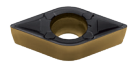
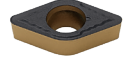


DC = RHOMBIC 55° POSITIVE

RÔMBICA 55° POSITIVA | RÓMBICA 55° POSITIVA

			P								M								K				N	S	
			CVD-MT						PVD		CVD-MT						PVD		UNC	CVD-MT			UNC	PVD	
			new grades								new grades														
		(2) Grade code	L7	R2	L8	R3	L9	V5	G1	G4	L7	U4	L8	U5	L9	V6	G1	G4	25	L5	L6	L9	10	G1	G4
Inserts Pastilhas Plaquetas	(1) Geometry code	ISO Reference	PH5115	PHG115	PH5125	PHG125	PH5740	PHG140	PH7910	PH7920	PH5115	PHS215	PH5125	PHS225	PH5740	PHS240	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
 Finishing	1120302	DCMW 070202																		⚠					
	1120303	DCMW 070204																		⚠					
	1121422	DCMW 070208																		⚠					
	1120304	DCMW 11T302																		⚠					
	1120305	DCMW 11T304																		⚠					
	1120306	DCMW 11T308																		⚠					
	1120878	DCMW 150404																		⚠					
	1120307	DCMW 150408																		⚠					
 Finishing	1121675	DCMT 070202-FP			⚠	⚠																			
	1121678	DCMT 070204-FP	⚠	⚠	⚠	⚠																			
	1121668	DCMT 11T302-FP			⚠	⚠				⚠															
	1121711	DCMT 11T304-FP	⚠	⚠	⚠	⚠																			
	1121713	DCMT 11T308-FP	⚠	⚠	⚠	⚠																			
 Finishing	1121674	DCMT 070202-FM																⚠							⚠
	1121677	DCMT 070204-FM											⚠	⚠				⚠							⚠
	1121667	DCMT 11T302-FM															⚠	⚠						⚠	⚠
	1121710	DCMT 11T304-FM											⚠	⚠			⚠	⚠						⚠	⚠
	1121712	DCMT 11T308-FM											⚠	⚠			⚠	⚠						⚠	⚠
 Finishing	1121673	DCMT 070202-FK																		⚠					
	1121676	DCMT 070204-FK																		⚠					
	1121714	DCMT 11T302-FK																		⚠					
	1121709	DCMT 11T304-FK																		⚠					
 Finishing Wiper	1121749	DCMT 070204-FW	⚠	⚠														⚠		⚠					⚠
	1121750	DCMT 070208-FW	⚠	⚠														⚠		⚠					⚠
	1121745	DCMT 11T304-FW	⚠	⚠														⚠		⚠					⚠
	1121755	DCMT 11T308-FW	⚠	⚠														⚠		⚠					⚠
 Medium to Finishing	1123802	DCMT 11T304-LM															⚠	⚠						⚠	⚠
	1123803	DCMT 11T308-LM															⚠	⚠						⚠	⚠
 Medium	1121681	DCMT 070204-MP	⚠	⚠	⚠	⚠				⚠															
	1121684	DCMT 070208-MP	⚠	⚠	⚠	⚠																			
	1121648	DCMT 11T304-MP	⚠	⚠	⚠	⚠				⚠															
	1121706	DCMT 11T308-MP	⚠	⚠	⚠	⚠				⚠															
	1121708	DCMT 11T312-MP	⚠	⚠	⚠	⚠			⚠																

First choice | 1ª Escolha | 1ª Opción

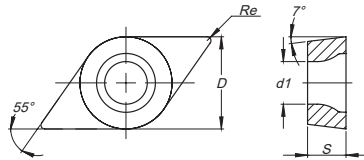
Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

Insert Order Code: ⁽¹⁾ Geometry code + ⁽²⁾ Grade code

Stock Items | Itens de stock

Available under request | Disponível sob consulta | Disponible bajo consulta

RELIEF ANGLE 7°



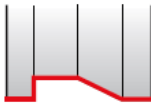
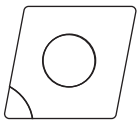
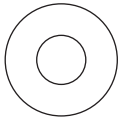
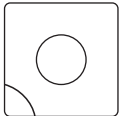
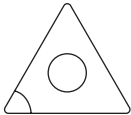
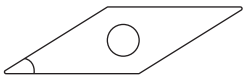
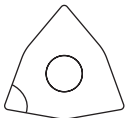
ISO Reference	ANSI Reference	Dimensions (mm) Dimensões (mm) Dimensiones (mm)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (mm)	Min	Max	fn (mm/rev)	Min	Max
DCMW 070202	DCMW 21.50.5	6,350	2,38	0,20	2,80	1,60	0,05	3,20	0,10	0,04	0,13
DCMW 070204	DCMW 21.51	6,350	2,38	0,40	2,80	1,60	0,05	3,20	0,20	0,08	0,26
DCMW 070208	DCMW 21.52	6,350	2,38	0,80	2,80	1,60	0,05	3,20	0,40	0,16	0,53
DCMW 11T302	DCMW 32.50.5	9,525	3,97	0,20	4,40	2,40	0,05	4,80	0,10	0,04	0,13
DCMW 11T304	DCMW 32.51	9,525	3,97	0,40	4,40	2,40	0,05	4,80	0,20	0,08	0,26
DCMW 11T308	DCMW 32.52	9,525	3,97	0,80	4,40	2,40	0,05	4,80	0,40	0,16	0,53
DCMW 150404	DCMW 431	12,700	4,76	0,40	5,50	2,80	0,10	5,50	0,20	0,10	0,26
DCMW 150408	DCMW 432	12,700	4,76	0,80	5,50	2,80	0,10	5,50	0,40	0,16	0,53
DCMT 070202-FP	DCMT 21.50.5-FP	6,350	2,38	0,20	2,80	0,26	0,06	1,50	0,06	0,03	0,11
DCMT 070204-FP	DCMT 21.51-FP	6,350	2,38	0,40	2,80	0,26	0,08	1,50	0,08	0,05	0,17
DCMT 11T302-FP	DCMT 32.50.5-FP	9,525	3,97	0,20	4,40	0,35	0,08	2,00	0,08	0,04	0,15
DCMT 11T304-FP	DCMT 32.51-FP	9,525	3,97	0,40	4,40	0,35	0,11	2,00	0,11	0,06	0,23
DCMT 11T308-FP	DCMT 32.52-FP	9,525	3,97	0,80	4,40	0,35	0,15	2,00	0,15	0,08	0,30
DCMT 070202-FM	DCMT 21.50.5-FM	6,350	2,38	0,20	2,80	0,26	0,06	1,50	0,06	0,03	0,11
DCMT 070204-FM	DCMT 21.51-FM	6,350	2,38	0,40	2,80	0,26	0,08	1,50	0,08	0,05	0,17
DCMT 11T302-FM	DCMT 32.50.5-FM	9,525	3,97	0,20	4,40	0,35	0,08	2,00	0,08	0,04	0,15
DCMT 11T304-FM	DCMT 32.51-FM	9,525	3,97	0,40	4,40	0,35	0,11	2,00	0,11	0,06	0,23
DCMT 11T308-FM	DCMT 32.52-FM	9,525	3,97	0,80	4,40	0,35	0,15	2,00	0,15	0,08	0,30
DCMT 070202-FK	DCMT 21.50.5-FK	6,350	2,38	0,20	2,80	0,26	0,06	1,50	0,06	0,03	0,11
DCMT 070204-FK	DCMT 21.51-FK	6,350	2,38	0,40	2,80	0,26	0,08	1,50	0,08	0,05	0,17
DCMT 11T302-FK	DCMT 32.50.5-FK	9,525	3,97	0,20	4,40	0,35	0,08	2,00	0,08	0,04	0,15
DCMT 11T304-FK	DCMT 32.51-FK	9,525	3,97	0,40	4,40	0,35	0,11	2,00	0,11	0,06	0,23
DCMT 070204-FW	DCMT 21.51-FW	6,350	2,38	0,40	2,80	0,70	0,30	2,00	0,12	0,05	0,25
DCMT 070208-FW	DCMT 21.52-FW	6,350	2,38	0,80	2,80	0,70	0,30	2,00	0,15	0,09	0,35
DCMT 11T304-FW	DCMT 32.51-FW	9,525	3,97	0,40	4,40	1,00	0,30	3,00	0,20	0,07	0,30
DCMT 11T308-FW	DCMT 32.52-FW	9,525	3,97	0,80	4,40	1,00	0,30	3,00	0,25	0,12	0,40
DCMT 11T304-LM	DCMT 32.51-LM	9,525	3,97	0,40	4,40	0,50	0,15	2,50	0,15	0,08	0,25
DCMT 11T308-LM	DCMT 32.52-LM	9,525	3,97	0,80	4,40	0,50	0,20	2,50	0,20	0,10	0,35
DCMT 070204-MP	DCMT 21.51-MP	6,350	2,38	0,40	2,80	0,60	0,19	2,25	0,11	0,06	0,17
DCMT 070208-MP	DCMT 21.52-MP	6,350	2,38	0,80	2,80	0,60	0,38	2,25	0,20	0,08	0,35
DCMT 11T304-MP	DCMT 32.51-MP	9,525	3,97	0,40	4,40	0,80	0,25	3,00	0,15	0,08	0,23
DCMT 11T308-MP	DCMT 32.52-MP	9,525	3,97	0,80	4,40	0,80	0,50	3,00	0,25	0,10	0,40
DCMT 11T312-MP	DCMT 32.53-MP	9,525	3,97	1,20	4,40	0,80	0,60	3,00	0,35	0,12	0,60

INSERTS RECOMENDATION

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.

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

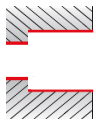
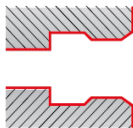
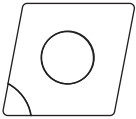
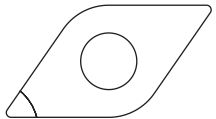
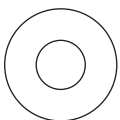
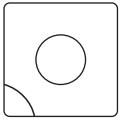
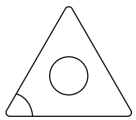
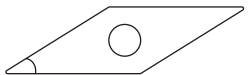
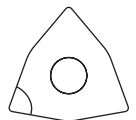
● ● Recommended Insert Shape

● Alternative Insert Shape

INTERNAL MACHINING | MAQUINAÇÃO INTERNA | MAQUINACIÓN INTERNA

General Recommendation:

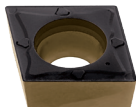
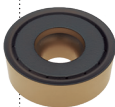
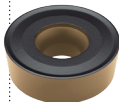
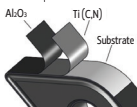
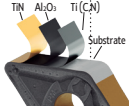
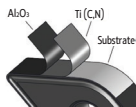
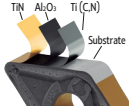
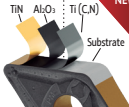
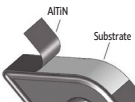
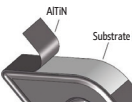
1. The choice of the insert shape depends of the operation
2. The insert shape should be selected to the required lead angle and the accessibility or versatility required of the tool.
3. Select the largest suitable point angle on the insert for strenght and economy.

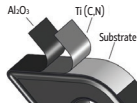
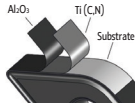
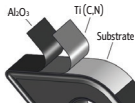
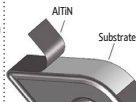
Operation		Longitudinal turning	Profiling	Facing
Insert Shape				
	Rhombic 80°	●		●●
	Rhombic 55°	●	●●	●
	Parallelogram 55°	●●		
	Round	●		●
	Square 90°	●		
	Triangular 60°	●●	●	●
	Rhombic 35°		●	
	Trigon 80°	●		●

●● Recommended Insert Shape

● Alternative Insert Shape

POSITIVE TURNING Application Range Overview

P 5° & 7°	Fine finishing		Finishing		Medium		Roughing		Heavy roughing	
	FS		FP		MP		RF	RM		
										
	BO		FW		MW		ST	RR		
				wiper		wiper				
	CVD Grades									
										
	PH5115 (P10-P25)		PHG115 (P10-P25)		PH5125 (P20-P35)		PHG125 (P20-P35)		PHG140 (P25-P45)	
	PVD Grades									
										
PH7910 (P05-P10)		PH7920 (P10-P35)								
Continuous cut ← → Interrupted cut										

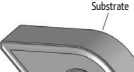
Fine finishing		Finishing		Medium		Roughing		Heavy roughing	
12		13		FLAT					
									
CVD Grades									
PH5115 (P15-P25)		PH5125 (P20-P35)				PH5740 (P25-P45)			
									
PVD Grades									
PH7920 (P10-P35)									
Continuous cut ←					→ Interrupted cut				

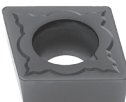
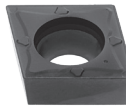
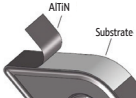
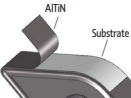
		Fine finishing			Finishing		Medium		Roughing		Heavy roughing	
M	5° & 7°	FS	FM	LM	MM		RF	RM				
		BO		FW		MW	wiper		RR			
		CVD Grades										
		 PH5215 (M10-M25)		 PH5125 (M15-M30)		 PHS225 (M15-M30)		 PH5740 (M25-M45)		 PHS240 (M25-M45)		
		PVD Grades										
		 PH7910 (M05-M10)				 PH7920 (M10-M25)						
Continuous cut ← → Interrupted cut												

		Fine finishing		Finishing		Medium		Roughing		Heavy roughing	
K	5° & 7°	FK		MK		FLAT		RM			
			FW		MW	wiper		ST			
		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	7°	Fine finishing	Finishing	Medium	Roughing	Heavy roughing
				LN 			
			Uncoated Grades				
				PH0910 (N01-N20) 			
Insert selection							
Overview			Continuous cut ← → Interrupted cut				

S	5° & 7°	Fine finishing	Finishing	Medium	Roughing	Heavy roughing
		FS 	FM 	LM 	MM 	
		BO 	FW 	MW 	wiper	wiper
		PVD Grades				
Positive inserts						
PCD inserts						
Heavy machining						
External Toolholders		PH7910 (S05-S10) 	PH7920 (S10-S25) 			
Internal Toolholders		Continuous cut ← → Interrupted cut				

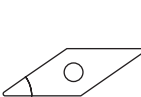
Chip-breaker
Indication



Nose Radius
Indication

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							
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.

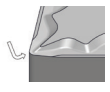
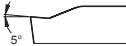
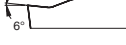
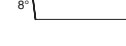
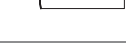
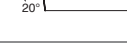
A small nose angle is weaker and has a small cutting edge engagement, both of which can make it more sensitive to the heat effects.

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.

CHIP BREAKER SPECIFICATIONS

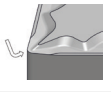
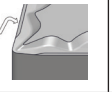
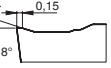
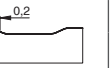
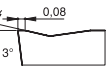
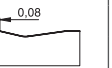
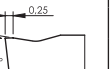
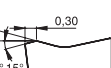
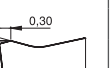
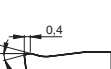
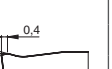
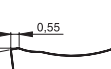
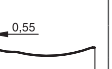
POSITIVES | POSITIVAS | POSITIVAS

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

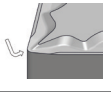
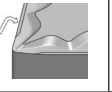
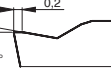
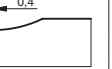
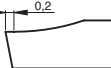
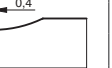
* T-Land varies according to the IC (IC reference used: 12,7mm)

** 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			CC __	DC __	RC __	SC __	TC __	VC __	VB __
							Feed Fn (mm/rev)	Depth of cut DOC (mm)							
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 NEW	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 NEW	RM			0,80 to 2,50	3,20 to 13,00							
			P M	RR			0,80 to 2,50	3,20 to 13,00							

* 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			CC __	DC __
							Feed Fn (mm/rev)	Depth of cut DOC (mm)		
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

TURNING GRADES | Graus de torneamento | Calidades para torneado

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

	ISO	ANSI	Uncoated grades	Coated Grades		
				CVD	PVD	
STEEL	P05	C8		^{NEW} PHG105	PH7910	↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste ↓ - Toughness - Tenacidade - Tenacidad
	P10			PHG115		
	P15	C7		PH5115		
	P20				PH7920	
	P25	C6		PHG125		
	P30			PH5125		
	P35			^{NEW} PHG140		
	P40			PH5740		
	P45	C5		^{NEW} PHG228		
	P50					
STAINLESS STEEL	M05				PH7910	↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste ↓ - Toughness - Tenacidade - Tenacidad
	M10	-		PH5115		
	M15			^{NEW} PHS215		
	M20	-		PH5125		
	M25			^{NEW} PHS225		
	M30	-		^{NEW} PHS240		
	M35			PH5740		
	M40	-		^{NEW} PHS228		
	M45					
	M50					
CAST IRON	K05	C4		PH5705		↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste ↓ - Toughness - Tenacidade - Tenacidad
	K10	C3				
	K15			PH5320		
	K20	C2				
	K25					
	K30	C1		PH5740		
ALUMINIUM & NON FERROUS	N05	C4	PH0910			↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste ↓ - Toughness - Tenacidade - Tenacidad
	N10	C3				
	N15					
	N20	C2				
	N25					
	N30	C1				
HEAT RESISTENT / TITANIUM ALLOYS	S05	-			PH7910	↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste ↓ - Toughness - Tenacidade - Tenacidad
	S10	-				
	S15				PH7920	
	S20	-				
	S25					
	S30	-				

Position and grade symbols shape indicate the suitable field of application.

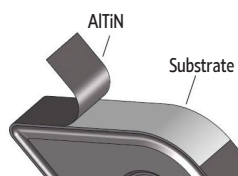
TURNING GRADES DESCRIPTION

Descrição de graus para torneamento | Descripción de calidades para torneado

PVD GRADES

PH7910

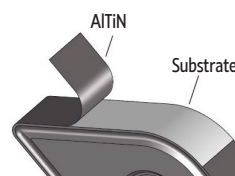
P05-P10
M05-M10
S05-S15



PVD (AlTiN) coated carbide grade with a very hard micro grain substrate improves wear resistance, heat dissipation and avoid built-up edge. High performance on "gummy" materials. For light turning of steels, hardened steels, stainless steels and HRSA.

PH7920

P10-P35
M10-M25
S10-S30

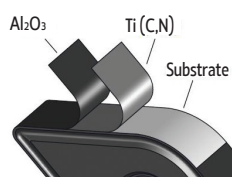


A micro grain size combined with the AlTiN PVD coating make it suitable for Roughing to Finishing operations under good cutting conditions to light interrupted cuts at medium cutting speeds. Suitable for steels, stainless steel, HRSA.

CVD GRADES

PH5115

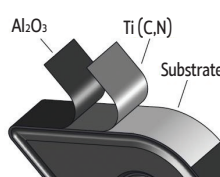
P10-P25
M10-M25



Medium temperature CVD coating with α -Al₂O₃. Carbide grade with a gradient layer close to the surface. Suitable for high to medium cutting speeds on steels & cast steels.

PH5125

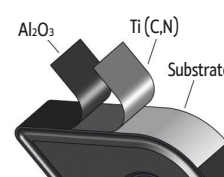
P20-P35
M15-M30



Carbide grade suitable for medium machining of steels & cast steels at medium cutting speeds. The substrate is suitable for the adhesion of the Alumina coating (α -Al₂O₃) medium temperature - CVD, improving the tool life.

PH5740

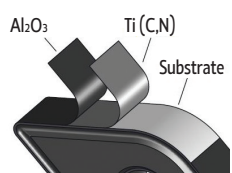
P25-P45
M25-M45
K20-K40



Substrate grade binary (Wc-Co) with medium grain size combined with the medium temperature CVD coating. Suitable for heavy roughing to roughing operations with interrupted cuts at medium to low cutting speeds.

PH5705

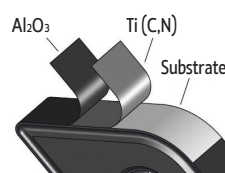
K05-K15



The substrate grade with a very good wear resistance combined with the MT-CVD coating allow to work at high to medium cutting speeds at stable conditions. Recommend for turning of grey cast irons (GCI) or hardened steels. Can also be a solution for high alloy steels.

PH5320

P01-P15
K10-K25



Medium temperature CVD coating (α -Al₂O₃) combined with a hard substrate make it capable of withstanding interrupted conditions. Recommended as general choice for roughing of all cast irons at low to medium cutting speeds. Can also be a solution for high alloy steels.

UNCOATED CARBIDE GRADE

PH0910

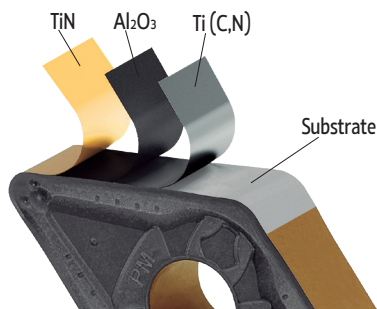
N01-N20



Uncoated carbide micrograin grade combining a good abrasive wear resistance and toughness. Suitable for rough to finish turning of HRSA, Titanium alloys, cast irons and Aluminium alloys.

TURNING GRADES DESCRIPTION

CVD GRADES



New CVD coating with
Al₂O₃+TiN.

PHG
TURNING
GRADE

PHG105
P05-P10

First choice for continuous cut with hardness higher than 38HRC

New CVD coating with Al₂O₃+TiN combined with a very hard substrate.

PHG115
P10-P25

Suitable for high to medium cutting speeds on steels

New CVD coating with Al₂O₃+TiN.

PHG125
P20-P35

Ideal for general application in all kind of steels

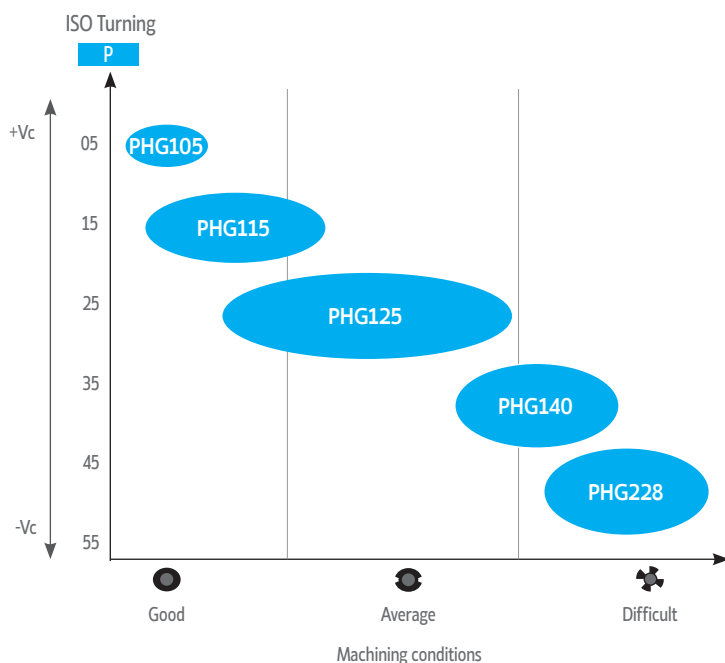
Carbide grade suitable for medium machining of steels at medium cutting speeds.

PHG140
P25-P45

First choice for roughing to heavy roughing operations with interrupted cut at medium to low cutting speeds

Binary substrate grade (Wc - Co) with medium grain size combined with a medium temperature CVD coating.

GRADES CHART || Gráfico de graus | Gráfico de calidades

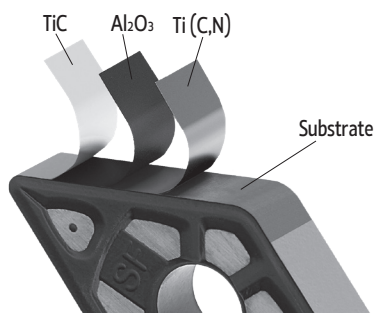


PHG228
P40-P50

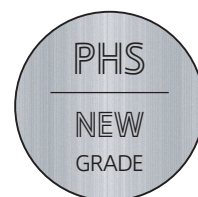
A very high toughness grade ideal for heavy roughing applications while using on large I.C inserts

New CVD coating with Al₂O₃+TiN.





New CVD coating with $\text{Al}_2\text{O}_3 + \text{TiC}$.



PHS215
M10-M25

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

New CVD coating with $\text{TiCN} + \text{Al}_2\text{O}_3 + \text{TiC}$.

PHS225
M15-M30

First choice for general application on turning of stainless steels

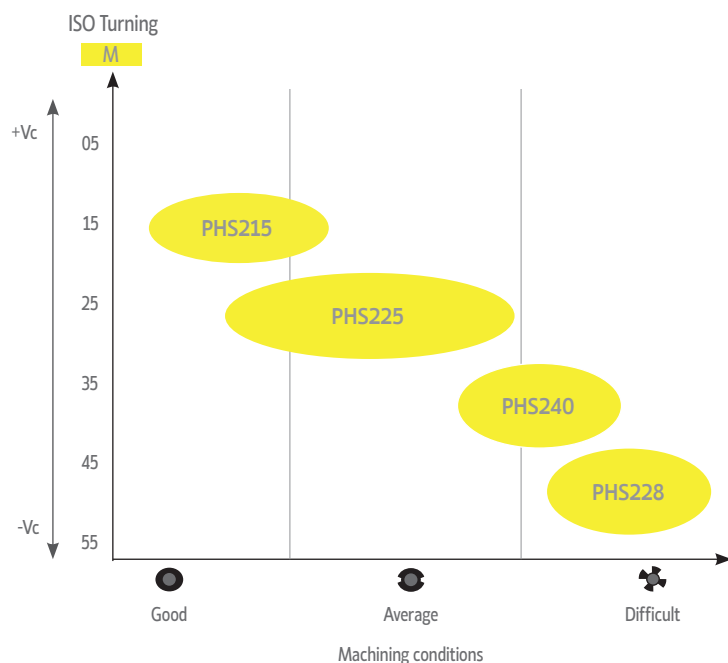
Carbide grade suitable for medium machining of stainless steels and super alloys at medium cutting speeds. New CVD coating with $\text{TiCN} + \text{Al}_2\text{O}_3 + \text{TiC}$.

PHS240
M25-M45

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

New CVD coating with $\text{TiCN} + \text{Al}_2\text{O}_3 + \text{TiC}$.

GRADES CHART || Gráfico de graus | Gráfico de calidades



PHS228
M40-M50

A very high toughness grade ideal for heavy roughing applications while using on large I.C inserts

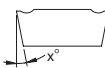
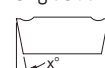
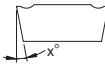
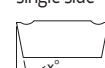
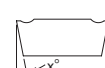
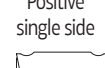
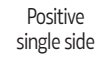
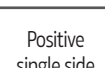
New CVD coating with $\text{TiCN} + \text{Al}_2\text{O}_3 + \text{TiC}$.



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	
	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	PH5125 PHS225	-	-				DCMT TCMT	S##C 93°
			-	-	-	-	-	-					
	Austenitic stainless steel DIN X2CrNiMoSi19 X8CrNiMo27 X2CrNiMoN22		FM LM	PH7910	LM MM	PH7910	MM	PHS215		Positive single side	Conventional nose radius 	#CMT #BMT	S##C S##B
			FM LM	PH7920	MM	PH7920	MM	PHS215					
			FM LM	PH5125 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	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	PH5125 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				



Stable cutting



General cutting

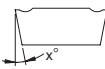
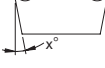
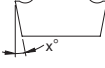
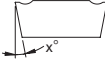
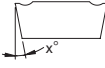
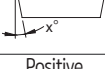
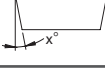
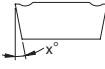


Unstable cutting

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				
			FW	PH5705	MW	PH5320	-	-	Positive single side 	Wiper nose radius 	CCMT	S##C 95°
			FW	PH5705	MW	PH5320	-	-				
			MW	PH5320	MW	PH5320	-	-			DCMT TCMT	S##C 93°
	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				
			FW	PH5705	MW	PH5320	-	-	Positive single side 	Wiper nose radius 	CCMT	S##C 95°
			FW	PH5705	MW	PH5320	-	-				
			MW	PH5320	MW	PH5320	-	-			DCMT TCMT	S##C 93°
S	Titanium Alloys DIN TiAl5Sn2.5 TiAl6V4 TiAl6V4ELI		FS	PH7910	FM	PH7910	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				
			FW	PH7920	FW	PH7920	-	-	Positive single side 	Wiper nose radius 	CCMT	S##C 95°
			FW	PH7920	MW	PH7920	-	-				
			MW	PH7920	MW	PH7920	-	-			DCMT TCMT	S##C 93°
	Super alloys DIN NiCr19Co11MoTi NiFe35Cr14MoTi CoCr20W15Ni		FS	PH7910	FM	PH7910	MM	PH7920	Positive single side 	Conventional nose radius 	#CMT #BMT	S##C S##B
			FM	PH7920	FM	PH7920	FM	PH7920				
			MM	PH7920	MM	PH7920	MM	PH7920				
			FW	PH7920	FW	PH7920	-	-	Positive single side 	Wiper nose radius 	CCMT	S##C 95°
			FW	PH7920	MW	PH7920	-	-				
			MW	PH7920	MW	PH7920	-	-			DCMT TCMT	S##C 93°
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

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
P	Unalloyed steel	125-170	280-380	210-300	200-250	250-350	180-270	170-220	250-350	180-270	170-220	200-295	170-240	150-215	200-295	170-240	150-215
	Low-alloy steel	180-350	220-280	200-260	170-210	190-250	170-230	140-180	190-250	170-230	140-180	170-230	140-210	120-190	170-230	140-210	120-190
	High-alloy stel	200-325	165-250	150-235	140-230	135-220	120-205	110-200	135-220	120-205	110-200	125-215	110-185	100-170	125-215	110-185	100-170
	Material	Grade fn (mm/r) HB (brinell)	CVD Coating						PVD Coating								
			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	135-230	120-210	115-200	140-245	130-225	115-220	130-230	120-220	110-210			
	Low-alloy steel	180-350	125-205	105-185	95-185	125-205	105-185	95-185	130-230	125-225	125-215	125-220	115-210	100-200			
	High-alloy stel	200-325	105-205	75-175	50-135	105-205	75-175	50-135	-	-	-	-	-	-			

ISO	Material	Grade fn (mm/r) HB (brinell)	CVD Coating											
			Wear Resistance									Toughness		
			PHS215			PH5125			PHS225			PH5740		
			0.2	0.4	0.6	0.2	0.4	0.6	0.2	0.4	0.6	0.2	0.4	0.6
M	SS - Ferritic/martensitic	200-330	125-260	100-220	80-200	110-230	70-175	50-135	110-230	70-175	50-135	85-180	65-160	45-135
	SS - Austenitic	180-330	130-290	100-240	80-190	100-240	70-175	55-130	100-240	70-175	55-130	85-170	65-145	45-125
	SS - Austenitic-ferritic (Duplex)	230-260	190-220	150-185	120-145	150-190	120-150	90-110	150-190	120-150	90-110	130-160	110-135	85-105
	Material	Grade fn (mm/r) HB (brinell)	PVD Coating											
			Wear Resistance						Toughness					
			PH7910			PH7920								
			0.2	0.4	0.6	0.2	0.4	0.6						
	SS - Ferritic/martensitic	200-330	128-230	120-220	115-215	133-235	130-225	120-220						
	SS - Austenitic	180-330	124-225	115-215	105-205	129-223	125-220	115-215						
	SS - Austenitic-ferritic (Duplex)	230-260	121-212	110-205	100-195	125-216	115-210	100-200						

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			PH7920		
			0.1	0.3	0.5	0.1	0.3	0.5
S	Heat resistant super alloys (Iron base)	200-280	75-130	62-127	55-115	70-120	55-115	50-110
	Heat resistant super alloys (Nickel base)	250-320	55-95	40-90	33-85	35-80	27-75	23-70
	Heat resistant super alloys (Cobalt base)	200-320	55-95	40-90	33-85	35-80	27-75	23-70
	Titanium alloys (400<or<1050[MPa])	-	80-172	70-162	65-155	65-152	50-145	45-135

ISO TURNING INSERTS CODE 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

*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.

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

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

2 - Normal clearance symbol

ISO	T	N	M	G
ANSI	T	N	M	G

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 hole	-	Without chipbreaker	
Q		Round hole / double countersink (40°~60°)	Without chipbreaker		J			Chipbreaker on both sides		R		-	Chipbreaker on one side	
U			Chipbreaker on both sides		A		Round hole	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	 V's	 D's	 C's	 S's	 T's	 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	

5 - Insert size symbol

* 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

6 - Insert thickness symbol

16	03	08	E	N	-	ST
		AN				
3	2	2	E	N	-	ST

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

NEGATIVE Chipbreakers

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

POSITIVE Chipbreakers

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.		