

ISD TURNING INSERTS CDDE KEY

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

1 - Insert shape symbol

Symbol	m (mm)	d (mm)	s (mm)
A	±0.005	±0.025	±0.025
F	±0.005	±0.013	±0.025
C	±0.013	±0.025	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.005	±0.05~±0.13	±0.025
K*	±0.013	±0.05~±0.13	±0.025
L*	±0.025	±0.05~±0.13	±0.025
M*	±0.08~±0.20	±0.05~±0.13	±0.13
N*	±0.08~±0.20	±0.05~±0.13	±0.025
U*	±0.13~±0.38	±0.08~±0.25	±0.13

Triangular inserts with a facet (secondary cutting edge)

Detailed dimension of M class insert Insert height Tolerances (mm)					
Inscribed circle	T	S	C	D	V
6.35	±0.08	-	-	-	-
9.525	±0.08	±0.08	±0.11	±0.10	±0.13
12.70	±0.13	±0.13	±0.13	±0.15	-
15.875	±0.15	±0.15	±0.15	±0.18	-
19.05	±0.15	±0.15	±0.15	±0.18	-
25.40	-	±0.18	-	-	-
31.75	-	±0.25	-	-	-

Inscribed circle Tolerances (mm)					
Inscribed circle	T	S	C	D	V
6.35	±0.05	-	-	-	-
9.525	±0.05	±0.05	±0.05	±0.05	±0.05
12.70	±0.08	±0.08	±0.08	±0.08	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	±0.10
19.05	-	-	-	-	±0.10
25.40	-	±0.13	-	-	±0.10
31.75	-	±0.20	-	-	±0.12

3 - Tolerances symbol

*As a rule, the sides of these inserts are as sintered. Tolerance differs with insert size, for the accuracy of class M, refer to the table on the right.

A	B	C	D	E
F	G	N	P	O
				Other clearance angle

2 - Normal clearance symbol



4 - Insert symbol															
symbol	Type	Hole type	Chipbreaker	Shape	symbol	Type	Hole type	Chipbreaker	Shape	symbol	Type	Hole type	Chipbreaker	Shape	
W	with hole	Round hole / one countersink (40°-60°)	Without chipbreaker		H	with hole	Round hole / one countersink (70°-90°)	Chipbreaker on one side		G	with hole	Round hole	Chipbreaker on both sides		
T			Chipbreaker on one side		C		Round hole / double countersink (70°-90°)	Without chipbreaker		N		-	Without chipbreaker		
Q		Round hole / double countersink (40°-60°)	Without chipbreaker		J		Round hole	Round hole	Chipbreaker on both sides		R	without hole	-	Chipbreaker on one side	
U			Chipbreaker on both sides		A				Without chipbreaker		F		-	Chipbreaker on both sides	
B		Round hole / one countersink (70°-90°)	Without chipbreaker		M		Chipbreaker on one side		X	-	-	-	-	On request	

R's	35° V's	55° D's	80° C's	90° S's	60° T's	80° W's	Ø CI		ANSI
							mm	inch	Symbol
-	06	04	-	03	06	02	3,97	5/32	1,20
-	08	05	04	04	08	L3	4,76	3/16	1,50
-	09	06	05	05	09	03	5,56	7/32	1,80
06**	-	-	-	-	-	-	6,00	0,236	
06*	11	07	06	06	11	04	6,35	1/4	2,00
07*	13	09	08	07	13	05	7,94	5/16	2,50
08*	-	-	-	-	-	-	8,00	0,315	
09*	16	11	09	09	16	06	9,525	3/8	3,00
10**	-	-	-	-	-	-	10,00	0,394	
12**	-	-	-	-	-	-	12,00	0,472	
12*	22	15	12	12	22	08	12,70	1/2	4,00
15*	27	19	16	15	27	10	15,875	5/8	5,00
16**	-	-	-	-	-	-	16,00	0,63	
19*	33	23	19	19	33	13	19,05	3/4	6,00
20**	-	-	-	-	-	-	20,00	0,787	
25**	-	-	-	-	-	-	25,00	0,984	
25*	44	31	25	25	44	17	25,40	1,00	8,00
31*	54	38	32	31	54	21	31,75	1 1/4	10,00
32**	-	-	-	-	-	-	32,00	1,26	

* ANSI designation only
(Radius Designation is R0)

** Metric designation only
(Radius Designation is M0)

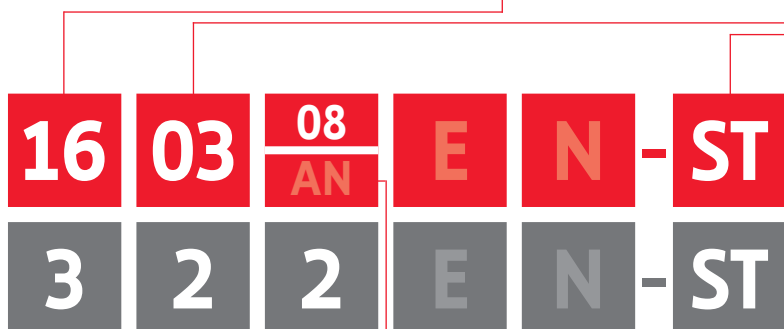
According to International Standard ISO 1832 - 2012(E)

"Indexable inserts for cutting tools - Designation"

ISO	mm	ANSI	inch
01	1.59	1	0.062
T1	1.98	1.2	0.078
02	2.38	1.5	0.094
03	3.18	2	0.125
T3	3.97	2.5	0.156
04	4.76	3	0.188
05	5.56	3.5	0.219
06	6.35	4	0.250
07	7.94	5	0.312
09	9.52	6	0.375
12	12.70	8	0.500

5 - Insert size symbol

6 - Insert thickness symbol



10 - Chipbreaker geometries					
FLAT	MF	GS	SF	LC	MS
MR	PM	ST	MW	SS	HR
MA	RP	HY	HZ	GR	

NEGATIVE Chipbreakers

FLAT	FP	BO	FM	FK	FW	LM	MP	MM
MK	MW	FS	LN	GS	ST	RF	RM	RR

POSITIVE Chipbreakers

7 - Insert corner symbol			
ISO	mm	inch	ANSI
00	Sharp nose		0
01	0.10	.004	0.2
02	0.20	.008	0.5
04	0.40	.015	1
08	0.80	.032	2
12	1.2	.047	3
16	1.6	.062	4
20	2.0	.078	5
24	2.4	.094	6
28	2.8	.109	7
32	3.2	.125	8
00 (inch or M0/metric)	Round insert		0

7.1* - Insert edges symbol			
For inserts having secondary edges two digits are used:			
1 st digit is secondary edge		2 nd digit is secondary edges relief angle	
A	45°	A	3°
D	60°	B	5°
E	75°	C	7°
F	85°	D	15°
P	90°	E	20°
Z	special	F	25°
*only when required.		G	30°
		N	0°
		P	11°
		Z	special

8* - Cutting edge information		
Shape	Honing	Symbol
	No honing	F
	With honing	E
	Chamfered No honing	T
	Chamfered with honing	S
*only when required.		

9* - Cutting direction		
Shape	Hand	Symbol
	Right	R
	Left	L
	None	N
*only when required.		

INSERTS RECDMENDATIDN

EXTERNAL MACHINING | MAQUINAÇÃO EXTERNA | MAQUINACIÓN EXTERNA

General Recommendation:

1. The choice of the insert shape depends of the operation
2. The insert shape should be selected to the required lead angle and the accessibility or versatility required of the tool.
3. Select the largest suitable point angle on the insert for strenght and economy.

Operation	Longitudinal turning	Profiling	Facing	Plunging
Insert Shape				
Rhombic 80°	●●		●	
Rhombic 55°	●	●●	●	
Parallelogram 55°	●	●		●
Round	●	●	●	●●
Square 90°	●		●●	
Triangular 60°	●	●	●	●
Rhombic 35°		●		
Trigon 80°	●		●	







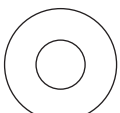
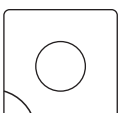

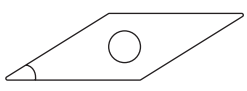

●● Recommended Insert Shape

● Alternative Insert Shape

INTERNAL MACHINING | MAQUINAÇÃO INTERNA | MAQUINACIÓN INTERNA

General Recommendation:

1. The choice of the insert shape depends of the operation
2. The insert shape should be selected to the required lead angle and the accessibility or versatility required of the tool.
3. Select the largest suitable point angle on the insert for strenght and economy.

Operation		Longitudinal turning	Profiling	Facing
Insert Shape				
	Rhombic 80°	●		●●
	Rhombic 55°	●	●●	●
	Parallelogram 55°	●●		
	Round	●		●
	Square 90°	●		
	Triangular 60°	●●	●	●
	Rhombic 35°		●	
	Trigon 80°	●		●

●● Recommended Insert Shape


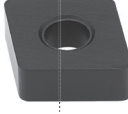


● Alternative Insert Shape


NEGATIVE TURNING Application Range Overview




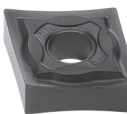

- TURNING
- Insert selection
- Overview
- Negative inserts
- Positive inserts
- PCBN & PCD inserts
- Heavy turning
- External Toolholders
- Internal Toolholders
- Automatic Lathes
- Spare Parts
- Technical Data

		Fine finishing	Finishing		Medium	Roughing	Heavy roughing	
P			MF	LC	MR	HR		
				PM	MA	RP	HY	
						1 face	1 face	
				MW		GR	HZ	
				wiper		NEW	1 face	
	CVD Grades							
			PHG105 <small>P05-P10</small>	PHG115 <small>P10-P25</small>	PH5125 <small>P20-P35</small>	PHG125 <small>P20-P35</small>	PH5740 <small>P25-P45</small>	PHG140 <small>P25-P45</small>
	PVD Grades							
			PH7910 <small>P05-P10</small>					
		← Continuous cut				Interrupted cut →		

		Fine finishing	Finishing	Medium	Roughing	Heavy roughing		
M			GS	SF	SS			
			MS		RP	HY		
					1 face	1 face		
	CVD Grades							
			PHS215 <small>M10-M25</small>		PHS225 <small>M15-M30</small>		PHS240 <small>M25-M45</small>	
	PVD Grades							
			PH7910 <small>M05-M10</small>	PHH910 <small>M05-M10</small>	PH7920 <small>M10-M25</small>	PHH920 <small>M30-M25</small>		
			← Continuous cut				Interrupted cut →	

K	Fine finishing	Finishing	Medium	Roughing	Heavy roughing
				ST 	FLAT 
			MW 	wiper	HZ 
CVD Grades					
		PH5705 K05-K15		PH5320 K10-K25	PH5740 K20-K40
Continuous cut ← → Interrupted cut					




N	Fine finishing	Finishing	Medium	Roughing	Heavy roughing
				MS 	
Uncoated Grades					
			PH0910 N01-N20		
Continuous cut ← → Interrupted cut					



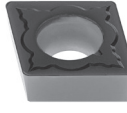

S	Fine finishing	Finishing	Medium	Roughing	Heavy roughing
			GS ^{NEW} 	SF 	SS 
			MS 		DOMX ^{NEW} 
PVD Grades					
		PH7910 S05-S10	PHH910 ^{NEW} S10-S25	PH7920 S10-S25	PHH920 ^{NEW} S10-S25
Continuous cut ← → Interrupted cut					

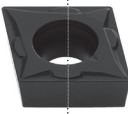
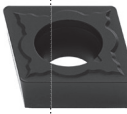
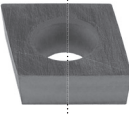


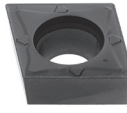

POSITIVE TURNING Application Range Overview

- TURNING
- Insert selection
- Overview
- Negative inserts
- Positive inserts
- PCBN & PCD inserts
- Heavy turning
- External Toolholders
- Internal Toolholders
- Automatic Lathes
- Spare Parts
- Technical Data

	Fine finishing	Finishing	Medium	Roughing		Heavy roughing	
P 5° & 7°	FS 	FP 	MP 	RF 	RM 		
	BO 	FW 	MW 	ST 	RR 		
	CVD Grades						
			PHG115 <small>P10-P25</small>	PH5125 <small>P20-P35</small>	PHG125 <small>P20-P35</small>	PHG140 <small>P25-P45</small>	PH5740 <small>P25-P45</small>
	PVD Grades						
	PH7910 <small>P05-P10</small>		PH7920 <small>P10-P35</small>				
	Continuous cut ← → Interrupted cut						


	Fine finishing	Finishing	Medium	Roughing	Heavy roughing	
P 11°		12 	13 	FLAT 		
	CVD Grades					
			PH5115 <small>P05-P20</small>	PH5125 <small>P20-P35</small>	PH5740 <small>P25-P45</small>	
	PVD Grades					
	Continuous cut ← → Interrupted cut					




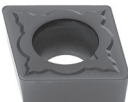



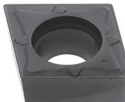
		Fine finishing	Finishing	Medium	Roughing	Heavy roughing	
M 5° & 7°		FS 	FM 	LM 	MM 		
		BO 	FW 	MW 	GS 		
		CVD Grades					
			PHS215 M10-M25		PHS225 M15-M30		PHS240 M25-M45
		PVD Grades					
	PH7910 M05-M10	PHH910 ^{NEW} M05-M10	PH7920 M10-M25	PHH920 ^{NEW} M10-M25			
		← Continuous cut			Interrupted cut →		

		Fine finishing	Finishing	Medium	Roughing	Heavy roughing	
K 5° & 7°		FK 	MK 	FLAT 	RM 		
			FW 	MW 	ST 		
			wiper	wiper			
		CVD Grades					
			PH5705 K05-K15		PH5320 K10-K25		
	Uncoated Grades						
		PH0705 K05-K15					
		← Continuous cut			Interrupted cut →		

POSITIVE TURNING

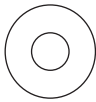
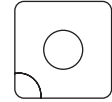
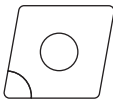

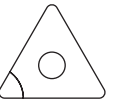
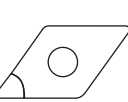
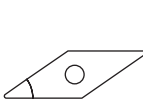
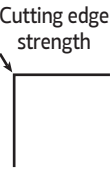





Application Range Overview | Vista geral de aplicações | Vista general de aplicaciones

TURNING	N	Fine finishing	Finishing	Medium	Roughing	Heavy roughing	
		LN					
							
		Uncoated Grades					
	7°	PH0910 N01-N20					
Overview		Continuous cut ← → Interrupted cut					

S	Fine finishing	Finishing	Medium	Roughing	Heavy roughing
	FS	FM	LM	MM	GS ^{NEW}
					
	BO	FW	MW		
					
		wiper		wiper	
	PVD Grades				
5° & 7°	PH7910 S05-S10		PHH910 ^{NEW} S10-S25		PH7920 S10-S25
	PHH920 ^{NEW} S10-S25				
Heavy turning	Continuous cut ← → Interrupted cut				

INSERT SHAPE SELECTION

Seleção de geometria para pastilha | Selección de geometria para plaquita

Shape angle		90°	80°	80°	60°	55°	35°	
Geometry shape code	R	S	C	W	T	D	V	
Geometry shape design								
Cutting edge strength								Accessibility 
Vibration tendency								Less power consumption Pc (kW) 

INSERT SHAPE

The insert shape should be selected relative to the entering angle accessibility from tools requirements.

The largest possible nose angle should be selected to provide insert strength and reliability, however, this has to be balanced against the cut variation need to be performed.

A large nose angle is strong, but requires more machine power and has a higher tendency for vibration.




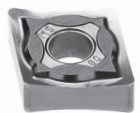








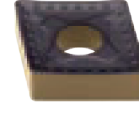

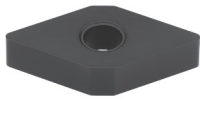





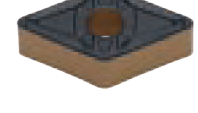










A small nose angle is weaker and has a small cutting edge engagement, both of which can make it more sensitive to the heat effects.

Scale 1: indicates the cutting edge strength. The inserts to the left have larger nose angles and are correspondingly stronger. The right hand inserts have better versatility and accessibility.













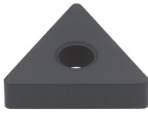



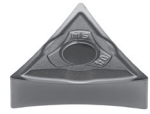



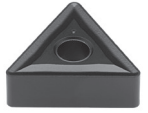




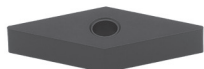







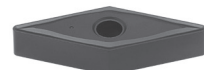

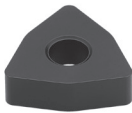



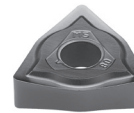



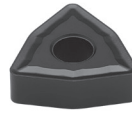

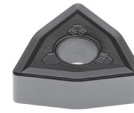

Scale 2: indicates that vibration tendencies increase to the left side, while power requirements decrease to the right.

NEGATIVE TURNING INSERTS OVERVIEW

TURNING
Insert selection
Overview
Negative inserts
Positive inserts
PCBN & PCD inserts
Heavy turning
External Toolholders
Internal Toolholders
Automatic Lathes
Spare Parts
Technical Data

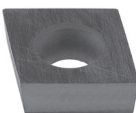







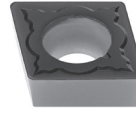
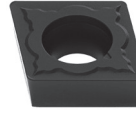
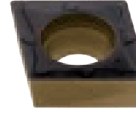


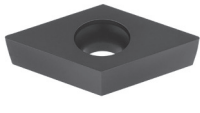




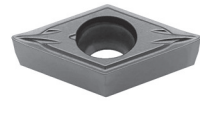




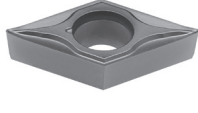
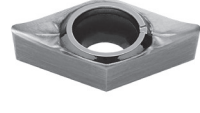















<p>CNMA</p>  <p>Roughing</p> <p>Page C - 388 Rhombic 80°</p>	<p>CNMG-MF</p>  <p>Finishing</p> <p>Page C - 388 Rhombic 80°</p>	<p>CNMG-SF</p>  <p>Medium to Finishing</p> <p>Page C - 388 Rhombic 80°</p>	<p>CNMG-LC</p>  <p>Medium to Finishing</p> <p>Page C - 388 Rhombic 80°</p>	<p>CNMG-MS</p>  <p>Medium</p> <p>Page C - 388 Rhombic 80°</p>	<p>CNMG-GS</p>  <p>Medium</p> <p>Page C - 388 Rhombic 80°</p>
<p>CNMG-MR</p>  <p>Medium</p> <p>Page C - 390 Rhombic 80°</p>	<p>CNMG-PM</p>  <p>Medium</p> <p>Page C - 390 Rhombic 80°</p>	<p>CNMG-ST</p>  <p>Medium</p> <p>Page C - 390 Rhombic 80°</p>	<p>CNMG-MW</p>  <p>Medium wiper</p> <p>Page C - 390 Rhombic 80°</p>	<p>CNMG-SS</p>  <p>Roughing to Medium</p> <p>Page C - 392 Rhombic 80°</p>	<p>CNMG-MA</p>  <p>Medium to Roughing</p> <p>Page C - 392 Rhombic 80°</p>
<p>CNMG-HR</p>  <p>Roughing</p> <p>Page C - 392 Rhombic 80°</p>	<p>CNMM-RP</p>  <p>Roughing</p> <p>Page C - 394 Rhombic 80°</p>	<p>CNMM-GR</p>  <p>Roughing</p> <p>Page C - 394 Rhombic 80°</p>	<p>CNMM-HY</p>  <p>Heavy to Roughing</p> <p>Page C - 394 Rhombic 80°</p>	<p>CNMM-HZ</p>  <p>Heavy to Roughing</p> <p>Page C - 394 Rhombic 80°</p>	
<p>DNMA</p>  <p>Roughing</p> <p>Page C - 396 Rhombic 55°</p>	<p>DNMG-MF</p>  <p>Finishing</p> <p>Page C - 396 Rhombic 55°</p>	<p>DNMG-SF</p>  <p>Medium to Finishing</p> <p>Page C - 396 Rhombic 55°</p>	<p>DNMG-LC</p>  <p>Medium to Finishing</p> <p>Page C - 396 Rhombic 55°</p>	<p>DNMG-MS</p>  <p>Medium</p> <p>Page C - 398 Rhombic 55°</p>	<p>DNMG-GS</p>  <p>Medium</p> <p>Page C - 398 Rhombic 55°</p>
<p>DNMG-MR</p>  <p>Medium</p> <p>Page C - 398 Rhombic 55°</p>	<p>DNMG-PM</p>  <p>Medium</p> <p>Page C - 398 Rhombic 55°</p>	<p>DNMG-ST</p>  <p>Medium</p> <p>Page C - 400 Rhombic 55°</p>	<p>DNMG-MW</p>  <p>Medium wiper</p> <p>Page C - 402 Rhombic 55°</p>	<p>DNMG-SS</p>  <p>Roughing to Medium</p> <p>Page C - 402 Rhombic 55°</p>	<p>DNMG-HR</p>  <p>Roughing</p> <p>Page C - 402 Rhombic 55°</p>
<p>DNMM-RP</p>  <p>Roughing</p> <p>Page C - 402 Rhombic 55°</p>	<p>DNMX-02</p>  <p>Medium to Finishing</p> <p>Page C - 402 Rhombic 55°</p>	<p>DNMX-03</p>  <p>Medium</p> <p>Page C - 402 Rhombic 55°</p>	<p>DNMX-01</p>  <p>Roughing to Medium</p> <p>Page C - 402 Rhombic 55°</p>		
<p>KNUX-01</p>  <p>Finishing</p> <p>Page C - 404 Parallelogram 55°</p>	<p>KNUX-02</p>  <p>Medium</p> <p>Page C - 404 Parallelogram 55°</p>				
<p>RNMG-ST</p>  <p>Medium</p> <p>Page C - 406 Round R°</p>					

Vista genérica de pastilhas de torneamento negativas
 Vista general de plaquitas de torneado negativas






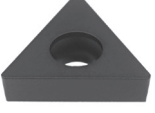

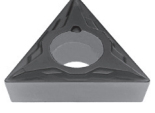
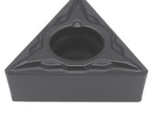


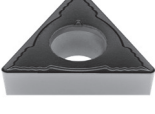
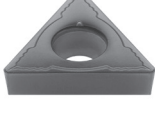

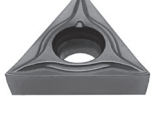









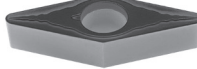










<p>SNMA</p>  <p>Roughing</p> <p>Page C - 408 Square 90°</p>	<p>SNMG-MF</p>  <p>Finishing</p> <p>Page C - 408 Square 90°</p>	<p>SNMG-SF</p>  <p>Medium to Finishing</p> <p>Page C - 408 Square 90°</p>	<p>SNMG-GS NEW</p>  <p>Medium</p> <p>Page C - 408 Square 90°</p>	<p>SNMG-MR</p>  <p>Medium</p> <p>Page C - 408 Square 90°</p>	<p>SNMG-PM</p>  <p>Medium</p> <p>Page C - 408 Square 90°</p>
<p>SNMG-ST</p>  <p>Medium</p> <p>Page C - 410 Square 90°</p>	<p>SNMG-SS</p>  <p>Roughing to Medium</p> <p>Page C - 410 Square 90°</p>	<p>SNMG-HR</p>  <p>Roughing</p> <p>Page C - 410 Square 90°</p>	<p>SNMM-RP</p>  <p>Roughing</p> <p>Page C - 410 Square 90°</p>	<p>SNMM-HY</p>  <p>Heavy to Roughing</p> <p>Page C - 412 Square 90°</p>	<p>SNMM-HZ</p>  <p>Heavy to Roughing</p> <p>Page C - 412 Square 90°</p>
<p>TNMA</p>  <p>Roughing</p> <p>Page C - 414 Triangular 60°</p>	<p>TNMG-MF</p>  <p>Finishing</p> <p>Page C - 414 Triangular 60°</p>	<p>TNMG-SF</p>  <p>Medium to Finishing</p> <p>Page C - 414 Triangular 60°</p>	<p>TNMG-LC</p>  <p>Medium to Finishing</p> <p>Page C - 414 Triangular 60°</p>	<p>TNMG-MS</p>  <p>Medium</p> <p>Page C - 414 Triangular 60°</p>	<p>TNMG-GS NEW</p>  <p>Medium</p> <p>Page C - 414 Triangular 60°</p>
<p>TNMG-MR</p>  <p>Medium</p> <p>Page C - 416 Triangular 60°</p>	<p>TNMG-PM</p>  <p>Medium</p> <p>Page C - 416 Triangular 60°</p>	<p>TNMG-ST</p>  <p>Medium</p> <p>Page C - 416 Triangular 60°</p>	<p>TNMG-MW</p>  <p>Medium wiper</p> <p>Page C - 418 Triangular 60°</p>	<p>TNMG-SS</p>  <p>Roughing to Medium</p> <p>Page C - 418 Triangular 60°</p>	<p>TNMG-HR</p>  <p>Roughing</p> <p>Page C - 418 Triangular 60°</p>
<p>TNMX-01</p>  <p>Medium to Finishing</p> <p>Page C - 418 Triangular 60°</p>		<p>VNMA</p>  <p>Roughing</p> <p>Page C - 420 Rhombic 35°</p>	<p>VNMG-MF</p>  <p>Finishing</p> <p>Page C - 420 Rhombic 35°</p>	<p>VNMG-SF</p>  <p>Medium to Finishing</p> <p>Page C - 420 Rhombic 35°</p>	<p>VNMG-LC</p>  <p>Medium to Finishing</p> <p>Page C - 420 Rhombic 35°</p>
<p>VNMG-MS</p>  <p>Medium</p> <p>Page C - 420 Rhombic 35°</p>	<p>VNMG-GS NEW</p>  <p>Medium</p> <p>Page C - 420 Rhombic 35°</p>	<p>VNMG-MR</p>  <p>Medium</p> <p>Page C - 420 Rhombic 35°</p>	<p>VNMG-PM</p>  <p>Medium</p> <p>Page C - 420 Rhombic 35°</p>	<p>VNMG-ST</p>  <p>Medium</p> <p>Page C - 420 Rhombic 35°</p>	<p>VNMG-SS</p>  <p>Roughing to Medium</p> <p>Page C - 420 Rhombic 35°</p>
<p>WNMA</p>  <p>Roughing</p> <p>Page C - 422 Trigon 80°</p>	<p>WNMG-MF</p>  <p>Finishing</p> <p>Page C - 422 Trigon 80°</p>	<p>WNMG-SF</p>  <p>Medium to Finishing</p> <p>Page C - 422 Trigon 80°</p>	<p>WNMG-LC</p>  <p>Medium to Finishing</p> <p>Page C - 422 Trigon 80°</p>	<p>WNMG-MS</p>  <p>Medium</p> <p>Page C - 422 Trigon 80°</p>	<p>WNMG-GS NEW</p>  <p>Medium</p> <p>Page C - 422 Trigon 80°</p>
<p>WNMG-MR</p>  <p>Medium</p> <p>Page C - 424 Trigon 80°</p>	<p>WNMG-PM</p>  <p>Medium</p> <p>Page C - 424 Trigon 80°</p>	<p>WNMG-ST</p>  <p>Medium</p> <p>Page C - 424 Trigon 80°</p>	<p>WNMG-MW</p>  <p>Medium wiper</p> <p>Page C - 424 Trigon 80°</p>	<p>WNMG-SS</p>  <p>Roughing to Medium</p> <p>Page C - 424 Trigon 80°</p>	<p>WNMG-HR</p>  <p>Roughing</p> <p>Page C - 424 Trigon 80°</p>

POSITIVE TURNING INSERTS OVERVIEW

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Negative inserts
Positive inserts
PCBN & PCD inserts
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Automatic Lathes
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<p>CCMW</p>  <p>Finishing</p> <p>Page C - 426 Rhombic 80°</p>	<p>CCMT-FP</p>  <p>Finishing</p> <p>Page C - 426 Rhombic 80°</p>	<p>CCMT-BO</p>  <p>Finishing</p> <p>Page C - 426 Rhombic 80°</p>	<p>CCMT-FM</p>  <p>Finishing</p> <p>Page C - 426 Rhombic 80°</p>	<p>CCMT-FK</p>  <p>Finishing</p> <p>Page C - 426 Rhombic 80°</p>	<p>CCMT-FW</p>  <p>Finishing wiper</p> <p>Page C - 428 Rhombic 80°</p>
<p>CCMT-LM</p>  <p>Medium to Finishing</p> <p>Page C - 428 Rhombic 80°</p>	<p>CCMT-MP</p>  <p>Medium</p> <p>Page C - 428 Rhombic 80°</p>	<p>CCMT-MM</p>  <p>Medium</p> <p>Page C - 428 Rhombic 80°</p>	<p>CCMT-MK</p>  <p>Medium</p> <p>Page C - 428 Rhombic 80°</p>	<p>CCMT-MW</p>  <p>Medium to Finishing wiper</p> <p>Page C - 428 Rhombic 80°</p>	
<p>CCGT-FS</p>  <p>Finishing to Fine finishing</p> <p>Page C - 430 Rhombic 80°</p>	<p>CCGT-LN</p>  <p>Medium to Finishing</p> <p>Page C - 430 Rhombic 80°</p>				
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<p>DCMT-MP</p>  <p>Medium</p> <p>Page C - 432 Rhombic 55°</p>	<p>DCMT-MM</p>  <p>Medium</p> <p>Page C - 434 Rhombic 55°</p>	<p>DCMT-MK</p>  <p>Medium</p> <p>Page C - 434 Rhombic 55°</p>	<p>DCMT-MW</p>  <p>Medium to Finishing wiper</p> <p>Page C - 434 Rhombic 55°</p>	<p>DCGT-FS</p>  <p>Finishing to Fine finishing</p> <p>Page C - 434 Rhombic 55°</p>	<p>DCGT-LN</p>  <p>Medium to Finishing</p> <p>Page C - 434 Rhombic 55°</p>
<p>RCMT-GS NEW</p>  <p>Medium</p> <p>Page C - 436 Round R°</p>	<p>RCMT-CP</p>  <p>Medium</p> <p>Page C - 436 Round R°</p>	<p>RCMT-ST</p>  <p>Roughing to Medium</p> <p>Page C - 436 Round R°</p>	<p>RCMT-RF</p>  <p>Roughing to Medium</p> <p>Page C - 436 Round R°</p>	<p>RCMT-RM</p>  <p>Roughing to Medium</p> <p>Page C - 436 Round R°</p>	
<p>RCMX-ST</p>  <p>Roughing to Medium</p> <p>Page C - 436 Round R°</p>	<p>RCMX-RM</p>  <p>Roughing to Medium</p> <p>Page C - 436 Round R°</p>	<p>RCMX-RR</p>  <p>Roughing to Medium</p> <p>Page C - 436 Round R°</p>		<p>RCGT-LN</p>  <p>Finishing to Fine finishing</p> <p>Page C - 438 Round R°</p>	
<p>SCMW</p>  <p>Finishing</p> <p>Page C - 440 Square 90°</p>	<p>SCMT-FP</p>  <p>Finishing</p> <p>Page C - 440 Square 90°</p>	<p>SCMT-FM</p>  <p>Finishing</p> <p>Page C - 440 Square 90°</p>	<p>SCMT-FK</p>  <p>Finishing</p> <p>Page C - 440 Square 90°</p>	<p>SCMT-MP</p>  <p>Medium</p> <p>Page C - 440 Square 90°</p>	<p>SCMT-MM</p>  <p>Medium</p> <p>Page C - 440 Square 90°</p>

Vista genérica de pastilhas de torneamento positivas
 Vista general de plaquitas de torneado positivas

<p>SCMT-MK</p>  <p>Medium</p> <p>Page C - 440 Square 90°</p>	<p>SCGT-LN</p>  <p>Medium to Finishing</p> <p>Page C - 440 Square 90°</p>		<p>SPUN</p>  <p>Medium to Finishing</p> <p>Page C - 442 Square 90°</p>	<p>SPMR-12</p>  <p>Finishing to Fine finishing</p> <p>Page C - 442 Square 90°</p>	<p>SPMR-13</p>  <p>Medium</p> <p>Page C - 442 Square 90°</p>
<p>TCMW</p>  <p>Finishing</p> <p>Page C - 444 Triangular 60°</p>	<p>TCMT-FP</p>  <p>Finishing</p> <p>Page C - 444 Triangular 60°</p>	<p>TCMT-FM</p>  <p>Finishing</p> <p>Page C - 444 Triangular 60°</p>	<p>TCMT-FK</p>  <p>Finishing</p> <p>Page C - 446 Triangular 60°</p>	<p>TCMT-FW</p>  <p>Finishing wiper</p> <p>Page C - 446 Triangular 60°</p>	<p>TCMT-MP</p>  <p>Medium</p> <p>Page C - 446 Triangular 60°</p>
<p>TCMT-MM</p>  <p>Medium</p> <p>Page C - 448 Triangular 60°</p>	<p>TCMT-MK</p>  <p>Medium</p> <p>Page C - 448 Triangular 60°</p>	<p>TCMT-MW</p>  <p>Medium to Finishing wiper</p> <p>Page C - 448 Triangular 60°</p>		<p>TCGT-FS</p>  <p>Finishing to Fine finishing</p> <p>Page C - 450 Triangular 60°</p>	<p>TCGT-LN</p>  <p>Medium to Finishing</p> <p>Page C - 450 Triangular 60°</p>
<p>TPUN</p>  <p>Medium to Finishing</p> <p>Page C - 452 Triangular 60°</p>	<p>TPMR-12</p>  <p>Finishing to Fine finishing</p> <p>Page C - 452 Triangular 60°</p>	<p>TPMR-13</p>  <p>Medium</p> <p>Page C - 452 Triangular 60°</p>			
<p>VBMW</p>  <p>Finishing</p> <p>Page C - 454 Rhombic 35°</p>	<p>VBMT-FP</p>  <p>Finishing</p> <p>Page C - 454 Rhombic 35°</p>	<p>VBMT-FM</p>  <p>Finishing</p> <p>Page C - 454 Rhombic 35°</p>	<p>VBMT-FK</p>  <p>Finishing</p> <p>Page C - 454 Rhombic 35°</p>	<p>VBMT-MP</p>  <p>Medium</p> <p>Page C - 454 Rhombic 35°</p>	<p>VBMT-MM</p>  <p>Medium</p> <p>Page C - 454 Rhombic 35°</p>
<p>VBMT-MK</p>  <p>Medium</p> <p>Page C - 454 Rhombic 35°</p>					
<p>VCMW</p>  <p>Finishing</p> <p>Page C - 456 Rhombic 35°</p>	<p>VCMT-FP</p>  <p>Finishing</p> <p>Page C - 456 Rhombic 35°</p>	<p>VCMT-FM</p>  <p>Finishing</p> <p>Page C - 456 Rhombic 35°</p>	<p>VCMT-FK</p>  <p>Finishing</p> <p>Page C - 456 Rhombic 35°</p>	<p>VCMT-MP</p>  <p>Medium</p> <p>Page C - 456 Rhombic 35°</p>	<p>VCMT-MM</p>  <p>Medium</p> <p>Page C - 456 Rhombic 35°</p>
<p>VCMT-MK</p>  <p>Medium</p> <p>Page C - 456 Rhombic 35°</p>		<p>VCGT-FS</p>  <p>Finishing to Fine finishing</p> <p>Page C - 458 Rhombic 35°</p>	<p>VCGT-LN</p>  <p>Medium to Finishing</p> <p>Page C - 458 Rhombic 35°</p>		

TURNING GRADES | Graus de torneamento | Calidades para torneado

	1	5	10	15	20	25	30	35	40	45	50		
P STEEL			PH7910									PVD	
				PH7920									
			PHG105										CVD
				PHG115									
				PH5115									
						PHG125							
							PH5125						
							PHG140						
							PH5740						
M STAINLESS SEEL			PHH910 <small>NEW</small>									PVD	
			PH7910										
				PHH920 <small>NEW</small>									
				PH7920									CVD
				PHS215									
					PHS225								
							PHS240						
K CAST IRON			PH5705									CVD	
			PH5320										
			PH5740										
			PBH920									PCBN	
				PBY930 <small>NEW</small>									
				PBY940 <small>NEW</small>									

TURNING GRADES | Graus de torneamento | Calidades para torneado

	1	5	10	15	20	25	30	35	40	45	50	
N ALUMINIUM & NON FERROUS		PH0910										UNCOTED
		PDP410										PCD
		PDP403										
S HEAT RESISTENT / TITANIUM ALLOYS		PHH910	NEW									PVD
		PH7910										
					PHH920	NEW						PCBN
					PH7920							
						PBH920	NEW					
		PBY603	NEW									
H HARDENED MATERIALS	PBY603	NEW										PCBN
			PBY620	NEW								
					PBH920	NEW						
					PBY930	NEW						
					PBY940	NEW						

- TURNING
- Insert selection
- Overview
- Negative inserts
- Positive inserts
- PCBN & PCD inserts
- Heavy turning
- External Toolholders
- Internal Toolholders
- Automatic Lathes
- Spare Parts
- Technical Data

TURNING GRADES DESCRIPTION

PVD GRADES

PHH...

A thin PVD coating. 1st choice for finishing operations stainless steels and HRSA.



PHH910 NEW
M05-M10
S05-S15

An hard micro grain substrate combined with a thin optimized nanostructure PVD coating with excellent heat dissipation

The solution for Stainless steel and HRSA from medium turning to finishing.
For continuous to semi-interrupted turning.
First choice for HRSA.

PHH920 NEW
M10-M25
S15-S30

A micro grain substrate combined with a thin optimized nanostructure PVD coating with excellent heat dissipation

Solution for general turning of stainless steels and HRSA.



PH7...

A thin PVD coating recommended for finishing operations on steels and suitable for stainless steels and HRSA. Work well on "gummy" materials.



PH7910
P05-P10
M05-M10
S05-S15

PH7920
P10-P35
M10-M25
S15-S30

CVD GRADES

PHS...

A medium temperature CVD coating with great adhesion and great heat dissipation properties. 1st choice for machining stainless steels.



PHS215
M10-M25

Suitable for high to medium cutting speeds in stainless steel. Ideal for turning on good condition of cut (continuous cut).

PHS225
M15-M30

First choice for general application on turning of stainless steel.

PHS240
M25-M45

First choice for roughing to heavy roughing operations with interrupted cut at medium to low cutting speeds on stainless steel.



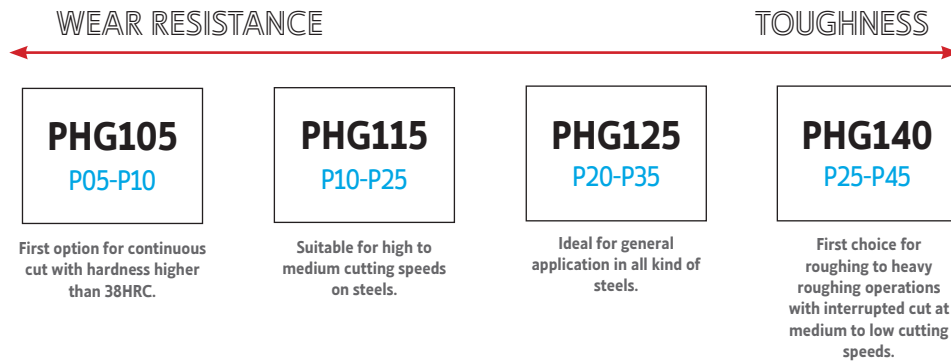
PH0910

Uncoated carbide micro-grain grade combining a good abrasive wear resistance and toughness. Suitable for rough to finish operations of aluminum alloys.

PH0910
N01-N20

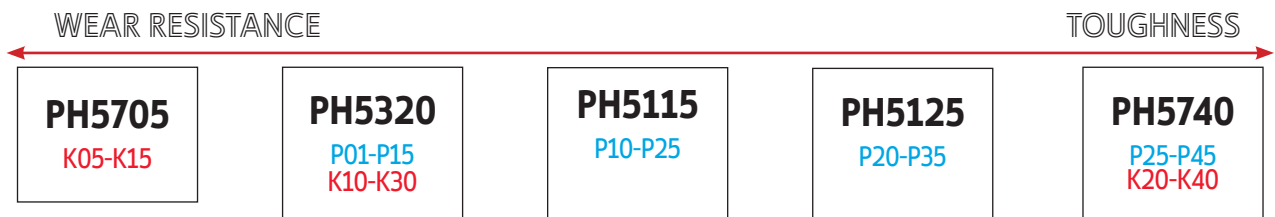
PHG...

A medium temperature CVD coating with great adhesion and great wear protection. 1st choice for machining steels.



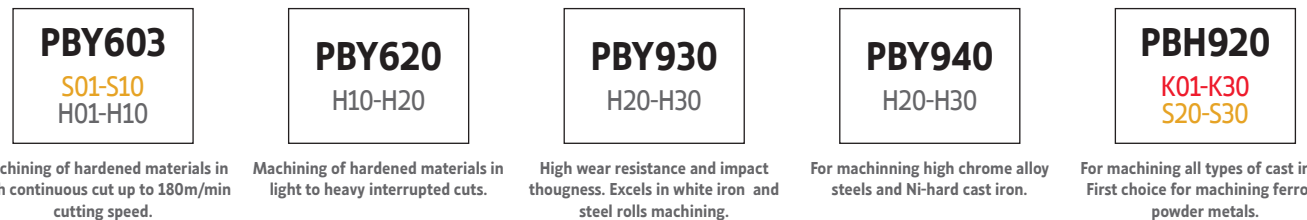
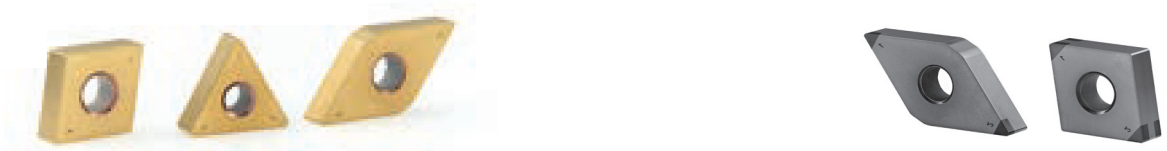
PH5...

A thick CVD coating with smooth surface. 1st choice for machining cast irons.



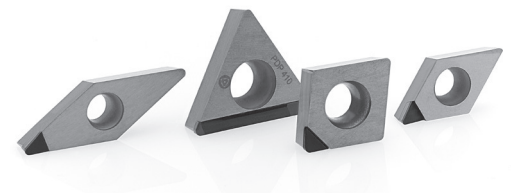
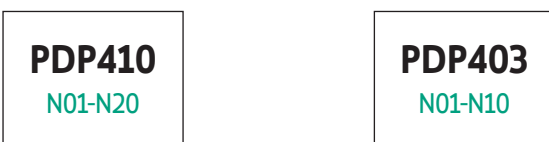
PCBN

PCBN insert excel in the finishing and semi-finishing process of hardened steels as well as hard cast iron and HRSA.



PCD

PCD insert are an achievement of extreme significance for the machining of Non-Ferrous Materials, such as high-silicon aluminium, metal matrix composites (MMC) and carbon fiber reinforced plastics (CFRP).



General purpose Fine surface finishing. <14% silicon aluminium alloy

Highest abrasion resistance Bimodal grain structure for increased diamond percentage content. >14% silicon aluminium alloy

GRADES COMPARATIVE CHART

PVD COATED GRADES | GRAUS REVESTIDOS A PVD | CALIDADES CON RECUBRIMIENTO PVD

ISO	Palbit	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Tungaloy	Walter	Kyocera	Taegutec	Korloy	Ceratizit
Material													
P	P01	PH7910								PR915 PR1005	PV3030	PC8110	
	P10	PH7910	GC1525 GC1025	KC5010 KC5510 KU10T	IC250 IC350 IC507 IC570 IC807 IC907 IC908	CP200 TS2001	VP10MF	AH710		PR915 PR1005 PR930 PR1025 PR1115 PR1225 PR1425	PV3010 PV3030 TT7080 TT1040	PC230	
	P20	PH7920	GC1525 GC1025 GC1125	KC5025 KC5525 KC7215 KC7315 KU25T	IC228 IC250 IC308 IC328 IC350 IC354 IC507 IC528 IC570 IC807 IC808 IC907 IC908 IC928 IC1008 IC1028 IC3028	CP250 TS2500	VP10RT VP20RT VP15TF VP20MF	AC520U	AH710 AH725 AH120 SH730 GH730 GH130	PR930 PR1025 PR1115 PR1225	TT7220 TT9020 TT7080 TT9080 TT7070	PC5300 PC8115	SR226 GM127
	P30	PH7920	GC1025 GC1125	KC7015 KC7020 KU25T KC7235	IC228 IC250 IC328 IC330 IC354 IC528 IC1008 IC1028 IC3028	CP500	VP10RT VP20RT VP20MF	AC530U	AH725 AH120 SH730 GH730 GH130 AH740 J740		TT9030 TT7030 TT7080 TT9030 TT9080	PC8115	GM40 CTP1235 CTP2235 SR226 GM127
STEEL	M01	PH7910	GC1005		IC520	TS2000 CP200	VP10MF		WSM10	PR915	TT5080		
	M10	PH7910	GC1005 GC1025 GC1125 GC1105	KC5010 KC5510 KC6005 KC6015	IC330 IC354 IC507 IC520 IC570 IC807 IC907 IC3028	CP200 TS2000	VP10MF	AH710	WSM20	PR915 PR1025 PR1225 PR1425	TT5030 PV3010 PV3030 TT9030	PC8110 PC9030	
	M20	PH7920	GC1005 GC1025 GC1125 GC1105	KC5025 KC5525 KC7020 KC7025	IC250 IC330 IC354 IC808 IC908 IC1008 IC1028 IC3028	CP250 TS2500 CP500	VP10RT VP20RT VP15TF VP20MF	AC520U	WSM30	PR1025 PR1125 PR1225 PR915 PR930	TT5030 PV3030 TT9020 TT9030	PC9030 PC8115	CTP2120 CTP1235 SR226 GM127
	M30	PH7920	GC1125 GC2035	KC7030 KC7225	IC228 IC250 IC328 IC330 IC1008 IC1028 IC3028	CP500	VP10RT VP20RT VP15TF VP20MF MP7035	AC520U AC530U	GH330 AH725 AH120 AH730 GH730 GH130 J740 AH645	PR1125	TT9030 TT9080 TT8030	PC9030	CTP2240 CTP1235 CTP2235 SR226 GM127
STAINLESS STEEL													

PH7910 = Best available choice

ISO		Palbit	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Tungaloy	Walter	Kyocera	Taegutec	Korloy	Ceratizit
Material														
S	S01	PH7910 PHH910			IC507 IC907		MP9005 VP05RT		AH905 AH905 SH730	WDSM10	PR915		PC8110	
	S10	PH7910 PHH910	GC1105 GC1005 GC1025	KC5010 KC5410 KC5510	IC507 IC903 IC300 IC808	CP200 CP250 TS2000 TS2500 CP250	MP9015 VP10RT MP9015	AC510U	AH110 AH120	WSM20	PR915	TT5030 TT5030	PC8110 PC8115 PC8105	CM40 SR226 CM45
	S20	PH7920 PHH920	GC1025 GC1125	KC5025 KC5525	IC908 IC928 IC3028 IC806	TS2500 CP500	MT9015 VP20RT	AC510U AC520U	AH120 AH720	WSM30	PR1125	TT8020 TT8030	PC8815 PC5300	CTP2440 GM127
	S30	PH7920 PHH920	GC1125				VP15TF	AC520U	AH725		PR1125	TT8020	PC5400	CTP2135

PHH910 = Best available choice



TURNING

Insert selection

Overview

Negative inserts

Positive inserts

PCBN & PCD inserts

Heavy turning

External Toolholders

Internal Toolholders

Automatic Lathes

Spare Parts

Technical Data

GRADES COMPARATIVE CHART

CVD COATED GRADES | GRAUS REVESTIDOS A CVD | CALIDADES CON RECUBRIMIENTO CVD

ISO	Palbit	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Tungaloy	Walter	Kyocera	Taegutec	Korloy	Ceratizit	
Material														
P	P05	PHG105	GC4205 GC4005	KCP05 KC9105	IC9150 IC8150 IC428	TP0500 TP1500	UE6105	AC810P AC700G	T9105 T9005	WPP01	CA510 CA5505	TT1300	NC3010	
	P10	PHG105 PH5115 PHG115	GC4315 GC4215 GC4015 GC4325	KCP10B KCP10 KCP25 KCP110	IC9150 IC9015 IC8150 IC8250	TP1500 TP2500	UE6105 MC6015 UE6110 MY5015	AC810P AC700G AC820P AC2000	T9105 T9005 T9115	WPP01 WPP05	CA5510 CA5505 CA515 CA5515	TT1300 TT7310 TT7400	NC3215	CTC1110 CTC1115 CTC3110 TCC410
	P20	PH5115 PHG115 PH5125 PHG125	GC4315 GC4215 GC4015 GC4325 GC4225 GC4025	KCP25B KCP25 KCP125	IC9015 IC8250 IC9050 IC9250 IC8350	TP2500	MC6015 UE6110 MC6025 UE6020 MY5015	AC820P AC2000 AC830P	T9115 T9125	WPP10S WPP20S	CA515 CA5515 CA525 CA5525 CR9025	TT3500 TT5100 TT7400 KT7300 TT7800	NC3220 NC3220 NC3120	CTC1110 CTC1115 CTC1125 CTC1130 CTC1425
	P30	PH5125 PHG125	GC4325 GC4225 GC4025 GC4235 GC4035	KCP30 KCP40 KCP8050	IC8350 IC9250 IC9350	TP3500 TP3000	MC025 UE6020 UE6035 UH6400	AC830P AC630M	T9125 T9135 T9035	WPP30S	CA525 CA5525 CA530 CA5335 CR9025	TT3500 TT5100 TT7400 KT7300	NC3215 NC3225 NC3120	CTC1125 CTC1130 CTC1135 CTC1425
	P40	PHG140 PH5740	GC4235 GC4035	KCP30 KCP40 KC9040 KC9240 KC9245	IC9350	TP3500 TP3000	UE6035 UH6400	AC630M	T9135 T9035		CA530 CA5535	TT5100 TT7100 KT7300 TT7800	NC500H NC5330	CTC1135 CTC1435 CTC2135
	M	M10	PHS215	GC2015	KCM15	IC9250 IC6015 IC8250	TM2000	MC7015 US7020	AC610M	T9115	WAM20	CA6515		NC9020
M20		PHS215 PHS225	GC2015	KCM15 KC9225	IC9250 IC6015 IC9025 IC656	TM2000	MC7015 US7020 MC7025	AC610M AC6030M AC630M	T6020 T9125		CA6515 CA6525	TT5100	NC9020	CTC1115 CTC1125 CTC1130 CTC1135
M30		PHS225 PHS240	GC2025	KCM25 KC9230	IC9350 IC6025 IC635	TM4000	MC7025 US735	AC6030M AC630M	T6030		CA6525	TT5100 TT7100	NC9025	CTC1125 CTC1135 CTC1425 CTC1435 CTC2135
M40		PHS240	GC2025	KCM35 KC9240 KC9245	IC6025 IC9350	TM4000	US735	AC6030M AC630M				TT7100	NC9025	CTC2135
M50		PHS228	GC2035	KC9245	IC9350								NC9035	
K	K05	PH5705	GC3205 GC3210	KCK05	IC5005 IC9007	TH1500 TK1001 TK1000	MC5005 UC5105	AC405K AC410K	T5105	WAK10	CA4505 CA4010			
	K10	PH5705 PH5320	GC3205 GC3210 GC3215	KCK15B KCK15B KC920 KC9315	IC5005 IC5010 IC9150 IC428 IC4028	TK1001 TK1000 TK2000 TK2001	MC5015 UC5115 MY5015	AC405K AC410K AC415K AC420K AC700G	T5115	WAK20	CA4515 CA4110 CA4115	TT3100 TT7310 TT8115	NC6205 NC6210 NC6215	CTC1110 CTC1115 CTC3110 TCC410 CTC3215
	K20	PH5320	GC3215	KCK20 KC9110 KC9325	IC5010 IC8150 IC9150 IC9015 IC418	TK2001 TK2000	MC5015 UC5115 UE6110 MY5015	AC415K AC420K AC700G AC820P	T5115 T5125	WAK30	CA4515 CA4115 CA4120	TT7310 TT8115	NC6215	CTC1115 CTC1125 CTC1130 CTC1425 CTC3215
	K30	PH5740		KC9125 KC9325	IC9015 IC418		UE6110	AC820P	T5125					TSC30

UNCOATED GRADES | GRAUS NÃO REVESTIDOS | CALIDADES SIN RECUBRIMIENTO

ISO		Palbit	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Tungaloy	Walter	Kyocera	Taegutec	Korloy	Ceratzit
Material														
ALUMINIUM	N01	PH0910	H10		IC20				KS05F	WK1	KW10	K10		
	N10		H10 H13A	KU10 K313 K68	IC20 IC08 IC28	890 HX KX	HTi10		TH10	WK1	KW10 KWK15	K10	H01	
	N20		H10 H13A	KU10 K313 K68	IC08 IC28	HX KX 883		H1	KS15F	WK1	KW10 KWK15		H01	

- TURNING
- Insert selection
- Overview
- Negative inserts
- Positive inserts
- PCBN & PCD inserts
- Heavy turning
- External Toolholders
- Internal Toolholders
- Automatic Lathes
- Spare Parts
- Technical Data

CHIP BREAKER COMPARATIVE CHART | Tabela de equivalências de quebra-apanas | Tabla de comparación de rompevirutas
 NEGATIVES | NEGATIVAS | NEGATIVAS

Application		Palbit	Sandvik	Kennametal	Iscar	Seco	Tungaloy	Mitsubishi	Sumitomo	Walter	Kyocera	Taegutec	Korloy	Ceratizit
Mat.	Operations													
STEEL	Finishing	MF	QF	FS, LF	SF, PP TF		O1 TF	PK FH	FA		DP	FA	VF, HU	
	Medium to Finishing	MF, LC	PF, QF, LC MF, R/L-K	FF, FN	F3P, NF, SF	FF2, FF1	TS, TSF, ZF 11, NS, AS, TQ, NM, CB, C	SA, FY, C, SH, MP	SU, FL, SE, SX	NF3, NS6	PQ, VFCJ PQ, GP, PP, HQ, GS, CQ	FG, VF, EA FC, MC, ML, MP	VL	CF, TF
	Medium Wiper	MW*	WL, WF, WMX WM, WR	FW, MW, RW	WF, WG	W-MF2, W-MF3	AFW, FW, ASW, SW		SW	LUW, SEW, GUW	NF, NM	WP, WQ	WS, WT	TFQ, TMQ
	Medium to Roughing	PM, MR, GR, MA	PM, QM, XM, XRM	P, MN	M3P, M3M, PP, TF, GN	MR7, MR6, M5, M6	TM, AM, DM, ZM All-round	MA, MH, MP	GU GE, UX	NMT, NM4	HS, PT, GT, CS, PS	PC, MT MC, MG-	VM	TMF, TMM M50
	Roughing	HR, RP", GR, MA	HM, PR MR	RN, RP MR	NR MR	MR6, R5	TH, THS	RP, GH HZ, HL	MU, ME HG	NM5, NM6 NM9	PH All-round	RT	GR, HR	TM, TRM
	Heavy Roughing	RP", HY", HZ"	PR, MR, HR, QR	RM RH	R3P, NM	R4, RR6	TU, TRS, TUS	HM, HX HV	HG, HP HU, HW HF	NR6, NRF NRR	PX	HT, HD RX, RH HY, HZ	GH, VT	TRR, TR, R28, R58 R88
STAINLESS STEEL	Finishing	SF, GS	MF, SM, XF, LC, R/L-K	FP	TF, VL	FF2, FF1, MF1	SF, SA, SS	GM, MS, SH, LM	EX, EG, SU, EF	NF4 NMS	GU, MQ	EA, SF, SU, FG	VP2	CF, F30 M34 F32, TF
	Medium	MS, SF, GS	MM, QM, SM XM, XRM	MP, P	M3M, PP	MF2, FF2, MF5	SM S	MM, MA ES	GU HM	NM4	TK MU	EM, ET	VP3, HS	TMF, M42 M30, M52
	Roughing	SS, RP, HZ"	MR HM, PR	UP, RP	MR, MH	M5, M6, R8, RS, R6	TH, SH, TU	GH, RM, HZ	EM, MU	NR4, NRT, NRS	MS	"GR, VM, VH, GH"	TM, M60, TRM, TMR, TRR R80	
CAST IRON	Medium to Finishing	ST	KF, XF	FN	GN	M4, M5	CF	LK, MA	UZ		C	FG	B25	CF
	Medium	ST, HR, FLAT	KM, QM, XM, XRM	RP, UN		FLAT	CM All-round	MK GK	GZ	NM5	ZS All-round	MT MG	FLAT	M50
	Roughing to Heavy Roughing	HR, FLAT, HZ"	KR Without chipbreaker	Without chipbreaker		MR7, M5	CH Without chip-breaker	RK Without chip-breaker	Without chip-breaker	Without chip-breaker	GC Without chip-breaker	RT	GR	TMR, TR R28, R58, R88
ALUMINIUM	Medium	MS	MF, QM	MS, MP MG	PP	-	P		AX		AH, A3	ML	HA	F32
HIRSA	Finishing	GS, SF, MS	SF, SM O1	FS, LS MS		MF1, M1	HRF	FJ, LS	EF EX	NFT NF4	MQ	SF	VP1	
	Medium	SF, SS, DOMX	MM, QM SMR	UP, P, NGP RP	PP	MR3, MR4	HRM, HMM, SA	MS RS GJ	EG MU	NMS NM4, NRS, NR4	TK MS MU	SU	VP2, VP3	M34, M52

MS = Best available choice

*=Wiper

"= Single face insert

CHIP BREAKER COMPARATIVE CHART | Tabela de equivalências de quebra-apanas | Tabla de comparación de rompevirutas
 POSITIVES | POSITIVAS | POSITIVAS - CLEARANCE ANGLE 5°, 7° AND 11° *

Application		Palbit	Sandvik	Kennametal	Iscar	Seco	Tungaloy	Mitsubishi	Sumitomo	Walter	Kyocera	Taegutec	Korloy	Ceratizit
Mat.	Operations													
STEEL	Fine Finishing	FS	UM	UF	SF	F1, MF2	01	FV, SMG	FC, FW	PF2	CF, CK	FA	HFP	F32
	Finishing	FS, FP	R/L-K, PF, XF, UF	11, GM, LF	PF, SM, 14, 17, 19, XL	FF1, F2, M3, MF2	PSF, PF, SS, PS, PSS, TS	FP, FV, SV, LP	FP, FZ, LU, FK, SS, SC, SU, SK, SF	PF5, PF4, PS5	CQ, GK, GP, HQ, XP, XQ	FG, GF	VF, VL, F	SF, SMF, SMQ
	Finishing Wiper	FW*	WF	FW	WF	W-F1	TSW, W08	SW	LUW, SDW	PF				
	Finishing to Medium	MP	PM	MF, MP, GM, MR	DT, HQ	MF2	PM, 23, 24 RS	MP, MV	SU, UM, UJ	PM5	VF, MF	MT, PC	HMP, C25, M.CMX	SM
	Finishing to Medium Wiper	MW*	WM	MW	WG			MW		PM		WT		
STAINLESS STEEL	Fine Finishing	FS	UM	LF, GM	SM	F1, MF2, FF1	PSF	FJ	FC	PF2	GQ, GF	FG	HFP	
	Finishing	FS, FM, LM	MF, UF, R/L-K	MF	PF, 14	F2, M3	SS, PSS	FM, FV, SV	SU	PF4	MQ	FA	VF, F	SF, SMF, SMQ
	Finishing Wiper	FW*	WF	FW	WF	W-F1		SW		PF				
	Finishing to Medium	MM, LM	MM, XM	MF, MP	SM	MF2, M5	PM	MM, MV	UM	PM5	XQ, VF	MT, PC	HMP, C25, M	F23, F43, SM
	Finishing to Medium Wiper	MW*	WM	MW	WG			MW		PM		WT		
CAST IRON	Finishing	FK	KF	11	PF	M3		FV	SK		GK	FA	HMP	SF
	Finishing Wiper	FW*	WF	FW	PF	W-F1		SW	LUW	PF		MT, PC		
	Finishing to Medium	MK, FLAT	KM, KR	MF, MP, FLAT	PM5, 19, FLAT	M5	CM, FLAT	MV, MK, FLAT	UM, FLAT	PM5, PS5	FLAT	FALT	C25, HMP, FLAT	25P, 27, 29
	Finishing to Medium Wiper	MW*	WM	MW		W-F2		MW		PM		WT		
ALUMINIUM	Medium	LN	AL	HP, GT	AF, AS	AL	AL, PP	AZ, R/L-F	AG, AX, AY	PF2, PM2	AH, A3	FL	AK, AR	23P, 25P, 27
HRSA	Fine Finishing	FS	UM	LF	SM	F1, MF2	PSF, PF, SS, PS, PSS, TS	FJ	FC	PF2	GQ		HFP	SF
	Finishing	FM, LM	MF, UF, R/L-K	GM	PF, 14	F1	PSS, PS	FV	FX, FY	PF4	MQ	FA	HFP	F23, F43, SM
	Finishing Wiper	FW*	WF	FW	WF					PF				
	Finishing to Medium	MM, LM	MM, XM	MF	SM		PM	MV	SI	PM5	MQ	FG	HMP	SM, 25P, 29
	Finishing to Medium Wiper	MW*	WM	MW	WG					PM				
Medium to Roughing	GS													

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CHIP BREAKER SPECIFICATIONS

NEGATIVES | NEGATIVAS | NEGATIVAS

Insert Type	Application	Tolerance Class	Major field of Application	Geometry	Cutting Edge*		Cutting Conditions**		Available Shapes								
					at the nose radius	at the flank	Feed Fn (mm/rev)	Depth of cut DOC (mm)	KN __	CN __	DN __	RN __	SN __	TN __	VN __	WN __	
Knux's	Finishing	U	P M K	01			0,20 to 0,35	1,00 to 6,00									
	Medium	U	P M K	02			0,40 to 0,70	1,50 to 6,00									
NEGATIVES - double side	Medium Finishing	M	P M	01			0,12 to 0,50	1,00 to 6,50									
	Roughing to Medium	M	P M	02			0,14 to 0,50	0,70 to 5,00									
	Medium Finishing	M	P M	03			0,15 to 0,50	0,80 to 6,00									
		M	P M	MF			0,05 to 0,60	0,10 to 2,50									
	Medium Finishing	M	M N S	MS			0,10 to 0,80	0,20 to 4,50									
	Medium Finishing		M S	NEW GS			0,10 to 0,60	0,40 to 2,00									
	Medium Finishing	M	M S	SF			0,10 to 0,55	0,60 to 3,00									
	Medium Finishing	M	P	LC			0,07 to 0,50	0,60 to 3,00									
	Medium Finishing	M	K	ST			0,10 to 0,50	0,15 to 10,50									
	Medium Finishing	M	P	MR			0,10 to 0,70	0,30 to 9,00									

* T-Land varies according to the IC (IC reference used: 12,7mm)

** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

NEGATIVES | NEGATIVAS | NEGATIVAS

Insert Type	Application	Tolerance Class	Major field of Application	Geometry	Cutting Edge*		Cutting Conditions**		Available Shapes							
					at the nose radius	at the flank	Feed Fn (mm/rev)	Depth of cut DOC (mm)	KN __	CN __	DN __	RN __	SN __	TN __	VN __	WN __
NEGATIVES - double side	Medium Finishing	M	P	PM			0,10 to 0,60	0,30 to 9,00								
	Medium Finishing	M	K	Flat			0,08 to 2,50	0,10 to 15,00								
	Medium Wiper	M	P M K	MW			0,15 to 0,90	0,30 to 6,00								
	Roughing to Medium roughing	M	M S	SS			0,10 to 1,00	0,30 to 8,50								
	Roughing to Medium roughing	M	P NEW	MA			0,30 to 0,70	1,20 to 8,00								
	Roughing	M	P M K	HR			0,20 to 1,20	0,80 to 15,00								
NEGATIVES - Single side	Roughing to Medium roughing	M	P NEW	GR			0,20 to 1,50	0,80 to 8,00								
	Roughing	M	P M	RP			0,30 to 1,50	2,00 to 12,00								
	Heavy Roughing to Roughing	M	P M	HY			0,35 to 1,60	2,00 to 15,00								
	Heavy Roughing	M	P K	HZ			0,35 to 1,60	2,40 to 17,00								

* T-Land varies according to the IC (IC reference used: 12,7mm)

** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

CHIP BREAKER SPECIFICATIONS

POSITIVES | POSITIVAS | POSITIVAS

Insert Type	Application	Tolerance Class	Major field of Application	Geometry	Cutting Edge*		Cutting Conditions**		Available Shapes						
					at the nose radius	at the flank	Feed F _n (mm/rev)	Depth of cut DOC (mm)	CC ___	DC ___	RC ___	SC ___	TC ___	VC ___	VB ___
									80°	55°		90°	60°	35°	35°
POSITIVES - Clearance angle 5° and 7°	Fine Finishing	M	P	FP			0,03 to 0,45	0,06 to 2,40							
			M	BO			0,05 to 0,30	0,30 to 1,50							
		M	M	FM			0,03 to 0,45	0,06 to 2,40							
			S				0,03 to 0,30	0,06 to 2,40							
	Fine Finishing wiper	M	P	FW			0,05 to 0,50	0,30 to 3,50							
			M				0,05 to 0,50	0,30 to 3,50							
	Finishing	M	M	LM			0,08 to 0,35	0,20 to 3,00							
			S				0,08 to 0,35	0,20 to 3,00							
	Finishing to fine finishing	G	P	FS			0,01 to 0,25	0,10 to 3,00							
			M				0,01 to 0,25	0,10 to 3,00							
	Medium	M	K	Flat			0,04 to 0,80	0,05 to 6,30							
			P	MP			0,06 to 0,60	0,19 to 3,60							
Medium	M	M	MM			0,06 to 0,60	0,19 to 3,60								
		S				0,06 to 0,60	0,19 to 3,60								
Medium	M	K	MK			0,06 to 0,60	0,19 to 3,60								
						0,06 to 0,60	0,19 to 3,60								

* T-Land varies according to the IC (IC reference used: 12,7mm)
 ** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

POSITIVES | POSITIVAS | POSITIVAS

Insert Type	Application	Tolerance Class	Major field of Application	Geometry	Cutting Edge*		Cutting Conditions**		Available Shapes							
					at the nose radius	at the flank	Feed Fn (mm/rev)	Depth of cut DOC (mm)	CC __	DC __	RC __	SC __	TC __	VC __	VB __	
									80°	55°		90°	60°	35°	35°	
POSITIVES - Clearance angle 5° and 7°	Finishing Wiper	M	P M K S	MW			0,10 to 0,50	0,50 to 4,00								
	Medium	M	P M S	CP			0,04 to 0,17	0,50 to 2,40								
	Medium to finishing		P M	RF			0,25 to 2,50	2,50 to 10,00								
	Roughing to Medium		M	P M K	ST			0,05 to 3,20	0,80 to 12,80							
				P M K	RM			0,80 to 2,50	3,20 to 13,00							
				P M	RR			0,80 to 2,50	3,20 to 13,00							
Medium to Roughing	M	M S	GS			0,05 to 4,00	0,40 to 5,00									

* T-Land varies according to the IC (IC reference used: 12,7mm)
 ** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

Insert Type	Application	Tolerance Class	Major field of Application	Geometry	Cutting Edge*		Cutting Conditions**		Available Shapes	
					at the nose radius	at the flank	Feed Fn (mm/rev)	Depth of cut DOC (mm)	CC __	DC __
									80°	55°
POSITIVES - Clearance angle 11°	Medium to Finishing	U	P M K S	Flat			0,05 to 2,20	1,00 to 10,00		
	Finishing to Fine Finishing	M	P M K	12			0,03 to 0,55	0,10 to 3,00		
	Medium	M	P M	13			0,03 to 0,55	0,20 to 7,00		

* T-Land varies according to the IC (IC reference used: 12,7mm)
 ** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

ISO	Material	Grade fn (mm/r) HB (brinell)	CVD Coating																	
			← Wear Resistance												Toughness →					
			PHG105			PH5115			PHG115			PH5125			PHG125					
			0.2	0.4	0.8	0.2	0.4	0.8	0.2	0.4	0.8	0.2	0.4	0.8	0.2	0.4	0.8			
	Unalloyed steel	125-170	280-380	210-300	200-250	240-340	170-260	160-210	250-350	180-270	170-220	190-285	160-230	140-205	200-295	170-240	150-215			
	Low-alloy steel	180-350	220-280	200-260	170-210	180-240	160-220	130-170	190-250	170-230	140-180	160-220	130-200	110-180	170-230	140-210	120-190			
	High-alloy steel	200-325	165-250	150-235	140-230	125-210	110-195	100-190	135-220	120-205	110-200	115-205	100-175	90-160	125-215	110-185	100-170			
P	Material	Grade fn (mm/r) HB (brinell)	CVD Coating									PVD Coating								
			← Wear Resistance						Toughness →			← Wear Resistance						Toughness →		
			PHG140			PH5740			PH7910			PH7920								
			0.2	0.4	0.8	0.2	0.4	0.8	0.2	0.4	0.8	0.2	0.4	0.8						
	Unalloyed steel	125-170	135-230	120-210	115-200	125-220	110-200	105-190	140-245	130-225	115-220	130-230	120-220	110-210						
	Low-alloy steel	180-350	125-205	105-185	95-185	115-195	95-175	85-175	130-230	125-225	125-215	125-220	115-210	100-200						
	High-alloy steel	200-325	105-205	75-175	50-135	95-195	65-165	40-125	-	-	-	-	-	-						

ISO	Material	Grade fn (mm/r) HB (brinell)	CVD Coating											
			← Wear Resistance							Toughness →				
			PHS215			PHS225			PHS240					
			0.2	0.4	0.6	0.2	0.4	0.6	0.2	0.4	0.6			
	SS - Ferritic/martensitic	200-330	125-260	100-220	80-200	115-230	90-180	70-160	110-230	85-175	70-140			
	SS - Austenitic	180-330	120-255	95-215	75-195	110-225	85-175	65-155	105-225	80-170	65-135			
	SS - Austenitic-ferritic (Duplex)	230-260	110-245	85-205	65-185	100-215	75-165	55-145	95-215	70-160	55-125			
M	Material	Grade fn (mm/r) HB (brinell)	PVD Coating											
			← Wear Resistance									Toughness →		
			PH7910			PHH910			PH7920			PHH920		
			0.2	0.4	0.6	0.2	0.4	0.6	0.2	0.4	0.6	0.2	0.4	0.6
	SS - Ferritic/martensitic	200-330	120-220	110-210	105-205	130-230	120-220	115-215	110-210	100-200	95-195	120-220	110-210	105-205
	SS - Austenitic	180-330	115-215	105-205	95-195	125-225	115-215	105-205	105-205	95-195	85-185	115-215	105-205	95-195
	SS - Austenitic-ferritic (Duplex)	230-260	105-202	100-195	90-185	115-212	110-205	100-195	95-192	90-185	80-175	105-202	100-195	90-185

ISO	Material	Grade fn (mm/r) HB (brinell)	CVD Coating								
			← Wear Resistance						Toughness →		
			PH5705			PH5320			PH5740		
			0.2	0.4	0.6	0.2	0.4	0.6	0.2	0.4	0.6
K	Marble cast iron	130-230	160-360	140-280	120-235	150-330	130-240	110-220	110-230	100-215	100-190
	Grey cast iron	180-220	220-380	190-330	150-290	200-330	170-280	150-230	150-230	140-220	110-210
	Nodular cast iron	160-380	150-280	135-265	120-220	140-250	125-230	110-220	125-220	115-205	105-185

ISO	Material	Grade fn (mm/r) HB (brinell)	Uncoated	
			PH0910	
			0.15	0.8
N	Aluminium alloys	60-130	375-2400	40-240
	Cooper and cooper alloys	90-110	375-630	35-65

ISO	Material	Grade fn (mm/r) HB (brinell)	PVD Coating											
			← Wear Resistance									Toughness →		
			PH7910			PHH910			PH7920			PHH920		
			0.1	0.3	0.5	0.2	0.4	0.6	0.1	0.3	0.5	0.2	0.4	0.6
S	Heat resistant super alloys (Iron base)	200-280	65-140	60-130	50-110	75-150	70-140	60-120	60-135	55-125	45-105	70-145	65-135	55-115
	Heat resistant super alloys (Nickel base)	250-320	45-120	40-110	30-100	55-130	50-120	40-110	40-115	35-105	25-95	50-125	45-115	35-105
	Heat resistant super alloys (Cobalt base)	200-320	45-115	40-105	30-90	55-125	50-115	40-100	40-110	35-100	25-85	50-120	45-110	35-95
	Titanium alloys (400<-or<-1050[MPa])	-	50-130	45-120	40-100	60-140	55-130	50-110	45-125	40-115	35-95	55-135	50-125	45-105

SELECTION GUIDE (GRADES AND CHIP-BREAKERS) FOR NEGATIVE INSERTS

Guia De Seleção (Graus E Quebra-Aparas) para pastilhas negativas | Guía De Selección (Calidades Y Rompevirutas) para plaquitas negativas

SELECTION GUIDE FOR NEGATIVE INSERTS - SINGLE SIDE ...NMM'S

ISO	Material workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holders
			Chip-breaker	Grade	Chip-breaker	Grade	Chip-breaker	Grade	Type		Type	
P	Unalloy steel HB 110 DIN C15 C45		RP	PH5125 PHG125	RP	PH5125 PHG125	HZ	PH5125 PHG125	Negative single side 0°	Conventional Nose Radius 	#NMM	D##N M##N M##N-K
			RP	PH5125 PHG125	HY	PH5125 PHG125	HZ	PH5125 PHG125				
			RP	PH5125 PHG125	HY	PH5740 PHG140	HZ	PH5740 PHG140				
	Low Alloyed Steel HB180 DIN 21NiCrM02 36CrNiM04		RP	PH5125 PHG125	RP	PH5125 PHG125	HZ	PH5125 PHG125	Negative single side 0°	Conventional Nose Radius 	#NMM	D##N M##N M##N-K
			RP	PH5125 PHG125	HY	PH5125 PHG125	HZ	PH5125 PHG125				
			RP	PH5125 PHG125	HY	PH5125 PHG125	HZ	PH5125 PHG125				
	High alloyed steel HB 200 DIN 34CrNiMo6 42CrMo4		RP	PH5125 PHG125	RP	PH5125 PHG125	HZ	PH5125 PHG125	Negative single side 0°	Conventional Nose Radius 	#NMM	D##N M##N M##N-K
			RP	PH5125 PHG125	HY	PH5125 PHG125	HZ	PH5125 PHG125				
			RP	PH5125 PHG125	HZ	PH5740 PHG140	HZ	PH5740 PHG140				
	High alloyed steel HB 400 DIN X40CrMoV5 X45GrSi93		RP	PH5125 PHG125	RP	PH5125 PHG125	HZ	PH5125 PHG125	Negative single side 0°	Conventional Nose Radius 	#NMM	D##N M##N M##N-K
			RP	PH5125 PHG125	HY	PH5125 PHG125	HZ	PH5125 PHG125				
			RP	PH5125 PHG125	HZ	PH5125 PHG125	HZ	PH5125 PHG125				
M	Ferritic/ martensitic stainless steel DIN X12CrMoS17 X6CrMo17		RP	PHS225	RP	PHS225	HY	PHS225	Negative single side 0°	Conventional Nose Radius 	#NMM	D##N M##N M##N-K
			RP	PHS225	HY	PHS225	HY	PHS225				
			RP	PHS225	HY	PHS240	HY	PHS240				
	Austenitic stainless steel DIN X5CrNi189 X5CrNiMo18		RP	PHS225	RP	PHS225	HS	PHS225	Negative single side 0°	Conventional Nose Radius 	#NMM	D##N M##N M##N-K
			RP	PHS225	RP	PHS225	HY	PHS225				
			RP	PHS225	HY	PHS240	HY	PHS240				
	Duplex stainless steel DIN X2CrNiMoSi19 X8CrNiMo27		RP	PHS225	RP	PHS225	HY	PHS225	Negative single side 0°	Conventional Nose Radius 	#NMM	D##N M##N M##N-K
			RP	PHS225	RP	PHS225	HY	PHS240				
			RP	PHS225	HY	PHS240	HY	PHS240				
K	Grey cast iron HB 220 DIN GG15 GG25 GG35		HZ	PH5320	HZ	PH5320	HY	PH5125	Negative single side 0°	Conventional Nose Radius 	#NMM	D##N M##N M##N-K
			HZ	PH5320	HZ	PH5320	HY	PH5125				
			HZ	PH5740	HZ	PH5740	HY	PH5740				
	Nodular cast iron HB 180 DIN GGG40 GGG50 GGG70		HZ	PH5320	HZ	PH5320	HY	PH5125	Negative single side 0°	Conventional Nose Radius 	#NMM	D##N M##N M##N-K
			HZ	PH5740	HZ	PH5740	HY	PH5125				
			HZ	PH5740	HZ	PH5740	HY	PH5740				

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SELECTION GUIDE (GRADES AND CHIP-BREAKERS) FOR NEGATIVE INSERTS

SELECTION GUIDE FOR NEGATIVE INSERTS - DOUBLE SIDE ...NMG'S

ISO	Material workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holders	
			Chip-breaker	Grade	Chip-breaker	Grade	Chip-breaker	Grade	Type		Type		
P	Unalloyed steel HB 110 DIN C15 C45 C60		MF	PH5115 PHG115	LC	PH5115 PHG115	MR PM	PH5115 PHG115	Negative double side 	Conventional Nose Radius 	#NMG	D##N M##N M##N-K P##N	
			MF	PH5115 PHG115	LC	PH5125 PHG125	MR PM	PH5125 PHG125					
			MF	PH5125 PHG125	LC	PH5125 PHG125	MR	PH5125 PHG125	0° 				
			MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115					
			MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115	0° 		Wiper Nose Radius 	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
			MW	PH5125 PHG125	MW	PH5125 PHG125	MW	PH5125 PHG125					
	Low alloyed Steel HB 180 DIN 21NiCrMo2 36CrNiMo4 34CrMo4		MF	PH7910	MR PM	PH5115 PHG115	HR	PH5115 PHG115	Negative double side 	Conventional Nose Radius 	#NMG	D##N M##N M##N-K P##N	
			MF	PH5115 PHG115	MR PM	PH5125 PHG125	HR	PH5125 PHG125					
			MF	PH5125 PHG125	MR / PM	PH5125 PHG125	HR	PH5125 PHG125	0° 				
			MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115					
			MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115	0° 		Wiper Nose Radius 	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
			MW	PH5125 PHG125	MW	PH5125 PHG125	MW	PH5125 PHG125					
	High alloyed steel HB 200 DIN 34CrNiMo6 42CrMo4		MF	PH7910	MR / PM	PH5115 PHG115	HR	PH5115 PHG115	Negative double side 	Conventional Nose Radius 	#NMG	D##N M##N M##N-K P##N	
			MF	PH5115 PHG115	MR / PM	PH5125 PHG125	HR	PH5125 PHG125					
			MF	PH5125 PHG125	MR / PM	PH5125 PHG125	HR	PH5125 PHG125	0° 				
			MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115					
			MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115	0° 		Wiper Nose Radius 	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
			MW	PH5125 PHG125	MW	PH5125 PHG125	MW	PH5125 PHG125					
	High alloyed steel HB 400 DIN X40CrMoV5 X45GrS193		MF ST	PH7910 PH5705	MR PM	PH5115 PHG115	HR	PH5115 PHG115	Negative double side 	Conventional Nose Radius 	#NMG	D##N M##N M##N-K P##N	
			MF ST	PH5115 PHG115 PH5320 PHG105	MR PM	PH5115 PHG125	HR	PH5115 PHG115					
			MF	PH5115 PHG115	MR PM	PH5125 PHG125	HR	PH5125 PHG125	0° 				
			MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115					
			MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115	0° 		Wiper Nose Radius 	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
			MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5125 PHG125					
M	Ferritic/ martensitic stainless steel DIN X12CrMoS17 X6CrMo17		SF, GS	PH7920 PHH920	SS	PH7920	HR	PHS225	Negative double side 	Conventional Nose Radius 	#NMG	D##N M##N M##N-K	
			SF, GS	PH7920 PHH920	SS	PH7920	HR	PHS225					
			SF, GS	PH7920 PHH920	SS	PH7920	HR	PHS240	0° 				
			MW	PHS215	MW	PHS215	-	-					
			MW	PHS215	MW	PHS225	-	-	0° 		Wiper Nose Radius 	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
			MW	PHS225	MW	PHS240	-	-					

Stable cutting

General cutting

Unstable cutting

DOUBLE SIDE ...NMG'S

ISO	Material workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holders
			Chip-breaker	Grade	Chip-breaker	Grade	Chip-breaker	Grade	Type			Type
M	Austenitic stainless steel		GS, SF	PH7920 PHH910	SS	PH7920	HR	PHS225	Negative double side 	Conventional Nose Radius 	#NMG	D##N M##N M##N-K P##N
			GS, GS	PH7910 PHH7920	SS	PH7920	HR	PHS225				
			GS, SF	PH7920 PHH920	SS	PH7920	HR	PHS240				
			MW	PHS215	MW	PHS215	-	-	Negative double side 	Wiper Nose Radius 	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
			MW	PHS215	MW	PHS225	-	-				
			MW	PHS225	MW	PHS240	-	-			0°	DNMG TNMG
	Duplex stainless steel		GS, SF	PH7920 PHH920	SS	PH7910	HR	PHS225	Negative double side 	Conventional Nose Radius 	#NMG	D##N M##N M##N-K P##N
			GS, SF	PH7920 PHH920	SS	PH7920	HR	PHS225				
			GS, SF	PH7920 PHH920	SS HR	PHS240	HR	PHS240				
			MW	PHS215	-	-	-	-	Negative double side 	Wiper Nose Radius 	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
			-	-	-	-	-	-				
			-	-	-	-	-	-			0°	DNMG TNMG
K	Grey cast iron		Flat	PH5705	Flat	PH5320	HR	PH5705	Negative double side 	Conventional Nose Radius 	#NMG	D##N M##N M##N-K P##N
			ST	PH5320	ST	PH5705	HR	PH5705				
			ST	PH5320	ST	PH5320	HR	PH5320				
			MW	PH5320	MW	PH5320	-	-	Negative double side 	Wiper Nose Radius 	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
			MW	PH5320	MW	PH5320	-	-				
			MW	PH5320	MW	PH5320	-	-			0°	DNMG TNMG
	Nodular cast iron		Flat	PH5705	ST	PH5705	HR	PH5705	Negative double side 	Conventional Nose Radius 	#NMG	D##N M##N M##N-K P##N
			ST	PH5320	ST	PH5320	HR	PH5320				
			ST	PH5320	ST	PH5320	HR	PH5320				
			MW	PH5320	MW	PH5320	-	-	Negative double side 	Wiper Nose Radius 	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
			MW	PH5320	MW	PH5320	-	-				
			MW	PH5320	MW	PH5320	-	-			0°	DNMG TNMG
S	Titanium Alloys		GS, SF	PH7910 PHH910	MS	PH7910 PHH910	SS	PH7920	Negative double side 	Conventional Nose Radius 	#NMG	D##N M##N M##N-K P##N
			GS, SF	PH7910 PHH910	MS	PH7910 PHH910	SS	PH7920				
			GS, SF	PH7910 PHH910	MS	PH7910 PHH910	SS	PH7920				

Stable cutting

General cutting

Unstable cutting

SELECTION GUIDE (GRADES AND CHIP-BREAKERS) FOR NEGATIVE INSERTS

Guia De Seleção (Graus E Quebra-Aparas) para pastilhas negativas | Guía De Selección (Calidades Y Rompevirutas) para plaquitas negativas

DOUBLE SIDE ...NMG'S

ISO	Material Workplace	Stability	Medium		Roughing		Medium roughing		Insert			HOLDERS
			Chip-breaker	Grade	Chip-breaker	Grade	Chip-breaker	Grade	Type			Type
S	Super Alloys DIN NiCr19Co11MoTi NiFe35Cr14MoTi CoCr20W15Ni		GS, SF	PH7910 PHH910	MS	PH7910 PHH910	SS	PH7920	 0°		#NMG	D##N M##N M##N-K P##N
			GS, SF	PH7910 PHH910	MS SS	PH7910 PHH910	SS	PH7920				
			GS, SF	PH7910 PHH910	MS SS	PH7910 PHH910	SS	PH7920				
N	Aluminium Alloys DIN AW7075 AlSi12 CuZn37		MS	PH0910	MS	PH0910	-	-	 0°		#NMG	D##N M##N M##N-K P##N
			MS	PH0910	MS	PH0910	-	-				
			MS	PH0910	MS	PH0910	-	-				

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SINGLE SIDE...CMT'S, BMT'S, CGT'S, RCMX'S, RCMT'S

ISO	Material Workplace	Stability	Medium		Roughing		Medium roughing		Insert			HOLDERS
			Chip-breaker	Grade	Chip-breaker	Grade	Chip-breaker	Grade	Type			Type
P	Unalloyed steel HB 110 DIN C15 C45 C60		FP	PH5115 PHG115	MP	PH5115 PHG115	MP	PH5115 PHG115	 x°		#CMT #BMT	S##C S##B
			FP	PH5115 PHG115	MP	PH5125 PHG125	MP	PH5125 PHG125				
			FP	PH5125 PHG125	MP	PH5125 PHG125	MP	PH5125 PHG125				
			FW	PH5115 PHG115	MW	PH5115 PHG115	-	-	 x°		CCMT	S##C 95°
			FW	PH5115 PHG115	MW	PH5115 PHG115	-	-				
			FW	PH5115 PHG115	MW	PH5115 PHG115	-	-				
		FP	PH5115 PHG115	MP	PH5115 PHG115	MP	PH5115 PHG115	 x°		#CMT #BMT	S##C S##B	
		FP	PH5115 PHG115	MP	PH5125 PHG125	MP	PH5125 PHG125					
		FP	PH5125 PHG125	MP	PH5125 PHG125	MP	PH5125 PHG125					
		FW	PH5115 PHG115	MW	PH5115 PHG115	-	-	 x°		CCMT	S##C 95°	
		FW	PH5115 PHG115	MW	PH5115 PHG115	-	-					
		FW	PH5115 PHG115	MW	PH5115 PHG115	-	-					
	FP	PH5115 PHG115	MP	PH5115 PHG115	MP	PH5115 PHG115	 x°		#CMT #BMT	S##C S##B		
	FP	PH5115 PHG115	MP	PH5125 PHG125	MP	PH5125 PHG125						
	FP	PH5125 PHG125	MP	PH5125 PHG125	MP	PH5125 PHG125						
	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-	 x°		CCMT	S##C 95°		
	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-						
	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-						
	FP	PH5115 PHG115	MP	PH5115 PHG115	MP	PH5115 PHG115	 x°		#CMT #BMT	S##C S##B		
	FP	PH5115 PHG115	MP	PH5125 PHG125	MP	PH5125 PHG125						
	FP	PH5125 PHG125	MP	PH5125 PHG125	MP	PH5125 PHG125						
	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-	 x°		CCMT	S##C 95°		
	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-						
	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-						

Stable cutting General cutting Unstable cutting

SELECTION GUIDE (GRADES AND CHIP-BREAKERS) FOR POSITIVE INSERTS

Guia De Seleção (Graus E Quebra-Aparas) para pastilhas positivas | Guía De Selección (Calidades Y Rompevirutas) para plaquitas positivas

SINGLE SIDE...CMT'S, BMT'S, CGT'S, RCMX'S, RCMT'S

ISO	Material Workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holders
			Chip-breaker	Grade	Chip-breaker	Grade	Chip-breaker	Grade	Type			Type
P	High alloyed Steel HB 400 DIN X40CrMoV5 X45GrSi93		FP FK	PH5115 PHG115 PH5705	MP MK	PH5115 PHG115 PH5320 PHG105	MP	PH5115 PHG115	Positive single side 	Conventional nose radius 	#CMT #BMT	S##C S##B
			FP FK	PH5115 PHG115 PH5320 PHG105	MP MK	PH5115 PHG115 PH5320 PHG105	MP	PH5115 PHG115				
			FP	PH5115 PHG115	MP	PH5125 PHG125	MP	PH5125 PHG125				
			FW	PH5115 PHG115	MW	PH5115 PHG115	-	-	Positive single side 	Wiper nose radius 	CCMT	S##C 95°
			FW	PH5115 PHG115	MW	PH5115 PHG115	-	-			DCMT TCMT	S##C 93°
			FW	PH5115 PHG115	MW	PH5115 PHG115	-	-				
M	Duplex stainless steel DIN X2CrNiMoSi19 X8CrNiMo27 X2CrNiMoN22		FM	PH7910	LM MM	PH7910	MM	PHS215	Positive single side 	Conventional nose radius 	#CMT #BMT	S##C S##B
			FM LM	PH7910	MM	PH7910	MM	PHS215				
			FM LM	PH7920	MM	PH7920	MM	PHS215				
			FW	PH7920	MW	PHS215	-	-	Positive single side 	Wiper nose radius 	CCMT	S##C 95°
			FW	PH7920	MW	PHS225	-	-			DCMT TCMT	S##C 93°
			-	-	-	-	-	-				
	Austenitic stainless steel DIN X2CrNiMoSi19 X8CrNiMo27 X2CrNiMoN22		FM LM	PH7910 PHH910	LM MM	PH7910 PHH910	MM	PHS215	Positive single side 	Conventional nose radius 	#CMT #BMT	S##C S##B
			FM LM	PH7920 PHH920	MM	PH7920 PHH920	MM	PHS215				
			FM LM	PHS225	MM	PHS215	MM	PHS215				
			MW	PH7920	MW	PH7920	-	-	Positive single side 	Wiper nose radius 	CCMT	S##C 95°
			MW	PHS215	MW	PHS215	-	-			DCMT TCMT	S##C 93°
			MW	PHS215	MW	PHS215	-	-				
	Duplex stainless steel DIN X2CrNiMoSi19 X8CrNiMo27 X2CrNiMoN22		FM LM	PH7910 PHH910	LM MM	PH7910 PHH910	MM	PHS215	Positive single side 	Conventional nose radius 	#CMT #BMT	S##C S##B
			FM LM	PH7910	MM	PH7910	MM	PHS215				
			FM LM	PHS225	MM	PHS215	MM	PHS215				
			-	-	-	-	-	-	Positive single side 	Wiper nose radius 	CCMT	S##C 95°
			-	-	-	-	-	-			DCMT TCMT	S##C 93°
			-	-	-	-	-	-				

Stable cutting

General cutting

Unstable cutting

SELECTION GUIDE (GRADES AND CHIP-BREAKERS) FOR POSITIVE INSERTS

Guia De Seleção (Graus E Quebra-Aparas) para pastilhas positivas | Guía De Selección (Calidades Y Rompevirutas) para plaquitas positivas

SINGLE SIDE ...CMT'S, BMT'S, CGT'S, RCMX'S, RCMT'S

ISO	Material Workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holders
			Chip-breaker	Grade	Chip-breaker	Grade	Chip-breaker	Grade	Type		Type	
K	Grey cast iron HB 220 DIN GG15 GG25 GG35	●	FK	PH5705	MK	PH5705	MK	PH5705	Positive single side 	Conventional nose radius 	#CMT #BMT	S##C S##B
			FK	PH5705	MK	PH5705	MK	PH5320				
		✖	MK	PH5320	MK	PH5320	MK	PH5320	Positive single side 	Wiper nose radius 	CCMT	S##C 95°
			FW	PH5705	MW	PH5320	-	-				
		●	FW	PH5705	MW	PH5320	-	-	Positive single side 	Wiper nose radius 	DCMT TCMT	S##C 93°
			MW	PH5320	MW	PH5320	-	-				
	Nodular Cast Iron HB 220 DIN GG15 GG25 GG35	●	FK	PH5705	MK	PH5320	MK	PH5320	Positive single side 	Conventional nose radius 	#CMT #BMT	S##C S##B
			FK	PH5705	MK	PH5320	MK	PH5320				
		✖	MK	PH5320	MK	PH5320	MK	PH5320	Positive single side 	Wiper nose radius 	CCMT	S##C 95°
			FW	PH5705	MW	PH5320	-	-				
		●	FW	PH5705	MW	PH5320	-	-	Positive single side 	Wiper nose radius 	DCMT TCMT	S##C 93°
			MW	PH5320	MW	PH5320	-	-				
S	Titanium Alloys DIN TiAl5Sn2.5 TiAl6V4 TiAl6V4ELI	●	FS	PHH910	FM	PHH910	MM	PH7920	Positive single side 	Conventional nose radius 	#CMT #BMT	S##C S##B
			FM	PH7920	MM	PH7920	MM	PH7920				
		✖	MM	PH7920	MM	PH7920	MM	PH7920	Positive single side 	Wiper nose radius 	CCMT	S##C 95°
			FW	PH7920	FW	PH7920	-	-				
		●	FW	PH7920	MW	PH7920	-	-	Positive single side 	Wiper nose radius 	DCMT TCMT	S##C 93°
			MW	PH7920	MW	PH7920	-	-				
	Super alloys DIN NiCr19Co11MoTi NiFe35Cr14MoTi CoCr20W15Ni	●	FS	PHH910	FM	PHH910	MM	PHH920	Positive single side 	Conventional nose radius 	#CMT #BMT	S##C S##B
			FM	PHH920	FM	PHH920	FM	PHH920				
		✖	MM	PHH920	MM	PHH920	MM	PHH920	Positive single side 	Wiper nose radius 	CCMT	S##C 95°
			FW	PH7920	FW	PH7920	-	-				
		●	FW	PH7920	MW	PH7920	-	-	Positive single side 	Wiper nose radius 	DCMT TCMT	S##C 93°
			MW	PH7920	MW	PH7920	-	-				
N	Aluminium Alloys DIN AW7075 AISI12 CuZn37	●	LN	PH0910	LN	PH0910	-	-	Positive single side 	Conventional nose radius 	#CMT #BMT	S##C S##B
		●	LN	PH0910	LN	PH0910	-	-				
		✖	LN	PH0910	LN	PH0910	-	-				



Stable cutting

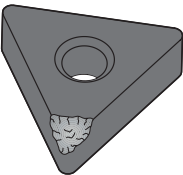
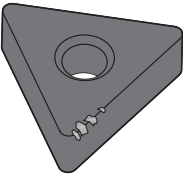
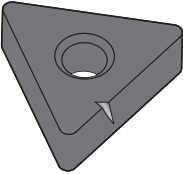
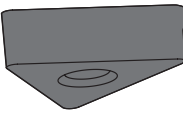


General cutting

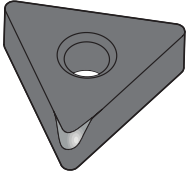
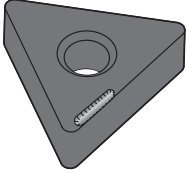
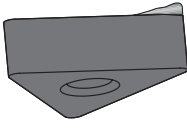
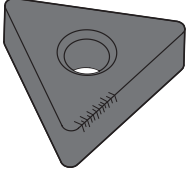


Unstable cutting

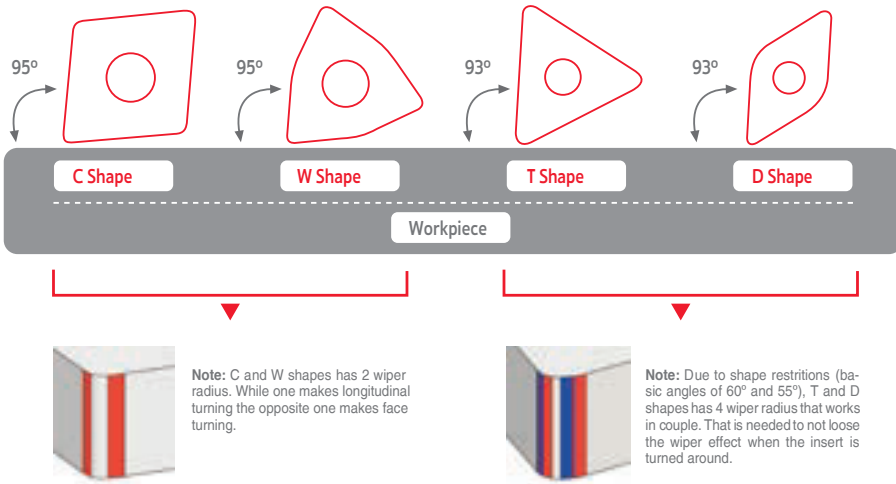
TOOL LIFE PROBLEMS | Problemas na vida útil da ferramenta | Problemas con la vida útil de la herramienta

Problem Problema	Possible Solution Solução Solución		
<ul style="list-style-type: none"> • Breakage or too short tool life • Rotura ou vida útil muito curta • Rotura o vida de la herramienta demasiado corto 	<ul style="list-style-type: none"> • Step 1. Reduce the cutting conditions (first feed rate, then cutting depth). • Step 2. Look at the wear pattern on the insert and use the table below as a guideline for improvement. • Passo 1. Reduza as condições de corte (primeiro o avanço / rotação depois a profundidade de corte). • Passo 2. Verifique o desgaste da pastilha e use as recomendações abaixo para otimizar a operação. • Paso 1. Reducir las condiciones de corte (primero el avance, después la profundidad de corte). • Paso 2. Comprobar el patrón de desgaste en la plaquita y usar la siguiente tabla como guía para la mejora. 		
<ul style="list-style-type: none"> • Insert fracture • Fratura da Pastilha • Fractura de la Plaquita 	<ul style="list-style-type: none"> • Reduce the feed rate (Fn). • Reduce the depth of cut (Ap). • Select a tougher grade (ex: P10 -> ... -> P40). • Use a more rigid toolholder. • Increase nose radius (Re). • Select a stronger chipbreaker. • Reduce the toolholder length. • Select larger shank size. 	<ul style="list-style-type: none"> • Reduza o avanço/rotação (Fn). • Reduza a profundidade de corte (Ap). • Selecione uma classe mais tenaz (ex: P10 -> ... -> P40). • Use um suporte mais rígido. • Aumente o raio de canto (Re). • Selecione um quebra- aparas mais resistente. • Reduza o comprimento do suporte. • Escolha uma largura de haste superior. 	<ul style="list-style-type: none"> • Reducir el avance (Fn). • Reducir la profundidad de corte (Ap). • Seleccionar una calidad más tenaz (ex: P10 -> ... -> P40). • Utilice un portaherramientas más rígido. • Aumente el radio de punta (Re). • Seleccionar un rompevirutas más robusto. • Reducir la longitud del portaherramientas. • Elija un ancho de vara superior.
<ul style="list-style-type: none"> • Edge chipping • Fragmentação da aresta • Fragmentación de la arista 	<ul style="list-style-type: none"> • Increase the cutting speed (Vc). • Reduce the feed rate (Fn). • Select a stronger chipbreaker. • Select a tougher grade (ex: P10 -> ... -> P40). • Reduce the rake angle. • Increase honing edges. • Reduce the toolholder length. • Select larger shank size. 	<ul style="list-style-type: none"> • Aumente a velocidade de corte (Vc). • Reduza o avanço/rotação (Fn). • Selecione um quebra- aparas mais resistente. • Selecione uma classe mais tenaz (ex: P10 -> ... -> P40). • Diminua o ângulo de ataque. • Aumente arestas boleadas. • Reduza o comprimento do suporte. • Escolha uma largura de haste superior. 	<ul style="list-style-type: none"> • Reducir el ángulo de ataque. • Aumentar aristas redondeadas. • Reducir la longitud del portaherramientas. • Elija un ancho de vara superior. • Aumentar la velocidad de corte (Vc). • Reducir el avance (Fn). • Seleccionar un rompevirutas más robusto. • Seleccionar una calidad más tenaz (ex: P10 -> ... -> P40).
<ul style="list-style-type: none"> • Notch wear • Desgaste de entalhe • Mellado 	<ul style="list-style-type: none"> • Reduce the cutting speed (Vc). • Reduce the feed rate (Fn). • Select a tool with a smaller setting angle (Kr°). • Select a more wear-resistant grade (ex: P40 -> ... -> P10). 	<ul style="list-style-type: none"> • Reduza a velocidade de corte (Vc). • Reduza o avanço/rotação (Fn). • Selecione uma ferramenta com um ângulo de posição menor (Kr°). • Selecione uma classe mais resistente ao desgaste (ex: P40 -> ... -> P10). 	<ul style="list-style-type: none"> • Reducir la velocidad de corte (Vc). • Reducir el avance (Fn). • Seleccionar una herramienta con un ángulo de posición menor (Kr°). • Seleccionar una calidad más resistente al desgaste (ex: P40 -> ... -> P10).
<ul style="list-style-type: none"> • Plastic deformation • Deformação plástica • Deformación plástica 	<ul style="list-style-type: none"> • Reduce the cutting speed (Vc). • Reduce the feed rate (Fn). • Select a more wear-resistant grade (ex: P40 -> ... -> P10). • Use more coolant and correct it volume/accuracy. • Choose grade with better heat conductivity. • Increase the rake angle. • Increase nose radius (Re). • Increase relief angle. 	<ul style="list-style-type: none"> • Reduza a velocidade de corte (Vc). • Reduza o avanço/rotação (Fn). • Selecione uma classe mais resistente ao desgaste (ex: P40 -> ... -> P10). • Utilize refrigeração em abundância e corrija o seu volume/precisão. • Escolha um grau com melhor condutividade térmica. • Aumente o ângulo de ataque. • Aumente o raio de canto (Re). • Aumente o ângulo de alívio superior. 	<ul style="list-style-type: none"> • Reducir la velocidad de corte (Vc). • Reducir el avance (Fn). • Seleccionar una calidad más resistente al desgaste (ex: P40 -> ... -> P10). • Usar abundante caudal de refrigerante y corregir el volumen / precisión. • Elija un grado con una mejor conductividad térmica. • Aumente el ángulo de ataque. • Aumente el radio de punta (Re). • Aumente el ángulo de alívio superior.

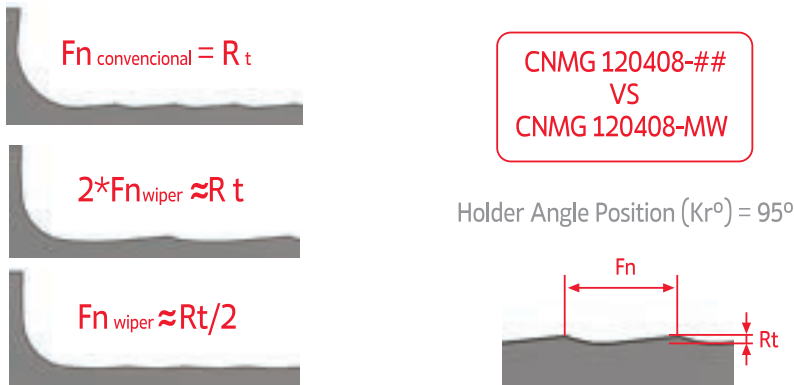
TOOL LIFE PROBLEMS | Problemas na vida útil da ferramenta | Problemas con la vida útil de la herramienta

Problem Problema	Possible Solution Solução Solución		
<ul style="list-style-type: none"> • Flank wear • Desgaste do flanco • Desgaste de la superficie 	<ul style="list-style-type: none"> • Reduce the cutting speed (Vc). • Select a more wear-resistant grade (ex: P40 -> ... -> P10). • Select a toolholder or chipbreaker which allow a bigger relief angle. • Increase the rake angle. • Increase nose radius (Re). • Reduce honing edges. 	<ul style="list-style-type: none"> • Reduza a velocidade de corte (Vc). • Selecione uma classe mais resistente ao desgaste (ex: P40 -> ... -> P10). • Selecione um suporte ou quebra-apanas que permita um ângulo de alívio superior. • Aumente o ângulo de ataque. • Aumente o raio de canto (Re). • Reduza arestas boleadas. 	<ul style="list-style-type: none"> • Reducir la velocidad de corte (Vc). • Seleccionar una calidad más resistente al desgaste (ex: P40 -> ... -> P10). • Seleccionar un portaherramientas o rompevirutas que permiten un ángulo de alivio superior. • Aumente el ángulo de ataque. • Aumente el radio de punta (Re). • Reducir aristas redondeadas.
<ul style="list-style-type: none"> • Crater wear • Craterização • Craterización 	<ul style="list-style-type: none"> • Reduce the cutting speed (Vc). • Reduce the feed rate (Fn). • Select a more wear-resistant grade (ex: P40 -> ... -> P10). • Use coolant. • Increase the rake angle. • Increase nose radius (Re). 	<ul style="list-style-type: none"> • Reduza a velocidade de corte (Vc). • Reduza o avanço/rotação (Fn). • Selecione uma classe mais resistente ao desgaste (ex: P40 -> ... -> P10). • Utilize refrigeração. • Aumente o ângulo de ataque. • Aumente o raio de canto (Re). 	<ul style="list-style-type: none"> • Reducir la velocidad de corte (Vc). • Reducir el avance (Fn). • Seleccionar una calidad más resistente al desgaste (ex: P40 -> ... -> P10). • Usar refrigerante. • Aumente el ángulo de ataque. • Aumente el radio de punta (Re).
<ul style="list-style-type: none"> • Built-up edge • Aresta postiça • Recrecimiento del filo 	<ul style="list-style-type: none"> • Increase the cutting speed (Vc). • Reduce the feed rate (Fn). • Use water-insoluble coolant fluid. • Select a more easy-cutting chipbreaker. • Increase the rake angle. • Reduce honing edges. • Select grade with low tendency to adhesion. 	<ul style="list-style-type: none"> • Aumente a velocidade de corte (Vc). • Reduza o avanço/rotação (Fn). • Utilize fluido refrigerante insolúvel em água. • Selecione um quebra-apanas mais positivo. • Aumente o ângulo de ataque. • Reduza arestas boleadas. • Selecione um grau com baixa tendência a aderência. 	<ul style="list-style-type: none"> • Aumentar la velocidad de corte (Vc). • Reducir el avance (Fn). • Utilice fluido refrigerante insoluble en agua. • Seleccionar un rompevirutas de corte más suave. • Aumente el ángulo de ataque. • Reducir aristas redondeadas. • Seleccionar un grado con baja tendencia a la adhesión.
<ul style="list-style-type: none"> • Thermal cracks • Trincas térmicas • Grietas en el filo 	<ul style="list-style-type: none"> • Reduce the cutting speed (Vc). • Increase the feed rate (Fn). • Use more coolant and correct it volume/accuracy. • Reduce honing edges. • Select a tougher grade (ex: P10 -> ... -> P40). • Increase the rake angle. 	<ul style="list-style-type: none"> • Reduza a velocidade de corte (Vc). • Aumente o avanço/rotação (Fn). • Utilize refrigeração em abundância e corrija o seu volume/precisão. • Reduza arestas boleadas. • Selecione uma classe mais tenaz (ex: P10 -> ... -> P40). • Aumente o ângulo de ataque. 	<ul style="list-style-type: none"> • Reducir la velocidad de corte (Vc). • Aumentar el avance (Fn). • Usar abundante caudal de refrigerante y corregir el volumen / precisión. • Reducir aristas redondeadas. • Seleccionar una calidad más tenaz (ex: P10 -> ... -> P40). • Aumente el ángulo de ataque.

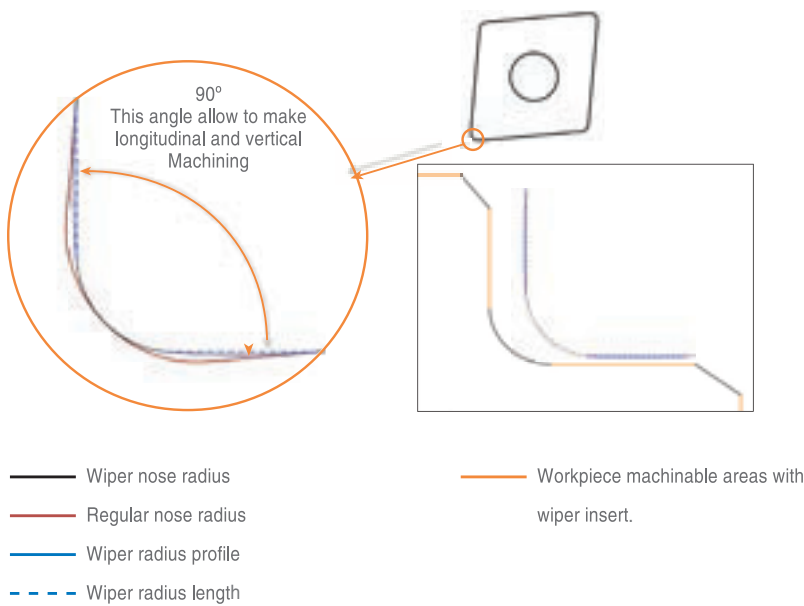
THE ANGLE POSITION (KR°)



THE WIPER PURPOSE IS BASED ON PRODUCTIVITY:



EXAMPLE CNMG 120404-MW WITH ANGLE POSITION OF 95°



Note: wiper radius length must be parallel to machinable workpiece areas.