15	06	CXS-06F 100-6215AR	6,0	2,95	–	3	37,3	0,15	★			★			★			★		
	3,0	6,2	1,5	15		150-6215AR	6,0	2,95	–	3	37,3	0,15	★			★			★			★		
	4,0	6,2	2,0	15		200-6215AR	6,0	2,95	–	3	37,3	0,15	★			★			★			★		
	5,0	6,2	2,5	15		250-6215AR	6,0	2,95	–	3	37,3	0,15	★			★			★			★		
	6,0	6,2	3,0	15		300-6215AR	6,0	2,95	–	3	37,3	0,15	★			★			★			★		
Pre-parting	0,7	5,2	1,00	15	05	CXS-05GX100-5215R/L	3,75	2,45	0,20	3	37,3	0,50	★			★				★			★	
	0,7	5,2	1,00	20		100-5220R	3,75	2,45	0,20	3	42,3	0,75	★			★				★			★	
	0,7	5,2	1,00	25		100-5225R/L	3,75	2,45	0,20	3	47,3	1,00	★			★				★			★	
	0,7	5,2	1,00	30		100-5230R	3,75	2,45	0,20	3	52,3	1,00	★			★				★			★	
													P25			M15			N15			S15		

= New item

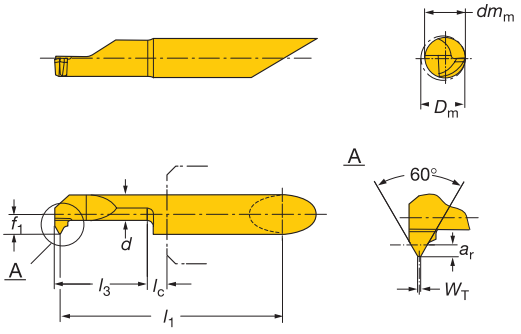
[1] To correspond with insert size on boring bar.

Ordering example: 10 pieces CXS-04R100-4215R 1025
CXS-04R100-4215L 1025
R = Right hand, L = Left hand

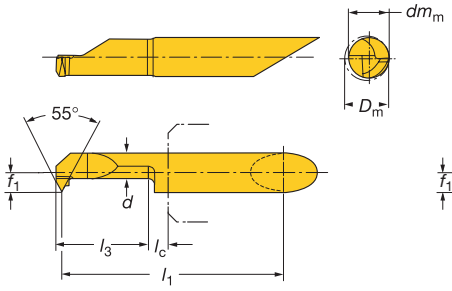
CoroTurn XS inserts

Threading

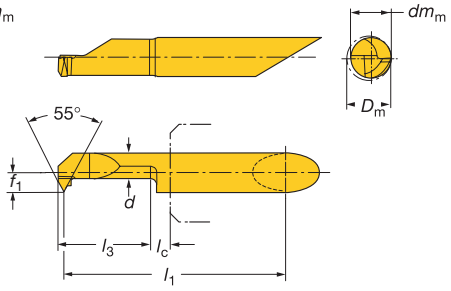
CXS-05TH VM V-profile 60°



CXS-05TH WH Withworth 55°

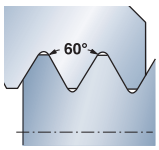
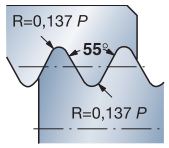
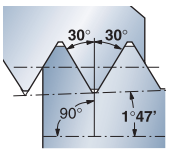


CXS-05TH NT NPT 60°



Coromant grades

GC = Coated carbide/Cermet

	Insert size[1]	Ordering code	Pitch mm (t.p.i.)	Dimensions, mm								P		M		N		S	
												GC		GC		GC		GC	
	dm_m			a_r max	d	D_m min	f_1	l_c	l_1	l_3	W_T	1025		1025		1025		1025	
V-profile 60°	04	0,50	**CXS-04TH 050VM-4215R/L**	0,27	2,95	4,2	1,95	3	32,3	15,0	0,06	★		★		★		★	
	05	0,50	**CXS-05TH 050VM-5215R**	0,27	3,75	5,2	2,45	3	37,3	15,0	0,06	★		★		★		★	
		0,75	**070VM-5115R**	0,40	3,65	5,1	2,35	3	37,3	15,0	0,09	★		★		★		★	
		1,00	**100VM-4815R/L**	0,55	3,55	4,8	2,25	3	37,3	15,0	0,12	★		★		★		★	
	06	1,00	**CXS-06TH 100VM-6215R/L**	0,55	3,55	6,2	2,95	3	37,3	15,0	0,12	★		★		★		★	
		1,25	**125VM-6215R/L**	0,68	3,55	6,2	2,95	3	37,3	15,0	0,12	★		★		★		★	
		1,50	**150VM-6215R/L**	0,81	3,55	6,2	2,95	3	37,3	15,0	0,12	★		★		★		★	
Withworth 55°	05	(24)	**CXS-05TH 24WH-5215R**	–	3,75	5,2	2,45	3	37,3	15,0	–	★		★		★		★	
		(26)	**26WH-5215R**	–	3,75	5,2	2,45	3	37,3	15,0	–	★		★		★		★	
		(28)	**28WH-5215R**	–	3,75	5,2	2,45	3	37,3	15,0	–	★		★		★		★	
	06	(19)	**CXS-06TH 19WH-6215R/L**	–	3,95	6,2	2,95	3	37,3	15,0	–	★		★		★		★	
		(20)	**20WH-6215R**	–	3,95	6,2	2,95	3	37,3	15,0	–	★		★		★		★	
		(22)	**22WH-6215R**	–	3,95	6,2	2,95	3	37,3	15,0	–	★		★		★		★	
		(24)	**24WH-6215R**	–	3,95	6,2	2,95	3	37,3	15,0	–	★		★		★		★	
		(26)	**26WH-6215R**	–	3,95	6,2	2,95	3	37,3	15,0	–	★		★		★		★	
		(28)	**28WH-6215R**	–	3,95	6,2	2,95	3	37,3	15,0	–	★		★		★		★	
NPT 60°	06	(18)	**CXS-06TH 18NT-6215R/L**	–	3,95	6,2	2,95	3	37,3	15,0	–	★		★		★		★	
		(27)	**27NT-6215R**	–	3,95	6,2	2,95	3	37,3	15,0	–	★		★		★		★	
												P25		M15		N15		S15	

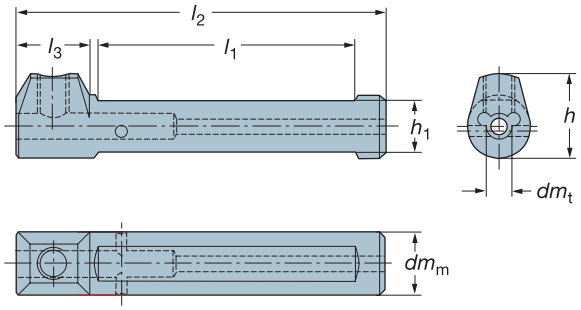
= New item

[1] To correspond with insert size on boring bar.

Ordering example: 10 pieces CXS-04TH050VM-4215R 1025
CXS-04TH050VM-4215L 1025
R = Right hand, L = Left hand

CoroTurn XS boring bars

With internal coolant supply



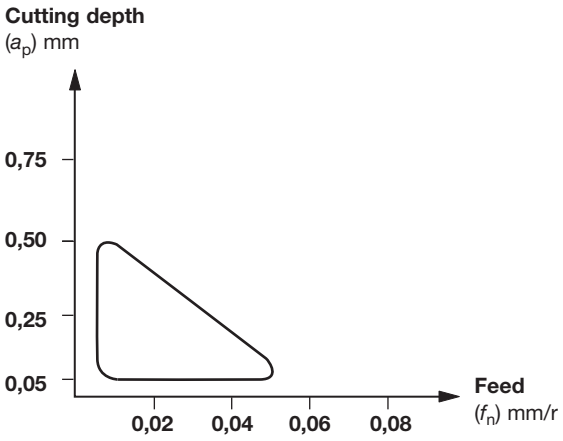
To be used with insert size	Ordering code	Dimensions, mm dm_m (inch)	dm_t	h	h_1	l_1	l_2	l_3	Torque Nm	Spare parts Screw	Key (Torx Plus)
	Metric design										
04	**CXS- A10-04**	10	4	14,5	8	45	65	14	3,0	5514 013-01	5680 049-01 (15IP)
	A12-04	12	4	15,5	10	50	70	14			
	A16-04	16	4	17,5	14	55	75	14			
	A20-04	20	4	20,0	18	70	90	14			
05	**CXS- A10-05**	10	5	15,0	8	45	65	14	3,0	5514 013-01	5680 049-01 (15IP)
	A12-05	12	5	16,0	10	50	70	14			
	A16-05	16	5	18,0	14	55	75	14			
	A20-05	20	5	20,0	18	70	90	14			
06	**CXS- A12-06**	12	6	16,5	10	50	70	14	3,0	5514 013-01	5680 049-01 (15IP)
	A16-06	16	6	18,5	14	55	75	14			
	A20-06	20	6	22,0	18	70	90	14			
07	**CXS- A16-07**	16	7	19,0	14	55	75	14	3,0	5514 013-01	5680 049-01 (15IP)
	A20-07	20	7	22,0	18	70	90	14			
	Inch design										
04	**CXS- A0500-04**	12,7 (½)	4	15,5	10	45	70	14	3,0	5514 013-01	5680 049-01 (15IP)
	A0625-04	15,9 (⅜)	4	17,5	14	55	75	14			
	A0750-04	19,1 (¾)	4	20,0	18	70	90	14			
	A1000-04	25,4 (1)	4	25,4	23	69	89	14			
05	**CXS- A0500-05**	12,7 (½)	5	16,0	10	45	70	14	3,0	5514 013-01	5680 049-01 (15IP)
	A0625-05	15,9 (⅜)	5	18,0	14	55	75	14			
	A0750-05	19,1 (¾)	5	20,0	18	70	90	14			
	A1000-05	25,4 (1)	5	25,4	23	69	89	14			
06	**CXS- A0500-06**	12,7 (½	6	16,5	10	45	70	14	3,0	5514 013-01	5680 049-01 (15IP)
	A0625-06	15,9 (⅜)	6	18,5	14	55	75	14			
	A0750-06	19,1 (¾)	6	22,0	18	70	90	14			
	A1000-06	25,4 (1)	6	25,4	23	69	89	14			
07	**CXS- A0625-07**	15,9 (⅜)	7	19,0	14	55	75	14	3,0	5514 013-01	5680 049-01 (15IP)
	A0750-07	19,1 (¾)	7	22,0	18	70	90	14			
	A1000-07	25,4 (1)	7	25,4	23	69	89	14			

= New item

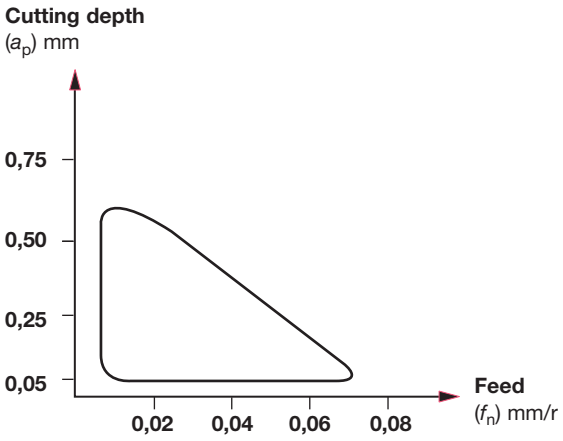
Ordering example: 10 pieces CXS-A10-04

Cutting data recommendations

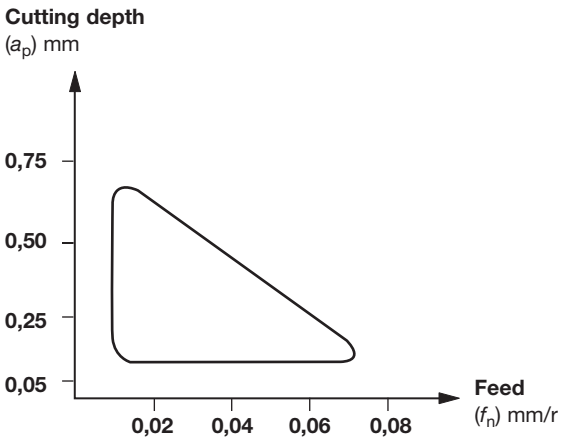
Turning, insert size 04



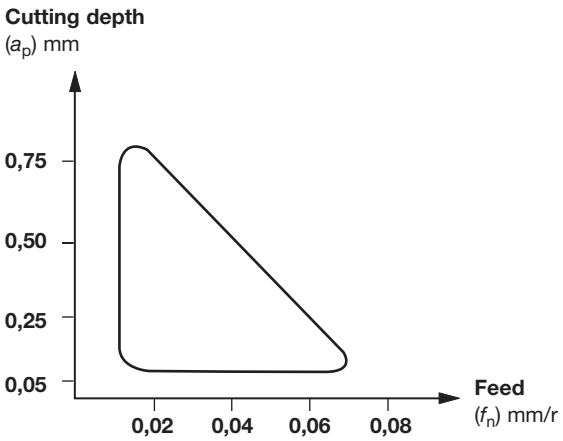
Turning, insert size 05



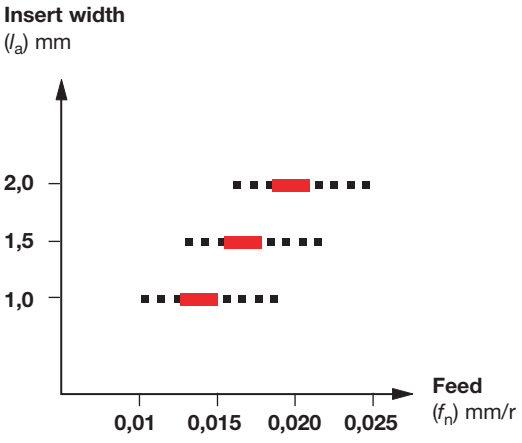
Turning, insert size 06



Turning, insert size 07



Grooving



= Recommended starting value.

Threading, (Infeed recommendations)

Thread	Insert	a_p	nap
V-profile 60°	CXS-04TH 050VM-4215R	0.68	14
	CXS-05TH 050VM-5215R	0.27	7
	070VM-5115R	0.40	8
	100VM-4815R	0.55	11
	CXS-06TH 100VM-6215R	0.55	11
	125VM-6215R	0.68	11
	150VM-6215R	0.81	13
Withworth 55°	CXS-05TH 24WH-5215R	0.65	13
	26WH-5215R	0.60	12
	28WH-5215R	0.87	14
	CXS-06TH 19WH-6215R	0.82	14
	20WH-6215R	0.74	12
	22WH-6215R	0.68	11
	24WH-6215R	0.65	11
	26WH-6215R	0.60	10
	28WH-6215R	0.27	7
NPT 60°	CXS-06TH 18NT-6215R	1.06	18
	27NT-6215R	0.71	12

a_p = total depth of thread

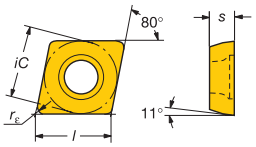
nap = number of passes

Cutting speed recommendations

Cutting speed (v_c) m/min	P	M	N	S
	60–200	60–180	90–400	20–50

Positive inserts - CoroTurn™ 111

Rhombic 80°



For dimensions, see code key on page A 10.

Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CT = Cermet (ISO = HT)
– = Uncoated cemented carbide (ISO = HW)

				P					M					K			S	
				CT	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	–	–	GC
				5015	1525	4015	4025	4035	1025	2015	2025	2035	3005	3025	H13A	H13A	1025
Finishing	 **PF** **P-Line** First choice for steel finishing.	CPMT	06 02 02-PF	★		★	☆											
			06 02 04-PF	☆		☆	☆											
	 **MF** **M-Line** First choice for stainless steel finishing.	CPMT	06 02 02-MF						★									★
			06 02 04-MF						☆	★	☆							★
	 **KF** **K-Line** First choice for cast iron finishing.	CPMT	06 02 04-KF										★	☆				
Medium	 **PM** **P-Line** First choice for steel medium machining.	CPMT	06 02 04-PM	☆	☆	☆	★	☆										
			06 02 08-PM	☆	☆	☆	★	☆										
	 **MM** **M-Line** First choice for stainless steel medium machining.	CPMT	06 02 04-MM						☆	★	☆							
			06 02 08-MM						☆	★	☆							
	 **KM** **K-Line** First choice for cast iron medium machining.	CPMT	06 02 04-KM										★	☆	☆	★		
			06 02 08-KM										★	☆	☆	★		
				P05	P15	P15	P25	P35	M15	M15	M25	M35	K10	K20	K15	S15	S15	

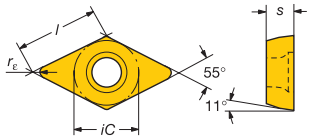
Ordering example: 10 pieces CPMT 06 02 02-PF 5015

★ = First choice

SANDVIK Coromant

Positive inserts - CoroTurn™ 111

Rhombic 55°



For dimensions, see code key on page A 10.

Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CT = Cermet (ISO = HT)
– = Uncoated cemented carbide (ISO = HW)

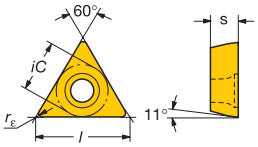
				P					M					K			S	
				CT	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	–	–	GC
				5015	1525	4015	4025	4035	1025	2015	2025	2035	3005	3025	H13A	H13A	1025
Finishing	 **PF** **P-Line** First choice for steel finishing.	DPMT	07 02 02-PF	★														
			07 02 04-PF	☆		★	☆											
	 **MF** **M-Line** First choice for stainless steel finishing.	DPMT	07 02 02-MF						★									★
			07 02 04-MF						☆	★	☆							★
	 **KF** **K-Line** First choice for cast iron finishing.	DPMT	07 02 04-KF										★	☆				
Medium	 **PM** **P-Line** First choice for steel medium machining.	DPMT	07 02 04-PM	☆	☆	☆	★	☆										
			07 02 08-PM	☆	☆	☆	★	☆										
			11 T3 04-PM	☆	☆	☆	★	☆										
			11 T3 08-PM	☆	☆	☆	★	☆										
	 **MM** **M-Line** First choice for stainless steel medium machining.	DPMT	07 02 04-MM							☆	★	☆						
			07 02 08-MM							☆	★	☆						
			11 T3 04-MM						☆	☆	★	☆						★
			11 T3 08-MM						☆	☆	★	☆						★
	 **KM** **K-Line** First choice for cast iron medium machining.	DPMT	07 02 04-KM										★	☆	☆	★		
			07 02 08-KM										★	☆	☆	★		
			11 T3 04-KM										★	☆	☆	★		
			11 T3 08-KM										★	☆	☆	★		
				P05	P15	P15	P25	P35	M15	M15	M25	M35	K10	K20	K15	S15	S15	

Ordering example: 10 pieces DPMT 07 02 02-PF 5015

★ = First choice

Positive inserts - CoroTurn™ 111

Triangular



For dimensions, see code key on page A 10.

Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CT = Cermet (ISO = HT)
– = Uncoated cemented carbide (ISO = HW)

				P					M				K			S	
				CT	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	–	–	GC
				5015	1525	4015	4025	4035	1025	2015	2025	2035	3005	3025	H13A	H13A	1025
Finishing	 **PF** **P-Line** First choice for steel finishing.	TPMT	06 T1 02-PF	★		★	☆										
			06 T1 04-PF	☆		★	☆										
			09 02 02-PF	★													
			09 02 04-PF	☆		★	☆										
			11 03 02-PF	★													
			11 03 04-PF	☆		★	☆										
			16 T3 04-PF	☆		★	☆										
	 **MF** **M-Line** First choice for stainless steel finishing.	TPMT	06 T1 02-MF						★								★
			06 T1 04-MF						☆	★	☆						★
			09 02 02-MF						★								★
			09 02 04-MF						☆	★	☆						★
			11 03 02-MF						★								★
			11 03 04-MF						☆	★	☆						★
			16 T3 04-MF						☆	★	☆						★
	 **KF** **K-Line** First choice for cast iron finishing.	TPMT	06 T1 04-KF										★	☆			
			09 02 04-KF										★	☆			
			11 03 04-KF										★	☆			
			16 T3 04-KF										★	☆			
Medium	 **PM** **P-Line** First choice for steel medium machining.	TPMT	09 02 04-PM	☆	☆	☆	★	☆									
			09 02 08-PM	☆	☆	☆	★	☆									
			11 03 04-PM	☆	☆	☆	★	☆									
			11 03 08-PM	☆	☆	☆	★	☆									
			16 T3 04-PM	☆	☆	☆	★										
			16 T3 08-PM	☆	☆	☆	★										
			16 T3 12-PM	☆	☆	☆	★										
	 **MM** **M-Line** First choice for stainless steel medium machining.	TPMT	09 02 04-MM							☆	★	☆					
			09 02 08-MM							☆	★	☆					
			11 03 04-MM						☆	☆	★	☆					★
			11 03 08-MM						☆	☆	★	☆					★
			16 T3 04-MM							☆	★	☆					
			16 T3 08-MM							☆	★	☆					
			16 T3 12-MM							☆	★	☆					
	 **KM** **K-Line** First choice for cast iron medium machining.	TPMT	09 02 04-KM										★	☆	☆	★	
			09 02 08-KM										★	☆	☆	★	
			11 03 04-KM										★	☆	☆	★	
			11 03 08-KM										★	☆	☆	★	
			16 T3 04-KM										★	☆	☆	★	
			16 T3 08-KM										★	☆	☆	★	
			16 T3 12-KM										★	☆	☆	★	
				P05	P15	P15	P25	P35	M15	M15	M25	M35	K10	K20	K15	S15	S15

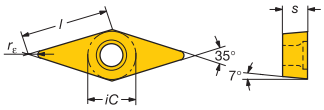
Ordering example: 10 pieces TPMT 06 T1 02-PF 5015

★ = First choice

SANDVIK Coromant

Positive inserts - CoroTurn™ 111

Rhombic 35°



For dimensions, see code key on page A 10.

Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CT = Cermet (ISO = HT)
– = Uncoated cemented carbide (ISO = HW)

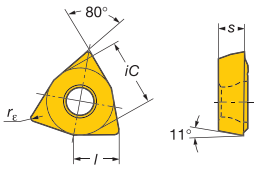
				P					M				K			S	
				CT	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	–	–	GC
				5015	1525	4015	4025	4035	1025	2015	2025	2035	3005	3025	H13A	H13A	1025
Finishing	 **PF** **P-Line** First choice for steel finishing.	VCMT	11 03 02-PF	★		★	☆										
			11 03 04-PF	☆													
	 **MF** **M-Line** First choice for stainless steel finishing.	VCMT	11 03 02-MF						★								★
			11 03 04-MF						☆	★	☆						★
	 **KF** **K-Line** First choice for cast iron finishing.	VCMT	11 03 04-KF										★	☆			
Medium	 **PM** **P-Line** First choice for steel medium machining.	VCMT	11 03 04-PM	☆	☆	☆	★	☆									
			11 03 08-PM	☆	☆	☆	★	☆									
	 **MM** **M-Line** First choice for stainless steel medium machining.	VCMT	11 03 04-MM						☆	☆	★	☆					★
			11 03 08-MM						☆	☆	★	☆					★
	 **KM** **K-Line** First choice for cast iron medium machining.	VCMT	11 03 04-KM										★	☆	☆	★	
			11 03 08-KM										★	☆	☆	★	
				P05	P15	P15	P25	P35	M15	M15	M25	M35	K10	K20	K15	S15	S15

Ordering example: 10 pieces VCMT 11 03 02-PF 5015

★ = First choice

Positive inserts - CoroTurn™ 111

Trigon 80°



For dimensions, see code key on page A 10.

Coromant grades

For ISO application areas, see bottom of the page.
For grade descriptions, see section K.

GC = Coated carbide/Cermet (ISO = HC)
CT = Cermet (ISO = HT)
– = Uncoated cemented carbide (ISO = HW)

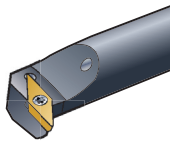
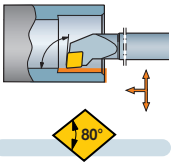
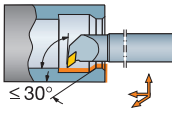
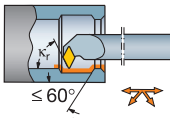
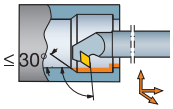
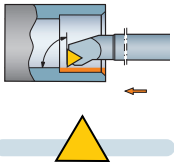
				P					M				K			S	
				CT	GC	GC	GC	GC	GC	GC	GC	GC	GC	GC	–	–	GC
				5015	1525	4015	4025	4035	1025	2015	2025	2035	3005	3025	H13A	H13A	1025
Finishing	PF **P-Line** First choice for steel finishing.	WPMT	02 01 02-PF	★													
			02 01 04-PF	☆		★	☆										
			04 02 02-PF	★													
			04 02 04-PF	☆		★	☆										
	MF **M-Line** First choice for stainless steel finishing.	WPMT	02 01 02-MF						★								★
			02 01 04-MF						☆	★	☆						★
			04 02 02-MF						★								★
			04 02 04-MF						☆	★	☆						★
	KF **K-Line** First choice for cast iron finishing.	WPMT	02 01 04-KF											★			
			04 02 04-KF										★	☆			
Medium	PM **P-Line** First choice for steel medium machining.	WPMT	04 02 04-PM	☆	☆	☆	★	☆									
			04 02 08-PM	☆	☆	☆	★	☆									
	MM **M-Line** First choice for stainless steel medium machining.	WPMT	04 02 04-MM						☆	☆	★	☆					★
			04 02 08-MM						☆	☆	★	☆					★
	KM **K-Line** First choice for cast iron medium machining.	WPMT	04 02 04-KM										★	☆	☆	★	
			04 02 08-KM										★	☆	☆	★	
				P05	P15	P15	P25	P35	M15	M15	M25	M35	K10	K20	K15	S15	S15

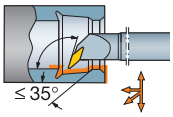
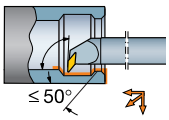
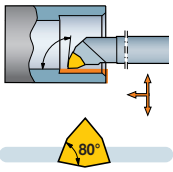
Ordering example: 10 pieces WPMT 02 01 02-PF 5015

★ = First choice

Steel shank boring bars

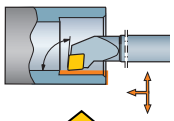
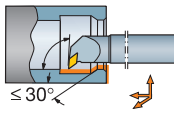
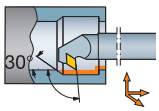
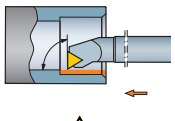
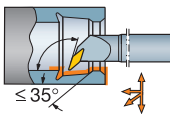
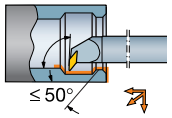
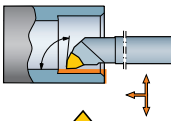
CoroTurn™ 111 screw clamp design

Entering angle κ_r	95°	93°	75°	93°	91°
					
	SCLPR/L	SDUPR/L	SDXPR/L	SDUPR/L-X Back boring	STFPR/L
	A 189	A 189	A 190	A 190	A 191

107°30'	93°	95°
		
SVQCR/L	SVUCR/L	SWLPR/L
A 191	A 192	A 192

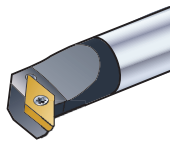
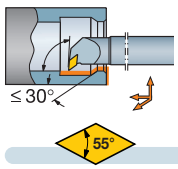
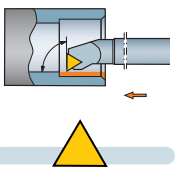
Carbide shank boring bars

CoroTurn™ 111 screw clamp design

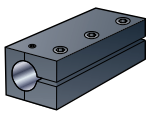
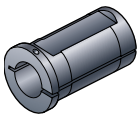
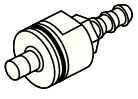
95°	93°	63°	91°	107°30'	93°	95°
						
SCLPR/L	SDUPR/L	SDUPR/L-X Back boring	STFPR/L	SVQCR/L	SVUCR/L	SWLPR/L
A 193	A 193	A 193	A 194	A 194	A 194	A 194

Damped carbide shank boring bars

CoroTurn™ 111 screw clamp design

Entering angle κ_r	95°	93°
		
	SDUPR/L	STFPR/L
	A 195	A 195

Accessories

Sleeves – Easy-fix		Coolant connector
		
131	132	
A 212	A 212	A 212

Steel shank boring bars

CoroTurn™ 111 screw clamp design

Entering angle: κ_r 95°

CPMT

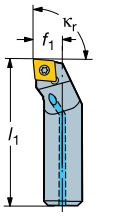
Max overhang 4 x dm_m

All with internal coolant supply

Right hand style shown

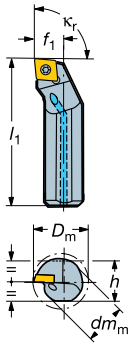
A...-SCLPR/L

κ_r 95°



A...-SCLPR/L

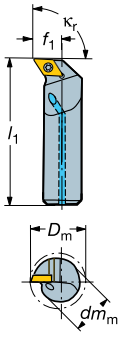
κ_r 95°



DPMT

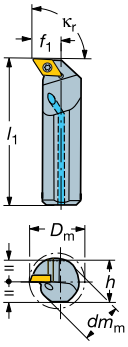
A...-SDUPR/L

κ_r 93°



A...-SDUPR/L

κ_r 93°



	Ordering code		Dimensions, mm						Gauge inserts	Torque Nm
			dm_m	D_m min	f_1	h	l_1	λ_s		
Cylindrical κ_r **95°**	06	**A08K-SCLPR/L 06-R**	8	10	5	–	125	-10°	CPMT 06 02 04	0,9
		A10K-SCLPR/L 06-R	10	12	6	–	125	-7°		
		A12M-SCLPR/L 06-R	12	16	9	–	150	-3°		
With flats	06	**A08K-SCLPR/L 06**	8	10	5	7	125	-10°	CPMT 06 02 04	0,9
		A10K-SCLPR/L 06	10	12	6	9	125	-7°		
		A12M-SCLPR/L 06	12	16	9	11	150	-3°		

	Ordering code		Dimensions, mm						Gauge inserts	Torque Nm
			dm_m	D_m min	f_1	h	l_1	λ_s		
Cylindrical κ_r **93°**	07	**A10K-SDUPR/L 07-ER**	10	15	9	–	125	-2°	DPMT 07 02 04	0,9
		A12M-SDUPR/L 07-ER	12	18	11	–	150	-1°		
		A16R-SDUPR/L 07-R	16	20	11	–	200	0°		
	11	**A20S-SDUPR/L 11-R**	20	25	13	–	250	-1°	DPMT 11 T3 08	3,0
With flats	07	**A10K-SDUPR/L 07-E**	10	15	9	9	125	-2°	DPMT 07 02 04	0,9
		A12M-SDUPR/L 07-E	12	18	11	11	150	-1°		
		A16R-SDUPR/L 07	16	20	11	15	200	0°		
	11	**A20S-SDUPR/L 11**	20	25	13	18	250	-1°	DPMT 11 T3 08	3,0
		A25T-SDUPR/L 11	25	32	17	23	300	2°		

λ_s = Angle of inclination.

Ordering example: 2 pieces A08K-SCLPR 06-R

Main spare parts

Insert size Bar dia.	Bar dia.	Insert screw	Key Torx Plus
06 8-10		5513 020-21	5680 051-02 (7IP)
06 12		5513 020-46	5680 051-02 (7IP)
	07 10	5513 020-48	5680 051-02 (7IP)
	07 12-16	5513 020-03	5680 051-02 (7IP)
	11 20-25	5513 020-09	5680 049-01 (15IP)

For additional spare parts and accessories, see complete spare part list.

Steel shank boring bars

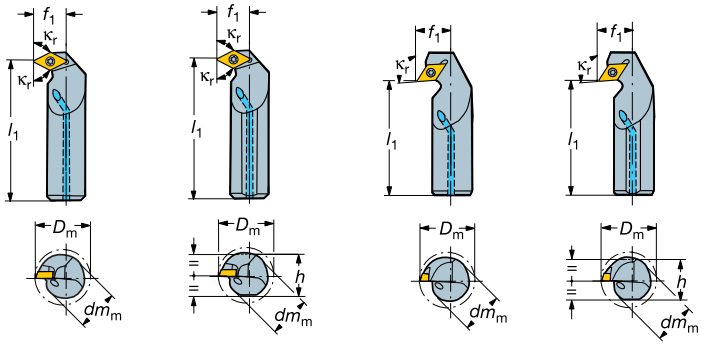
CoroTurn™ 111 screw clamp design

	A...-SDXPR/L	A...-SDXPR/L	A...-SDUPR/L-X	A...-SDUPR/L-X
Entering angle:	κ_r 63°	κ_r 63°	κ_r 93°	κ_r 93°

DPMT

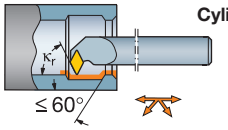
Max overhang 4 x dm_m

All with internal coolant supply

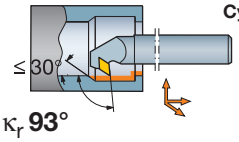


Right hand style shown

Ordering code			Dimensions, mm						Gauge inserts	Torque Nm
		L R	dm_m	D_m min	f_1	h	l_1	λ_s		
Cylindrical	**07**	**A16R-SDXPR/L 07-ER**	16	22	13	–	200	0°	DPMT 07 02 04	0,9
With flats	**07**	**A16R-SDXPR/L 07-E**	16	22	13	15	200	0°	DPMT 07 02 04	0,9
Cylindrical	**07**	**A16R-SDUPR/L 07-ERX**	16	22	13	–	200	1°	DPMT 07 02 04	0,9
With flats	**07**	**A16R-SDUPR/L 07-EX**	16	22	13	15	200	1°	DPMT 07 02 04	0,9



κ_r 63°



κ_r 93°

Back boring

λ_s = Angle of inclination.

Ordering example: 2 pieces A16R-SDXPR 07-ER

Main spare parts

Insert size Bar dia.	Insert screw	Key Torx Plus
07 16	5513 020-03	5680 051-02 (7IP)

For additional spare parts and accessories, see complete spare part list.

Steel shank boring bars

CoroTurn™ 111 screw clamp design

Entering angle: κ_r 91°

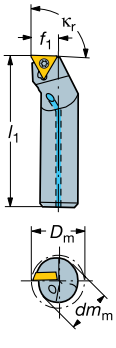
TPMT

Max overhang 4 x dm_m

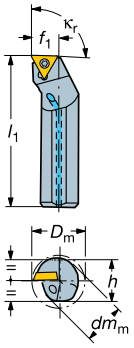
All with internal coolant supply

Right hand style shown

A...-STFPR/L κ_r 91°



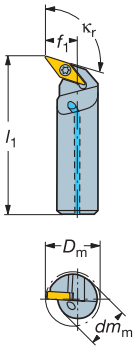
A...-STFPR/L κ_r 91°



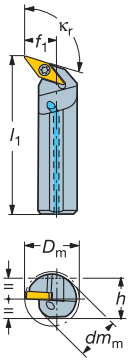
VCMT, VCGX

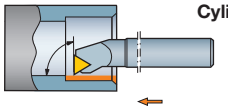
VCMW

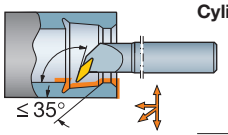
A...-SVQCR/L κ_r 107°30'



A...-SVQCR/L κ_r 107°30'



		Ordering code		Dimensions, mm							
				dm_m	D_m min	f_1	h	l_1	λ_s	Gauge inserts	Torque Nm
 κ_r **91°**	Cylindrical	**06**	**A06F-STFPR/L 06-R**	6	8,5	4,5	–	80	-9°	TPMT 06 T1 02	0,6
			A08H-STFPR/L 06-R	8	10	5	–	100	-8°		
		09	**A10K-STFPR/L 09-R**	10	13	7	–	125	-3°	TPMT 09 02 04	0,9
			A12M-STFPR/L 09-R	12	16	9	–	150	-2°		
		11	**A12M-STFPR/L 11-R**	12	16	9	–	150	-2°	TPMT 11 03 04	0,9
			A16R-STFPR/L 11-R	16	20	11	–	200	0°		
		16	**A20S-STFPR/L 16-R**	20	25	13	–	250	-1°	TPMT 16 T3 08	3,0
	With flats	**06**	**A06H-STFPR/L 06**	6	8,5	4,5	5	100	-9°	TPMT 06 T1 02	0,6
			A08K-STFPR/L 06	8	10	5	7	125	-8°		
		09	**A10K-STFPR/L 09**	10	13	7	9	125	-3°	TPMT 09 02 04	0,9
			A12M-STFPR/L 09	12	16	9	11	150	-2°		
		11	**A12M-STFPR/L 11**	12	16	9	11	150	-2°	TPMT 11 03 04	0,9
			A16R-STFPR/L 11	16	20	11	15	200	0°		
		16	**A20S-STFPR/L 16**	20	25	13	18	250	-1°	TPMT 16 T3 08	3,0
			A25T-STFPR/L 16	25	32	17	23	300	1°		

		Ordering code		Dimensions, mm							
				dm_m	D_m min	f_1	h	l_1	λ_s	Gauge inserts	Torque Nm
 ≤ 35° κ_r **107°30'**	Cylindrical	**11**	**A16R-SVQCR/L 11-ER**	16	22	13	–	200	-4°	VCMT 11 03 04	0,9
	With flats	**11**	**A16R-SVQCR/L 11-E**	16	22	13	15	200	-4°	VCMT 11 03 04	0,9

λ_s = Angle of inclination.

Ordering example: 2 pieces A06F-STFPR 06-R

Main spare parts

Insert size Bar dia.	Bar dia.	Insert screw	Key Torx Plus
06 6		5513 020-44	5680 051-01 (6IP)
06 8		5513 020-28	5680 051-01 (6IP)
09 10-12		5513 020-47	5680 051-02 (7IP)
11 12		5513 020-48	5680 051-02 (7IP)
11 16		5513 020-03	5680 051-02 (7IP)
16 20		5513 020-09	5680 049-01 (15IP)
16 25		5513 020-10	5680 049-01 (15IP)
	11 16	5513 020-03	5680 051-02 (7IP)

For additional spare parts and accessories, see complete spare part list.

Steel shank boring bars

CoroTurn™ 111 screw clamp design

Entering angle:

VCMT, VCEX, VCGX

VCMW

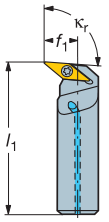
Max overhang 4 x dm_m

All with internal coolant supply

Right hand style shown

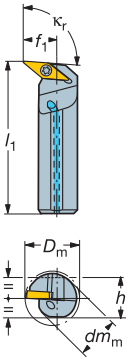
A...-SVUCR/L

κ_r 93°



A...-SVUCR/L

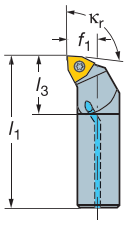
κ_r 93°



WPMT

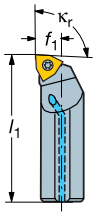
A...-SWLPR/L

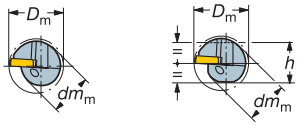
κ_r 95°

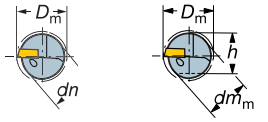


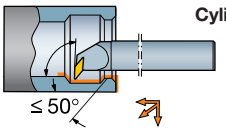
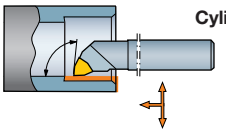
A...-SWLPR/L

κ_r 95°







		Ordering code		Dimensions, mm								
				dm_m	D_m min	f_1	h	l_1	l_3	λ_s	Gauge inserts	Torque Nm
	Cylindrical	11	**A16R-SVUCR/L 11-ER**	16	22	13	–	200		-4°	VCMT 11 03 04	0,9
κ_r **93°**	With flats	11	**A16R-SVUCR/L 11-E**	16	22	13	15	200		-4°	VCMT 11 03 04	0,9
	Cylindrical	02	**A05F-SWLPR/L 02-R**	5	7	4	–	80	7	-13°	WPMT 02 01 02	0,6
			A06F-SWLPR/L 02-R	6	8,5	4,5	–	80	–	-11°		
			A08H-SWLPR/L 02-R	8	10	5	–	100	–	-10°		
		04	**A10K-SWLPR/L 04-R**	10	12	6	–	125	–	-7°	WPMT 04 02 04	0,9
κ_r **95°**			**A12M-SWLPR/L 04-R**	12	16	9	–	150	–	-3°		
	With flats	02	**A06F-SWLPR/L 02**	6	8,5	4,5	5	80	–	-11°	WPMT 02 01 02	0,6
			A08H-SWLPR/L 02	8	10	5	7	100	–	-10°		
		04	**A10K-SWLPR/L 04**	10	12	6	9	125	–	-7°	WPMT 04 02 04	0,9
			A12M-SWLPR/L 04	12	16	9	11	150	–	-3°		

λ_s = Angle of inclination.

Ordering example: 2 pieces A16R-SVUCR 11-ER

Main spare parts

Insert size Bar dia.	Bar dia.	Insert screw	Key Torx Plus
11 16		5513 020-03	5680 051-02 (7IP)
	02 **5**	5513 020-53	5680 051-01 (6IP)
	02 **6-8**	5513 020-44	5680 051-01 (6IP)
	04 **10**	5513 020-21	5680 051-02 (7IP)
	04 **12**	5513 020-46	5680 051-02 (7IP)

For additional spare parts and accessories, see complete spare part list.

Carbide shank boring bars

CoroTurn™ 111 screw clamp design

E...-SCLPR/L

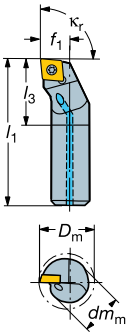
Entering angle: κ_r 95°

CPMT

Max overhang 6 x dm_m

All with internal coolant supply

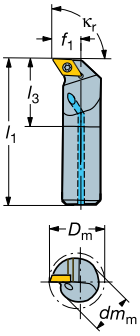
Right hand style shown



E...-SDUPR/L

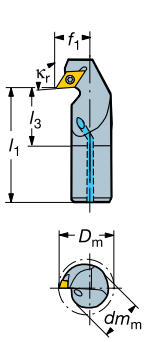
κ_r 93°

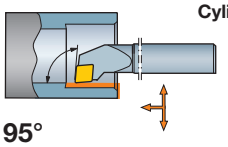
DPMT

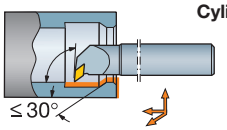
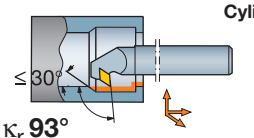


E...-SDUPR/L -X

κ_r 93°



		Ordering code		Dimensions, mm						Gauge inserts	Torque Nm
				dm_m	D_m min	f_1	l_1	l_3	λ_s		
 κ_r **95°**	Cylindrical	06	**E08K-SCLPR/L 06-R**	8	10	5	125	17	-10°	CPMT 06 02 04	0,9
			E10M-SCLPR/L 06-R	10	12	6	150	21	-7°		
			E12Q-SCLPR/L 06-R	12	16	9	180	25	-3°		

		Ordering code		Dimensions, mm						Gauge inserts	Torque Nm
				dm_m	D_m min	f_1	l_1	l_3	λ_s		
 κ_r **93°**	Cylindrical	07	**E10M-SDUPR/L 07-ER**	10	15	9	150	21	-2°	DPMT 07 02 04	0,9
			E12Q-SDUPR/L 07-ER	12	18	11	180	25	-1°		
			E16R-SDUPR/L 07-R	16	20	11	200	33	0°		
 κ_r **93°**	Cylindrical	07	**E16R-SDUPR/L 07-ERX**	16	22	13	200	33	1°	DPMT 07 02 04	0,9
Back boring											

λ_s = Angle of inclination.

Ordering example: 2 pieces E08K-SCLPR 06-R

Main spare parts

Insert size Bar dia.	Bar dia.	Insert screw	Key Torx Plus
06 8-10		5513 020-21	5680 051-02 (7IP)
06 12		5513 020-46	5680 051-02 (7IP)
	07 10	5513 020-48	5680 051-02 (7IP)
	07 12-16	5513 020-03	5680 051-02 (7IP)

For additional spare parts and accessories, see complete spare part list.

Carbide shank boring bars

CoroTurn™ 111 screw clamp design

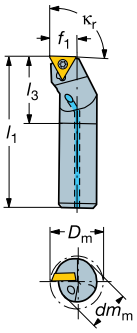
E...-STFPR/L

Entering angle: κ_r 91°

TPMT

Max overhang 6 x dm_m

All with internal coolant supply



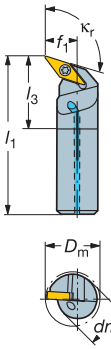
Right hand style shown

VCMT, VCEX, VCGX

VCMW

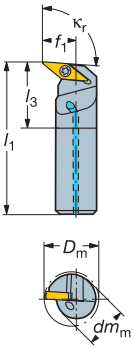
E...-SVQCR/L

κ_r 107°30'



E...-SVUCR/L

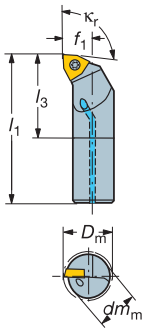
κ_r 93°



WPMT

E...-SWLPR/L

κ_r 95°



	Ordering code		Dimensions, mm							
			dm_m	D_m min	f_1	l_1	l_3	λ_s	Gauge inserts	Torque Nm
Cylindrical κ_r **91°**	**06**	**E06H-STFPR/L 06-R**	6	8,5	4,5	100	13	-9°	TPMT 06 T1 02	0,6
		E08K-STFPR/L 06-R	8	10	5	125	17	-8°		
	09	**E10M-STFPR/L 09-R**	10	13	7	150	21	-3°	TPMT 09 02 04	0,9
		E12Q-STFPR/L 09-R	12	16	9	180	25	-2°		
	11	**E12Q-STFPR/L 11-R**	12	16	9	180	25	-2°	TPMT 11 03 04	0,9
		E16R-STFPR/L 11-R	16	20	11	200	33	0°		

	Ordering code		Dimensions, mm							
			dm_m	D_m min	f_1	l_1	l_3	λ_s	Gauge inserts	Torque Nm
Cylindrical ≤35° κ_r **107°30'**	**11**	**E16R-SVQCR/L 11-ER**	16	22	13	200	33	-4°	VCMT 11 03 04	0,9
Cylindrical ≤50° κ_r **93°**	**11**	**E16R-SVUCR/L 11-ER**	16	22	13	200	33	-4°	VCMT 11 03 04	0,9

	Ordering code		Dimensions, mm							
			dm_m	D_m min	f_1	l_1	l_3	λ_s	Gauge inserts	Torque Nm
Cylindrical κ_r **95°**	**02**	**E05H-SWLPR/L 02-R**	5	7	4	100	11	-13°	WPMT 02 01 02	0,6
		E06H-SWLPR/L 02-R	6	8,5	4,5	100	13	-11°		
		E08K-SWLPR/L 02-R	8	10	5	125	17	-10°		
	04	**E10M-SWLPR/L 04-R**	10	12	6	150	21	-7°	WPMT 04 02 02	0,9
		E12Q-SWLPR/L 04-R	12	16	9	180	25	-3°		

λ_s = Angle of inclination.

Ordering example: 2 pieces E06H-STFPR 06-R

Main spare parts

Insert size Bar dia.	Bar dia.	Bar dia.	Insert screw	Key Torx Plus
06 6			5513 020-44	5680 051-01 (6IP)
06 8			5513 020-28	5680 051-01 (6IP)
09 10-12			5513 020-47	5680 051-02 (7IP)
11 12			5513 020-48	5680 051-02 (7IP)
11 16			5513 020-03	5680 051-02 (7IP)
	11 16		5513 020-03	5680 051-02 (7IP)
		02 5	5513 020-53	5680 051-01 (6IP)
		02 6-8	5513 020-44	5680 051-01 (6IP)
		04 10	5513 020-21	5680 051-02 (7IP)
		04 12	5513 020-46	5680 051-02 (7IP)

For additional spare parts and accessories, see complete spare part list.

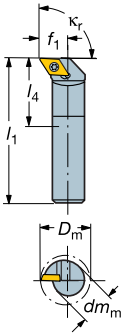
Damped carbide shank boring bars

CoroTurn™ 111 screw clamp design

DPMT

Entering angle: κ_r 93°

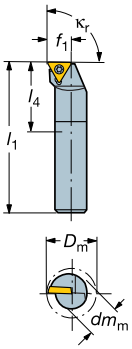
F...-SDUPR/L



TPMT

κ_r 93°

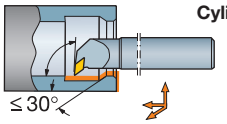
F...-STFPR/L



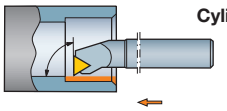
Max overhang 10 x dm_m

Silent Tools™

Right hand style shown

	Ordering code		Dimensions, mm							
			dm_m	D_m min	f_1	l_1	l_4 min	λ_s	Gauge inserts	Torque Nm
 Cylindrical	07	**F10M-SDUPR/L 07-ER**	10	15	9	150	60	-3°	DPMT 07 02 04	0,9
		F12Q-SDUPR/L 07-ER	12	18	11	180	72	-1°		

κ_r **93°**

	Ordering code		Dimensions, mm							
			dm_m	D_m min	f_1	l_1	l_4 min	λ_s	Gauge inserts	Torque Nm
 Cylindrical	09	**F10M-STFPR/L 09-R**	10	13	7	150	60	-4°	TPMT 09 02 04	0,9
		F12Q-STFPR/L 09-R	12	16	9	180	72	-3°		

κ_r **91°**

λ_s = Angle of inclination.

l_4 = minimum overhang (damped part)
Do not clamp in this area.
This is indicated on boring bar.

Ordering example: 2 pieces F10M-SDUPR 07-ER

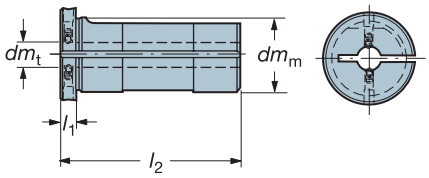
Main spare parts

Insert size Bar dia.	Insert size Bar dia.	Insert screw	Key Torx Plus
07 10		5513 020-48	5680 051-02 (7IP)
07 12		5513 020-03	5680 051-02 (7IP)
	09 10-12	5513 020-47	5680 051-02 (7IP)

For additional spare parts and accessories, see complete spare part list.

New EasyFix sleeves for Swiss type machines

132L-
(ISO 9766)



Bar dia. dm_t	Ordering code	l_1	l_2	dm_m
8	**132L -1208050-B**	5	50	19,05
	-1608050-B	5	50	25,4
10	**-1210050-B**	5	50	19,05
	-1610050-B	5	50	25,4

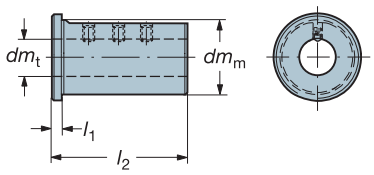
= New item

Ordering example: 2 pieces 132L-1205050-B

For the complete assortment of EasyFix sleeves, see page A 216 in Turning tools catalogue.

Sleeves

132N-



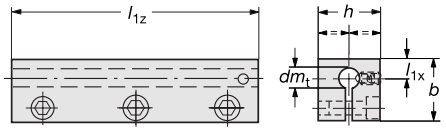
Bar dia. dm_t	Ordering code	l_1	l_2	dm_m	Spare parts: Screw	Spare parts: Key (mm)
6	**132N -2506**	5	61	25	3214 010-356	174.1-864
8	**-2508**	5	61	25	3214 010-406	174-815
10	**-2510**	5	61	25	3214 010-405	174-815
12	**-2512**	5	61	25	3214 010-405	174-815
16	**-2516**	5	61	25	–	–
20	**-2520**	5	61	25	–	–
20	**132N -4020**	5	75	40	3214 010-457	3021 010-050
25	**-4025**	5	75	40	3214 010-456	3021 010-050
32	**-4032**	5	75	40	–	–

Ordering example: 2 pieces 132N-2506

Sleeves – EasyFix

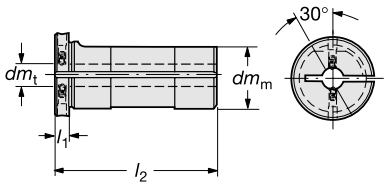
For more information about EasyFix, see page A 175.

131-



Clamping diameter dm_m	Ordering code 131-	Dimensions, mm l_{1Z}	h	b	l_{1X}	Spare parts Screw	Key
5	131-2005-B	80	20	20	5,5	3212 010-258	174.1-864
6	-2006-B	80	20	20	6	3212 010-258	174.1-864
8	-2008-B	80	20	20	7	3212 010-258	174.1-864
10	-2010-B	80	20	20	7,5	3212 010-258	174.1-864
12	-2512-B	80	25	25	9	3212 010-259	174.1-864
16	-2516-B	80	25	25	10	3212 010-259	174.1-864
20	-3220-B	100	32	40	12	3212 010-310	5680 010-05

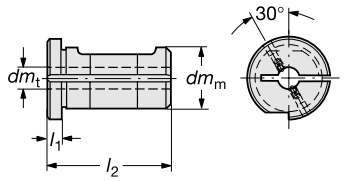
132L-



dm_t	132L- ISO 9766	l_1	l_2	dm_m
6	132L -2506-B	5	61	25
8	-2508-B	5	61	25
10	-2510-B	5	61	25
12	-2512-B	5	61	25
16	-2516-B	5	61	25
20	-4020-B	5	75	40
25	-4025-B	5	75	40

dm_t	132L-	l_1	l_2	dm_m
5	132L-2505085-B	5	85	25
5	-3205085-B	5	85	32
6	-3206085-B	5	85	32
8	-3208085-B	5	85	32
10	-3210085-B	5	85	32
12	-3212085-B	5	85	32
16	-3216085-B	5	85	32
20	-3220085-B	5	85	32
6	-4006105-B	5	105	40
8	-4008105-B	5	105	40
10	-4010105-B	5	105	40
12	-4012105-B	5	105	40
16	-4016105-B	5	105	40
20	-4020105-B	5	105	40
25	-4025105-B	5	105	40
12	-5012125-B	5	125	50
16	-5016125-B	5	125	50
20	-5020125-B	5	125	50
25	-5025125-B	5	125	50

132W- (Whistle Notch)



dm_t	132W- Wistle Notch	l_1	l_2	dm_m
5	132W-2505-B	5	50	25
6	-2506-B	5	50	25
8	-2508-B	5	50	25
10	-2510-B	5	50	25
12	-2512-B	5	50	25
16	-2516-B	5	50	25
20	-4020-B	5	75	40
25	-4025-B	5	75	40

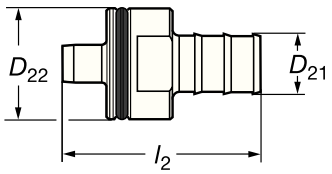
Sleeves for boring bars, type 131- and 132-, can be used for all Sandvik Coromant boring bars in diameter range 6—25 mm

Note!

EasyFix function, the setting of correct center height of the bar, at present only for CoroTurn 107, CoroTurn 111 and CoroCut boring bars.

Ordering example: 2 pieces 131-2006-B

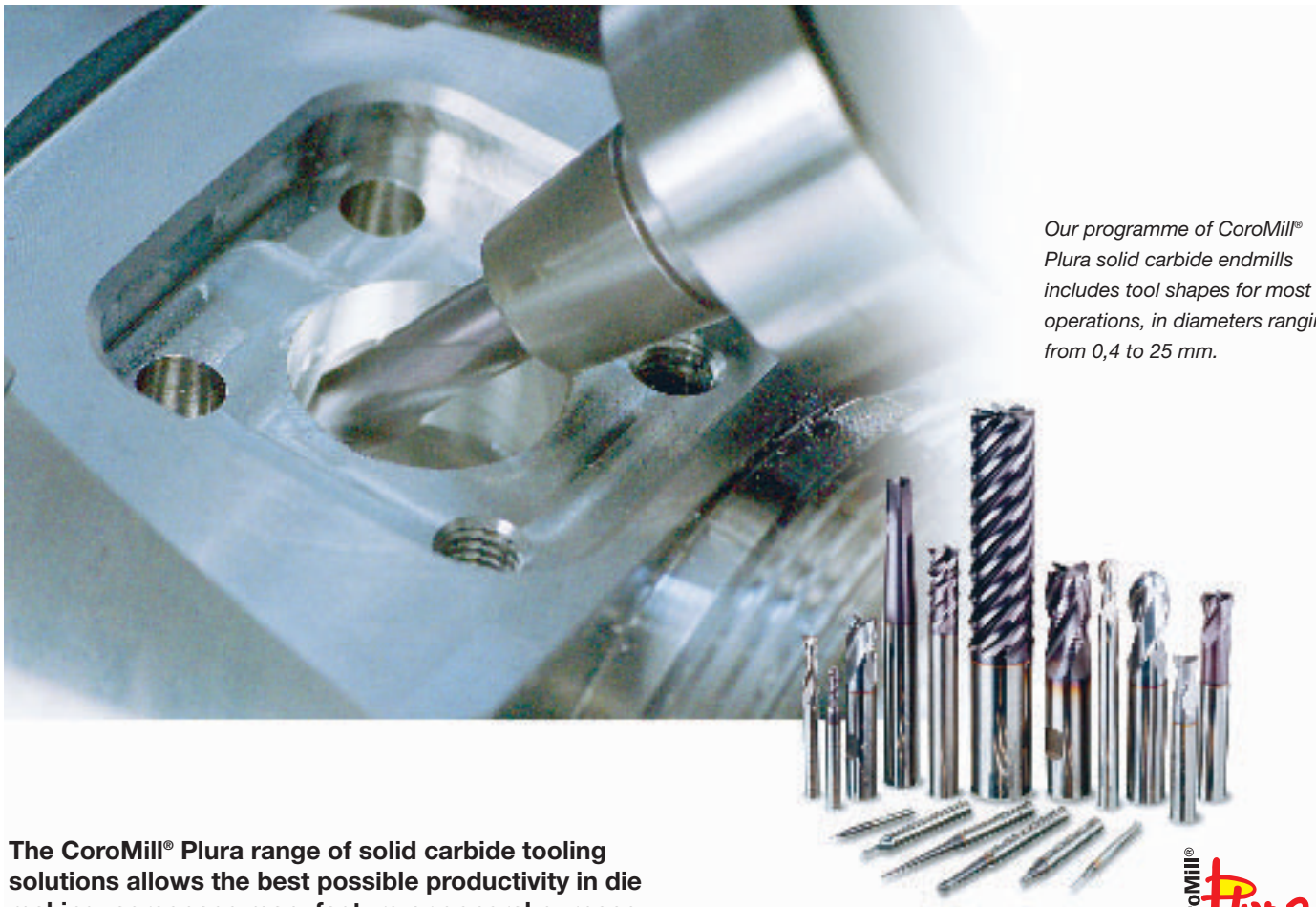
Coolant connectors



Bar dia. dm_t	Ordering code	Dimensions, mm D_{21}	D_{22}	l_2
6	CS-060-054	5,4	6,0	25,0
8	CS-080-066	6,6	8,0	28,5
10	CS-100-086	8,6	10,0	28,5
12	CS-120-086	8,6	12,0	38,0
16	CS-160-137	13,7	16,0	40,0
20	CS-200-137	13,7	20,0	40,0
25	CS-250-137	13,7	25,0	44,0

Ordering example: 2 pieces CS-060-054

The evolution of CoroMill® Plura continues



Our programme of CoroMill® Plura solid carbide endmills includes tool shapes for most operations, in diameters ranging from 0,4 to 25 mm.

The CoroMill® Plura range of solid carbide tooling solutions allows the best possible productivity in die making, aerospace manufacture or general purpose milling.

Following the introduction of GC1610 grade for applications in hard workpieces and the general grades GC1620 and GC1630, Coromant now continues the evolution of the Plura family with another grade, GC1640.
GC1640 is a grade with a Coromant unique PVD TiAlN-coating and a new, very tough substrate based on the Pluratech technology.
With the GC1640 grade, the CoroMill Plura system provides the perfect solution for demanding operations like machining under unstable conditions.

CoroMill Plura and CoroGrip – made for each other

The advanced machining capabilities of Plura and the high precision CoroGrip holding chucks are a perfect match. CoroGrip's design provides clamping forces in excess of anything possible from shrink fit holders or hydraulic chucks, and a level of high stability which makes it the first choice for High Speed Machining (HSM).

CoroMill Plura has been specifically designed for HSM applications, with tool geometries and a new grade family profile allowing the best possible productivity in all workpiece materials.
Together these two complementary technologies can cope with any task you present, in conventional or multi-task machining.

Choosing your CoroMill® Plura endmill

Step 1: Select the Plura grade for your workpiece material

ISO H : Choose grade GC1610
for semi-finishing to finishing operations in hot work steel ≥ 43 HRC and cold work steel ≥ 52 HRC.

Choose grade GC1620
for roughing operations. See page A 151.

ISO P M K S H : Choose grade GC1620
for semi-finishing to finishing operations demanding wear resistance, especially in dry machining. This grade also performs well when machining stainless steels wet.

ISO P M K N S : Choose grade GC1630
for roughing to semi-finishing operations demanding edge line toughness. This grade also works well in machining of very soft and smearing steels.

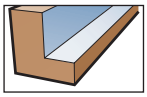
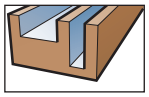
ISO P M K : Choose grade GC1640
for roughing operations where toughness is important or where stability demands a tough grade.

GC1610, GC1620	Dry	Wet
Finishing	GC1610	✗
Semi finishing		
Roughing	GC1620	

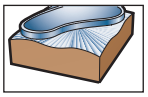
GC1620, GC1630, GC1640	Dry	Wet
Finishing	GC1620	
Semi finishing		GC1630
Roughing		GC1640

Step 2: Classify your machining operation

Milling of straight surfaces or grooving.
(see also keyway slotting – page A 173)

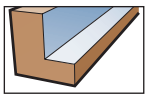
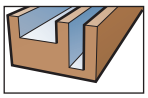
 

or profiling



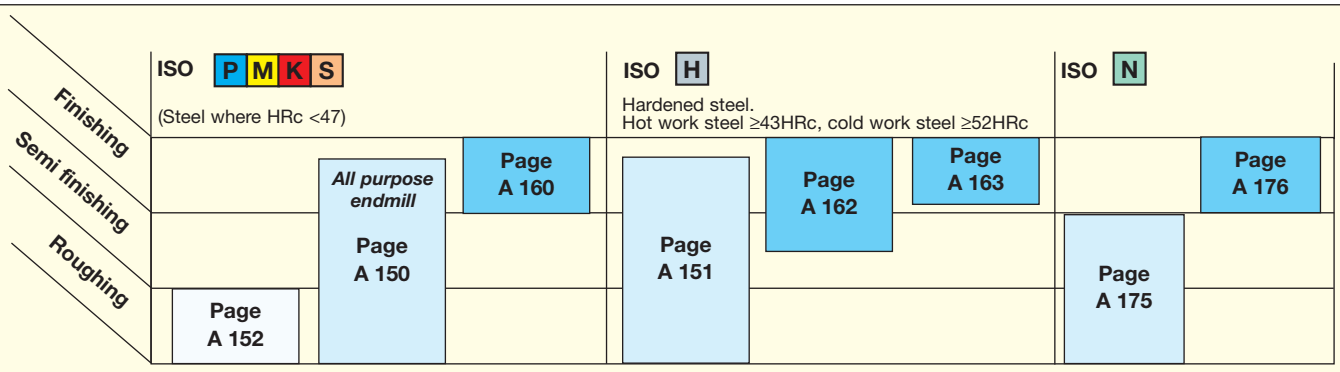
For cutting data and tool recommendation, please consult Pluraguide (C-2948-036).

Step 3: Select your CoroMill® Plura endmill

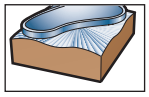
For straight surfaces and grooving

The “All purpose endmill” with variable flute depth for maximum stability, page A 150, is the first choice for roughing to finishing in ISO P, M, K and S materials.

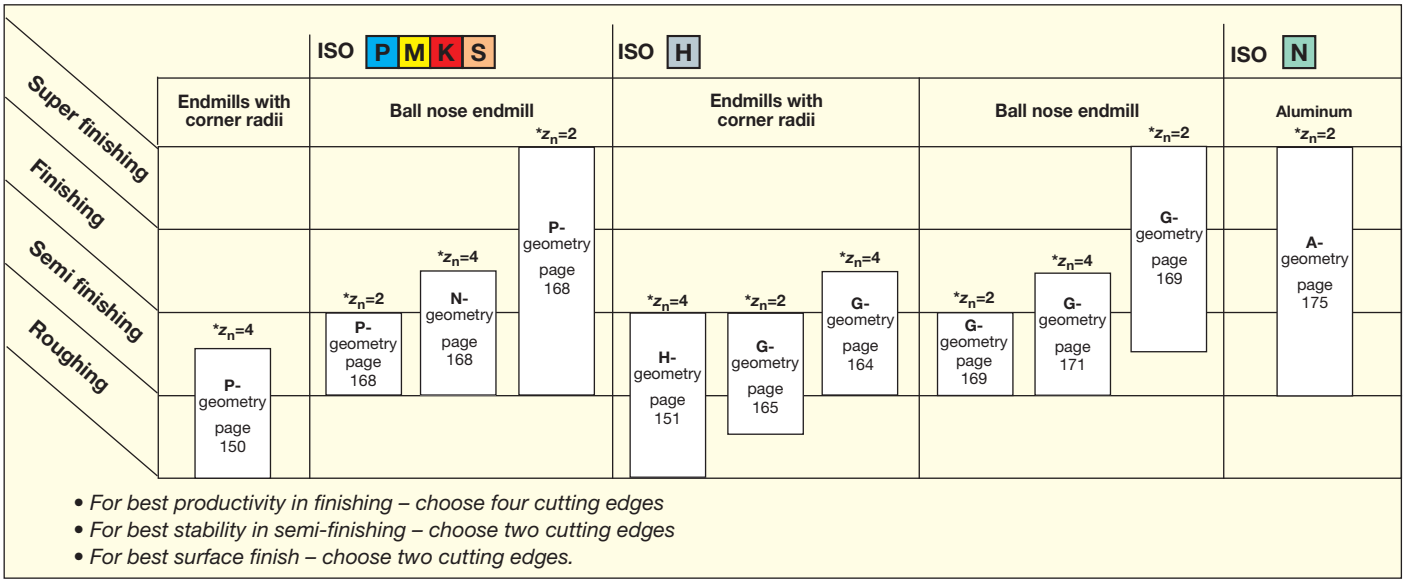


Note: Roughing endmills which suffer from chipping in steels ≥ 35 HRc or titanium, should be replaced with variable flute depth endmills.

SANDVIK Coromant



For profiling



- *For best productivity in finishing – choose four cutting edges*
- *For best stability in semi-finishing – choose two cutting edges*
- *For best surface finish – choose two cutting edges.*

*z_n=Total number of edges in the tool

Chamfering tools

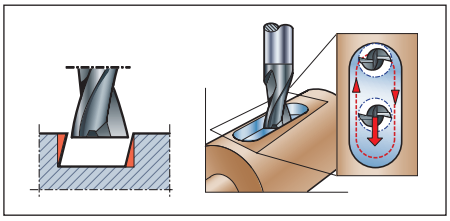
Tools for 30°, 45° chamfering in 0,5–6 mm radius are available, in grade GC1620 for all workpiece materials, page A 172.

Mini tools

For all applications where $D_c \leq 1$ mm is needed we recommend Sandvik Coromant's Mini tools on pages A 166 – A 167.

Keyway slotting

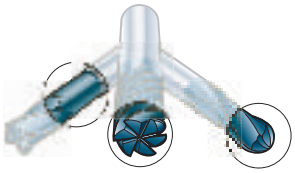
For this particular operation, some specific guidance can be given in addition to the general recommendations for milling of straight surfaces and grooving.
Due to the direction of the cutting forces and the tendency of the tool to bend, a slot milled in a single step will not have a perfectly square form.
The best accuracy and productivity will be achieved if the operation employs an undersized endmill, and is divided into two steps:
1. key slot milling – roughing of the full slot.
2. side milling – finishing all round the slot using up milling, to create true square corners.
Page A 173.



Key slot milling in two steps.

Engineered solutions

When our standard tools do not match your needs you can depend on Sandvik Coromant's experience in engineered tool solutions to provide the answer, however demanding the criteria.
Define the endmill you require and we will design it for you to your own specified dimensions. Forward your enquiry to us and we will supply a quotation including delivery time, price, and a design drawing.



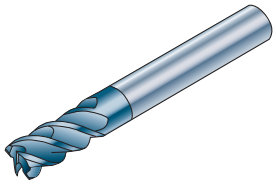
With engineered solutions Sandvik Coromant offer endless possibilities to change tool shapes, diameters and lengths.

All purpose endmill

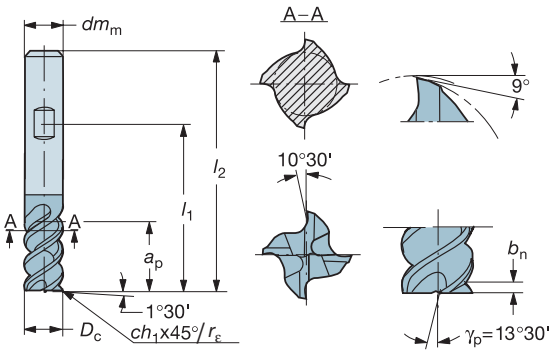
Variable flute depth tools

Hardness ≤48HRc

P M K S



Helix angle: ~50°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	z_n	D_c mm	Ordering code	l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Radius r_ε	1620	1630	1640
Weldon				**Short**											
		4	6	**R216.34-06050-BC13P**	39	57	13	6	16	0,10	0,25	–	☆	☆	☆
		4	8	**08050-BC19P**	45	63	19	8	22,4	0,10	0,25	–	☆	☆	☆
		4	10	**10050-BC22P**	52	72	22	10	28	0,10	0,25	–	☆	☆	☆
		4	12	**12050-BC26P**	61	83	26	12	35,5	0,10	0,25	–	☆	☆	☆
		4	14	**14050-BC26P**	61	83	26	14	40	0,15	0,35	–	☆	☆	☆
		4	16	**16050-BC32P**	68	92	32	16	45	0,15	0,35	–	☆	☆	☆
		4	20	**20050-BC38P**	79	104	38	20	56	0,15	0,35	–	☆	☆	☆
		4	6	**R216.24-06050CBC13P**	39	57	13	6	16	–	–	1	☆	☆	
		4	8	**08050EBC19P**	45	63	19	8	22,4	–	–	2	☆	☆	
		4	10	**10050EBC22P**	52	72	22	10	28	–	–	2	☆	☆	
		4	12	**12050GBC26P**	61	83	26	12	35,5	–	–	3	☆	☆	
		4	14	**14050GBC26P**	61	83	26	14	40	–	–	3	☆	☆	
		4	16	**16050IBC32P**	68	92	32	16	45	–	–	4	☆	☆	
		4	20	**20050IBC38P**	79	104	38	20	56	–	–	4	☆	☆	
Cylindrical				**Long**											
		3	4	**R216.33-04050-AK11P**	–	57	11	6	11,2	0,10	0,25	–	☆	☆	
		3	5	**05050-AK13P**	–	57	13	6	14	0,10	0,25	–	☆	☆	
		4	6	**R216.34-06050-AK13P**	–	65	13	6	16	0,10	0,25	–	☆	☆	
		4	8	**08050-AK19P**	–	80	19	8	22,4	0,10	0,25	–	☆	☆	
		4	10	**10050-AK22P**	–	100	22	10	28	0,10	0,25	–	☆	☆	
		4	12	**12050-AK26P**	–	100	26	12	35,5	0,10	0,25	–	☆	☆	
		4	14	**14050-AK26P**	–	104	26	14	40	0,15	0,35	–	☆	☆	
		4	16	**16050-AK32P**	–	115	32	16	45	0,15	0,35	–	☆	☆	
		4	20	**20050-AK38P**	–	125	38	20	56	0,15	0,35	–	☆	☆	
		3	4	**R216.23-04050CAK11P**	–	57	11	6	11,2	–	–	1	☆	☆	
		3	5	**05050CAK13P**	–	57	13	6	14	–	–	1	☆	☆	
		4	6	**R216.24-06050CAK13P**	–	65	13	6	16	–	–	1	☆	☆	
		4	8	**08050EAK19P**	–	80	19	8	22,4	–	–	2	☆	☆	
		4	10	**10050EAK22P**	–	100	22	10	28	–	–	2	☆	☆	
		4	12	**12050GAK26P**	–	100	26	12	35,5	–	–	3	☆	☆	
		4	14	**14050GAK26P**	–	104	26	14	40	–	–	3	☆	☆	
		4	16	**16050IAK32P**	–	115	32	16	45	–	–	4	☆	☆	
		4	20	**20050IAK38P**	–	125	38	20	56	–	–	4	☆	☆	

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.34-06050-BC13P 1620

Variable flute depth, ≤48HRc, ISO-P, M, K, S

For roughing to finishing in steel ≤48HRc, stainless steel, cast iron, HRSA and titanium

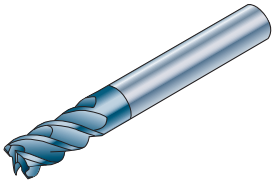
Generally this tool should be your first choice.
Always use the shortest possible tool protrusion. This tool has a differential pitch to improve stability in roughing applications. If you experience problems with too high axial forces try an endmill with four cutting edges and 30° helix, pages A 157 – A 158. If the chip room is not large enough try an endmill with three cutting edges and 45° helix, page A 156 (in weak materials and large a_p an endmill with four cutting edges and 45° helix might work, page A 159). For higher productivity in finishing applications we recomend an endmill with more edges, page A 160.

Roughing endmill

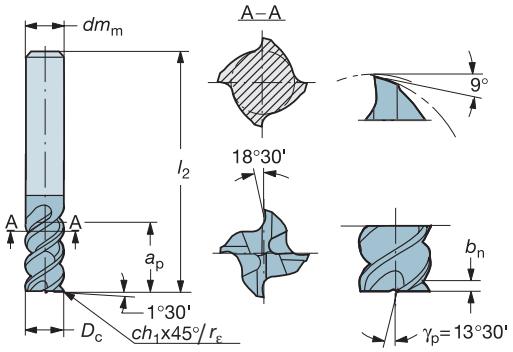
Variable flute depth tools

Hardness 43≤HRc≤63

P H



Helix angle: ~50°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	z_n	D_c mm	Ordering code	l_2	Max a_p [1]	dm_m	Helix l_{sh} [2] mm	ch_1	b_n	Radius r_ε	Grade 1620
Cylindrical		3	2	**R216.33- 02050-AK70H**	57	7	6	5,6	–	0,25	–	☆
		3	3	**03050-AK08H**	57	8	6	8	–	0,25	–	☆
		3	4	**04050-AK11H**	57	11	6	11,2	0,10	0,25	–	☆
		3	5	**05050-AK13H**	57	13	6	14	0,10	0,25	–	☆
		4	6	**R216.34- 06050-AK13H**	65	13	6	16	0,10	0,25	–	☆
		4	8	**08050-AK19H**	80	19	8	22,4	0,10	0,25	–	☆
		4	10	**10050-AK22H**	100	22	10	28	0,10	0,25	–	☆
		4	12	**12050-AK26H**	100	26	12	35,5	0,10	0,25	–	☆
		4	14	**14050-AK26H**	104	26	14	40	0,15	0,35	–	☆
		4	16	**16050-AK32H**	115	32	16	45	0,15	0,35	–	☆
		4	20	**20050-AK38H**	125	38	20	56	0,15	0,35	–	☆
		3	2	**R216.23- 02050BAK70H**	57	7	6	5,6	–	–	0,5	☆
		3	3	**03050BAK08H**	57	8	6	8	–	–	0,5	☆
		3	4	**04050CAK11H**	57	11	6	11,2	–	–	1	☆
		3	5	**05050CAK13H**	57	13	6	14	–	–	1	☆
		4	6	**R216.24- 06050CAK13H**	65	13	6	16	–	–	1	☆
		4	8	**08050EAK19H**	80	19	8	22,4	–	–	2	☆
		4	10	**10050EAK22H**	100	22	10	28	–	–	2	☆
		4	12	**12050GAK26H**	100	26	12	35,5	–	–	3	☆
		4	14	**14050GAK26H**	104	26	14	40	–	–	3	☆
		4	16	**16050IAK32H**	115	32	16	45	–	–	4	☆
		4	20	**20050IAK38H**	125	38	20	56	–	–	4	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.23-02050BAK70H 1620

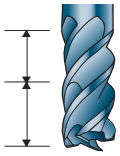
Variable flute depth, ISO-P, H

For warm work steels ≥43HRc.
For cold work steels ≥52HRc.

If you experience problems with this endmill we recommend you reduce the engagement since hardened steels are very demanding. For higher productivity with finishing engagements we recommend an endmill with more edges, page A 162.

Core: 85% of D_c

Core: 50% of D_c
Length: 1 x D_c

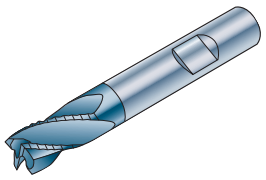


Roughing endmill

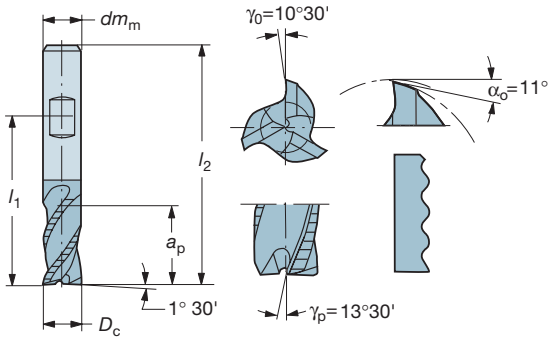
Kordell

Hardness <28HRc

P M K



Helix angle: ~30°, 40°
Tolerances: D_c — h14
dm_m — h6



l_1 = programming length

Shank type	Front type	D_c mm	Ordering code	l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	Grade 1640
Weldon	z_n = 3		Short					(30°)	
		6	**R216.33-06030-BS07K**	36	54	7	6	35,5	☆
		8	**08030-BS09K**	40	58	9	8	45	☆
		10	**10030-BS11K**	46	66	11	10	56	☆
		12	**12030-BS12K**	50,5	73	12	12	71	☆
		14	**14030-BS14K**	52,5	75	14	14	80	☆
		16	**16030-BS16K**	58	82	16	16	90	☆
		20	**20030-BS20K**	67	92	20	20	112	☆
	z_n = 4		Long					(40°)	
		6	**R216.34-06040-BC13K**	39	57	13	6	25	☆
		8	**08040-BC19K**	45	63	19	8	31,5	☆
		10	**10040-BC22K**	52	72	22	10	40	☆
		12	**12040-BC26K**	60,5	83	26	12	45	☆
		14	**14040-BC26K**	60,5	83	26	14	56	☆
		16	**16040-BC32K**	68	92	32	16	63	☆
		18	**18040-BC32K**	68	92	32	18	71	☆
		20	**20040-BC38K**	79	104	38	20	80	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.33-06030-BS07K 1640

Kordell, ISO-P, M, K

Primarily for roughing in steel <28HRc, stainless and cast iron.

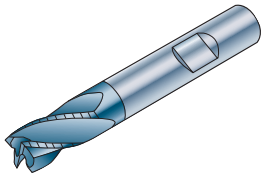
For materials >28HRc we recommend our endmill with variable flute depth, page A 150. If you experience problems with these endmills, primarily chipping, we recommend our endmill with variable flute depth, page A 150.

Roughing endmill

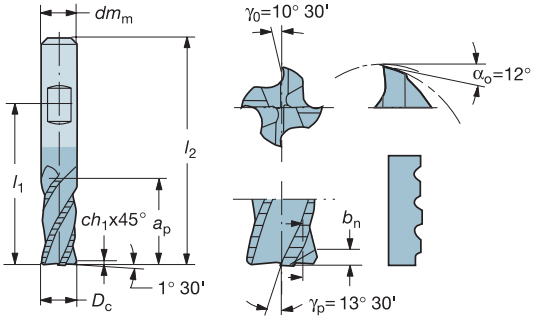
Chip dividing

Hardness <48HRc

S **Titanium**



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6



l_1 = programming length

Shank type	Front type	z_n	D_c mm	Ordering code	l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1620
Weldon		4	6	**R216.34-06030-BC13B**	39	57	13	6	35,5	–	0,25	☆
		4	8	**08030-BC19B**	45	63	19	8	45	–	0,25	☆
		4	10	**10030-BC22B**	52	72	22	10	56	0,10	0,25	☆
		4	12	**12030-BC26B**	60,5	83	26	12	71	0,10	0,25	☆
		4	14	**14030-BC26B**	60,5	83	26	14	80	0,15	0,35	☆
		4	16	**16030-BC32B**	68	92	32	16	90	0,15	0,35	☆
		4	18	**18030-BC32B**	68	92	32	18	100	0,15	0,35	☆
		4	20	**20030-BC38B**	79	104	38	20	112	0,15	0,35	☆
		5	25	**R216.35-25030-BC45B**	93	125	45	25	140	0,15	0,35	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.34-06030-BC13B 1620

Chip dividing, ISO-S

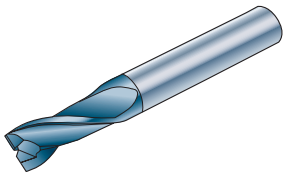
Primarily for roughing in titanium <48HRc.

The design shows the best improvement at large axial depth of cut. If you experience chipping with this tool then the toughness demands in your application are to high for this geometry and we would recommend using the endmill with variable flute depth, page A 150.

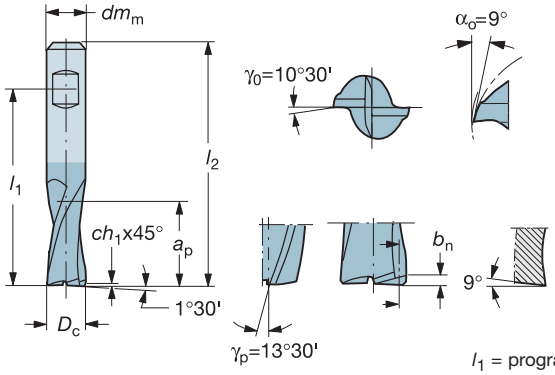
General purpose endmill

Hardness <48HRc

P M K S



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6



l_1 = programming length

Shank type	Front type	D_c mm	Ordering code	l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1630
Cylindrical	z_n = 2	1	**R216.32-01030-AC30P**	–	57	3	6	5,6	–	–	☆
		1,5	**01530-AC30P**	–	57	3	6	9,0	–	–	☆
		2	**02030-AC60P**	–	57	6	6	11,2	–	–	☆
		2,5	**02530-AC70P**	–	57	7	6	14,0	–	–	☆
		3	**03030-AC07P**	–	57	7	6	16	–	–	☆
		3,5	**03530-AC07P**	–	57	7	6	20,0	–	–	☆
		4	**04030-AC08P**	–	57	8	6	22,4	–	0,25	☆
		4,5	**04530-AC08P**	–	57	8	6	25,0	–	0,25	☆
		5	**05030-AC10P**	–	57	10	6	28	–	0,25	☆
		6	**06030-AC10P**	–	57	10	6	35,5	–	0,25	☆
		7	**07030-AC13P**	–	63	13	8	40,0	–	0,25	☆
		8	**08030-AC16P**	–	63	16	8	45	–	0,25	☆
		9	**09030-AC16P**	–	72	16	10	50,0	0,10	0,25	☆
		10	**10030-AC19P**	–	72	19	10	56	0,10	0,25	☆
		11	**11030-AC22P**	–	83	22	12	63	0,10	0,25	☆
		12	**12030-AC22P**	–	83	22	12	71	0,10	0,25	☆
		14	**14030-AC22P**	–	83	22	14	80	0,15	0,35	☆
		16	**16030-AC26P**	–	92	26	16	90	0,15	0,35	☆
		18	**18030-AC26P**	–	92	26	18	100	0,15	0,35	☆
		20	**20030-AC32P**	–	104	32	20	112	0,15	0,35	☆
Weldon	z_n = 2	10	**R216.32-10030-BC19P**	52	72	19	10	56	0,10	0,25	☆
		12	**12030-BC22P**	60,5	83	22	12	71	0,10	0,25	☆
		16	**16030-BC26P**	68	92	26	16	90	0,15	0,35	☆
		18	**18030-BC26P**	68	92	26	18	100	0,15	0,35	☆
		20	**20030-BC32P**	79	104	32	20	112	0,15	0,35	☆

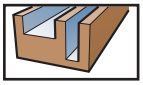
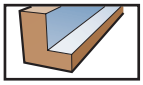
[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.32-01030-AC30P 1630

2-30°, ISO-P, M, K, S

For steel <48HRc, stainless steel, cast iron, HRSA and titanium

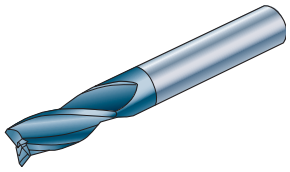
The problem solver–but bear in mind that with two cutting edges you can never achieve the highest metal removal rates. Moving from three to two cutting edges will not usually improve stability. In most applications, the shorter tool with two cutting edges for keyway slotting (page 173) will work better. For higher productivity try an endmill with three cutting edges and 45° helix, page A 156.

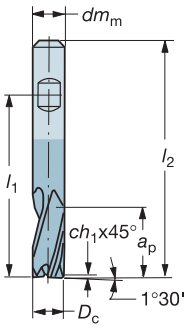
General purpose endmill

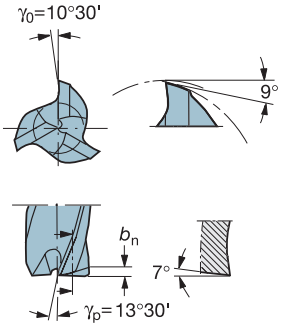
Hardness <48HRc

P M K S



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6





l_1 = programming length

Shank type	Front type	D_c mm	Ordering code	Dimensions, mm l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1630
Cylindrical	z_n = 3	1	**R216.33-01030-AC30P**	–	57	3	6	5,6	–	–	☆
		1,5	**01530-AC30P**	–	57	3	6	9	–	–	☆
		2	**02030-AC60P**	–	57	6	6	11,2	–	–	☆
		2,5	**02530-AC70P**	–	57	7	6	14	–	–	☆
		3	**03030-AC07P**	–	57	7	6	16	–	–	☆
		3,5	**03530-AC07P**	–	57	7	6	16	–	–	☆
		4	**04030-AC08P**	–	57	8	6	22,4	–	0,25	☆
		4,5	**04530-AC08P**	–	57	8	6	25	–	0,25	☆
		5	**05030-AC10P**	–	57	10	6	28	–	0,25	☆
		5,5	**05530-AC10P**	–	57	10	6	31,5	–	0,25	☆
		6	**06030-AC10P**	–	57	10	6	35,5	–	0,25	☆
		6,5	**06530-AC13P**	–	63	13	8	35,5	–	0,25	☆
		7	**07030-AC13P**	–	63	13	8	40	–	0,25	☆
		7,5	**07530-AC16P**	–	63	16	8	45	–	0,25	☆
		8	**08030-AC16P**	–	63	16	8	45	–	0,25	☆
		9	**09030-AC16P**	–	72	16	10	50	0,10	0,25	☆
		10	**10030-AC19P**	–	72	19	10	56	0,10	0,25	☆
		11	**11030-AC22P**	–	83	22	12	63	0,10	0,25	☆
		12	**12030-AC22P**	–	83	22	12	71	0,10	0,25	☆
		13	**13030-AC22P**	–	83	22	14	71	0,15	0,35	☆
		14	**14030-AC22P**	–	83	22	14	80	0,15	0,35	☆
		15	**15030-AC26P**	–	92	26	16	90	0,15	0,35	☆
		16	**16030-AC26P**	–	92	26	16	90	0,15	0,35	☆
		18	**18030-AC26P**	–	92	26	18	100	0,15	0,35	☆
		20	**20030-AC32P**	–	104	32	20	112	0,15	0,35	☆
Weldon	z_n = 3	6	**R216.33-06030-BC10P**	39	57	10	6	35,5	–	0,25	☆
		8	**08030-BC16P**	45	63	16	8	45	–	0,25	☆
		9	**09030-BC16P**	52	72	16	10	50	0,10	0,25	☆
		10	**10030-BC19P**	52	72	19	10	56	0,10	0,25	☆
		12	**12030-BC22P**	60.5	83	22	12	71	0,10	0,25	☆
		14	**14030-BC22P**	60.5	83	22	14	80	0,15	0,35	☆
		16	**16030-BC26P**	68	92	26	16	90	0,15	0,35	☆
		18	**18030-BC26P**	68	92	26	18	100	0,15	0,35	☆
		20	**20030-BC32P**	79	104	32	20	112	0,15	0,35	☆
			Extra long								
Cylindrical	z_n = 3	1	**R216.33-01030-AK40P**	–	57	4	6	5,6	–	–	☆
		1,5	**01530-AK60P**	–	57	6	6	9	–	–	☆
		2	**02030-AK80P**	–	57	8	6	11,2	–	–	☆
		3	**03030-AK12P**	–	57	12	6	18	–	–	☆
		4	**04030-AK14P**	–	57	14	6	22,4	–	0,25	☆
		5	**05030-AK16P**	–	50	16	6	28	–	0,25	☆
		6	**06030-AK22P**	–	65	22	6	35,5	–	0,25	☆
		8	**08030-AK28P**	–	80	28	8	45	–	0,25	☆
		10	**10030-AK32P**	–	100	32	10	56	0,10	0,25	☆
		12	**12030-AK38P**	–	100	38	12	71	0,10	0,25	☆
		16	**16030-AK50P**	–	115	50	16	90	0,15	0,35	☆
		20	**20030-AK50P**	–	125	50	20	112	0,15	0,35	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.33-01030-AC30P 1630

3-30°, ISO-P, M, K, S

For steel <48HRc, stainless steel, cast iron, HRSA and titanium.

In most applications the shorter tool with three cutting edges for keyway slotting will work better, page A 173.

For higher productivity try a tool with four cutting edges and 30° helix, pages A 157-A 158.

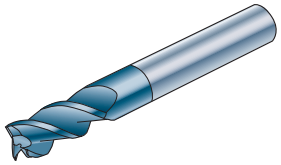
In most applications you will gain better stability with an endmill with three cutting edges and 45°helix, page A 156.

When you have problems with this endmill try an endmill with two cutting edges, page A 154.

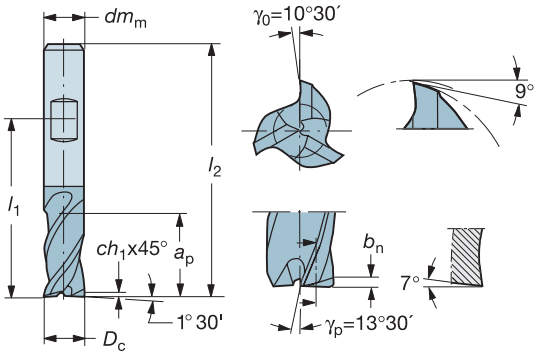
General purpose endmill

Hardness <48HRc

P M K S



Helix angle: ~45°
Tolerances: D_c — h10
dm_m — h6



l_1 = programming length

Shank type	Front type	Ordering code	D_c mm	l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1620	Grade 1630
Cylindrical	z_n = 3	**R216.33-02045-AC60P**	2	–	57	6	6	6,3	–	–	☆	☆
		03045-AC07P	3	–	57	7	6	10	–	–	☆	☆
		04045-AC08P	4	–	57	8	6	12,5	0,10	0,25	☆	☆
		05045-AC10P	5	–	57	10	6	16	0,10	0,25	☆	☆
		06045-AC10P	6	–	57	10	6	20	0,10	0,25	☆	☆
		07045-AC13P	7	–	63	13	8	22,4	0,10	0,25	☆	☆
		08045-AC16P	8	–	63	16	8	25	0,10	0,25	☆	☆
		09045-AC16P	9	–	72	16	10	28	0,10	0,25	☆	☆
		10045-AC19P	10	–	72	19	10	31,5	0,10	0,25	☆	☆
		12045-AC22P	12	–	83	22	12	40	0,10	0,25	☆	☆
		14045-AC22P	14	–	83	22	14	45	0,15	0,35	☆	☆
		16045-AC26P	16	–	92	26	16	50	0,15	0,35	☆	☆
		18045-AC26P	18	–	92	26	18	56	0,15	0,35	☆	☆
		20045-AC32P	20	–	104	32	20	63	0,15	0,35	☆	☆
Weldon	z_n = 3	**R216.33-06045-BC10P**	6	39	57	10	6	20	0,10	0,25		☆
		08045-BC16P	8	45	63	16	8	25	0,10	0,25		☆
		10045-BC19P	10	52	72	19	10	31,5	0,10	0,25		☆
		12045-BC22P	12	60,5	83	22	12	40	0,10	0,25		☆
		14045-BC22P	14	60,5	83	22	14	45	0,15	0,35		☆
		16045-BC26P	16	68	92	26	16	50	0,15	0,35		☆
		18045-BC26P	18	68	92	26	18	56	0,15	0,35		☆
		20045-BC32P	20	79	104	32	20	63	0,15	0,35		☆

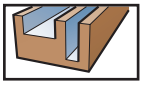
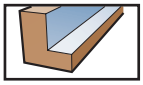
[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.33-02045-AC60P 1620

3-45°, ISO-P, M, K, S

For steel <48HRc, stainless steel, cast iron, HRSA and titanium. A very good tool in most applications!

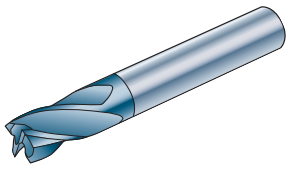
If you experience problems with too high axial forces try an endmill with three cutting edges and 30° helix, page A 173. If the chip room is not large enough try an endmill with two cutting edges and 30° helix, page A 154.

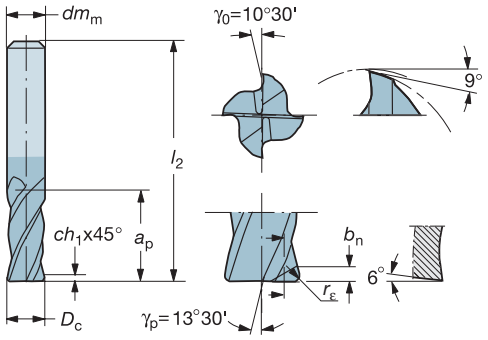
General purpose endmill

Hardness <48HRc

P M K S



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	Ordering code	D_c mm	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1620	Grade 1630
Cylindrical	z_n = 4	**Short**									
		R216.34-02030-AS40N	2	50	4	6	11,2	–	–	☆	☆
		03030-AS05N	3	50	5	6	18	–	–	☆	☆
		04030-AS08N	4	54	8	6	22,4	–	0,25	☆	☆
		05030-AS09N	5	54	9	6	28	–	0,25	☆	☆
		06030-AS10N	6	54	10	6	35,5	–	0,25	☆	☆
		07030-AS11N	7	58	11	8	40	–	0,25	☆	☆
		08030-AS12N	8	58	12	8	45	–	0,25	☆	☆
		10030-AS14N	10	66	14	10	56	0,10	0,25	☆	☆
		12030-AS16N	12	73	16	12	71	0,10	0,25	☆	☆
		14030-AS18N	14	75	18	14	80	0,15	0,35	☆	☆
		16030-AS22N	16	82	22	16	90	0,15	0,35	☆	☆
		18030-AS24N	18	84	24	18	100	0,15	0,35	☆	☆
		20030-AS26N	20	92	26	20	112	0,15	0,35	☆	☆
		Long									
		R216.34-02030-AC70N	2	57	7	6	11,2	–	–	☆	☆
		03030-AC08N	3	57	8	6	16	–	–	☆	☆
		03530-AC10N	3,5	57	10	6	20	–	–	☆	☆
		04030-AC11N	4	57	11	6	22,4	–	0,25	☆	☆
		04530-AC11N	4,5	57	11	6	25	–	0,25	☆	☆
		05030-AC13N	5	57	13	6	28	–	0,25	☆	☆
		05530-AC13N	5,5	57	13	6	31,5	–	0,25	☆	☆
		06030-AC13N	6	57	13	6	35,5	–	0,25	☆	☆
		06530-AC16N	6,5	63	16	8	35,5	–	0,25	☆	☆
		07030-AC16N	7	63	16	8	40	–	0,25	☆	☆
		08030-AC19N	8	63	19	8	45	–	0,25	☆	☆
		09030-AC19N	9	72	19	10	50	0,10	0,25	☆	☆
		10030-AC22N	10	72	22	10	56	0,10	0,25	☆	☆
		12030-AC26N	12	83	26	12	71	0,10	0,25	☆	☆
		14030-AC26N	14	83	26	14	80	0,15	0,35	☆	☆
		16030-AC32N	16	92	32	16	90	0,15	0,35	☆	☆
		18030-AC32N	18	92	32	18	100	0,15	0,35	☆	☆
		20030-AC38N	20	104	38	20	112	0,15	0,35	☆	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.34-02030-AS40N 1620

4-30°, ISO-P, M, K, S

For steel <48HRc, stainless steel, cast iron, HRSA and titanium

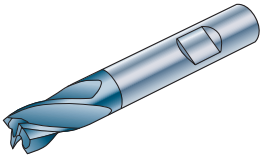
Always use the shortest possible tool protrusion. For higher productivity try a tool with six cutting edges and 50° helix, page A 160. In most applications you will gain better stability with an endmill with four cutting edges and 50° helix, page A 150.

If the chip room is not large enough try an endmill with three cutting edges and 45° helix, page A 156.

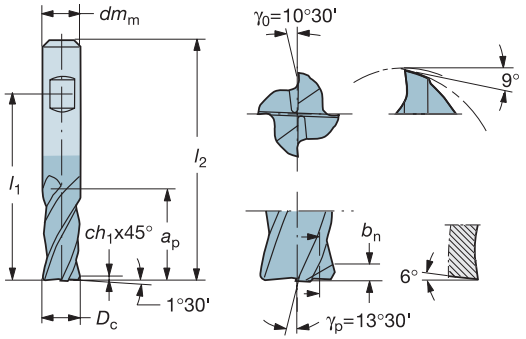
General purpose endmill

Hardness <48HRc

P M K S



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6



l_1 = programming length

Shank type	Front type	Ordering code	D_c mm	Dimensions, mm l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1630
Weldon	z_n = 4	**Short**									
		R216.34-06030-BS10N	6	36	54	10	6	35,5	–	0,25	☆
		08030-BS12N	8	40	58	12	8	45	–	0,25	☆
		10030-BS14N	10	46	66	14	10	56	0,10	0,25	☆
		12030-BS16N	12	50,5	73	16	12	71	0,10	0,25	☆
		14030-BS18N	14	52,5	75	18	14	80	0,15	0,35	☆
		16030-BS22N	16	58	82	22	16	90	0,15	0,35	☆
		18030-BS24N	18	60	84	24	18	100	0,15	0,35	☆
		20030-BS26N	20	67	92	26	20	112	0,15	0,35	☆
		Long									
		R216.34-06030-BC13N	6	39	57	13	6	35,5	–	0,25	☆
		08030-BC19N	8	45	63	19	8	45	–	0,25	☆
		10030-BC22N	10	52	72	22	10	56	0,10	0,25	☆
		12030-BC26N	12	60,5	83	26	12	71	0,10	0,25	☆
		14030-BC26N	14	60,5	83	26	14	80	0,15	0,35	☆
		16030-BC32N	16	68	92	32	16	90	0,15	0,35	☆
		18030-BC32N	18	68	92	32	18	100	0,15	0,35	☆
		20030-BC38N	20	79	104	38	20	112	0,15	0,35	☆
		25030-BC45N	25	89	121	45	25	140	0,15	0,35	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.34-06030-BS10N 1630

4-30°, ISO-P, M, K, S

For steel <48HRc, stainless steel, cast iron, HRSA and titanium

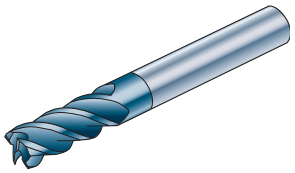
Always use the shortest possible tool protrusion. For higher productivity try a tool with six cutting edges and 50° helix, page A 160. In most applications you will gain better stability with an endmill with four cutting edges and 50° helix, page A 150.

If the chip room is not large enough try an endmill with three cutting edges and 45° helix, page A 156.

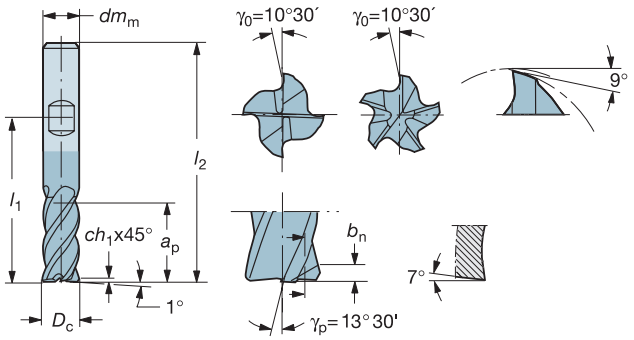
General purpose endmill

Hardness <48HRc

P M K S



Helix angle: ~45°
Tolerances: D_c — h10
dm_m — h6



l_1 = programming length

Shank type	Front type	z_n	D_c mm	Ordering code	l_1	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1620	Grade 1630
Cylindrical		4	2	**R216.34-02045-AC70N**	–	57	7	6	6,3	–	–	☆	☆
		4	3	**03045-AC08N**	–	57	8	6	10	–	–	☆	☆
		4	4	**04045-AC11N**	–	57	11	6	12,5	0,10	0,25	☆	☆
		4	5	**05045-AC13N**	–	57	13	6	16	0,10	0,25	☆	☆
		4	6	**06045-AC13N**	–	57	13	6	20	0,10	0,25	☆	☆
		4	8	**08045-AC19N**	–	63	19	8	25	0,10	0,25	☆	☆
		4	10	**10045-AC22N**	–	72	22	10	31,5	0,10	0,25	☆	☆
		4	12	**12045-AC26N**	–	83	26	12	40	0,10	0,25	☆	☆
		4	14	**14045-AC26N**	–	83	26	14	45	0,15	0,35	☆	☆
		4	16	**16045-AC32N**	–	92	32	16	50	0,15	0,35	☆	☆
		5	18	**R216.35-18045-AC32N**	–	92	32	18	56	0,15	0,35	☆	☆
		5	20	**R216.35-20045-AC38N**	–	104	38	20	63	0,15	0,35	☆	☆
Weldon		4	6	**R216.34-06045-BC13N**	39	57	13	6	20	0,10	0,25		☆
		4	8	**08045-BC19N**	45	63	19	8	25	0,10	0,25		☆
		4	10	**10045-BC22N**	52	72	22	10	31,5	0,10	0,25		☆
		4	12	**12045-BC26N**	60,5	83	26	12	40	0,10	0,25		☆
		4	14	**14045-BC26N**	60,5	83	26	14	45	0,15	0,35		☆
		4	16	**16045-BC32N**	68	92	32	16	50	0,15	0,35		☆
		5	20	**R216.35-20045-BC38N**	79	104	38	20	63	0,15	0,35		☆
Cylindrical				Extra long									
		4	6	**R216.34-06045-AK22N**	–	65	22	6	20	0,10	0,25	☆	
		4	8	**08045-AK28N**	–	80	28	8	28	0,10	0,25	☆	
		4	10	**10045-AK32N**	–	100	32	10	31,5	0,10	0,25	☆	
		4	12	**12045-AK40N**	–	100	40	12	40	0,10	0,25	☆	
		4	14	**14045-AK50N**	–	104	50	14	45	0,15	0,35	☆	
		5	16	**R216.35-16045-AK50N**	–	115	50	16	56	0,15	0,35	☆	
		5	20	**R216.35-20045-AK55N**	–	125	55	20	63	0,15	0,35	☆	
		6	20	**R216.36-20045-AK75N**	–	145	75	20	63	0,15	0,35	☆	
		8	25	**R216.38-25045-AK90N**	–	153	90	25	80	0,15	0,35	☆	

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.34-02045-AC70N 1620

4-45°, ISO-P, M, K, S

For steel <48HRc, stainless steel, cast iron, HRSA and titanium

Always use the shortest possible tool protrusion. For higher productivity try a tool with six cutting edges and 50° helix, page A 160.

You will gain better stability with an endmill with four cutting edges and 50° helix, page A 150.

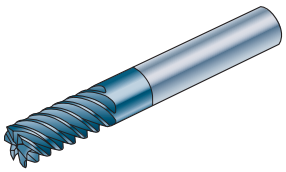
If the chip room is not large enough try an endmill with three cutting edges and 45° helix, page A 156.

Finishing endmill

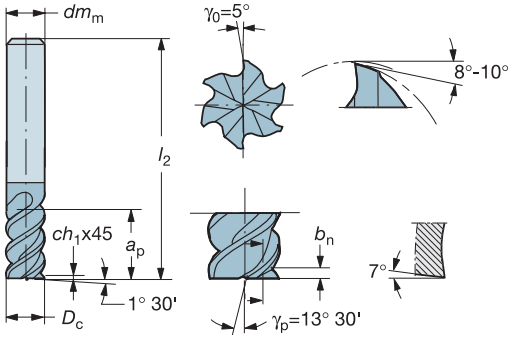
Non centre cutting

Hardness <48HRc

P M K S



Helix angle: ~50°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	z_n	D_c mm	Ordering code	l_2	a_p[1]	Max dm_m	Helix l_{sh}[2] mm	ch_1	b_n	Grade 1620
Cylindrical		4	3	**R215.34-03050-AC08L**	57	8	6	8	–	0,25	☆
		4	4	**R215.34-04050-AC11L**	57	11	6	11,2	0,10	0,25	☆
		5	5	**R215.35-05050-AC13L**	57	13	6	14	0,10	0,25	☆
		6	6	**R215.36-06050-AC13L**	57	13	6	16	0,10	0,25	☆
		6	8	**R215.36-08050-AC19L**	63	19	8	22,4	0,10	0,25	☆
		6	10	**R215.36-10050-AC22L**	72	22	10	28	0,10	0,25	☆
		6	12	**R215.36-12050-AC26L**	83	26	12	35,5	0,10	0,25	☆
		6	16	**R215.36-16050-AC32L**	92	32	16	45	0,15	0,35	☆
		8	20	**R215.38-20050-AC38L**	104	38	20	56	0,15	0,35	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R215.34-03050-AC08L 1620

New tool, 50°, ISO-P, M, K, S

For finishing applications in steel <48HRc, stainless steel, cast iron. HRSA and titanium.

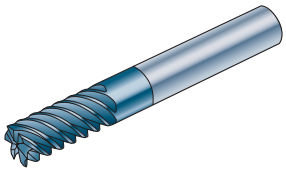
In most applications you will gain better stability with an endmill with four cutting edges and 50° helix, page A 150. If the chip room is not large enough try an endmill with four cutting edges and 45° helix, Page A 159.

Finishing endmill

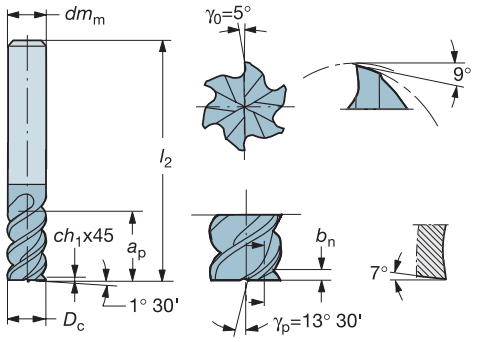
Non centre cutting

Hardness <48HRc

P M K S



Helix angle: ~60°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	z_n	D_c mm	Ordering code	l_2	a_p [1]	Max dm_m	Helix l_{sh} [2] mm	ch_1	b_n	Grade 1620
Cylindrical		6	6	**R215.36- 06060-AC13L**	57	13	6	11,2	0,10	0,25	☆
		6	8	**08060-AC19L**	63	19	8	16	0,10	0,25	☆
		6	10	**10060-AC22L**	72	22	10	20	0,10	0,25	☆
		6	12	**12060-AC26L**	83	26	12	22,4	0,10	0,25	☆
		6	14	**14060-AC26L**	83	26	14	28	0,15	0,35	☆
		6	16	**16060-AC32L**	92	32	16	31,5	0,15	0,35	☆
		6	18	**18060-AC32L**	92	32	18	35,5	0,15	0,35	☆
		6	20	**20060-AC38L**	104	38	20	40	0,15	0,35	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R215.36-06060-AC13L 1620

6-60°, ISO-P, M, K, S

For finishing applications in steel <48HRc, stainless steel, cast iron, HRSA and titanium.

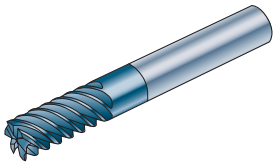
In most applications you will gain better stability with an endmill with six cutting edges and 50° helix, Page A 162 (new tool). If the chip room is not large enough try an endmill with four cutting edges and 50° helix, page A 150.

Finishing endmill

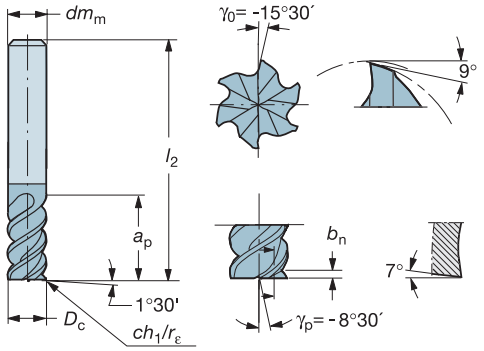
Non centre cutting

Hardness 43≤HRc≤63

P H



Helix angle: ~50°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	z_n	D_c mm	Ordering code	l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	b_n	ch_1	r_ε	Grade 1610
Cylindrical		4	3	**R215.34-03050-AC08H**	57	8	6	8	–	–	–	☆
		4	4	**04050-AC11H**	57	11	6	11,2	0,25	0,10	–	☆
		6	6	**R215.36-06050-AC13H**	57	13	6	16	0,25	0,10	–	☆
		6	8	**08050-AC19H**	63	19	8	22,4	0,25	0,10	–	☆
		6	10	**10050-AC22H**	72	22	10	28	0,25	0,10	–	☆
		6	12	**12050-AC26H**	83	26	12	35,5	0,25	0,10	–	☆
		6	16	**16050-AC32H**	92	32	16	45	0,35	0,15	–	☆
		8	20	**R215.38-20050-AC38H**	104	38	20	56	0,35	0,15	–	☆
		4	3	**R215.24-03050BAC08H**	57	8	6	8	–	–	0,5	☆
		4	4	**04050BAC11H**	57	11	6	11,2	–	–	0,5	☆
		6	6	**R215.26-06050BAC13H**	57	13	6	16	–	–	0,5	☆
		6	8	**08050BAC19H**	63	19	8	22,4	–	–	0,5	☆
		6	10	**10050CAC22H**	72	22	10	28	–	–	1,0	☆
		6	10	**10050DAC22H**	72	22	10	28	–	–	1,5	☆
		6	10	**10050EAC22H**	72	22	10	28	–	–	2,0	☆
		6	12	**12050CAC26H**	83	26	12	35,5	–	–	1,0	☆
		6	16	**16050DAC32H**	92	32	16	45	–	–	1,5	☆
		8	20	**R215.28-20050DAC38H**	104	38	20	56	–	–	1,5	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R215.34-03050-AC08H 1610

6-50°H, ISO-P, H

For finishing applications in warm work steels ≥ 43 HRc.
For finishing applications in cold work steels≥52HRc.

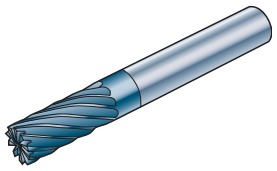
For higher productivity when working with very small a_e, try the multiflute, page A 163. If the chip room is not large enough try an endmill with four cutting edges and 50° helix, page A 151.

Finishing endmill

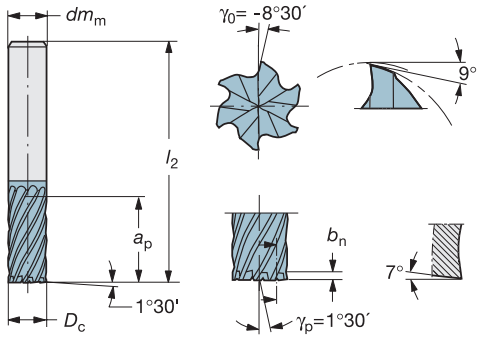
Non centre cutting

Hardness 43≤HRc≤63

P H



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6

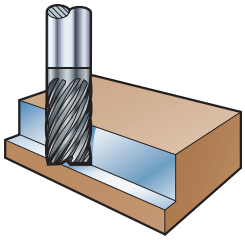


Shank type	Front type	z_n	D_c mm	Ordering code	Dimensions, mm l_2	a_p[1]	Max dm_m	b_n	Helix l_{sh}[2] mm	Grade 1610		
Cylindrical		6	5	**R215.36-05030-AC13H**	57	13	6	28	0,25	☆		
		6	6	**R215.36-06030-AC13H**	57	13	6	35,5	0,25	☆		
		8	8	**R215.38-08030-AC19H**	63	19	8	45	0,25	☆		
		10	10	**R215.3A-10030-AC22H**	72	22	10	56	0,25	☆		
		12	12	**R215.3C-12030-AC26H**	83	26	12	71	0,25	☆		
		14	14	**R215.3E-14030-AC26H**	83	26	14	80	0,35	☆		
		16	16	**R215.3G-16030-AC32H**	92	32	16	90	0,35	☆		
		16	20	**R215.3G-20030-AC38H**	104	38	20	112	0,35	☆		

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R215.36-05030-AC13H 1610

Best surface in hardened steel



Tool: R215.3A-10030-BC22H
Grade: 1610
Material: Tool steel 56 HRC
Cutting depths: a_p = 20 mm, a_e = 0,3 mm

	Test 1
Speed v_c, m/min	100
Feed/tooth f_z, mm/tooth	0,025
Feed v_f, mm/min	804
Method	Downmilling
Surface finish R_a, µm	0,13
Tool life, min	85

Multiflute, ISO-H

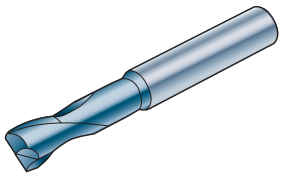
For finishing applications in warm work steels ≥ 43 HRc.
For finishing applications in cold work steels≥52HRc.

For higher productivity when working with very small a_e. If the chip room is not large enough try an endmill with six cutting edges and 50° helix, page A 162.

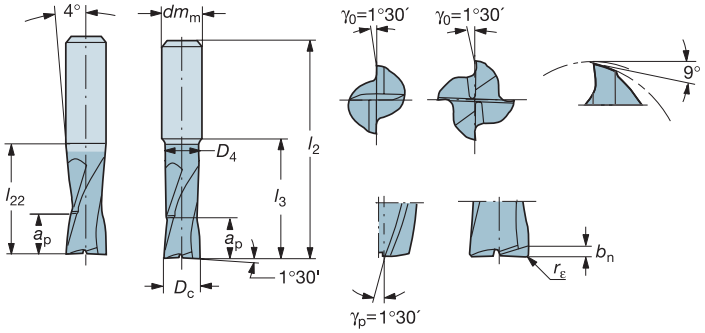
Corner radius endmill

Hardness 43≤HRc≤63

P H



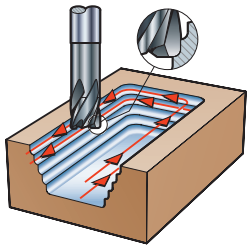
Helix angle: ~30°
Tolerances: D_c — h9
dm_m — h6



Shank type	Front type	z_n	D_c mm	Ordering code	r_ε±0,01	l_2	D_4	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	l_3	Grade 1610
Cylindrical				Normal								
		2	2	**R216.22-02030AAI20G**	0,2	57	–	2	6	11,2	19	☆
		2	3	**03030BAI03G**	0,5	57	–	3	6	16	18	☆
		2	4	**04030BAI04G**	0,5	57	–	4	6	22,4	20	☆
		2	5	**05030BAI05G**	0,5	57	4,7	5	6	28	20	☆
		2	6	**06030CAI06G**	1	57	5,7	6	6	35,5	21	☆
		2	8	**08030CAI08G**	1	63	7,7	8	8	45	27	☆
		2	10	**10030DAI10G**	1,5	72	9,7	10	10	56	32	☆
		2	12	**12030DAI12G**	1,5	83	11,7	12	12	71	36	☆
		4	6	**R216.24-06030CAI06G**	1	57	5,7	6	6	35,5	21	☆
		4	8	**08030CAI08G**	1	63	7,7	8	8	45	27	☆
		4	10	**10030DAI10G**	1,5	72	9,7	10	10	56	32	☆
		4	12	**12030DAI12G**	1,5	83	11,7	12	12	71	36	☆
		4	16	**16030EAI16G**	2	92	15,5	16	16	90	42	☆
				Long								
		2	2	**R216.22-02030AAJ20G**	0,2	72	1,9	2	6	11,2	20	☆
		2	3	**03030AAJ03G**	0,3	72	2,9	3	6	18	20	☆
		4	4	**R216.24-04030AAJ04G**	0,4	72	3,8	4	6	22,4	20	☆
		4	5	**05030BAJ05G**	0,5	72	4,7	5	6	28	20	☆
		4	6	**06030BAJ06G**	0,5	72	5,7	6	6	35,5	24	☆
		4	8	**08030BAJ08G**	0,5	80	7,7	8	8	45	29	☆
		4	8	**08030CAJ08G**	1	80	7,7	8	8	45	29	☆
		4	8	**08030DAJ08G**	1,5	80	7,7	8	8	45	29	☆
		4	10	**10030BAJ10G**	0,5	100	9,7	10	10	56	35	☆
		4	10	**10030CAJ10G**	1	100	9,7	10	10	56	35	☆
		4	12	**12030BAJ12G**	0,5	100	11,7	12	12	71	36	☆
		4	12	**12030CAJ12G**	1	100	11,7	12	12	71	36	☆
		4	12	**12030EAJ12G**	2	100	11,7	12	12	71	36	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.22-02030AAI20G 1610



Machine: MC ISO 40
Tool: R216.24-10030DAI10G
Grade: 1610
Material: Tool steel 52 HRC
Cutting depths: a_p = 1 mm
a_e = 1 mm
Dry milling

Machining example	
Speed v_c, m/min	240
Rev/min	7775
Feed/tooth f_z, mm/tooth	0,075
Feed v_f, mm/min	2330
Tool life, min	200

Semi-finishing, ISO-P, H

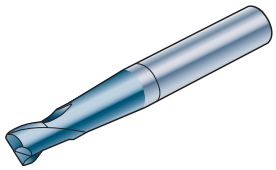
For finishing applications in warm work steels ≥ 43HRc.
For semi-finishing applications in cold work steels ≥52HRc.

For highest productivity in semi-finishing applications.
Always use the shortest possible tool protrusion.
When stability allows use an endmill with four cutting edges.

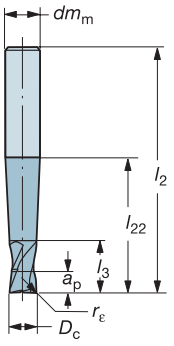
Corner radius endmill

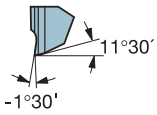
Hardness 43≤HRc≤63

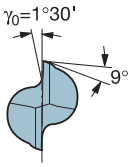
P H



Helix angle: 30°
Tolerances: D_c — h9
dm_m — h6







Shank type	Front type	D_c mm	Ordering code	r_ε±0,01	l_2	Max a_p[1]	dm_m	l_3	l_{22}	Grade 1610
Cylindrical			Extra long							
	z_n = 2	3	**R216.22-03030BAP03G**	0,5	80	3	6	4	36,9	☆
		4	**04030BAP04G**	0,5	90	4	6	5	50,7	☆
		6	**06030BAP06G**	0,5	96	6	8	7	52,7	☆
	z_n = 4	6	**R216.24-06030CAP06G**	1	96	6	8	7	52,7	☆
		8	**08030CAP08G**	1	100	8	10	10	52,6	☆
		10	**10030CAP10G**	1	125	10	12	12	67,3	☆
		10	**10030GAP10G**	3	125	10	12	12	67,3	☆
		12	**12030CAP12G**	1	135	12	14	14	69,3	☆
		12	**12030GAP12G**	3	135	12	14	14	69,3	☆
		16	**16030CAP16G**	1	150	16	16	–	–	☆
		16	**16030GAP16G**	3	150	16	16	–	–	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.22-03030BAP03G 1610

Semi-finishing, ISO-P, H

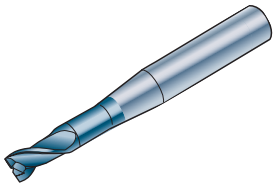
For finishing applications in warm work steels ≥ 43HRc.
For semi-finishing applications in cold work steels ≥52HRc.

For highest productivity in semi-finishing applications.
Always use the shortest possible tool protrusion.
When stability allows use an endmill with four cutting edges.

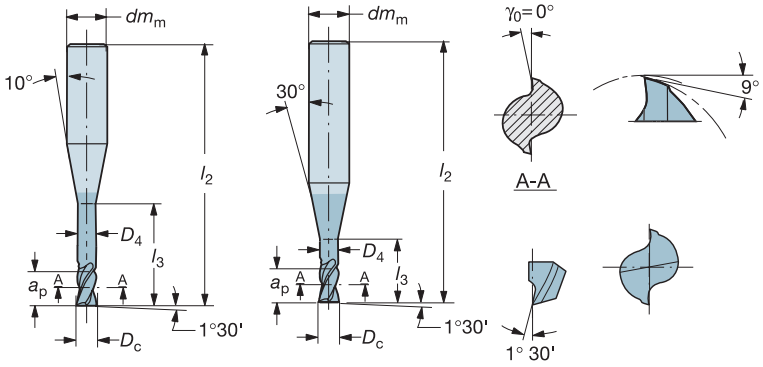
General purpose endmill

Hardness <63HRc

P M K N S H



Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	Ordering code	D_c mm	l_2	l_3	Max a_p[1]	D_4	dm_m	Helix l_{sh}[2] mm	Grade 1620
Cylindrical	z_n = 2	2,5 x D_c								
		R216.32-00430-AE04G	0,4	54	1	0,4	0,36	6	2,24	☆
		00530-AE05G	0,5	54	1,2	0,5	0,46	6	2,8	☆
		00630-AE06G	0,6	54	1,5	0,6	0,56	6	3,55	☆
		00830-AE08G	0,8	54	2	0,8	0,76	6	4,5	☆
		01030-AE10G	1,0	54	2,5	1,0	0,96	6	5,6	☆
		5 x D_c								
		R216.32-00530-AI05G	0,5	57	2,5	0,5	0,46	6	2,8	☆
		00630-AI06G	0,6	57	3	0,6	0,56	6	3,55	☆
		00830-AI08G	0,8	57	4	0,8	0,76	6	4,5	☆
		01030-AI10G	1,0	57	5	1,0	0,96	6	5,6	☆
		10 x D_c								
		R216.32-00530-AJ05G	0,5	57	5	0,5	0,46	6	2,8	☆
		00630-AJ06G	0,6	57	6	0,6	0,56	6	3,55	☆
		00830-AJ08G	0,8	57	8	0,8	0,76	6	4,5	☆
		01030-AJ10G	1,0	57	10	1,0	0,96	6	5,6	☆

[1] Maximum cutting edge length. [2] Pitch per rev.

Ordering example: 10 pieces R216.32-00430-AE04G 1620

Mini general purpose endmill

ISO-P, M, K, N, S, H

For steel <63HRc, stainless steel, cast iron, HRSA, titanium, aluminum and hardened steel

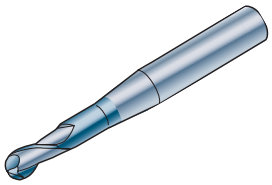
For all applications where D_c<1 mm is needed.

Always use the shortest possible tool protrusion.

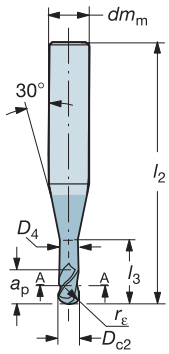
Ball nose endmill

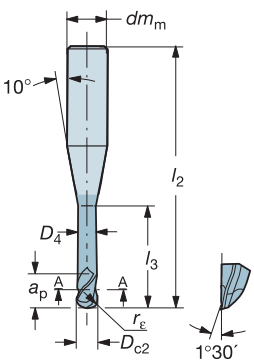
Hardness <63 HRc

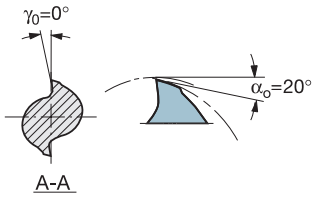
P M K N S H



Helix angle: ~30°
Tolerances: D_{c2} — h9
dm_m — h6







Shank type	Front type	Ordering code	D_{c2} mm	r_ε±0,01	l_2	l_3	Max a_p[1]	D_4	dm_m	Helix l_{sh}[2] mm	Grade 1620
Cylindrical	z_n = 2	2,5 x D_c									
		R216.42- 00430-AE04G	0,4	0,2	54	1	0,4	0,36	6	2,24	☆
		00530-AE05G	0,5	0,25	54	1,2	0,5	0,46	6	2,8	☆
		00630-AE06G	0,6	0,3	54	1,5	0,6	0,56	6	3,55	☆
		00830-AE08G	0,8	0,4	54	2	0,8	0,76	6	4,5	☆
		01030-AE10G	1,0	0,5	54	2,5	1,0	0,96	6	5,6	☆
		5 x D_c									
		R216.42- 00530-AO05G	0,5	0,25	57	2,5	0,5	0,46	6	2,8	☆
		00630-AO06G	0,6	0,3	57	3	0,6	0,56	6	3,55	☆
		00830-AO08G	0,8	0,4	57	4	0,8	0,76	6	4,5	☆
		01030-AO10G	1,0	0,5	57	5	1,0	0,96	6	5,6	☆
		10 x D_c									
		R216.42- 00530-AJ05G	0,5	0,25	57	5	0,5	0,46	6	2,8	☆
		00630-AJ06G	0,6	0,3	57	6	0,6	0,56	6	3,55	☆
		00830-AJ08G	0,8	0,4	57	8	0,8	0,76	6	4,5	☆
		01030-AJ10G	1,0	0,5	57	10	1,0	0,96	6	5,6	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.42-00430-AE04G 1620

Mini ball nose, ISO-P, M, K, N, S, H

For steel <63HRc, stainless steel, cast iron, HRSA, titanium, aluminum and hardened steel

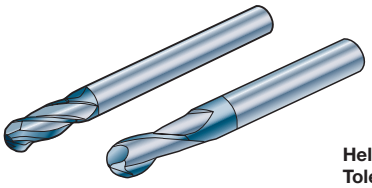
For all applications where D_{c2}<1 mm is needed.

Always use the shortest possible tool protrusion.

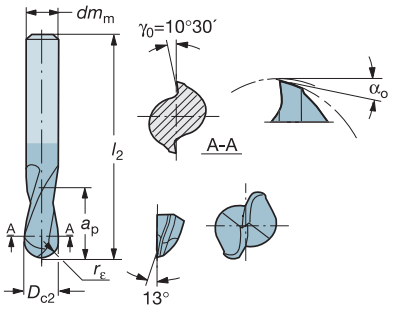
Ball nose endmill

Hardness <48 HRc

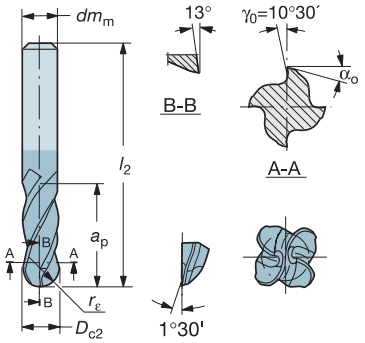
P M K S



Short



Long



Helix angle: ~30°
Tolerances: D_{c2} — h9
dm_m — h6

Shank type	Front type	Ordering code	D_{c2} mm	r_ε±0,01	l_2	Max a_p[1]	dm_m	α_o	Helix l_{sh}[2] mm	Grade 1620
Cylindrical	 z_n = 2	Short								
		R216.42-01030-AC30P	1	0,5	57	3	6	20°	5,6	☆
		01530-AC30P	1,5	0,75	57	3	6	20°	9	☆
		02030-AC60P	2	1,0	57	6	6	20°	11,2	☆
		02530-AC70P	2,5	1,25	57	7	6	20°	14	☆
		03030-AC07P	3	1,5	57	7	6	20°	16	☆
		04030-AC08P	4	2,0	57	8	6	14°	22,4	☆
		05030-AC10P	5	2,5	57	10	6	14°	28	☆
		06030-AC10P	6	3,0	57	10	6	14°	35,5	☆
		07030-AC13P	7	3,5	63	13	8	14°	40	☆
		08030-AC16P	8	4,0	63	16	8	14°	45	☆
		09030-AC16P	9	4,5	72	16	10	12°	50	☆
		10030-AC19P	10	5,0	72	19	10	12°	56	☆
		12030-AC22P	12	6,0	83	22	12	12°	71	☆
		14030-AC22P	14	7,0	83	22	14	12°	80	☆
		16030-AC26P	16	8,0	92	26	16	12°	90	☆
		18030-AC26P	18	9,0	92	26	18	12°	100	☆
		20030-AC32P	20	10,0	104	32	20	10°	112	☆
	 z_n = 4	Long								
		R216.44-03030-AK08N	3	1,5	80	8	6	20°	16	☆
		04030-AK11N	4	2,0	80	11	6	14°	22,4	☆
		05030-AK13N	5	2,5	80	13	6	14°	28	☆
		06030-AK13N	6	3,0	80	13	6	14°	35,5	☆
		07030-AK16N	7	3,5	100	16	8	14°	40	☆
		08030-AK19N	8	4,0	100	19	8	14°	45	☆
		09030-AK19N	9	4,5	100	19	10	12°	50	☆
		10030-AK22N	10	5,0	100	22	10	12°	56	☆
		12030-AK26N	12	6,0	100	26	12	12°	71	☆
		16030-AK32N	16	8,0	100	32	16	12°	90	☆
		20030-AK38N	20	10,0	125	38	20	10°	112	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.42-01030-AC30P 1620

Ball nose, <48HRc, ISO-P, M, K, S

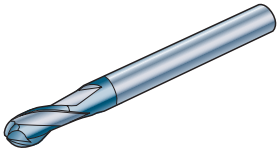
For profiling applications in steel <48HRc, stainless steel, cast iron, HRSA and titanium
Always use the shortest possible tool protrusion. In roughing applications where you need large chip room and good stability use a tool with two cutting edges.
In semi-finishing applications and general applications, use a tool with four cutting edges for best productivity.

In finishing/super-finishing applications use a tool with two cutting edges.
Use an endmill with two cutting edges for optimal stability and to avoid the transition area between four and two cutting edges.
A ball nose with four cutting edges has only two cutting edges over the tool centre.

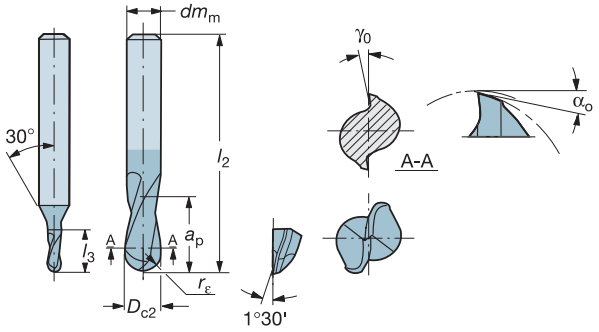
Ball nose endmill

Hardness 43≤HRc≤63

P H



Helix angle: ~30°
Tolerances: D_{c2} — h9
dm_m — h6



Shank type	Front type	D_{c2} mm	Ordering code	r_ε±0,01	l_2	l_3	Max a_p [1]	dm_m	α_o	Helix l_{sh} [2] mm	γ_o	Grade 1610
Cylindrical	z_n = 2	1	**R216.42-01030-AC15G**	0,5	57	4,5	1,5	6	19-21°	5,6	0-3°	☆
		2	**02030-AC30G**	1	57	6	3	6	19-21°	11,2	0-3°	☆
		3	**03030-AC04G**	1,5	57	6,9	4	6	19-21°	18	0-3°	☆
		4	**04030-AC05G**	2	57	14	5	6	13-15°	22,4	0-3°	☆
		5	**05030-AC06G**	2,5	57	15	6	6	13-15°	28	0-3°	☆
		6	**06030-AC10G**	3	57	–	10	6	13-15°	35,5	0-3°	☆
		8	**08030-AC16G**	4	63	–	16	8	13-15°	45	0-3°	☆
		10	**10030-AC19G**	5	72	–	19	10	11-13°	56	0-3°	☆
		12	**12030-AC22G**	6	83	–	22	12	11-13°	71	0-3°	☆
		1	**R216.42-01030-AK15G**	0,5	57	3	1,5	6	19-21°	5,6	0-3°	☆
		1,5	**01530-AK20G**	0,75	57	4	2	6	19-21°	9	0-3°	☆
		2	**02030-AK30G**	1,0	57	6	3	6	19-21°	11,2	0-3°	☆
		2,5	**02530-AK30G**	1,25	57	6	3	6	19-21°	14	0-3°	☆
		3	**03030-AK04G**	1,5	57	7	4	6	19-21°	16	0-3°	☆
		4	**04030-AK05G**	2,0	80	8	5	6	13-15°	22,4	0-3°	☆
		5	**05030-AK06G**	2,5	80	10	6	6	13-15°	28	0-3°	☆
		6	**06030-AK10G**	3,0	80	–	10	6	13-15°	35,5	0-3°	☆
		8	**08030-AK16G**	4,0	100	–	16	8	13-15°	45	0-3°	☆
		10	**10030-AK19G**	5,0	100	–	19	10	11-13°	56	0-3°	☆
		12	**12030-AK22G**	6,0	100	–	22	12	11-13°	71	0-3°	☆
		16	**16030-AK32G**	8,0	125	–	32	16	11-13°	90	0-3°	☆
		1	**R216.42-01030-AK15H**	0,5	57	3	1,5	6	19-21°	5,6	-13-16° [3]	☆
		1,5	**01530-AK20H**	0,75	57	4	2	6	19-21°	9	-13-16° [3]	☆
		2	**02030-AK25H**	1,0	57	6	2,5	6	19-21°	11,2	-13-16° [3]	☆
		2,5	**02530-AK30H**	1,25	57	6	3	6	19-21°	14	-13-16° [3]	☆
		3	**03030-AK04H**	1,5	57	7	4	6	19-21°	16	-13-16° [3]	☆
		4	**04030-AK05H**	2,0	80	8	5	6	13-15°	22,4	-13-16° [3]	☆
		5	**05030-AK06H**	2,5	80	10	6	6	13-15°	28	-13-16° [3])	☆
		6	**06030-AK07H**	3,0	80	–	7	6	13-15°	35,5	-13-16° [3]	☆
		8	**08030-AK09H**	4,0	100	–	9	8	13-15°	45	-13-16° [3]	☆
		10	**10030-AK11H**	5,0	100	–	11	10	11-13°	56	-13-16° [3]	☆
		12	**12030-AK12H**	6,0	100	–	12	12	11-13°	71	-13-16° [3]	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.
[3] -13-16 means minus 13° to minus 16°.

Ordering example: 10 pieces R216.42-01030-AC15G 1610

Ball nose, ISO-P, H

For profiling applications in warm work steels ≥43 HRc.
For profiling applications in cold work steels ≥52HRc.

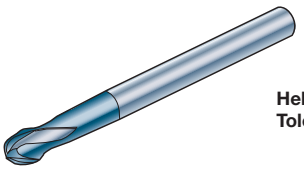
Always use the shortest possible tool protrusion.
First choice is G-geometry. When the workpiece material is very short chipping it is possible to achieve better productivity with the H-geometry. In semi-finishing/finishing applications better productivity is possible with a ballnose with four cutting edges, pages A 170 – A 171.

When working along steep walls the spherical design ballnose will have shorter contact length, page A 170. When better accessibility or a neck behind the cutting edges is needed, page A 171.

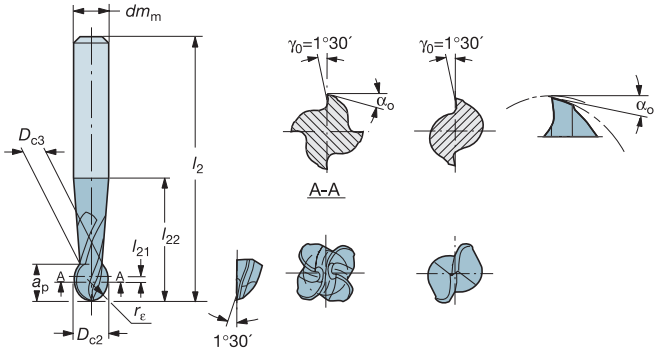
Ball nose endmill

Spherical design
Hardness 43≤HRc≤63

P H



Helix angle: ~30°
Tolerances: D_{c2} — h9
dm_m — h6 (D_{c2}≤10~h5)



Shank type	Front type	Ordering code	D_{c2} mm	Dimensions, mm								Grade
				r_ε ±0,01	l_2	Max a_p[1]	dm_m	α_o	Helix l_{sh}[2] mm	l_{21}	l_{22}	D_{c3}	1610
Cylindrical	z_n = 2		1	R216.62-01030-AO20G	0,5	75	2	6	19-21°	5,6	1,5	20	–	☆
			2	02030-AO30G	1	75	3	6	19-21°	11,2	1,5	20	1,7	☆
			3	03030-AO04G	1,5	80	4	6	19-21°	16	1,5	30	2,5	☆
			4	04030-AO05G	2	80	5	6	13-15°	22,4	1,5	30	3,3	☆
			5	05030-AO07G	2,5	80	7	6	13-15°	28	2	43	4,1	☆
			6	06030-AO07G	3	100	7	6	13-15°	35,5	2	30	4,7	☆
			8	08030-AO09G	4	100	9	8	13-15°	45	3	36	6,5	☆
			10	10030-AO11G	5	100	11	10	11-13°	56	3	43	8,2	☆
			12	12030-AO13G	6	100	13	12	11-13°	71	3	52	9,8	☆
			16	16030-AO15G	8	150	15	16	11-13°	90	3	61	13,4	☆
	z_n = 4		5	R216.64-05030-AO07G	2,5	80	7	6	13-15°	28	2	43	4,1	☆
			6	06030-AO07G	3	100	7	6	13-15°	35,5	2	30	4,7	☆
			8	08030-AO09G	4	100	9	8	13-15°	45	3	36	6,5	☆
			10	10030-AO11G	5	100	11	10	11-13°	56	3	43	8,2	☆
			12	12030-AO13G	6	100	13	12	11-13°	71	3	52	9,8	☆
			16	16030-AO15G	8	150	15	16	11-13°	90	3	61	13,4	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.62-01030-AO20G 1610

Ballnose, ISO-P, H

For profiling applications in warm work steels ≥43 HRc.
For profiling applications in cold work steels ≥52HRc.

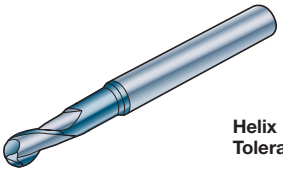
Always use the shortest possible tool protrusion.
When the workpiece material is very short chipping it is possible to achieve better productivity with the H-geometry, page A 169.
In semi-finishing/finishing applications better productivity is possible with a ball nose with four cutting edges.

For better stability use tools with shorter tool protrusion, page A 169. When better accessability is needed, page A 171.

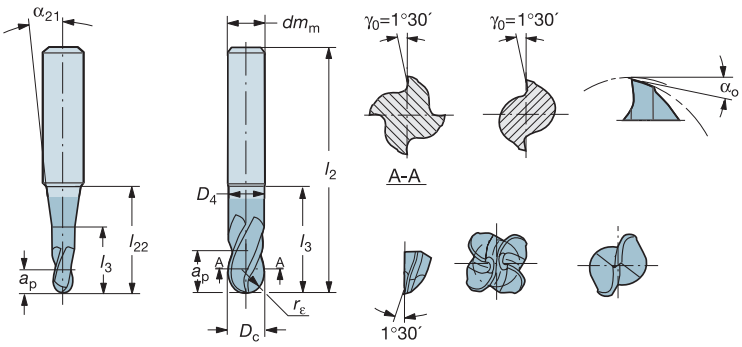
Ball nose endmill

Hardness 43≤HRc≤63

P H



Helix angle: ~30°
Tolerances: D_{c2} — h9
dm_m — h6 (D_{c2}≤8~h5)



Shank type	Front type	D_{c2} mm	Ordering code	r_ε ±0,01	l_2	D_4	Max a_p[1]	dm_m	α_o	Helix l_{sh}[2] mm	l_3	l_{22}	α_{21}	Grade 1610
Cylindrical	 z_n = 2	1	**R216.42-01030-AI10G**	0,5	57	–	1	6	20°	5,6	2	20	4°	☆
		1,5	**01530-AI15G**	0,75	57	–	1,5	6	20°	9	3	20	4°	☆
		2	**02030-AI20G**	1	57	–	2	6	20°	11,2	4	20	4°	☆
		2,5	**02530-AI25G**	1,25	57	–	2,5	6	20°	14	4	20	4°	☆
		3	**03030-AI03G**	1,5	57	–	3	6	20°	16	5	20	4°	☆
		4	**04030-AI04G**	2	57	–	4	6	14°	22,4	6	20	4°	☆
		5	**05030-AI05G**	2,5	57	4,7	5	6	14°	28	20	–	4°	☆
		6	**06030-AI06G**	3	57	5,7	6	6	14°	35,5	21	–	4°	☆
		8	**08030-AI08G**	4	63	7,7	8	8	14°	45	27	–	4°	☆
		10	**10030-AI10G**	5	72	9,7	10	10	12°	56	32	–	4°	☆
		12	**12030-AI12G**	6	83	11,7	12	12	12°	71	36	–	4°	☆
			Extra long											
		1	**R216.42-01030-AP10G**	0,5	80	–	1	6	20°	5,6	2	36,5	2,5°	☆
		2	**02030-AP20G**	1	80	–	2	6	20°	11,2	3	40	2,5°	☆
		3	**03030-AP03G**	1,5	80	–	3	6	20°	18	4	38,5	2,5°	☆
		4	**04030-AP04G**	2	90	–	4	8	14°	22,4	5	51	2,5°	☆
		5	**05030-AP05G**	2,5	100	–	5	8	14°	28	6	40,5	2,5°	☆
		6	**06030-AP06G**	3	100	–	6	10	14°	35,5	7	53	2,5°	☆
		8	**08030-AP08G**	4	100	–	8	12	14°	45	10	53	2,5°	☆
		10	**10030-AP10G**	5	125	–	10	14	12°	56	12	58	2,5°	☆
		12	**12030-AP12G**	6	140	–	12	16	12°	71	14	60	2,5°	☆
	 z_n = 4	6	**R216.44-06030-AI06G**	3	57	–	6	6	14°	35,5	20	5,7	4°	☆
		8	**08030-AI08G**	4	63	–	8	8	14°	45	26	7,7	4°	☆
		10	**10030-AI10G**	5	72	–	10	10	12°	56	30	9,7	4°	☆
		12	**12030-AI12G**	6	83	–	12	12	12°	71	36	11,7	4°	☆
		16	**16030-AI16G**	8	92	–	16	16	12°	90	42	15,5	4°	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.42-01030-AI10G 1610

Ball nose, ISO-P, H

For profiling applications in warm work steels ≥ 43 HRc.
For profiling applications in cold work steels≥52HRc.

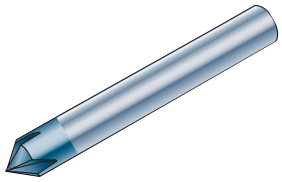
Always use the shortest possible tool protrusion.
First choice is G-geometry. When the workpiece material is very short chipping it is possible to achieve better productivity with the H-geometry, page A 169. In semi-finishing/ finishing applications better productivity is possible with a ballnose with four cutting edges.

When working along steep walls the spherical design ballnose will have shorter contact length, page A 170.
For better stability use a tool with shorter tool protrusion, page A 169.

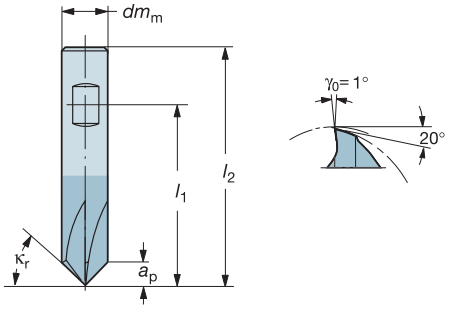
Chamfering endmill

Hardness <63HRc

P M K N S H



Helix angle: 0
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	z_n	Ordering code	Dimensions, mm K_r	l_1	l_2	Max a_p[1]	dm_m	Grade 1620
Cylindrical		4	**R215.94-01500-AC74G**	60°	–	100	7,35	10	☆
		4	**R215.84-01000-AC25G**	45°	–	57	2,5	6	☆
		4	**R215.84-01500-AC43G**	45°	–	100	4,25	10	☆
		5	**R215.85-02000-AC30G**	45°	–	80	3	8	☆
		6	**R215.86-03000-AC05G**	45°	–	83	4,5	12	☆
Weldon		4	**R215.94-01500-BC74G**	60°	80	100	7,35	10	☆
		4	**R215.84-01500-BC43G**	45°	80	100	4,25	10	☆
		6	**R215.86-03000-BC05G**	45°	60,5	83	4,5	12	☆

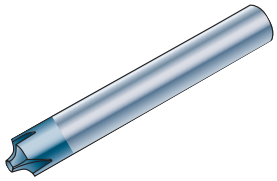
[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R215.94-01500-AC74G 1620

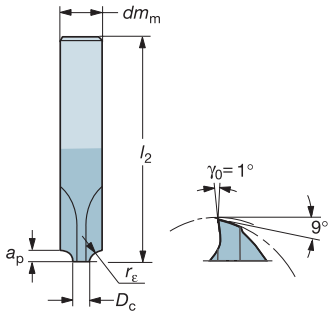
Chamfering radius endmill

Hardness <63HRc

P M K N S H



Helix angle: 0
Tolerances: dm_m — h6



Shank type	Front type	z_n	Ordering code	Dimensions, mm r_ε	D_c	l_2	Max a_p[1]	dm_m	Grade 1620
Cylindrical		3	**R215.03-04000BAC01G**	0,5	4	57	0,5	6	☆
		3	**R215.03-04000CAC01G**	0,75	4	57	0,75	6	☆
		4	**R215.04-04000CAC01G**	1	4	63	1,0	8	☆
		4	**R215.04-04000DAC02G**	1,5	4	63	1,5	8	☆
		4	**R215.04-05000EAC02G**	2	5	72	2,0	10	☆
		4	**R215.04-05000FAC03G**	2,5	5	72	2,5	10	☆
		4	**R215.04-05000GAC03G**	3	5	83	3,0	12	☆
		4	**R215.04-06000IAC04G**	4	6	83	4,0	14	☆
		4	**R215.04-06000KAC05G**	5	6	92	5,0	16	☆
		4	**R215.04-08000MAC06G**	6	8	104	6,0	20	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R215.03-04000BAC01G 1620

Chamfering, ISO-P, M, K, N, S, H

Endmill designed for chamfering

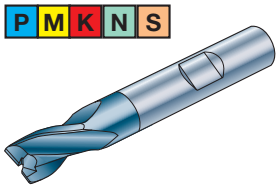
For 30° and 45° chamfer.
For 0,5-6 mm radius.

Slotting endmill

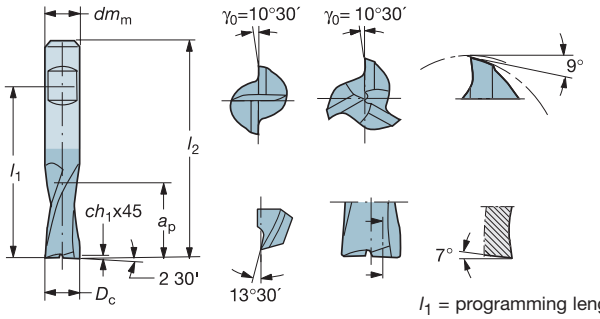
Key slot

Hardness <48HRc

P M K N S



Helix angle: ~30°
Tolerances: D_c — h10/e8
dm_m — h6



l_1 = programming length

Shank type	Front type	Ordering code	D_c mm	l_1	l_2	Max a_p [1]	dm_m	Helix l_{sh} [2] mm	ch_1	Tol. D_c	Grade 1630
Weldon	z_n = 2	R216.12- 02030-BS30P	2,0	32	50	3	6	11,2	0,10	e8	☆
		02530-BS30P	2,5	32	50	3	6	14	0,10	e8	☆
		02830-BS40P	2,8	32	50	4	6	16	0,10	h10	☆
		03030-BS04P	3,0	32	50	4	6	16	0,10	e8	☆
		03530-BS04P	3,5	32	50	4	6	20	0,10	e8	☆
		03830-BS05P	3,8	36	54	5	6	22,4	0,10	h10	☆
		04030-BS05P	4,0	36	54	5	6	22,4	0,10	e8	☆
		04830-BS06P	4,8	36	54	6	6	28	0,15	h10	☆
		05030-BS06P	5,0	36	54	6	6	28	0,15	e8	☆
		05830-BS07P	5,75	36	54	7	6	35,5	0,15	h10	☆
		06030-BS07P	6,0	36	54	7	6	35,5	0,15	e8	☆
		06830-BS08P	6,75	40	58	8	8	40,0	0,15	h10	☆
		07030-BS08P	7,0	40	58	8	8	40,0	0,15	e8	☆
		07830-BS09P	7,75	40	58	9	8	45,0	0,15	h10	☆
		08030-BS09P	8,0	40	58	9	8	45,0	0,15	e8	☆
		09030-BS10P	9,0	46	66	10	10	50,0	0,25	e8	☆
		09730-BS11P	9,7	46	66	11	10	56,0	0,25	h10	☆
		10030-BS11P	10,0	46	66	11	10	56,0	0,25	e8	☆
		11730-BS12P	11,7	50,5	73	12	12	71,0	0,25	h10	☆
		12030-BS12P	12,0	50,5	73	12	12	71,0	0,25	e8	☆
		13730-BS14P	13,7	52,5	75	14	14	80,0	0,25	h10	☆
		14030-BS14P	14,0	52,5	75	14	14	80,0	0,25	e8	☆
		15730-BS16P	15,7	58	82	16	16	90,0	0,25	h10	☆
		16030-BS16P	16,0	58	82	16	16	90,0	0,25	e8	☆
		17730-BS18P	17,7	60	84	18	18	100	0,25	h10	☆
		18030-BS18P	18,0	60	84	18	18	100	0,25	e8	☆
		19730-BS20P	19,7	67	92	20	20	112	0,35	h10	☆
		20030-BS20P	20,0	67	92	20	20	112	0,35	e8	☆
	z_n = 3	R216.13- 01830-BS30P	1,8	32	50	3	6	10	0,10	h10	☆
		02030-BS30P	2,0	32	50	3	6	11,2	0,10	e8	☆
		02830-BS40P	2,8	32	50	4	6	16	0,10	h10	☆
		03030-BS04P	3,0	32	50	4	6	16	0,10	e8	☆
		03830-BS05P	3,8	36	54	5	6	22,4	0,10	h10	☆
		04030-BS05P	4,0	36	54	5	6	22,4	0,10	e8	☆
		04830-BS06P	4,8	36	54	6	6	28	0,15	h10	☆
		05030-BS06P	5,0	36	54	6	6	28	0,15	e8	☆
		05830-BS07P	5,75	36	54	7	6	35,5	0,15	h10	☆
		06030-BS07P	6,0	36	54	7	6	35,5	0,15	e8	☆
		06830-BS08P	6,75	40	58	8	8	40,0	0,15	h10	☆
		07030-BS08P	7,0	40	58	8	8	40,0	0,15	e8	☆
		07830-BS09P	7,75	40	58	9	8	45,0	0,15	h10	☆
		08030-BS09P	8,0	40	58	9	8	45,0	0,15	e8	☆
		09030-BS10P	9,0	46	66	10	10	50,0	0,25	e8	☆
		09730-BS11P	9,7	46	66	11	10	56,0	0,25	h10	☆
		10030-BS11P	10,0	46	66	11	10	56,0	0,25	e8	☆
		11730-BS12P	11,7	50,5	73	12	12	71,0	0,25	h10	☆
		12030-BS12P	12,0	50,5	73	12	12	71,0	0,25	e8	☆
		13730-BS14P	13,7	52,5	75	14	14	80,0	0,25	h10	☆
		14030-BS14P	14,0	52,5	75	14	14	80,0	0,25	e8	☆
		15730-BS16P	15,7	58	82	16	16	90,0	0,25	h10	☆
		16030-BS16P	16,0	58	82	16	16	90,0	0,25	e8	☆
		17730-BS18P	17,7	60	84	18	18	100	0,25	h10	☆
		18030-BS18P	18,0	60	84	18	18	100	0,25	e8	☆
		19730-BS20P	19,7	67	92	20	20	112	0,35	h10	☆
		20030-BS20P	20,0	67	92	20	20	112	0,35	e8	☆

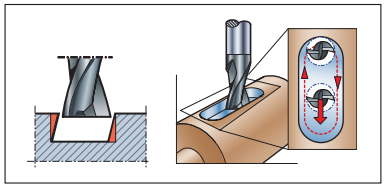
Cutting data

First choice:
Use Plura Guide.
Order number C-2948-036

Second choice:
Use tables on pages A 238 – A 240.

[1] Maximum cutting edge length.
[2] Pitch per rev.

Ordering example: 10 pieces R216.12-02030-BS30P 1630



Key slotting, ISO-P, M, K, N, S

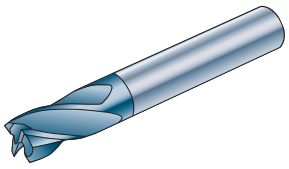
Endmill designed for key slot milling.

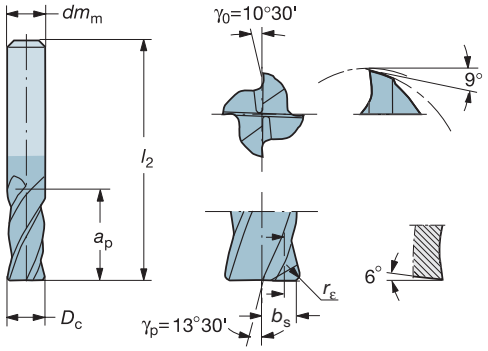
These endmills are shorter and therefore more stable than our normal endmills with two and three cutting edges.
All these endmills have a relatively large corner chamfer. The standard sizes tools have tighter tolerances on cutting edges. When you want an endmill with two or three edges and can work with a tool with a corner chamfer, this should be your first choice. In almost all applications you will achieve the highest productivity with three cutting edges compared to two.

Endmills for Turn-Milling

Hardness <48HRc

P M K N S H





Helix angle: ~30°
Tolerances: D_c — h10
dm_m — h6

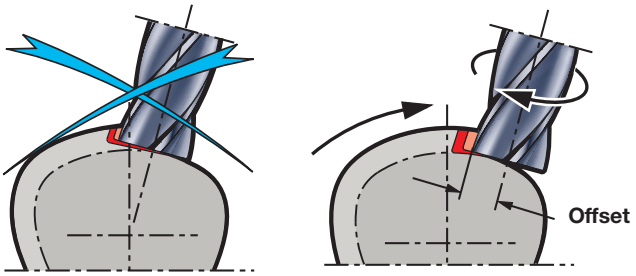
Shank type	Front type	Ordering code D_c mm		Dimensions, mm l_2	Max a_p[1]	dm_m	Helix l_{sh}[2] mm	r_ε	Grade 1620
Cylindrical	z_n = 4	6	**R216.T4-06030BAS10N**	54	10	6	35,5	0,5	☆
		8	**R216.T4-08030BAS12N**	58	12	8	45	0,5	☆
		10	**R216.T4-10030CAS14N**	66	14	10	56	1,0	☆
		12	**R216.T4-12030CAS16N**	73	16	12	71	1,0	☆

[1] Maximum cutting edge length.
[2] Pitch per rev.

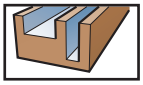
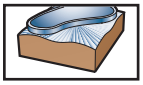
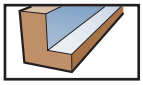
Ordering example: 10 pieces R216.T4-06030BAS10N 1620

Turn-Milling, ISO P, M, K, N, S, H

A specialised CoroMill Plura endmill with a cutting geometry designed for use in Turn-Mill operations. Two of the four cutting edges cut in both radial and axial directions, while the remaining two cut mainly in the radial direction.
For best performance, the endmill's axis of rotation should ***not*** align exactly with the workpiece's central axis. Instead the endmill should be offset, and sit further round in the workpiece's rotational cycle.



0,25 × D_c ≤ offset ≤ 0,45 × D_c

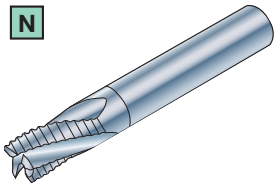




High performance ISO N endmill

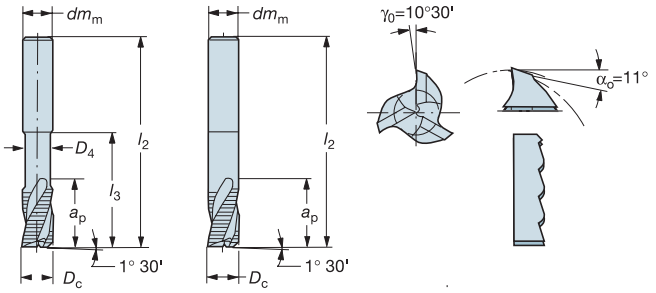
Roughing

Kordell design

N



Material: Aluminium and copper
Helix angle: ~40°
Tolerances: D_c — h14
dm_m — h6



Shank type	Front type	Ordering code	D_c mm	l_2	Max a_p [1]	dm_m	l_3	D_4	Grade H10F
Cylindrical	z_n = 3	Long							
		R216.33- 06040-AC13U	6	57	13	6	–	–	☆
		08040-AC19U	8	63	19	8	–	–	☆
		10040-AC22U	10	72	22	10	–	–	☆
		12040-AC26U	12	83	26	12	–	–	☆
		14040-AC26U	14	83	26	14	–	–	☆
		16040-AC32U	16	92	32	16	–	–	☆
		18040-AC32U	18	92	32	18	–	–	☆
		20040-AC38U	20	104	38	20	–	–	☆
		Extra long							
		R216.33- 06040-AJ10U	6	63	10	8	24	5.6	☆
		08040-AJ12U	8	72	12	10	29	7.5	☆
		10040-AJ14U	10	83	14	12	35	9.3	☆
		12040-AJ16U	12	100	16	12	50	11.5	☆
		16040-AJ20U	16	115	20	16	63	15.5	☆
		20040-AJ20U	20	125	20	20	70	19.5	☆
		25040-AJ25U	25	135	25	25	75	24.0	☆

[1] Maximum cutting edge length.

Ordering example: 10 pieces R216.33-06040-AC13U H10F

Aluminum, Kordel, ISO-N

FIRST CHOICE for roughing of Aluminum and copper.

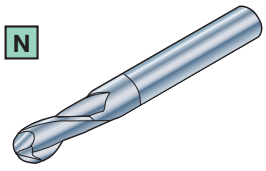
Kordel-geometry for reduced cutting forces and improved chip-evacuation.
Always use the shortest possible tool protrusion.

When the rough finish produced by Kordel-geometry is not acceptable try the straight cutting edge, page A 176.
For Aluminum with a higher Si-content a coated Kordel endmill could be more productive, page A 152.

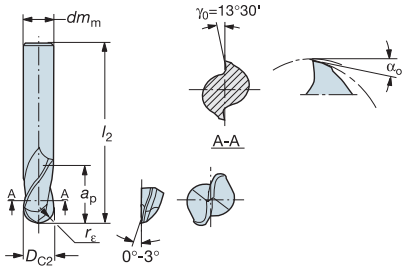
High performance ISO N endmill

Ball nose

N



Material: Aluminium and copper
Helix angle: ~30°
Tolerances: D_{c2} — h9
dm_m — h6



Shank type	Front type	Ordering code	D_{c2} mm	r_ε±0.01	l_2	Max a_p [1]	dm_m	α_o	Grade H10F
Cylindrical	z_n = 2	R216.42- 02030-AK60A	2	1	57	6	6	19-21°	☆
		03030-AK07A	3	1.5	80	7	6	19-21°	☆
		04030-AK08A	4	2	80	8	6	13-15°	☆
		05030-AK10A	5	2.5	80	10	6	13-15°	☆
		06030-AK10A	6	3	80	10	6	13-15°	☆
		08030-AK16A	8	4	100	16	8	13-15°	☆
		10030-AK19A	10	5	100	19	10	11-13°	☆
		12030-AK22A	12	6	100	22	12	11-13°	☆
		16030-AK26A	16	8	100	26	16	11-13°	☆

[1] Maximum cutting edge length.

Ordering example: 10 pieces R216.42-02030-AK60A H10F

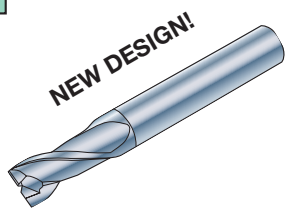
Aluminum, Ballnose, ISO-N

For profiling of Aluminum.

- For Aluminum with a higher Si-content a coated ballnose could be more productive, page A 168.

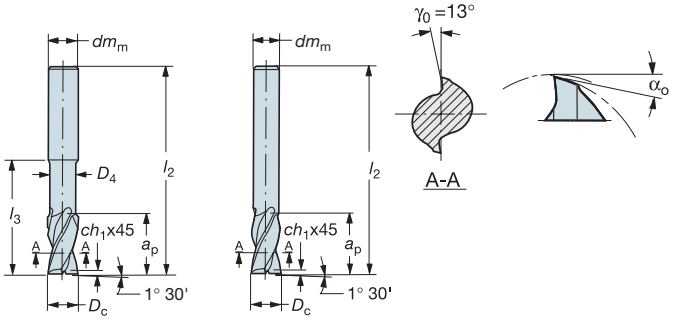
High performance ISO N endmill

N



This cutter has a new design improving drilling capability.

Material: Aluminium and copper
Helix angle: ~30°, ~25°, ~25°
Tolerances: D_c — h10
dm_m — h6



Shank type	Front type	D_c mm	Ordering code	l_2	Max a_p[1]	dm_m	D_4	l_3	ch_1	Grade H10F
Cylindrical	z_n = 2		**Normal**							
		2	**R216.32- 02030-AC60A**	57	6	6	–	9,5	–	☆
		3	**03030-AC07A**	57	7	6	–	10,4	–	☆
		4	**04030-AC08A**	57	8	6	–	15,3	–	☆
		5	**05030-AC10A**	57	10	6	–	16,1	–	☆
		6	**06030-AC10A**	57	10	6	–	–	–	☆
		8	**08030-AC16A**	63	16	8	–	–	–	☆
		10	**10030-AC19A**	72	19	10	–	–	0,10	☆
		12	**12030-AC22A**	83	22	12	–	–	0,10	☆
			Long							
		2	**R216.32- 02025-AK80A**	57	8	6	–	10,0	–	☆
		3	**03025-AK12A**	57	12	6	–	14,9	–	☆
		4	**04025-AK14A**	57	14	6	–	18,0	–	☆
		5	**05025-AK16A**	57	16	6	–	19,1	–	☆
		6	**06025-AK22A**	65	22	6	–	–	–	☆
		8	**08025-AK28A**	80	28	8	–	–	–	☆
		10	**10025-AK32A**	90	32	10	–	–	0,10	☆
		12	**12025-AK38A**	100	38	12	–	–	0,10	☆
			Extra long							
		2	**R216.32- 02025-AP30A**	57	3	6	1,9	6	–	☆
		3	**03025-AP04A**	57	4	6	2,9	7	–	☆
		4	**04025-AP06A**	57	6	6	3,8	10	–	☆
		5	**05025-AP08A**	57	8	6	4,8	16	–	☆
		6	**06025-AP10A**	65	10	6	5,7	28	–	☆
		8	**08025-AP12A**	80	12	8	7,7	35	–	☆
		10	**10025-AP14A**	90	14	10	9,7	45	0,10	☆
		12	**12025-AP16A**	100	16	12	11,7	50	0,10	☆
		16	**16025-AP20A**	115	20	16	15,5	63	0,15	☆
		20	**20025-AP20A**	125	20	20	19,5	70	0,15	☆

[1] Maximum cutting edge length.

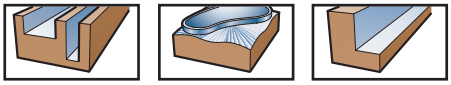
Ordering example: 10 pieces R216.32-02030-AC60A H10F

General, ISO-N (Aluminium, Copper)

For general machining/finishing of aluminum.

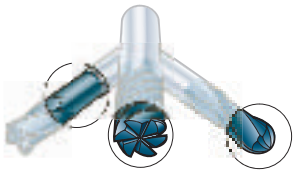
Always use the shortest possible tool protrusion.

For aluminum with a higher Si-content a coated endmill could be more productive.



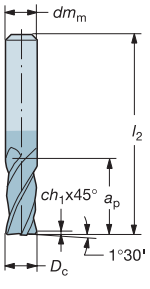
ENGINEERED SOLUTIONS — CoroMill® Plura

For quotation please contact your nearest Sandvik Coromant representative.



❷ Type of cutter

10



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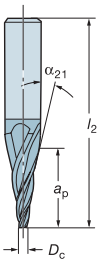

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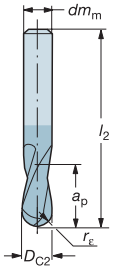

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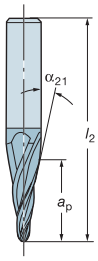
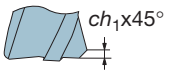


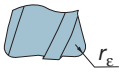
❸ Corner design

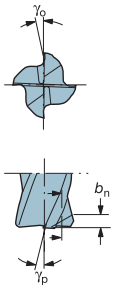
Sharp

Chamfer

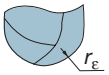


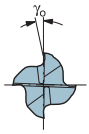
Radius



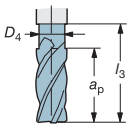


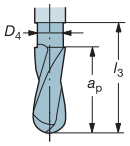
Radius





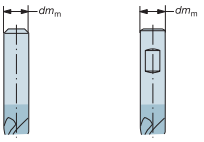
❹ Cutter with recess



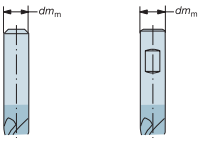


❺ Shank type

Cylindrical **Weldon**



Cylindrical **Weldon**



Options

System of measurement	metric
Material to machine	ISO-P, ISO-H, ISO-M, ISO-K, ISO-S, ISO-N
D_c or D_{c2}	2-32 mm
Endmill types	10 = square endmills 20 = ballnose endmills 40 = conical endmills 50 = conical ball nose endmills
Alternative grades	GC1610, GC1620, GC1630, H10F, Special: Substrate: H10F, 10EF; Coating: TiCN, Futura, Extreme, X.CEED
Rake angle γ_o	-20° - +15°
Drilling	**YES** or **NO**
Helix angle	0° - 60°
Helix reduction	**YES** or **NO**
α_{21}	**No, 0°30' – 10°**

Helix red. angle γ_p	-10° - +20°
Helix red. width b_n	0-1 mm
Tolerances on D_c or D_{c2}	h9, h10 or e8
z_c	(number of teeth) 1 - (=D_c)
l_2	< 180 mm
a_p	< 5 × D_c
l_3	< 140 mm
Recess	**YES** (state D_4) or **NO**
Recess diameter D_4	Min D_4 = (D_c or D_{c2}) - 2 mm
dm_m	6; 6,35; 8; 9,525; 10; 12; 12,7; 14; 15,875; 16; 18; 19,05; 20; 25; 32 mm
Corner mod.	**YES** (state radius or chamfer) or **NO**
ch_1	45° × 0,1 - 2 mm
r_ε	< D_c/2
Shank type	Cylindrical shank - **CYL** and Weldon shank - **W**

Code key for solid carbide endmills

Metric tools

R215.3A-10030-AC22H													
1	3	4		5	6		7	8	9	10	11	12	13

Inch tools

RA215.3A-1030AAC22H													
1	2	3	4		5	6		7	8	9	10	11	12	13

1 Direction of rotation

R	Right hand
L	Left hand

2 System of measurement

A	Inch version

3 Type of tool

21	Endmill

4 Drilling function

5	Non drilling
6	Drilling

5 Basic design of endmill

0	Concave chamfer endmill
1	Square form with/without corner chamfer, tight tolerance at D_c
2	Square form with corner radius
3	Square form with or without corner chamfer
4	Full radius (ball nose) form (6 or less teeth)
5	Conical full radius (ball nose) form (6 or less teeth)
6	Full radius (ball nose) with spherical form
7	Conical straight form
8	45° chamfer endmill
9	30° chamfer endmill
T	Turn-mill endmill

6 Number of teeth

1 - 9	1 to 9 teeth
A -Z	10 to 32 teeth

7 Cutting diameter

Metric tools

Cutting diameter D_c or D_3 in 1/10 mm.
Example: **100** = 10.0 mm

Inch Tools

Cutting diameter D_c or D_3 in 1/64 inch.
Example: **10** = 5/32 inch

8 Helix angle

Degree of helix rounded to nearest 5 degree

9 Corner radius

Metric tools

–	No radius	C	1,0 mm
A	<0,5 mm	D	1,5 mm
B	0,5 mm	E	2,0 mm
		F	2,5 mm
		Etc.	Etc.

Inch tools

–	No radius	D	1/16 inch
A	1/64 inch	E	5/64 inch
B	1/32 inch	F	3/32 inch
C	3/64 mm	Etc.	Etc.

10 Shank type

A	Cylindrical
B	Weldon

11 Length of shank

S	Short shank length	**E**	Short l_2 and l_3 or l_{22}
C	Long shank length	**I**	Medium l_2 medium l_3 or l_{22}
K	Shank length > "C"	**J**	Medium l_2, long l_3 or l_{22}
L	Shank length > "K"	**O**	Long l_2, medium l_3 or l_{22}
X	Shank length > "L"	**P**	Long l_2, long l_3 or l_{22}

12 Max. cutting depth, a_p

Metric tools

Cutting length in mm
If D_c or D_{c2} < 3mm in 1/10 mm
Example: **07** = 7 mm for D_c 6 mm
70 = 7 mm for D_c 2,5 mm

Inch tools

Cutting length in 1/16 inch
If D_c or D_{c2} < 1/8 in 1/64 inch
Example: **09** = 9/16 inch for D_c 3/16 inch

13 Geometry type

	Cutting edge	TW % of D_c or D_{c2}	Rake angle γ°		Cutting edge	TW % of D_c or D_{c2}	γ°
K	Kordell	50–60	9°–12°	**N**	Straight	56–65	9°–12°
B	Chip breaker	60	4°–7°	**L**	Straight	66–75	4°–12°
U	Kordell	<50	9°–12°	**G**	Straight	50–75	–3°–3°
A	Straight	<45	12°–15°	**H**	Straight	>75	<–3°
P	Straight	45–55	9°–12°				

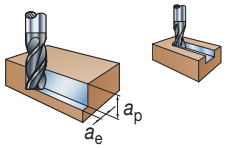
TW = Core diameter

CoroMill® Plura cutting data

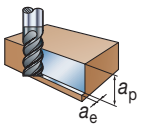
Speed recommendations

CoroMill® Plura

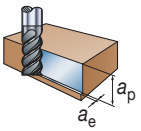
GC1620
GC1630
H10F



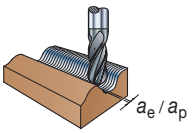
$a_p \times a_e > D_c$



$a_p \times a_e < D_c$



$a_e \leq 0{,}05 \times D_c$



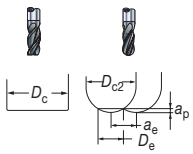
$a_e \leq 0{,}05 \times D_c$ or D_{c2}
$a_p \leq 0{,}05 \times D_c$ or D_{c2}

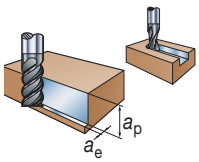
ISO	CMC	HB	HRC	v_e m/min	v_e m/min	v_e m/min	v_e m/min
P	01.1	125		155	200	375	690
	01.2	150		135	185	340	630
	01.4	200		120	140	255	470
	02.2	250		100	130	245	450
	02.2	300		90	120	220	410
	03.22	400		75	95	180	335
	03.22	450		65	85	160	300
M	05.11	200		60	90	165	300
	05.21	200		60	75	145	270
	05.51	230		45	55	110	200
K	07.1	150		135	180	330	610
	09.2	200		100	130	240	440
	08.1	180		85	110	210	385
N	30.22	90		1000	1100	1250	1300
S	20.22	350		265	300	510	1300
	23.22	350		220	255	420	1070
H	04.1	50		55	80	GC1610	
		55		-	55		
		60		-	40		

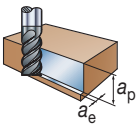
Feed recommendations

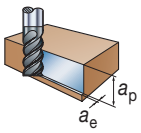
CoroMill® Plura

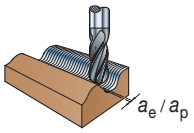
GC1620
GC1630
H10F











Metric

$$n = \frac{1000 \times v_c \text{ or } v_e}{\pi \times D_c \text{ or } D_{c2}} \quad \text{(rpm)}$$

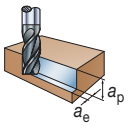
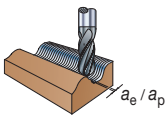
$$v_f = n \times f_z \times z_n \quad \text{(mm/min)}$$

$$D_e = 2 \times \sqrt{a_p \times (D_{c2} - a_p)} \quad \text{(mm)}$$

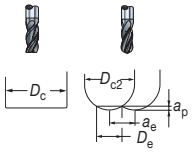
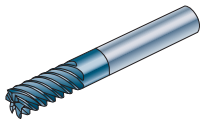
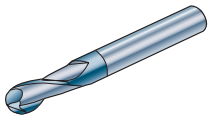
D_c or D_{c2} mm	f_z mm/tooth	f_z mm/tooth	f_z mm/tooth	f_z mm/tooth
0,5	*Plura Guide*			
1	0,002	0,002	0,013	0,023
2	0,004	0,003	0,032	0,056
3	0,006	0,007	0,039	0,07
3,175	0,006	0,008	0,040	0,072
4	0,008	0,014	0,045	0,08
4,76	0,010	0,019	0,046	0,078
5	0,011	0,021	0,046	0,078
6	0,014	0,03	0,055	0,099
6,35	0,015	0,031	0,056	0,102
8	0,020	0,033	0,063	0,114
9,525	0,025	0,050	0,069	0,124
10	0,027	0,055	0,071	0,127
12	0,036	0,071	0,077	0,139
12,7	0,039	0,074	0,079	0,143
15,875	0,054	0,089	0,089	0,160
16	0,055	0,09	0,089	0,161
19,05	0,073	0,105	0,097	0,175
20	0,078	0,11	0,1	0,18
25	0,11	0,11	0,11	—

CoroMill® Plura cutting data

Speed recommendations

CoroMill® Plura GC1610							
				$a_e < 0{,}1 \times D_c$ $a_p < 0{,}5 \times D_c$	$a_e < 0{,}05 \times D_c$ $a_p < 1 \times D_c$	$a_e < 0{,}1 \times D_{c2}$ or D_e $a_p < 0{,}1 \times D_{c2}$ or D_e	$a_e < 0{,}01 \times D_{c2}$ or D_e $a_p < 0{,}01 \times D_{c2}$ or D_e
ISO	**CMC**	**HB**	**HRC**	v_e m/min	v_e m/min	v_e m/min	v_e m/min
P	**03.22**	**400**		170	200	320	815
		450		150	180	280	715
K	**08.1**	**200**		265	300	510	1300
	09.2	**250**		220	255	420	1070
H	**04.1**		**48**	130	170	270	680
			52	120	155	210	600
			55	105	110	200	425
			58	75	90	145	370
			60	65	80	130	320
			62	60	65	100	265

Feed recommendations

CoroMill® Plura GC1610				
			$a_e < 0{,}1 \times D_{c2}$ or D_e $a_p < 0{,}1 \times D_{c2}$ or D_e	$a_e < 0{,}01 \times D_{c2}$ or D_e $a_p < 0{,}01 \times D_{c2}$ or D_e
Metric $n = \frac{v_e \times 1000}{\pi \times D_e}$ (rpm) $v_f = n \times f_z \times z_n$ (mm/min) $D_e = 2 \times \sqrt{a_p \times (D_{c2} - a_p)}$ (mm)	D_c or D_{c2} (mm)	f_z mm/tooth	f_z mm/tooth	f_z mm/tooth
	1	–	0,015	0,040
	2	–	0,035	0,055
	3	0,040	0,050	0,070
	3,175	0,041	0,055	0,072
	4	0,045	0,080	0,080
	4,76	0,037	0,088	0,088
	5	0,035	0,090	0,090
	6	0,030	0,100	0,100
	6,35	0,034	0,103	0,103
	8	0,055	0,115	0,115
	9,525	0,066	0,123	0,123
	10	0,070	0,125	0,125
	12	0,075	0,140	0,140
	12,7	0,078	0,144	0,144
	15,875	0,090	–	–
	16	0,090	0,160	0,160
	19,05	0,098	–	–

High security demands in HSM

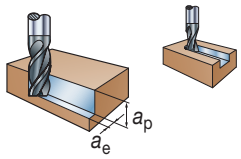
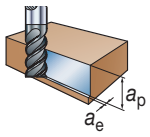
The machine tools used for HSM must be safely guarded, as splinters or parts of damaged tools might cause serious accidents. High speed machinery has to be “bullet proof”.

Dry milling extends tool life

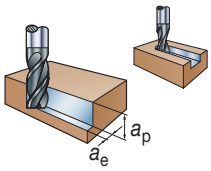
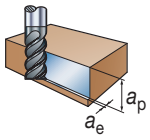
CoroMill Plura endmills are developed to withstand constant high cutting speeds and temperatures. Their tool life and reliability are, in most cases, much better suited to a dry environment. Tool life improvements of more than 40% are not unusual.

CoroMill® Plura cutting data

Speed recommendations

CoroMill® Plura GC1640				
			$a_p \times a_e \leq D_c$	$a_p \times a_e < 0,5 \times D_c$
ISO	**CMC**	**HB HRC**	v_e m/min	v_e m/min
P	**01.1**	**125**	145	160
	01.2	**150**	135	145
	01.4	**200**	100	110
	02.2	**250**	85	95
	02.2	**300**	80	85
	03.22	**350**	75	80
M	**05.11**	**200**	65	70
	05.21	**200**	50	55
	05.51	**230**	35	40
K	**07.1**	**150**	130	14
	09.2	**200**	105	115
	08.1	**250**	70	75
S	**20.22**	**350**	25	25
	23.22	**350**	40	45

Feed recommendations

CoroMill® Plura GC1640			
Metric	D_c mm	f_z mm/tooth	f_z mm/tooth
$n = \frac{v_c \times 1000}{\pi \times D_c}$ (rpm)	6	0,013	0,019
	6,35	0,013	0,022
	8	0,016	0,035
	9,525	0,023	0,041
$v_f = n \times f_z \times z_n$ (mm/min)	10	0,025	0,043
	12	0,031	0,055
	12,7	0,035	0,057
	15,875	0,052	0,068
	16	0,053	0,069
	19,05	0,065	0,081
	20	0,069	0,085

High performance, solid carbide drill for small part machining

CoroDrill® Delta-C R840

Hole diameters 1,50 – 2,90 mm

Applications: Steel and cast materials, titanium alloys, cast iron, non ferrous materials and hard materials.

CoroDrill® Delta-C — the first choice in modern high performance machines

Self-centering drill
Good surface quality
Easy-to-regrind geometry
Drill design according to DIN 6539/1897
Manufacturing tolerance h7

Long design:
Max hole depth:
4 – 5 x diameter

Cutting fluid supply
External cutting fluid supply.

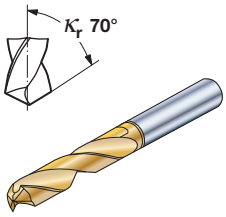
Product benefits

Cutting material: micro-grain carbide for **high resistance to wear and extreme toughness.**
TiN-coating for **universal applications.**
Flute geometry for **efficient chip transportation.**
Geometry for **high cutting performance.**

CoroDrill® Delta-C R840 for small part machining

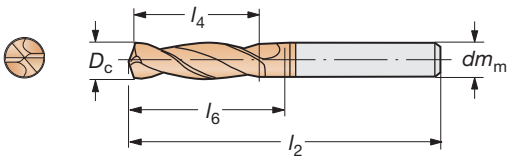
4 – 5 × D_c

Cylindrical shank



Drill diameter: 1,50 – 2,90 mm
Max hole depth: 4-5 × D_c
Coating: TiN
Hole tolerance: IT8 –10
Surface finish: R_a 1–2 µm
Cutting fluid: Emulsion or cutting oil
Drill standard: DIN 1897 (dia. 1,50 – 1,80 mm)
DIN 6539 (dia. 1,90 – 2,90 mm)
Tolerances: dm_m = h6
D_c = h7

External coolant supply



l_4 = recommended drilling depth

Drill diameter D_c mm	(Inch)	Ordering code External coolant supply	Coromant grades 1020	dm_m	l_2	l_4	l_6
1,50		R840-0150-50-A0B	☆	1,50	32	7	9
1,588	(1/16)	0159-50-A0B	☆	1,588	34	8	10
1,60		0160-50-A0B	☆	1,60	34	8	10
1,70		0170-50-A0B	☆	1,70	34	8	10
1,80		0180-50-A0B	☆	1,80	36	9	11
1,90		0190-50-A0B	☆	1,90	36	9	11
1,984	(5/64)	0198-50-A0B	☆	1,984	38	9	12
2,00		0200-50-A0B	☆	2,00	38	9	12
2,10		0210-50-A0B	☆	2,10	38	9	12
2,20		0220-50-A0B	☆	2,20	40	10	13
2,30		R840-0230-50-A0B	☆	2,30	40	10	13
2,381	(3/32)	0238-50-A0B	☆	2,381	43	11	14
2,40		0240-50-A0B	☆	2,40	43	11	14
2,50		0250-50-A0B	☆	2,50	43	11	14
2,60		0260-50-A0B	☆	2,60	43	11	14
2,70		0270-50-A0B	☆	2,70	46	12	16
2,778	(7/64)	0278-50-A0B	☆	2,778	46	12	16
2,80		0280-50-A0B	☆	2,80	46	12	16
2,90		0290-50-A0B	☆	2,90	46	12	16

= New item

Ordering example: 10 pieces R840-0150-50-A0A 1020

The total CoroDrill® Delta-C drill programme

Besides the introduction of the above drills for small part machining, productive CoroDrill Delta-C drills are available in larger diameter range up to 20 mm.

The new Rotating tools catalogue describes the full range and the last product introductions.

Example of new CoroDrill Delta-C drills introduced in that catalogue are:

– R840, diameter 3,0 – 4,9 mm, drill depth 3 × D_c and 5 × D_c, all with internal coolant supply.

– R840, diameter 5,0 – 14,0 mm, drill depth 7 × D_c

– R850, diameter 5,0 – 14,0 mm, drill depth 7 × D_c, for aluminium machining

CoroDrill™ Delta-C R840

The solid carbide drill – a precision tool for high productivity hole making

Hole diameters 3,00 – 20,00 mm

CoroDrill™ Delta-C — the first choice in modern high performance machines

Self-centering drill
No need for pre-drilling
Good surface finish
Easy-to-regrind geometry
Drill design according to DIN 6537
Tolerance m7 to suit tapping operations

Good clamping features

Cylindrical shank according to DIN 6535 HA (K) – First choice.

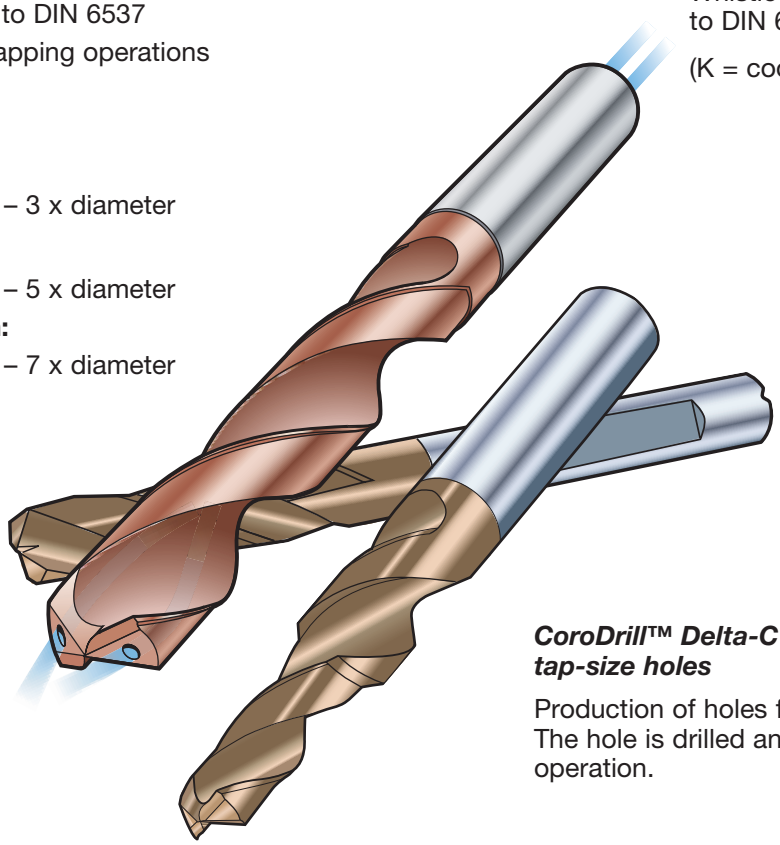
Whistle Notch shank according to DIN 6535 HE (K)

(K = coolant holes)

Short design:
Max hole depth: 2 – 3 x diameter

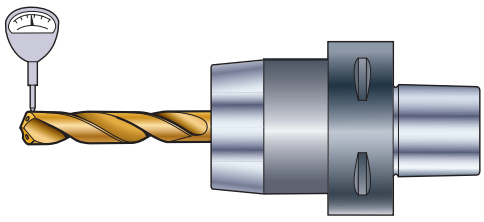
Long design:
Max hole depth: 4 – 5 x diameter

Extra long design:
Max hole depth: 6 – 7 x diameter



CoroDrill™ Delta-C chamfer drill for tap-size holes

Production of holes for threading (M4 – M16). The hole is drilled and chamfered in one operation.



CoroGrip® power chuck

For precision and small run out

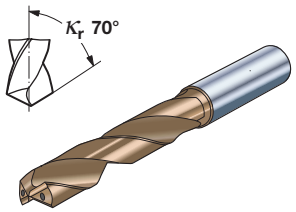
Tailor Made

Even more possibilities thanks to tailored design!

If you do not find what you need in our comprehensive standard programme, choose the tool shape you require and we will tailor it for you to *your* dimensions.

2 – 3 × D_c

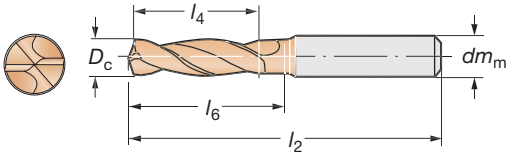
Cylindrical shank



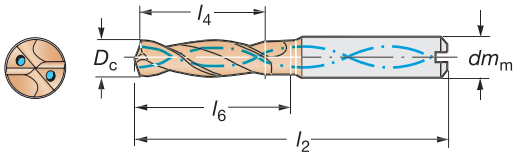
Drill diameter: 3,00-20,00 mm
Max hole depth: 2-3 x D_c
Coating: TiN/ TiAlN multilayer
Hole tolerance: IT8-9
Surface finish: R_a 1-2 µm
Cutting fluid: Emulsion or cutting oil

Drill standard: DIN 6537
Tolerances: dm_m = h6
D_c = m7:
$D_c \leq 3$ +0,012/+0,002
D_c 3≤ 6 +0,016/+0,004
D_c 6≤10 +0,021/+0,006

External coolant supply



Internal coolant supply



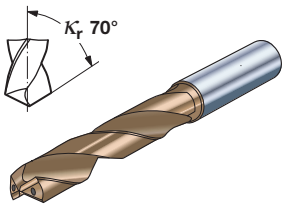
l_4 = recommended drilling depth

Drill diameter D_c mm	Fraction/ Thread size	Ordering code External coolant supply	Coromant grades 1220	Coromant grades P M K N S H	Ordering code Internal coolant supply	Coromant grades 1220	Coromant grades P M K N S H	Dimensions, mm dm_m	l_2	l_4	l_6
3,00		R840- 0300-30-A0A	☆		R840- 0300-30-A1A	☆ *		6,0	62	13	20
3,10		0310-30-A0A	☆		0310-30-A1A	☆ *		6,0	62	13	20
3,17	1/8	-			0317-30-A1A	☆ *		6,0	62	13	20
3,20		0320-30-A0A	☆		0320-30-A1A	☆ *		6,0	62	13	20
3,30		0330-30-A0A	☆		0330-30-A1A	☆ *		6,0	62	13	20
3,40		0340-30-A0A	☆		0340-30-A1A	☆ *		6,0	62	13	20
3,45	8-32 UNC	-			0345-30-A1A	☆ *		6,0	62	14	20
3,50		0350-30-A0A	☆		0350-30-A1A	☆ *		6,0	62	14	20
3,55	8-36 UNF	-			0355-30-A1A	☆ *		6,0	62	14	20
3,57	9/64	-			0357-30-A1A	☆ *		6,0	62	14	20
3,60		R840- 0360-30-A0A	☆		R840- 0360-30-A1A	☆ *		6,0	62	14	20
3,70		0370-30-A0A	☆		0370-30-A1A	☆ *		6,0	62	14	20
3,80		0380-30-A0A	☆		0380-30-A1A	☆ *		6,0	62	14	20
3,90	10-24 UNC	0390-30-A0A	☆		0390-30-A1A	☆ *		6,0	62	14	20
3,97	5/32	-			0397-30-A1A	☆ *		6,0	66	17	24
4,00		0400-30-A0A	☆		0400-30-A1A	☆ *		6,0	66	17	24
4,10	10-32 UNF	0410-30-A0A	☆		0410-30-A1A	☆ *		6,0	66	17	24
4,20		0420-30-A0A	☆		0420-30-A1A	☆ *		6,0	66	17	24
4,30	M5	0430-30-A0A	☆		0430-30-A1A	☆ *		6,0	66	17	24
4,36	11/64	-			0436-30-A1A	☆ *		6,0	66	17	24
4,40		R840- 0440-30-A0A	☆		R840- 0440-30-A1A	☆ *		6,0	66	17	24
4,50		0450-30-A0A	☆		0450-30-A1A	☆ *		6,0	66	17	24
4,55	12-24 UNC	-			0455-30-A1A	☆ *		6,0	66	17	24
4,60		0460-30-A0A	☆		0460-30-A1A	☆ *		6,0	66	17	24
4,70		0470-30-A0A	☆		0470-30-A1A	☆ *		6,0	66	17	24
4,76	3/16	-			0476-30-A1A	☆ *		6,0	66	18	24
4,80	12-32 UNF	0480-30-A0A	☆		0480-30-A1A	☆ *		6,0	66	18	28
4,90		0490-30-A0A	☆		0490-30-A1A	☆ *		6,0	66	18	28
5,00		0500-30-A0A	☆		0500-30-A1A	☆		6,0	66	18	28
5,10		0510-30-A0A	☆		0510-30-A1A	☆		6,0	66	18	28
5,16	13/64	-			R840- 0516-30-A1A	☆		6,0	66	18	28
5,20		R840- 0520-30-A0A	☆		0520-30-A1A	☆		6,0	66	18	28
5,30		0530-30-A0A	☆		0530-30-A1A	☆		6,0	66	18	28
5,40		0540-30-A0A	☆		0540-30-A1A	☆		6,0	66	18	28
5,50		0550-30-A0A	☆		0550-30-A1A	☆		6,0	66	19	28
5,56	7/32	-			0556-30-A1A	☆		6,0	66	19	28
5,60		0560-30-A0A	☆		0560-30-A1A	☆		6,0	66	19	28
5,70		0570-30-A0A	☆		0570-30-A1A	☆		6,0	66	19	28
5,80		0580-30-A0A	☆		0580-30-A1A	☆		6,0	66	19	28
5,90		0590-30-A0A	☆		0590-30-A1A	☆		6,0	66	19	28
5,95	15/64	-			R840- 0595-30-A1A	☆		6,0	66	19	28
6,00		R840- 0600-30-A0A	☆		0600-30-A1A	☆		6,0	66	19	28
6,10		0610-30-A0A	☆		0610-30-A1A	☆		8,0	79	22	34
6,20		0620-30-A0A	☆		0620-30-A1A	☆		8,0	79	22	34
6,30		0630-30-A0A	☆		0630-30-A1A	☆		8,0	79	22	34
6,35	1/4	-			0635-30-A1A	☆		8,0	79	22	34
6,40		0640-30-A0A	☆		0640-30-A1A	☆		8,0	79	22	34
6,50		0650-30-A0A	☆		0650-30-A1A	☆		8,0	79	22	34
6,60		0660-30-A0A	☆		0660-30-A1A	☆		8,0	79	22	34
6,70		0670-30-A0A	☆		0670-30-A1A	☆		8,0	79	22	34
6,75	17/64	-			R840- 0675-30-A1A	☆		8,0	79	22	34
6,80		R840- 0680-30-A0A	☆		0680-30-A1A	☆		8,0	79	22	34
6,90		0690-30-A0A	☆		0690-30-A1A	☆		8,0	79	22	34
7,00		0700-30-A0A	☆		0700-30-A1A	☆		8,0	79	22	34
7,10		0710-30-A0A	☆		0710-30-A1A	☆		8,0	79	28	41

Ordering example: 10 pieces R840-0300-30-A0A 1220

2 – 3 × D_c

Cylindrical shank

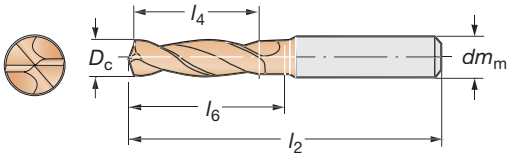


Drill diameter: 3,00—20,00 mm
Max hole depth: 2—3 x D_c
Coating: TiN/ TiAlN multilayer
tolerance: IT8-9
Surface finish: R_a 1-2 µm
Cutting fluid: Emulsion or cutting oil

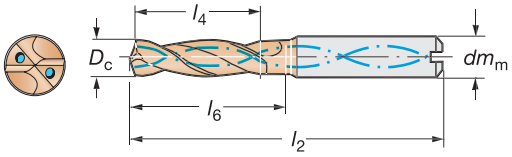
Drill standard: DIN 6537
Tolerances: dm_m = h6
D_c = m7:
D_c 6≤10 +0,021/+0,006
D_c 10≤18 +0,025/+0,007

Hole

External coolant supply



Internal coolant supply



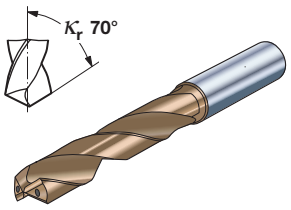
l_4 = recommended drilling depth

Drill diameter D_c mm	Fraction/ Thread size	Ordering code External coolant supply	Coromant grades 1220	P M K N S H	Ordering code Internal coolant supply	Coromant grades 1220	P M K N S H	Dimensions, mm dm_m	l_2	l_4	l_6
7,14	9/32	-			R840- 0714-30-A1A	☆		8,0	79	28	41
7,20		R840- 0720-30-A0A	☆		0720-30-A1A	☆		8,0	79	28	41
7,30		0730-30-A0A	☆		0730-30-A1A	☆		8,0	79	28	41
7,40		0740-30-A0A	☆		0740-30-A1A	☆		8,0	79	28	41
7,50		0750-30-A0A	☆		0750-30-A1A	☆		8,0	79	28	41
7,54	19/64	-			R840- 0754-30-A1A	☆		8,0	79	28	41
7,60		R840- 0760-30-A0A	☆		0760-30-A1A	☆		8,0	79	28	41
7,70		0770-30-A0A	☆		0770-30-A1A	☆		8,0	79	28	41
7,80		0780-30-A0A	☆		0780-30-A1A	☆		8,0	79	28	41
7,90		0790-30-A0A	☆		0790-30-A1A	☆		8,0	79	28	41
7,94	5/16	-			0794-30-A1A	☆		8,0	79	28	41
8,00		0800-30-A0A	☆		0800-30-A1A	☆		8,0	79	28	41
8,10		0810-30-A0A	☆		0810-30-A1A	☆		10,0	89	30	47
8,20		0820-30-A0A	☆		0820-30-A1A	☆		10,0	89	30	47
8,30		0830-30-A0A	☆		0830-30-A1A	☆		10,0	89	30	47
8,33	21/64	-			R840- 0833-30-A1A	☆		10,0	89	30	47
8,40		R840- 0840-30-A0A	☆		0840-30-A1A	☆		10,0	89	30	47
8,50		0850-30-A0A	☆		0850-30-A1A	☆		10,0	89	30	47
8,60		0860-30-A0A	☆		0860-30-A1A	☆		10,0	89	30	47
8,70		0870-30-A0A	☆		0870-30-A1A	☆		10,0	89	30	47
8,73	11/32	-	-		0873-30-A1A	☆		10,0	89	30	47
8,80		0880-30-A0A	☆		0880-30-A1A	☆		10,0	89	30	47
8,90		0890-30-A0A	☆		0890-30-A1A	☆		10,0	89	30	47
9,00		0900-30-A0A	☆		0900-30-A1A	☆		10,0	89	31	47
9,10		0910-30-A0A	☆		0910-30-A1A	☆		10,0	89	31	47
9,13	23/64	-			R840- 0913-30-A1A	☆		10,0	89	31	47
9,20		R840- 0920-30-A0A	☆		0920-30-A1A	☆		10,0	89	31	47
9,30		0930-30-A0A	☆		0930-30-A1A	☆		10,0	89	31	47
9,40		0940-30-A0A	☆		0940-30-A1A	☆		10,0	89	31	47
9,50		0950-30-A0A	☆		0950-30-A1A	☆		10,0	89	31	47
9,52	3/8	-			0952-30-A1A	☆		10,0	89	31	47
9,60		0960-30-A0A	☆		0960-30-A1A	☆		10,0	89	31	47
9,70		0970-30-A0A	☆		0970-30-A1A	☆		10,0	89	31	47
9,80		0980-30-A0A	☆		0980-30-A1A	☆		10,0	89	31	47
9,90		0990-30-A0A	☆		0990-30-A1A	☆		10,0	89	31	47
9,92	25/64	-			R840- 0992-30-A1A	☆		10,0	89	31	47
10,00		R840- 1000-30-A0A	☆		1000-30-A1A	☆		10,0	89	31	47
10,10		1010-30-A0A	☆		1010-30-A1A	☆		12,0	102	34	55
10,20		1020-30-A0A	☆		1020-30-A1A	☆		12,0	102	34	55
10,30		1030-30-A0A	☆		1030-30-A1A	☆		12,0	102	34	55
10,32	13/32	-			1032-30-A1A	☆		12,0	102	34	55
10,40		1040-30-A0A	☆		1040-30-A1A	☆		12,0	102	34	55
10,50		1050-30-A0A	☆		1050-30-A1A	☆		12,0	102	34	55
10,60		1060-30-A0A	☆		1060-30-A1A	☆		12,0	102	34	55
10,70		1070-30-A0A	☆		1070-30-A1A	☆		12,0	102	34	55
10,71	27/64	-			R840- 1071-30-A1A	☆		12,0	102	34	55
10,80		R840- 1080-30-A0A	☆		1080-30-A1A	☆		12,0	102	34	55
10,90		1090-30-A0A	☆		1090-30-A1A	☆		12,0	102	34	55
11,00		1100-30-A0A	☆		1100-30-A1A	☆		12,0	102	35	55
11,10		1110-30-A0A	☆		1110-30-A1A	☆		12,0	102	35	55
11,11	7/16	-			1111-30-A1A	☆		12,0	102	35	55
11,20		1120-30-A0A	☆		1120-30-A1A	☆		12,0	102	35	55
11,30		1130-30-A0A	☆		1130-30-A1A	☆		12,0	102	35	55
11,40		1140-30-A0A	☆		1140-30-A1A	☆		12,0	102	35	55
11,50		1150-30-A0A	☆		1150-30-A1A	☆		12,0	102	35	55

Ordering example: 10 pieces R840-0720-30-A0A 1220

2 – 3 × D_c

Cylindrical shank

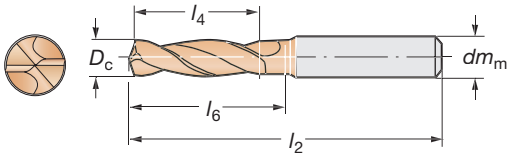


Drill diameter: 3,00-20,00 mm
Max hole depth: 2-3 x D_c
Coating: TiN/ TiAlN multilayer
Hole tolerance: IT8-9
Surface finish: R_a 1-2 µm
Cutting fluid: Emulsion or cutting oil

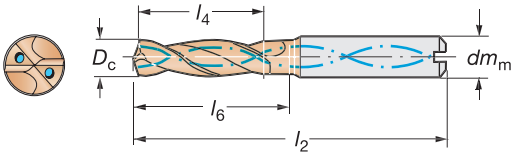
Drill standard: DIN 6537

Tolerances: dm_m = h6
D_c = m7:
D_c 10≤18 +0,025/+0,007
D_c 18≤20 +0,029/+0,008

External coolant supply



Internal coolant supply



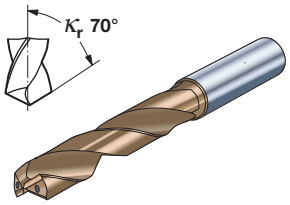
l_4 = recommended drilling depth

D_c mm	Fraction/ Thread size	Ordering code External coolant supply	Coromant grades 1220 P M K N S H	Ordering code Internal coolant supply	Coromant grades 1220 P M K N S H	Dimensions, mm dm_m	l_2	l_4	l_6
11,51	29/64	-		R840- 1151-30-A1A	☆	12,0	102	35	55
11,60		R840- 1160-30-A0A	☆	1160-30-A1A	☆	12,0	102	35	55
11,70		1170-30-A0A	☆	1170-30-A1A	☆	12,0	102	35	55
11,80		1180-30-A0A	☆	1180-30-A1A	☆	12,0	102	35	55
11,90	15/32	1190-30-A0A	☆	1190-30-A1A	☆	12,0	102	35	55
12,00		1200-30-A0A	☆	1200-30-A1A	☆	12,0	102	35	55
12,10		1210-30-A0A	☆	1210-30-A1A	☆	14,0	107	38	60
12,20		1220-30-A0A	☆	1220-30-A1A	☆	14,0	107	38	60
12,30	31/64	1230-30-A0A	☆	1230-30-A1A	☆	14,0	107	38	60
12,40		1240-30-A0A	☆	1240-30-A1A	☆	14,0	107	38	60
12,50		1250-30-A0A	☆	1250-30-A1A	☆	14,0	107	38	60
12,60		R840- 1260-30-A0A	☆	R840- 1260-30-A1A	☆	14,0	107	38	60
12,70	1/2	1270-30-A0A	☆	1270-30-A1A	☆	14,0	107	38	60
12,80		1280-30-A0A	☆	1280-30-A1A	☆	14,0	107	38	60
13,00		1300-30-A0A	☆	1300-30-A1A	☆	14,0	107	39	60
13,10	33/64	-		1310-30-A1A	☆	14,0	107	39	60
13,25		1325-30-A0A	☆	1325-30-A1A	☆	14,0	107	39	60
13,50	17/32	1350-30-A0A	☆	1350-30-A1A	☆	14,0	107	39	60
13,75		1375-30-A0A	☆	1375-30-A1A	☆	14,0	107	39	60
13,80		1380-30-A0A	☆	1380-30-A1A	☆	14,0	107	39	60
13,89	35/64	-		1389-30-A1A	☆	14,0	107	39	60
14,00		R840- 1400-30-A0A	☆	R840- 1400-30-A1A	☆	14,0	107	39	60
14,25		1425-30-A0A	☆	1425-30-A1A	☆	16,0	115	41	65
14,29	9/16	-		1429-30-A1A	☆	16,0	115	41	65
14,50		1450-30-A0A	☆	1450-30-A1A	☆	16,0	115	41	65
14,69	37/64	-		1469-30-A1A	☆	16,0	115	41	65
14,75		1475-30-A0A	☆	1475-30-A1A	☆	16,0	115	41	65
14,80		1480-30-A0A	☆	1480-30-A1A	☆	16,0	115	41	65
15,00		1500-30-A0A	☆	1500-30-A1A	☆	16,0	115	42	65
15,50		1550-30-A0A	☆	1550-30-A1A	☆	16,0	115	42	65
15,80		R840- 1580-30-A0A	☆	R840- 1580-30-A1A	☆	16,0	115	42	65
15,87	5/8	-		1587-30-A1A	☆	16,0	115	42	65
16,00		1600-30-A0A	☆	1600-30-A1A	☆	16,0	115	42	65
16,08	Tube sheet	-		1608-30-A1A	☆	18,0	123	46	73
16,10	Tube sheet	-		1610-30-A1A	☆	18,0	123	46	73
16,50		1650-30-A0A	☆	1650-30-A1A	☆	18,0	123	46	73
16,80		1680-30-A0A	☆	1680-30-A1A	☆	18,0	123	46	73
17,00		1700-30-A0A	☆	1700-30-A1A	☆	18,0	123	47	73
17,46	11/16	-		1746-30-A1A	☆	18,0	123	47	73
17,50		1750-30-A0A	☆	1750-30-A1A	☆	18,0	123	47	73
17,80		R840 1780-30-A0A	☆	R840- 1780-30-A1A	☆	18,0	123	47	73
18,00		1800-30-A0A	☆	1800-30-A1A	☆	18,0	123	47	73
18,50		1850-30-A0A	☆	1850-30-A1A	☆	20,0	131	49	79
18,80		1880-30-A0A	☆	1880-30-A1A	☆	20,0	131	49	79
19,00		1900-30-A0A	☆	1900-30-A1A	☆	20,0	131	50	79
19,05	3/4	-		1905-30-A1A	☆	20,0	131	50	79
19,25	Tube sheet	-		1925-30-A1A	☆	20,0	131	50	79
19,30	Tube sheet	-		1930-30-A1A	☆	20,0	131	50	79
19,50		1950-30-A0A	☆	1950-30-A1A	☆	20,0	131	50	79
19,80		1980-30-A0A	☆	1980-30-A1A	☆	20,0	131	50	79
20,00		2000-30-A0A	☆	2000-30-A1A	☆	20,0	131	50	79

Ordering example: 10 pieces R840-1160-30-A0A 1220

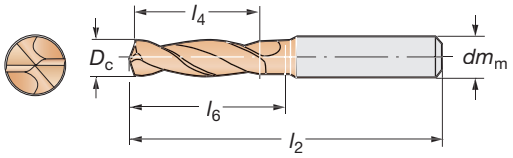
4 – 5 × D_c

Cylindrical shank

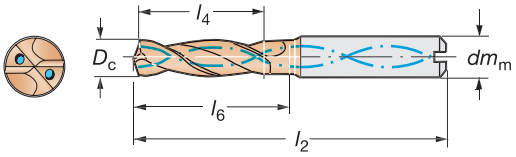


Drill diameter:	3,00-20,00 mm
Max hole depth:	4-5 x D_c
Coating:	TiN/ TiAlN multilayer
Hole tolerance:	IT8-9-10
Surface finish:	R_a 1-2 µm
Cutting fluid:	Emulsion or cutting oil
Drill standard:	DIN 6537
Tolerances:	dm_m = h6
	D_c = m7:
	$D_c \leq 3$ +0,012/+0,002
	D_c 3≤ 6 +0,016/+0,004
	D_c 6≤10 +0,021/+0,006

External coolant supply



Internal coolant supply



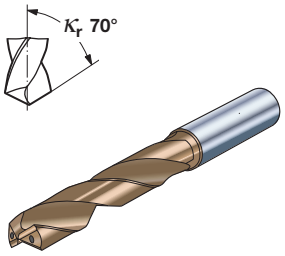
l_4 = recommended drilling depth

Drill diameter D_c mm	Fraction/ Thread size	Ordering code External coolant supply	Coromant grades 1220 P M K N S H	Ordering code Internal coolant supply	Coromant grades 1220 P M K N S H	Dimensions, mm dm_m	l_2	l_4	l_6
3,00		R840- 0300-50-A0A	☆	R840- 0300-50-A1A	☆*	6,0	66	20	28
3,10		0310-50-A0A	☆	0310-50-A1A	☆*	6,0	66	20	28
3,17	1/8	-		0317-50-A1A	☆*	6,0	66	20	28
3,20		0320-50-A0A	☆	0320-50-A1A	☆*	6,0	66	20	28
3,30		0330-50-A0A	☆	0330-50-A1A	☆*	6,0	66	20	28
3,38	M4	0338-50-A0A	☆	-		6,0	66	20	28
3,40		0340-50-A0A	☆	0340-50-A1A	☆*	6,0	66	20	28
3,45	8-32 UNC	0345-50-A0A	☆	0345-50-A1A	☆*	6,0	66	20	28
3,50		0350-50-A0A	☆	0350-50-A1A	☆*	6,0	66	20	28
3,55	8-36 UNF	0355-50-A0A	☆	0355-50-A1A	☆*	6,0	66	20	28
3,57	9/64	-		R840- 0357-50-A1A	☆*	6,0	66	20	28
3,60		R840- 0360-50-A0A	☆	0360-50-A1A	☆*	6,0	66	20	28
3,70		0370-50-A0A	☆	0370-50-A1A	☆*	6,0	66	20	28
3,80		0380-50-A0A	☆	0380-50-A1A	☆*	6,0	66	20	28
3,90	10-24 UNC	0390-50-A0A	☆	0390-50-A1A	☆*	6,0	66	20	28
3,97	5/32	-		0397-50-A1A	☆*	6,0	74	27	36
4,00		0400-50-A0A	☆	0400-50-A1A	☆*	6,0	74	27	36
4,10	10-32 UNF	0410-50-A0A	☆	0410-50-A1A	☆*	6,0	74	27	36
4,20		0420-50-A0A	☆	0420-50-A1A	☆*	6,0	74	27	36
4,30	M5	0430-50-A0A	☆	0430-50-A1A	☆*	6,0	74	27	36
4,36	11/64	-		R840- 0436-50-A1A	☆*	6,0	74	27	36
4,40		R840- 0440-50-A0A	☆	0440-50-A1A	☆*	6,0	74	27	36
4,50		0450-50-A0A	☆	0450-50-A1A	☆*	6,0	74	27	36
4,55	12-24 UNC	0455-50-A0A	☆	0455-50-A1A	☆*	6,0	74	27	36
4,60		0460-50-A0A	☆	0460-50-A1A	☆*	6,0	74	27	36
4,70		0470-50-A0A	☆	0470-50-A1A	☆*	6,0	74	27	36
4,76	3/16	-		0476-50-A1A	☆*	6,0	74	27	36
4,80	12-32 UNF	0480-50-A0A	☆	0480-50-A1A	☆*	6,0	74	27	36
4,90		0490-50-A0A	☆	0490-50-A1A	☆*	6,0	82	34	44
5,00		0500-50-A0A	☆	0500-50-A1A	☆	6,0	82	35	44
5,10	M6	R840- 0510-50-A0A	☆	R840- 0510-50-A1A	☆	6,0	82	35	44
5,16	13/64	-		0516-50-A1A	☆	6,0	82	35	44
5,20		0520-50-A0A	☆	0520-50-A1A	☆	6,0	82	35	44
5,25	1/4-20 UNC	-		0525-50-A1A	☆	6,0	82	35	44
5,30		0530-50-A0A	☆	0530-50-A1A	☆	6,0	82	35	44
5,40		0540-50-A0A	☆	0540-50-A1A	☆	6,0	82	35	44
5,50		0550-50-A0A	☆	0550-50-A1A	☆	6,0	82	35	44
5,55	1/4-28 UNF	-		0555-50-A1A	☆	6,0	82	35	44
5,56	7/32	-		0556-50-A1A	☆	6,0	82	35	44
5,60		0560-50-A0A	☆	0560-50-A1A	☆	6,0	82	35	44
5,70		R840- 0570-50-A0A	☆	R840- 0570-50-A1A	☆	6,0	82	35	44
5,80		0580-50-A0A	☆	0580-50-A1A	☆	6,0	82	35	44
5,90		0590-50-A0A	☆	0590-50-A1A	☆	6,0	82	35	44
5,95	15/64	-		0595-50-A1A	☆	6,0	82	35	44
6,00		0600-50-A0A	☆	0600-50-A1A	☆	6,0	82	35	44
6,10		0610-50-A0A	☆	0610-50-A1A	☆	8,0	91	39	53
6,20		0620-50-A0A	☆	0620-50-A1A	☆	8,0	91	39	53
6,30		0630-50-A0A	☆	0630-50-A1A	☆	8,0	91	39	53
6,35	1/4	-		0635-50-A1A	☆	8,0	91	39	53
6,40		0640-50-A0A	☆	0640-50-A1A	☆	8,0	91	39	53
6,50		R840- 0650-50-A0A	☆	R840- 0650-50-A1A	☆	8,0	91	39	53
6,60		0660-50-A0A	☆	0660-50-A1A	☆	8,0	91	39	53
6,70	5/18-18 UNF	0670-50-A0A	☆	0670-50-A1A	☆	8,0	91	39	53
6,75	17/64	-		0675-50-A1A	☆	8,0	91	39	53
6,80		0680-50-A0A	☆	0680-50-A1A	☆	8,0	91	39	53

Ordering example: 10 pieces R840-0300-50-A0A 1220

4 – 5 × D_c

Cylindrical shank

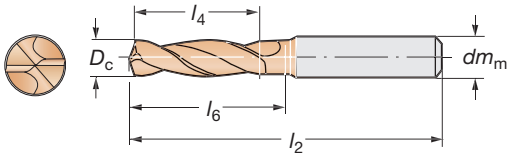


Drill diameter: 3,00-20,00 mm
Max hole depth: 4-5 x D_c
Coating: TiN/ TiAlN multilayer
Hole tolerance: IT8-9-10
Surface finish: R_a 1-2 µm
Cutting fluid: Emulsion or cutting oil

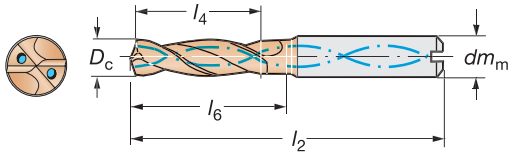
Drill standard: DIN 6537

Tolerances: dm_m = h6
D_c = m7:
D_c 6≤10 +0,021/+0,006
D_c 10≤18 +0,025/+0,007

External coolant supply



Internal coolant supply



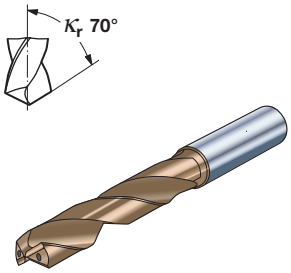
l_4 = recommended drilling depth

Drill diameter		Ordering code		Coromant grades		Ordering code		Coromant grades		Dimensions, mm			
D_c mm	Fraction/ Thread size	External coolant supply		1220	P M K N S H	Internal coolant supply		1220	P M K N S H	dm_m	l_2	l_4	l_6
6,90	M8	R840-	0690-50-A0A	☆		R840-	0690-50-A1A	☆		8,0	91	39	53
7,00	5/18-24 UNF		0700-50-A0A	☆			0700-50-A1A	☆		8,0	91	40	53
7,10	MF8 x 1		0710-50-A0A	☆			0710-50-A1A	☆		8,0	91	40	53
7,14	9/32		-				0714-50-A1A	☆		8,0	91	40	53
7,20			0720-50-A0A	☆			0720-50-A1A	☆		8,0	91	40	53
7,30			0730-50-A0A	☆			0730-50-A1A	☆		8,0	91	40	53
7,40			0740-50-A0A	☆			0740-50-A1A	☆		8,0	91	40	53
7,50			0750-50-A0A	☆			0750-50-A1A	☆		8,0	91	40	53
7,54	19/64		-				0754-50-A1A	☆		8,0	91	40	53
7,60			0760-50-A0A	☆			0760-50-A1A	☆		8,0	91	40	53
7,70		R840-	0770-50-A0A	☆		R840-	0770-50-A1A	☆		8,0	91	40	53
7,80			0780-50-A0A	☆			0780-50-A1A	☆		8,0	91	40	53
7,90			0790-50-A0A	☆			0790-50-A1A	☆		8,0	91	40	53
7,94	5/16		-				0794-50-A1A	☆		8,0	91	40	53
8,00			0800-50-A0A	☆			0800-50-A1A	☆		8,0	91	40	53
8,10			0810-50-A0A	☆			0810-50-A1A	☆		10,0	103	44	61
8,15	3/8-16 UNC		-				0815-50-A1A	☆		10,0	103	44	61
8,20			0820-50-A0A	☆			0820-50-A1A	☆		10,0	103	44	61
8,30			0830-50-A0A	☆			0830-50-A1A	☆		10,0	103	44	61
8,33	21/64		-				0833-50-A1A	☆		10,0	103	44	61
8,40		R840-	0840-50-A0A	☆		R840-	0840-50-A1A	☆		10,0	103	44	61
8,50			0850-50-A0A	☆			0850-50-A1A	☆		10,0	103	44	61
8,60	3/8-24 UNF		0860-50-A0A	☆			0860-50-A1A	☆		10,0	103	44	61
8,70	M10		0870-50-A0A	☆			0870-50-A1A	☆		10,0	103	44	61
8,73	11/32		-				0873-50-A1A	☆		10,0	103	44	61
8,80			0880-50-A0A	☆			0880-50-A1A	☆		10,0	103	44	61
8,90	MF10 x 1.25		0890-50-A0A	☆			0890-50-A1A	☆		10,0	103	44	61
9,00			0900-50-A0A	☆			0900-50-A1A	☆		10,0	103	44	61
9,10			0910-50-A0A	☆			0910-50-A1A	☆		10,0	103	45	61
9,13	23/64		-				0913-50-A1A	☆		10,0	103	45	61
9,20		R840-	0920-50-A0A	☆		R840-	0920-50-A1A	☆		10,0	103	45	61
9,30			0930-50-A0A	☆			0930-50-A1A	☆		10,0	103	45	61
9,40			0940-50-A0A	☆			0940-50-A1A	☆		10,0	103	45	61
9,50			0950-50-A0A	☆			0950-50-A1A	☆		10,0	103	45	61
9,52	3/8		-				0952-50-A1A	☆		10,0	103	45	61
9,55	7/16-14 UNC		-				0955-50-A1A	☆		10,0	103	45	61
9,60			0960-50-A0A	☆			0960-50-A1A	☆		10,0	103	45	61
9,70			0970-50-A0A	☆			0970-50-A1A	☆		10,0	103	45	61
9,80			0980-50-A0A	☆			0980-50-A1A	☆		10,0	103	45	61
9,90			0990-50-A0A	☆			0990-50-A1A	☆		10,0	103	45	61
9,92	25/64		-			R840-	0992-50-A1A	☆		10,0	103	45	61
10,00	7/16-20 UNF	R840-	1000-50-A0A	☆			1000-50-A1A	☆		10,0	103	45	61
10,10			1010-50-A0A	☆			1010-50-A1A	☆		12,0	118	50	71
10,20			1020-50-A0A	☆			1020-50-A1A	☆		12,0	118	50	71
10,30			1030-50-A0A	☆			1030-50-A1A	☆		12,0	118	50	71
10,32	13/32		-				1032-50-A1A	☆		12,0	118	50	71
10,40			1040-50-A0A	☆			1040-50-A1A	☆		12,0	118	50	71
10,45	M12		-				1045-50-A1A	☆		12,0	118	50	71
10,50			1050-50-A0A	☆			1050-50-A1A	☆		12,0	118	50	71
10,60			1060-50-A0A	☆			1060-50-A1A	☆		12,0	118	50	71
10,70	MF12 x 1.5	R840-	1070-50-A0A	☆		R840-	1070-50-A1A	☆		12,0	118	50	71
10,71	27/64		-				1071-50-A1A	☆		12,0	118	50	71
10,80			1080-50-A0A	☆			1080-50-A1A	☆		12,0	118	50	71
10,90			1090-50-A0A	☆			1090-50-A1A	☆		12,0	118	50	71
11,00	1/2-13 UNC		1100-50-A0A	☆			1100-50-A1A	☆		12,0	118	51	71

Ordering example: 10 pieces R840-0690-50-A0A 1220

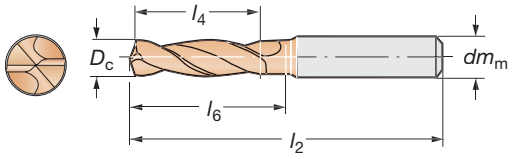
4 – 5 × D_c

Cylindrical shank

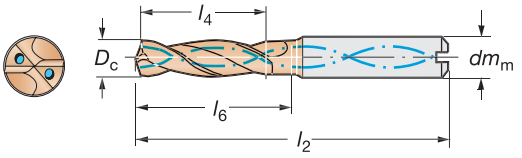


Drill diameter:	3,00-20,00 mm
Max hole depth:	4-5 x D_c
Coating:	TiN/ TiAlN multilayer
Hole tolerance:	IT8-9-10
Surface finish:	R_a 1-2 µm
Cutting fluid:	Emulsion or cutting oil
Drill standard:	DIN 6537
Tolerances:	dm_m = h6 D_c = m7: D_c 10≤18 +0,025/+0,007 D_c 18≤20 +0,029/+0,008

External coolant supply



Internal coolant supply



l_4 = recommended drilling depth

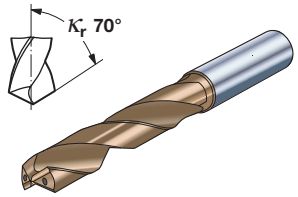
Drill diameter D_c mm	Fraction/ Thread size	Ordering code External coolant supply	Coromant grades 1220	Ordering code Internal coolant supply	Coromant grades 1220	Dimensions, mm dm_m	l_2	l_4	l_6
11,10		R840- 1110-50-A0A	☆	R840- 1110-50-A1A	☆	12,0	118	51	71
11,11	7/16	-		1111-50-A1A	☆	12,0	118	51	71
11,20		1120-50-A0A	☆	1120-50-A1A	☆	12,0	118	51	71
11,30		1130-50-A0A	☆	1130-50-A1A	☆	12,0	118	51	71
11,40		1140-50-A0A	☆	1140-50-A1A	☆	12,0	118	51	71
11,50		1150-50-A0A	☆	1150-50-A1A	☆	12,0	118	51	71
11,51	29/64	-		1151-50-A1A	☆	12,0	118	51	71
11,60	1/2-20 UNF	1160-50-A0A	☆	1160-50-A1A	☆	12,0	118	51	71
11,70		1170-50-A0A	☆	1170-50-A1A	☆	12,0	118	51	71
11,80		1180-50-A0A	☆	1180-50-A1A	☆	12,0	118	51	71
11,90	15/32	R840- 1190-50-A0A	☆	R840- 1190-50-A1A	☆	12,0	118	51	71
12,00		1200-50-A0A	☆	1200-50-A1A	☆	12,0	118	51	71
12,10		1210-50-A0A	☆	1210-50-A1A	☆	14,0	124	55	77
12,20		1220-50-A0A	☆	1220-50-A1A	☆	14,0	124	55	77
12,30	31/64	1230-50-A0A	☆	1230-50-A1A	☆	14,0	124	55	77
12,40		1240-50-A0A	☆	1240-50-A1A	☆	14,0	124	55	77
12,50		1250-50-A0A	☆	1250-50-A1A	☆	14,0	124	55	77
12,60		1260-50-A0A	☆	1260-50-A1A	☆	14,0	124	55	77
12,70		1270-50-A0A	☆	1270-50-A1A	☆	14,0	124	55	77
12,80		1280-50-A0A	☆	1280-50-A1A	☆	14,0	124	55	77
13,00		R840- 1300-50-A0A	☆	R840- 1300-50-A1A	☆	14,0	124	56	77
13,10	33/64	-		1310-50-A1A	☆	14,0	124	56	77
13,25		1325-50-A0A	☆	1325-50-A1A	☆	14,0	124	56	77
13,50	17/32	1350-50-A0A	☆	1350-50-A1A	☆	14,0	124	56	77
13,75		1375-50-A0A	☆	1375-50-A1A	☆	14,0	124	56	77
13,80		1380-50-A0A	☆	1380-50-A1A	☆	14,0	124	56	77
13,89	35/64	-		1389-50-A1A	☆	14,0	124	56	77
14,00		1400-50-A0A	☆	1400-50-A1A	☆	14,0	124	56	77
14,25		1425-50-A0A	☆	1425-50-A1A	☆	16,0	133	59	83
14,29	9/16	-		1429-50-A1A	☆	16,0	133	59	83
14,50		R840- 1450-50-A0A	☆	R840- 1450-50-A1A	☆	16,0	133	59	83
14,69	37/64	-		1469-50-A1A	☆	16,0	133	59	83
14,75		1475-50-A0A	☆	1475-50-A1A	☆	16,0	133	59	83
14,80		1480-50-A0A	☆	1480-50-A1A	☆	16,0	133	59	83
15,00		1500-50-A0A	☆	1500-50-A1A	☆	16,0	133	60	83
15,50		1550-50-A0A	☆	1550-50-A1A	☆	16,0	133	60	83
15,80		1580-50-A0A	☆	1580-50-A1A	☆	16,0	133	60	83
15,87	5/8	-		1587-50-A1A	☆	16,0	133	60	83
16,00		1600-50-A0A	☆	1600-50-A1A	☆	16,0	133	60	83
16,08	Tube sheet	-		1608-50-A1A	☆	18,0	133	66	93
16,10	Tube sheet	-		R840- 1610-50-A1A	☆	18,0	143	66	93
16,50		R840- 1650-50-A0A	☆	1650-50-A1A	☆	18,0	143	66	93
16,67	21/32	-		1667-50-A1A	☆	18,0	143	66	93
16,80		1680-50-A0A	☆	1680-50-A1A	☆	18,0	143	66	93
17,00		1700-50-A0A	☆	1700-50-A1A	☆	18,0	143	67	93
17,46	11/16	-		1746-50-A1A	☆	18,0	143	67	93
17,50		1750-50-A0A	☆	1750-50-A1A	☆	18,0	143	67	93
17,80		1780-50-A0A	☆	1780-50-A1A	☆	18,0	143	67	93
18,00		1800-50-A0A	☆	1800-50-A1A	☆	18,0	143	67	93
18,50		1850-50-A0A	☆	1850-50-A1A	☆	20,0	153	71	101
18,80		R840- 1880-50-A0A	☆	R840- 1880-50-A1A	☆	20,0	153	71	101
19,00		1900-50-A0A	☆	1900-50-A1A	☆	20,0	153	72	101
19,05	3/4	1905-50-A0A	☆	1905-50-A1A	☆	20,0	153	72	101
19,25	Tube sheet	1925-50-A0A	☆	1925-50-A1A	☆	20,0	153	72	101
19,30	Tube sheet	1930-50-A0A	☆	1930-50-A1A	☆	20,0	153	72	101
19,50		1950-50-A0A	☆	1950-50-A1A	☆	20,0	153	72	101
19,80		1980-50-A0A	☆	1980-80-A1A	☆	20,0	153	72	101
20,00		2000-50-A0A	☆	2000-50-A1A	☆	20,0	153	72	101

Ordering example: 10 pieces R840-1150-50-A0A 1220

6 – 7 × D_c

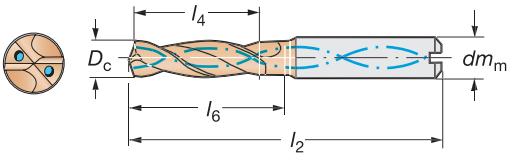
Cylindrical shank

Introduction during autumn 2003.



Drill diameter: 5,00-14,00 mm
Max hole depth: 6-7 x D_c
Coating: TiN/ TiAlN multilayer
Hole tolerance: IT8-9-10
Surface finish: R_a 1-2 µm
Cutting fluid: Emulsion or cutting oil
Drill standard: DIN 6537
Tolerances: dm_m = h6
D_c = m7:
D_c 3≤6 +0,016/+0,004
D_c 6≤10 +0,021/+0,006

Internal coolant supply



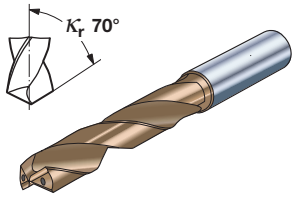
l_4 = recommended drilling depth

Drill diameter D_c mm	Fraction/ Thread size	Ordering code Internal coolant supply		Coromant grades 1220 P M K N S H	Dimensions, mm dm_m	l_2	l_4	l_6
5,00		R840-	0500-70-A1A	☆	6	93	42	50
5,10			0510-70-A1A	☆	6	93	42	50
5,16	13/64		0516-70-A1A	☆	6	93	42	50
5,20			0520-70-A1A	☆	6	93	42	50
5,30			0530-70-A1A	☆	6	93	42	50
5,40		R840-	0540-70-A1A	☆	6	93	42	50
5,50			0550-70-A1A	☆	6	93	42	50
5,56	7/32		0556-70-A1A	☆	6	93	42	50
5,60			0560-70-A1A	☆	6	93	42	50
5,70			0570-70-A1A	☆	6	93	42	50
5,80		R840-	0580-70-A1A	☆	6	93	42	50
5,90			0590-70-A1A	☆	6	93	42	50
5,95	15/64		0595-70-A1A	☆	6	93	42	50
6,00			0600-70-A1A	☆	6	93	42	50
6,10			0610-70-A1A	☆	6	93	42	50
6,20		R840-	0620-70-A1A	☆	8	117	49	58
6,30			0630-70-A1A	☆	8	117	49	58
6,35	1/4		0635-70-A1A	☆	8	117	49	58
6,40			0640-70-A1A	☆	8	117	49	58
6,50			0650-70-A1A	☆	8	117	49	58
6,60		R840-	0660-70-A1A	☆	8	117	49	58
6,70	5/18-18 UNF		0670-70-A1A	☆	8	117	49	58
6,75	17/64		0675-70-A1A	☆	8	117	49	58
6,80			0680-70-A1A	☆	8	117	49	58
6,90			0690-70-A1A	☆	8	117	49	58
7,00	5/18-24 UNF	R840-	0700-70-A1A	☆	8	117	49	58
7,10			0710-70-A1A	☆	8	117	56	67
7,14	9/32		0714-70-A1A	☆	8	117	56	67
7,20			0720-70-A1A	☆	8	117	56	67
7,30			0730-70-A1A	☆	8	117	56	67
7,40		R840-	0740-70-A1A	☆	8	117	56	67
7,50			0750-70-A1A	☆	8	117	56	67
7,54	19/64		0754-70-A1A	☆	8	117	56	67
7,60			0760-70-A1A	☆	8	117	56	67
7,70			0770-70-A1A	☆	8	117	56	67
7,80		R840-	0780-70-A1A	☆	8	117	56	67
7,90			0790-70-A1A	☆	8	117	56	67
7,94	5/16		0794-70-A1A	☆	8	117	56	67
8,00			0800-70-A1A	☆	8	117	56	67
8,10			0810-70-A1A	☆	10	133	62	74
8,20		R840-	0820-70-A1A	☆	10	133	62	74
8,30			0830-70-A1A	☆	10	133	62	74
8,33	21/64		0833-70-A1A	☆	10	133	62	74
8,40			0840-70-A1A	☆	10	133	62	74
8,50			0850-70-A1A	☆	10	133	62	74
8,60	3/8-24 UNF	R840-	0860-70-A1A	☆	10	133	62	74
8,70			0870-70-A1A	☆	10	133	62	74
8,73	11/32		0873-70-A1A	☆	10	133	62	74
8,80			0880-70-A1A	☆	10	133	62	74
8,90			0890-70-A1A	☆	10	133	62	74
9,00		R840-	0900-70-A1A	☆	10	133	70	84
9,10			0910-70-A1A	☆	10	133	70	84
9,13	23/64		0913-70-A1A	☆	10	133	70	84
9,20			0920-70-A1A	☆	10	133	70	84
9,30			0930-70-A1A	☆	10	133	70	84

Ordering example: 10 pieces R840-0500-70-A1A 1220

6 – 7 × D_c

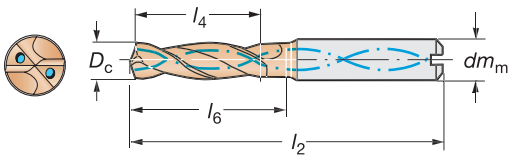
Cylindrical shank



Introduction during autumn 2003.

Drill diameter:	5,00-14,00 mm
Max hole depth:	6-7 x D_c
Coating:	TiN/ TiAlN multilayer
Hole tolerance:	IT8-9-10
Surface finish:	R_a 1-2 µm
Cutting fluid:	Emulsion or cutting oil
Drill standard:	DIN 6537
Tolerances:	dm_m = h6 D_c = m7: D_c 10≤18 +0,025/+0,007

Internal coolant supply



l_4 = recommended drilling depth

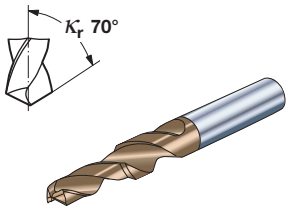
Drill diameter D_c mm	Fraction/ Thread size	Ordering code Internal coolant supply	Coromant grades 1220	dm_m	l_2	l_4	l_6
9,40		R840- 0940-70-A1A	☆	10	133	70	84
9,50		0950-70-A1A	☆	10	133	70	84
9,52	3/8	0952-70-A1A	☆	10	133	70	84
9,60		0960-70-A1A	☆	10	133	70	84
9,70		0970-70-A1A	☆	10	133	70	84
9,80		R840- 0980-70-A1A	☆	10	133	70	84
9,90		0990-70-A1A	☆	10	133	70	84
9,92	25/64	0992-70-A1A	☆	10	133	70	84
10,00	7/16-20 UNF	1000-70-A1A	☆	10	133	70	84
10,10		1010-70-A1A	☆	12	151	76	91
10,20		R840- 1020-70-A1A	☆	12	151	76	91
10,30		1030-70-A1A	☆	12	151	76	91
10,32	13/32	1032-70-A1A	☆	12	151	76	91
10,40		1040-70-A1A	☆	12	151	76	91
10,45		1045-70-A1A	☆	12	151	76	91
10,50		R840- 1050-70-A1A	☆	12	151	76	91
10,60		1060-70-A1A	☆	12	151	76	91
10,70		1070-70-A1A	☆	12	151	76	91
10,71	27/64	1071-70-A1A	☆	12	151	76	91
10,80		1080-70-A1A	☆	12	151	76	91
10,90		R840- 1090-70-A1A	☆	12	151	76	91
11,00	1/2-13 UNC	1100-70-A1A	☆	12	151	84	100
11,10		1110-70-A1A	☆	12	151	84	100
11,11	7/16	1111-70-A1A	☆	12	151	84	100
11,20		1120-70-A1A	☆	12	151	84	100
11,30		R840- 1130-70-A1A	☆	12	151	84	100
11,40		1140-70-A1A	☆	12	151	84	100
11,50		1150-70-A1A	☆	12	151	84	100
11,51	29/64	1151-70-A1A	☆	12	151	84	100
11,60	1/2-20 UNF	1160-70-A1A	☆	12	151	84	100
11,70		R840- 1170-70-A1A	☆	12	151	84	100
11,80		1180-70-A1A	☆	12	151	84	100
11,90	15/32	1190-70-A1A	☆	12	151	84	100
12,00		1200-70-A1A	☆	12	151	84	100
12,10		1210-70-A1A	☆	14	160	89	107
12,20		R840- 1220-70-A1A	☆	14	160	89	107
12,30	31/64	1230-70-A1A	☆	14	160	89	107
12,40		1240-70-A1A	☆	14	160	89	107
12,50		1250-70-A1A	☆	14	160	89	107
12,60		1260-70-A1A	☆	14	160	89	107
12,70		R840- 1270-70-A1A	☆	14	160	89	107
12,80		1280-70-A1A	☆	14	160	89	107
13,00		1300-70-A1A	☆	14	160	91	110
13,10	33/64	1310-70-A1A	☆	14	160	91	110
13,25		1325-70-A1A	☆	14	160	91	110
13,50	17/32	R840- 1350-70-A1A	☆	14	160	91	110
13,75		1375-70-A1A	☆	14	160	91	110
13,80		1380-70-A1A	☆	14	160	91	110
13,89	35/64	1389-70-A1A	☆	14	160	91	110
14,00		1400-70-A1A	☆	14	160	91	110

Ordering example: 10 pieces R840-0940-70-A1A 1220

2 – 3 × D_c

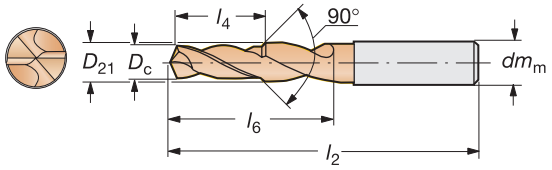
Chamfer drill for tap-size holes

Cylindrical shank



Drill diameter:	3,35—14,50 mm
Max hole depth:	2—3 x D_c
Coating:	TiN/ TiAlN multilayer
Hole tolerance:	IT8–9
Surface finish:	R_a 1—2 µm
Cutting fluid:	Emulsion or cutting oil
Drill standard:	DIN 6537
Tolerances:	dm_m = h6
	D_c = m8:
	D_c 3≤6 +0,022/+0,004
	D_c 6≤10 +0,028/+0,006
	D_c 10≤18 +0,034/+0,007

External coolant supply



l_4 = recommended drilling depth

Drill diameter D_c mm	Tap drill size	Ordering code External coolant supply	Coromant grades 1220	dm_m	D_{21}	l_2	l_4	l_6
Normal threads								
3,35	M4	R841- 0335-30-A0A	☆	6,0	4,4	66	11	18
3,40	M4	0340-30-A0A	☆	6,0	4,4	66	11	18
4,25	M5	0425-30-A0A	☆	6,0	5,7	66	14	22
4,30	M5	0430-30-A0A	☆	6,0	5,7	66	14	22
5,00	M6	0500-30-A0A	☆	8,0	6,8	79	17	27
5,10	M6	0510-30-A0A	☆	8,0	6,9	79	17	27
6,85	M8	0685-30-A0A	☆	10,0	9,3	89	21	35
6,90	M8	0690-30-A0A	☆	10,0	9,3	89	21	35
8,60	M10	R841- 0860-30-A0A	☆	12,0	11,2	89	21	38
8,70	M10	0870-30-A0A	☆	12,0	11,7	102	26	43
10,30	M12	1030-30-A0A	☆	14,0	13,1	102	26	45
10,40	M12	1040-30-A0A	☆	14,0	13,7	107	30	50
12,10	M14	1210-30-A0A	☆	16,0	15,5	115	35	58
12,25	M14	1225-30-A0A	☆	16,0	15,7	115	35	58
14,10	M16	1410-30-A0A	☆	18,0	17,5	123	39	65
14,25	M16	1425-30-A0A	☆	18,0	17,5	123	39	65
Fine threads								
7,00	M8 x 1.0	R841- 0700-30-A0A	☆	10,0	9,4	89	21	35
9,00	M10 x 1.0	0900-30-A0A	☆	12,0	11,8	102	26	43
10,50	M12 x 1.5	1050-30-A0A	☆	14,0	13,7	107	30	50
12,50	M14 x 1.5	1250-30-A0A	☆	16,0	15,7	115	35	58
14,50	M16 x 1.5	1450-30-A0A	☆	18,0	17,7	123	39	65

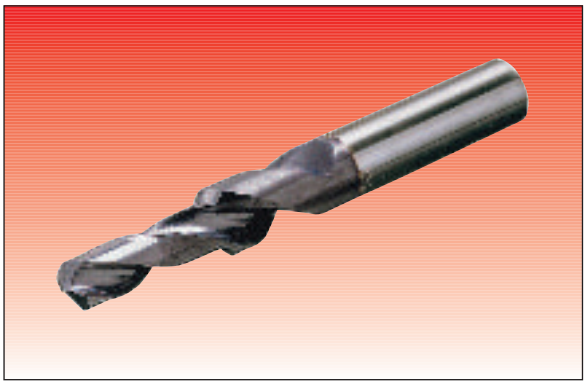
Ordering example: 10 pieces R841-0335-30-A0A 1220

Save tool space and time in machining centres and transfer lines with the chamfering drill

This solid carbide drill is the most rational solution for production of holes for threading. In one operation the hole is drilled and chamfered.

The drill is available in sizes to suit threads from M4 up to M16 and as Tailor Made, even in a wider range.

It is designed for external supply of cutting fluid and available in grade GC1220 for ISO P, K and N materials.



CoroDrill™ Delta-C R850

The solid carbide drill for aluminium

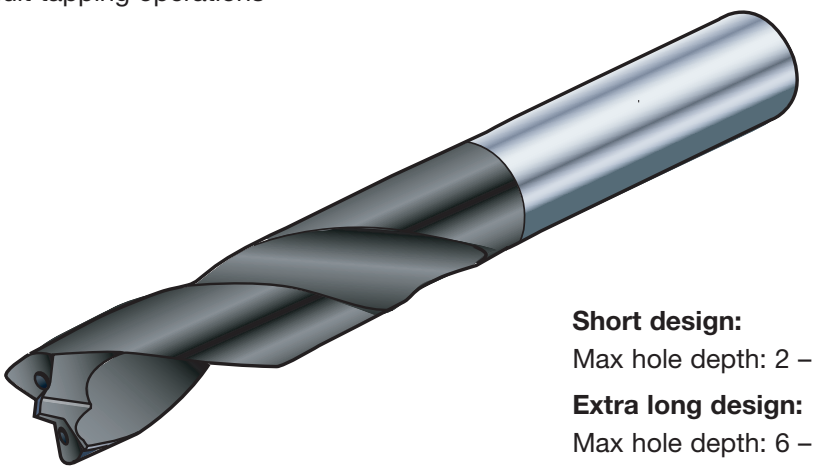
Hole diameters 5,00 – 14,00 mm

CoroDrill™ Delta-C — First choice in ISO-N materials, especially aluminium

Self-centering drill
No need for pre-drilling
Good surface finish
Easy-to-regrind geometry
Drill design according to DIN 6537
Tolerance m7 to suit tapping operations

CoroDrill™ Delta-C R850

For aerospace and automotive applications the CoroDrill Delta-C R850 offers the potential to completely replace PCD drills in many aluminium drilling operations. Hole tolerance and quality are enhanced, while burr formation is dramatically reduced.

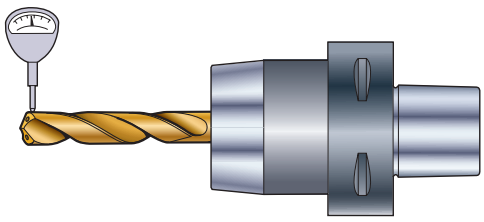


Short design:
Max hole depth: 2 – 3 x diameter

Extra long design:
Max hole depth: 6 – 7 x diameter

Good clamping feature

Cylindrical shank according to DIN 6535 HK.



CoroGrip® power chuck

For precision and small run out

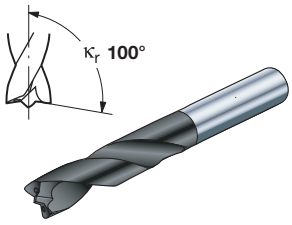
Tailor Made

Even more possibilities thanks to tailored design!

If you do not find what you need in our comprehensive standard programme, choose the tool shape you require and we will tailor it for you to *your* dimensions.

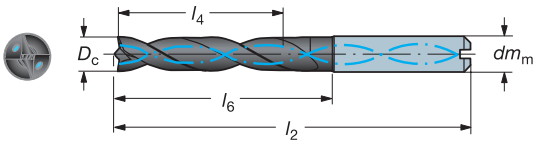
2 - 3 × D_c

Aluminium



Drill diameter: 5,00-14,00 mm
Max hole depth: 2-3 x D_c
Coating: TiAlN extra surface finish
Hole tolerance: IT8-9-10
Surface finish: R_a 1-2 µm
Cutting fluid: Emulsion or cutting oil
Drill standard: DIN 6537
Tolerances: dm_m = h6
D_c = m7:
D_c 3≤6 +0,016/+0,004
D_c 6≤10 +0,021/+0,006

Internal coolant supply



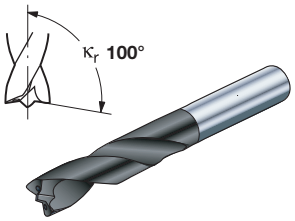
l_4 = recommended drilling depth

Drill diameter D_c mm	Fraction/ Thread size	Ordering code Internal coolant supply	Coromant grades N20D	N	Dimensions, mm dm_m	l_2	l_4	l_6
5,00		R850- 0500-30-A1A	☆		6	66	18	28
5,10		0510-30-A1A	☆		6	66	18	28
5,16	13/64	0516-30-A1A	☆		6	66	18	28
5,20		0520-30-A1A	☆		6	66	18	28
5,30		0530-30-A1A	☆		6	66	18	28
5,40		R850- 0540-30-A1A	☆		6	66	18	28
5,50		0550-30-A1A	☆		6	66	19	28
5,56	7/32	0556-30-A1A	☆		6	66	19	28
5,60		0560-30-A1A	☆		6	66	19	28
5,70		0570-30-A1A	☆		6	66	19	28
5,80		R850- 0580-30-A1A	☆		6	66	19	28
5,90		0590-30-A1A	☆		6	66	19	28
5,95	15/64	0595-30-A1A	☆		6	66	19	28
6,00		0600-30-A1A	☆		6	66	19	28
6,10		0610-30-A1A	☆		8	79	22	34
6,20		R850- 0620-30-A1A	☆		8	79	22	34
6,30		0630-30-A1A	☆		8	79	22	34
6,35	1/4	0635-30-A1A	☆		8	79	22	34
6,40		0640-30-A1A	☆		8	79	22	34
6,50		0650-30-A1A	☆		8	79	22	34
6,60		R850- 0660-30-A1A	☆		8	79	22	34
6,70		0670-30-A1A	☆		8	79	22	34
6,75	17/64	0675-30-A1A	☆		8	79	22	34
6,80		0680-30-A1A	☆		8	79	22	34
6,90		0690-30-A1A	☆		8	79	22	34
7,00		R850- 0700-30-A1A	☆		8	79	22	34
7,10		0710-30-A1A	☆		8	79	28	41
7,14	9/32	0714-30-A1A	☆		8	79	28	41
7,20		0720-30-A1A	☆		8	79	28	41
7,30		0730-30-A1A	☆		8	79	28	41
7,40		R850- 0740-30-A1A	☆		8	79	28	41
7,50		0750-30-A1A	☆		8	79	28	41
7,54	19/64	0754-30-A1A	☆		8	79	28	41
7,60		0760-30-A1A	☆		8	79	28	41
7,70		0770-30-A1A	☆		8	79	28	41
7,80		R850- 0780-30-A1A	☆		8	79	28	41
7,90		0790-30-A1A	☆		8	79	28	41
7,94	5/16	0794-30-A1A	☆		8	79	28	41
8,00		0800-30-A1A	☆		8	79	28	41
8,10		0810-30-A1A	☆		10	89	30	47
8,20		R850- 0820-30-A1A	☆		10	89	30	47
8,30		0830-30-A1A	☆		10	89	30	47
8,33	21/64	0833-30-A1A	☆		10	89	30	47
8,40		0840-30-A1A	☆		10	89	30	47
8,50		0850-30-A1A	☆		10	89	30	47
8,60		R850- 0860-30-A1A	☆		10	89	30	47
8,70		0870-30-A1A	☆		10	89	30	47
8,73	11/32	0873-30-A1A	☆		10	89	30	47
8,80		0880-30-A1A	☆		10	89	30	47
8,90		0890-30-A1A	☆		10	89	30	47
9,00		R850- 0900-30-A1A	☆		10	89	31	47
9,10		0910-30-A1A	☆		10	89	31	47
9,13	23/64	0913-30-A1A	☆		10	89	31	47
9,20		0920-30-A1A	☆		10	89	31	47
9,30		0930-30-A1A	☆		10	89	31	47

Ordering example: 10 pieces R850-0500-30-A1A N20D

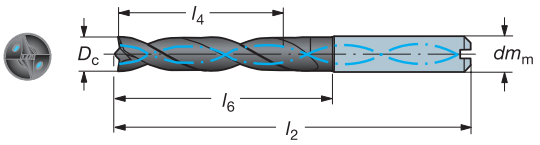
2 - 3 × D_c

Aluminium



Drill diameter: 5,00-14,00 mm
Max hole depth: 2-3 x D_c
Coating: TiAlN extra surface finish
Hole tolerance: IT8-9-10
Surface finish: R_a 1-2 µm
Cutting fluid: Emulsion or cutting oil
Drill standard: DIN 6537
Tolerances: dm_m = h6
D_c = m7:
D_c 6≤10 +0,021/+0,006
D_c 10≤18 +0,025/+0,007

Internal coolant supply



l_4 = recommended drilling depth

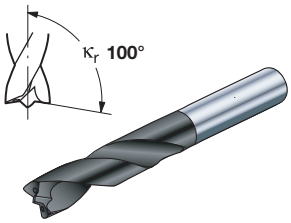
Drill diameter D_c mm	Fraction/ Thread size	Ordering code Internal coolant supply	Coromant grades N20D	N	Dimensions, mm dm_m	l_2	l_4	l_6
9,40		R850- 0940-30-A1A	☆		10	89	31	47
9,50		0950-30-A1A	☆		10	89	31	47
9,52	3/8	0952-30-A1A	☆		10	89	31	47
9,60		0960-30-A1A	☆		10	89	31	47
9,70		0970-30-A1A	☆		10	89	31	47
9,80		R850- 0980-30-A1A	☆		10	89	31	47
9,90		0990-30-A1A	☆		10	89	31	47
9,92	25/64	0992-30-A1A	☆		10	89	31	47
10,00		1000-30-A1A	☆		10	89	31	47
10,10		1010-30-A1A	☆		12	102	34	55
10,20		R850- 1020-30-A1A	☆		12	102	34	55
10,30		1030-30-A1A	☆		12	102	34	55
10,32	13/32	1032-30-A1A	☆		12	102	34	55
10,40		1040-30-A1A	☆		12	102	34	55
10,45		1045-30-A1A	☆		12	102	34	55
10,50		R850- 1050-30-A1A	☆		12	102	34	55
10,60		1060-30-A1A	☆		12	102	34	55
10,70		1070-30-A1A	☆		12	102	34	55
10,71	27/64	1071-30-A1A	☆		12	102	34	55
10,80		1080-30-A1A	☆		12	102	34	55
10,90		R850- 1090-30-A1A	☆		12	102	34	55
11,00	1/2-13 UNC	1100-30-A1A	☆		12	102	35	55
11,10		1110-30-A1A	☆		12	102	35	55
11,11	7/16	1111-30-A1A	☆		12	102	35	55
11,20		1120-30-A1A	☆		12	102	35	55
11,30		R850- 1130-30-A1A	☆		12	102	35	55
11,40		1140-30-A1A	☆		12	102	35	55
11,50		1150-30-A1A	☆		12	102	35	55
11,51	29/64	1151-30-A1A	☆		12	102	35	55
11,60		1160-30-A1A	☆		12	102	35	55
11,70		R850- 1170-30-A1A	☆		12	102	35	55
11,80		1180-30-A1A	☆		12	102	35	55
11,90	15/32	1190-30-A1A	☆		12	102	35	55
12,00		1200-30-A1A	☆		12	102	35	55
12,10		1210-30-A1A	☆		12	107	38	60
12,20		R850- 1220-30-A1A	☆		14	107	38	60
12,30	31/64	1230-30-A1A	☆		14	107	38	60
12,40		1240-30-A1A	☆		14	107	38	60
12,50		1250-30-A1A	☆		14	107	38	60
12,60		1260-30-A1A	☆		14	107	38	60
12,70	1/2	R850- 1270-30-A1A	☆		14	107	38	60
12,80		1280-30-A1A	☆		14	107	38	60
13,00		1300-30-A1A	☆		14	107	39	60
13,10	33/64	1310-30-A1A	☆		14	107	39	60
13,25		1325-30-A1A	☆		14	107	39	60
13,50	17/32	R850- 1350-30-A1A	☆		14	107	39	60
13,75		1375-30-A1A	☆		14	107	39	60
13,80		1380-30-A1A	☆		14	107	39	60
13,89	35/64	1389-30-A1A	☆		14	107	39	60
14,00		1400-30-A1A	☆		14	107	39	60

Ordering example: 10 pieces R850-0940-30-A1A N20D

6 - 7 × D_c

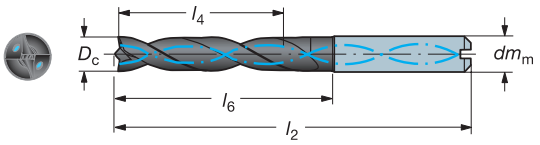
Aluminium

Introduction during autumn 2003.



Drill diameter:	5,00-14,00 mm
Max hole depth:	6-7 x D_c
Coating:	TiAlN extra surface finish
Hole tolerance:	IT8-9-10
Surface finish:	R_a 1-2 µm
Cutting fluid:	Emulsion or cutting oil
Drill standard:	DIN 6537
Tolerances:	dm_m = h6
	D_c = m7:
	D_c 3≤6 +0,016/+0,004
	D_c 6≤10 +0,021/+0,006

Internal coolant supply



l_4 = recommended drilling depth

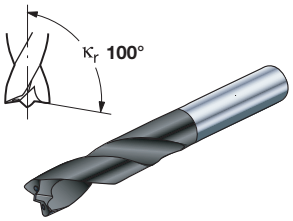
Drill diameter D_c mm	Fraction/ Thread size	Ordering code Internal coolant supply	Coromant grades N20D	N	Dimensions, mm dm_m	l_2	l_4	l_6
5,00		R850- 0500-70-A1A	☆		6	93	42	50
5,10		0510-70-A1A	☆		6	93	42	50
5,16	13/64	0516-70-A1A	☆		6	93	42	50
5,20		0520-70-A1A	☆		6	93	42	50
5,30		0530-70-A1A	☆		6	93	42	50
5,40		R850- 0540-70-A1A	☆		6	93	42	50
5,50		0550-70-A1A	☆		6	93	42	50
5,56	7/32	0556-70-A1A	☆		6	93	42	50
5,60		0560-70-A1A	☆		6	93	42	50
5,70		0570-70-A1A	☆		6	93	42	50
5,80		R850- 0580-70-A1A	☆		6	93	42	50
5,90		0590-70-A1A	☆		6	93	42	50
5,95	15/64	0595-70-A1A	☆		6	93	42	50
6,00		0600-70-A1A	☆		6	93	42	50
6,10		0610-70-A1A	☆		8	117	49	58
6,20		R850- 0620-70-A1A	☆		8	117	49	58
6,30		0630-70-A1A	☆		8	117	49	58
6,35	1/4	0635-70-A1A	☆		8	117	49	58
6,40		0640-70-A1A	☆		8	117	49	58
6,50		0650-70-A1A	☆		8	117	49	58
6,60		R850- 0660-70-A1A	☆		8	117	49	58
6,70	5/18-18 UNF	0670-70-A1A	☆		8	117	49	58
6,75	17/64	0675-70-A1A	☆		8	117	49	58
6,80		0680-70-A1A	☆		8	117	49	58
6,90		0690-70-A1A	☆		8	117	49	58
7,00	5/18-24 UNF	R850- 0700-70-A1A	☆		8	117	49	58
7,10		0710-70-A1A	☆		8	117	56	67
7,14	9/32	0714-70-A1A	☆		8	117	56	67
7,20		0720-70-A1A	☆		8	117	56	67
7,30		0730-70-A1A	☆		8	117	56	67
7,40		R850- 0740-70-A1A	☆		8	117	56	67
7,50		0750-70-A1A	☆		8	117	56	67
7,54	19/64	0754-70-A1A	☆		8	117	56	67
7,60		0760-70-A1A	☆		8	117	56	67
7,70		0770-70-A1A	☆		8	117	56	67
7,80		R850- 0780-70-A1A	☆		8	117	56	67
7,90		0790-70-A1A	☆		8	117	56	67
7,94	5/16	0794-70-A1A	☆		8	117	56	67
8,00		0800-70-A1A	☆		8	117	56	67
8,10		0810-70-A1A	☆		10	133	62	74
8,20		R850- 0820-70-A1A	☆		10	133	62	74
8,30		0830-70-A1A	☆		10	133	62	74
8,33	21/64	0833-70-A1A	☆		10	133	62	74
8,40		0840-70-A1A	☆		10	133	62	74
8,50		0850-70-A1A	☆		10	133	62	74
8,60	3/8-24 UNF	R850- 0860-70-A1A	☆		10	133	62	74
8,70		0870-70-A1A	☆		10	133	62	74
8,73	11/32	0873-70-A1A	☆		10	133	62	74
8,80		0880-70-A1A	☆		10	133	62	74
8,90		0890-70-A1A	☆		10	133	62	74
9,00		R850- 0900-70-A1A	☆		10	133	70	84
9,10		0910-70-A1A	☆		10	133	70	84
9,13	23/64	0913-70-A1A	☆		10	133	70	84
9,20		0920-70-A1A	☆		10	133	70	84
9,30		0930-70-A1A	☆		10	133	70	84

Ordering example: 10 pieces R850-0500-70-A1A N20D

6 - 7 × D_c

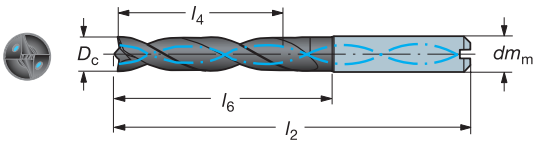
Aluminium

Introduction during autumn 2003.



Drill diameter:	5,00-14,00 mm
Max hole depth:	6-7 x D_c
Coating:	TiAlN extra surface finish
Hole tolerance:	IT8-9-10
Surface finish:	R_a 1-2 µm
Cutting fluid:	Emulsion or cutting oil
Drill standard:	DIN 6537
Tolerances:	dm_m = h6
	D_c = m7:
	D_c 6≤10 +0,021/+0,006
	D_c 10≤18 +0,025/+0,007

Internal coolant supply



l_4 = recommended drilling depth

Drill diameter D_c mm	Fraction/ Thread size	Ordering code Internal coolant supply	Coromant grades N20D	N	Dimensions, mm dm_m	l_2	l_4	l_6
9,40		R850- 0940-70-A1A	☆		10	133	70	84
9,50		0950-70-A1A	☆		10	133	70	84
9,52	3/8	0952-70-A1A	☆		10	133	70	84
9,60		0960-70-A1A	☆		10	133	70	84
9,70		0970-70-A1A	☆		10	133	70	84
9,80		R850- 0980-70-A1A	☆		10	133	70	84
9,90		0990-70-A1A	☆		10	133	70	84
9,92	25/64	0992-70-A1A	☆		10	133	70	84
10,00	7/16-20 UNF	1000-70-A1A	☆		10	133	70	84
10,10		1010-70-A1A	☆		12	151	76	91
10,20		R850- 1020-70-A1A	☆		12	151	76	91
10,30		1030-70-A1A	☆		12	151	76	91
10,32	13/32	1032-70-A1A	☆		12	151	76	91
10,40		1040-70-A1A	☆		12	151	76	91
10,45		1045-70-A1A	☆		12	151	76	91
10,50		R850- 1050-70-A1A	☆		12	151	76	91
10,60		1060-70-A1A	☆		12	151	76	91
10,70		1070-70-A1A	☆		12	151	76	91
10,71	27/64	1071-70-A1A	☆		12	151	76	91
10,80		1080-70-A1A	☆		12	151	76	91
10,90		R850- 1090-70-A1A	☆		12	151	76	91
11,00	1/2-13 UNC	1100-70-A1A	☆		12	151	84	100
11,10		1110-70-A1A	☆		12	151	84	100
11,11	7/16	1111-70-A1A	☆		12	151	84	100
11,20		1120-70-A1A	☆		12	151	84	100
11,30		R850- 1130-70-A1A	☆		12	151	84	100
11,40		1140-70-A1A	☆		12	151	84	100
11,50		1150-70-A1A	☆		12	151	84	100
11,51	29/64	1151-70-A1A	☆		12	151	84	100
11,60	1/2-20 UNF	1160-70-A1A	☆		12	151	84	100
11,70		R850- 1170-70-A1A	☆		12	151	84	100
11,80		1180-70-A1A	☆		12	151	84	100
11,90	15/32	1190-70-A1A	☆		12	151	84	100
12,00		1200-70-A1A	☆		12	151	84	100
12,10		1210-70-A1A	☆		14	160	89	107
12.2		R850- 1220-70-A1A	☆		14	160	89	107
12,30	31/64	1230-70-A1A	☆		14	160	89	107
12,40		1240-70-A1A	☆		14	160	89	107
12,50		1250-70-A1A	☆		14	160	89	107
12,60		1260-70-A1A	☆		14	160	89	107
12,70		R850- 1270-70-A1A	☆		14	160	89	107
12,80		1280-70-A1A	☆		14	160	89	107
13,00		1300-70-A1A	☆		14	160	91	110
13,10	33/64	1310-70-A1A	☆		14	160	91	110
13,25		1325-70-A1A	☆		14	160	91	110
13,50	17/32	R850- 1350-70-A1A	☆		14	160	91	110
13,75		1375-70-A1A	☆		14	160	91	110
13,80		1380-70-A1A	☆		14	160	91	110
13,89	35/64	1389-70-A1A	☆		14	160	91	110
14,00		1400-70-A1A	☆		14	160	91	110

Ordering example: 10 pieces R850-0940-70-A1A N20D

Coromant Delta

Brazed carbide drill – for high productivity drilling of close tolerance holes, diameter 9,50 – 30,40 mm

Drills 3,5 – 5 × D_c deep – as standard

Main features

Longer total tool life
– longer carbide tip
– more regrinds

Reinforced chip flutes
– locally hardened by laser
– minimizes chip erosion

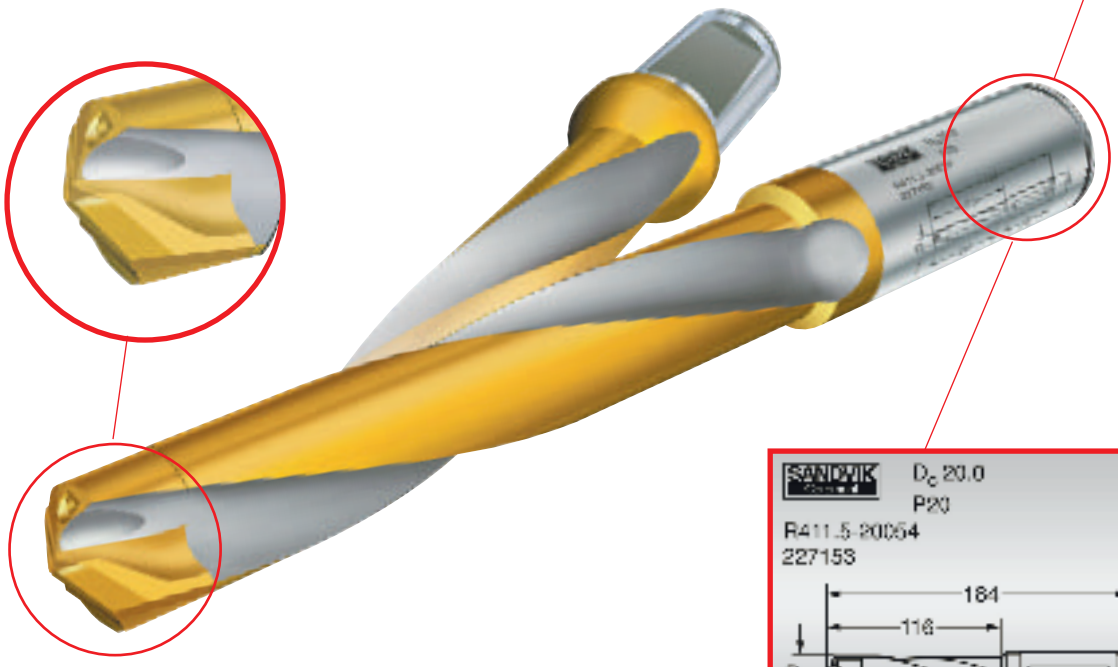
High performance
– PVD TiN coating

Good clamping

Cylindrical shank with flat (ISO 9766)

Coromant Whistle Notch

Easy mounting
– "self locating".



Complete information

Permanent marking by laser of diameter, carbide grade, code number and batch number

Delta chamfering drill

Production of holes for threading. The hole is drilled and chamfered in one operation.

Also used for pre-drilling of tap holes.

Regrinding service available

Benchmarks — Coromant Delta

- The brazed, carbide tipped drill, TIN-coated as standard
- Optimized geometries and coatings for special applications
- Intermediate diameters available at no surcharge

Quality consistency

The same result every time.

Coromant's quality control covers the whole process – from powder to finished product.

Performance

Superior hole tolerance and surface finish

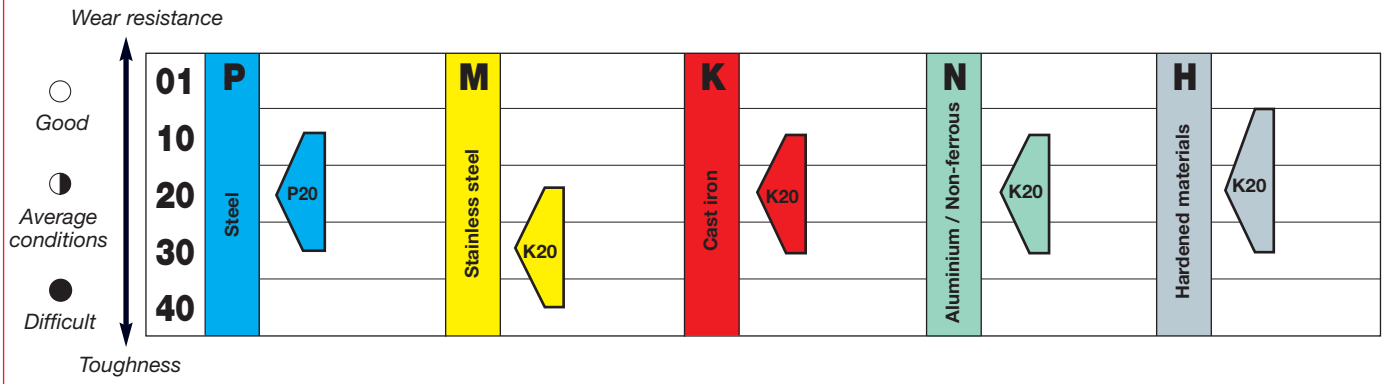
Suitable for unstable operations

Tailor Made

Even more possibilities thanks to tailored design!

If you do not find what you need in our comprehensive standard programme, choose the tool shape you require and we will tailor it for you to *your* dimensions.

Basic grades for Coromant Delta



Tailor Made options

Coatings

Balinit® FUTURA
Wear resistant coating for steel and cast iron

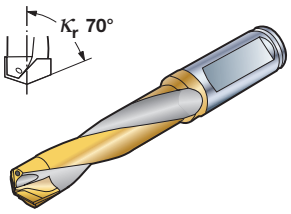
Balinit® HARDLUBE
Low friction coating for long chipping materials

Grades

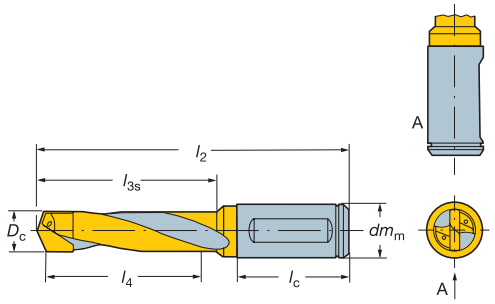
H10F
Fine grain carbide. In combination with Hardlube coating optimized for stainless steel.

3,5 × D_c

Cylindrical shank with flat according to ISO 9766



Drill diameter:	9,50-30,40 mm
Hole depth:	3,5 × D_c
Hole tolerance:	IT8-9
Surface finish:	R_a 1-2 µm
Cutting fluid:	Emulsion or Neat oil
Tolerances:	D_c = js7 dm_m = h6



l_4 = Recommended drilling depth

Drill diameter D_c mm	Ordering code	Coromant grades P20 P	Coromant grades K20 M K H N	dm_m	l_2	l_{3s}	l_4	l_c	KG	Stocked drills
9,50-10,00	R411.5- 10034 Dxx.xx	☆	☆	16[1]	98	39	35	48	0,1	*Drills in the diameter range 9,75 – 20,00 mm are available as stocked standard in steps of 0,25 mm in grade P20 and K20.*
10,01-10,50	10534 Dxx.xx	☆	☆	16[1]	100	41	37	48	0,1	
10,51-11,00	11034 Dxx.xx	☆	☆	16[1]	103	44	39	48	0,1	
11,01-11,50	11534 Dxx.xx	☆	☆	16[1]	105	46	40	48	0,1	
11,51-12,00	12034 Dxx.xx	☆	☆	16[1]	108	49	42	48	0,1	
12,01-12,50	R411.5- 12534 Dxx.xx	☆	☆	16[1]	113	54	44	48	0,1	
12,51-13,00	13034 Dxx.xx	☆	☆	16[1]	113	54	46	48	0,1	
13,01-13,50	13534 Dxx.xx	☆	☆	16[1]	118	59	47	48	0,1	
13,51-14,00	14034 Dxx.xx	☆	☆	16[1]	118	59	49	48	0,1	
14,01-14,50	R411.5- 14534 Dxx.xx	☆	☆	20	123	63	51	50	0,2	
14,51-15,00	15034 Dxx.xx	☆	☆	20	123	63	53	50	0,2	
15,01-15,50	15534 Dxx.xx	☆	☆	20	128	68	54	50	0,2	
15,51-16,00	16034 Dxx.xx	☆	☆	20	128	68	56	50	0,2	
16,01-16,50	R411.5- 16534 Dxx.xx	☆	☆	20	133	73	58	50	0,2	
16,51-17,00	17034 Dxx.xx	☆	☆	20	133	73	60	50	0,2	
17,01-17,50	17534 Dxx.xx	☆	☆	20	136	76	61	50	0,3	
17,51-18,00	18034 Dxx.xx	☆	☆	20	136	76	63	50	0,3	
18,01-18,50	R411.5- 18534 Dxx.xx	☆	☆	20	139	79	65	50	0,3	
18,51-19,00	19034 Dxx.xx	☆	☆	25	149	81	67	56	0,3	
19,01-19,50	19534 Dxx.xx	☆	☆	25	154	86	68	56	0,3	
19,51-20,00	20034 Dxx.xx	☆	☆	25	154	86	70	56	0,3	
20,01-20,50	R411.5- 20534 Dxx.xx	☆	☆	25	159	91	72	56	0,4	*Drills in the diameter range 20,5 – 30,00 mm are available as stocked standard in steps of 0,50 mm in grade P20 and K20.*
20,51-21,00	21034 Dxx.xx	☆	☆	25	159	91	74	56	0,4	
21,01-21,50	21534 Dxx.xx	☆	☆	25	164	96	75	56	0,4	
21,51-22,00	22034 Dxx.xx	☆	☆	25	164	96	77	56	0,4	
22,01-22,50	R411.5- 22534 Dxx.xx	☆	☆	25	168	100	79	56	0,4	
22,51-23,00	23034 Dxx.xx	☆	☆	25	168	100	81	56	0,4	
23,01-23,50	23534 Dxx.xx	☆	☆	25	174	106	82	56	0,4	
23,51-24,00	24034 Dxx.xx	☆	☆	25	174	106	84	56	0,4	
24,01-24,50	R411.5- 24534 Dxx.xx	☆	☆	32	183	110	86	60	0,4	
24,51-25,00	25034 Dxx.xx	☆	☆	32	183	110	88	60	0,4	
25,01-25,50	25534 Dxx.xx	☆	☆	32	189	116	89	60	0,4	
25,51-26,00	26034 Dxx.xx	☆	☆	32	189	116	91	60	0,4	
26,01-26,50	R411.5- 26534 Dxx.xx	☆	☆	32	193	120	93	60	0,4	
26,51-27,00	27034 Dxx.xx	☆	☆	32	193	120	95	60	0,4	
27,01-27,50	27534 Dxx.xx	☆	☆	32	199	126	96	60	0,4	
27,51-28,00	28034 Dxx.xx	☆	☆	32	199	126	98	60	0,4	
28,01-28,50	R411.5- 28534 Dxx.xx	☆	☆	32	204	131	100	60	0,4	
28,51-29,00	29034 Dxx.xx	☆	☆	32	204	131	102	60	0,4	
29,01-29,50	29534 Dxx.xx	☆	☆	32	208	135	103	60	0,4	
29,51-30,40	30034 Dxx.xx	☆	☆	32	208	135	105	60	0,4	

[1] Internal Coromant standard.

Ordering example standard diameter: 10 pieces R411.5-10034 D09.50 P20
Ordering example intermediate diameter: 10 pieces R411.5-10034 D*09.53*P20

Regrinding

For regrinding service, please contact your Sandvik representative for support.

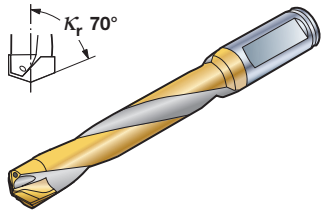
Carbide grades

P20, TiN-coated. For general applications in steel.

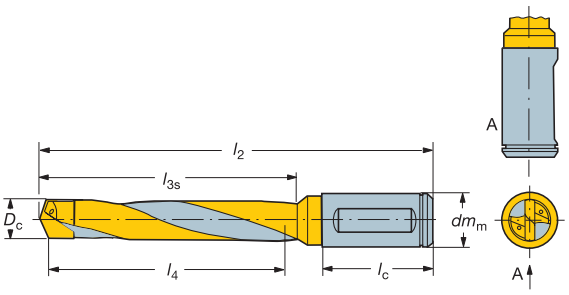
K20, TiN coated. For stainless steel, cast iron, aluminium and hardened steel.

$5 \times D_c$

Cylindrical shank with flat according to ISO 9766



Drill diameter: 9,50-20,00 mm
Hole depth: $5 \times D_c$
Hole tolerance: IT9-10
Surface finish: R_a 2-4 µm
Cutting fluid: Emulsion or Neat oil
Tolerances: D_c = js7
dm_m = h6



l_4 = Recommended drilling depth

Drill diameter D_c mm	Ordering code	Coromant grades P20 P	Coromant grades K20 M K H N	dm_m	l_2	l_{3s}	l_4	l_c	KG	Stocked drills
9,50-10,00	R411.5-10054 Dxx.xx	☆	☆	16[1)]	113	54	50	48	0,1	*Drills in the diameter range 10,0 – 20,0 mm are available as stocked standard in steps of 0,5 mm in grade P20 and K20.*
10,01-10,50	10554 Dxx.xx	☆	☆	16[1)]	116	57	53	48	0,1	
10,51-11,00	11054 Dxx.xx	☆	☆	16[1)]	120	61	55	48	0,1	
11,01-11,50	11554 Dxx.xx	☆	☆	16[1)]	122	63	58	48	0,1	
11,51-12,00	12054 Dxx.xx	☆	☆	16[1)]	126	67	60	48	0,1	
12,01-12,50	R411.5-12554 Dxx.xx	☆	☆	16[1)]	133	74	63	48	0,1	
12,51-13,00	13054 Dxx.xx	☆	☆	16[1)]	133	74	65	48	0,1	
13,01-13,50	13554 Dxx.xx	☆	☆	16[1)]	139	80	68	48	0,1	
13,51-14,00	14054 Dxx.xx	☆	☆	16[1)]	139	80	70	48	0,1	
14,01-14,50	R411.5-14554 Dxx.xx	☆	☆	20	146	86	73	50	0,2	
14,51-15,00	15054 Dxx.xx	☆	☆	20	146	86	75	50	0,2	
15,01-15,50	15554 Dxx.xx	☆	☆	20	152	92	78	50	0,2	
15,51-16,00	16054 Dxx.xx	☆	☆	20	152	92	80	50	0,2	
16,01-16,50	R411.5-16554 Dxx.xx	☆	☆	20	159	99	83	50	0,2	
16,51-17,00	17054 Dxx.xx	☆	☆	20	159	99	85	50	0,2	
17,01-17,50	17554 Dxx.xx	☆	☆	20	163	103	88	50	0,3	
17,51-18,00	18054 Dxx.xx	☆	☆	20	163	103	90	50	0,3	
18,01-18,50	R411.5-18554 Dxx.xx	☆	☆	20	167	107	93	50	0,3	
18,51-19,00	19054 Dxx.xx	☆	☆	25	178	110	95	56	0,3	
19,01-19,50	19554 Dxx.xx	☆	☆	25	184	116	98	56	0,3	
19,51-20,00	20054 Dxx.xx	☆	☆	25	184	116	100	56	0,3	

[1)] Internal Coromant standard.

Ordering example standard diameter: 10 pieces R411.5-10054 D09.50 P20
Ordering example intermediate diameter: 10 pieces R411.5-10054 D*09.53* P20

Carbide grades

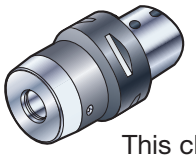
P20, TiN-coated. For general applications in steel.

K20, TiN coated. For stainless steel, cast iron, aluminium and hardened steel.

Regrinding

For regrinding service, please contact your Sandvik representative for support.

CoroGrip Precision Power Chuck



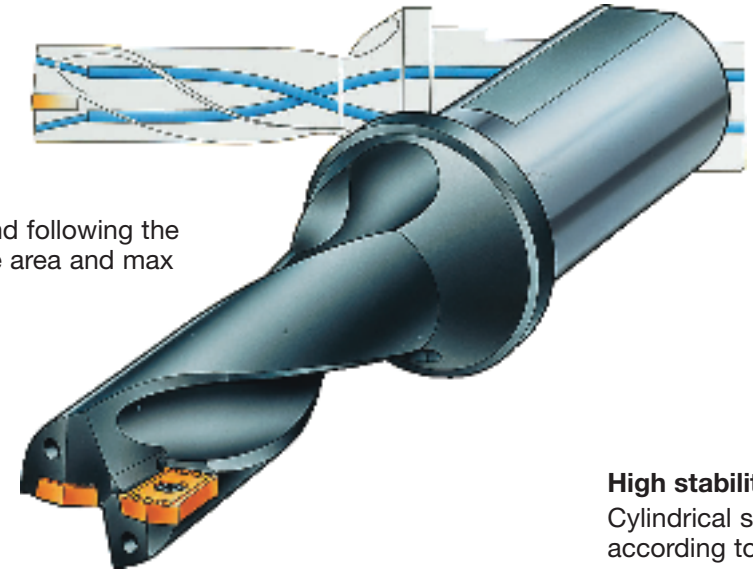
An excellent tooling combination for precision drilling is the new CoroGrip power chuck.

This chuck is suitable for the Delta drill with cylindrical shank.

Coromant U

Indexable drills for high productivity and cost efficient holes

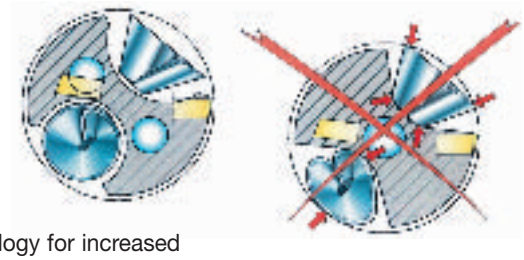
Lengths for hole depths: 2 – 4 × Dia. As Tailor Made option: 5 × Dia
Hole diameters 12,7–58 mm



Effective cutting fluid holes
located along the periphery and following the helix — to allow optimum flute area and max cutting fluid flow.

High stability shank
Cylindrical shank with flat according to ISO 9766

Smooth, unobstructed chip evacuation
for good hole quality and trouble-free operation. The safe tool for unmanned production.

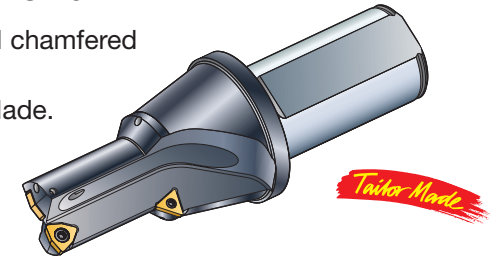


Wiper High feed Wiper technology for increased productivity with good surface finish.

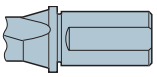
Step and chamfer drill

The hole is drilled and chamfered in one operation.

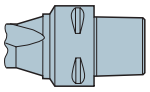
Standard and Tailor Made.



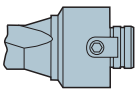
Mounting options



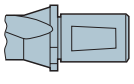
Cylindrical with flat
- according to ISO 9766



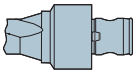
Coromant Capto®



Varilock



Coromant Whistle Notch

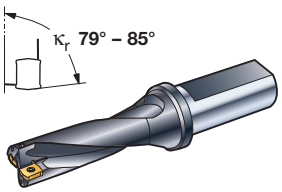


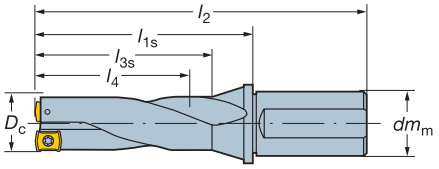
Compatible with ABS holders

2 × D_c

Cylindrical shank

Flat according to ISO 9766





Drill diameter, D_c	12,7–58 mm
Hole tolerance	+0,3 mm -0,1 mm
Tolerance, D_c	± 0,15 mm (D_c 12,7 – 25,0 mm) ± 0,20 mm (D_c 26,0 – 58,0 mm)
Max hole depth, l_4	2 x D_c

l_{1s} = programming length

Drill diameter	Ordering code	Dimensions, mm						Inserts[2]	Spare parts		Radial adjustment (max)	
D_c mm		dm_m	l_{1s}	l_2	l_{3s}	l_4	KG		Insert screw	Screwdriver (Torx Plus)		Max D_c
12,7	**R416.2- 0127L20-21**		41	91	28	25	0,2	LCMX 02..P LCMX 02..C	5513 020-33	5680 046-03 (7IP)	+ 1,2 →	15,1
13	**0130L20-21**		42	92	29	26	0,2				+ 1,15	15,3
13,5	**0135L20-21**	20	43	93	30	27	0,2				+ 1,1	15,7
14	**0140L20-21**		44	95	31	28	0,2				+ 1,0	16,0
14,5	**0145L20-21**		46	96	32	29	0,2				+ 0,9	16,3
15	**0150L20-21**		47	97	33	30	0,2				+ 0,85	16,7
15,5	**0155L20-21**		49	99	35	31	0,2				+ 0,75	17,0
16	**0160L20-21**	20	51	101	36	32	0,2				+ 0,7	17,4
16,5	**0165L20-21**		52	102	37	33	0,2				+ 0,6	17,7
17	**0170L20-21**		53	103	38	34	0,2				+ 0,5	18,0

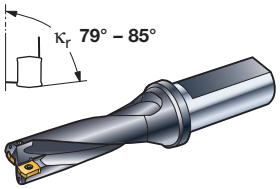
[1] Inserts are ordered separately.

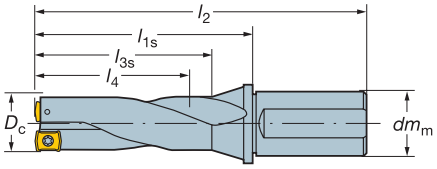
Ordering example: 2 pieces R416.2-0127L20-21

3 × D_c

Cylindrical shank

Flat according to ISO 9766





Drill diameter, D_c	12,7–58 mm
Hole tolerance	+0,3 mm -0,1 mm
Tolerance, D_c	± 0,15 mm (D_c 12,7 – 30,0 mm) ± 0,20 mm (D_c 31,0 – 58,0 mm)
Max hole depth, l_4	3 x D_c

l_{1s} = programming length

Drill diameter	Ordering code	Dimensions, mm						Inserts[1]	Spare parts		Radial adjustment (max)	
D_c mm		dm_m	l_{1s}	l_2	l_{3s}	l_4	KG		Insert screw	Screwdriver (Torx Plus)		Max D_c
12,7	**R416.2- 0127L20-31**		54	104	41	38	0,2	LCMX 02..P LCMX 02..C	5513 020-33	5680 046-03 (7IP)	+ 1,2 →	15,1
13	**0130L20-31**		55	105	42	39	0,2				+ 1,15	15,3
13,5	**0135L20-31**	20	56	106	43	41	0,2				+ 1,1	15,7
14	**0140L20-31**		58	108	45	42	0,2				+ 1,0	16,0
14,5	**0145L20-31**		60	110	46	44	0,2				+ 0,9	16,3
15	**0150L20-31**		62	112	48	45	0,2				+ 0,85	16,7
15,5	**0155L20-31**		64	114	50	47	0,2				+ 0,75	17,0
16	**0160L20-31**	20	66	116	51	48	0,2				+ 0,7	17,4
16,5	**0165L20-31**		68	118	53	50	0,2				+ 0,6	17,7
17	**0170L20-31**		69	119	54	51	0,2				+ 0,5	18,0

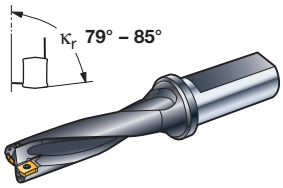
[1] Inserts are ordered separately.

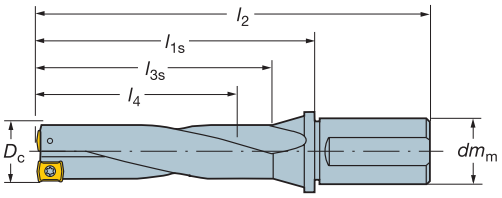
Ordering example: 2 pieces R416.2-0127L20-31

4 × D_c

Cylindrical shank

Flat according to ISO 9766





Drill diameter, D_c	12,7–58 mm
Hole tolerance	+0,4 mm -0,1 mm
Tolerance, D_c	± 0,20 mm
Max hole depth, l_4	4 x D_c

l_{1s} = programming length

Drill diameter D_c mm	**Ordering code**	dm_m	l_{1s}	l_2	l_{3s}	l_4	kg	**Inserts**[1]	**Spare parts** Insert screw	Screwdriver (Torx Plus)	Radial adjustment (max)	Max D_c
12,7	**R416.2- 0127L20-41**		66	116	53	51	0,2	LCMX 02..P	5513 020-33	5680 046-03	+ 1,2 →	15,1
13	**0130L20-41**		68	118	55	52	0,2	LCMX 02..C		(7IP)	+ 1,15	15,3
13,5	**0135L20-41**	20	70	120	57	54	0,2				+ 1,1	15,7
14	**0140L20-41**		72	122	59	56	0,2				+ 1,0	16,0
14,5	**0145L20-41**		75	125	61	58	0,2				+ 0,9	16,3
15	**0150L20-41**		77	127	63	60	0,2				+ 0,85	16,7
15,5	**0155L20-41**		79	129	65	62	0,2				+ 0,75	17,0
16	**0160L20-41**	20	82	132	67	64	0,2				+ 0,7	17,4
16,5	**0165L20-41**		84	134	69	66	0,2				+ 0,6	17,7
17	**0170L20-41**		86	136	71	68	0,2				+ 0,5	18,0

[1] Inserts are ordered separately.

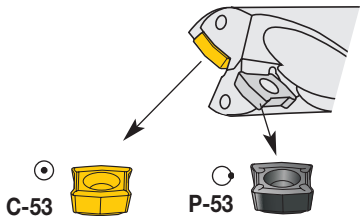
Ordering example: 2 pieces R416.2-0127L20-41

Geometry recommendations for Coromant U and T-MAX U drills

Central insert Peripheral insert

D_c 12,7 — 17 mm

General choice

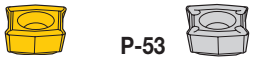


C-53 P-53

P M K N S H

- Good chip control in most materials including: steel, stainless, cast iron, titanium, heat resistant alloys and aluminium
- Low to high cutting speeds
- Central and peripheral insert

Complementary choice



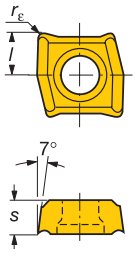
TC-53 P-53

P K H

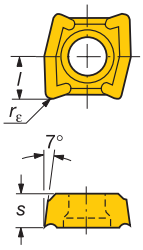
- TC -53, optimized geometry for increased edge security

Inserts for Coromant U drills R416.2, R416.21, R416.22 and T-Max® U drills R416.9, L416.1

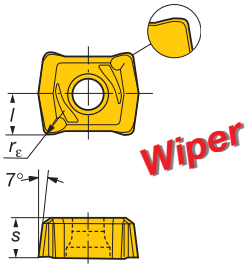
Central
LCMX 02
C-53
D_c 12,7-17,0



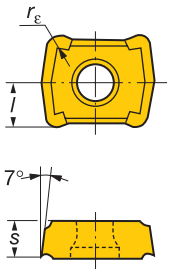
Peripheral
LCMX 02
P-53
D_c 12,7-17,0



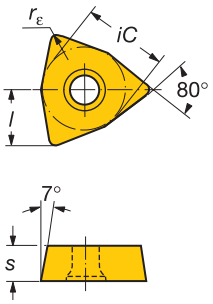
LCMX 03/04
R-WM
D_c 12,7-17,0



LCMX 03/04
D_c 17,5-25,0



WCMX 05/06/08
D_c 26,0-80,0



Insert code

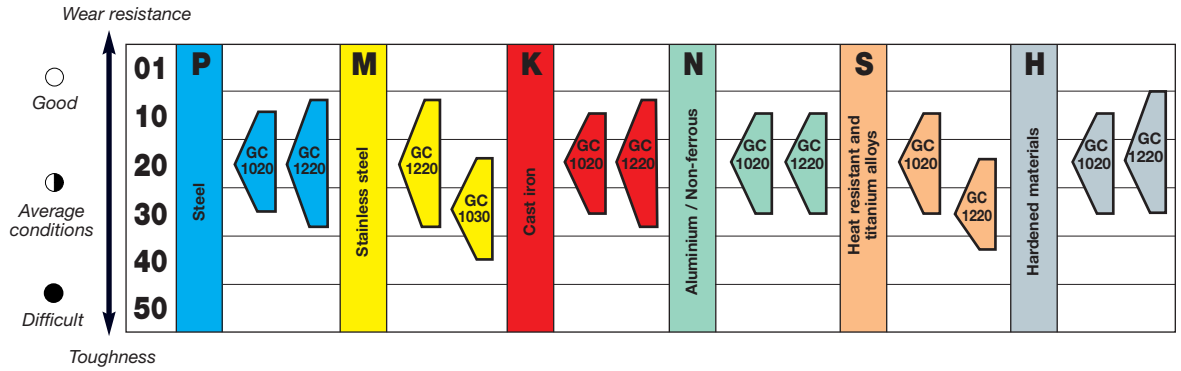
○ = Peripheral insert
◉ = Central insert
◉ = Central and peripheral insert

	Insert code		COROMANT GRADES																		Dimensions, mm				
			P				M					K				N			S			H				
			3040	235	1020	1120	3040	235	1020	1120	H13A	3040	1020	1120	H13A	1020	1120	H13A	1020	1120	H13A	1020	1120	3040	l	iC	d_1	s	r_ε
All-round geometry																													
02	**LCMX 02 02 04 P-53**	○	★			☆	☆			★		★		☆			★			★			★	☆	2,68	–	2,5	2,38	0,4
	02 02 04 C-53	◉			★				★				★			★			★			★			2,68	–	2,5	2,38	0,4
	02 02 04 TC-53	◉			★								★									☆			2,68	–	2,5	2,38	0,4
03	**LCMX 03 03 08-53**	○	★	☆	☆		☆	☆	★		☆	★	☆		☆	☆		★	★		☆	★		☆	3,25	–	2,5	3,18	0,8
	03 03 08-53	◉			★			☆	★		☆		★		☆	☆		★	★		☆	★			3,25	–	2,5	3,18	0,8
	03 03 04-58	○	★	☆			★	☆																	3,25	–	2,5	3,18	0,4
	03 03 08 T-53	◉			★								★									☆			3,25	–	2,5	3,18	0,8
	03 03 04R-WM	○	★									★													3,25	–	2,5	3,18	0,4
	03 03 04R-WM	◉			★								★												3,25	–	2,5	3,18	0,4
04	**LCMX 04 03 08-53**	○	★	☆	☆		☆	☆	★		☆	★	☆		☆	☆		★	★		☆	★		☆	4,0	–	2,8	3,18	0,8
	04 03 08-53	◉			★			☆	★		☆		★		☆	☆		★	★		☆	★			4,0	–	2,8	3,18	0,8
	04 03 04-58	○	★	☆			★	☆																	4,0	–	2,8	3,18	0,4
	04 03 08 T-53	◉			★								★									☆			4,0	–	2,8	3,18	0,8
	04 03 04R-WM	○	★									★													4,0	–	2,8	3,18	0,4
	04 03 04R-WM	◉			★								★												4,0	–	2,8	3,18	0,4
05	**WCMX 05 03 04 R-WM**	○	★									★													5,07	7,938	3,2	3,18	0,4
	05 03 04 R-WM	◉			★								★												5,07	7,938	3,2	3,18	0,4
	050308 R-51	○		☆				☆			☆				☆										5,07	7,938	3,2	3,18	0,8
	05 03 08 R-53	○	★		☆		☆	☆	★		☆	★	☆		☆	☆		★	★		☆	★		☆	5,07	7,938	3,2	3,18	0,8
	05 03 08 R-53	◉			★			☆	★		☆		★		☆	☆		★	★		☆	★			5,07	7,938	3,2	3,18	0,8
	05 03 08-58	○	★	☆			★	☆																	5,07	7,938	3,2	3,18	0,8
	05 03 08 T-53	◉			★								★									☆			5,07	7,938	3,2	3,18	0,8
	05 03 08-56	○		☆				☆																	5,07	7,938	3,2	3,18	0,8
06	**WCMX 06 T3 04 R-WM**	○	★									★													6,14	9,525	3,7	3,97	0,4
	06 T3 04 R-WM	◉			★								★												6,14	9,525	3,7	3,97	0,4
	06 T3 08 R-51	○		☆				☆			☆				☆										6,14	9,525	3,7	3,97	0,8
	06 T3 08 R-53	○	★	☆	☆		☆	☆	★		☆	★	☆		☆	☆		★	★		☆	★		☆	6,14	9,525	3,7	3,97	0,8
	06 T3 08 R-53	◉			★			☆	★		☆		★		☆	☆		★	★		☆				6,14	9,525	3,7	3,97	0,8
	06 T3 08-58	○	★	☆			★	☆																	6,14	9,525	3,7	3,97	0,8
	06 T3 08 T-53	◉			★								★									☆			6,14	9,525	3,7	3,97	0,8
	06 T3 08-56	○		☆				☆																	6,14	9,525	3,7	3,97	0,8
08	**WCMX 08 04 12 R-51**	○		☆				☆			☆				☆										8,14	12,7	4,3	4,76	1,2
	08 04 12 R-53	○	★	☆	☆		☆	☆	★		☆	★	☆		☆	☆		★	★		☆	★		☆	8,14	12,7	4,3	4,76	1,2
	08 04 12 R-53	◉			★			☆	★		☆		★		☆	☆		★	★		☆				8,14	12,7	4,3	4,76	1,2
	08 04 12-58	○	★	☆			★	☆																	8,14	12,7	4,3	4,76	1,2
	08 04 12 T-53	◉			★								★									☆			8,14	12,7	4,3	4,76	1,2
	08 04 12-56	○		☆				☆																					

★ = First choice

Ordering example: 100 pieces LCMX 02 02 04 P-53 3040

Cutting data recommendations – CoroDrill® Delta-C



	Material			Drill diameter, mm							
				Coromant grade	Cutting speed v_c m/min	1,50—2,90	Coromant grade	Cutting speed v_c m/min	3,00—6,00	6,01—10,00	10,01—14,00	14,01-20,00
	CMC No	HB				Feed f_n mm/r [3]			Feed f_n mm/r [3]			
P	**Unalloyed steel**											
	01.0	125	C = 0,05-0,10%	1020	80-100	0,04-0,08	1220	80-140	0,10-0,25	0,15-0,34	0,20-0,40	0,22-0,45
	01.1	125	C = 0,10-0,25%	1020	80-100	0,04-0,08	1220	80-140	0,10-0,25	0,15-0,34	0,20-0,40	0,22-0,45
	01.2	150	C = 0,25-0,55%	1020	70-85	0,03-0,07	1220	80-140	0,10-0,25	0,15-0,34	0,20-0,40	0,22-0,45
	01.3	170	C = 0,55-0,80%	1020	70-85	0,03-0,07	1220	70-130	0,10-0,25	0,15-0,34	0,20-0,40	0,22-0,45
	High carbon steel											
	01.4	210	Carbon tool steel	1020	65-80	0,03-0,07	1220	70-120	0,10-0,25	0,15-0,34	0,20-0,40	0,22-0,45
	Low alloy steel											
	02.1	180	Non-hardened	1020	60-75	0,03-0,06	1220	70-120	0,10-0,20	0,14-0,30	018-0,35	0,20-0,40
	02.2	275	Hardened and tempered	1020	45-60	0,03-0,06	1220	70-100	0,10-0,20	0,14-0,30	018-0,35	0,20-0,40
	02.2	350	Hardened and tempered	1020	35-50	0,015-0,030	1220	50-80	0,10-0,20	0,14-0,25	018-0,35	0,20-0,38
	High alloy steel											
	03.11	200	Annealed	1020	45-60	0,03-0,07	1220	40-80	0,08-0,14	0,10-0,22	0,14-0,25	0,16-0,32
	03.21	325	Hardened tool steel	1020	40-50	0,03-0,06	1220	40-70	0,08-0,14	0,10-0,22	0,12-0,25	0,18-0,28
	Steel castings											
	06.1	180	Unalloyed	1020	60-75	0,03-0,06	1220	70-130	0,10-0,25	0,15-0,34	0,20-0,40	0,22-0,45
	06.2	200	Low-alloy (alloying elements <5%)	1020	50-65	0,03-0,06	1220	70-120	0,10-0,25	0,15-0,34	0,20-0,40	0,22-0,45
M	**Stainless steel**											
	05.11	200	Non-hardened / Ferritic/Martensitic	–	–	–	1220	40-80 [1]	0,08-0,14	0,08-0,20	0,12-0,22	0,14-0,24
				–	–	–	1030		0,08-0,20	0,10-0,25	0,15-0,30	0,18-0,35
	05.21	180	Austenitic	–	–	–	1220	40-80 [1]	0,08-0,14	0,08-0,20	0,12-0,22	0,14-0,24
				–	–	–	1030		0,08-0,20	0,10-0,25	0,15-0,30	0,18-0,35
	Stainless steel											
	15.21	200	Austenitic castings	–	–	–	1220	40-80 [1]	0,08-0,14	0,08-0,20	0,12-0,22	0,14-0,24
				–	–	–	1030		0,08-0,20	0,10-0,25	0,15-0,30	0,18-0,35
S	**Heat resistant super alloys —Nickel base**											
	20.21	250	Annealed or solution treated	–	–	–	1220	10-25	0,06-0,12	0,08-0,15	0,08-0,15	0,10-0,16
	20.22	350	Aged or solution treated and aged	–	–	–	1220	10-25	0,06-0,12	0,08-0,15	0,08-0,15	0,10-0,16
	20.24	320	Cast or cast and aged	–	–	–	1220	10-25	0,06-0,12	0,08-0,15	0,08-0,15	0,10-0,16
	Titanium alloys											
	23.21	Rm [2] = 850	α, near α and α + β alloys, annealed	1020	30-40	0,02-0,04	1220	20-60	0,06-0,12	0,08-0,20	0,14-0,28	0,16-0,30
	23.22	Rm [2] =1050	α + β alloys in aged conditions, β alloys, annealed or aged	1020	30-40	0,02-0,04	1220	20-60	0,06-0,12	0,08-0,20	0,14-0,28	0,16-0,30
K	**Malleable cast iron**											
	07.1	130	Ferritic (short chipping)	1020	70-95	0,06-0,10	1220	90-150	0,15-0,30	0,25-0,40	0,35-0,60	0,40-0,60
	07.2	230	Pearlitic (long chipping)	1020	65-80	0,06-0,10	1220	70-130	0,15-0,25	0,20-0,35	0,30-0,55	0,35-0,55
	Grey cast iron											
	08.1	180	Low tensile strength	1020	70-95	0,06-0,10	1220	90-150	0,15-0,30	0,25-0,40	0,35-0,60	0,40-0,60
	08.2	260	High tensile strength	1020	60-80	0,06-0,10	1220	70-130	0,15-0,25	0,20-0,35	0,30-0,55	0,35-0,55
	Nodular cast iron, SG iron											
	09.1	160	Ferritic	1020	60-80	0,06-0,10	1220	80-110	0,15-0,30	0,25-0,40	0,35-0,60	0,40-0,60
	09.2	250	Pearlitic	1020	50-65	0,06-0,10	1220	70-100	0,15-0,25	0,20-0,35	0,30-0,55	0,35-0,55
H	**Extra hard steel**											
	04.1	43-47 HRc	Hardened and tempered	1020	20-30	0,01-0,02	1220	30-50	0,06-0,10	0,08-0,12	0,10-0,15	0,12-0,18
	04.1	47-60 HRc						15-25	0,06-0,10	0,08-0,12	0,10-0,15	0,12-0,18
N	**Aluminium alloys**											
	30.11	60	Wrought or wrought and coldworked, non aging	1020	200-250	0,06-0,10	1220	120-230	0,15-0,25	0,20-0,40	0,30-0,50	0,40-0,60
	30.21	75	Cast, non-aging	1020	150-200	0,06-0,10	1220	120-230	0,15-0,25	0,20-0,40	0,30-0,50	0,40-0,60
	Copper and copper alloys											
	33.1	110	Free cutting alloys, ≥1% Pb	1020	140-170	0,06-0,10	1220	90-150	0,15-0,25	0,20-0,40	0,30-0,50	0,40-0,60
	33.2	90	Brass, leaded bronzes, ≤1% Pb	1020	160-190	0,06-0,10	1220	90-150	0,15-0,25	0,20-0,40	0,30-0,50	0,40-0,60

[1] Internal cutting fluid supply is recommended when drilling stainless steel as a good supply of coolant at the cutting edges is essential for chip evacuation and tool life.

[2] Rm = ultimate tensile strength measured in MPa.

[3] Higher feeds should be used in stable and favourable machining conditions.

Coromant Delta drill® — R411.5

ISO	CMC No.	Material		HB	Grade	Cutting speed v_c m/min	Drill diameter, mm 9,50-14 Feed f_n mm/r	14,01-17 Feed f_n mm/r	17,01-30,40 Feed f_n mm/r
P	01.0	**Unalloyed steel**	Non-hardened 0,05-0,10% C	**80-170**	P20	75-100	0,14-0,22	0,15-0,25	0,18-0,31
	01.1		Non-hardened 0,10-0,25% C	**90-200**					
	01.2		Non-hardened 0,25-0,55% C	**125-225**		70-90	0,15-0,23	0,18-0,26	0,20-0,30
	01.3		Non-hardened 0,55-0,80% C	**150-225**					
	01.4		High carbon & carbon tool steel	**180-225**					
	02.1	**Low alloy steel**	Non-hardened	**150-260**	P20	55-90	0,14-0,22	0,18-0,26	0,20-0,28
	02.2		Hardened	**220-400**		35-65	0,14-0,22	0,15-0,25	0,18-0,26
	03.11	**High alloy steel**	Annealed	**150-250**	P20	40-70	0,15-0,20	0,18-0,25	0,20-0,27
	03.22		Hardened steel	**250-400**		40-60	0,15-0,20	0,17-0,20	0,18-0,24
	06.1	**Steel castings**	Unalloyed	**90-225**	P20	70-90	0,17-0,23	0,19-0,25	0,20-0,26
	06.2		Low alloyed (alloying elements < 5%)	**150-250**		50-75	0,15-0,21	0,17-0,23	0,19-0,25
M	05.11	**Stainless steel**	Ferritic, Martensitic 13-25% Cr	**150-270**	K20	25-55	0,14-0,21	0,17-0,24	0,18-0,27
	05.21	**Stainless steel**	Austenitic Ni > 8%, 18-25% Cr	**150-270**	K20	25-55	0,14-0,20[1)]	0,16-0,23[1)]	0,19-0,25[1)]
K	07.1	**Malleable cast iron**	Ferritic (short chipping)	**110-145**	K20	75-120	0,15-0,26	0,18-0,30	0,21-0,39
	07.2		Pearlitic (long chipping)	**150-270**		75-110	0,15-0,25	0,16-0,29	0,18-0,35
	08.1	**Grey cast iron**	Low tensile strength	**150-220**	K20	85-115	0,19-0,31	0,23-0,39	0,26-0,46
	08.2		High tensile strength	**200-330**		55-100	0,19-0,30	0,24-0,36	0,28-0,44
	09.1	**Nodular cast iron**	Ferritic	**125-230**	K20	65-105	0,16-0,26	0,20-0,35	0,23-0,41
	09.2		Pearlitic	**200-300**		55-95	0,15-0,25	0,18-0,33	0,21-0,39
H	04.1	**Extra hard steel**	Hardened and tempered	***HRC 43-47***	P20	25-40	0,10-0,15	0,12-0,17	0,15-0,20
				47-60		15-30			
N	30.12	**Aluminium alloys**	Wrought solution treated and aged	**75-150**	K20	95-150	0,21-0,33	0,18-0,41	0,18-0,41
	30.21		Cast	**40-100**					
	33.1	**Copper and copper alloys**	Free cutting alloys (Pb ≥ 1%)	**50-160**	K20	45-150	0,16-0,29	0,20-0,35	0,25-0,44
	33.2		Brass and leaded bronzes (Pb ≤ 1%)						

[1)] If chip control is difficult to achieve with the recommended cutting data, reduce the feed to 0,08 - 0,10 mm/rev.

Indexable U drills — R/L416.1, R416.2, R416.21, R416.22 and R416.9

ISO	CMC No.	Material	HB	Drill dia D_c mm	Feed f_n mm/r	Speed v_c m/min	Geometry / Grade — *FIRST CHOICE* Highest productivity ◔	*FIRST CHOICE* Highest productivity ⊙	Complementary ◔	Complementary ⊙
P	01.0	**Unalloyed steel** Non hardened 0,05–0,10% C	80–170	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,08 0,04–0,08 0,05–0,08 0,07–0,10 0,08–0,12	290 (230–380)	-53/3040 -53/3040 -53/3040 -53/3040 -53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	01.1	Non hardened 0,05–0,25% C	90–200	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,08 0,04–0,08 0,05–0,10 0,07–0,12 0,08–0,14	270 (225–345)	-53/3040 -53/3040 -53/3040 -53/3040 -53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	01.2	Non hardened 0,25–0,55% C	125–225	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,04–0,14 0,08–0,18 0,10–0,20 0,12–0,24	230 (190–290)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	01.3	Non hardened 0,55–0,80% C	150–225	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,06–0,14 0,08–0,18 0,10–0,20 0,12–0,24	210 (170–275)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	01.4	High carbon & carbon tool steel	180–275	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,06–0,14 0,08–0,18 0,10–0,20 0,12–0,24	210 (200–275)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	02.1	**Low-alloy steel** Non hardened	150–260	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0-80,0	0,04–0,10 0,06–0,12 0,10–0,16 0,11–0,18 0,12–0,22	220 (180–290)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	02.2	Hardened	220–450	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,06–0,14 0,10–0,18 0,10–0,20 0,12–0,24	170 (90–230)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	03.11	**High-alloy steel** Annealed	50–250	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,08 0,04–0,14 0,08–0,18 0,10–0,20 0,12–0,24	180 (160–275)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	03.21	Hardened steel	250–450	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,06–0,12 0,10–0,16 0,11–0,18 0,12–0,22	130 (80–200)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	06.1	**Steel castings** Unalloyed	90–225	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,08 0,04–0,08 0,05–0,10 0,06–0,12 0,07–0,14	200 (140–310)	-53/3040 -53/3040 -53/3040 -53/3040 -53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	06.2	Low alloyed (alloying elements ≤ 5%)	150–250	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,06–0,12 0,10–0,16 0,11–0,18 0,12–0,22	160 (110–250)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
M	05.11	**Stainless steel** Ferritic, Martensitic 13–25% Cr	150–270	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,04–0,14 0,08–0,18 0,10–0,20 0,12–0,24	170 (120–265)	-53/3040 -53/3040 -53/3040 -53/3040 -53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020
	05.21	Austenitic Ni > 8% 13–25% Cr	150–275	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,04–0,12 0,08–0,14 0,10–0,16 0,11–0,18	150 (120–250)	-53/3040 -53/3040 -53/3040 -53/3040 -53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020
	05.51 05.52	Austenitic Ferritic (duplex)	180–320	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,04–0,12 0,08–0,14 0,10–0,16 0,11–0,18	110 (90–145)	-53/3040 -53/3040 -53/3040 -53/3040 -53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020

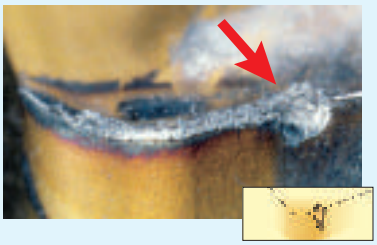
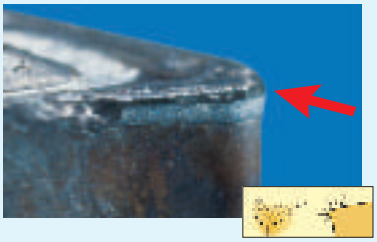
Insert positioning: ⊙ = Central ◔ = Peripheral

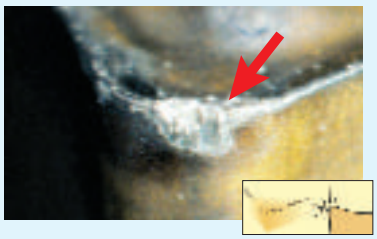
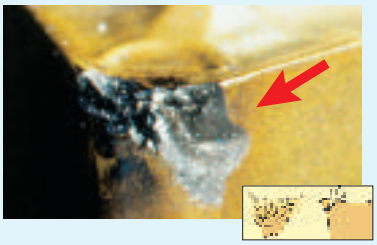
Wiper -WM geometry for machining steel and cast iron with hardness < 200 HB in stable conditions, increase feed (f_n) with 50%. For easy to machine stainless steels in stable conditions, increase feed (f_n) with 25%.

ISO	CMC No.	Material	HB	Drill dia D_c mm	Feed f_n mm/r	Speed v_c m/min	Geometry / Grade — FIRST CHOICE Highest productivity ◔	FIRST CHOICE Highest productivity ⊙	Complementary ◔	Complementary ⊙
M	15.21	**Stainless steel** Austenitic castings	150–250	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,08 0,04–0,12 0,05–0,12 0,06–0,14 0,06–0,14	110 (80–155)	-53/1120 -53/1020	-53/1020 -53/1020 -53/1020 -53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020
S	20.21 20.22 20.24	**Heat resistant alloys** Ni based	140–425	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,03–0,08 0,04–0,08 0,06–0,10 0,08–0,12 0,09–0,14	50 (20– 88)	-53/1120 -53/1020	-53/1020 -53/1020 -53/1020 -53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020
	23.21 23.22	**Titanium alloys** α, near α and α + β alloys in annealed or aged conditions	*R_m (MPa)* ***600–1500***	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,08–0,14 0,12–0,16 0,14–0,18 0,16–0,20	60 (40–132)	-53/1120 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1020 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1120 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1020 -53/H13A -53/H13A -53/H13A -53/H13A
K	07.1	**Malleable cast iron** Ferritic (short chipping)	110–145	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,14 0,10–0,18 0,14–0,20 0,16–0,26 0,18–0,28	170 (140–230)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	07.2	Pearlitic (long chipping)	150–270	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,08–0,14 0,12–0,18 0,14–0,20 0,15–0,22	140 (105–170)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	08.1	**Grey cast iron** Low tensile strength	150–220	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,14 0,10–0,18 0,14–0,20 0,16–0,26 0,18–0,28	250 (210–310)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	08.2	High tensile strength	200–330	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,08–0,14 0,12–0,18 0,14–0,20 0,15–0,22	170 (125–230)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	09.1	**Nodular cast iron** Ferritic	125–230	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,08–0,14 0,12–0,18 0,14–0,20 0,15–0,22	170 (125–215)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020 T-53/1020
	09.2	Pearlitic	200–300	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,10 0,08–0,14 0,12–0,18 0,14–0,20 0,15–0,22	150 (110–200)	-53/3040	-53/1020	-53/1120 -53/1020 -53/1020 -53/1020 -53/1020	-53/1020
H	04.1	**Extra hard steel** Hardened and tempered	450–	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,05–0,08 0,07–0,15 0,07–0,15 0,10–0,15 0,10–0,15	40 (30–80)	-53/3040	-53/1020	-53/1020 -53/1120	-53/1020
N	30.12	**Aluminium alloys** Wrought or wrought and aged	30–150	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,12 0,06–0,16 0,10–0,18 0,12–0,22 0,14–0,26	350 (300–440)	-53/1120 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1020 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1120 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1020 -53/H13A -53/H13A -53/H13A -53/H13A
	30.21	Cast, non aging	40–100	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,12 0,06–0,16 0,10–0,18 0,12–0,22 0,14–0,26	150 (30–440)	-53/1120 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1020 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1120 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1020 -53/H13A -53/H13A -53/H13A -53/H13A
	30.22	Cast or cast and aged	70–140	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,12 0,06–0,16 0,10–0,18 0,12–0,22 0,14–0,26	300 (250–385)	-53/1120 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1020 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1120 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1020 -53/H13A -53/H13A -53/H13A -53/H13A
	33.1	**Copper and copper alloys** Free cutting alloys (Pb ≥ 1%)	50–160	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,12 0,06–0,16 0,10–0,18 0,12–0,22 0,14–0,26	300 (250–385)	-53/1120 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1020 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1120 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1020 -53/H13A -53/H13A -53/H13A -53/H13A
	33.2	Brass and leaded alloys (Pb ≤ 1%)	50–160	12,7–17,0 17,5–25,4 26,0–30,0 31,0–41,3 42,0–80,0	0,04–0,12 0,06–0,16 0,10–0,18 0,12–0,22 0,14–0,26	230 (180–265)	-53/1120 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1020 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1120 -53/H13A -53/H13A -53/H13A -53/H13A	-53/1020 -53/H13A -53/H13A -53/H13A -53/H13A

Insert positioning: ⊙ = Central ◔ = Peripheral

Wiper Cutting data for wiper inserts, see page B 87.

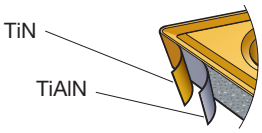
Problem:		Cause:	Remedy:
Flank and notch wear 	a. Rapid flank wear causing poor surface finish or out of tolerance. b/c. Notch wear causing poor surface finish and risk of edge breakage.	a. Cutting speed too high or insufficient wear resistance.	Reduce the cutting speed. Select a more wear resistant grade.
		b/c. Oxidation	Select an Al_2O_3 coated grade. For work hardening materials select a smaller entering angle or a more wear resistant grade.
		b/c. Attrition	Reduce the cutting speed. (When machining heat resistant material with ceramics increase cutting speed.)
		c. Oxidation	Select a cermet grade
Crater wear 	Excessive crater wear causing a weakened edge. Cutting edge breakthrough on the training edge causes poor surface finish.	Diffusion wear due to too high cutting temperatures on the rake face.	Select an Al_2O_3 coated grade. Select a positive insert geometry. First reduce the speed to obtain a lower temperature, then reduce the feed.
Plastic deformation 	Plastic deformation Edge depression or flank impression Leading to poor chip control and poor surface finish. Risk of excesive flank wear leading to insert breakage	Cutting temperature too high combined with a high pressure.	Select a harder grade with better resistance to plasic deformation. Edge depression – Reduce speed Flank impression – Reduce feed
Built-up edge (B.U.E.) 	Built-up edge causing poor surface finish and cutting edge frittering when the B.U.E. is torn away.	Workpiece material is welded to the insert due to: Low cutting speed. Negative cutting geometry.	 Increase cutting speed. Select a positive geometry.

Problem:		Cause:	Remedy:
Chip hammering 	The part of the cutting edge not in cut is damaged through chip hammering. Both the top side and the support for the insert can be damaged.	The chips are deflected against the cutting edge.	Change the feed. Select an alternative insert geometry.
Frittering 	Small cutting edge fractures (frittering) causing poor surface finish and excessive flank wear.	Grade too brittle. Insert geometry too weak. Built-up edge	Select tougher grade. Select an insert with a stronger geometry (bigger chamfer for ceramic inserts). Increase cutting speed or select a positive geometry. Reduce feed at beginning of cut.
Thermal cracks 	Small cracks perpendicular to the cutting edge causing frittering and poor surface finish.	Thermal cracks due to temperature variations caused by: - Intermittent machining. - Varying coolant supply.	 Select a tougher grade with better resistance to thermal shocks. Coolant should be applied copiously or not at all.
Insert breakage 	Insert breakage that damages not only the insert but also the shim and workpiece.	Grade too brittle. Excessive load on the insert. Insert geometry too weak. Insert size too small.	Select a tougher grade. Reduce the feed and/or the depth of cut. Select a stronger geometry, preferably a single sided insert. Select a thicker/larger insert.
Slice fracture – Ceramics 		Too big tool pressure.	Reduce the feed. Select a tougher grade. Select an insert with smaller chamfer.

COATED CARBIDE

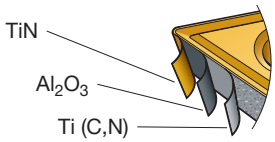
CVD = Chemical Vapour Deposition coated grades — GC2015, GC2025, GC2135, GC235, GC3005, GC3015, GC3020, GC3025, GC3115, GC4015, GC4025, GC4035, S05F, and CD1810.

PVD = Physical Vapour Deposition coated grades — GC1005, GC1020, GC1025, GC1525, GC2035, GC2145 and GC4125.



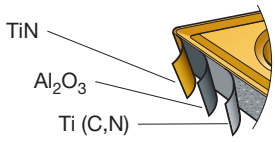
GC1005 (M15, S15)

GC1005 has a 4 µm PVD coating of TiAlN-TiN. This tough and wear resistant coating, in combination with a very hard and fine grained substrate, provides the needed properties to have sharp cutting edges and a high security against chip hammering. A grade for close tolerances and excellent surface finish for finishing in HRSA and stainless steels.



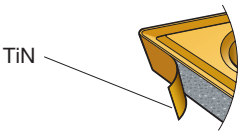
GC2015 (M15, P25)

GC2015 consists of a 9 µm CVD TiCN- Al2O3-TiN coating on a substrate with a gradient zone close to the surface. This gives excellent adhesion with high wear performance and good resistance to diffusion wear, and plastic deformation at high temperatures. Also reduces friction and hence the formation of built-up-edges.



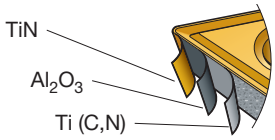
GC2135 (M30, P35, S30)

GC2135 is based on a tough substrate with very good resistance to thermal and mechanical shocks. On top of that is a thin 4 µm CVD TiCN- Al_2O_3-TiN coating, which provides very good flank wear resistance and reduces friction and hence the formation of built-up-edges. This is a grade with very good bulk and edgeline toughness. To be used at low to medium cutting speeds



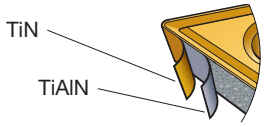
GC1020 (M20, P25)

GC1020 has a 1-2 µm PVD TiN coating on top of a very fine grained substrate developed for high quality threading. Excellent performance in all three material groups P, M and K.



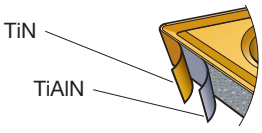
GC2025 (M25, P35)

GC2025 consists of a 5.5 µm CVD TiCN- Al_2O_3-TiN coating on a substrate which features excellent resistance to both mechanical and thermal shock. This gives excellent adhesion with high wear resistance to crater wear and plastic deformation at high ttemperatures. Also reduces friction and hence the formation of built-up-edges.



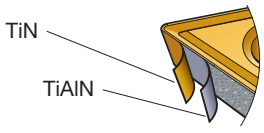
GC2145 (M40, P45, S40)

GC2145 has an even tougher substrate than GC2135 but still with a very good resistance to thermal and mechanical shocks. The tough and wear resistant coating, a 4 µm PVD coating of TiAlN-TiN, in combination with the very tough substrate makes GC2145 the perfect choice for cut-off to centre and other applications with an extreme demand on toughness. To be used at low cutting speeds.



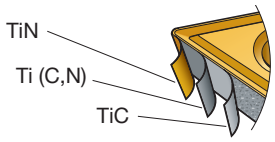
GC1025 (M15, S15, P25)

GC1025 has a 4 µm PVD coating of TiAlN-TiN. This tough and wear resistant coating, in combination with a very fine grained substrate, provides the needed properties to have sharp cutting edges and a high security against chip hammering. A grade for close tolerances and excellent surface finish for finishing in stainless steels.



GC2035 (M25)

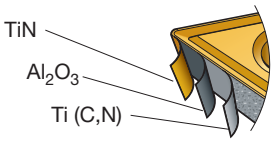
GC2035 has a 4 µm PVD coating of TiAlN-TiN, which provides very good wear resistance, toughness and reduces friction, hence the formation of built up edges. The good resistance to both mechanical and thermal shock of GC2025 is preserved in GC2035. A grade with maximum edge toughness, ideal for both intermittent machining at high speeds in the M25 area and for heavy roughing where cutting speeds are limited.



GC235 (M40, P45)

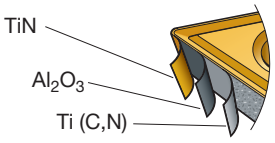
GC235 has a very tough substrate, which provides and extremely good edge scurity. It is coated with a 2.5 µm CVD TiC-TiCN-TiC for added wear resistance and lower friction. GC235 is very good in demanding roughing applications, e.g. interrupted cuts and low speeds. Works well in steel and stainless steel at low to moderate speeds.

COATED CARBIDE



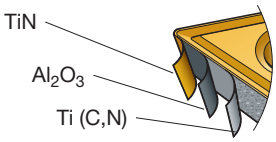
GC3005 (K10, P10)

GC3005 has a 9 µm CVD TiCN- Al_2O_3-TiN coating. It has good coating adhesion and wear resistance for nodular cast iron and also for finishing of grey cast iron. The substrate withstands high temperatures without being deformed.



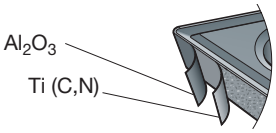
GC3015 (K10, P10)

GC3015 has a thick, 14 µm, CVD TiCN- Al_2O_3-TiN coating optimized for high wear resistance in cast iron machining. The hard substrate withstands high temperatures without being deformed. GC3015 is an excellent general purpose grade for roughing to finishing of cast irons at moderate to high cutting speeds.



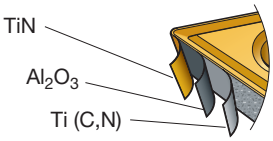
GC3025 (K20, P25)

GC3025 has a 9 µm CVD TiCN- Al_2O_3-TiN coating, the same type as GC3005 but a tougher substrate with a gradient zone close to the surface, which makes it a reliable alternative to GC3005 and 3015 for tougher operations in nodular and grey cast iron.



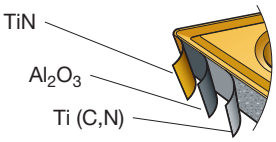
GC3115, GC3020 (K15, P15)

Based on a hard substrate with a good resistance to plastic deformation due to high hot hardness. The top performance CVD coating of TiCN and Al_2O_3 provides an excellent flank wear resistance. Ideal for grooving and turning operations in cast iron with high cutting speeds. Also for cut-off under stable conditions.



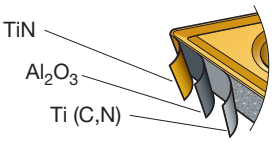
GC4015 (P15, K15)

GC4015 has a thick, 14 µm, CVD TiCN- Al_2O_3-TiN coating. The coating has an extremely good wear resistance and is golden coloured for easy wear detection. Under the coating there is a hard substrate with a thin gradient zone close to the surface. Because of this, the grade can withstand high cutting temperatures and still have a good edgeline security. This makes GC4015 ideal for high cutting speeds and dry machining in the P15 area. A top performing grade. Also a good choice for machining of grey and nodular cast iron.



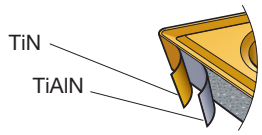
GC4025 (P25, M15)

GC4025 has a thick layer of Al_2O_3 on top of a medium sized TiCN layer. A thin TiN outer layer gives the grade a yellow colour for easy wear detection. The total thickness of this CVD coating is approx. 12 µm. The substrate is rather hard but has a large gradient zone that brings toughness and better edgeline behaviour to the grade. The combination of a thick wear resistant coating and a hard substrate with excellent edge security has made GC4025 very popular. It works extremely well in P25 applications but also in stainless steels and cast iron. Used in many different operations.



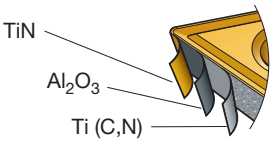
GC4035 (P35, M25)

GC4035 has a coating of the same type as GC4025. The coating brings wear resistance to the grade. The substrate is tougher than GC4025 and has a gradient zone close to the surface. GC4035 is a good choice in applications with demands on both toughness and resistance to plastic deformation. It works very well in interrupted cuts. A secure grade for high productive applications in the P35 area, the tough steelworker. Also suitable for stainless steel machining in the M25 area when extra wear resistance is sought.



GC4125 (P30, M25, K30, S25)

GC4125 has a 4 µm PVD coating of TiAlN-TiN. This tough and wear resistant coating, in combination with a very fine grained substrate, makes the grade both hard and tough. A true all-round grade that works good in most types of materials and operations.

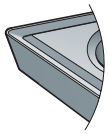


S05F (S05)

S05F has a thin 4 µm CVD TiCN- Al_2O_3-TiN coating on top of a very hard and fine-grain substrate. This grade is optimized for finishing cuts in HRSA. To be used in conditions where notch is not a significant problem, i.e. shallow depths of cuts, round inserts, small entry angle and softer materials.

CERMET

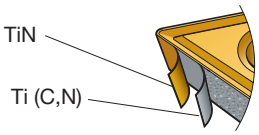
Uncoated cermet (HT)



CT5015 (P05,K05)

CT5015 is an uncoated titanium based cemented carbide, more frequently called a cermet. Titanium instead of tungsten improves the chemical stability and makes CT5015 ideal for machining of smearing materials. CT5015 is a hard wear resistant grade with good resistance to plastic deformation. A pure cobalt binder adds toughness and security to the substrate. Keeping the grade uncoated ensures that a sharp edge is maintained throughout the tool life. This means good surface finish and low cutting forces. A finishing grade for high quatlity surfaces at both high and low cutting speeds.

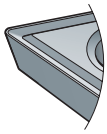
Coated cermet (HC)



GC1525 (P15,M10)

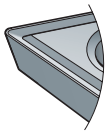
GC1525 is a PVD coated cermet for finishing and semi-finishing. The substrate is of the same kind as CT5015 but tougher. The 3 µm PVD coating of TiCN-TiN adds wear resistance and resistance to plastic deformation. The coating is chosen due to superior compatibility with the substrate, minimizing the risk of flaking. GC1525 is our toughest available cermet for high process security and good surface finish.

UNCOATED CARBIDE



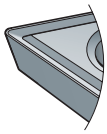
H10 (N15, S10)

H10 is an uncoated fine-grain carbide grade. Combines excellent abrasive wear resistance and edge sharpness. For rough to finish turning of aluminum alloys. Also suitable for finish turning of HRSA and Titanium alloys.



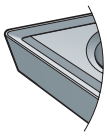
H10A (S10)

H10A is an uncoated carbide grade. Combines good abrasive wear resistance and toughness for medium to rough turning of heat resistant steels and Titanium alloys.



H10F (S15)

H10F is an uncoated fine-grain carbide grade. Recommended for heat resistant super alloys or Titanium alloys at very low speeds. Great resistance to thermal shock and notch wear makes it suitable for long or intermittent cuts.

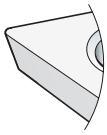


H13A (K20, S15, N15)

H13A is an uncoated carbide grade. Combines good abrasive wear resistance and toughness. For rough to finish turning of heat resistant alloys, Titanium alloys, cast irons and Aluminum alloys.

CERAMICS

Pure ceramic (CA):



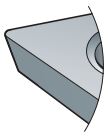
CC620 (K01)
CC620 is a pure oxide ceramic grade based on alumina with a small addition of zirconium oxide to give it improved toughness. CC620 is designed for high cutting speed applications in cast iron and steel under stable conditions. Coolant should not be used.

Mixed ceramic (CM):

CC650 (K01, H05, S05)
CC650 is a mixed ceramic grade based on alumina with an addition of titanium carbide. It is primarily recommended for finishing operations in cast iron, hardened steel, hardened cast iron and heat resistant super alloys where the combination of wear resistant and good thermal properties is required.

CC670 (S15, H10)
CC670 is a silicon carbide "whisker" reinforced ceramic grade, where the whiskers are randomly orientated within the host material. It is particularly well suited for high speed machining of heat resistant super alloys and hardened materials where demands are high for security or toughness.

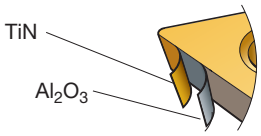
Silicon nitride based ceramic (CN):



CC6080 (S10)
CC6080 is a SiAlON ceramic grade. This grade is well suited for high speed machining of heat resistant super alloys under stable conditions.

CC6090 (K10)
CC6090 is a pure silicon nitride ceramic grade well suited for roughing to finishing of grey cast iron at high speeds under stable conditions.

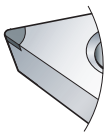
Coated ceramic (CC):



GC1690 (K10)
GC1690 is a silicon nitride substrate with a 1 µm thin Al_2O_3 -TiN coating. The properties of GC1690 make it highly recommendable for light roughing, medium and finishing applications in cast iron.

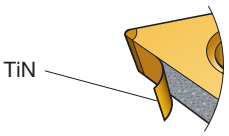
cBN

Cubic Boron Nitride (BN)



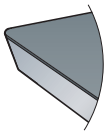
CB20 (H01)

CB20 is a cubic Boron Nitride (cBN) grade based on cBN with an addition of titanium nitride. Typically, this grade consists of one cBN tip, which is brazed onto a carbide carrier. A grade with high chemical resistance as well as high wear resistance for finishing operations in hardened steel and hardened cast iron.



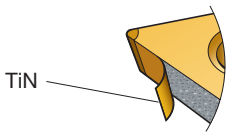
CB7020 (H01)

CB7020 is a cubic Boron Nitride (cBN) grade based on cBN with an addition of titanium nitride. For superior bonding and security, the cBN material is sintered (not brazed) onto each corner of the carbide carrier, hence the name “multi-corner insert”. The insert also has a PVD TiN coating for easy wear detection. A grade with high chemical resistance as well as high wear resistance for finishing operations in hardened steel and hardened cast iron.



CB50 (K05, H05)

CB50 is a pure cubic Boron Nitride (cBN) grade with very high abrasive wear resistance and toughness. Typically, this grade consists of one cBN tip, which is brazed onto a carbide carrier. CB50 is primarily recommended for cast iron and hardened materials in tough conditions.

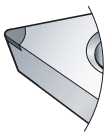


CB7050 (K05, H05)

CB7050 is a pure cubic Boron Nitride (cBN) grade with very high abrasive wear resistance and toughness. For superior bonding and security, the cBN material is sintered (not brazed) onto each corner of the carbide carrier, hence the name “multi-corner insert”. The insert also has a PVD TiN coating for easy wear detection. CB7050 is primarily recommended for cast iron and hardened materials in tough conditions.

DIAMOND

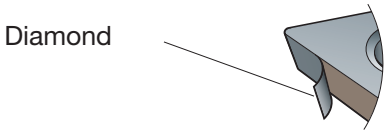
Polycristaline Diamond (DP)



CD10 (N05)

CD10, a polycrystalline diamond grade , is composed of fine to medium-fine grain crystals with an average diamerer of 7 µm. It is recommended for finishing and semi-finishing of non-ferrous and non-metallic materials.

CVD diamond coated carbide (HC)



CD1810 (N10)

CD1810 is a CVD diamond coated insert based on a specially adapted substrate. The extremely wear resistant coating of 6 – 8 µm high purity dimond provides excellent properties for the machining of non-ferrous alloys.

GENERAL TURNING

P **Steel, cast steel, long chipping malleable iron.**

Basic grades

CT5015 (HT) – P10 (P01 — P20)
An uncoated cermet with excellent resistance to built-up-edge and plastic deformation. New formula with improved toughness. For finishing of low alloy and alloy steels when high surface quality and/or low cutting force are required. f_n x a_p < 0,35 mm^2

GC1525 (HC) – P15 (P05 — P25)
A PVD coated cermet. Very high wear resistance and good edge toughness. For finishing and semifinishing of low carbon and low alloyed steels. To be used when good surface quality is demanded at medium to high cutting speeds. f_n x a_p < 0,35 mm^2.

GC4015 (HC) – P15 (P01 — P30)
CVD-coated carbide grade for finishing to light roughing of steel and steel castings at high cutting speeds in wet and dry applications. Is able to withstand high temperatures without sacrificing edge security.

GC4025 (HC) – P25 (P10 — P35)
CVD-coated carbide grade for finishing to roughing of steel and steel castings. The combination of a wear resistant coating and a tough substrate allows the grade to handle continuous cuts as well as interrupted cuts at high metal removal rates.

GC4035 (HC) – P35 (P20 — P45)
CVD-coated carbide grade for roughing of steel and steel castings under unfavorable conditions. The tough substrate allows the grade to handle interrupted cuts at high metal removal rates.

Complementary grades

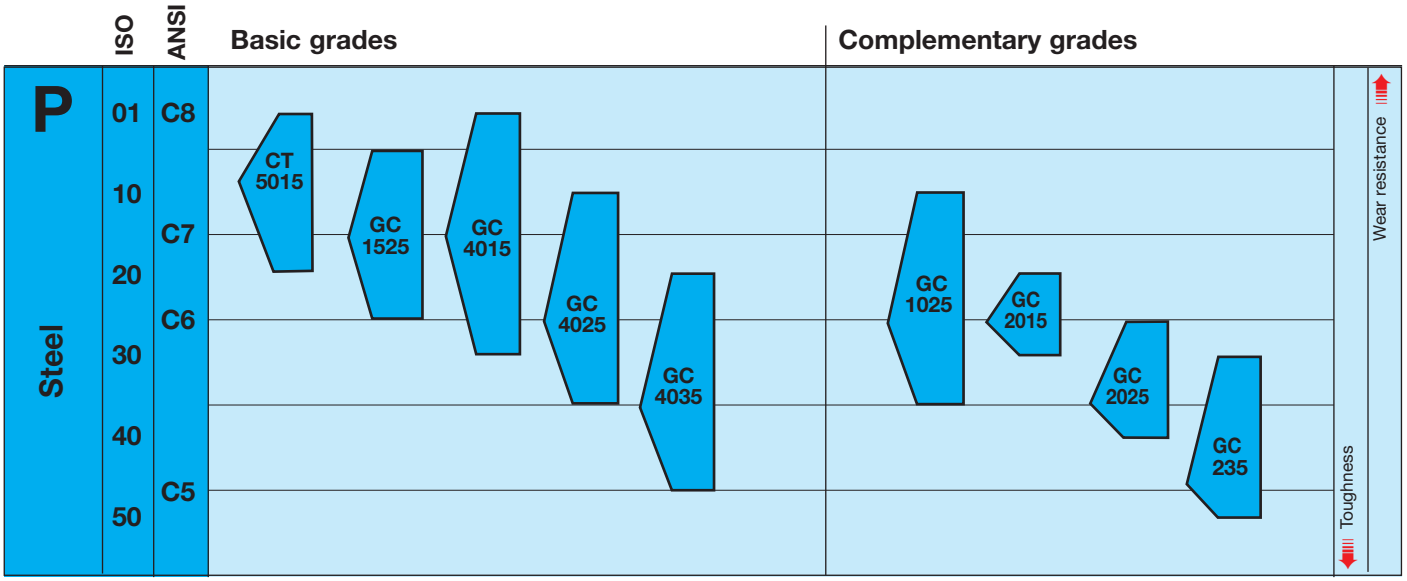
GC1025 (HC) – P25 (P10 — P35)
PVD-coated micro-grain carbide. Recommended for finishing of low carbon steel and other "sticky" steel alloys when excellent surface finish or sharp cutting action is needed. Great resistance to thermal shock makes it also suitable for intermittent cuts.

GC2015 (HC) – P25 (P20 — P30)
CVD-coated carbide grade. Combined with geometries providing sharp cutting action, this grade is recommended for finishing to light roughing of carbon steels and other "sticky" alloys

GC2025 (HC) – P35 (P25 — P40)
CVD-coated carbide grade. Alternative choice for toughness demanding steel applications.

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

GENERAL TURNING

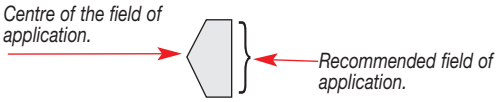


Letter symbols specifying the designation of hard cutting materials:

Hardmetals:

HT	Uncoated hardmetal, *also called cermet*, containing primarily titanium carbides (TIC) or titanium nitrides (TIN) or both.
HC	Hardmetals as above, but coated.

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



GENERAL TURNING

M

Austenitic/ferritic/martensitic stainless steel, cast steel, manganese steel, alloy cast iron, malleable iron, free cutting steel.

Basic grades

GC1025 (HC) – M15 (M10 — M25)
PVD-coated micro-grain carbide. Recommended for finishing of stainless steels when close tolerances, excellent surface finishes or sharp cutting action is needed. Great resistance to thermal shock makes it also suitable for intermittent cuts.

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)
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.

Complementary grades

GC1525 (HC) – M10 (M05 — M15)
A PVD coated cermet. Very high wear resistance and good edge toughness. Low smearing tendency.Exellent for finishing of stainless steel under favorouble conditions.To be used at high speeds and relatively low feeds.
$f_n \times a_p < 0{,}35$ mm^2

GC1005 (HC)– M15 (M05 — M20)
PVD-coated carbide. The combination of a hard fine grain substrate with good plastic deformation resistance and a coating with high wear resistance at high temperatures, makes this grade suitable for finishing of stainless steels at high speeds.

GC4025 (HC)– M15 (M05 — M20)
CVD-coated carbide grade for finishing to light roughing of stainless steels. The combination of a wear resistant coating and a tough substrate makes the grade suitable for stainless steel castings.

GC4035 (HC) — M25 (M15 — M30)
CVD-coated carbide grade, which may be used for semi-finishing to roughing of stainless steels at moderate cutting speeds. Good resistance to thermal shock and mechanical shock provides excellent edge security also for interrupted cuts.

GC235 (HC) – M40 (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

Cast iron, chilled cast iron, short chipping malleable iron.

Basic grades

CC650 (CM) – K01 (K01 — K05)
Mixed Al2O3-based ceramic. Recommended for high speed finishing of grey cast irons and hardened cast irons under stable conditions.

CB7050/CB50 (BN) – K05 (K01 — K10)
An extremely hard Cubic Boron Nitride grade. High edge toughness and good wear resistance makes it optimal for high speed finishing of grey cast iron under continuous as well as interrupted conditions.

CC6090 (CC) – K10 (K01 — K20)
Pure silicon nitride based ceramic providing good wear resistance at high temperatures. Recommended for high speed roughing to finishing of cast irons under good conditions. Is able to handle some interruptions.

GC1690 (CC) – K10 (K05 — K15)
A CVD coated silicon nitride ceramic grade. The properties of GC1690 makes it highly recommendable for light roughing, medium and finishing applications in cast iron.

GC3015 (HC) – K10 (K01 — K20)
CVD-coated carbide consisting of a thick, wear resistant coating and a hard substrate, capable of withstanding high temperatures. Recommended as first choice for finishing and roughing of cast irons at high cutting speeds.

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.

GC3025 (HC) – K20 (K10 — K30)
CVD-coated carbide. A tough substrate capable of withstanding relatively high temperatures makes this grade a good choice for turning of cast irons under unfavorable conditions requiring extra edge toughness.

Complementary grades

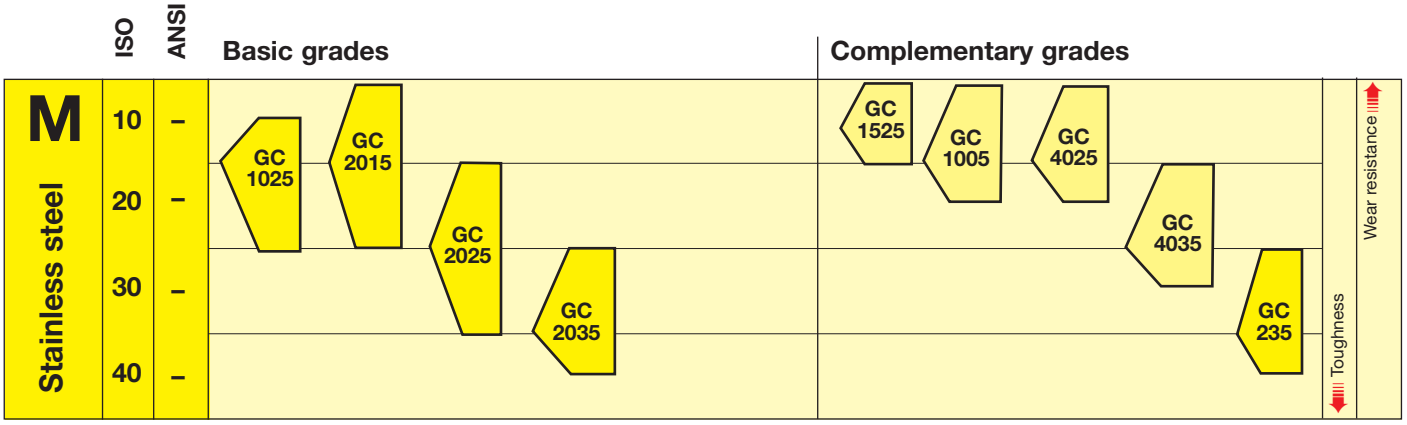
CC620 (CA) – K01 (K01 — K05)
"Pure" Al2O3-based ceramic. Recommended for high speed finishing of grey cast irons under stable and dry conditions.

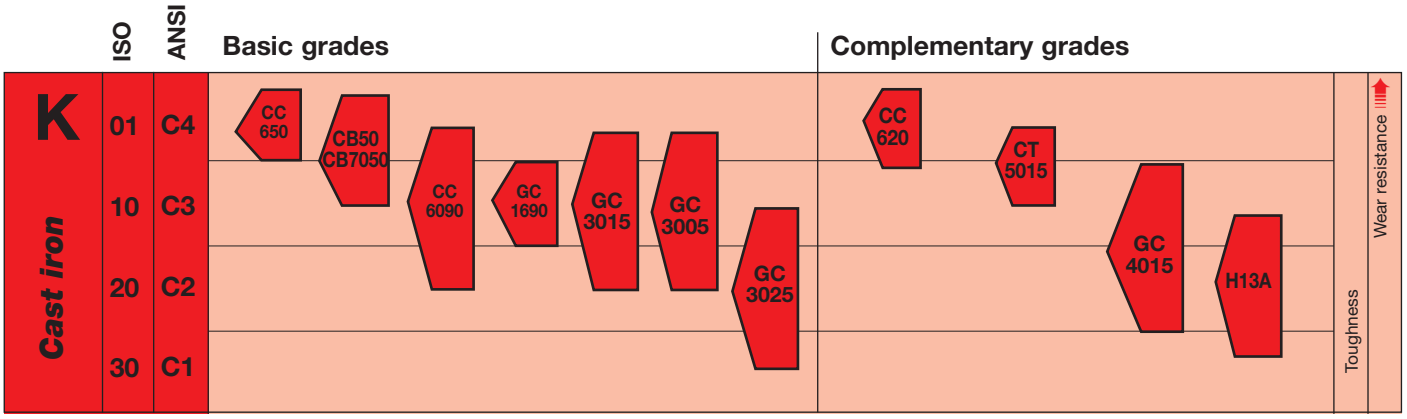
CT5015 (HT) – K05 (K01 — K10)
An uncoated cermet grade with excellent resistance to built-up-edge and plastic deformation. For finishing of nodular cast irons when high surface quality, close tolerances and/or low cutting forces are required.
$f_n \times a_p < 0{,}35$ mm^2

GC4015 (HC) – K15 (K05 — K25)
CVD-coated carbide grade for finishing to roughing of grey and nodular cast irons at high cutting speeds. Is able to withstand high temperatures without sacrificing edge security.

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.

GENERAL TURNING





Hardmetals:

HW Uncoated hardmetal containing primarily tungsten carbide (WC).

HT Uncoated hardmetal, *also called cermet*, containing primarily titanium carbides (TIC) or titanium nitrides (TIN) or both.

HC Hardmetals as above, but coated.

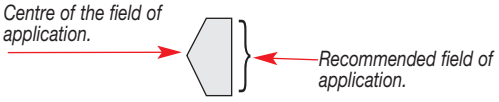
Ceramics:

CA Oxide ceramics containing primarily aluminium oxide (Al_2O_3).

CM Mixed ceramics based on aluminium oxide (Al_2O_3) but containing components other than oxides.

CC Ceramics as above, but coated.

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



GENERAL TURNING

N Non ferrous metals

Basic grades

H10 (HW) – N15 (N01 — N25)
Uncoated carbide grade. Combines excellent abrasive wear resistance and edge sharpness. For rough to finish turning of Aluminum alloys.

CD1810 (HC) – N10 (N01 — N15)
A diamond-coated grade for finishing to roughing of aluminium, magnesium, copper, brass, plastics etc. The diamond-coating gives excellent wear-resistance and less built-up-edge, which results in high surface quality.

CD10 (DP) – N05 (N01 — N10)
A polycrystalline diamond grade for finishing and semi-finishing of non-ferrous and non-metallic materials. Gives long tool life, clean cut and good finish.

Complementary grades

H13A (HW) – N15 (N05 — N25)
Uncoated carbide grade. Combines good abrasive wear resistance and toughness for medium to rough turning of aluminum alloys.

S Heat resistant and super alloys

Basic grades

CC6080 (CA) – S10 (S05 — S20)
Sialon based ceramic offering high chemical stability and an even and predictable wear. Well suited for intermediate stage machining of pre-machined HRSA components at high speeds. Should be applied with a consistant coolant flow.

CC670 (CA) – 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.

S05F– S05 (S05 — S15)
CVD-coated carbide. For high speed finishing in HRSA, or long cuts at lower speeds.
For applications where notch is not a significant problem ie round inserts, small entry angle and softer materials, this grade can also be used in roughing applications.

GC1005 (HC)– S15 (S10 — S25)
PVD-coated carbide. The combination of a hard fine grain substrate with good plastic deformation resistance and a coating with high wear resistance at high temperatures, makes this grade most suitable for Ni, Fe or Co-based heat resistant super alloys.

GC1025 (HC) – S15 (S10 — S25)
PVD-coated micro-grain carbide. Recommended for heat resistant super alloys and Titanium alloys at low speeds. Great resistance to thermal shock and notch wear makes it suitable for long cuts or intermittent cuts.

Complementary grades

CC650 (CA) – 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.

H10 (HW) – S10 (S01 — S15)
Uncoated carbide grade. Combines excellent abrasive wear resistance and edge sharpness. For finish turning of heat resistant steels and titanium alloys

H10A (HW) – S10 (S01 — S20)
Uncoated carbide grade. Combines good abrasive wear resistance and toughness for medium to rough turning of heat resistant steels and titanium alloys.

H10F (HW) – S15 (S10 — S30)
Uncoated fine-grain carbide grade. Recommended for heat resistant super alloys or Titanium alloys at very low speeds. Great resistance to thermal shock and notch wear makes it suitable for long cuts or intermittent cuts.

H13A (HW) – S15 (S10 — S30)
Uncoated carbide grade. Combines good abrasive wear resistance and toughness for medium to rough turning of heat resistant steels and Titanium alloys.

H Hardened materials

Basic grades

CB7020/CB20(BN) – H01 (H01 — H10)
High performance Cubic Boron Nitride grade. First choice for continuous and light interrupted cuts in hardened steel.

CB7050/CB50 (BN) – H05 (H05 — H15)
An extremely hard Cubic Boron Nitride Grade. High edge toughness and good wear resistance makes it first choice for interrupted cuts in hardened steel.

CC650 (CM) – H05 (H05 — H10)
Mixed Al2O3-based ceramic. Good thermal properties and wear resistance. Primarily recommended for light continuous finishing.

Complementary grades

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

GC 4015 (HC) – H15 (H05 — H25)
CVD-coated carbide grade for finishing to roughing of hardened materials. Is able to withstand high temperatures without sacrifying edge security.

H13A (HW) – H20 (H15 — H25)
Uncoated carbide grade. Combines good abrasive wear resistance and toughness for turning of hardened materials at low speeds.

GENERAL TURNING

Letter symbols specifying the designation of hard cutting materials:

Hardmetals:

HW Uncoated hardmetal containing primarily tungsten carbide (WC).

HT Uncoated hardmetal, *also called cermet*, containing primarily titanium carbides (TIC) or titanium nitrides (TIN) or both.

HC Hardmetals as above, but coated.

Ceramics:

CA Oxide ceramics containing primarily aluminium oxide (Al_2O_3).

CM Mixed ceramics based on aluminium oxide (Al_2O_3) but containing components other than oxides.

CN Nitride ceramics containing primarily silicon nitride (Si_3N_4).

CC Ceramics as above, but coated.

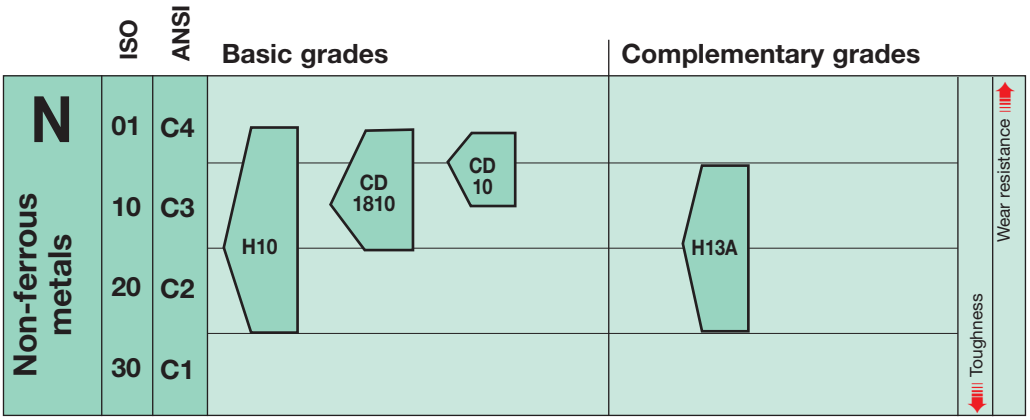
Diamond:

DP Polycrystalline diamond[1].

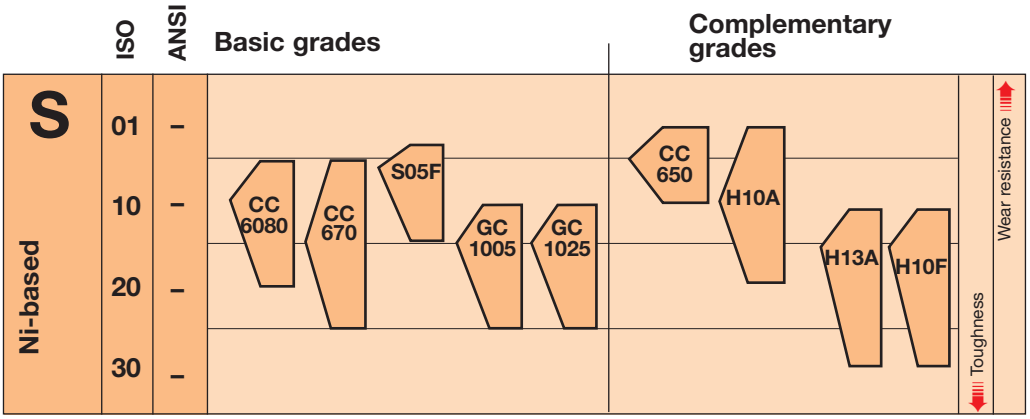
Boron nitride:

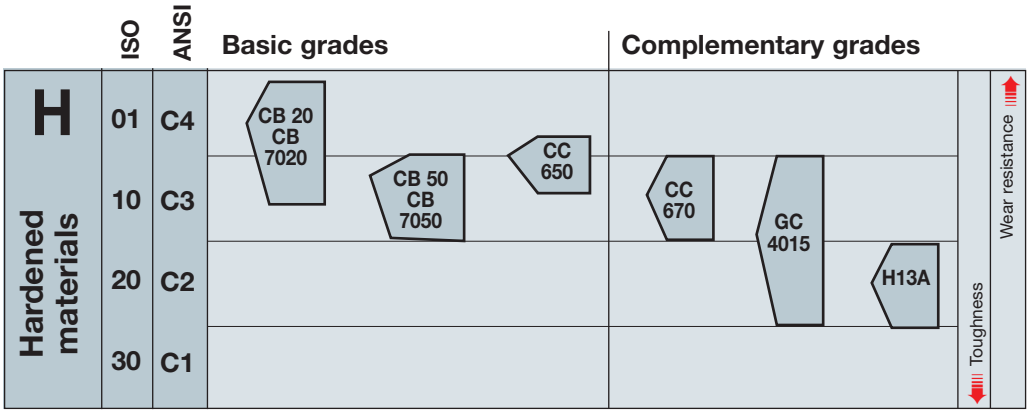
BN Polycrystalline boron nitride[1].

[1] Polycrystalline diamond and polycrystalline boron nitride are also named *superhard cutting materials*.

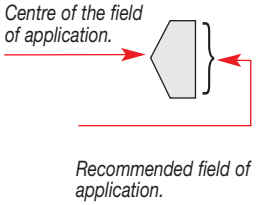


Heat resistant and super alloys





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



PARTING AND GROOVING

P

Steel, cast steel, long chipping malleable iron.

Basic grades

GC3115 (HC) – P15 (P05 — P25)
A very high wear resistant CVD-coated grade. Especially recommended for grooving and turning at stable conditions. Due to its excellent hot hardness, also effective in hard steels. To be used at high cutting speeds under good conditions.

GC3020 (HC) – P15 (P05 — P25)
A very high wear resistant CVD-coated grade. Especially recommended for grooving and turning at stable conditions. Due to its excellent hot hardness, also effective in hard steels. To be used at high cutting speeds under good conditions.

GC4025 (HC) – P20 (P10 — P35)
An allround CVD-coated grade with excellent combination of high wear resistance and good edge security, first choice for grooving and turning operations under stable conditions. Medium to high cutting speeds.

GC4125 (HC) – P30 (P15 — P45)
An excellent allround grade. First choice for parting-off tubes in steel, also very good in grooving and turning operations. This PVD-coated grade works very well in low carbon steel and other smearing materials. Speeds and feeds from medium to low.

GC2135 (HC) – P35 (P20 — P50)
A CVD-coated carbide grade for toughness demanding operations such as cut-off to centre and interrupted cuts. Back up alternative when grooving and turning. Very good bulk and edge-line toughness. To be used at low to medium cutting speeds.

Complementary grades

CT525 (HT) – P10 (P01 — P15)
A titanium based grade with excellent resistance to oxidation and smearing. For high quality surface finishes when grooving low alloyed and alloyed steels under fairly good conditions. Moderate c utting speeds and feeds.

GC235 (HC) – P45 (P25 — P50)
Parting and grooving of steel in operations requiring toughness. Suitable for low speeds and under unfavourable conditions.

GC2145 (HC) – P45 (P30 — P55)
An extremely tough PVD-coated carbide grade for steel applications with very high demands on toughness. The combination of a substrate with very good bulk toughness and a wear resistant coating makes it a first choice in toughness demanding applications.

M

Austenitic/ferritic/martensitic stainless steel, cast steel, manganese steel, alloy cast iron, malleable iron, free cutting steel.

Basic grades

GC4125 (HC) – M25 (M15 — M35)
An excellent allround PVD-coated grade with a combination of high wear resistance and good edge security for stainless steels. First choice for grooving and turning operations, also good for parting-off especially tubes. Medium to low cutting speeds.

GC2135 (HC) – M30 (M20 — M40)
First choice CVD-coated carbide grade for parting-off in stainless steel and other toughness demanding operations. Very good bulk and edge-line toughness. To be used at medium to low cutting speeds.

GC2145 (HC) – M40 (M30 — M45)
The solution for stainless steel applications with very high demands on toughness. Extremely good bulk toughness combined with a PVD coating that works very well in smearing materials. To be used at low cutting speeds.

Complementary grades

GC1005 (HC) – M10 (M05 — M20)
PVD-coated carbide. The combination of a hard fine grain substrate with good plastic deformation resistance and a coating with high wear resistance at high temperatures, makes this grade suitable for finishing of stainless steels at high speeds.

CT525 (HT) – M10 (M05 — M15)
A titanium based grade with excellent resistance to oxidation and smearing. For high quality surface finishes when grooving stainless steels under good conditions. Moderate cutting speeds and feeds.

GC1015 (HC) – M15 (M05 — M20)
A PVD-coated carbide grade for parting/grooving in stainless steels when resistance to built-up-edge is needed.

H13A (HW) – M15 (M10 — M30)
Combines good abrasive wear resistance and toughness for grooving of heat resistant steels and titanium alloys.

GC235 (HC) – M35 (M25 — M40)
Parting and grooving of stainless steels where toughness is required.Use at low speeds and under unfavourable conditions.

K

Cast iron, chilled cast iron, short chipping malleable iron.

Basic grades

GC3115 (HC) – K15 (K05 — K25)
A very high wear resistant CVD-coated grade for high cutting speeds in grooving and turning under good conditions. Due to its excellent hot hardness also effective on hard cast-iron.

GC4025 (HC) – K25 (K10 — K35)
An allround CVD-coated grade with excellent combination of high wear resistance and good edge security. To be used in grooving and turning operations at medium to high cutting speeds. Also good in parting off tubes.

GC4125 (HC) – K30 (K15 — K35)
A PVD-coated allround grade for toughness demanding operations and interrupted cuts. To be used at medium to low cutting speeds.

Complementary grades

GC1015 (HC) – K15 (K10 — K25)
A PVD-coated carbide grade for parting/grooving in nodular cast-iron. Combines good wear and built-up-edge resistance.

GC3020 (HC) – K15 (K05 — K25)
A very high wear resistant CVD-coated grade for high cutting speeds in grooving and turning under good conditions. Due to its excellent hot hardness also effective on hard cast-iron.

H13A (HW) – K20 (K10 — K30)
Good abrasive wear resistance and toughness for parting/grooving of cast iron.

PARTING AND GROOVING

Letter symbols specifying the designation of hard cutting materials:

Hardmetals:

HW Uncoated hardmetal containing primarily tungsten carbide (WC).

HT Uncoated hardmetal, *also called cermet*, containing primarily titanium carbides (TIC) or titanium nitrides (TIN) or both.

HC Hardmetals as above, but coated.

Ceramics:

CA Oxide ceramics containing primarily aluminium oxide (Al_2O_3).

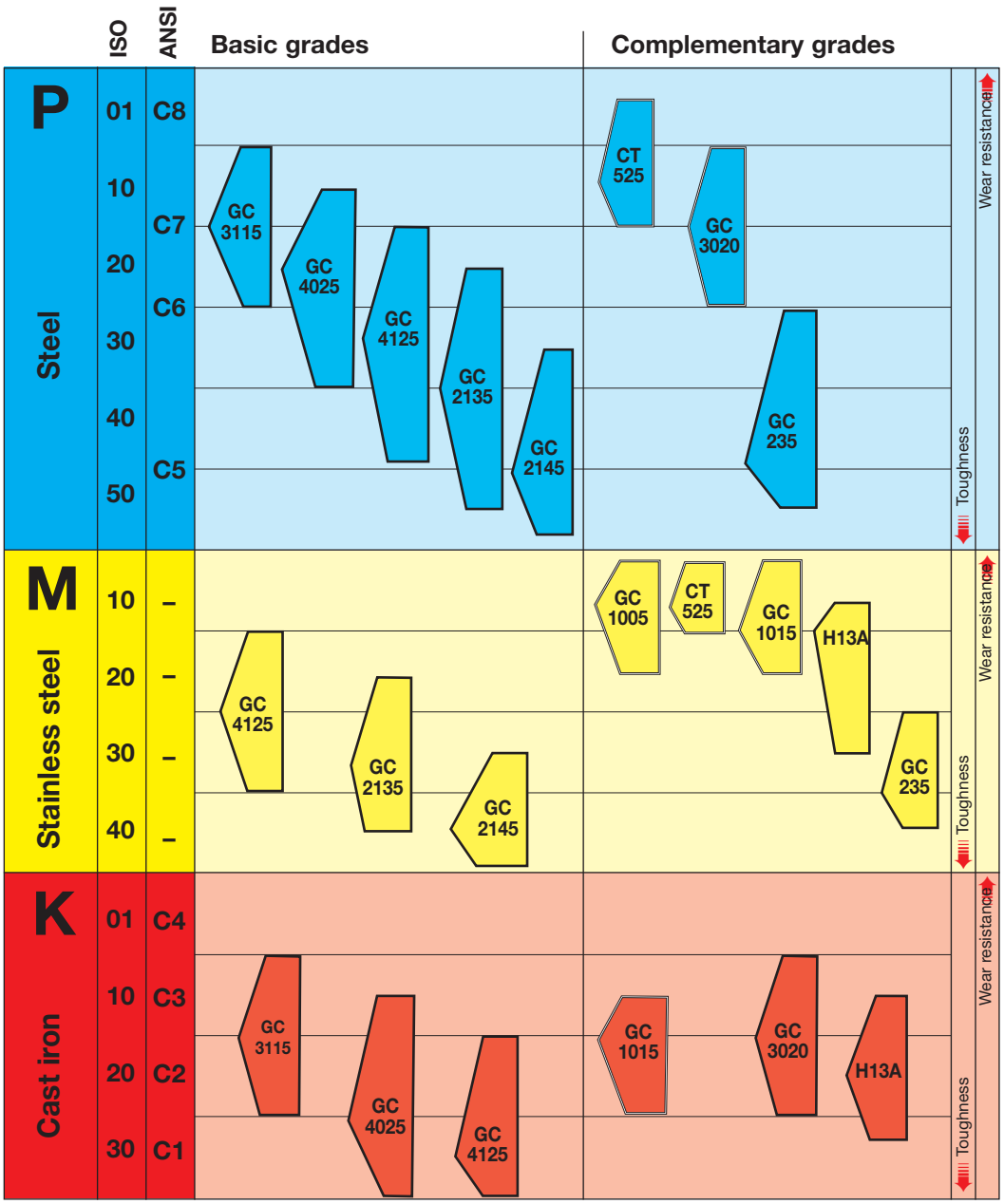
Diamond:

DP Polycrystalline diamond[1].

Boron nitride:

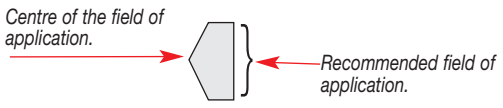
BN Polycrystalline boron nitride[1].

[1] Polycrystalline diamond and polycrystalline boron nitride are also named *superhard cutting materials.*



For grade and geometry recommendations, see also page B 7.

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



PARTING AND GROOVING

N Non ferrous metals

Basic grades

CD10 (DP) – N01 (N01 — N15)
A polycrystalline diamond (PCD) grade recommended for machining of non-ferrous metals and non-metallic materials. Very good surface finish.

CD1810 (HC) – N10 (N01 — N10)
A diamond-coated cemented carbide grade with good wear resistance. Minimal risk of built up edge. Good surface finish over a large range of cutting speeds. Low cutting forces.

H10 (HW) – N10 (N05 — N15)
Uncoated carbide grade with good edge sharpness. Recommended for machining of Aluminium and for intermittent cuts.

H13A (HW) – N20 (N10 — N30)
Uncoated carbide grade. Combines good abrasive wear resistance and toughness for parting and grooving of Aluminium alloys.

S Heat resistant and super alloys

Basic grades

GC1005 (HC) – S15 (S10 — S20)
PVD-coated carbide. The combination of a hard fine grain substrate with good plastic deformation resistance and a coating with high wear resistance at high temperatures, makes this grade most suitable for Ni, Fe or Co-based heat resistant super alloys.

H13A (HW) – S15 (S10 — S30)
Uncoated carbide grade. Combines good abrasive wear resistance and toughness for parting and grooving. First choice in Titanium.

GC4125 (HC) – S25 (S15 — S35)
A PVD-coated grade for toughness demanding operations, first choice for interrupted cuts. To be used at low cutting speeds.

CC670 (CA) – S10 (S05 — S25)
A silicon carbide whisker reinforced aluminium oxide based ceramic with excellent bulk toughness. Recommended for heat resistant alloys under favourable conditions.

Complementary grades

H10 (HW) – S15 (S10 — S20)
Uncoated carbide grade with good edge sharpness. Recommended for finishing in Titanium.

GC1015 (HC) – S15 (S10 — S25)
A PVD-coated carbide grade for parting/grooving in heat resistant super alloys.

GC2135 (HC) – S30 (S20 – S40)
A CVD-coated grade for toughness demanding operations such as cut-off to centre and interrupted cuts in heat resistant super alloys.

GC235 (HC) – S30 (S25 — S40)
A CVD-coated carbide grade for parting and grooving of heat resistant super alloys. Use at low cutting speeds.

GC2145 – S40 (S30 — S40)
A tough PVD-coated grade. First choice in parting off in heat resistant super alloys.

H Hardened materials

Basic grade

CB20 (BN) – H01 (H01 — H10)
High performance Cubic Boron Nitride composite. Suitable for hardened ferrous materials. Can be used for both continuous and interrupted cuts.

CC670 (CA) – H10 (H05 — H15)
A silicon carbide whisker reinforced aluminium oxide based ceramic with excellent bulk toughness. Primarily recommended for heat resistant alloys and hard part turning under unfavourable conditions

PARTING AND GROOVING

Letter symbols specifying the designation of hard cutting materials:

Hardmetals:

HW Uncoated hardmetal containing primarily tungsten carbide (WC).

HT Uncoated hardmetal, *also called cermet*, containing primarily titanium carbides (TIC) or titanium nitrides (TIN) or both.

HC Hardmetals as above, but coated.

Ceramics:

CA Oxide ceramics containing primarily aluminium oxide (Al_2O_3).

CM Mixed ceramics based on aluminium oxide (Al_2O_3) but containing components other than oxides.

CN Nitride ceramics containing primarily silicon nitride (Si_3N_4).

CC Ceramics as above, but coated.

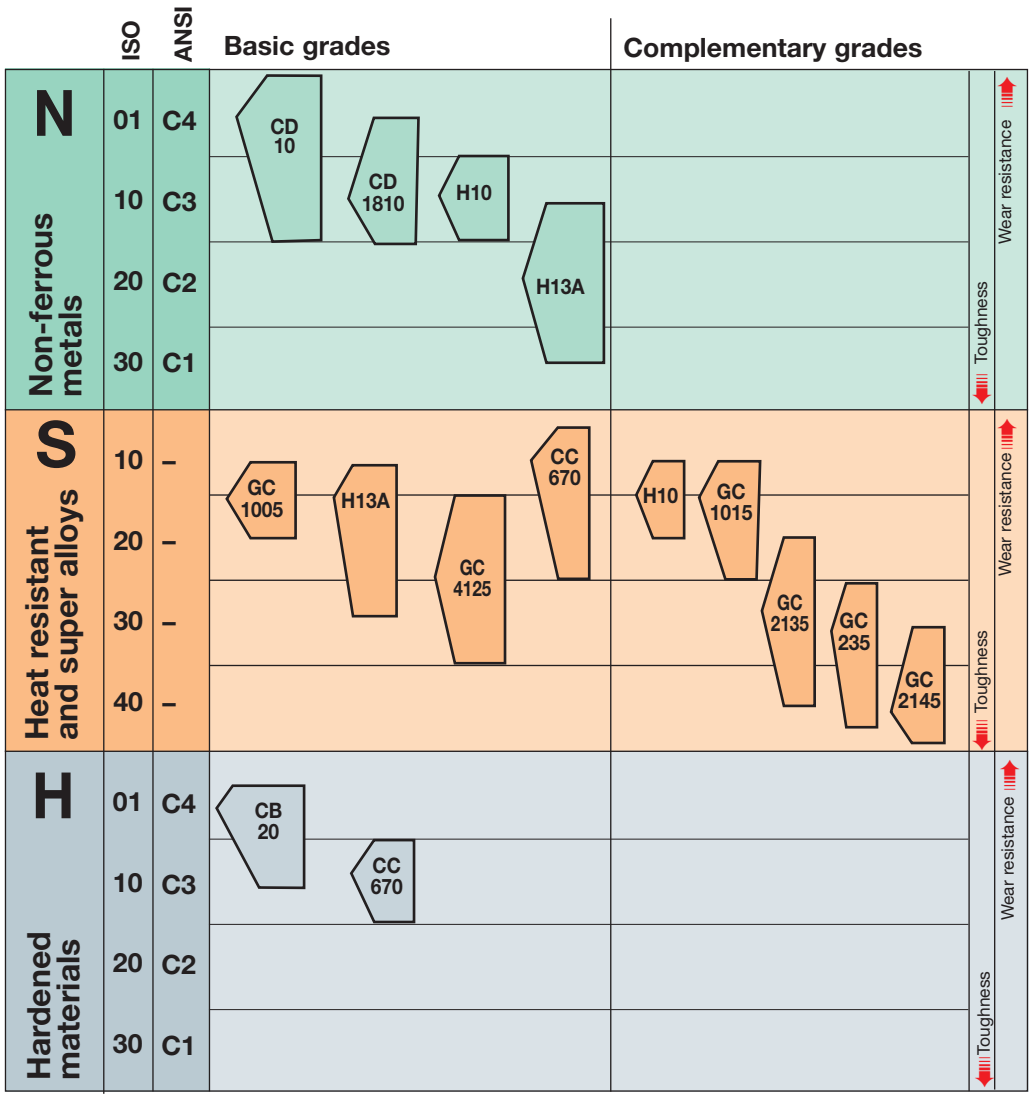
Diamond:

DP Polycrystalline diamond[1].

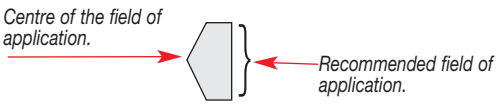
Boron nitride:

BN Polycrystalline boron nitride[1].

[1] Polycrystalline diamond and polycrystalline boron nitride are also named *superhard cutting materials.*



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



THREADING

P Steel, cast steel, long chipping malleable iron.

GC1020 (HC) – P20 (P10 — P40)
Good all round PVD-coated grade for threading steels. Combines good wear resistance with edge sharpness also in low carbon.

GC4125 (HC) – P20 (P05 — P35)
Used as an optimizing PVD-coated grade for varius steel threadings. It has excellent wear resistance at high cutting speeds and long cutting times.

S30 (HW) – P30 (P15 — P40)
For threading in steel, cast steel and stainless materials. Medium cutting speed. Unfavourable conditions. Good edge sharpness.

M Austenitic/ferritic/martensitic stainless steel, cast steel, manganese steel, alloy cast iron, malleable iron, free cutting steel.

GC1020 (HC) – M20 (M10 — M30)
Good all round PVD-coated grade for threading stainless steels. Combines good wear resistance with edge sharpness.

GC4125 (HC) – M20 (M05 — M25)
This PVD-coated grade works well in stainless steels and other smearing materials at higher cutting speed.

H13A (HW) – M25 (M20 — M30)
Uncoated carbide grade. Combines good abrasive wear resistance and toughness. For moderate to low speeds and high feeds.

K Cast iron, chilled cast iron, short chipping malleable iron.

GC1020 (HC) – K15 (K01 — K20)
Good PVD-coated all round grade for threading cast iron. Combines good wear resistance with edge sharpness. Moderate cutting speeds.

GC4125 (HC) – K15 (K05 — K20)
This PVD-allround grade for toughness demanding operations. To be used at higher cutting speeds.

H13A (HW) – K20 (K10 — K25)
Uncoated carbide grade. Combines good abrasive wear resistance and toughness. For moderate to low speeds and high feeds in cast iron.

N Non ferrous metals

GC1020 (HC) – N25 (N10 — N30)
Good all round PVD-coated grade with good wear resistance and edge sharpness in non-ferrous materials.

H13A (HW) – N25 (N20 — N30)
Uncoated carbide grade. Combines good abrasive wear resistance and toughness for medium to rough turning of aluminum alloys and brass.

S Heat resistant and super alloys

GC1020 (HC) – S20 (S05 — S30)
A PVD-coated carbide grade for toughness demanding super alloy operations.To be used at low cutting speeds.

GC4125 (HC) – S20 (S10 — S25)
A PVD-coated carbide grade for toughness demanding super alloy operations. To be used at lower cutting speeds..

H13A (HW) – S25 (S20 — S30)
Uncoated carbide grade. Combines good abrasive wear resistance and toughness for threading of heat resistant alloys and titanium alloys.

H Hardened materials

GC1020 (HC) – H20 (H05 — H30)
Good all round PVD-coated grade with good wear resistance and edge sharpness. To be used at low cutting speed.

GC4125 (HC) – H20 (H10 — H25)
A PVD-coated carbide grade. As an allround grade to be used with lower cutting speeds.

CB20 (BN) – H10 (H01 — H20)
High performance composite material consisting of cubic Boron nitride (cBN). Suitable for hardened ferrous materials and cast-iron.

THREADING

Letter symbols specifying the designation of hard cutting materials:

Hardmetals:

HW Uncoated hardmetal containing primarily tungsten carbide (WC).

HC Hardmetals as above, but coated.

Boron nitride:

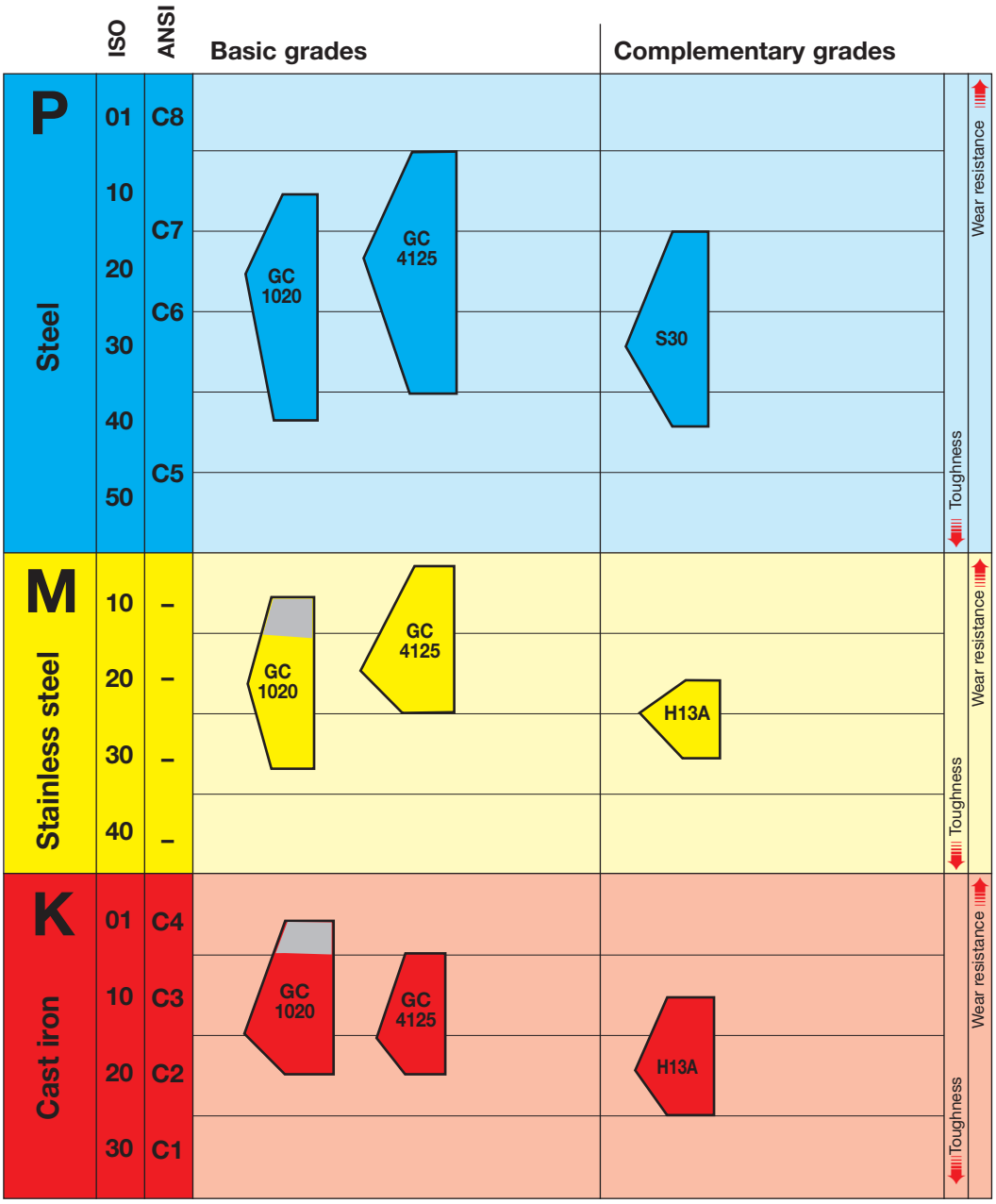
BN Polycrystalline boron nitride[1].

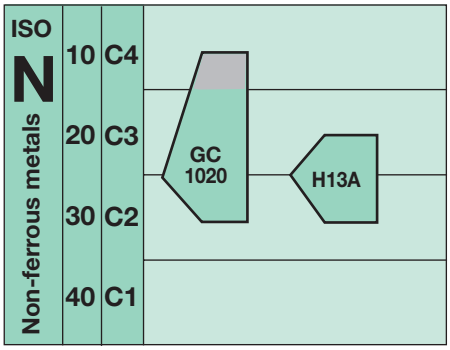
[1] Polycrystalline diamond and polycrystalline boron nitride are also named *superhard cutting materials.*

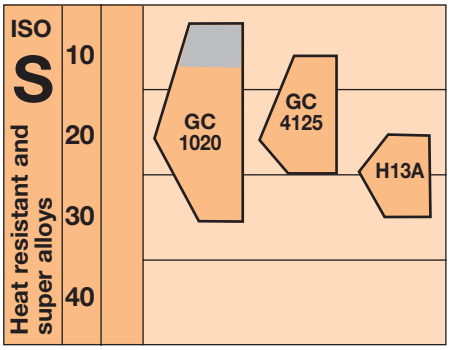
The position and form of the grade symbols indicate the suitable field of application.

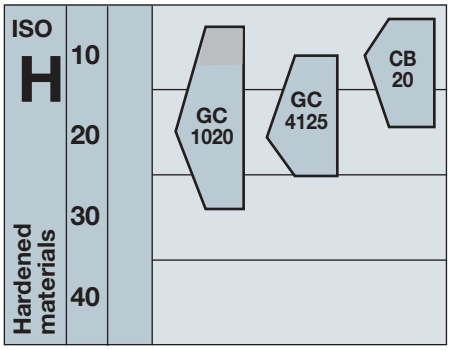
Centre of the field of application.

Recommended field of application.









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

ISO	Coromant Material Classification (CMC)	Country									
		Great Britain		Sweden	USA	Germany		France	Italy	Spain	Japan
		Standard									
		BS	EN	SS	AISI/SAE	W.-nr.	DIN	AFNOR	UNI	UNE	JIS
P Steel	02.1/02.2	816M40	110	-	9840	1.6511	36CrNiMo4	40NCD3	38NiCrMo4(KB)	35NiCrMo4	-
	02.1/02.2	817M40	24	2541	4340	1.6582	35CrNiMo6	35NCD6	35NiCrMo6(KB)	-	-
	02.1/02.2	530A32	18B	-	5132	1.7033	34Cr4	32C4	34Cr4(KB)	35Cr4	SCr430(H)
	02.1/02.2	530A40	18	-	5140	1.7035	41Cr4	42C4	41Cr4	42Cr4	SCr440(H)
	02.1/02.2	(527M20)	-	2511	5115	1.7131	16MnCr5	16MC5	16MnCr5	16MnCr5	-
	02.1/02.2	1717CDS110	-	2225	4130	1.7218	25CrMo4	25CD4	25CrMo4(KB)	55Cr3	SCM420;SCM430
	02.1/02.2	708A37	19B	2234	4137;4135	1.7220	34CrMo4	35CD4	35CrMo4	AM26CrMo4 34CrMo4	SCM432;SCCRM3
	02.1/02.2	708M40	19A	2244	4140;4142	1.7223	41CrMo4	42CD4TS	41CrMo4	42CrMo4	SCM 440
	02.1/02.2	708M40	19A	2244	4140	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	735A50	47	2230	6150	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	BL3	-	-	L3	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
	High-alloy steel										
	03.11	1501-509;510	-	-	ASTM A353	1.5662	X8Ni9	-	X10Ni9	XBNi09	-
	03.11	-	-	-	2515	1.5680	12Ni19	Z18N5	-	-	-
	03.11	832M13	36C	-	-	1.6657	14NiCrMo134	-	15NiCrMo13	14NiCrMo131	-
	03.11 03.11	BD3	-	- 2314	D3	1.2080 1..2083	X210Cr12	Z200C12	X210Cr13KU X250Cr12KU	X210Cr12	SKD1
	03.11	BH13	-	2242	H13	1.2344	X40CrMoV5 1	Z40CDV5	X35CrMoV05KU X40CrMoV511KU	X40CrMoV5	SKD61
	03.11	BA2	-	2260	A2	1.2363	X100CrMoV5 1	Z100CDV5	X100CrMoV51KU	X100CrMoV5	SKD12
	03.11	-	-	2312	-	1.2436	X210CrW12	-	X215CrW12 1KU	X210CrW12	SKD2
	03.11	BS1	-	2710	S1	1.2542	45WCrV7	-	45WCrV8KU	45WCrSi8	-
	03.11 03.11	BH21	-	- 2310	H21	1.2581 1.2601	X30WCrV9 3 X30WCrV9 3KU X165CrMoV 12	Z30WCV9	X28W09KU X30WCrV9 3KU X165CrMoW12KU	X30WCrV9 X160CrMoV12	SKD5 -
	03.11	401S45	52	-	HW3	1.4718	X45GrSi93	Z45CS9	X45GrSi8	F322	SUH1
	03.11	4959BA2	-	2715	D3	1.3343	S6-5-2	Z40CSD10	15NiCrMo13	-	SUH3
	03.13	BM 2		2722	M 2	1.3343	S6/5/2	Z 85 WDCV	HS 6-5-2-2	F-5603.	SKH 51
	03.13	BM 35		2723	M 35	1.3243	S6/5/2/5	6-5-2-5	HS 6-5-2-5	F-5613	SKH 55
	03.13	-		2782	M 7	1.3348	S2/9/2	-	HS 2-9-2	F-5607	-
	03.21	-	-	2736	HNV3	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)
	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									
		Great Britain		Sweden	USA	Germany		France	Italy	Spain	Japan
		Standard									
		BS	EN	SS	AISI/SAE	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	403S17	-	2301	403	1.4000 1.4001	X7Cr13 X7Cr14	Z6C13 -	X6Cr13 -	F.3110 F.8401	SUS403 -
	05.11/15.11	416 S 21		2380	416	1.4005	X12CrS13	Z11CF13	X12 CrS 13	F-3411	SUS 416
	05.11/15.11	430S15	960	2320	430	1.4016	X8Cr17	Z8C17	X8Cr17	F3113	SUS430
	05.11/15.11	410S21	56A	2302	410	1.4006	X10Cr13	Z10C14	X12Cr13	F.3401	SUS410
	05.11/15.11	430S17	60	2320	430	-	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	405S17	-	-	405	1.4002	-	Z8CA12	X6CrAl13	-	-
	05.11/15.11	420S37	-	2303	420	1.4021	-	Z20C13	X20Cr13	-	-
	05.11/15.11	431S29	57	2321	431	1.4057	X22CrNi17	Z15CNi6.02	X16CrNi16	F.3427	SUS431
	05.11/15.11	-	-	2383	430F	1.4104	X12CrMoS17	Z10CF17	X10CrS17	F.3117	SUS430F
	05.11/15.11	434S17	-	2325	434	1.4113	X6CrMo17	Z8CD17.01	X8CrMo17	-	SUS434
	05.11/15.11	425C11	-	2385	CA6-NM	1.4313	X5CrNi13 4	Z4CND13.4M	(G)X6CrNi304	-	SCS5
	05.11/15.11	403S17	-	-	405	1.4724	X10CrA113	Z10C13	X10CrA112	F.311	SUS405
	05.11/15.11	430S15	60	-	430	1.4742	X10CrA118	Z10CAS18	X8Cr17	F.3113	SUS430
	05.11/15.11	443S65	59	-	HNV6	1.4747	X80CrNiSi20	Z80CSN20.02	X80CrSiNi20	F.320B	SUH4
	05.11/15.11	-	-	2322	446	1.4762	X10CrA124	Z10CAS24	X16Cr26	-	SUH446
	05.11/15.11	349S54	-	-	EV8	1.4871	X53CrMnNiN21 9	Z52CMN21.09	X53CrMnNiN21 9	-	SUH35, SUH36
	05.11/15.11	-		2326	S44400	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	304S11	-	2352	304L	1.4306	-	Z2CN18-10	X2CrNi18 11	-	-
	05.21/15.21	304S31	58E	2332/2333	304	1.4350	X5CrNi189	Z6CN18.09	X5CrNi18 10	F.3551 F.3541 F.3504	SUS304
	05.21/15.21	303S21	58M	2346	303	1.4305	X12CrNiS18 8	Z10CNF 18.09	X10CrNiS 18.09	F.3508	SUS303
	05.21/15.21	304S15 304C12	58E	2332 2333	304	1.4301	X5CrNi189	Z6CN18.09 Z3CN19.10	X5CrNi18 10 -	F.3551 -	SUS304 SUS304L
	05.21/15.21	304S12	-	2352	304L	1.4306	X2CrNi18 9	Z2CrNi18 10	X2CrNi18 11	F.3503	SCS19
	05.21/15.21	-	-	2331	301	1.4310	X12CrNi17 7	Z12CN17.07	X12CrNi17 07	F.3517	SUS301
	05.21/15.21	304S62	-	2371	304LN	1.4311	X2CrNiN18 10	Z2CN18.10	-	-	SUS304LN
	05.21/15.21	316S16	58J	2347	316	1.4401	X5CrNiMo18 10	Z6CND17.11	X5CrNiMo17 12	F.3543	SUS316
	05.21/15.21	-	-	2375	316LN	1.4429	X2CrNiMoN18 13	Z2CND17.13	-	-	SUS316LN
	05.21/15.21	316S13		2348	316L	1.4404	-	Z2CND17-12	X2CrNiMo1712	-	-
	05.21/15.21	316S13	-	2353	316L	1.4435	X2CrNiMo18 12	Z2CND17.12 -	X2CrNiMo17 12 -	- -	SCS16 SUS316L
	05.21/15.21	316S33	-	2343 2347	316	1.4436	-	Z6CND18-12-03	X8CrNiMo1713	-	-
	05.21/15.21	317S12	-	2367	317L	1.4438	X2CrNiMo18 16	Z2CND19.15	X2CrNiMo18 16	-	SUS317L
	05.21/15.21	-		2562	UNS V 0890A	1.4539	X1NiCrMo	Z2 NCDU25-20	-	-	-
	05.21/15.21	321S12	58B	2337	321	1.4541	X10CrNiTi18 9	Z6CNT18.10	X6CrNiTi18 11	F.3553 F.3523	SUS321
	05.21/15.21	347S17	58F	2338	347	1.4550	X10CrNiNb18 9	Z6CNNb18.10	X6CrNiNb18 11	F.3552 F.3524	SUS347
	05.21/15.21	320S17	58J	2350	316Ti	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	309S24	-	-	309	1.4828	X15CrNiSi20 12	Z15CNS20.12	-	-	SUH309
	05.21/15.21	310S24	-	2361	310S	1.4845	X12CrNi25 21	Z12CN25 20	X6CrNi25 20	F.331	SUH310
	05.21/15.21	301S21	58C	2370	308	1.4406	X10CrNi18.08	Z1NCDU25.20	-	F.8414	SCS17
	15.21	-		2387	-	1.4418	X4 CrNiMo16 5	Z6CND16-04-01			
	05.22/15.22	316S111	-	-	17-7PH	1.4568/ 1.4504	-	Z8CNA17-07	X2CrNiMo1712	-	-
	05.23/15.23	-	-	2584	NO8028	1.4563	-	Z1NCDU31-27-03	-	-	-
	05.23/15.23	-	-	2378	S31254	-	-	Z1CNDU20-18-06AZ	-	-	-
	Austenitic / ferritic materials (Duplex) *(05.51, 52 = Forged, 15.51, 52 = Cast)*										
	05.51/15.51	-	-	2376	S31500	1.4417	X2CrNiMoSi19 5	-	-	-	-
	05.51/15.51	-	-	2324	S32900	-	X8CrNiMo27 5	-	-	-	-
	05.52/15.52	-	-	2327	S32304	-	X2CrNiN23 4	Z2CN23-04AZ	-	-	-
	05.52/15.52	-	-	2328	-	-	-	-	-	-	-
	05.52/15.52	-	-	2377	S31803	-	X2CrNiMoN22 53	Z2CND22-05-03	-	-	-

Stainless steel

ISO	Coromant Material Classification (CMC)	Country									
		Great Britain		Sweden	USA	Germany		France	Italy	Spain	Japan
		Standard									
		BS	EN	SS	AISI/SAE	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	B 340/12		0815	32510		GTS-35	MN 35-10			FCMW330
	07.2	P 440/7		0852	40010	0.8145	GTS-45	Mn 450	GMN 45		FCMW370
	07.2	P 510/4		0854	50005	0.8155	GTS-55	MP 50-5	GMN 55		FCMP490
		P 570/3		0858	70003		GTS-65	MP 60-3			FCMP540
	07.2	P570/3		0856	A220-70003	0.8165	GTS-65-02	Mn 650-3	GMN 65	-	FCMP590
	07.3	P690/2		0862	A220-80002	0.8170	GTS-70-02	Mn700-2	GMN 70		FCMP690
		Grey cast iron									
	08.1			0100							
	08.1			0110	No 20 B		GG 10	Ft 10 D			FC100
	08.1	Grade 150		0115	No 25 B	0.6015	GG 15	Ft 15 D	G 15	FG 15	FC150
	08.1	Grade 220		0120	No 30 B	0.6020	GG 20	Ft 20 D	G 20		FC200
	08.2	Grade 260		0125	No 35 B No 40 B	0.6025	GG 25	Ft 25 D	G 25	FG 25	FC250
	08.2	Grade 300		0130	No 45 B	0.6030	GG 30	Ft 30 D	G 30	FG 30	FC300
	08.2	Grade 350		0135	No 50 B	0.6035	GG 35	Ft 35 D	G 35	FG 35	FC350
	08.2	Grade 400		0140	No 55 B	0.6040	GG 40	Ft 40 D			
	08.3	L-NiCuCr202		0523	A436 Type 2	0.6660	GGL-NiCr202	L-NC 202	-	-	
		Nodular cast iron									
	09.1	SNG 420/12		0717-02	60-40-18	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	SNG 500/7		0727-02	80-55-06	0.7050	GGG 50	FGS 500-7	GS 500	FGE 50-7	FCD500
	09.1	Grade S6		0776	A43D2	0.7660	GGG-NiCr202	S-NC 202	-	-	
	09.2	SNG 600/3		0732-03	-		GGG 60	FGS 600-3			FCD600
	09.2	SNG 700/2		0737-01	100-70-03	0.7070	GGG 70	FGS 700-2	GS 700-2	FGS 70-2	FCD700

Cast iron

ISO	Coromant Material Classification (CMC)	Country									
		Great Britain		Sweden	USA	Germany		France	Italy	Spain	Japan
		Standard									
		BS	EN	SS	AISI/SAE	W.-nr.	DIN	AFNOR	UNI	UNE	JIS
N Non-ferrous metals											
	30.21	-	-	4251	SC64D	3.2373	G-AlSi9MgWA	A-S7G	-	-	C4BS
	30.21	LM5	-	4252	GD-AlSi12	-	G-ALMG5	A-SU12	-	-	AC4A
	30.21/30.22	LM25		4244	356.1						A5052
				4247	A413.0		GD-AlSi12				A6061
		LM24		4250	A380.1		GD-AlSi8Cu3				A7075
		LM20		4260	A413.1		G-AlSi12(Cu)				ADC12
		LM6		4261	A413.2		G-AlSi12				
		LM9		4253	A360.2		G-AlSi10Mg(Cu)				
S Heat resistans super alloys	**Heat resistant super alloys**										
	20.11	-	-	-	330	1.4864	X12NiCrSi36 16	Z12NCS35.16	F-3313	-	SUH330
	20.11	330C11	-	-	-	1.4865	G-X40NiCrSi38 18	-	XG50NiCr39 19	-	SCH15
	20.21	-	-	-	5390A	2.4603	-	NC22FeD	-	-	
	20.21	-	-	-	5666	2.4856	NiCr22Mo9Nb	NC22FeDNB	-	-	
	20.21	HR5,203-4	-	-	-	2.4630	NiCr20Ti	NC20T	-	-	
	20.22	-	-	-	5660	LW2.4662	NiFe35Cr14MoTi	ZSNCDT42	-	-	
	20.22	3146-3	-	-	5391	LW2 4670	S-NiCr13A16MoNb	NC12AD	-	-	
	20.22	HR8	-	-	5383	LW2.4668	NiCr19Fe19NbMo	NC19eNB	-	-	
	20.22	3072-76	-	-	4676	2.4375	NiCu30Al	-	-	-	
	20.22	Hr401,601	-	-	-	2.4631	NiCr20TiAk	NC20TA	-	-	
	20.22	-	-	-	AMS 5399	2.4973	NiCr19Co11MoTi	NC19KDT	-	-	
	20.22	-	-	-	AMS 5544	LW2.4668	NiCr19Fe19NbMo	NC20K14	-	-	
	20.24	-	-	-	AMS 5397	LW2 4674	NiCo15Cr10MoAlTi	-	-	-	
	20.32	-	-	-	5537C	LW2.4964	CoCr20W15Ni	KC20WN	-	-	
		-	-	-	AMS 5772	-	CoCr22W14Ni	KC22WN	-	-	
	Titanium alloys										
	23.22	TA14/17	-	-	AMS R54520	-	TiAl5Sn2.5	T-A5E	-	-	
	23.22	TA10-13/TA28	-	-	AMS R56400	-	TiAl6V4	T-A6V	-	-	
	23.22	TA11	-	-	AMS R56401	-	TiAl6V4ELI	-	-	-	
	23.22	-	-	-	-	-	TiAl4Mo4Sn4Si0.5	-	-	-	
	Trade names										
		Iron base									
	20.11	Incoloy 800									
		Nickel base									
	20.2	Haynes 600									
	20.2	Nimocast PD16									
	20.2	Nimonic PE 13									
	20.2	Rene 95									
	20.21	Hastelloy C									
	20.21	Incoloy 825									
	20.21	Inconel 600									
	20.21	Monet 400									
	20.22	Inconel 700									
	20.22	Inconel 718									
	20.22	Mar - M 432									
	20.22	Nimonic 901									
	20.22	Waspaloy									
	20.24	Jessop G 64									
		Cobalt base									
	20.3	Air Resist 213									
	20.3	Jetalloy 209									
H	**Hardened materials**										
	04.1	-	-	2258-08	440A	1.4108	X100CrMo13	-	-	-	C4BS
	04.1	-	-	2534-05	610	1.4111	X110CrMoV15	-	-	-	AC4A
	04.1	-	-	2541-06	0-2	-	X65CrMo14	-	-	-	AC4A