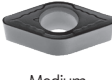






DC = RHOMBIC 55° POSITIVE

RÔMBICA 55° POSITIVA | RÓMBICA 55° POSITIVA

			P						M						K			N		S						
			CVD-MT				PVD		CVD-MT				PVD		UNC	CVD-MT		UNC	PVD							
			new grades																							
			(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	
 DCMT-MM Medium	1121680	DCMT 070204-MM									⊗	⊗					⊗	⊗							⊗	⊗
	1121683	DCMT 070208-MM									⊗	⊗						⊗								⊗
	1121647	DCMT 11T304-MM									⊗	⊗					⊗	⊗							⊗	⊗
	1121705	DCMT 11T308-MM									⊗	⊗					⊗	⊗							⊗	⊗
	1121707	DCMT 11T312-MM									⊗	⊗					⊗	⊗								⊗
 DCMT-MK Medium	1121679	DCMT 070204-MK																	⊗	⊗						
	1121682	DCMT 070208-MK																	⊗	⊗						
	1121646	DCMT 11T304-MK																	⊗	⊗						
	1121704	DCMT 11T308-MK																	⊗	⊗						
	1121955	DCMT 11T312-MK																	⊗	⊗						
 DCMT-MW Medium to Finishing Wiper	1121414	DCMT 11T304-MW	⊗	⊗							⊗							⊗		○	⊗					⊗
	1121756	DCMT 11T308-MW	⊗	⊗							⊗							⊗			⊗					
 DCGT-FS Finishing to Fine Finishing	1121747	DCGT 070201-FS							⊗	⊗							⊗	⊗							⊗	⊗
	1121748	DCGT 070202-FS							⊗	⊗							⊗	⊗							⊗	⊗
	1121872	DCGT 070204-FS							⊗	⊗							⊗	⊗							⊗	⊗
	1121873	DCGT 11T301-FS							⊗	⊗							⊗	⊗							⊗	⊗
	1121874	DCGT 11T302-FS							⊗	⊗							⊗	⊗							⊗	⊗
	1121875	DCGT 11T304-FS							⊗	⊗							⊗	⊗							⊗	⊗
	1124101	DCGT 11T308-FS							⊗	⊗							⊗	⊗							⊗	⊗
 DCGT-LN Medium to Finishing	1121900	DCGT 070202-LN															○							⊗	○	
	1121901	DCGT 070204-LN															○							⊗	○	
	1111540	DCGT 11T302-LN															⊗							⊗	⊗	
	1111534	DCGT 11T304-LN															⊗							⊗	⊗	
	1121904	DCGT 11T308-LN															○							⊗	○	
	1124004	DCGT 11T312-LN															○							⊗	○	

⊗ First choice | 1ª Escolha | 1ª Opción

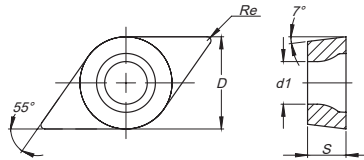
⊗ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

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
DCMT 070204-MM	DCMT 21.51-MM	6,350	2,38	0,40	2,80	0,60	0,19	2,25	0,11	0,06	0,17
DCMT 070208-MM	DCMT 21.52-MM	6,350	2,38	0,80	2,80	0,60	0,38	2,25	0,20	0,08	0,35
DCMT 11T304-MM	DCMT 32.51-MM	9,525	3,97	0,40	4,40	0,80	0,25	3,00	0,15	0,08	0,23
DCMT 11T308-MM	DCMT 32.52-MM	9,525	3,97	0,80	4,40	0,80	0,50	3,00	0,25	0,10	0,40
DCMT 11T312-MM	DCMT 32.53-MM	9,525	3,97	1,20	4,40	0,80	0,60	3,00	0,35	0,12	0,60
DCMT 070204-MK	DCMT 21.51-MK	6,350	2,38	0,40	2,80	0,60	0,19	2,25	0,11	0,06	0,17
DCMT 070208-MK	DCMT 21.52-MK	6,350	2,38	0,80	2,80	0,60	0,38	2,25	0,20	0,08	0,35
DCMT 11T304-MK	DCMT 32.51-MK	9,525	3,97	0,40	4,40	0,80	0,25	3,00	0,15	0,08	0,23
DCMT 11T308-MK	DCMT 32.52-MK	9,525	3,97	0,80	4,40	0,80	0,50	3,00	0,25	0,10	0,40
DCMT 11T312-MK	DCMT 32.53-MK	9,525	3,97	1,20	4,40	0,80	0,50	3,00	0,35	0,12	0,60
DCMT 11T304-MW	DCMT 32.51-MW	9,525	3,97	0,40	4,40	1,50	0,50	4,00	0,25	0,12	0,40
DCMT 11T308-MW	DCMT 32.52-MW	9,525	3,97	0,80	4,40	1,50	0,50	4,00	0,30	0,15	0,50
DCGT 070201-FS	DCGT 21.50.2-FS	6,350	2,38	0,10	2,80	0,30	0,10	1,00	0,03	0,01	0,06
DCGT 070202-FS	DCGT 21.50.5-FS	6,350	2,38	0,20	2,80	0,50	0,10	1,50	0,07	0,02	0,12
DCGT 070204-FS	DCGT 21.51-FS	6,350	2,38	0,40	2,80	0,80	0,15	1,50	0,15	0,08	0,25
DCGT 11T301-FS	DCGT 32.50.2-FS	9,525	3,97	0,10	4,40	0,50	0,10	1,50	0,03	0,01	0,06
DCGT 11T302-FS	DCGT 32.50.5-FS	9,525	3,97	0,20	4,40	1,00	0,10	2,00	0,07	0,02	0,12
DCGT 11T304-FS	DCGT 32.51-FS	9,525	3,97	0,40	4,40	1,50	0,15	3,00	0,15	0,08	0,25
DCGT 11T308-FS	DCGT 32.52-FS	9,525	3,97	0,80	4,40	2,00	0,20	3,50	0,18	0,10	0,30
DCGT 070202-LN	DCGT 21.50.5-LN	6,350	2,38	0,20	2,80	1,00	0,05	3,00	0,07	0,05	0,12
DCGT 070204-LN	DCGT 21.51-LN	6,350	2,38	0,40	2,80	2,05	0,10	4,00	0,15	0,10	0,20
DCGT 11T302-LN	DCGT 32.50.5-LN	9,525	3,97	0,20	4,40	2,03	0,05	4,00	0,07	0,05	0,12
DCGT 11T304-LN	DCGT 32.51-LN	9,525	3,97	0,40	4,40	2,55	0,10	5,00	0,16	0,10	0,22
DCGT 11T308-LN	DCGT 32.52-LN	9,525	3,97	0,80	4,40	2,55	0,10	5,00	0,22	0,15	0,50
DCGT 11T312-LN	DCGT 32.53-LN	9,525	3,97	1,20	4,40	2,70	0,15	5,00	0,35	0,15	0,70

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 selection	Operation	Longitudinal turning	Profiling	Facing	Plunging
Overview	Insert Shape				
Negative inserts	 Rhombic 80°	● ●		●	
Positive inserts	 Rhombic 55°	●	● ●	●	
PCD inserts	 Parallelogram 55°	●	●		●
Heavy machining	 Round	●	●	●	● ●
External Toolholders	 Square 90°	●		● ●	
Internal Toolholders	 Triangular 60°	●	●	●	●
Automatic Lathes	 Rhombic 35°		●		
Spare Parts	 Trigon 80°	●		●	

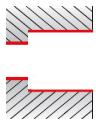
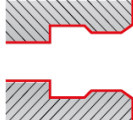

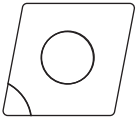
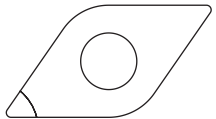

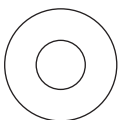
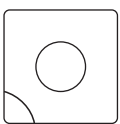
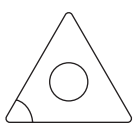
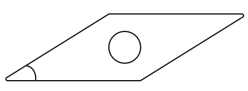
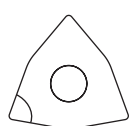
● ● Recommended Insert Shape

● 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.




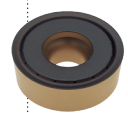



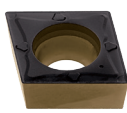
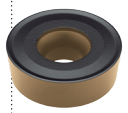

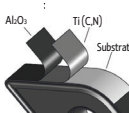
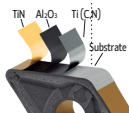
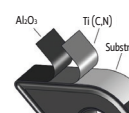
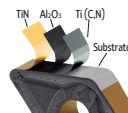
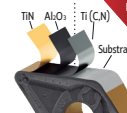
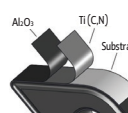
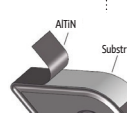
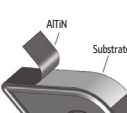
Insert Shape		Operation		Longitudinal turning	Profiling	Facing
						
	Rhombic 80°		●			●●
	Rhombic 55°		●		●●	●
	Parallelogram 55°		●●			
	Round		●			●
	Square 90°		●			
	Triangular 60°		●●		●	●
	Rhombic 35°				●	
	Trigon 80°		●			●




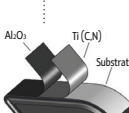
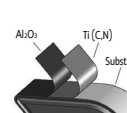
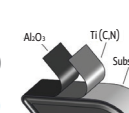
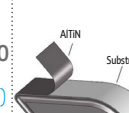
●● Recommended Insert Shape

● Alternative Insert Shape

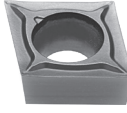


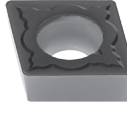




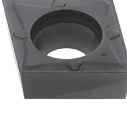

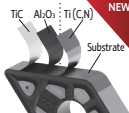
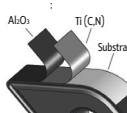
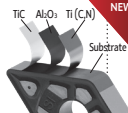
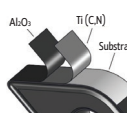
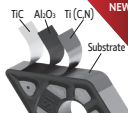
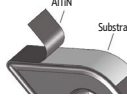
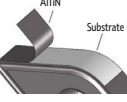
POSITIVE TURNING Application Range Overview

- TURNING
- Insert selection
- Overview
- Negative inserts
- Positive inserts
- PCD inserts
- Heavy machining
- 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						
		 PH5115 (P10-P25)	 PHG115 (P10-P25)	 PH5125 (P20-P35)	 PHG125 (P20-P35)	 PHG140 (P25-P45)	 PH5740 (P25-P45)
	PVD Grades						
		 PH7910 (P05-P10)	 PH7920 (P10-P35)				
Continuous cut ←			→ Interrupted cut				

	Fine finishing	Finishing	Medium	Roughing	Heavy roughing	
P 11°	12 	13 	FLAT 			
	CVD Grades					
		 PH5115 (P15-P25)	 PH5125 (P20-P35)		 PH5740 (P25-P45)	
	PVD Grades					
		 PH7920 (P10-P35)				
	Continuous cut ←			→ Interrupted cut		

M
5° & 7°

Fine finishing	Finishing		Medium	Roughing		Heavy roughing
FS 	FM 	LM 	MM 	RF 	RM 	
BO 	FW 	MW 	wiper		RR 	
CVD Grades						
 PHS215 (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			

K
5° & 7°

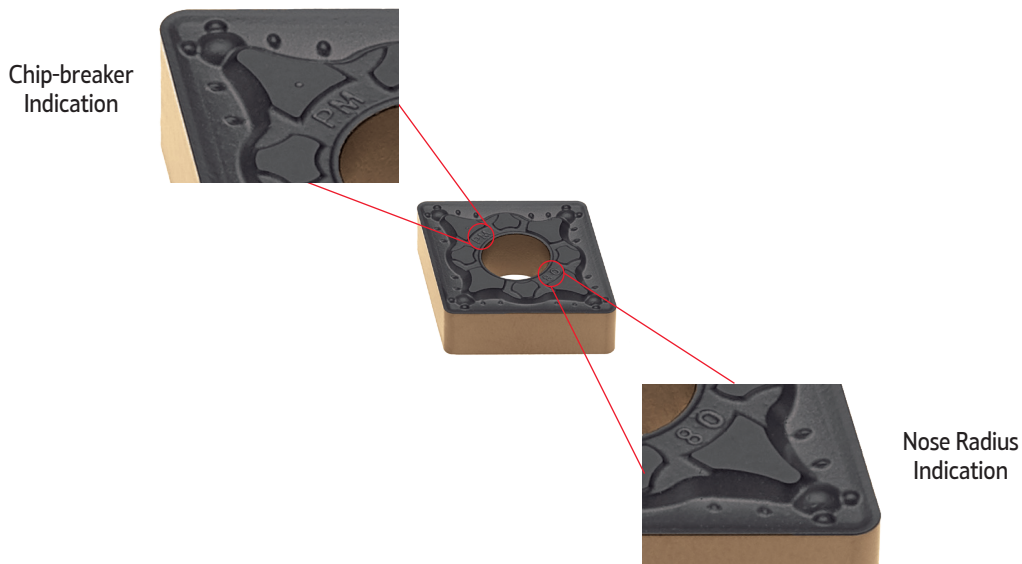
Fine finishing	Finishing		Medium	Roughing	Heavy roughing
FK 	MK 	FLAT 		RM 	
	FW 	MW 	wiper		ST 
CVD Grades					
 PH5705 (K05-K15)			 PH5320 (K10-K25)		
Uncoated Grades					
 PH0705 (K05-K15)					
Continuous cut ←			→ Interrupted cut		

POSITIVE TURNING

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

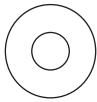
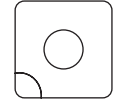
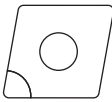

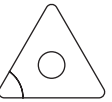
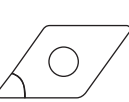
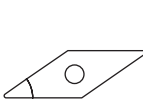
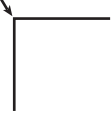




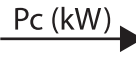
TURNING	N	Fine finishing	Finishing	Medium	Roughing	Heavy roughing
		Uncoated Grades				
		7°	PH0910 (N01-N20)	Substrate		
Overview		Continuous cut ←				→ Interrupted cut

S	Fine finishing	Finishing	Medium	Roughing	Heavy roughing
	FS	FM	LM	MM	
	BO	FW	MW	wiper	wiper
5° & 7°	PVD Grades				
PH7910 (S05-S10)	ATIN Substrate	PH7920 (S10-S25)	ATIN Substrate		
External Toolholders	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 

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	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	P M S	BO			0,05 to 0,30	0,30 to 1,50								
		M	M S	FM			0,03 to 0,45	0,06 to 2,40								
		M	K	FK			0,03 to 0,30	0,06 to 2,40								
		Fine Finishing wiper	M	P M K S	FW			0,05 to 0,50	0,30 to 3,50							
		Finishing	M	M S NEW	LM			0,08 to 0,35	0,20 to 3,00							
		Finishing to fine finishing	G	P M S	FS			0,01 to 0,25	0,10 to 3,00							
	G		N	LN			0,05 to 1,60	0,05 to 7,00								
		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 S	MM			0,06 to 0,60	0,19 to 3,60								
	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	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°	Finishing Wiper	M	P	MW			0,10 to 0,50	0,50 to 4,00							
			M												
	Medium	M	P	CP			0,04 to 0,17	0,50 to 2,40							
			M												
	Medium to finishing	M	P	RF			0,25 to 2,50	2,50 to 10,00							
			M												
	Roughing to Medium	M	P	ST			0,05 to 3,20	0,80 to 12,80							
			M												
			K												
			P		RM					0,80 to 2,50	3,20 to 13,00				
M															
Roughing to Medium	M	P	RR			0,80 to 2,50	3,20 to 13,00								
		M													

* 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 F _n (mm/rev)	Depth of cut DOC (mm)	CC __	DC __
									80°	55°
POSITIVES - Clearance angle 11°	Medium to Finishing	U	P	Flat			0,05 to 2,20	1,00 to 10,00		
			M							
	Finishing to Fine Finishing	M	P	12			0,03 to 0,55	0,10 to 3,00		
M										
Medium	M	P	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

	ISO	ANSI	Uncoated grades	Coated Grades			
				CVD	PVD		
STEEL	P	05		^{NEW} PHG105		↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste	
		10					
		15	C7		PHG115		PH5115
		20					
		25	C6				
	30			PHG125	PH5125	↓ - Toughness - Tenacidade - Tenacidad	
	35						
	40						
	45	C5					
	50						
STAINLESS STEEL	M	05				↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste	
		10	-				
		15			^{NEW} PHS215		
		20	-				
		25			PH5125		^{NEW} PHS225
	30	-				↓ - Toughness - Tenacidade - Tenacidad	
	35						
	40	-					
	45						
	50						
CAST IRON	K	05	C4			↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste	
		10	C3		PH5705		
		15					
		20	C2				PH5320
		25					
30	C1				PH5740	↓ - Toughness - Tenacidade - Tenacidad	
35							
40							
ALUMINIUM & NON FERROUS	N	05	C4				↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste
		10	C3				
		15					
		20	C2				
		25					
30	C1						
35							
HEAT RESISTENT / TITANIUM ALLOYS	S	05	-			↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste	
		10					
		15					
		20					
		25					
		30					

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

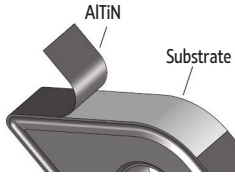
TURNING GRADES DESCRIPTION

Descrição de graus para torneamento | Descripción de calidades para torneado

PVD GRADES

PH7910

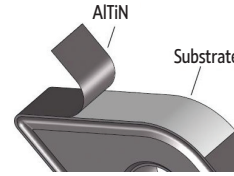
P05-P10
M05-M10
S05-S15



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

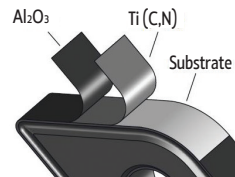


A micro grain size combined with the AlTiN PVD coating make it suitable for Roughing to Finishing operations under good cutting conditions to light interrupted cuts at medium cutting speeds. Suitable for steels, stainless steel, HRSA.

CVD GRADES

PH5115

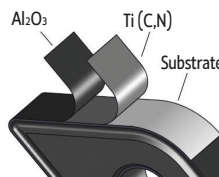
P10-P25
M10-M25



Medium temperature CVD coating with α - Al_2O_3 . Carbide grade with a gradient layer close to the surface. Suitable for high to medium cutting speeds on steels & cast steels.

PH5125

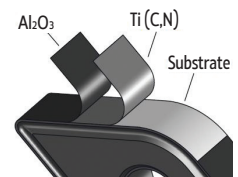
P20-P35
M15-M30



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 - Al_2O_3) medium temperature - CVD, improving the tool life.

PH5740

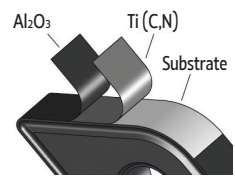
P25-P45
M25-M45
K20-K40



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

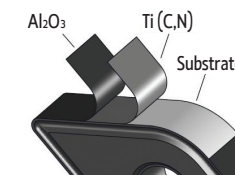
K05-K15



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

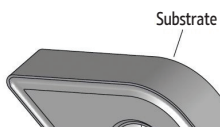


Medium temperature CVD coating (α - Al_2O_3) combined with a hard substrate make it capable of withstanding interrupted conditions. Recommended as general choice for roughing of all cast irons at low to medium cutting speeds. Can also be a solution for high alloy steels.

UNCOATED CARBIDE GRADE

PH0910

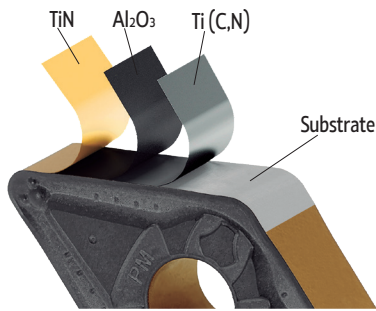
N01-N20



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 $\text{Al}_2\text{O}_3 + \text{TiN}$.



PHG105
P05-P10

First choice for continuous cut with hardness higher than 38HRC

New CVD coating with $\text{Al}_2\text{O}_3 + \text{TiN}$ combined with a very hard substrate.

PHG115
P10-P25

Suitable for high to medium cutting speeds on steels

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

PHG125
P20-P35

Ideal for general application in all kind of steels

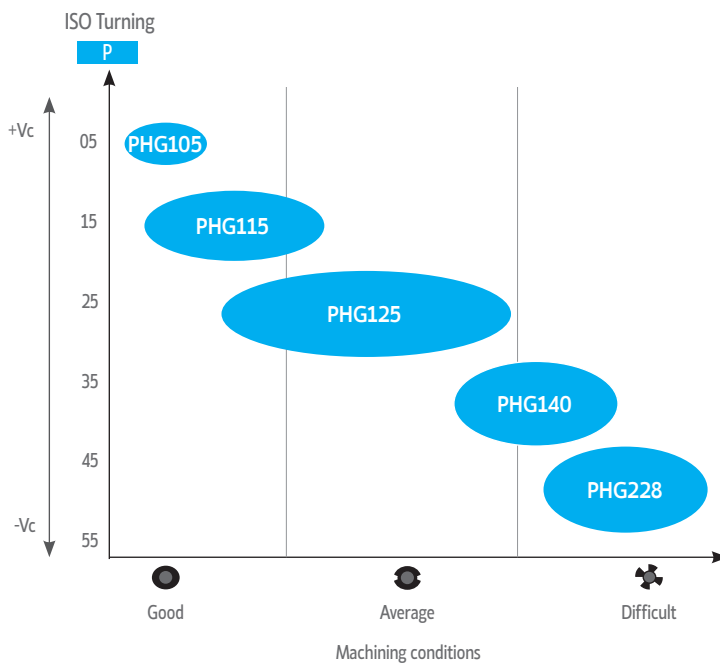
Carbide grade suitable for medium machining of steels at medium cutting speeds.

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

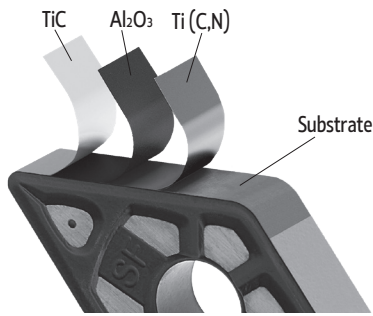


PHG228
P40-P50

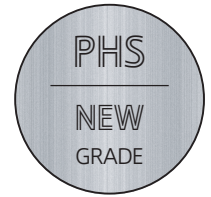
A very high toughness grade ideal for heavy roughing applications while using on large I.C inserts

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





New CVD coating with Al_2O_3+TiC .



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

New CVD coating with $TiCN+Al_2O_3+TiC$.



First choice for general application on turning of stainless steels

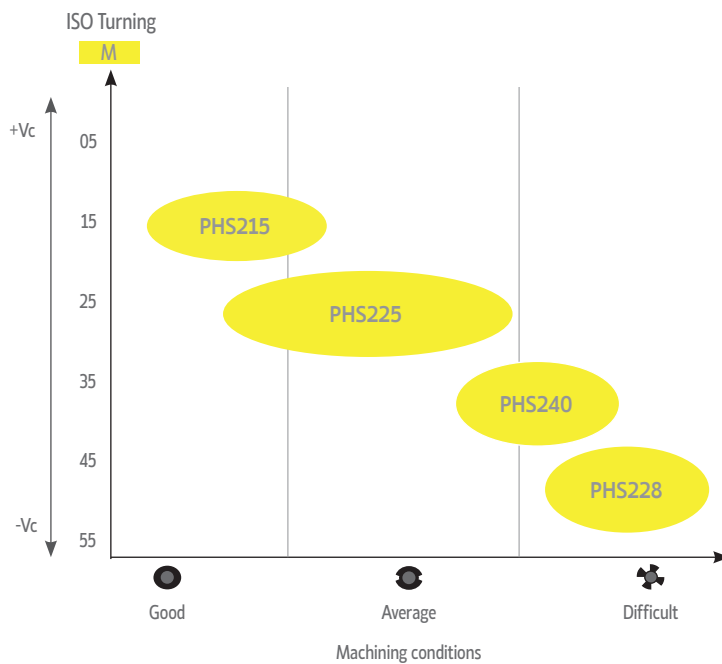
Carbide grade suitable for medium machining of stainless steels and super alloys at medium cutting speeds. New CVD coating with $TiCN+Al_2O_3+TiC$.



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

New CVD coating with $TiCN+Al_2O_3+TiC$.

GRADES CHART || Gráfico de graus | Gráfico de calidades



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

New CVD coating with $TiCN+Al_2O_3+TiC$.



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	
M	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		Positive single side	Wiper nose radius	CCMT	S##C 95°
			FW	PH5115 PHG115	MW	PH5115 PHG115	-	-					
			FW	PH5115 PHG115	MW	PH5115 PHG115	-	-				DCMT TCMT	S##C 93°
		M	Duplex stainless steel DIN X2CrNiMoSi19 X8CrNiMo27 X2CrNiMoN22		FM	PH7910	LM MM	PH7910	MM	PHS215		Positive single side	Conventional nose radius
	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	-	-					
			MW	PHS215	MW	PHS215	-	-				DCMT TCMT	S##C 93°
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

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

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	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	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	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	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

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 →			← 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	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 →			
			PH5215			PH5125			PH5225			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.

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

A	B	C	D	E
				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	without hole	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		Chipbreaker on both sides		R	-		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		Round hole	Chipbreaker on one side		X		-	-	-	-

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 R00)

** 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	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

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 MO/ 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.		