

TNMG	L	I.C	S	d
11 03	11	6.35	3.18	2.26
16 04	16.5	9.525	4.76	3.81
22 04	22	12.7	4.76	5.16

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

**Turning inserts**

TN** negative insert				HC <sup>1</sup> (CVD)								HC <sup>1</sup> (PVD)			HT	HC <sup>2</sup>	HW												
	P	M	K	N	S	H																							
	ISO	r	a <sub>p</sub>	f	YBC103	YB6315	YBC152	YBC203	YBC252	YBC352	YBM153	YBM253	YBD102	YB7315	YBD152	YBD152C	YBG101	YBG102	YBG105	YBG205	YB9320	YPD201	YBS103	YNG151	YNT251	YNG151C	YD101	YD201	
		<b>TNMG110304-EF</b>	0.4	0.1-1.0	0.05-0.20															●									
		<b>TNMG110308-EF</b>	0.8	0.1-1.0	0.05-0.40															●									
		<b>TNMG160404-EF</b>	0.4	0.1-1.5	0.05-0.30							●								●									
		<b>TNMG160408-EF</b>	0.8	0.1-1.5	0.1-0.4							●								●									
<b>TNMG160412-EF</b>		1.2	0.2-2.5	0.15-0.40							○								●										
<b>TNMG220404-EF</b>		0.4	0.5-2.5	0.05-0.25							○								●										
<b>TNMG220408-EF</b>		0.8	0.5-2.5	0.1-0.4							○								●										

● Ex stock ○ On demand  
 YBC152F, YBC252F, YBM153F, YBM253F available

















HC<sup>1</sup> Coated carbide  
 HT Uncoated cermet  
 HC<sup>2</sup> Coated cermet  
 HW Uncoated carbide

Tool holder						
DTGNR/L	PTFNR/L	PTTNR/L	PTGNR/L	MTGNR/L	MTJNR/L	MTJNR/L
Kr: 91°	Kr: 91°	Kr: 60°	Kr: 90°	Kr: 90°	Kr: 93°	Kr: 93°
A233	A247	A248	A249	A260	A261	A262
MTFNR/L	S***-PTFNR/L					
Kr: 91°	Kr: 90°					
A263	A330					










## ISO standard

**T N M G 22 04 08 (N) – DM**

**1 2 3 4 5 6 7 8 9**

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















**1**

Clearance angle	
A 	B 
C 	D 
E 	F 
G 	N 
P 	O Special

**2**

Tolerance class			
Code	I.C [mm]	m [mm]	S [mm]
A	±0,025	±0,005	±0,025
C	±0,025	±0,013	±0,025
E	±0,025	±0,025	±0,025
F	±0,013	±0,005	±0,025
G	±0,025	±0,025	±0,130
H	±0,013	±0,013	±0,025
J	±0,05–0,15	±0,005	±0,025
K	±0,05–0,15	±0,013	±0,025
L	±0,05–0,15	±0,025	±0,025
M	±0,05–0,15	±0,08–0,20	±0,130
N	±0,05–0,15	±0,08–0,20	±0,025
U	±0,08–0,25	±0,13–0,38	±0,130

**3**

Fastening features (metric)	
Insert shape	
A 	B 
C 	F 
G 	H 
J 	M 
N 	Q 
R 	T 
U 	W 
X Special	

**4**

Cutting edge length l [mm]								
I.C [mm]	Insert shape							
	C	D	R	S	T	V	W	K
3,97	06							
5,0	05							
5,56	09							
6,0	06							
6,35	06	07			11	11		
8,0	08							
9,525	09	11	09	09	16	16	06	16
10,0	10							
12,0	12							
12,7	12	15	12	12	22	22	08	
15,875	16		15	15	27			
16,0	19							
19,05	19		19	19	33			
20,0	20							
25,0	25	25	25					
25,4	25 25							
31,75	31							
32	32							

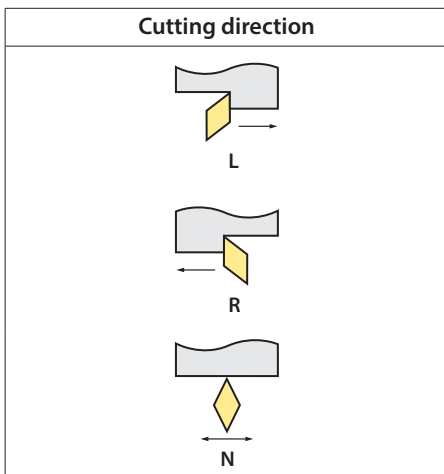
**5**

Insert thickness S [mm]			
Code	S	Code	S
00	0,79	T5	5,95
T0	0,99	06	6,35
01	1,59	T6	6,75
T1	1,98	07	7,94
02	2,38	09	9,52
T2	2,58	T9	9,72
03	3,18	11	11,11
T3	3,97	12	12,70
04	4,76		
T4	4,96		
05	5,56		

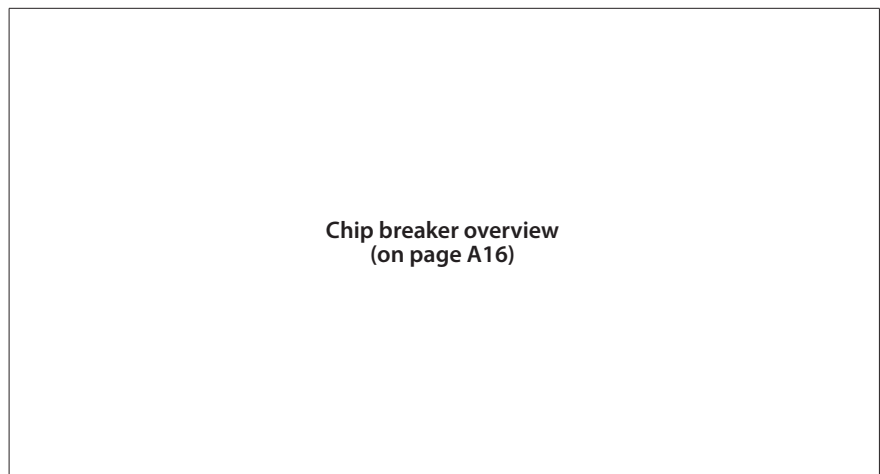
6

Nose radius r [mm]	
Code	r
00	–
02	0,2
04	0,4
08	0,8
12	1,2
16	1,6
20	2,0
24	2,4
32	3,2
X	Special
MO	Round inserts

7

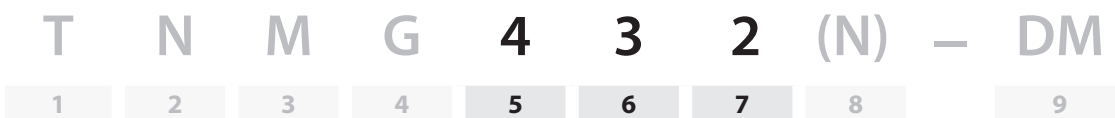


8



9

**ANSI standard**



Inner circle		
Code	[mm]	Pouce
2	6.35	0.250
3	9.525	0.375
4	12.7	0.500
5	15.875	0.625
6	19.05	0.750
8	25.4	1.000

5

Insert thickness		
Code	[mm]	Pouce
2	3.18	0.125
3	4.76	0.187
4	6.35	0.250
5	7.94	0.313
6	9.52	0.375

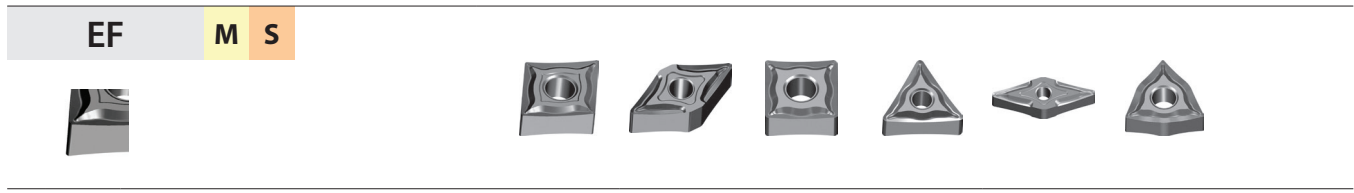
6

Nose radius		
Code	[mm]	Pouce
0	0.2	0.008
1	0.4	0.016
2	0.8	0.031
3	1.2	0.047
4	1.6	0.063
5	2.0	0.079
6	2.4	0.094

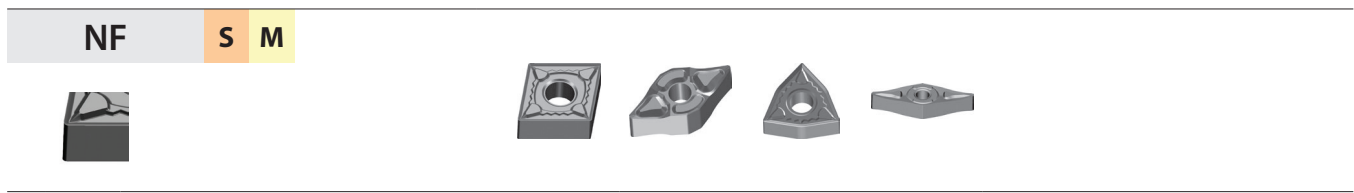
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Negative inserts

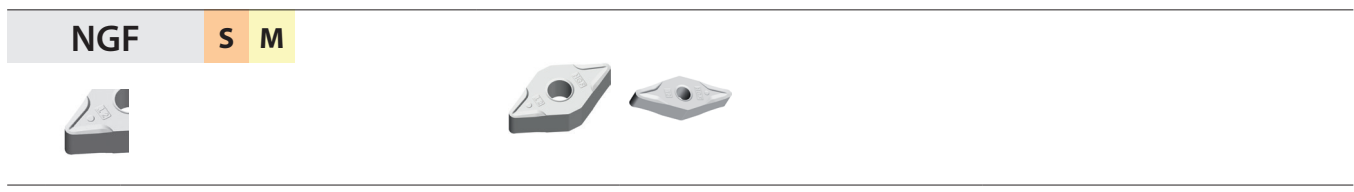
Finishing



Double sided chip breaker with sharp cutting edge and large rake angle for finishing of stainless steel.



Double sided chip breaker with ground cutting edge and large rake angle for finishing. E-tolerance for high repeatability.



Double sided chip breaker with ground cutting edge and large rake angle for finishing. E-tolerance for high repeatability.

Wiper



Double sided chip breaker with wiper geometry. Allows to double the feed rate and improves the surface quality.

Medium machining



Double-sided chip breaker for medium machining operations in the P application field. Superb chip control at high and low feed rates.

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

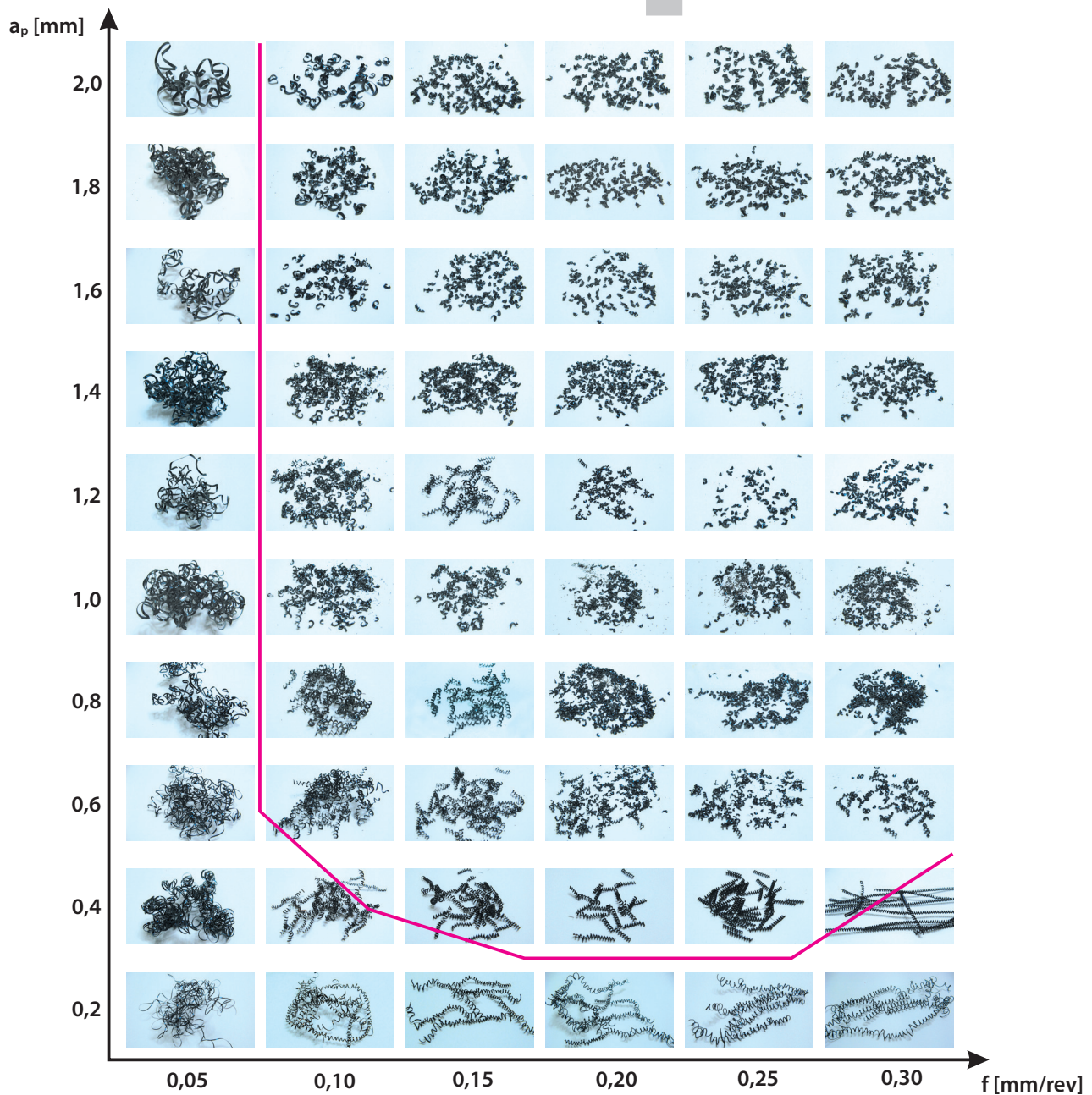
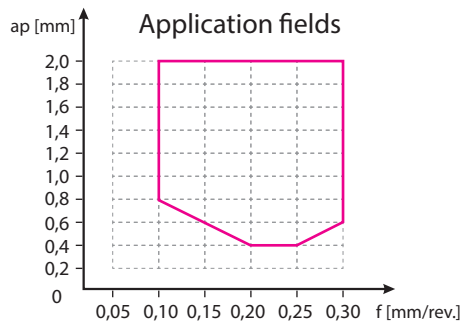
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## General turning

### Application fields of chip breakers

**Example**

Insert: CNMG120408-DF  
 Holder: PCLNL2525M12  
 Material: C45 steel  
 $V_C$ : 200 m/min



**A**

Turning

**B**

Milling

**C**

Drilling


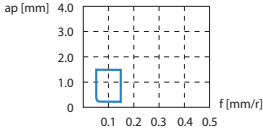



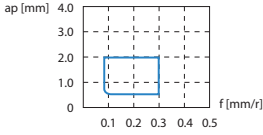




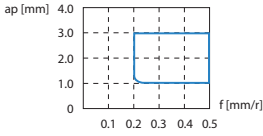
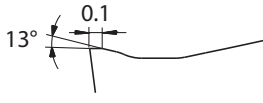
**D**

Technical Information


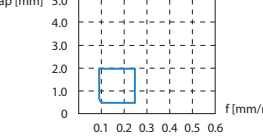
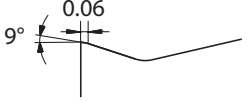


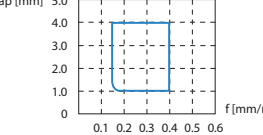
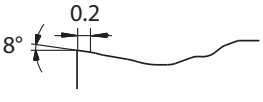


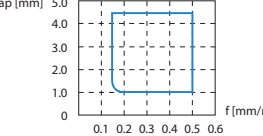
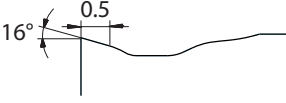



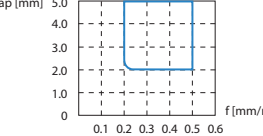
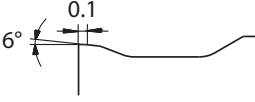



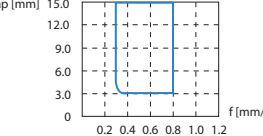
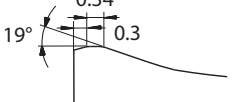
**E**

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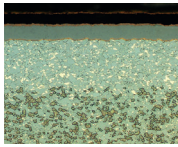
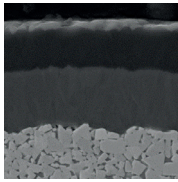
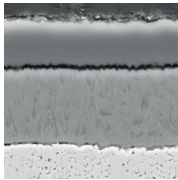
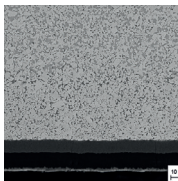
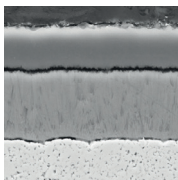
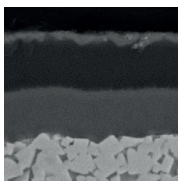
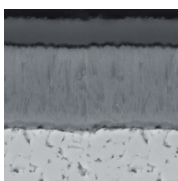
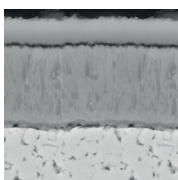
## M Positive inserts

Chip breaker	Application		Application fields	Cutting edge design
USF	Fine-finishing			
EF	Finishing	 		
EM	Medium machining	  		

## M Negative inserts

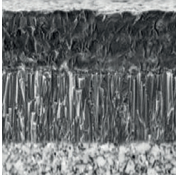
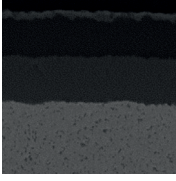
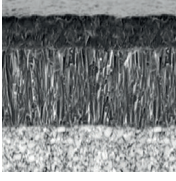
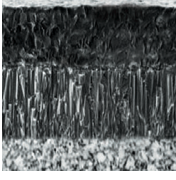
Chip breaker	Application		Application fields	Cutting edge design
EF	Finishing			
EM	Medium machining	 		
EG	Medium machining	 		
ER	Roughing	  		
ER (single sided)	Roughing	  		

## Coated cemented carbide CVD

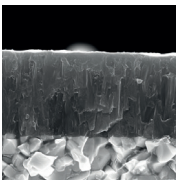
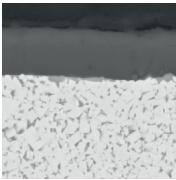
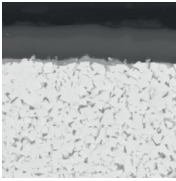
Grade	ISO	Micro structure	Grade description
<b>A</b> Turning	<b>YBC103</b>	P05 – P15 	P10 grade with excellent wear resistance at higher cutting speeds. Latest sinter processes and CVD coating technologies enable a wide range of applications in the P material range.
	<b>YB6315</b>	P05 – P20 	CVD coated P10–P20 carbide grade for finishing to medium operation of steel, casting steel and high chrome material. Outstanding performance under high cutting speed and temperature with excellent wear resistance.
<b>B</b> Milling	<b>YBC152</b>	P10 – P20 	CVD coated P10–P20 carbide grade for finishing to medium operation of steel and casting steel. Outstanding performance under higher cutting speed and temperature with excellent wear resistance.
	<b>YBC203</b>	P15 – P25 	P20 grade with exceptional wear resistance and toughness for reliable machining operations. Ultra-modern sintering technique and CVD coating technologies allow for a wide range of applications in the P material range.
<b>C</b> Drilling	<b>YBC252</b>	P20 - P35 	CVD coated P20–P35 carbide grade for medium operation to roughing of steel and casting steel. Optimal performance of wear resistance and toughness for a wide application field.
	<b>YBC352</b>	P20 - P40 	CVD coated P20–P40 carbide grade for roughing operation of steel and casting steel. Optimal performance of wear resistance and toughness for a wide application field.
<b>D</b> Technical Information	<b>YBM153</b>	M10 - M25 	CVD coated M10–M25 carbide grade for finishing to medium application in stainless steel. High wear resistance and capability against plastic deformation at higher cutting speed.
	<b>YBM253</b>	M15 - M35 	CVD coated M15–M35 carbide grade for medium to roughing operation in stainless steel with wide application field. High wear resistance and capability against plastic deformation at higher cutting speed.
<b>E</b> Index			



**Coated cemented carbide CVD**

Grade	ISO	Micro structure	Grade description
<b>YBD102</b>	K05 - K20		CVD coated K05-K20 carbide substrate. Optimized for medium operation of cast iron, special nodular cast iron and hard steel at high cutting speed.
<b>YB7315</b>	K10 - K25		CVD coated K10-K25 carbide substrate. Optimized for medium to roughing operation of cast iron. Improved wear resistance and toughness at high cutting speed.
<b>YBD152</b>	K10 - K25		CVD coated K10-K25 carbide substrate. Optimized for medium to roughing operation of cast iron. Good wear resistance and toughness at higher cutting speed.
<b>YBD152C</b>	K10 - K25		Thick Al <sub>2</sub> O <sub>3</sub> CVD coated K05-K25 carbide substrate. Optimized for medium to roughing operation of cast iron. Higher wear resistance and toughness at higher cutting speed in combination with TC chip breaker.

**Coated cemented carbide PVD**

Grade	ISO	Micro structure	Grade description
<b>YBG101</b>	N05 - N20		PVD coated N05-N20 carbide substrate for finishing to semi-finishing in aluminium materials. Coating only on the top face, in combination with the aluminium chip breakers, prevents built-up edges and gives a smooth cut.
<b>YBG102</b>	S05 - S15		PVD coated S05-S15 carbide substrate for finishing to medium application of super alloy material, stainless steel and aluminum. Good wear resistance in a wide application field.
<b>YBG105</b>	S05 - S20		PVD multilayer coated S05-S20 carbide substrate for finishing to medium application of super alloy material but also stainless steel. Good wear resistance and thermal stability in a wide application field.

**A**

Turning

**B**

Milling

**C**

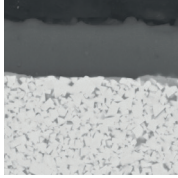
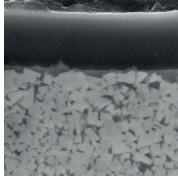
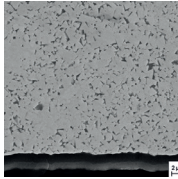
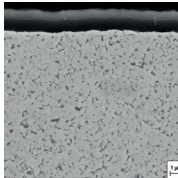
Drilling

**D**Technical  
Information**E**

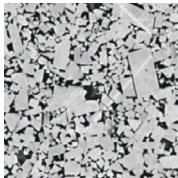
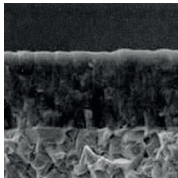
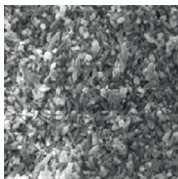
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## Coated cemented carbide PVD

Grade	ISO	Micro structure	Grade description
<b>YBG205</b>	P10 - P30 M20 - M40 S15-S25		PVD multilayer coated P10–P30/M20–M40/S15–S25 carbide substrate for finishing to medium machining of stainless steel, super alloys and steel (milling). Excellent wear resistance and thermal stability in a wide range of applications.
<b>YB9320</b>	P10 - P30 M10 - M25		PVD multilayer coated P10–P30/M10–M25 carbide substrate for finishing to medium machining of stainless steel, super alloys and steel (grooving/milling). Optimised coating stability for higher wear resistance and thermal stability in a wide range of applications.
<b>YPD201</b>	S20 - S30		Carbide grade for semi-roughing to chip breaking of high-strength and high-alloy materials. High-performance grade with high wear resistance. Balanced hardness and internal stress ratio provide a wide range of applications.
<b>YBS103</b>	S10 - S20		Turning grade for processing nickel-base materials. A special carbide substrate and the latest PVD coating technology enable a very good wear behaviour and high thermal stability.

## Ceramic

Grade	ISO	Micro structure	Grade description
<b>CA1000</b>	K10 - K25 H10 - H25		Uncoated H10–H25/K10–K25 mixed ceramic grade for finishing to medium operation in hardened steel and nodular cast iron. Good wear resistance and toughness.
<b>CM1000</b>	K10 - K25 H10 - H25		Coated H1–H25/K10–K25 mixed ceramic grade for finishing to medium operations in hardened steel, tool steel, HSS material and nodular cast iron. Good wear resistance and toughness.
<b>CN1000</b>	K05 - K15		Uncoated K05–K15 Si <sub>3</sub> N <sub>4</sub> ceramic grade for finishing to medium operation in grey cast iron. Good wear resistance and thermal stability.

**A**  
Turning

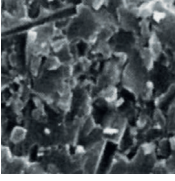
**B**  
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**C**  
Drilling

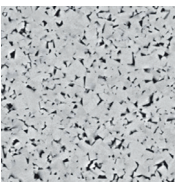
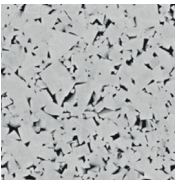
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**Ceramic**

Grade	ISO	Micro structure	Grade description
<b>CS1000</b>	S05 – S20		Uncoated SiAlON ceramic grade for medium machining to roughing of nickel- and cobalt-based alloys at medium to low cutting speeds.
<b>CW1400</b>	S10 – S20 H10-H20		Uncoated whisker ceramic grade for medium and low speed cutting in HSS steel, high chrome steel and cobalt-base alloy also with interrupted cut. Good wear resistance, notch wear resistance and thermal stability.
<b>CW1800</b>	S10 – S25		Uncoated whisker ceramic grade for finishing to rough operations in Ni-base alloy material like Inconel, Nimonic or Hastelloy. Good wear resistance, notch wear resistance and thermal stability.

**Uncoated cemented carbide**

Grade	ISO	Micro structure	Grade description
<b>YD101</b>	N05 - N20 K05 - K20		Uncoated N05–N20/K05–K20 carbide substrate for fine to medium application in aluminum and other material.
<b>YD201</b>	N10 - N30 K10 - K30		Uncoated N10–N30/K10–K30 carbide substrate for medium application in aluminum and other material.

**CBN**

Grade	ISO	Micro structure	Grade description
<b>YCB112</b>	S10 – S20		Uncoated, brazed S10–S20 CBN grade for fine finishing operations on hardened steel and super alloys. Excellent wear resistance and thermal stability.

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## CBN

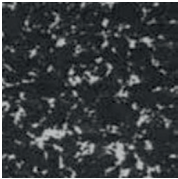
Grade	ISO	Micro structure	Grade description
<b>YCB113</b>	H01 - H10		Uncoated, brazed H01–H10 CBN grade for fine finishing operation in hardened steel with continuous cut. High wear resistance and productivity at higher cutting speed.
<b>YCB121</b>	H10 - H25		Uncoated, brazed H10–H25 CBN grade for fine to medium application in hardened steel from continuous to light interrupted cut. Good wear resistance and toughness for universal use.
<b>YCB131</b>	H20 - H35		Uncoated, brazed H20–H35 CBN grade for fine to medium application in hardened steel with interrupted cut. Good wear resistance and optimized toughness for safe process.
<b>YCB113C</b>	H01 - H10		Coated, brazed H01–H10 CBN grade for fine finishing operations on hardened steel with a continuous cut. High wear resistance and productivity at higher cutting speeds
<b>YCB121C</b>	H10 - H25		Coated, brazed H10–H25 CBN grade for fine to medium machining operations on hardened steel with a continuous to partially interrupted cut. Good wear resistance and toughness for universal application.
<b>YCB131C</b>	H20 - H25		Coated, brazed H20–H35 CBN grade for fine to medium machining operations on hardened steel with an interrupted cut. Good wear resistance and optimum toughness for reliable operations.
<b>YCB215</b>	K10 - K20		Uncoated, brazed K10–K20 CBN grade for fine to medium machining operations on cast iron. Excellent wear resistance and thermal conductivity.
<b>YZB630</b>	H20 - H30		Uncoated H20–H30 solid CBN grade for medium machining operations on hardened steel with a slight to medium interrupted cut. Excellent combination of wear resistance and thermal stability.

**CBN**

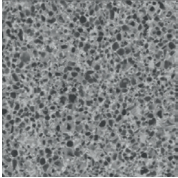
Grade	ISO	Micro structure	Grade description
<b>YZB630C</b>	H20 - H30		Coated H20–H30 solid CBN grade for medium machining operations on hardened steel with a slight to medium interrupted cut. Excellent combination of wear resistance and thermal stability.

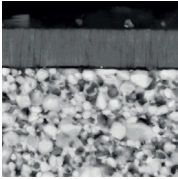
<b>YZB223</b>	K10 - K25		Uncoated H10–H25/K10–K25 mixed ceramic grade for finishing to medium operation in hardened steel and nodular cast iron. Good wear resistance and toughness.
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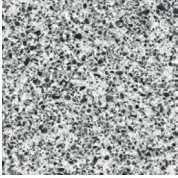
**PCD**

Grade	ISO	Micro structure	Grade description
<b>YCD421</b>	N01 - N10		Uncoated, brazed N01–N10 PCD grade for fine finishing operation of aluminum alloys less than 12 % Si, composites, copper/magnesium and other alloys. Medium grain size grade with good wear resistance for a wide application field.

**Cermet**

Grade	ISO	Micro structure	Grade description
<b>YNG151</b>	P05 - P15		Uncoated P05–P15 cermet grade for fine finishing operation of steel and stainless steel. Good resistance against plastic deformation for good surface finishing.

<b>YNG151C</b>	P05 - P15		PVD coated P05–P15 cermet grade for fine finishing operation of steel and stainless steel. Good wear resistance and capability against plastic deformation for good surface roughness.
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<b>YNT251</b>	P10 - P25		Uncoated P10–P25 cermet grade for fine finishing to medium operation of steel and stainless steel. Good wear resistance and toughness. Suitable also in light interrupted cut.
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**A**

Turning

**B**

Milling

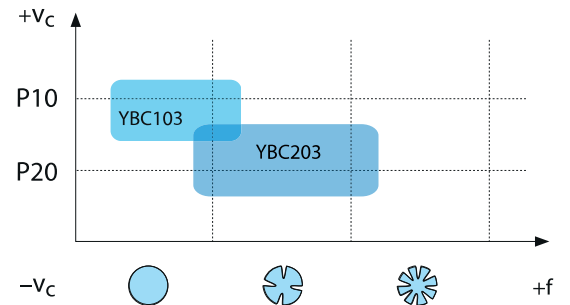
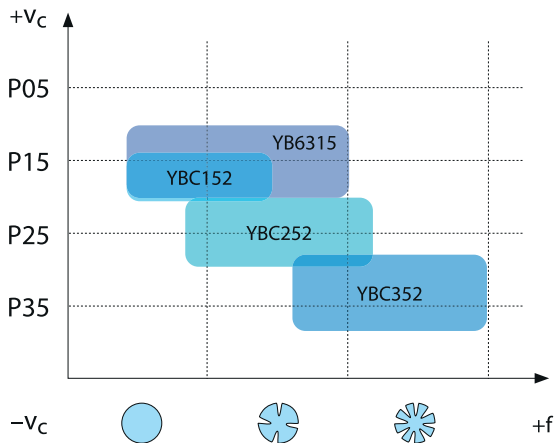
**C**

Drilling

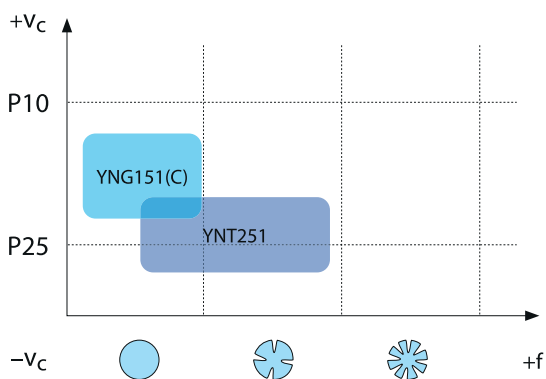
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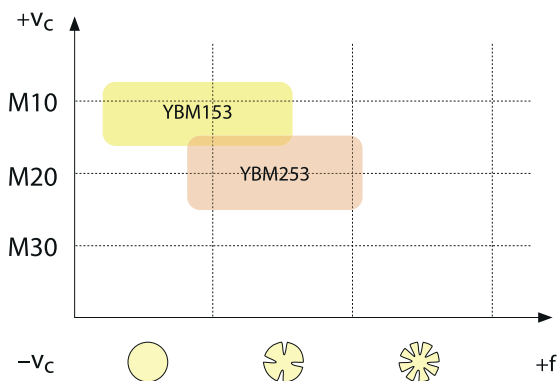
## CVD coated carbide grades for steel



## Cermet grades for steel



## CVD coated carbide grades for stainless steel



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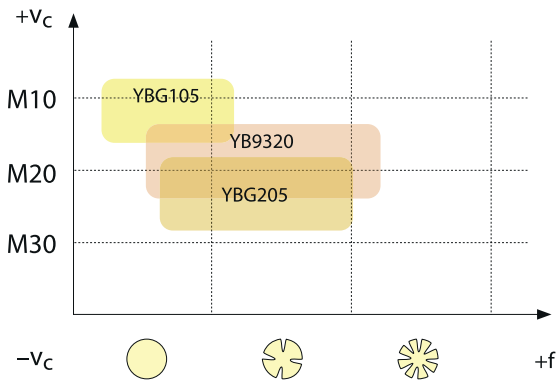
D

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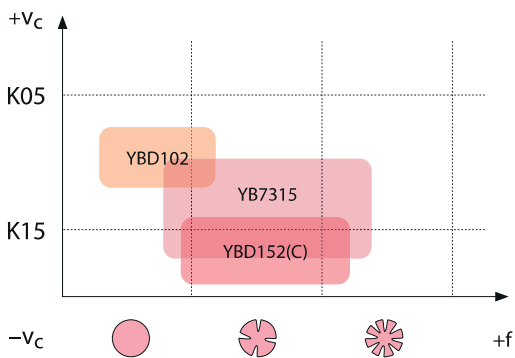
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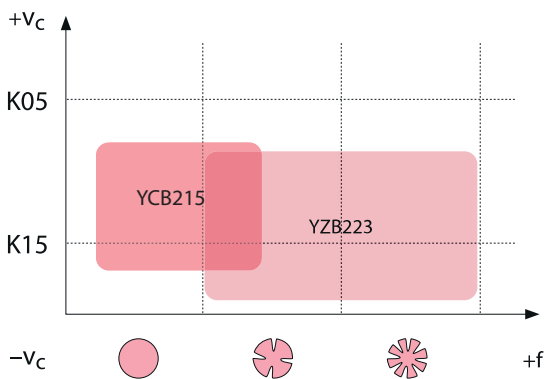
**PVD coated carbide grades for stainless steel**



**CVD coated carbide grades for cast iron**



**CBN grades for cast iron**



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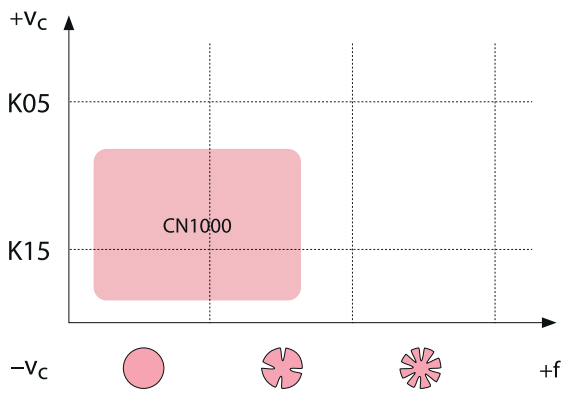
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**A**

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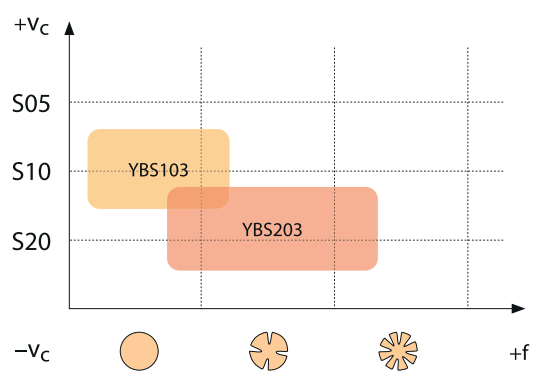
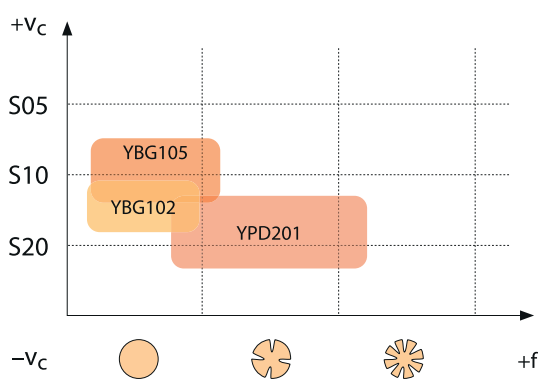
## Ceramic grades for cast iron



**B**

Milling

## PVD coated carbide grades for superalloys



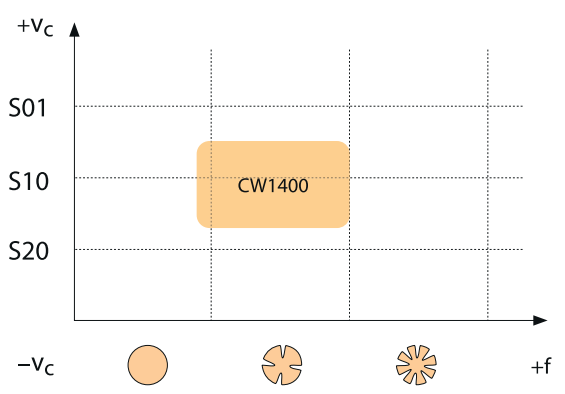
**C**

Drilling

**D**

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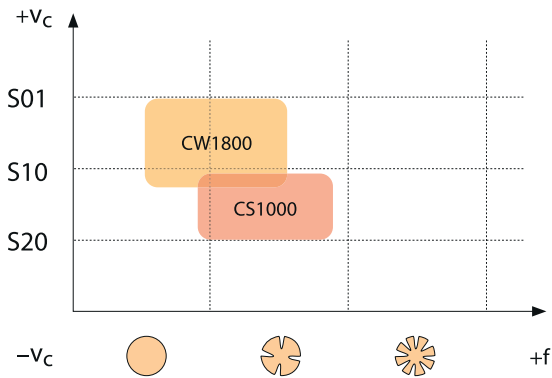
## Ceramic grades for cobalt base alloys/HSS



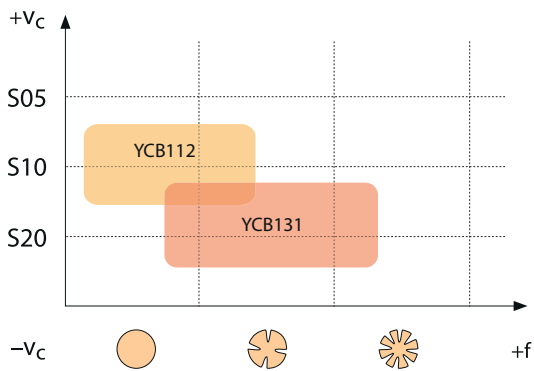
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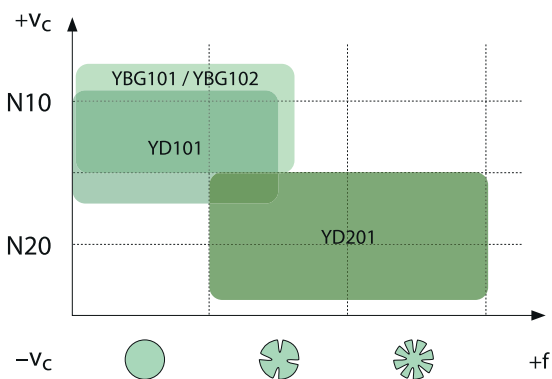
**Ceramic grades for nickel base alloys**



**CBN grades for superalloys**



**Carbide grades for non-ferrous metals**



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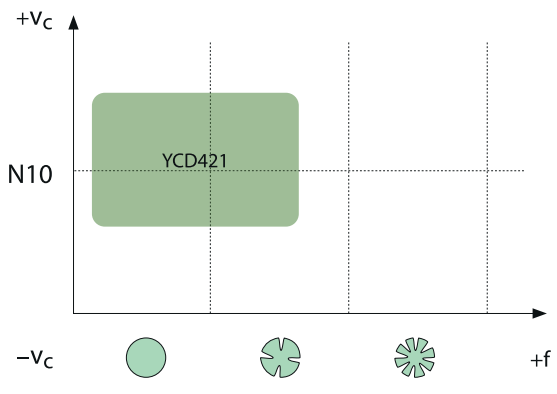
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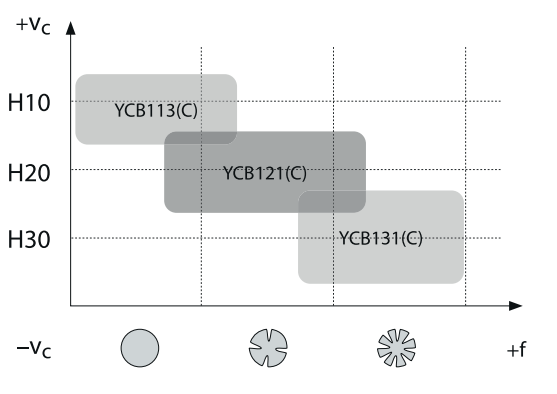
## PCD grades for non-ferrous metals



**B**

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## CBN grades for hardened steel



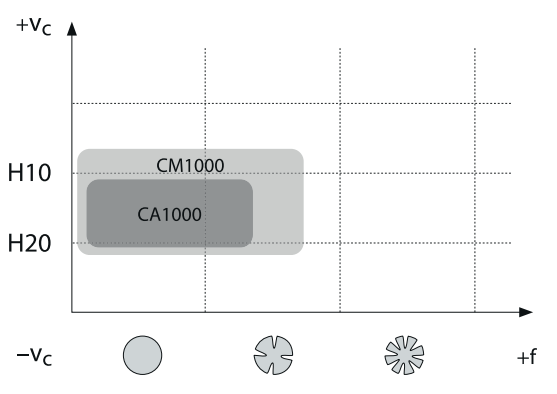
**C**

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## Ceramic grades for hardened steel



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Application fields of grades – general turning

	ISO	HC <sup>1</sup> (CVD)	HC <sup>1</sup> (PVD)	HT	HC <sup>2</sup>	Ceramic	HW	CBN	PCD
<b>P</b>	P01	YBC103		YNG151	YNG151C				
	P10	YB6315		YNT251					
	P20	YBC152							
	P30	YBC203							
	P40	YBC252							
		YBC352							
<b>M</b>	M01		YBG105	YNG151	YNG151C				
	M10	YBM153	YB9320						
	M20	YBM253	YBG205						
	M30								
	M40								
<b>K</b>	K01					CN1000		YCB215	YZB223
	K10	YBD102					YD201		
	K20	YBD152							
	K30	YB7315							
		YBD152C							
<b>N</b>	N01						YD101		YCD421
	N10		YBG101				YD201		
	N20		YBG102						
	N30								
<b>S</b>	S01		YBS103			CS1000		YCB112	
	S10		YBG102			CW1400		YCB131	
	S20		YBG105			CW1800			
	S30		YB9320						
			YPD201						
<b>H</b>	H01							YCB113(C)	
	H10							YCB121(C)	
	H20								YCB131(C)
	H30								

<b>P</b>	Steel
<b>M</b>	Stainless steel
<b>K</b>	Cast iron

<b>N</b>	Non-ferrous metals
<b>S</b>	Heat-resistant alloys
<b>H</b>	Hardened materials

HC<sup>1</sup> Coated carbide  
 HT Uncoated cermet  
 HC<sup>2</sup> Coated cermet  
 HW Uncoated carbide

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