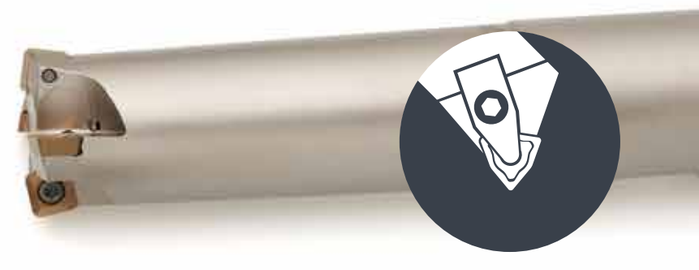
Complete solutions
on cutting tools

palbit
HARDMETAL TOOLS SOLUTIONS

IMPERIAL
General Catalogue

100 YEARS
SINCE 1916



MILLING

DRILLING

TURNING

GROOVING & PARTING OFF

THREADING

MILLING

A

MILLING TOOL SELECTION

Selecção da ferramenta de fresagem | Selección de la herramienta de fresado

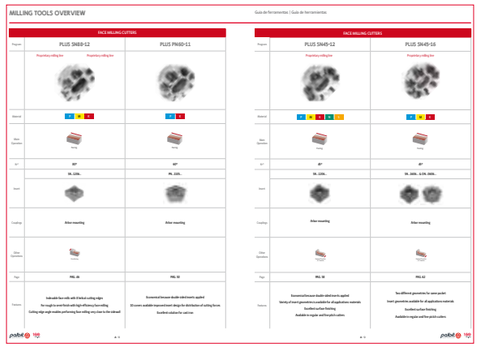
1 - Define your operation type:

Identify your operation type

- Face milling
- Highfeed milling
- Shoulder milling
- Profile milling
- Hardmill

Select your tool:

See page A - 8

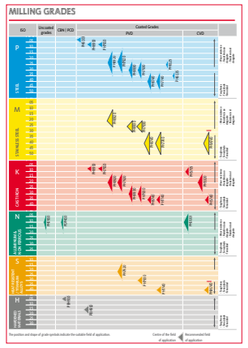


2 - Define your material

Define your material according to ISO:

- P Steel
- M Stainess Steel
- K Cast Iron
- N Alluninium
- S Heat Resistent and Titanium Alloy
- H Hardened Material

See last pages for Palbit Selection Materials - PSM



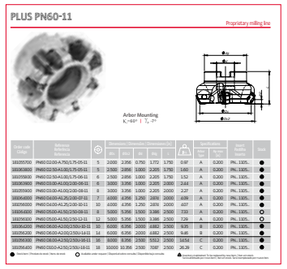
3 - Select your milling cutter

Choose the cutter pitch and mounting:

Use a close pitch cutter as first choice

Use a coarse pitch cutter for long overhang and unstable conditions

Choose a mouting type



4 - Select your insert

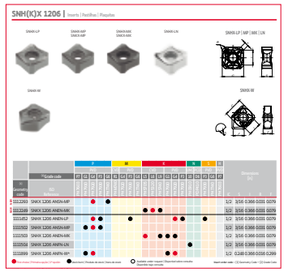
Choose the insert geometry for your operation:

Geometry L= Light (for light cuts when low forces/power are required)

Geometry M = Medium (first choice for mixed production)

Geometry H = Heavy (for rough operations, forging, cast skin and vibration)

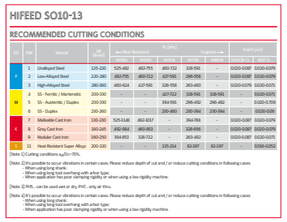
Select insert grade for optimum productivity



5 - Define your starting cutting parameters

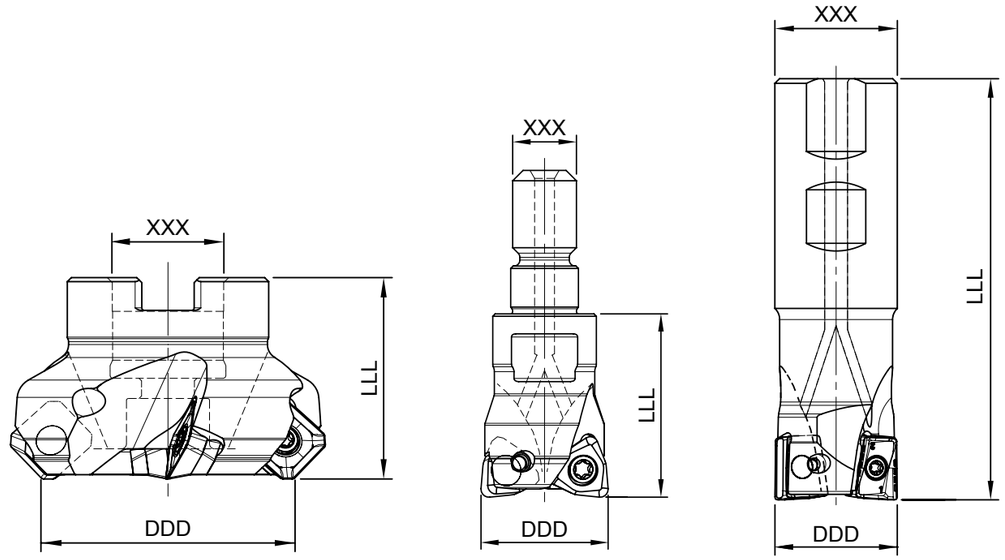
Cutting speeds and feeds for different materials are given on the insert boxes and in the tables for each solution.

The values should be optimized according to the machine and conditions.



MILLING TOOLS CODIFICATION

Codificação das ferramentas de fresagem | Codificación de heramientas de fresadoo



A N 9 0 - D 3 . 0 0 A X X X / L L L U - 0 6 - 1 6 - L

Rotation (R/L)
Rotação (R/L)
Rotación (R/L)
*In case of right rotation the "R" is supressed.

Insert dimension
Dimensão da pastilha
Dimesion del inserto

Number of teeth
Número de dentes
Numero de dientes

Cooling system
Refrigeração
Refrigeración

U - Whitout cooling system
U - Sem refrigeração
U - Sin refrigeración

Total lenght
Comprimento total
Longitud total

Coupling diameter
Diâmetro de acoplamento
Diámetro de acoplamiento

Coupling Type (A-6)
Tipo de acoplamento (A-6)
Tipo de acoplamiento (A-6)

Diameter
Diâmetro
Diametro

Lead angle
Ângulo de posicionamento da pastilha
Ángulo de posicion del inserto

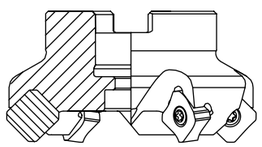
Insert Type (A-7)
Pastilha aplicável (A-7)
Inserto aplicable (A-7)

COUPLING TYPES | Tipo de acoplamento | Tipo de acoplamiento

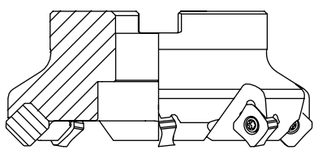
Symbol Símbolo Símblo	Coupling type Tipo de acoplamento Tipo de acoplamiento	Inserts fixation type Fixação de pastilhas Fijación de plaquitas	Standard Norma Norma
A	Arbor mounting Montagem tipo árvore Montaje tipo husillo	Insert screw Parafuso pastilha Tornillo de la plaquita	ISO 6462
B		Wedge Cunha Cuña	ISO 6462
C		Insert screw and washer, screw clamp or clamp Parafuso para pastilha e anilha, parafuso e grampo ou grampo Tornillo de la plaquita y arandela, tornillo y brida o brida	ISO 6462
D		Washer Anilha Arandela	ISO 6462
E	Cylindrical shank Haste cilíndrica Mango recto	Any type Qualquer tipo Cualquier tipo	DIN 1835 - A
R	Threaded coupling Acoplamento roscado Acoplamiento tipo tornillo	Any type Qualquer tipo Cualquier tipo	Palbit internal standard Norma interna Palbit
W	Weldon shank Haste weldon tipo mango	Any type Qualquer tipo Cualquier tipo	DIN 1835 - B

ISO ARBOR MOUNTING TYPES | Estilos de montagem ISO tipo árvore | Estilos de montaje ISO tipo husillo

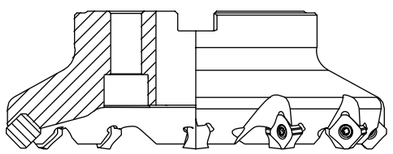
Arbor type A



Arbor type B

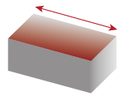


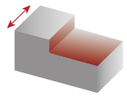
Arbor type C

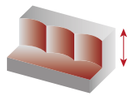


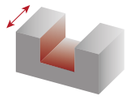
NOTE: For each type of arbor mounting (see previous table of coupling type on simbols A, B, C, D), we can have a different arbor types (see images above).

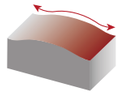
MILLING OPERATIONS | Operações de fresagem | Operaciones de fresado

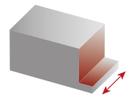

Facing

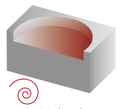

Shouldering

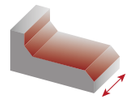

Plunging

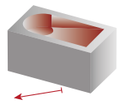

Slotting

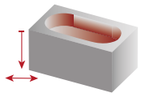

Copying

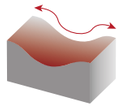

Side milling


Helical Interpolation


Slanted Shoulder & Chamfer


Ramp down


Plunging & Recessing


Profiling

INSERTS CODIFICATION FOR MILLING HOLDERS

Codificação de pastilhas para fresas | Codificación de insertos para herramientas de fresado

Code	Inserts Description
SO10-08	SO... 0803...
SO10-13	SO... 13M5...
SO15-16	SO... 1605...
AP90-10	AP... 1003...
AP90-16	AP... 1604
AN90-10	ANHX 1004...
AN90-12	ANHX 1204...
AN90-16	ANHX 1607...
XP90-06	XPET 0602...
XP90-10	XPET 1003...
XP90-17	XPET 1706...
SN88-12	SN...U 1206...

Code	Inserts description
RP90-10	RP... 10T3...
RP90-12	RP... 1204...
RP90-16	RP... 1605...
RN90-12	RN... 1204...
WN90-04	WNHU 04T3...-LP
WD60-12	WD... 1204...
WN60-12	WNMW 1207...
XD90-15	XDGX 15M5...
XD90-22	XDGX 22M7...
PN60-11	PNHX 1105...
SN45-12	SN...X 1206...
SN45-16	SN...X 1606... & ON...X 0606...

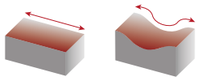
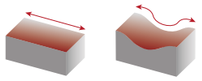
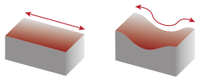
FACE MILLING CUTTERS

Program	PLUS SN88-12	PLUS PN60-11
	Proprietary milling line 	Proprietary milling line 
Material	P M K	P K
Main Operation	 Facing	 Facing
Kr°	80°	60°
Insert	SN...1206... 	PN...1105... 
Couplings	Arbor mounting	Arbor mounting
Other Operations	 Shouldering	
Page	PAG. 50	PAG. 54
Features	Indexable face mills with 8 helical cutting edges For rough to semi-finish with high-efficiency face milling Cutting edge angle enables performing face milling very close to the sidewall	Economical because double sided inserts applied 10 coners available improved insert design for distribution of cutting forces Excellent solution for cast iron

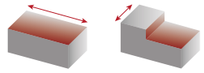
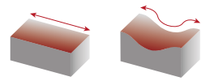
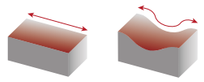
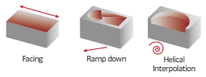
FACE MILLING CUTTERS

Program	PLUS SN45-12	PLUS SN45-16
	Proprietary milling line 	Proprietary milling line 
Material	P M K N S	P M K
Main Operation	 Facing	 Facing
Kr°	45°	45°
Insert	SN...1206... 	SN...1606... & ON...0606... 
Couplings	Arbor mounting	Arbor mounting
Other Operations	 Slanted Shoulder & Chamfer	 Slanted Shoulder & Chamfer
Page	PAG. 56	PAG. 60
Features	Economical because double sided inserts applied Variety of insert geometries is available for all applications materials Excellent surface finishing Available in regular and fine pitch cutters	Two different geometries for same pocket Insert geometries available for all applications materials Excellent surface finishing Available in regular and fine pictch cutters

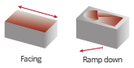
HIFEED MILLING CUTTERS

Program	HIFEED SO10-08	HIFEED SO10-13	HIFEED SO15-16
	Proprietary milling line 	Proprietary milling line 	Proprietary milling line 
Material	P M K S	P M K S	P M K S
Main Operation	 Facing Profiling	 Facing Profiling	 Facing Profiling
Kr°	10°	10°	15°
Insert	SO...0803... 	SO...13M5... 	SO...1605... 
Couplings	Weldon shank Threaded coupling Arbor mounting	Arbor mounting	Arbor mounting
Other Operations	 Ramp down Helical Interpolation Plunging	 Ramp down Helical Interpolation Plunging	 Ramp down Helical Interpolation Plunging
Page	PAG. 64	PAG. 70	PAG. 74
Features	High feed cutting with low cutting load High productivity		High feed cutting with low cutting load High productivity

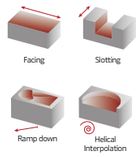
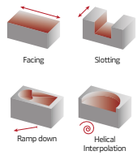
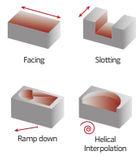
HIFEED MILLING CUTTERS

Program	PRO XP90-06 | XP90-10 NEW	HIFEED WD60-12	HIFEED WN60-12
	Proprietary milling line 		
Material	P M K S H	P M K S	P K
Main Operation	 Facing Shouldering	 Facing Profiling	 Facing Profiling
Kr°	90°	10°	
Insert	XP...0602... | XP...1003... 	WD...1204... 	WN...1207... 
Couplings	Arbor mounting Cylindrical shank Threaded coupling	Arbor mounting	Arbor mounting
Other Operations	 Facing Ramp down Helical Interpolation	 Ramp down Helical Interpolation Plunging	 Ramp down Helical Interpolation Plunging
Page	PAG. 100 | 104	PAG. 78	PAG. 82
Features	New chipbreaker HF for Hifeed machining	High feed cutting with low cutting load	High feed cutting with low cutting load Excellent in high overhang

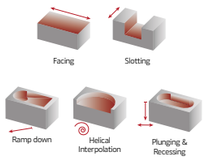
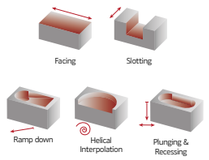
SHOULDER MILLING CUTTERS

Program	PLUS WN90-04 (NEW)	PLUS AN90-10	PLUS AN90-12 (NEW)	PLUS AN90-16
	Proprietary milling line	Proprietary milling line	Proprietary milling line	Proprietary milling line
				
Material	P K	P M K N S	P M K S	P K N
Main Operation	 Shouldering	 Shouldering	 Shouldering	 Shouldering
Kr°	90°	90°	90°	90°
Insert	WNHU 04T308-LP	ANHX 1004...	ANHX 1206...	ANHX 1607...
				
Couplings	Threaded coupling Cylindrical shank	Arbor mounting Weldon shank	Arbor mounting Weldon shank Threaded coupling	Arbor mounting Weldon shank
Other Operations	 Facing, Ramp down	 Facing, Slotting, Plunging	 Facing, Slotting, Plunging	 Facing, Slotting, Plunging
Page	PAG. 86	PAG. 88	PAG. 92	PAG. 96
Features	Economical because double sided inserts applied Robust geometry	4 corners insert with positive cutting edge Variety of insert geometries is available for all applications Helical cutting edge Available in regular and fine pitch cutters	4 corners insert with positive cutting edge Variety of insert geometries is available for all applications Helical cutting edge Available in regular and fine pitch cutters	4 corners insert with positive cutting edge Variety of insert geometries is available for all applications Helical cutting edge Available in regular and fine pitch cutters

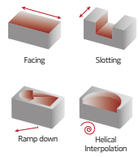
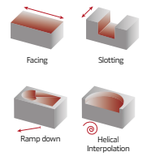
SHOULDER MILLING CUTTERS

Program	LINEPRO XP90-06	LINEPRO XP90-10	LINEPRO XP90-17
	Proprietary milling line	Proprietary milling line	Proprietary milling line
			
Material	P M K S H	P M K N S H	P M K N S
Main Operation	 Shouldering	 Shouldering	 Shouldering
Kr°	90°	90°	90°
Insert	XP...0602...	XP...1003...	XP...1706...
			
Couplings	Cylindrical shank Threaded coupling	Arbor mounting Weldon shank Threaded coupling	Arbor mounting Weldon shank
Other Operations	 Facing, Slotting, Ramp down, Helical Interpolation	 Facing, Slotting, Ramp down, Helical Interpolation	 Facing, Slotting, Ramp down, Helical Interpolation
Page	PAG. 100	PAG. 104	PAG. 110
Features	Excellent solution for square shoulder milling Offers longer tool life, better tolerances and better productivity parameters Low power requirement & smooth cutting possible due to positive helical angle Very flexible and suitable for most milling operations High positive cutting rake geometry		

SHOULDER MILLING CUTTERS

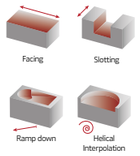
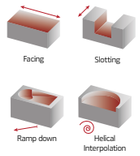
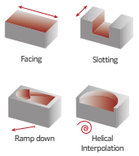
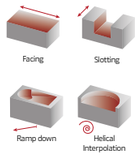
Program	ALUPRO XD90-15	ALUPRO XD90-22
	Proprietary milling line 	Proprietary milling line 
Material	N	N
Main Operation	 Shouldering	 Shouldering
Kr°	90º	90º
	XDGX 15M5...	XDGX 22M7...
Insert		
Couplings	Arbor mounting Cylindrical shank	Arbor mounting Cylindrical shank
Other Operations		
Page	PAG. 114	PAG. 118
Features	Solution for multi functional milling operations on aluminum alloys High speed conditions with high metal removel rate Stable clamping conditions (Anti-fly) High rake angle geometry that provides a good surface finish and low cutting forces	

SHOULDER MILLING CUTTERS

Program	LINEPRO AP90-10	LINEPRO AP90-16
		
Material	P M K N	P M K N
Main Operation	 Shouldering	 Shouldering
Kr°	90º	90º
	AP...1003...	AP...1604...
Insert		
Couplings	Weldon shank	Arbor mounting Weldon shank
Other Operations		
Page	PAG. 122	PAG. 126
Features	Strong insert and low cutting force Helical cutting edge Good ship evacuation	

MILLING TOOLS OVERVIEW

PROFILE MILLING CUTTERS

Program	TOROMILL RP90-10 NEW	TOROMILL RP90-12 NEW	TOROMILL RP90-16 NEW	TOROMILL RN90-12 NEW
	Proprietary milling line 	Proprietary milling line 	Proprietary milling line 	Proprietary milling line 
Material	M S	M S	M S	P M K S
Main Operation	 Profiling	 Profiling	 Profiling	 Profiling
Krº	-	-	-	-
Insert	RPHT 10T3... 	RPHT 1204... 	RPHT 1605... 	RNHX 1204... 
Couplings	Arbor mounting Weldon shank Threaded coupling	Arbor mounting	Arbor mounting	Arbor mounting Weldon shank Threaded coupling
Other Operations				
Page	PAG. 132	PAG. 132	PAG. 132	PAG. 136
Features	Excellent solution for profile milling Low power requirement & smooth cutting possible due to positive helical angle First choice for problematic materials (M and S material classes) High positive cutting rake geometry		Excellent solution for profile milling Low power requirement & smooth cutting possible due to positive helical angle First choice for problematic materials (M and S material classes) High positive cutting rake geometry	Excellent solution for Profile milling "First choice for problematic materials (M and S material classes) High positive cutting rake geometry

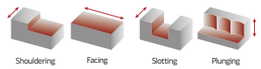
HARDMILL

Program	HARDMILL XN90-12 NEW
	
Material	K N
Main Operation	 Facing
Krº	90º
Insert	XNHW 1205... 
Couplings	Arbor mounting
Other Operations	 Shouldering
Page	PAG. 140
Features	Excellent solution for aluminum PCD tip

Vista genérica dos novos programas | Vista general de los nuevos programas

PLUS AN90-12

NEW



Range extention on 90º Shoulder milling solution

P M K S

ANHX-LS

ANHX-MP

see more on page A-92.

True 90º wall
- 90º allows multi applications;
- Excellent for shouldering;

Pocket
- Better chip evacuation due to a wide pocket;

Double-sided insert
- 4 cutting edges;
- Negative insert has a strong edge;

Chip Breaker
- Cutting load reduction due to high rake angle;
- Improvement of chip flow and evacuation in multiple applications and materials;
- New LS chip breaker (on ANHX12) for M and S class materials;

TOROMILL RP90-10 | RP90-12 RP90-16

NEW

M S

Line for machining stainless steels and difficult-to-cut materials

RPHT

see more on page A-132.

Features
- High positive rake angle results in low cutting resistance;
- Optimal cutter design for stainless steel and difficult-to-cut material machining;
- Special grade (PHM740) with wear resistence and thoughness characteristics;
- Optimized insert for machining with 6 cutting edges.

TOROMILL RP90-10	TOROMILL RP90-12	TOROMILL RP90-16
RPHT 10T3...	RPHT 1204...	RPHT 1605...

NEW MILLING PROGRAMS OVERVIEW

Vista genérica dos novos programas | Vista general de los nuevos programas

TOROMILL RN90-12

NEW

Revolutionary double-sided round milling insert for turbine blade machining.

P M K S

RNHX-LP

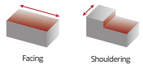
RNHX-MP

see more on page A-136.

Features
- Double-sided insert with up to 12 cutting edges for a more productive cutting process;
- Higher clearance in bodies to permit pocketing and profile milling;
- Two different types of chip-breakes;
- Unique anti-rotation feature for excellent stability with higher feed rates and cutting forces. User-friendly insert rotation.

HARDMILL XN90-12

NEW



K N

High performance. cutting with PCD inserts!

- Smooth cutting (high rake angle)
- High productivity (minimum cycle times)
- Economical (high quantities per cutting edge applying PCD)

XNHW 1205...

see more on page A-140.

Optimized insert geometries
- Available as corner tipped variant;
- Available with full lenght tipping;
- Long consistent tool life.

PHM - NEW MILLING GRADE | PHM - Novo grau de fresagem | PHM - Nuevo calidad de fresado

NEW

A new step on coating inovation!

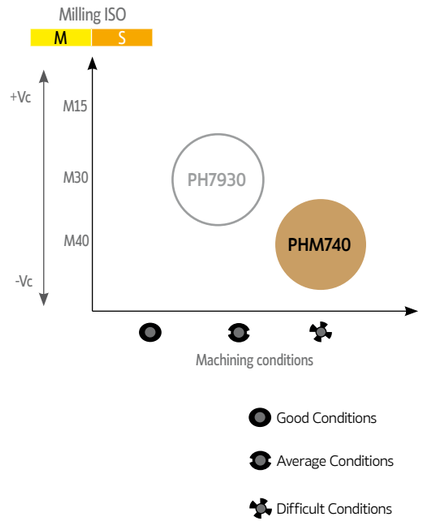
PHM
NEW
GRADE

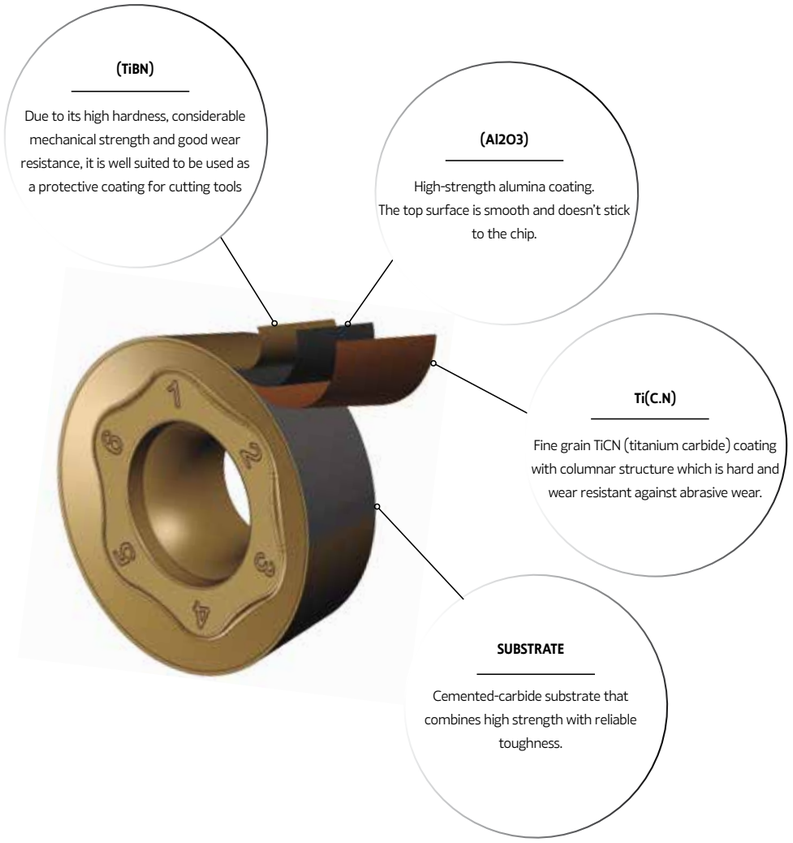
NEW MT CVD coated carbide grade. named PHM.

Developed to provide a better performance in milling of stainless-steels and high temperature alloys.

Main features:

- Extraordinary heat resistance
- High toughness
- Excellent resistance to notching
- CVD high-performance coating with maximum hardness and extremely smooth surface





GRADES CODIFICATION SYSTEM

Sistema de codificação de graus | Codificación de calidad

PH	X	X	XX
PH - Palbit Hardmetal	0 - Uncoated	1 - Steel	01 - ISO Field
PD - Palbit diamond	1 - SPB / SKB - CVD Black Al_2O_3	2 - Stainess steel	50 - ISO Field
PB - Palbit CBN	2 - SPA / SKA - CVD Yellow Al_2O_3	3 - Cast Iron	
PC - Palbit Ceramic	3 - STN - TiN / TCN	4 - Non Ferrous	
PR - Palbit Ceramic (coated)	4 - TiCN - CVD	5 - Super Alloys	
PT - Palbit Cermet	5 - Gen. Purpose - CVD	6 - Hardened Materials	
	6 - TiAlN - PVD	7 - Wearparts	
	C - TiAN + TiN - PVD	9 - Universal Range	
	7 - TiAlN - PVD		
	8 - TiN - PVD		
	9 - Gen. Purpose - PVD		
	T - TiB_2		
	D - Diamond Coating		
	B - CBN Coating		
	A - Al_2O_3 Ceramic (uncoated)		
	N - Nitride Ceramic (uncoated)		
	R - Reinforced Ceramic (uncoated)		
	H - High content of CBN		
	L - Low Content of CBN		
	P - Policristaline Diamond		
	G - Al_2O_3 - 15 Gold - CVD		
	M - Al_2O_3 - TiB_2 - CVD		

FACE MILLING INSERTS

Reference	SNHU	SNKU	PNHX	PNKX NEW
	Proprietary milling insert	Proprietary milling insert		
				
Size	12	12	11	11
Material	P M K	P M K	P K	P K
Page	Pag. 51	Pag. 51	Pag. 54	Pag. 54

FACE MILLING INSERTS

Reference	SNHX	SNKX	ONHX	ONKX
	Proprietary milling insert	Proprietary milling insert	Proprietary milling insert	Proprietary milling insert
				
Size	12 | 16	12 | 16	06	06
Material	P M K S	P K	P M S	P M K S
Page	Pag. 57 | 61	Pag. 57 | 61	Pag. 61	Pag. 61

HIFEED MILLING INSERTS

Reference	SOEW	SOET	WDET	WDMW
	Proprietary milling insert	Proprietary milling insert		
				
Size	08 | 13 | 16	08 | 13 | 16	12	12
Material	P K	P M S	P M S	P K
Page	Pag. 65 | 71 | 74	Pag. 65 | 71 | 74	Pag. 79	Pag. 79

HIFEED MILLING INSERTS

Reference	WNMW	XPET...HF NEW
		Proprietary milling insert
		
Size	12	06 | 10
Material	P K	P M K S
Page	Pag. 83	Pag. 101 | 106

SHOULDER MILLING INSERTS

Reference	WNHU NEW	ANHX NEW	XPET	XDGX
	Proprietary milling insert	Proprietary milling insert	Proprietary milling insert	Proprietary milling insert
				
Size	04	10 | 12 | 16	06 | 10 | 17	15 | 22
Material	P K	P M K N S	P M K N S	N
Page	Pag. 87	Pag. 89 | 93 | 96	Pag. 101 | 106 | 111	Pag. 115 | 119

SHOULDER MILLING INSERTS

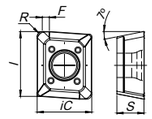
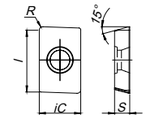
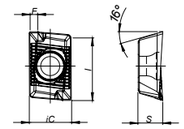
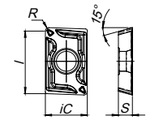
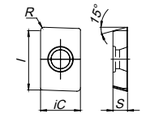
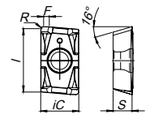
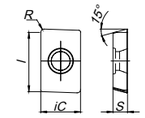
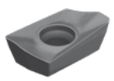
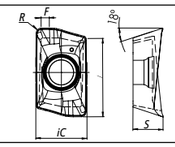
Reference	APET	APKT	APHT
			
Size	10	10 | 16	16
Material	N	P M K N	N
Page	Pag. 123	Pag. 123 | 128	Pag. 128

PROFILE MILLING INSERTS

Reference	RPHT NEW	RNHX NEW
	Proprietary milling insert	Proprietary milling insert
		
Size	10 | 12 | 16	12
Material	M S	P M S
Page	Pag. 134	Pag. 137

HARDMILL MILLING INSERTS

Reference	XNHW NEW
	
Size	12
Material	P K
Page	Pag. 143

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M			K									N	Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
			PVD							PVD			CVD		PVD						UNC	UNC							
		(2) Grade code	M6	54	68	66	78	86	I5	68	66	I5	L5	L9	D2	54	68	67	66	I5	17	10							
			PH6103	PH6910	PH6920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6930	PH6740	PH5705	PH5740	PH6705	PH6910	PH6920	PH6325	PH6930	PH6740	PH0325	PH0910	ic	S	l	R	a	F	
	1111423	ACET 150612 TR			◎					◎							◎						0.500	0.250	0.591	0.047	-	0.067	
	1110005	ADHW 150308 R			○												○						0.375	0.125	0.591	0.031	-	-	
	1110006	ADKT 1505 PDR			◎	○				◎	○						○		○				0.376	0.222	0.618	-	-	0.063	
	1111218	ADKT 1505 PDSR			◎	◎					◎						◎		◎				0.376	0.222	0.618	-	-	0.063	
	1111209	ADKT 1505 PDTR			◎	○					○						◎		○				0.376	0.222	0.618	-	-	0.063	
	1110010	ADMT 150308R			○			○		○							○						0.375	0.125	0.591	0.031	-	-	
	1110011	ADMW 150308R			○												○						0.375	0.125	0.591	0.031	-	-	
	1110014	APFT 1604 PDFR			○												○						0.375	0.187	0.630	0.031	-	0.079	
	1110015	APFT 1604 PDSR			◎												◎						0.375	0.187	0.630	0.031	-	0.079	
	1110557	APFT 1604 PDTR			○												○						0.375	0.187	0.630	0.031	-	0.079	
	1111184	APFW 1604 PDER			○												○						0.375	0.187	0.630	0.031	-	0.079	
	1110016	APFW 1604 PDTR			○												○						0.375	0.187	0.630	0.031	-	0.079	
	1112192	BOMT 130408R			○												○						0.320	0.191	0.453	0.047	-	0.055	

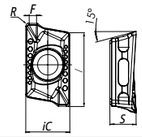
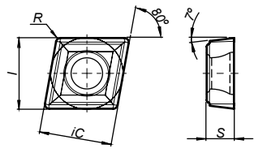
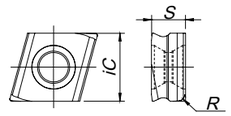
◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

◬ Inventory maintained. To be replaced by new item. | Iten em stock.
Será substituído por novo item | Iten en stock. Será reemplezado por nuevo iten.

◎ Stock item | Produto de stock | Itens de stock

Insert order code = (1) Geometry Code + (2) Grade Code

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M		K						S			N	Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
			PVD							PVD		PVD						PVD			UNC							
		(2) Grade code	G1	54	68	G4	P3	86	I5	P3	66	G1	54	G4	68	P3	I5	P3	G6	I5	10							
			PH7910	PH6910	PH6920	PH7920	PH7930	PH6135	PH6740	PH7930	PH6930	PH7910	PH6910	PH7920	PH6920	PH7930	PH6740	PH7930	PH7740	PH6740	PH0910	ic	S	l	R	a	F	
	1110038	BCKT 1304 PDR						◎														0.331	0.193	0.504	0.024	-	0.055	
	1121620	CCMT 060202-BO	◎			◎	◎			◎		◎		◎		◎		◎				0.250	0.094	0.250	0.008	-	-	
	1121621	CCMT 060204-BO	◎			◎	◎			◎		◎		◎		◎		◎				0.250	0.094	0.250	0.016	-	-	
	1121601	CCMT 09T304-BO	◎			◎	◎			◎		◎		◎		◎		◎				0.375	0.156	0.375	0.016	-	-	
	1121622	CCMT 09T308-BO	◎			◎	◎			◎		◎		◎		◎		◎				0.375	0.156	0.375	0.031	-	-	
	1121624	CCMT 120404-BO	◎			◎	◎			◎		◎		◎		◎		◎				0.250	0.188	0.500	0.016	-	-	
	1121623	CCMT 120408-BO	◎			◎	◎			◎		◎		◎		◎		◎				0.250	0.188	0.500	0.031	-	-	
	1112194	ENHQ 090400 R			○																	0.375	0.187	-	-	-	-	
	1110617	ENHQ 090400-L			○																	0.375	0.187	-	-	-	-	
	1112208	ENHQ 090408-L			○																	0.375	0.187	-	0.031	-	-	
	1112207	ENHQ 090408-R			○																	0.375	0.187	-	0.031	-	-	
	1111037	ENHQ 120600 L			○																	0.500	0.250	-	-	-	-	
	1110790	ENHQ 120600 R			○																	0.500	0.250	-	-	-	-	
	1110730	ENHQ 120610 L			○																	0.500	0.250	-	0.039	-	-	
	1110729	ENHQ 120610 R			○																	0.500	0.250	-	0.039	-	-	
	1111353	ENHQ 120630 TR			○																	0.500	0.250	-	0.118	-	-	
	1110793	ENHQ 120640 R			○																	0.500	0.250	-	0.157	-	-	

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

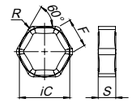
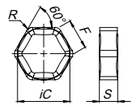
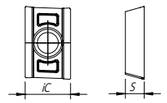
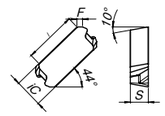
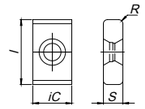
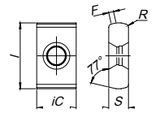
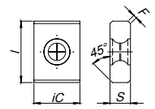
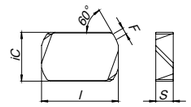
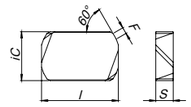
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

△ Inventory maintained. To be replaced by new item. | Iten em stock.
Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

◎ Stock item | Produto de stock | Itens de stock

Insert order code = (1) Geometry Code + (2) Grade Code

Visão genérica de outras pastilhas para fresagem | Visión general de otras plaquitas para fresado

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M		K							N	Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
			PVD							PVD		CVD		PVD					UNC	UNC						
		(2) Grade code	M6	54	68	66	78	86	I5	68	66	L5	L9	D2	54	68	67	I5	17	10						
			PH6103	PH6910	PH6920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6930	PH5705	PH5740	PH6705	PH6910	PH6920	PH6325	PH6740	PH0325	PH0910	ic	S	l	R	a	F	
	1110922	HNGF 090520 - V										◎				○	◎				0.638	0.219	0.361	0.079	-	-	
	1110957	HNGF 090520 - W										◎		◎		○					0.368	0.219	0.361	0.079	-	-	
	1112410	LDHT 15T3			○																0.375	0.156	-	-	-	-	
	1112388	LNCX 1806 AZ R-11			○											○		○			0.394	0.252	0.739	-	-	0.079	
	1112428	LNCX 1806 AZ L-11			○											○		○			0.394	0.252	0.739	-	-	0.079	
	1111876	LNE 323-02														○					0.375	0.187	0.625	-	-	0.016	
	1111877	LNE 323-10														○					0.375	0.187	0.625	0.050	-	-	
	1110952	LNE 323-02 SP														◎					0.375	0.187	0.625	0.031	-	0.047	
	1111420	LNE 434-02														○					0.562	0.250	0.750	-	-	0.031	
	1111416	LNJN 2205 DDSR-A1														○					0.551	0.197	0.866	-	0.079	-	
	1111351	LNJN 3007 DDTP-SP														○					0.630	0.276	1.181	-	0.079	-	

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

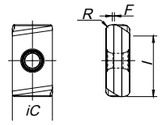
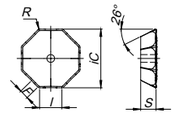
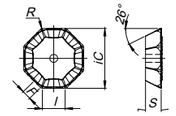
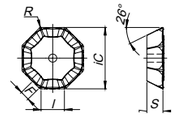
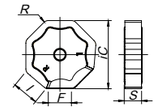
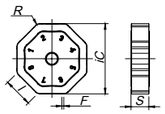
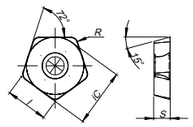
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

△ Inventory maintained. To be replaced by new item. | Iten em stock.
Será substituido por novo item | Iten en stock. Será reemplazado por nuevo iten.

◎ Stock item | Produto de stock | Itens de stock

Insert order code = (1) Geometry Code + (2) Grade Code

Visão genérica de outras pastilhas para fresagem | Visión general de otras plaquitas para fresado

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M			K								N	Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
			PVD							PVD			CVD	PVD						UNC	UNC							
		(2) Grade code	M6	54	68	66	78	86	I5	68	66	I5	L9	D2	54	68	67	I5	17	10		ic	S	l	R	a	F	
			PH6103	PH6910	PH6920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6930	PH6740	PH5740	PH6705	PH6910	PH6920	PH6325	PH6740	PH0325	PH0910								
	1123709	LNUJ 220920S R			○																	0.625	0.372	0.945	-	0.039	-	
	1111518	OFEN 070405 TN		◎	◎				◎						◎	◎		◎				0.709	0.187	0.291	0.024	-	0.087	
	1111569	OFKR 070408 FN-LN																		◎		0.709	0.187	0.291	0.024	-	0.087	
	1111568	OFKR 070408 SN-MP		◎	◎		◎		◎			◎			◎	◎		◎				0.709	0.187	0.291	0.024	-	0.063	
	1112015	ONEF 090520 ZZTN-W-14											○									0.866	0.219	0.354	0.079	-	0.354	
	1112016	ONMF 090520 ANTN-MK-16											○					○				0.866	0.219	0.354	0.079	-	0.024	
	1110554	PDHW 120420 T			◎		◎	◎								◎						0.650	0.188	0.472	0.079	-	-	
	1110555	PDMW 120420 T					◎	◎														0.650	0.188	0.472	0.079	-	-	

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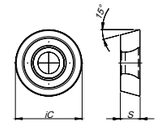
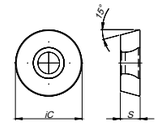
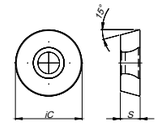
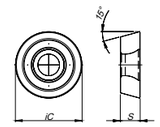
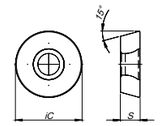
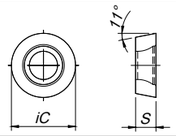
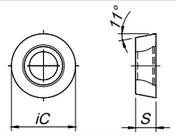
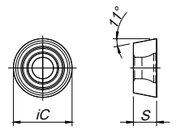
◎ Stock item | Produto de stock | Itens de stock

Insert order code = (1) Geometry Code + (2) Grade Code

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M			K					N	H		Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
			PVD							PVD			PVD					PCD	PVD	CBN							
		(2) Grade code	M6	54	68	66	78	86	I5	68	66	I5	D2	54	68	67	I5	D6	M6	D4							
			PH6103	PH6910	PH6920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6930	PH6740	PH6705	PH6910	PH6920	PH6325	PH6740	PDP410	PH6103	PBH910	ic	S	I	R	a	F	
	1112040	RDHT 12T3 M0S-MP			◉		○		◉												0.472	0.156	-	-	-	-	
	1112039	RDHT 1604 M0S-MP			◉		○		◉												0.630	0.188	-	-	-	-	
	1110082	RDHT 1003 M0T					◉	◉													0.394	0.125	-	-	-	-	
	1110083	RDHT 12T3 M0T					◉	◉													0.472	0.156	-	-	-	-	
	1110084	RDHT 1604 M0T					◉	◉													0.630	0.188	-	-	-	-	
	1110672	RDHT 2006 M0T					○	○													0.787	0.250	-	-	-	-	
	2110530	RDHW 0702 M0T 02020																		◉	0.276	0.094	-	-	-	-	
	2110531	RDHW 1003 M0T 02020																		◉	0.394	0.125	-	-	-	-	
	1110961	RDHW 0702 M0F																○			0.276	0.094	-	-	-	-	
	1110548	RDHW 0702 M0T	◉	◉	◉									◉	◉				◉		0.276	0.094	-	-	-	-	
	1110962	RDHW 1003 M0F																○			0.394	0.125	-	-	-	-	
	1110087	RDHW 1003 M0T	◉	◉	◉			◉						◉	◉				◉		0.394	0.125	-	-	-	-	
	1110090	RDHW 12T3 M0T	◉	◉	◉			◉						◉	◉				◉		0.472	0.156	-	-	-	-	
	1110092	RDHW 1604 M0T	◉	◉	◉			◉						◉	◉				◉		0.630	0.188	-	-	-	-	
	1111217	RDHW 2006 M0T			○		○	○													0.787	0.250	-	-	-	-	
	1110583	RDMT 1003 M0T					◉	◉													0.394	0.125	-	-	-	-	
	1110558	RDMT 12T3 M0T					◉	◉													0.472	0.156	-	-	-	-	
	1110556	RDMT 1604 M0T					◉	◉													0.630	0.188	-	-	-	-	
	1110659	RDMT 2006 M0T					◉	◉													0.787	0.250	-	-	-	-	
	1110549	RDMW 1003 M0T			◉		◉	◉							◉						0.394	0.125	-	-	-	-	
	1110096	RDMW 12T3 M0T			◉		◉	◉							◉						0.472	0.156	-	-	-	-	
	1110097	RDMW 1604 M0T			◉		◉	◉							◉						0.630	0.188	-	-	-	-	
	1110869	RDMW 2006 M0T					◉	◉							○						0.787	0.250	-	-	-	-	
	1112133	RPEW 1204 M0			○						○				○						0.472	0.187	-	-	-	-	
	1121079	RPMW 1003 M0			○						○				○						0.394	0.125	-	-	-	-	
	1120454	RPMW 1204 M0T			○						○				○						0.472	0.187	-	-	-	-	
	1121742	RPMT 1003 M0T			○										○						0.394	0.125	-	-	-	-	
	1120448	RPMT 1204 M0T			○										○						0.472	0.187	-	-	-	-	

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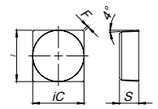
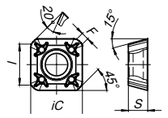
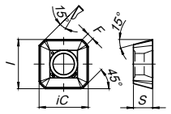
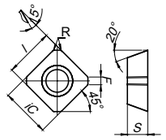
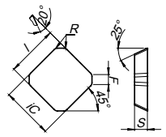
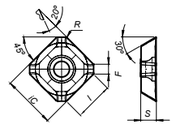
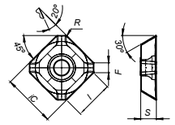
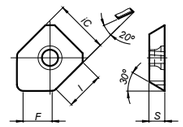
Visão genérica de outras pastilhas para fresagem | Visión general de otras plaquitas para fresado

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M			K							N		Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
			PVD							PVD			CVD	PVD						UNC	UNC							
		(2) Grade code	M6	54	68	66	78	86	I5	68	66	I5	L9	D2	54	68	67	I5	17	10		ic	S	l	R	a	F	
			PH6103	PH6910	PH6920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6930	PH6740	PH5740	PH6705	PH6910	PH6920	PH6325	PH6740	PH0325	PH0910							
	1110194	SBEX 1204ZZ														○						0.498	0.187	0.500	-	-	-	
	1110200	SDHT 1204 AEEN			○						○					○						0.500	0.187	0.394	-	-	0.071	
	1110693	SDHT 1204 AFFN		○												○						0.500	0.187	0.394	-	-	0.071	
	1110201	SDHT 1204 AESN-PL			○		○									○						0.500	0.187	0.394	-	-	0.071	
	1110818	SDHW 09T3 AEEN			○											○						0.375	0.156	0.287	0.012	-	0.059	
	1110743	SDHW 09T3 AEFN			○											○						0.375	0.156	0.287	0.012	-	0.059	
	1110781	SDHW 1204 AEEN			○											○						0.500	0.187	0.354	-	-	0.098	
	1110782	SDHW 1204 AETN			○											○						0.500	0.187	0.354	-	-	0.098	
	1112339	SDHW 150412			○											○						0.625	0.187	-	0.047	-	-	
	1110206	SEAN 1203 AFEN			○											○						0.500	0.125	0.362	0.031	-	0.094	
	1110207	SEAN 1203 AFFN			○											○						0.500	0.125	0.362	0.031	-	0.094	
	1110208	SEAN 1203 AFSN			◬											◬						0.500	0.125	0.362	0.047	-	0.094	
	1110209	SEAN 1203 AFTN			○											○						0.500	0.125	0.362	0.047	-	0.094	
	1110211	SEAN 1504 AFFN			○											○						0.625	0.187	0.457	0.039	-	0.094	
	1110212	SEAN 1504 AFTN			○											○						0.625	0.187	0.457	0.039	-	0.094	
	1110576	SEHT 09T3 AFTN			◬				◬							○						0.375	0.156	0.287	-	-	0.059	
	1110218	SEHT 1204 AFTN			◬				◬			◬				◬		◬				0.500	0.188	0.500	-	-	0.110	
	1110216	SEHT 1204 AFEN			◬				◬			◬				◬		◬				0.500	0.188	0.500	-	-	0.110	
	1110559	SEHT 13T3 AGSN			◬				◬			◬				◬		◬				0.526	0.156	0.394	-	-	0.079	
	1110931	SEHT 13T3 AGTN			○				○			○				○		○				0.526	0.156	0.394	-	-	0.079	
	1112283	SEHT 1204 AFFN-LN																			◬	0.500	0.188	0.500	-	-	0.079	
	1111586	SEHT 13T3 AGFN-LN																			◬	0.526	0.156	0.394	-	-	0.091	
	1110627	SEHT 13T3 AGSN-W			◬											◬						0.526	0.156	0.394	-	-	0.323	

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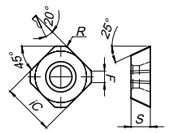
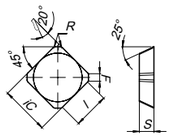
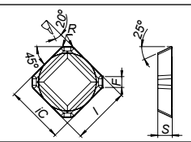
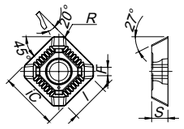
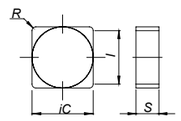
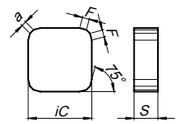
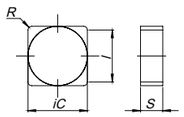
Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M			K								N	Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
			PVD							PVD			CVD	PVD						UNC	UNC							
		(2) Grade code	M6	54	68	66	78	86	I5	68	66	I5	L9	D2	54	68	67	I5	17	10		ic	S	l	R	a	F	
			PH6103	PH6910	PH6920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6930	PH6740	PH5740	PH6705	PH6910	PH6920	PH6325	PH6740	PH0325	PH0910								
	1110219	SEHW 1204 AFEN			◉				◉			◉				◉		◉				0.500	0.188	0.500	-	-	0.110	
	1110222	SEHW 1204 AFTN			◉				◉			◉				◉		◉				0.500	0.188	0.500	-	-	0.110	
	1111146	SEHW 13T3 AGFN			◉											◉						0.526	0.156	0.394	-	-	0.079	
	1110224	SEHW 1504 AFSN			○											○						0.625	0.187	0.457	0.008	-	0.110	
	1110225	SEHW 1504 AFTN			○											○						0.625	0.187	0.457	0.008	-	0.110	
	1110226	SEKN 1203 AFEN			○											○						0.500	0.125	0.362	0.047	-	0.094	
	1110227	SEKN 1203 AFFN			○											○						0.500	0.125	0.362	0.047	-	0.094	
	1110228	SEKN 1203 AFSN			◉											◉						0.500	0.125	0.362	0.047	-	0.094	
	1110230	SEKN 1203 AFTN			○											○						0.500	0.125	0.362	0.047	-	0.094	
	1110794	SEKN 1204 AFFN			○											○						0.500	0.187	0.362	0.047	-	0.094	
	1110232	SEKN 1204 AFSN			◉											◉						0.500	0.187	0.362	0.047	-	0.094	
	1110233	SEKN 1204 AFTN			○											○						0.500	0.187	0.362	0.047	-	0.094	
	1110235	SEKN 1504 AFEN		◉	◉				◉			◉			◉	◉		◉				0.625	0.187	0.484	0.039	-	0.094	
	1110238	SEKN 1504 AFTN			◉				◉							◉		◉				0.625	0.187	0.484	0.039	-	0.094	
	1110239	SEKR 1203 AFEN			◉											◉						0.500	0.125	0.362	0.047	-	0.094	
	1110240	SEKR 1203 AFSN			◉											◉						0.500	0.125	0.362	0.047	-	0.094	
	1110241	SEKR 1204 AFSN			○											○						0.500	0.187	0.362	0.047	-	0.094	
	1110759	SEKR 1504 AFSN			◉				◉							◉		◉				0.625	0.187	0.484	0.039	-	0.094	
	1111921	SEXT 14M4 AGSN-M			○											○						0.551	0.157	0.362	0.039	-	0.110	
	1110266	SNGN 120408			○											○						0.500	0.187	-	0.031	-	-	
	1110267	SNGN 120412			○											○						0.500	0.187	-	0.047	-	-	
	1110597	SNGN 190412			○											○						0.750	0.187	-	0.047	-	-	
	1110598	SNGN 190416			○											○						0.750	0.187	-	0.063	-	-	
	1110271	SNKN 1204 ENEN			◉											◉						0.500	0.187	-	-	0.059	0.031	
	1110273	SNKN 1204 ENSN			◉											◉						0.500	0.187	-	-	0.059	0.031	
	1120541	SNUN 120404			○											○						0.500	0.187	0.437	0.016	-	-	
	1120542	SNUN 120408			○											○						0.500	0.187	0.437	0.031	-	-	
	1120544	SNUN 120408			○											○						0.500	0.187	0.437	0.047	-	-	
	1121880	SNUN 190612T				○																0.750	0.250	-	0.047	-	-	

◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

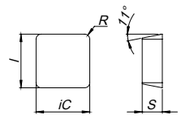
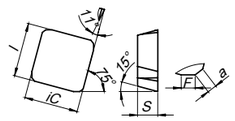
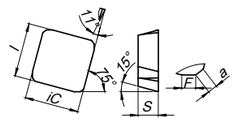
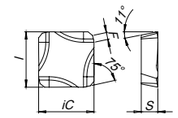
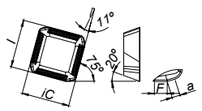
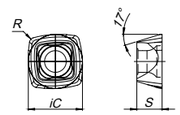
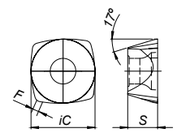
◉ Inventory maintained. To be replaced by new item. | Iten em stock.
Será substituido por novo item | Iten en stock. Será reemplazado por nuevo iten.

◉ Stock item | Produto de stock | Itens de stock

Insert order code = (1) Geometry Code + (2) Grade Code

Visão genérica de outras pastilhas para fresagem | Visión general de otras plaquitas para fresado

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M			K						
			PVD							PVD			CVD	PVD					UNC
		(2) Grade code	M6	54	68	66	78	86	15	68	66	15	L9	D2	54	68	67	15	17
			PH6103	PH6910	PH6920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6930	PH6740	PH5740	PH6705	PH6910	PH6920	PH6325	PH6740	PH0325
	1110765	SPGN 090312			○											○			
	1111173	SPGN 090316			○											○			
	1110300	SPGN 120308			○											○			
	1110301	SPGN 120312			○											○			
	1110303	SPGN 120408			○											○			
	1110588	SPGN 120412			○											○			
	1110590	SPGN 150408			○											○			
	1110304	SPGN 150412			○											○			
	1110326	SPKN 1203 EDFR																	◎
	1110328	SPKN 1203 EDSR			○		◎	◎								○			
	1110330	SPKN 1203 EDTR			◎		◎	◎	◎							◎		◎	
	1110331	SPKN 1204 EDER			◎														
	1110332	SPKN 1204 EDSR			◎				◎							◎		◎	
	1110333	SPKN 1204 EDTR			○											○			
	1110336	SPKN 1504 EDER			◎		◎									◎			
	1110337	SPKN 1504 EDFR			○											○			◎
	1110339	SPKN 1504 EDSR			◎				◎							◎		◎	
	1110340	SPKN 1504 EDTR			◎		◎		◎							◎		◎	
	1110335	SPKN 1504 EDEL			○											○			
	1110338	SPKN 1504 EDSL			○											○			
	1111976	SPKR 1203 EDTR			○											○			
	1110564	SPKR 1504 EDFR			○											○			
	1111449	SPKR 1504 EDSR			○											○			
	1111107	SPKR 1906			○											○			
	1111314	SPKT 08T308-E			◎					◎						◎			
	1111195	SPKT 130510-E			◎					◎						◎			
	1111364	SPKW 08T308-E			◎											◎			
	1121227	SPKW 08T308-S			◎		○	○								◎			
	1111153	SPKW 130510 F		○	○										○	○			
	1111355	SPKW 130510-E			◎											◎			
	1110888	SPKW 130510-S			◎											◎			

(1) Geometry code	Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
	ic	S	l	R	a	F	
1110765	0.375	0.125	-	0.047	-	-	
1111173	0.375	0.125	-	0.063	-	-	
1110300	0.500	0.125	-	0.031	-	-	
1110301	0.500	0.125	-	0.047	-	-	
1110303	0.500	0.187	-	0.031	-	-	
1110588	0.500	0.187	-	0.047	-	-	
1110590	0.625	0.187	-	0.031	-	-	
1110304	0.625	0.187	-	0.047	-	-	
1110326	0.500	0.125	0.500	-	0.039	0.059	
1110328	0.500	0.125	0.500	-	0.039	0.059	
1110330	0.500	0.125	0.500	-	0.039	0.059	
1110331	0.500	0.187	0.500	-	0.039	0.059	
1110332	0.500	0.187	0.500	-	0.039	0.059	
1110333	0.500	0.187	0.500	-	0.039	0.059	
1110336	0.625	0.187	0.625	-	0.039	0.059	
1110337	0.625	0.187	0.625	-	0.039	0.059	
1110339	0.625	0.187	0.625	-	0.039	0.059	
1110340	0.625	0.187	0.625	-	0.039	0.059	
1110335	0.625	0.187	0.625	-	0.039	0.059	
1110338	0.625	0.187	0.625	-	0.039	0.059	
1111976	0.500	0.125	0.500	-	0.039	0.055	
1110564	0.625	0.187	0.625	-	0.039	0.055	
1111449	0.625	0.187	0.625	-	0.039	0.055	
1111107	0.750	0.250	0.750	-	0.039	0.055	
1111314	0.335	0.156	-	0.0.31	-	-	
1111195	0.512	0.219	-	0.039	-	-	
1111364	0.335	0.156	-	0.031	-	-	
1121227	0.335	0.156	-	0.031	-	-	
1111153	0.512	0.219	-	0.039	-	-	
1111355	0.512	0.219	-	0.039	-	-	
1110888	0.512	0.219	-	0.039	-	-	

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

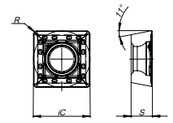
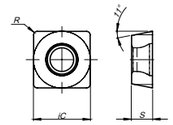
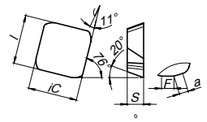
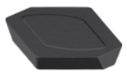
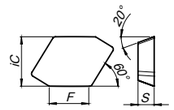
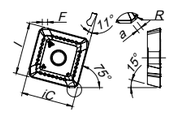
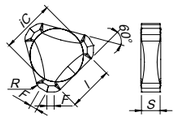
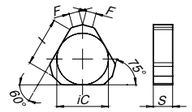
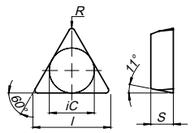
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

◎ Inventory maintained. To be replaced by new item. | Iten em stock.
Será substituido por novo item | Iten en stock. Será reemplazado por nuevo iten.

◎ Stock item | Produto de stock | Itens de stock

Insert order code = (1) Geometry Code + (2) Grade Code

Visão genérica de outras pastilhas para fresagem | Visión general de otras plaquitas para fresado

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	M									K							S		Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
									PVD			CVD		PVD					PVD								
		(2) Grade code	54	68	66	78	86	I5	68	66	I5	L5	L9	D2	54	68	67	I5	P3	I5							
			PH6910	PH6920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6930	PH6740	PH5705	PH5740	PH6705	PH6910	PH6920	PH6325	PH6740	PH7930	PH6740	ic	S	l	R	a	F	
	1111609	SPMT 120408-MP		◎				◎	◎		◎					◎		◎		◎	0.250	0.188	-	0.031	-	-	
	1120572	SPMW 120408		○				◎			◎			◎		○		◎			0.250	0.188	-	0.031	-	-	
	1191186	SPXN 1906		○			○	○					○			○					0.750	0.250	0.750	-	0.039	0.055	
	1112384	SPXN 1906-W		○												○					0.750	0.250	-	-	-	0.472	
	1112134	SPXR 1203 EDSR-MP		◎				◎								◎		◎			0.500	0.125	0.500	0.039	0.039	0.054	
	1110393	TNHF 1204 AN-CA										◎	◎	◎	◎	○					0.500	0.187	0.472	0.079	-	0.067	
	1111333	TNHF 1204 AN-K										◎	◎			◎					0.500	0.187	0.472	0.118	-	0.051	
	1110395	TNJN 1204 AN														○					0.500	0.187	0.472	-	-	0.098	
	1110422	TPGN 110304		○												○					0.250	0.125	-	0.016	-	-	
	1110423	TPGN 110308		○												○					0.250	0.125	-	0.016	-	-	
	1110425	TPGN 160304		◎												◎					0.375	0.125	-	0.016	-	-	
	1110426	TPGN 160308		◎												◎					0.375	0.125	-	0.031	-	-	
	1110431	TPGN 220408		○												○					0.500	0.188	-	0.031	-	-	
	1110432	TPGN 220412		○												○					0.500	0.188	-	0.047	-	-	

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

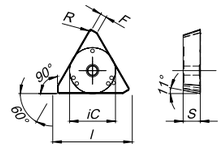
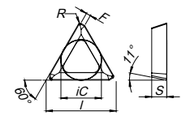
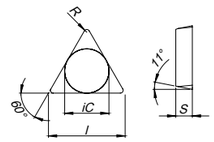
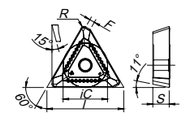
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

◎ Inventory maintained. To be replaced by new item. | Iten em stock.
Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

◎ Stock item | Produto de stock | Itens de stock

Insert order code = (1) Geometry Code + (2) Grade Code

Inserts Pastilhas Plaquitas			P								M			K					
			PVD						CVD		PVD			CVD	PVD				UNC
		(2) Grade code	54	68	G4	66	I5	G6	L8	L9	68	66	I5	L9	54	68	67	I5	17
	(1) Geometry code	ISO Reference	PH6910	PH6920	PH7920	PH6930	PH6740	PH7740	PH5125	PH5740	PH6920	PH6930	PH6740	PH5740	PH6910	PH6920	PH6325	PH6740	PH0325
	1110450	TPKN 1603 PDEL		○												○			
	1110543	TPKN 1603 PDSL		○												○			
	1110547	TPKN 1603 PPEN		○												○			
	1110460	TPKN 1603 PPSN		○												○			
	1110462	TPKN 1603 PPTN		○												○			
	1110452	TPKN 1603 PDFR		○															◬
	1110458	TPKN 1603 PPER		○												○			
	1110461	TPKN 1603 PPSR		○												○			
	1110451	TPKN 1603 PDER		◬			◬									◬		◬	
	1110671	TPKN 1603 PDSR		○												○			
	1110455	TPKN 1603 PDTR		◬			◬									◬		◬	
	1110459	TPKN 1603 PPFN		○												○			
	1110463	TPKN 1603 PPTR		○												○			
	1110465	TPKN 2204 PDER		◬			◬									◬		◬	
	1110466	TPKN 2204 PDFR		○												○			◬
	1110609	TPKN 2204 PDSR		◬			◬									◬		◬	
	1110471	TPKN 2204 PPSR		○												○			
	1110468	TPKN 2204 PDTR		○												○			
	1111404	TPKN 2204 PPTR		○												○			
	1110476	TPKR 1603 PDSR		◬			◬									◬		◬	
	1110921	TPKR 1603 PDTR		○												○			
	1110477	TPKR 2204 PDSR		◬			◬									◬		◬	
	1120761	TPUN 110304			○														
	1120762	TPUN 110308			○														
	1120765	TPUN 160304			◬			○	◬	◬									
	1120766	TPUN 160308			◬			◬	◬	◬									
	1120770	TPUN 160312			○			○	◬	◬									
	1120777	TPUN 220404			○			○	◬	◬									
	1120779	TPUN 220408			○			◬	◬	◬									
	1120783	TPUN 220412			○			◬	◬	◬									
	1120791	TPUN 270616							○										
	1112135	TPXR 2204 PDSR-MP		◬			◬									◬		◬	

Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
ic	S	l	R	a	F	
0.375	0.125	0.650	0.028	-	0.047	
0.375	0.125	0.650	0.028	-	0.047	
0.375	0.125	0.650	-	-	0.043	
0.375	0.125	0.650	-	-	0.043	
0.375	0.125	0.650	-	-	0.043	
0.375	0.125	0.650	0.028	-	0.055	
0.375	0.125	0.650	-	-	0.043	
0.375	0.125	0.650	-	-	0.043	
0.375	0.125	0.650	0.028	-	0.055	
0.375	0.125	0.650	0.028	-	0.047	
0.375	0.125	0.650	0.028	-	0.055	
0.375	0.125	0.650	-	-	0.043	
0.375	0.125	0.650	-	-	0.043	
0.500	0.187	0.866	0.020	-	0.067	
0.500	0.187	0.866	0.020	-	0.067	
0.500	0.187	0.866	0.020	-	0.067	
0.500	0.187	0.866	-	-	0.055	
0.500	0.187	0.866	-	-	0.055	
0.500	0.187	0.866	-	-	0.055	
0.375	0.125	0.650	0.024	-	0.047	
0.375	0.125	0.650	0.024	-	0.047	
0.500	0.187	0.866	0.020	-	0.067	
0.250	0.125	0.433	0.016	-	-	
0.250	0.125	0.433	0.031	-	-	
0.375	0.125	0.650	0.016	-	-	
0.375	0.125	0.650	0.031	-	-	
0.375	0.125	0.650	0.047	-	-	
0.500	0.187	0.866	0.016	-	-	
0.500	0.187	0.866	0.031	-	-	
0.500	0.187	0.866	0.047	-	-	
0.625	0.250	1.063	0.063	-	-	
0.500	0.187	0.866	0.039	-	0.067	

◬ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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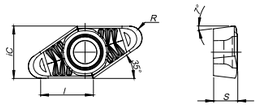
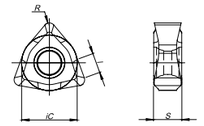
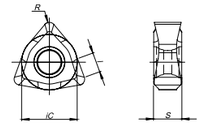
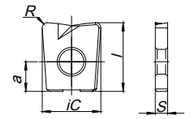
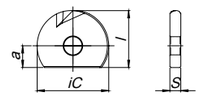
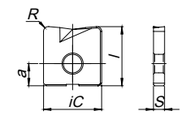
Será substituido por novo item | Iten en stock. Será reemplazado por nuevo iten.

◬ Stock item | Produto de stock | Itens de stock

Insert order code = (1) Geometry Code + (2) Grade Code

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ISO Reference	P							M			K						H	N	Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
			PVD							PVD			PVD						PVD	UNC							
			M6	G1	54	G4	68	78	I5	68	66	I5	G1	54	G4	68	67	I5	M6	10	ic	S	l	R	a	F	
			PH6103	PH7910	PH6910	PH7920	PH6920	PH6125	PH6740	PH6920	PH6930	PH6740	PH7910	PH6910	PH7920	PH6920	PH6325	PH6740	PH6103	PH0910							
	1121907	VCGX 220530 LN																		◎	0.500	0.220	0.500	0.118	-	-	
	1110783	WNHU 04T310	◎	◎		◎							◎		◎				◎		0.250	0.138	0.110	0.039	-	-	
	1111424	WNHU 064010	◎	◎		◎							◎		◎				◎		0.375	0.188	0.134	0.039	-	-	
	1110851	WPB 08	○		○		○							○		○					0.315	0.079	0.374	0.024	0.157	-	
	1110852	WPB 10	○		○		○							○		○					0.394	0.098	0.453	0.031	0.197	-	
	1110853	WPB 12	○		○		○							○		○					0.472	0.098	0.551	0.039	0.236	-	
	1110923	WPB 16	○		○		○							○		○					0.630	0.118	0.630	0.051	0.236	-	
	1111019	WPB 20	○		○		○							○		○					0.787	0.118	0.787	0.063	0.236	-	
	1111554	WPRX-2 08			○		○							○		○					0.315	0.079	0.374	-	0.098	-	
	1111331	WPRX-2 10			◎		◎							◎		◎					0.394	0.098	0.453	-	0.197	-	
	1111555	WPRX-2 12			◎		◎							◎		◎					0.472	0.098	0.469	-	0.236	-	
	1111329	WPRX-2 16			◎		◎							◎		◎					0.630	0.118	0.547	-	0.236	-	
	1111330	WPRX-2 20			◎		◎							◎		◎					0.787	0.118	0.626	-	0.236	-	
	1111556	WPRX-2 25			◎		◎							◎		◎					0.984	0.157	0.839	-	0.354	-	
	1111557	WPRX-2 32			◎		◎							◎		◎					1.260	0.197	1.016	-	0.394	-	
	1110820	WPV 08	○		○		○							○		○					0.315	0.079	0.374	0.024	0.157	–	
	1110821	WPV 10	○		○		○							○		○					0.394	0.098	0.453	0.031	0.197	–	
	1110822	WPV 12	○		○		○							○		○					0.472	0.098	0.551	0.039	0.236	–	
	1110948	WPV 16	○		○		○							○		○					0.630	0.118	0.630	0.051	0.236	–	
	1111020	WPV 20	○		○		○							○		○					0.787	0.118	0.787	0.063	0.236	–	

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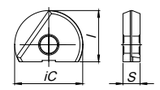
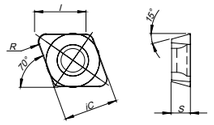
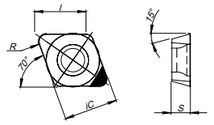
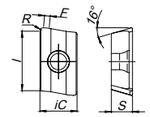
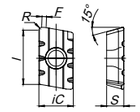
Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

◎ Stock item | Produto de stock | Itens de stock

Insert order code = (1) Geometry Code + (2) Grade Code

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M			K				N				H		Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
			PVD										PVD				CVD	UNC	PCD	PVD	CBN								
		(2) Grade code	M6	54	68	66	78	86	I5	68	66	I5	D2	54	68	I5	P2	10	D6	M6	D4		ic	S	l	R	a	F	
			PH6103	PH6910	PH6920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6930	PH6740	PH6705	PH6910	PH6920	PH6740	PHD103	PH0910	PDP410	PH6103	PBH910								
	1110543	WPZ 08	◎	○	○									○	○								0.315	0.094	0.276	-	0.118	–	
	1110551	WPZ 10	◎	○	○									○	○								0.394	0.102	0.335	-	0.138	–	
	1110552	WPZ 12	◎	○	○									○	○								0.472	0.118	0.394	-	0.157	–	
	1110544	WPZ 16	◎	◎	○									○	○								0.630	0.157	0.472	-	0.157	–	
	1110553	WPZ 20	◎	◎	○									○	○								0.787	0.197	0.591	-	0.197	–	
	1110661	WPZ 25	◎	◎	○									○	○								0.984	0.236	0.728	-	0.236	–	
	1110662	WPZ 32	◎	◎	○									○	○								1.260	0.276	0.925	-	0.295	–	
	1110905	XDHW 040105	○	○			○							○	○		◎			○			0.157	0.063	0.157	0.020	-	-	
	1110573	XDHW 040110	◎	◎			◎							◎	○	◎	◎			◎			0.157	0.063	0.157	0.039	-	-	
	1110532	XDHW 060210	◎	◎			◎	◎						◎	○	◎	◎			◎			0.256	0.094	0.244	0.039	-	-	
	1110565	XDHW 10T310	◎	◎			◎	◎						◎	○	◎	○			◎			0.394	0.156	0.390	0.039	-	-	
	1112316	XDHW 040110 FN																	◎				0.157	0.063	0.157	0.039	-	-	
	1112317	XDHW 040110 TN																			◎		0.157	0.063	0.157	0.039	-	-	
	1112318	XDHW 060210 FN																	◎				0.256	0.094	0.244	0.039	-	-	
	1111875	XDHW 060210 TN																			◎		0.256	0.094	0.244	0.039	-	-	
	1112320	XDHW 10T310 FN																	◎				0.394	0.156	0.390	0.039	-	-	
	1112321	XDHW 10T310 TN																			◎		0.394	0.156	0.390	0.039	-	-	
	1110910	XPHT 1604 PDTR			○										○								0.375	0.187	0.630	0.047	-	0.067	
	1111206	XPHT 160420 PPTR			○										○								0.375	0.187	0.630	0.079	–	0.028	
	1110926	XPHT 160432 PDSR			○										○								0.375	0.187	0.630	0.126	–	–	
	1110958	XPHT 160412-MR			○										○								0.375	0.187	0.630	0.047	–	0.067	

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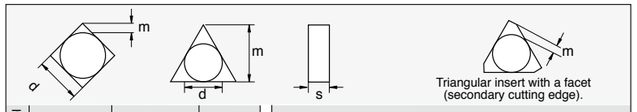
◎ Stock item | Produto de stock | Itens de stock

Insert order code = (1) Geometry Code + (2) Grade Code

MILLING INSERTS ISO IDENTIFICATION SYSTEM

H	120°	M	86°
O	135°	V	35°
P	108°	W	80°
S	90°	L	90°
T	60°	A	85°
C	80°	B	82°
D	55°	K	55°
E	75°	R	
F	50°	X	Special Geometries

Symbol for insert shape (1)



Symbol	m (in)	d (in)	s (in)
A	±0.0002	±0.0010	±0.0010
F	±0.0002	±0.0005	±0.0010
C	±0.0005	±0.0010	±0.0010
H	±0.0005	±0.0005	±0.0010
E	±0.0010	±0.0010	±0.0010
G	±0.0010	±0.0010	±0.0050
J	±0.0002	±0.002~±0.006	±0.0010
K*	±0.0005	±0.002~±0.006	±0.0010
L*	±0.0010	±0.002~±0.006	±0.0010
M*	±0.003~±0.008	±0.002~±0.006	±0.0050
N*	±0.003~±0.008	±0.002~±0.006	±0.0010
U*	±0.005~±0.015	±0.003~±0.005	±0.0050

* 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
Tolerances of insert height (in)

Inscribed circle	T	S	C	D	V
1/4	±0.003	-	-	-	-
3/8	±0.003	±0.003	±0.003	±0.004	±0.005
1/2	±0.005	±0.005	±0.005	±0.006	-
5/8	±0.006	±0.006	±0.006	±0.007	-
3/4	±0.006	±0.006	±0.006	±0.007	-
1	-	±0.007	-	-	-
11/4	-	±0.010	-	-	-

Tolerances of inscribed circle (in)

Inscribed circle	T	S	C	D	V	R
1/4	±0.002	-	-	-	-	-
3/8	±0.002	±0.002	±0.002	±0.002	±0.002	±0.002
1/2	±0.003	±0.003	±0.003	±0.003	-	±0.003
5/8	±0.004	±0.004	±0.004	±0.004	-	±0.004
3/4	-	-	-	-	-	±0.004
1	-	±0.005	-	-	-	±0.004
11/4	-	±0.008	-	-	-	±0.004

Tolerances symbol (3)

	A	B	C	D	E
	3°	5°	7°	15°	20°
	F	G	N	P	O
	25°	30°	0	11°	Other clearance angle

Normal clearance symbol (2)

	1	2	3	4
ISO	T	N	G	N
ANSI	T	N	G	N

(4) Chipbreaker and/or clamping type

Metrical

Symbol	Type	Type of hole	Chipbreaker	Shape	Symbol	Type	Type of hole	Chipbreaker	Shape	Symbol	Type	Type of hole	Chipbreaker	Shape
W	With Hole	Round hole / one countersink (40°~60°)	Without chipbreaker		H	With Hole	Round hole / double countersink (70°~90°)	Chipbreaker on one side		G	With Hole	Round hole	Chipbreaker on both sides	
T	With Hole		Chipbreaker on one side		C	With Hole	Round hole / double countersink (70°~90°)	Without chipbreaker		N	With-out Hole	-	Without chipbreaker	
Q	With Hole	Round hole / double countersink (40°~60°)	Without chipbreaker		J	With Hole		Chipbreaker on both sides		R	With-out Hole	-	Chipbreaker on one side	
U	With Hole		Chipbreaker on both sides		A	With Hole	Round hole	Without chipbreaker		F	With-out Hole	-	Chipbreaker on both sides	
B	With Hole	Round hole / double countersink (70°~90°)	Without chipbreaker		M	With Hole	Round hole	Chipbreaker on one side		X	-	-	-	On request

R's	V's	D's	C's	S's	T's	W's	Ø CI mm	Ø CI inch	ANSI 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	

Insert size symbol (5)

* ANSI designation only (Radius Designation is 00)
** Metric designation only (Radius Designation is M0)
According to International Standard ISO 1832 - - 2004 "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

Insert thikness symbol (6)

5	6	7	7b	8	9	10
16	03	08	AN	E	N	MP
3	2	2		E	N	MP

(10) Chipbreaker geometries

Cutting Condition	Main Application
1st letter	2nd letter
L - Light	P - Steel
M - Medium	M - Stainless steel
H - Heavy	K - Cast Iron
W - Wiper	N - Aluminum
	S - HRSA Titanium alloys
	H - Hardened materials

Ex: ANHX 160708 PNER - MP

(7) Insert corner configuration symbol

ISO	mm	inch	ANSI
00	Sharp nose		0
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	2.78	.109	7
32	3.18	.125	8
	Round insert		0

(7b) Insert with secondary edges symbol

For inserts ho have secondary edges, use the following digits:

1st Digit: Secondary edge		2nd Digit: Secondary 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°
		G	30°
		N	0°
		P	11°

(8) Cutting edge conditions

Shape	Honing	Symbol
	No honing	F
	With honing	E
	Chamfred no honing	T
	Chamfred with honing	S

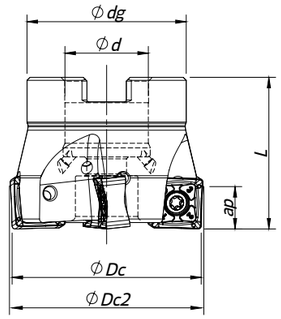
* We use handing symbols (R.L.) only, omitting honing symbols

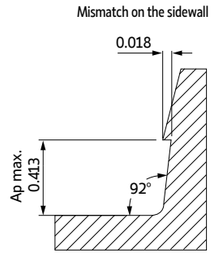
(9) Cutting direction

Shape	Hand	Symbol
	Right	R
	Left	L
	None	N

PLUS SN88-12

Proprietary milling line





Arbor Mounting

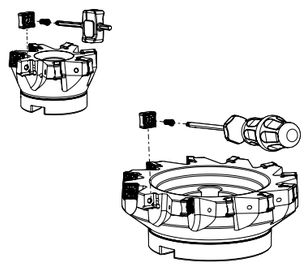
K_r=88° | γ_p=-6°

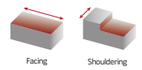
Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	ØDc2	Ød	Ødg	L	lbs	Specifications Arbor Type	Ap max (in)	Insert Pastilha Inserto	Stock
181103400	SN88 D2.00-A.750/1.75-04-12	4	2.000	2.035	0.750	1.772	1.750	0.92	A	0.413	SN... 1206...	◎
181103500	SN88 D2.00-A.750/1.75-05-12	5	2.000	2.035	0.750	1.772	1.750	0.88	A	0.413	SN... 1206...	○
181103600	SN88 D2.50-A1.00/1.75-05-12	5	2.500	2.535	1.000	2.205	1.750	1.14	A	0.413	SN... 1206...	◎
181103700	SN88 D2.50-A1.00/1.75-06-12	6	2.500	2.535	1.000	2.205	1.750	1.10	A	0.413	SN... 1206...	◎
181103800	SN88 D3.00-A1.00/2.00-07-12	7	3.000	3.035	1.000	2.205	2.000	2.20	A	0.413	SN... 1206...	◎
181103900	SN88 D3.00-A1.00/2.00-09-12	9	3.000	3.035	1.000	2.205	2.000	2.12	A	0.413	SN... 1206...	○
NEW 181139100	SN88 D4.00-A1.50/2.50-08-12	8	4.000	4.035	1.500	2.874	2.500	3.52	A	0.413	SN... 1206...	○
NEW 181139200	SN88 D4.00-A1.50/2.50-11-12	11	4.000	4.035	1.500	2.874	2.500	3.30	A	0.413	SN... 1206...	○
181104000	SN88 D4.00-A1.25/2.00-08-12	8	4.000	4.035	1.250	2.874	2.000	3.52	A	0.413	SN... 1206...	◬
181104200	SN88 D5.00-A1.50/2.50-12-12	12	5.000	5.035	1.500	3.386	2.500	6.83	A	0.413	SN... 1206...	○
181104300	SN88 D6.00-A2.00/2.50U-18-12	18	6.000	6.035	2.000	4.882	2.500	7.71	B	0.413	SN... 1206...	◎
181104400	SN88 D8.00-A2.50/2.50U-14-12	14	8.000	8.035	2.500	5.512	2.500	13.90	C	0.413	SN... 1206...	◎
181104500	SN88 D10.0-A2.50/2.50U-22-12	22	10.000	10.035	2.500	7.087	2.500	15.87	C	0.413	SN... 1206...	◎

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta ◬ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value lbf/in
SN88-A-12 - 2.00-3.00	P0401200	XT15	26.6
SN88-A-12 - 4.00-10.00	P0401200	PT15	26.6

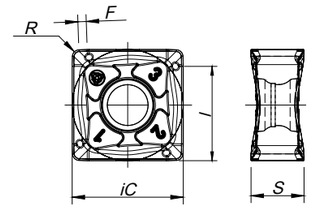




SNH(K)U 1206 | Inserts | Pastilhas | Plaquitas

SNHU-LP

SNKU-LP NEW



		P				M				K							N		S	H		Dimensions (in)				
		PVD				CVD	PVD			CVD			PVD				UNC	PCD	PVD	PVD	CBN					
	(2) Grade code	G1	G4	P3	G6	R1	G4	P3	G6	L5	L6	L9	G1	G4	P3	G6	10	D6	P3	P7	D4					
(1) Geometry code	ISO Reference	PH7910	PH7920	PH7930	PH7740	PHM740	PH7920	PH7930	PH7740	PH5705	PH5320	PH5740	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PH7930	PH7603	PBH910	iC	S	I	R	F
1112020	SNHU 120608 ZNER-LP		◎	◎	◎			◎	◎	◎		◎										0.524	1/4	0.457	0.031	0.039
NEW 1112278	SNKU 120608 ZNER-LP		◎	◎	◎			◎	◎	◎		◎										0.524	1/4	0.457	0.031	0.039

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance PH5705	PH7920	PH7930	PH5740	Toughness → PH7740
P	1	Unalloyed Steel	125-220		✓	✓		✓
	2	Low-Alloyed Steel	220-280		✓	✓		✓
	3	High-Alloyed Steel	280-380		✓	✓		✓
M	4	SS - Ferritic / Martensitic	200-330			✓		✓
	5	SS - Austenitic / Duplex	200-330			✓		✓
	6	SS - Duplex	230-260			✓		✓
K	7	Malleable Cast Iron	130-230	✓			✓	
	8	Grey Cast Iron	180-245	✓			✓	
	9	Nodular Cast iron	160-250	✓			✓	

Good Conditions
Average Conditions
Difficult Conditions

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance Toughness →			Vc (sfm) ← Wear Resistance Toughness →		Feed fz (in/t)
				PH5705	PH7920	PH7930	PH5740	PH7740	SNH(K)U 1206...
P	1	Unalloyed Steel	125-220	-	591 **(820)** 1 050	-	460 **(558)** 624	492 **(591)** 656	0.004 **(0.010)** 0.014
	2	Low-Alloyed Steel	220-280	-	460 **(591)** 820	-	394 **(460)** 558	427 **(492)** 591	0.004 **(0.010)** 0.014
	3	High-Alloyed Steel	280-380	-	427 **(591)** 722	-	328 **(394)** 492	361 **(427)** 525	0.004 **(0.010)** 0.014
M	4	SS - Ferritic / Martensitic	200-330	-	-	460 **(558)** 624	-	427 **(492)** 558	0.004 **(0.010)** 0.014
	5	SS - Austenitic / Duplex	200-330	-	-	394 **(460)** 558	-	328 **(427)** 525	0.004 **(0.010)** 0.014
	6	SS - Duplex	230-260	-	-	328 **(394)** 492	-	263 **(328)** 460	0.004 **(0.010)** 0.014
K	7	Malleable Cast Iron	130-230	525 **(591)** 968	-	-	460 **(525)** 820	-	0.004 **(0.010)** 0.014
	8	Grey Cast Iron	180-245	558 **(886)** 1 116	-	-	476 **(591)** 919	-	0.004 **(0.010)** 0.014
	9	Nodular Cast iron	160-250	394 **(492)** 656	-	-	345 **(492)** 558	-	0.004 **(0.010)** 0.014

(Note 1) The above table indicates the cutting conditions of 70% of the tool engagement.
(Note 2) With low workspace clamping rigidity or long overhang of the tool, adjust cutting speed and feed to 70 or 80% of the recommended conditions above
(Note 3) Surface finishing is determinated by speed/feed used.
(Note 4) PH5... can be used wet or dry. PH7... use only air.

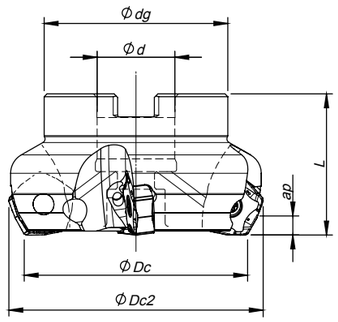
Selection Example:

ISO	PSM	Material	HB (brinell)	Vc (sfm) ← Wear Resistance Toughness →		Feed fz (in/t)
				PH5705	PH5740	SNHU 1206... SNKU 1206...
K	7	Malleable cast iron	130-230	525 **(591)** 968	460 **(525)** 820	0.004 **(0.010)** 0.014
	8	Grey cast iron	180-245	558 **(886)** 1 116	476 **(591)** 919	0.004 **(0.010)** 0.014
	9	Nodular cast iron	160-250	394 **(492)** 656	345 **(492)** 558	0.004 **(0.010)** 0.014

This example shows the recommended starting cutting conditions, indicated in **Bold type**.

PLUS PN60-11

Proprietary milling line



Arbor Mounting
K_r=60° | γ_p -7°

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	ØDc2	Ød	Ødg	L	lbs	Specifications Arbor Type	Ap max (in)	Insert Pastilha Inserto	Stock
181055700	PN60 D2.00-A.750/1.75-05-11	5	2.000	2.356	0.750	1.772	1.750	0.97	A	0.200	PN... 1105...	◎
181063800	PN60 D2.50-A1.00/1.75-05-11	5	2.500	2.856	1.000	2.205	1.750	1.60	A	0.200	PN... 1105...	◎
181055800	PN60 D2.50-A1.00/1.75-06-11	6	2.500	2.856	1.000	2.205	1.750	1.52	A	0.200	PN... 1105...	◎
181063900	PN60 D3.00-A1.00/2.00-06-11	6	3.000	3.356	1.000	2.205	2.000	2.44	A	0.200	PN... 1105...	◎
181055900	PN60 D3.00-A1.00/2.00-08-11	8	3.000	3.356	1.000	2.205	2.000	2.27	A	0.200	PN... 1105...	◎
181064000	PN60 D4.00-A1.25/2.00-07-11	7	4.000	4.356	1.250	2.874	2.000	4.09	A	0.200	PN... 1105...	◎
181056000	PN60 D4.00-A1.25/2.00-10-11	10	4.000	4.356	1.250	2.874	2.000	4.07	A	0.200	PN... 1105...	◎
181064100	PN60 D5.00-A1.50/2.50-08-11	8	5.000	5.356	1.500	3.386	2.500	7.33	A	0.200	PN... 1105...	○
181056100	PN60 D5.00-A1.50/2.50-12-11	12	5.000	5.356	1.500	3.386	2.500	7.29	A	0.200	PN... 1105...	○
181064200	PN60 D6.00-A2.00/2.50U-10-11	10	6.000	6.356	2.000	4.882	2.500	9.35	B	0.200	PN... 1105...	◎
181056200	PN60 D6.00-A2.00/2.50U-14-11	14	6.000	6.356	2.000	4.882	2.500	9.46	B	0.200	PN... 1105...	◎
181056300	PN60 D8.00-A2.50/2.50U-16-11	16	8.000	8.356	2.500	5.512	2.500	14.54	C	0.200	PN... 1105...	◎
181056400	PN60 D10.0-A2.50/2.50U-18-11	18	10.000	10.356	2.500	7.087	2.500	26.29	C	0.200	PN... 1105...	◎

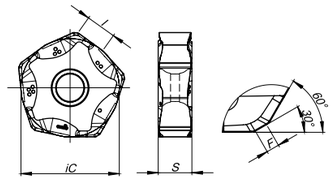
◎ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

PNH(K)X 1105 | Inserts | Pastilhas | Plaquitas

PNHX-MK

PNHX-HK

PNKX-MK NEW



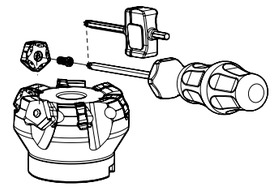
		P					M			K							N		S		H	
		PVD					CVD	PVD		CVD			PVD				UNC	PCD	PVD		PVD	CBN
	(2) Grade code	P7	G1	G4	P3	G6	R1	G4	G6	L5	L6	L9	G1	G4	P3	G6	10	D6	P3	G6	P7	D4
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PH7740	PHM740	PH7920	PH7740	PH5705	PH5320	PH5740	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PH7930	PH7740	PH7603	PBH910
1111374	PNHX 1105 ZNER-MK		◎	◎		○				◎		◎	◎	◎		○						
1111998	PNHX 1105 ZNER-HK									◎		○										
NEW 1112294	PNKX 1105 ZNER-MK		◎	◎						◎		○										

	Dimensions (in) iC	S	l	F
1111374	0.650	0.223	0.224	0.051
1111998	0.650	0.223	0.224	0.051
1112294	0.650	0.223	0.224	0.051

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción
◎ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta
Disponible bajo consulta
Insert order code = (1) Geometry Code + (2) Grade Code

SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value lbf/in
PN60-A-11 - 2.00-3.00	P0401200	XT15	26.6
PN60-A-11 - 4.00-10.00	P0401200	PT15	26.6



GRADES SELECTION GUIDE

ISO	PSM	Material	HB (brinell)	Grades ← Wear Resistance Toughness → PH5705	PH7910	PH7920	PH5740	PH7740
P	1	Unalloyed Steel	125-220		✓	✓		✓
	2	Low-Alloyed Steel	220-280		✓	✓		✓
	3	High-Alloyed Steel	280-380		✓	✓		✓
K	7	Malleable Cast Iron	130-230	✓			✓	
	8	Grey Cast Iron	180-245	✓			✓	
	9	Nodular Cast iron	160-250	✓			✓	

Good Conditions
Average Conditions
Difficult Conditions

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance Toughness → PH5705	PH7910	PH7920	PH5740	Feed fz (in/t) PNH(K)X 11...
P	1	Unalloyed Steel	125-220	-	624-919	591-820	-	0.006-0.012
	2	Low-Alloyed Steel	220-280	-	591-788	558-689	-	0.006-0.012
	3	High-Alloyed Steel	280-380	-	558-722	525-656	-	0.006-0.010
K	7	Malleable Cast Iron	130-230	624-1116	-	-	558-984	0.005-0.014
	8	Grey Cast Iron	180-245	591-984	-	-	492-853	0.005-0.014
	9	Nodular Cast iron	160-250	460-820	-	-	427-722	0.005-0.012

(Note 1) Cutting conditions a_e/DC=70%.
(Note 2) Cutting conditions should be ajusted according to the machine and work rigidity.(Note 3) If chattering occurs, reduce ap and Vc by 30% and keep the same fz per tooth.

CHIP-BREAKER SELECTION GUIDE

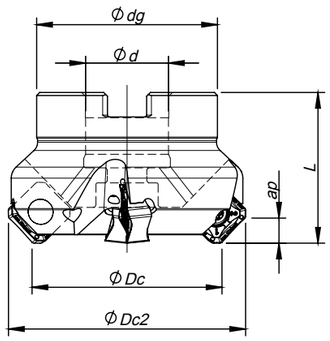
ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application 1st choise	Dificult Operations
P	1	Unalloyed Steel	125-220	PNH(K)X... -MK	-
	2	Low-Alloyed Steel	220-280	PNH(K)X... -MK	-
	3	High-Alloyed Steel	280-380	PNH(K)X... -MK	-
K	7	Malleable Cast Iron	130-230	PNH(K)X... -MK	PNH(K)X 11... -HK
	8	Grey Cast Iron	180-245	PNH(K)X... -MK	PNH(K)X 11... -HK
	9	Nodular Cast iron	160-250	PNH(K)X... -MK	PNH(K)X 11... -HK

PLUS SN45-12

Proprietary milling line

Arbor Mounting

K_r=45° | γ_p=-6°



Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	ØDc2	Ød	Ødg	L	lbs	Specifications Arbor Type	Ap max (in)	Insert Pastilha Inserto	Stock
181072800	SN45 D1.50-A.500/1.50-03-12	3	1.500	2.006	0.500	1.417	1.500	1.03	A	0.236	SN... 1206	◉
181048800	SN45 D2.00-A.750/1.75-04-12	4	2.000	2 513	0.750	1.772	1.750	1.05	A	0.236	SN... 1206	◉
181062700	SN45 D2.00-A.750/1.75-06-12	6	2.000	2 513	0.750	1.772	1.750	1.03	A	0.236	SN... 1206	◉
181048900	SN45 D2.50-A1.00/1.75-06-12	6	2.500	3 013	1.000	2.205	1.750	1.51	A	0.236	SN... 1206	◉
181062800	SN45 D2.50-A1.00/1.75-08-12	8	2.500	3 013	1.000	2.205	1.750	1.52	A	0.236	SN... 1206	◉
181049000	SN45 D3.00-A1.00/2.00-07-12	7	3.000	3 513	1.000	2.205	2.000	2.23	A	0.236	SN... 1206	◉
181062900	SN45 D3.00-A1.00/2.00-10-12	10	3.000	3 513	1.000	2.205	2.000	2.16	A	0.236	SN... 1206	◉
NEW 181136600	SN45 D4.00-A1.50/2.50-08-12	8	4.000	4 513	1.500	2.874	2.500	3.91	A	0.236	SN... 1206	◉
NEW 181136700	SN45 D4.00-A1.50/2.50-12-12	12	4.000	4 513	1.500	2.874	2.500	3.80	A	0.236	SN... 1206	◉
181049100	SN45 D4.00-A1.25/2.00-08-12	8	4.000	4 513	1.250	2.874	2.000	3.91	A	0.236	SN... 1206	◬
181063000	SN45 D4.00-A1.25/2.00-12-12	12	4.000	4 513	1.250	2.874	2.000	3.80	A	0.236	SN... 1206	◬
181049200	SN45 D5.00-A1.50/2.50-10-12	10	5.000	5 513	1.500	3.386	2.500	7.36	A	0.236	SN... 1206	◉
181049300	SN45 D6.00-A2.00/2.50U-12-12	12	6.000	6 513	2.000	4.882	2.500	9.51	B	0.236	SN... 1206	◉
181054400	SN45 D8.00-A2.50/2.50U-14-12	14	8.000	8 513	2.500	5.512	2.500	13.51	C	0.236	SN... 1206	◉
181054500	SN45 D10.0-A2.50/2.50U-16-12	16	10.000	10 513	2.500	7.087	2.500	24.58	C	0.236	SN... 1206	◉

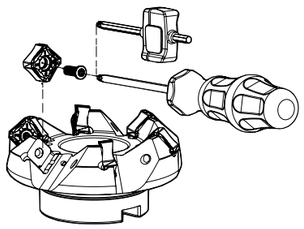
◉ Stock item | Produto de stock | Itens de stock

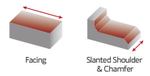
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

◬ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value lbf/in
SN45-A-12 - 1.50-3.00	P0401200	XT15	26.6
SN45-A-12 - 4.00-10.00	P0401200	PT15	26.6





SNH(K)X 1206 | Inserts | Pastilhas | Plaquitas

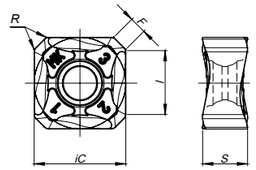
SNHX-LP

SNHX-MP
SNKX-MP

SNHX-MK
SNKX-MK

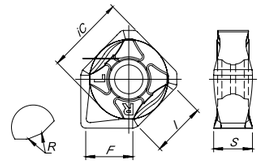
SNHX-LN

SNHX-LP | MP | MK | LN



SNHX-W

SNHX-W



(1) Geometry code	ISO Reference	P PVD PH7603	PH7910	PH7920	PH7930	PH7740	M CVD PHM740	PVD PH7920	PH7930	PH7740	K CVD PH5705	PH5320	PH5740	PVD PH7910	PH7920	PH7930	N UNC PH0910	PCD PDP410	S PVD PH7930	PVD PH7740	H PVD PH7603	Dimensions (in) iC	S	I	R	F
	(2) Grade code	P7	G1	G4	P3	G6	R1	G4	P3	G6	L5	L6	L9	G1	G4	P3	10	D6	P3	G6	P7					
NEW 1112293	SNKX 1206 ANSN-MP			◉		◉																1/2	3/16	0.366	0.031	0.079
NEW 1112249	SNKX 1206 ANEN-MK										◉	◉	◉									1/2	3/16	0.366	0.031	0.079
1111452	SNHX 1206 ANEN-LP			◉	◉				◉						◉	◉			◉			1/2	3/16	0.366	0.031	0.079
1111502	SNHX 1206 ANSN-MP		◉	◉	◉																	1/2	3/16	0.366	0.031	0.079
1111503	SNHX 1206 ANEN-MK										◉		◉	◉	◉							1/2	3/16	0.366	0.031	0.079
1111504	SNHX 1206 ANFN-LN																◉					1/2	3/16	0.366	0.031	0.079
1111899	SNHX 1206 ANFN-W*		◉	◉										◉	◉							1/2	0.248	0.366	0.016	0.299

◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◉ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

* Wiper insert with 2 rights and 2 left-hand cutting edges.

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance Toughness →				Vc (sfm) ← Wear Resistance Toughness →			Feed fz (in/t)				
				PH0910	PH5705	PH7910	PH7920	PH7930	PH5740	PH7740	SNHX 1206... LP	SNH(K)X 1206... MP	SNH(K)X 1206... MK	SNHX 1206... LN	SNHX 1206... W
P	1	Unalloyed Steel	125-220	-	-	624-919	591-820	525-722	-	460-558	0.004-0.014	0.004-0.014	-	-	0.004-0.014
	2	Low-Alloyed Steel	220-280	-	-	591-788	558-689	492-591	-	427-525	0.004-0.014	0.004-0.014	-	-	0.004-0.014
	3	High-Alloyed Steel	280-380	-	-	558-722	525-656	427-525	-	361-460	0.004-0.012	0.004-0.012	-	-	0.004-0.012
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	394-591	-	-	0.004-0.012	-	-	-	-
	5	SS - Austenitic / Duplex	200-330	-	-	-	-	328-525	-	-	0.004-0.012	-	-	-	-
	6	SS - Duplex	230-260	-	-	-	-	230-460	-	-	0.004-0.010	-	-	-	-
K	7	Malleable Cast Iron	130-230	-	624-1116	591-1050	558-984	525-919	558-984	427-820	0.004-0.014	-	0.004-0.014	-	0.004-0.016
	8	Grey Cast Iron	180-245	-	591-984	558-919	492-820	460-788	492-853	361-722	0.004-0.014	-	0.004-0.014	-	0.004-0.016
	9	Nodular Cast iron	160-250	-	460-820	328-788	296-689	296-656	427-722	263-558	0.004-0.012	-	0.004-0.012	-	0.004-0.016
N	10	Aluminum and Non Ferrous	30-130	1 148-3936	-	-	-	-	-	-	-	-	-	0.004-0.014	-
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	99-246	-	-	0.003-0.008	-	-	-	-

(Note 1) Cutting conditions a_e/Dc=70%.
(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) PH5... can be used wet or dry. PH7... use only air.

GRADES SELECTION GUIDE

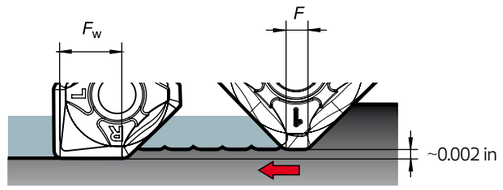
ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance Toughness →						
				PH0910	PH5705	PH7910	PH7920	PH7930	PH5740	PH7740
P	1	Unalloyed Steel	125-220			✓	✓	✓		✓
	2	Low-Alloyed Steel	220-280			✓	✓	✓		✓
	3	High-Alloyed Steel	280-380			✓	✓	✓		✓
M	4	SS - Ferritic / Martensitic	200-330					✓		
	5	SS - Austenitic / Duplex	200-330					✓		
	6	SS - Duplex	230-260					✓		
K	7	Malleable Cast Iron	130-230		✓		✓		✓	
	8	Grey Cast Iron	180-245		✓		✓		✓	
	9	Nodular Cast iron	160-250		✓		✓		✓	
N	10	Aluminum and Non Ferrous	30-130	✓						
S	11	Heat Resistant Super Alloys	200-320					✓		

Good Conditions
Average Conditions
Difficult Conditions

CHIP-BREAKER SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application	
				1st choise	Dificult Operations
P	1	Unalloyed Steel	125-220	SNHX 12... -LP	SNH(K)X 12... -MP
	2	Low-Alloyed Steel	220-280	SNHX 12... -LP	SNH(K)X 12... -MP
	3	High-Alloyed Steel	280-380	SNH(K)X 12... -MP	-
M	4	SS - Ferritic / Martensitic	200-330	SNHX 12... -LP	-
	5	SS - Austenitic / Duplex	200-330	SNHX 12... -LP	-
	6	SS - Duplex	230-260	SNHX 12... -LP	-
K	7	Malleable Cast Iron	130-230	SNH(K)X 12... -MK	-
	8	Grey Cast Iron	180-245	SNH(K)X 12... -MK	-
	9	Nodular Cast iron	160-250	SNH(K)X 12... -MK	-
N	10	Aluminum and Non Ferrous	30-130	SNHX 12... -LN	-
S	11	Heat Resistant Super Alloys	200-320	SNHX 12... -LP	-

WIPER INSERTS



Rec. Cutting Conditions
- F_W at least 40% larger than f_n (f_n-f_2xZ);
- Axial deepth of cut 0.020 - 0.031 in.

Example:
- The width of the parallel land (F) of the insert is 0.079 in.
- Width a cutter of 10 inserts and using a feed per tooth (f_z) of 0.012 in, i.e. 33% bigger than the parallel land.
- To obtain a good surface finish, the feed per revolution should be a maximum of 80% of 0.079 in = 0.063 in.
- Then wiper insert will have a parallel land (F_W) with a width of approximately 0.299 in.
- Result: Feed per revolution (f_n) could be increased from 0.063 in to 60% of 0.299 in = 0.180 in.

Note: Other limitations, such a machine power, must be taken into consideration.

How to use a wiper insert :
- Since wiper is one corner use to standard cutters, please attach the insert with the parallel land down to the workspace cutting surface.

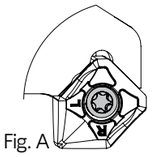


Fig. A

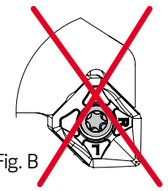
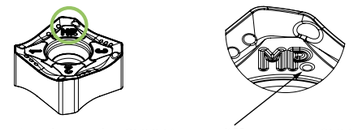


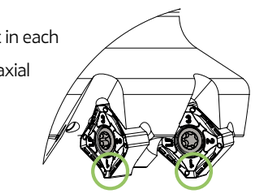
Fig. B

When using wiper insert, install the insert as shown on Fig. A if the insert is installed as shown on Fig. B breakage of the insert is inevitable and normal surface finish can not been obtained.



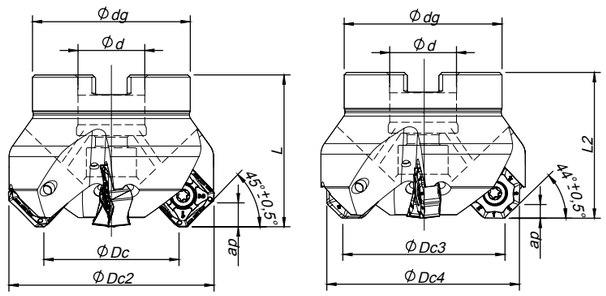
This point shows the SNKX insert difference to SNHX

Put the same side of insert in each pocket for best radial and axial runout when using SNKX.



PLUS SN45-16

Proprietary milling line



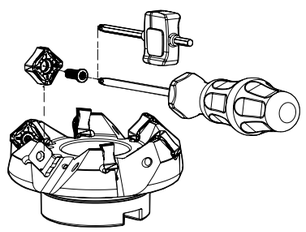
Arbor Mounting
K_r=45° | γ_p=-6°

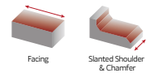
Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)								lbs	Specifications		Insert Pastilha Inserto	Stock
			ØDc	ØDc2	ØDc3	ØDc4	Ød	Ødg	L	L2		Arbor Type	Ap (in)		
181102400	SN45 D2.50-A1.00/2.00-05-16	5	2.500	3.173	2.641	3.011	1.000	2.047	2.000	1.921	1.79	A	0.335|0.150	SN...16|ON...06	◉
181102500	SN45 D3.00-A1.00/2.00-06-16	6	3.000	3.673	3.141	3.511	1.000	2.362	2.000	1.921	2.40	A	0.335|0.150	SN...16|ON...06	◉
181102600	SN45 D3.00-A1.00/2.00-08-16	8	3.000	3.673	3.141	3.511	1.000	2.362	2.000	1.921	2.33	A	0.335|0.150	SN...16|ON...06	○
181138800	SN45 D4.00-A1.50/2.50-07-16	7	4.000	4.673	4.141	4.511	1.500	3.150	2.500	2.421	4.95	A	0.335|0.150	SN...16|ON...06	◉
181138900	SN45 D4.00-A1.50/2.50-10-16	10	4.000	4.673	4.141	4.511	1.500	3.150	2.500	2.421	4.85	A	0.335|0.150	SN...16|ON...06	○
181102700	SN45 D4.00-A1.25/2.00-07-16	7	4.000	4.673	4.141	4.511	1.250	3.150	2.000	1.921	5.02	A	0.335|0.150	SN...16|ON...06	◇
181102900	SN45 D5.00-A1.50/2.50-08-16	8	5.000	5.673	5.141	5.511	1.500	3.543	2.500	2.421	6.70	A	0.335|0.150	SN...16|ON...06	◉
181103000	SN45 D6.00-A2.00/2.50U-10-16	10	6.000	6.673	6.141	6.511	2.000	4.331	2.500	2.421	9.70	B	0.335|0.150	SN...16|ON...06	◉
181103100	SN45 D8.00-A2.50/2.50U-12-16	12	8.000	8.673	8.141	8.511	2.500	6.772	2.500	2.421	20.11	C	0.335|0.150	SN...16|ON...06	◉
181103200	SN45 D10.0-A2.50/2.50U-14-16	14	10.000	10.673	10.141	10.511	2.500	6.772	2.500	2.421	26.37	C	0.335|0.150	SN...16|ON...06	◉

◉ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
◇ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplazado por nuevo iten.

SPARE PARTS ‖ Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
			lbf/in
SN45-A-16 - 2.50-3.00	P0451400	XT20	44.3
SN45-A-16 - 4.00-10.00	P0451400	PT20	44.3





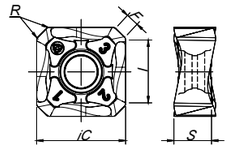
SNH(K)X 1606 ‖ ONH(K)X 0606 ‖ Inserts | Pastilhas | Plaquitas

SNHX-LP

SNHX-MP
SNKX-MP

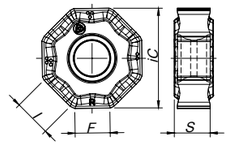
SNHX-MK
SNKX-MK

SNH(K)X - LP | MP | MK



ONHX-W

ONHX - W

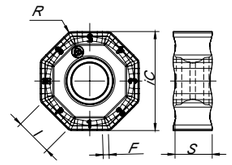


ONHX-LP
ONKX-LP

ONHX-MP
ONKX-MP

ONHX-MK
ONKX-MK

ONH(K)X - LP | MP | MK



			P				M				K							N		S			H
			PVD				CVD	PVD			CVD			PVD				UNC	PCD	PVD			PVD
		(2) Grade code	G1	G4	P3	G6	R1	G4	P3	G6	L5	L6	L9	G1	G4	P3	G6	10	D6	P3	G6	P7	
	(1) Geometry code	ISO Reference	PH7910	PH7920	PH7930	PH7740	PHM740	PH7920	PH7930	PH7740	PH5705	PH5320	PH5740	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PH7930	PH7740	PH7603	Dimensions (in)
	1111951	SNHX 1606 ANER-LP		◉	◉	◉			◉	◉					◉	◉	◉						iC 0.65 / S 1/4 / l 0.492 / R 0.031 / F 0.087
	1111952	SNHX 1606 ANER-MP		◉		◉																	iC 0.65 / S 1/4 / l 0.492 / R 0.031 / F 0.087
	1111953	SNHX 1606 ANER-MK											◉										iC 0.65 / S 1/4 / l 0.492 / R 0.031 / F 0.087
NEW	1112281	SNKX 1606 ANER-MP		◉		◉																	iC 0.65 / S 1/4 / l 0.492 / R 0.031 / F 0.087
NEW	1112282	SNKX 1606 ANER-MK										◉	◉										iC 0.65 / S 1/4 / l 0.492 / R 0.031 / F 0.087
	1111954	ONHX 0606 ANEN-LP		◉	◉	◉			◉	◉		○			◉	◉	◉						iC 0.65 / S 1/4 / l 0.244 / R 0.031 / F 0.039
	1111955	ONHX 0606 ANEN-MP		◉		◉																	iC 0.65 / S 1/4 / l 0.244 / R 0.031 / F 0.039
	1111956	ONHX 0606 ANEN-MK									◉		◉										iC 0.65 / S 1/4 / l 0.244 / R 0.031 / F 0.039
	1112053	ONHX 0606 ANEN-W*		◉							◉				◉								iC 0.65 / S 1/4 / l 0.244 / R - / F 0.236
NEW	1112284	ONKX 0606 ANEN-LP		◉	◉	◉			◉	◉		◉			◉	◉	◉						iC 0.65 / S 1/4 / l 0.244 / R 0.031 / F 0.039
NEW	1112287	ONKX 0606 ANEN-MP		◉		◉																	iC 0.65 / S 1/4 / l 0.244 / R 0.031 / F 0.039
NEW	1112291	ONKX 0606 ANEN-MK									◉		◉										iC 0.65 / S 1/4 / l 0.244 / R 0.031 / F 0.039

◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción
◉ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

* Wiper insert with 4 rights and 4 left-hand cutting edges.

GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance				Toughness →
				PH5705	PH7920	PH7930	PH5740	PH7740
P	1	Unalloyed Steel	125-220		✓	✓		✓
	2	Low-Alloyed Steel	220-280		✓	✓		✓
	3	High-Alloyed Steel	280-380		✓	✓		✓
M	4	SS - Ferritic / Martensitic	200-330			✓		✓
	5	SS - Austenitic / Duplex	200-330			✓		✓
	6	SS - Duplex	230-260			✓		✓
K	7	Malleable Cast Iron	130-230	✓	✓		✓	
	8	Grey Cast Iron	180-245	✓	✓		✓	
	9	Nodular Cast iron	160-250	✓	✓		✓	
S	11	Heat Resistant Super Alloys	200-320			✓		✓

Good Conditions
Average Conditions
Difficult Conditions

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance		Toughness →
				PH5705	PH7920	PH7930
P	1	Unalloyed Steel	125-220	-	591 **(853)** 1 050	-
	2	Low-Alloyed Steel	220-919	-	492 **(656)** 788	-
	3	High-Alloyed Steel	919-380	-	460 **(591)** 656	-
M	4	SS - Ferritic / Martensitic	656-330	-	-	394 **(591)** 656
	5	SS - Austenitic / Duplex	656-330	-	-	328 **(460)** 591
	6	SS - Duplex	230-853	-	-	296 **(361)** 460
K	7	Malleable Cast Iron	427-230	558 **(624)** 1 001	-	-
	8	Grey Cast Iron	180-245	591 **(919)** 1 148	-	-
	9	Nodular Cast iron	525-250	427 **(525)** 689	-	-
S	11	Heat Resistant Super Alloys	656-1 050	-	-	115 **(164)** 246

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance	Toughness →	Feed fz (in/t)
				PH5740	PH7740	SNH(K)X/ONH(K)X
P	1	Unalloyed Steel	125-220	-	525 **(656)** 780	0.006 **(0.010)** 0.016
	2	Low-Alloyed Steel	220-280	-	455 **(525)** 656	0.006 **(0.010)** 0.016
	3	High-Alloyed Steel	280-380	-	390 **(455)** 553	0.006 **(0.010)** 0.016
M	4	SS - Ferritic / Martensitic	656-330	-	358 **(455)** 525	0.004 **(0.008)** 0.012
	5	SS - Austenitic / Duplex	656-330	-	293 **(1 268)** 455	0.004 **(0.008)** 0.012
	6	SS - Duplex	230-260	-	260 **(328)** 1 268	0.004 **(0.008)** 0.012
K	7	Malleable Cast Iron	130-230	488 **(553)** 845	-	0.006 **(0.010)** 0.016
	8	Grey Cast Iron	180-245	504 **(618)** 943	-	0.006 **(0.010)** 0.016
	9	Nodular Cast iron	525-250	374 **(455)** 585	-	0.006 **(0.010)** 0.016
S	11	Heat Resistant Super Alloys	656-320	-	65 **(130)** 178	0.004 **(0.006)** 0.007

(Note 1) Cutting conditions a_e/Dc=70%.
(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) PH5... can be used wet or dry. PH7... only air thru.

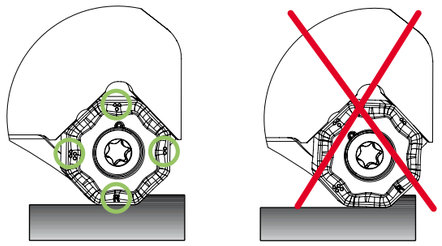
SELECTION EXAMPLE

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance	Toughness →	Feed fz (in/t)
				PH5705	PH5740	SNHX/ONHX
K	7	Malleable cast iron	130-230	558 **(624)** 1 001	492 **(558)** 853	0.006 **(0.010)** 0.016
	8	Grey cast iron	180-245	591 **(919)** 1 148	509 **(624)** 952	0.006 **(0.010)** 0.016
	9	Nodular cast iron	160-250	427 **(525)** 689	378 **(460)** 591	0.006 **(0.010)** 0.016

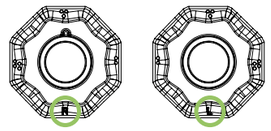
This example shows the recommended starting cutting conditions, indicated in **Bold type**.

CHIP-BREAKER SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application	
				1st choice	Alternative
P	1	Unalloyed Steel	125-220	LP	MP
	2	Low-Alloyed Steel	220-280	LP	MP
	3	High-Alloyed Steel	280-380	MP	-
M	4	SS - Ferritic / Martensitic	200-330	LP	-
	5	SS - Austenitic / Duplex	200-330	LP	-
	6	SS - Duplex	230-260	LP	-
K	7	Malleable Cast Iron	130-230	MK	-
	8	Grey Cast Iron	180-245	MK	-
	9	Nodular Cast iron	160-250	MK	LP
S	11	Heat Resistant Super Alloys	200-320	LP	-



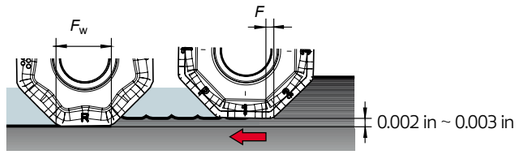
The points and letter (R or L) on the insert indicates the side that should be parallel to the workspace material.



Wiper insert with 4 Right and 4 Left-hand cutting edges. The side work of the insert it's indicated by the letter R (Right) & L (Left).

WIPER INSERTS

Rec. Cutting Conditions
- F_W at least 40% larger than f_n (f_n-f_2xZ);
- Axial depth of cut is 0.020 - 0.031 in.



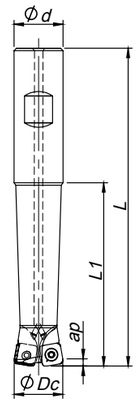
Example:
- The width of the parallel land (F) of the insert is 0.039 in.
- Width a cutter of 10 inserts and using a feed per tooth (f_z) of 0.012 in, the feed per revolution (f_n) will be 0.018 in, i.e. 66% bigger than the parallel land.
- To obtain a good surface finishing, the feed per revolution should be a maximum of 80% of 0.039 in = 0.031 in.
- The wiper insert will have a parallel land (F_W) with a width of approximately 0.236 in.
- Result: Feed per revolution (f_n) could be increased from 0.031 in to 60% of 0.236 in = 0.142 in.

Note: Other limitations, such as machine power, must be taken into consideration.

How to use a wiper insert :
- Since wiper is one corner use to standard cutters, please attach the insert with the parallel land down to the workspace cutting surface.
- The points and the letter (R or L) on the insert indicates the side that should be parallel to the worspace material.
- The side work of the insert it's indicated by the letter (R - Right & L - Left).

HIFEED SO10-08

Proprietary milling line

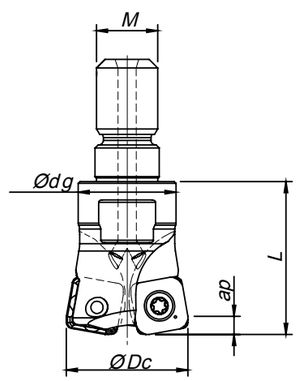


Weldon Shank

K_r=10° | γ_p=+2° | γ_f=+2° | R_p=0.079

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				lbs	Specifications	Insert Pastilha Inserto	Stock
			ØDc	Ød/M	L	L1		Ap max (in)		
181078700	SO10 D.750-W.750/5.00-02-08	2	0.750	0.750	5.000	2.835	0.79	0.039	SO...0803...	◎
181078800	SO10 D.750-W.750/8.00-02-08	2	0.750	0.750	8.000	2.835	0.69	0.039	SO...0803...	◎
181078900	SO10 D1.00-W1.00/5.00-03-08	3	1.000	1.000	5.000	2.835	0.90	0.039	SO...0803...	◎
181079000	SO10 D1.00-W1.00/8.00-03-08	3	1.000	1.000	8.000	4.843	1.26	0.039	SO...0803...	◎
181134800	SO10 D1.25-W1.25/6.00-04-08	4	1.250	1.250	6.000	3.425	0.76	0.039	SO...0803...	◎
181134900	SO10 D1.25-W1.25/8.00-04-08	4	1.250	1.250	8.000	4.843	1.68	0.039	SO...0803...	◎

◎ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
△ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

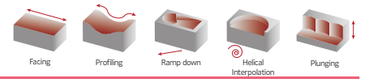


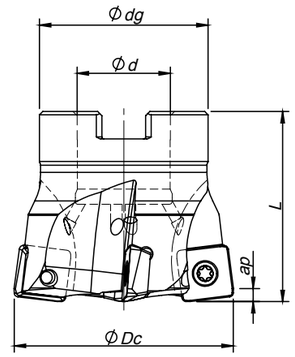
Threaded Coupling

K_r=10° | γ_p=+2° | γ_f=+2° | R_p=0.079

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				lbs	Specifications	Insert Pastilha Inserto	Stock
			ØDc	Ød/M	Ødg	L		Ap max (in)		
181135000	SO10 D.750-R-10/.984-02-08	2	0.750	M10	0.630	0.984	0.088	0.039	SO...0803...	◎
181135100	SO10 D1.00-R-12/1.18-03-08	3	1.000	M12	0.827	1.181	0.154	0.039	SO...0803...	◎
181135200	SO10 D1.25-R-16/1.37-04-08	4	1.250	M16	1.142	1.378	0.358	0.039	SO...0803...	◎

◎ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
△ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.





Arbor Mounting

K_r=10° | γ_p=+2° | γ_f=+2° | R_p=0.079

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				lbs	Specifications		Insert Pastilha Inserto	Stock
			ØDc	Ød/M	Ødg	L		Ap max (in)	Arbor Type		
181135300	SO10 D1.50-A.500/1.50-05-08	5	1.500	0.500	1.200	1.500	0.33	0.039	A	SO...0803...	◎
181135400	SO10 D2.00-A.750/1.75-06-08	6	2.000	0.750	1.457	1.750	0.63	0.039	A	SO...0803...	◎

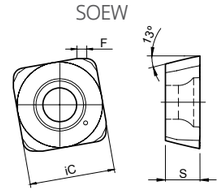
◎ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
△ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

SO...0803... ‖ Inserts | Pastilhas | Plaquitas

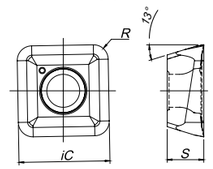
SOEW | SOKW

SOET

SOEW



SOET



			P					M				K						N		S			H		Dimensions (in)				
			PVD					CVD	PVD			CVD		PVD				UNC	PCD	CVD	PVD		PVD	CBN					
	(2) Grade code		P7	G1	G4	P3	G6	R1	G4	P3	G6	L5	L9	G1	G4	P3	G6	10	D6	R1	P3	G6	P7	D4					
(1) Geometry code	ISO Reference		PH7603	PH7910	PH7920	PH7930	PH7740	PHM740	PH7920	PH7930	PH7740	PH5705	PH5740	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PHM740	PH7930	PH7740	PH7603	PBH910	iC	S	I	R	F
	1111884	SOEW 080310 S		◎	◎									◎	◎										0.039	0.137	-	0.039	0.039
	1112149	SOET 080315-MS				◎	◎	◎		◎	◎									◎	◎	◎			0.039	0.137	-	0.059	-
NEW	1112487	SOKW 080310 S		◎	◎									◎	◎										0.039	0.137	-	0.039	0.039

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción
◎ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta
Disponible bajo consulta

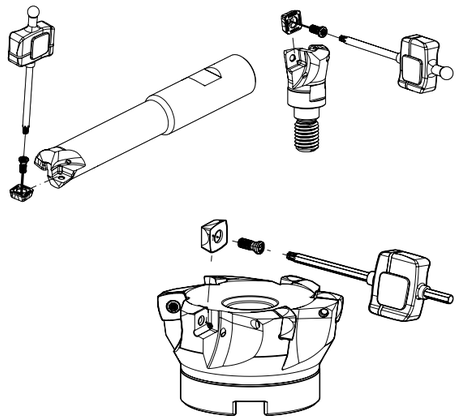
Insert order code = (1) Geometry Code + (2) Grade Code

SPARE PARTS | Complementos | Complementos

Order separatly

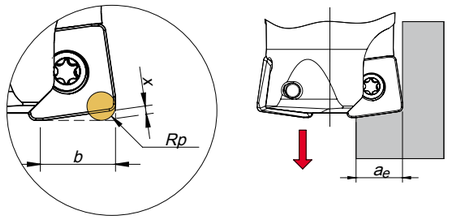
Cutter ØDc	Insert Screw	Key (Torx)	Torque Key (Torx)	Torque Value
				lbf/in
SO10-W-08 - 0.75-1.25	P0300800	XT09	DT0914	12.4
SO10-R-08 - 0.75-1.25	P0300800	XT09	DT0914	12.4
SO10-A-08 - 1.50-2.00	P0300800	XT09	DT0914	12.4

Note: Please check the procedures for the clamping screws on the page A-149



PROGRAMMING DATA

Insert	Programming Data			
	Rp	X	b	a_e
SO... 0803..	0.079	0.031	0.268	0.248



CHIP-BREAKER SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application	
				1st choise	Dificult Operations
P	1	Unalloyed Steel	125-220	SOET 08...	SOE(K)W 08...
	2	Low-Alloyed Steel	220-280	SOE(K)W 08...	-
	3	High-Alloyed Steel	280-380	SOE(K)W 08...	-
M	4	SS - Ferritic / Martensitic	200-330	SOET 08...	-
	5	SS - Austenitic / Duplex	200-330	SOET 08...	-
	6	SS - Duplex	230-260	SOET 08...	-
K	7	Malleable Cast Iron	130-230	SOET 08...	SOE(K)W 08...
	8	Grey Cast Iron	180-245	SOE(K)W 08...	-
	9	Nodular Cast iron	160-250	SOE(K)W 08...	-
S	11	Heat Resistant Super Alloys	200-320	SOET 08...	-

GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades				
				← Wear Resistance				Toughness →
				PH7910	PH7920	PH7930	PH7740	PHM740
P	1	Unalloyed Steel	125-220	✓	✓	✓	✓	
	2	Low-Alloyed Steel	220-280	✓	✓	✓	✓	
	3	High-Alloyed Steel	280-380	✓	✓	✓	✓	
M	4	SS - Ferritic / Martensitic	200-330			✓	✓	✓
	5	SS - Austenitic / Duplex	200-330			✓	✓	✓
	6	SS - Duplex	230-260			✓	✓	✓
K	7	Malleable Cast Iron	130-230	✓	✓			
	8	Grey Cast Iron	180-245	✓	✓			
	9	Nodular Cast iron	160-250	✓	✓			
S	11	Heat Resistant Super Alloys	200-320			✓		✓

Good Conditions
Average Conditions
Difficult Conditions

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm)					Feed fz (in/t)	
				← Wear Resistance				Toughness →		
				PH7910	PH7920	PH7930	PH7740	PHM740	SOE(K)W 08...	SOET 08...
P	1	Unalloyed Steel	125-220	525-919	492-755	460-722	328-591	-	0.016-0.071	0.016-0.071
	2	Low-Alloyed Steel	220-280	492-755	460-722	427-591	296-558	-	0.016-0.071	0.016-0.071
	3	High-Alloyed Steel	280-380	460-624	427-591	328-558	263-460	-	0.012-0.060	0.012-0.052
M	4	SS - Ferritic / Martensitic	200-330	-	-	427-722	328-591	328-591	-	0.016-0.052
	5	SS - Austenitic / Duplex	200-330	-	-	394-591	296-492	296-492	-	0.016-0.052
	6	SS - Duplex	230-260	-	-	230-460	230-394	230-394	-	0.004-0.040
K	7	Malleable Cast Iron	130-230	525-1148	492-1017	-	-	-	0.02-0.071	-
	8	Grey Cast Iron	180-245	492-984	460-853	-	-	-	0.02-0.071	-
	9	Nodular Cast iron	160-250	394-853	328-722	-	-	-	0.02-0.060	-
S	11	Heat Resistant Super Alloys	200-320	-	-	115-214	82-197	82-197	-	0.016-0.040

(Note 1) Cutting conditions a_e/Dc=70%.

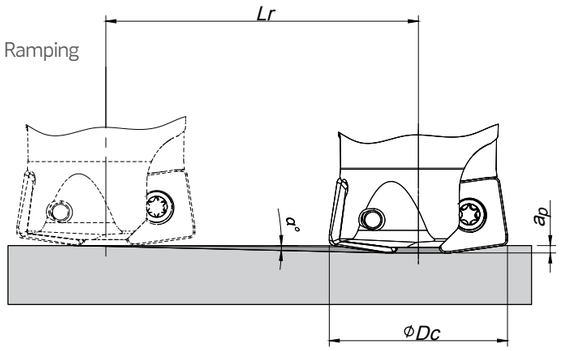
(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) PH5... can be used wet or dry. PH7... only air thru.

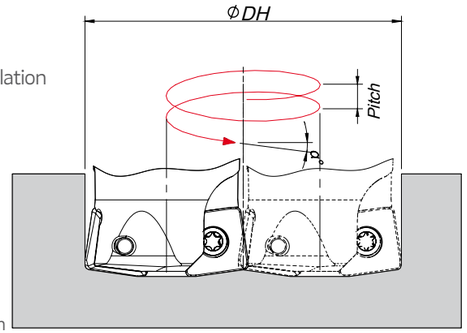
(Note 4) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

RAMPING AND HELICAL INTERPOLATION

Ramping



Helical Interpolation



Blind hole
Flat bottom

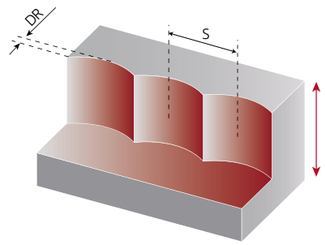
Ødi = ØDH - ØDc

ØDc	Ramping			Helical Interpolation		
	Max Ramp a°	Max ap	Min Lr	ØDHmin	ØDHmax	Max Pitch/Rev.
0.750	15.0	0.039	0.146	0.964 -	- 1.421	0.180 0.560
1.000	9.5	0.039	0.233	1.464 -	- 1.921	0.240 0.480
1.250	5.5	0.039	0.405	1.964 -	- 2.421	0.210 0.350
1.500	4.0	0.039	0.558	2.464 -	- 2.921	0.210 0.310
2.000	2.5	0.039	0.893	3.464 -	- 3.921	0.200 0.260

Note: During helical interpolation do not exceed max Pitch.

PLUNGING

L≤3Dc	L>3Dc	S max.
f_z (in/t)		
0.004-0.006	0.002-0.004	$S_{max} = \sqrt{DC.DR-DR^2}$

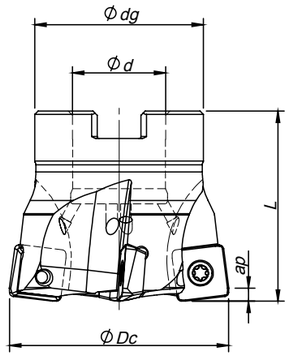


S max and DR corrsponding cutting diameter Dc (in)					
DR (in)	Dc (in)				
	0.750	1.000	1.250	1.500	2.000
0.039	0.167	0.194	0.217	0.239	0.277
0.079	0.230	0.270	0.304	0.335	0.390
0.118	0.273	0.323	0.365	0.404	0.471
0.157	0.305	0.364	0.414	0.459	0.538
0.197	0.330	0.398	0.455	0.507	0.596
0.236	0.348	0.425	0.489	0.546	0.645

Note: Recommended for L ≤ 4 Dc for extra long tool this step and side cut must be reduced.

HIFEED SO10-13

Proprietary milling line



Arbor Mounting

K_r=10° | γ_p=+5° | R_p=0.098

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	Ødg	L	lbs	Specifications Ap max (in)	Arbor Type	Insert Pastilha Inserto	Stock
181099300	SO10 D2.00-A.750/1.75-04-13	4	2.000	0.750	1.772	1.750	0.73	0.059	A	SO...13M5	Stock item
NEW 181139300	SO10 D2.00-A.750/1.75-05-13	5	2.000	0.750	1.772	1.750	0.70	0.059	A	SO...13M5	Stock item
181099400	SO10 D2.50-A1.00/2.00-05-13	5	2.500	1.000	2.205	2.000	1.32	0.059	A	SO...13M5	Stock item
181099500	SO10 D3.00-A1.00/2.00-06-13	6	3.000	1.000	2.205	2.000	1.98	0.059	A	SO...13M5	Stock item
NEW 181137800	SO10 D3.00-A1.25/2.00-06-13	6	3.000	1.250	2.441	2.000	1.82	0.059	A	SO...13M5	Stock item
181099600	SO10 D4.00-A1.25/2.00-06-13	6	4.000	1.250	2.874	2.000	3.31	0.059	A	SO...13M5	Inventory maintained
NEW 181137900	SO10 D4.00-A1.50/2.50-08-13	8	4.000	1.500	3.150	2.500	4.41	0.059	A	SO...13M5	Stock item

Stock item | Produto de stock | Itens de stock

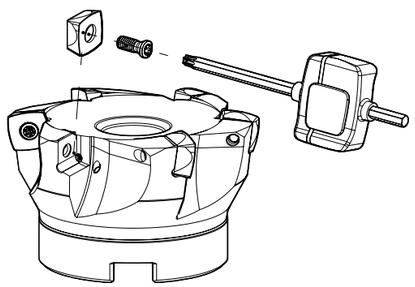
Available under request | Disponível sobre consulta | Disponible bajo consulta

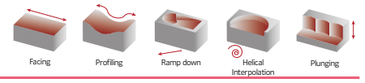
Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value lbf/in
SO10-A-13 - 2.00-3.00	P0401200	XT15	26.6
SO10-A-13 - 4.00	P0401200	PT15	26.6

Note: Please check the procedures for the clamping screws on the page A-149



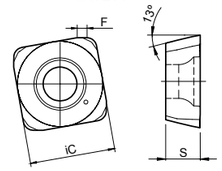


SO...13M5... | Inserts | Pastilhas | Plaquitas

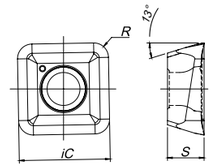
SOEW | SOKW

SOET

SOEW



SOET



		P					M				K					N		S			H		Dimensions (in)				
		PVD					CVD	PVD			CVD		PVD			UNC	PCD	CVD	PVD		PVD	CBN					
	(2) Grade code	P7	G1	G4	P3	G6	R1	G4	P3	G6	L5	L6	G1	G4	P3	10	D6	R1	P3	G6	P7	D4					
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PH7740	PHM740	PH7920	PH7930	PH7740	PH5705	PH5320	PH7910	PH7920	PH7930	PH0910	PDP410	PHM740	PH7930	PH7740	PH7603	PBH910	iC	S	I	R	F
1111906	SOEW 13M510 S		Stock item	Stock item First choice		Stock item							Stock item	Stock item First choice									0.489	0.197	-	0.047	0.039
1112147	SOET 13M520-MS				Stock item First choice	Stock item	Stock item First choice		Stock item	Stock item								Stock item	Stock item	Stock item First choice			0.489	0.197	-	0.079	-
NEW 1112488	SOKW 13M510 S		Stock item	Stock item First choice		Stock item							Stock item	Stock item First choice									0.489	0.197	-	0.047	0.039

Stock item | Produto de stock | Itens de stock First choice | Primeira opção | 1ª opción

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance Toughness → PH7910	PH7920	PH7930	PH7740	PHM740
P	1	Unalloyed Steel	125-220	✓	✓	✓	✓	
	2	Low-Alloyed Steel	220-280	✓	✓	✓	✓	
	3	High-Alloyed Steel	280-380	✓	✓	✓	✓	
M	4	SS - Ferritic / Martensitic	200-330				✓	✓
	5	SS - Austenitic / Duplex	200-330				✓	✓
	6	SS - Duplex	230-260				✓	✓
K	7	Malleable Cast Iron	130-230	✓	✓		✓	
	8	Grey Cast Iron	180-245	✓	✓		✓	
	9	Nodular Cast iron	160-250	✓	✓		✓	
S	11	Heat Resistant Super Alloys	200-320			✓	✓	✓

Good Conditions
Average Conditions
Difficult Conditions

HIFEED SO10-13

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance				Toughness →	Feed fz (in/t)	
				PH7910	PH7920	PH7930	PH7740	PHM740	SOE(K)W 13...	SOET 13...
P	1	Unalloyed Steel	125-220	525-919	492-755	460-722	328-591	-	0.020-0.087	0.020-0.079
	2	Low-Alloyed Steel	220-280	492-755	460-722	427-591	296-558	-	0.020-0.087	0.020-0.079
	3	High-Alloyed Steel	280-380	460-624	427-591	328-558	263-460	-	0.020-0.079	0.020-0.071
M	4	SS - Ferritic / Martensitic	200-330	-	-	427-722	328-591	328-591	-	0.020-0.071
	5	SS - Austenitic / Duplex	200-330	-	-	394-591	296-492	296-492	-	0.020-0.071
	6	SS - Duplex	230-260	-	-	230-460	230-394	230-394	-	0.020-0.060
K	7	Malleable Cast Iron	130-230	525-1148	492-1017	-	394-788	-	0.020-0.087	0.020-0.079
	8	Grey Cast Iron	180-245	492-984	460-853	-	328-656	-	0.020-0.087	0.020-0.079
	9	Nodular Cast iron	160-250	394-853	328-722	-	263-492	-	0.020-0.087	0.020-0.071
S	11	Heat Resistant Super Alloys	200-320	-	-	115-214	82-197	82-197	-	0.016-0.052

(Note 1) Cutting conditions a_e/Dc=70%.

(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) PH5... can be used wet or dry. PH7... only air thru.

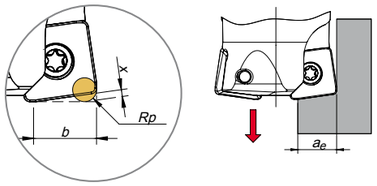
(Note 4) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

CHIP-BREAKER SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application	
				1st choise	Dificult Operations
P	1	Unalloyed Steel	125-220	SOET 13...	SOE(K)W 13...
	2	Low-Alloyed Steel	220-280	SOE(K)W 13...	-
	3	High-Alloyed Steel	280-380	SOE(K)W 13...	-
M	4	SS - Ferritic / Martensitic	200-330	SOET 13...	-
	5	SS - Austenitic / Duplex	200-330	SOET 13...	-
	6	SS - Duplex	230-260	SOET 13...	-
K	7	Malleable Cast Iron	130-230	SOET 13...	SOE(K)W 13...
	8	Grey Cast Iron	180-245	SOE(K)W 13...	-
	9	Nodular Cast iron	160-250	SOE(K)W 13...	-
S	11	Heat Resistant Super Alloys	200-320	SOET 13...	-

PROGRAMMING DATA

Insert	Programming Data			
	Rp	X	b	a_e
SO... 13M5..	0.098	0.043	0.038	0.394



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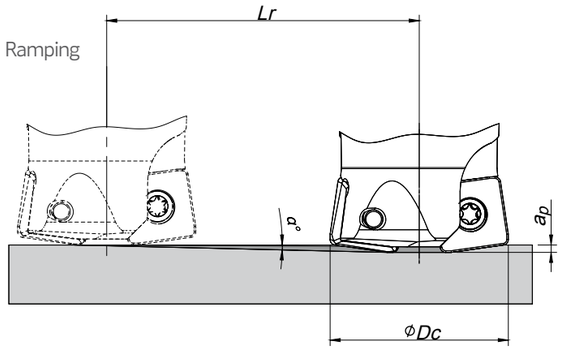
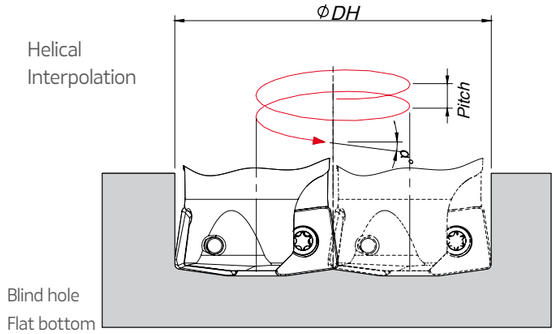
RAMPING AND HELICAL INTERPOLATION





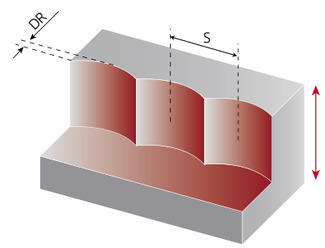
Ødi = ØDH - ØDc

ØDc	Ramping			Helical Interpolation		
	Max Ramp a°	Max a_p	Min Lr	ØDHmin	ØDHmax	Max Pitch/Rev.
2.000	4.3	0.059	0.785	3.924 -	- 3.921	0.450 0.450
2.500	3.0	0.059	1.126	4.924 -	- 4.921	0.390 0.390
3.000	2.0	0.059	1.690	5.924 -	- 5.921	0.320 0.320
4.000	0.7	0.059	4.829	7.924 -	- 7.921	0.150 0.150

Note: During helical interpolation do not exceed max Pitch.

PLUNGING

L≤3Dc	L>3Dc	S max.
f_z (in/t)		
0.004-0.008	0.003-0.006	$S_{max} = \sqrt{DC.DR-DR^2}$



S max and DR corrsponding cutting diameter Dc (in)				
DR (in)	Dc (in)			
	2.000	2.500	3.000	4.000
0.039	0.277	0.310	0.340	0.393
0.079	0.390	0.437	0.480	0.557
0.118	0.471	0.530	0.583	0.677
0.157	0.538	0.607	0.668	0.777
0.197	0.596	0.674	0.743	0.866
0.236	0.645	0.731	0.808	0.942
0.276	0.690	0.783	0.867	1.014
0.315	0.729	0.830	0.920	1.077
0.354	0.763	0.872	0.968	1.136
0.394	0.795	0.911	1.013	1.192

Note: Recommended for L ≤ 4 Dc for extra long tool this step and side cut must be reduced.

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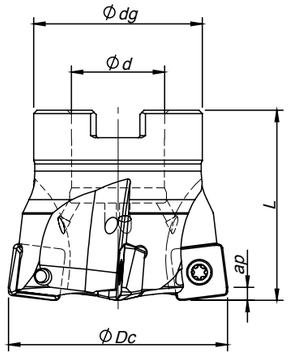
HIFEED SO15-16

Proprietary milling line



Arbor Mounting

K_r=15° | γ_p=+2° | R_p=0.177

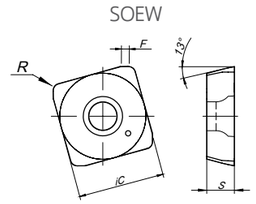
Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	Ødg	L	Ibs	Specifications Ap max (in)	Arbor Type	Insert Pastilha Inserto	Stock
181073900	SO15 D2.50-A1.00/1.75-05-16	5	2.500	1.000	2.205	1.750	1.42	0.138	A	SO...1605...	●
181074000	SO15 D3.00-A1.00/2.00-06-16	6	3.000	1.000	2.205	2.000	1.69	0.138	A	SO...1605...	●
NEW 181138400	SO15 D3.00-A1.25/2.00-06-16	6	3.000	1.250	2.441	2.000	1.69	0.138	A	SO...1605...	●
181074100	SO15 D4.00-A1.25/2.00-08-16	8	4.000	1.250	2.874	2.000	3.19	0.138	A	SO...1605...	◬
NEW 181138500	SO15 D4.00-A1.50/2.50-08-16	8	4.000	1.500	3.150	2.500	3.19	0.138	A	SO...1605...	●
181074200	SO15 D5.00-A1.50/2.50-10-16	10	5.000	1.500	3.386	2.500	6.92	0.138	A	SO...1605...	●
181074300	SO15 D6.00-A2.00/2.50U-12-16	12	6.000	2.000	4.882	2.500	8.22	0.138	B	SO...1605...	●

● Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
◬ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplazado por nuevo iten.

SOE...1605... | Inserts | Pastilhas | Plaquitas

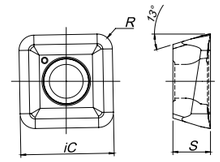
SOEW

SOEW



SOET

SOET

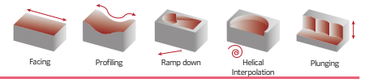


		P					M			K						N		S			H	
		PVD					CVD	PVD		CVD		PVD				UNC	PCD	CVD	PVD		PVD	CBN
	(2) Grade code	P7	G1	G4	P3	G6	R1	P3	G6	L5	L6	G1	G4	P3	G6	10	D6	R1	P3	G6	P7	D4
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PH7740	PHM740	PH7930	PH7740	PH5705	PH5320	PH7910	PH7920	PH7930	PH7740	PHO910	PDP410	PHM740	PH7930	PH7740	PH7603	PBH910
1111907	SOEW 160512 S		●	●		●						●	●		●							
1112221	SOET 160520-MS				●	●	●	●	●									●	●	●		

Geometry code	Grade code	Dimensions (in) iC	S	I	R	F
1111907	SOEW 160512 S	0.646	0.207	-	0.047	0.059
1112221	SOET 160520-MS	0.646	0.207	-	0.047	-

● Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción
● Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta
Disponible bajo consulta

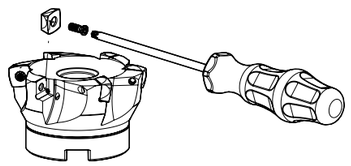
Insert order code = (1) Geometry Code + (2) Grade Code



SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value Ibf/in
SO15-A-16 - 2.50-6.00	P0501302	PT20	44.3

Note: Please check the procedures for the clamping screws on the page A-149



GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance PH7910	PH7920	PH7930	PH7740	PHM740 Toughness →
P	1	Unalloyed Steel	125-220	✓	✓	✓	✓	
	2	Low-Alloyed Steel	220-280	✓	✓	✓	✓	
	3	High-Alloyed Steel	280-380	✓	✓	✓	✓	
M	4	SS - Ferritic / Martensitic	200-330			✓	✓	✓
	5	SS - Austenitic / Duplex	200-330			✓	✓	✓
	6	SS - Duplex	230-260			✓	✓	✓
K	7	Malleable Cast Iron	130-230	✓	✓		✓	
	8	Grey Cast Iron	180-245	✓	✓		✓	
	9	Nodular Cast iron	160-250	✓	✓		✓	
S	11	Heat Resistant Super Alloys	200-320			✓	✓	✓

● Good Conditions
Average Conditions
Difficult Conditions

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance PH7910	PH7920	PH7930	PH7740	PHM740 Toughness →	Feed fz (in/t) SOEW 16...	SOET 16...
P	1	Unalloyed Steel	125-220	525-919	492-755	460-722	328-591	-	0.024-0.099	0.020-0.087
	2	Low-Alloyed Steel	220-280	492-755	460-722	427-591	296-558	-	0.024-0.099	0.020-0.087
	3	High-Alloyed Steel	280-380	460-624	427-591	328-558	263-460	-	0.024-0.079	0.020-0.071
M	4	SS - Ferritic / Martensitic	200-330	-	-	427-722	328-591	328-591	-	0.024-0.079
	5	SS - Austenitic / Duplex	200-330	-	-	394-591	296-492	296-492	-	0.024-0.087
	6	SS - Duplex	230-260	-	-	230-460	230-394	230-394	-	0.020-0.071
K	7	Malleable Cast Iron	130-230	525-1148	492-1017	-	394-853	-	0.024-0.099	0.020-0.079
	8	Grey Cast Iron	180-245	492-984	460-853	-	427-722	-	0.024-0.099	0.020-0.079
	9	Nodular Cast iron	160-250	394-853	328-722	-	328-591	-	0.024-0.079	0.020-0.071
S	11	Heat Resistant Super Alloys	200-320	-	-	115-214	82-197	82-197	0.016-0.071	0.016-0.071

(Note 1) Cutting conditions a_e/Dc=70%.

(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) PH5... can be used wet or dry. PH7... only air thru.

(Note 4) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

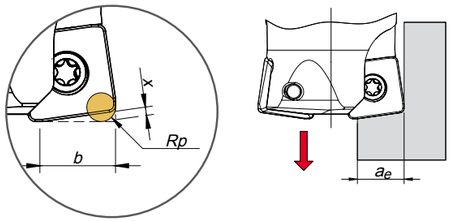
HIFEED SO15-16

CHIP-BREAKER SELECTION GUIDE

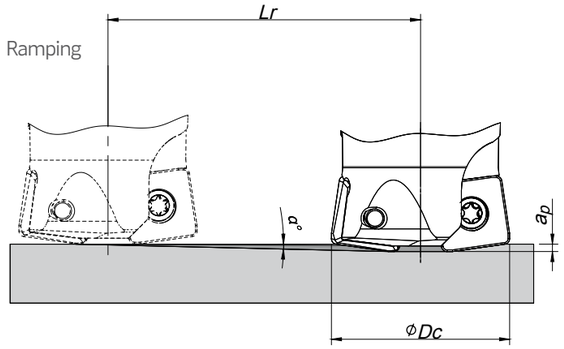
ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application	
				1st choise	Dificult Operations
P	1	Unalloyed Steel	125-220	SOET 16...	SOEW 16...
	2	Low-Alloyed Steel	220-280	SOEW 16...	-
	3	High-Alloyed Steel	280-380	SOEW 16...	-
M	4	SS - Ferritic / Martensitic	200-330	SOET 16...	-
	5	SS - Austenitic / Duplex	200-330	SOET 16...	-
	6	SS - Duplex	230-260	SOET 16...	-
K	7	Malleable Cast Iron	130-230	SOET 16...	SOEW 16...
	8	Grey Cast Iron	180-245	SOEW 16...	-
	9	Nodular Cast iron	160-250	SOEW 16...	-
S	11	Heat Resistant Super Alloys	200-320	SOET 16...	-

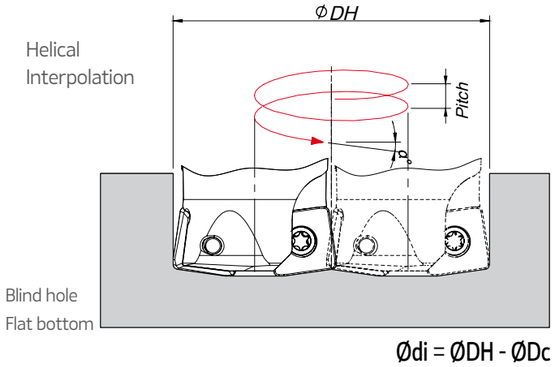
PROGRAMMING DATA

Insert	Programming Data			
	Rp	X	b	a_e
SO... 1605..	0.177	0.091	0.531	0.504



RAMPING AND HELICAL INTERPOLATION





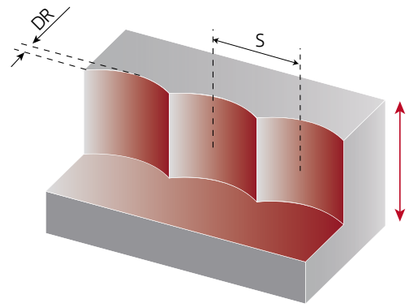
Ødi = ØDH - ØDc

ØDc	Ramping			Helical Interpolation		
	Max Ramp a°	Max ap	Min Lr	ØDHmin	ØDHmax	Max Pitch/Rev.
2.500	3.5	0.138	2.256	3.938 -	- 4.921	0.270 0.460
3.000	2.0	0.138	3.952	4.938 -	- 5.921	0.210 0.320
4.000	1.5	0.138	5.270	6.938 -	- 7.921	0.240 0.320
5.000	1.0	0.138	7.906	8.938 -	- 9.921	0.210 0.260
6.000	0.5	0.138	15.813	10.938 -	- 11.921	0.130 0.160

Note: During helical interpolation do not exceed max Pitch.

PLUNGING

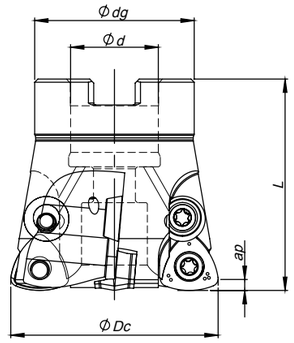
L≤3Dc	L>3Dc	S max.
f_z (in/t)		
0.004-0.008	0.003-0.006	Smax = $\sqrt{DC.DR-DR^2}$



S max and DR corrsponding cutting diameter Dc (in)					
DR (in)	Dc (in)				
	2.500	3.000	4.000	5.000	6.000
0.039	0.310	0.340	0.393	0.440	0.482
0.079	0.437	0.480	0.557	0.624	0.684
0.118	0.530	0.583	0.677	0.759	0.833
0.157	0.607	0.668	0.777	0.872	0.958
0.197	0.674	0.743	0.866	0.973	1.069
0.236	0.731	0.808	0.942	1.060	1.166
0.276	0.783	0.867	1.014	1.142	1.257
0.315	0.830	0.920	1.077	1.215	1.338
0.354	0.872	0.968	1.136	1.282	1.414
0.394	0.911	1.013	1.192	1.347	1.486
0.433	0.946	1.054	1.243	1.406	1.553
0.472	0.978	1.092	1.290	1.462	1.615

Note: Recommended for L ≤ 4 Dc for extra long tool this step and side cut must be reduced.

HIFEED WD60-12



Arbor Mounting

γ_p=+5° | R_p=0.126

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (mm) ØDc	Ød	Ødg	L	Ibs	Specifications Ap max (mm)	Arbor Type	Insert Pastilha Inserto	Stock
181134700	WD60 D2.00-A.750/2.00-04-12	4	2.000	0.750	1.772	2.000	0.93	0.059	A	WD... 1204...	◈
181139800	WD60 D2.50-A1.00/2.00-05-12	5	2.500	1.000	1.772	2.000	1.39	0.059	A	WD... 1204...	○
181139900	WD60 D3.00-A1.25/2.00-06-12	6	3.000	1.250	2.283	2.000	2.25	0.059	A	WD... 1204...	○

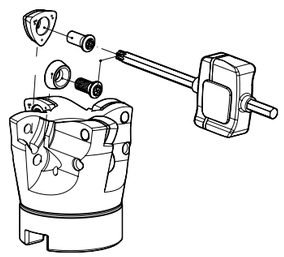
◈ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
◇ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

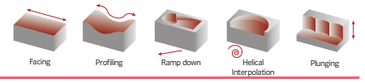
SPARE PARTS || Complementos | Complementos

Order separatly

ScrewCutter ØDc	Insert Screw	Key (Torx)	Torque Key (Torx)	Torque Value	Washer	Washer Screw
WD60-A-12 - 2.00-3.00	P0451001	XT20	DT2050	44.3 lbf/in	HC01200	P0451001

Note: Please check the procedures for the clamping screws on the page A-149



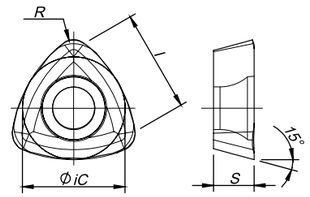


WDET 1204 | WDMW 1204 || Inserts | Pastilhas | Plaquitas

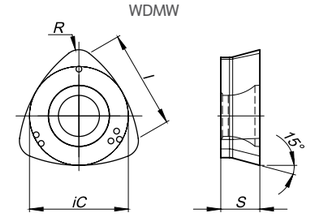
WDET

WDMW

WDET



WDMW



		P					M				K						N		S		H		Dimensions (mm)				
		PVD					CVD	PVD			CVD		PVD				UNC	PCD	PVD		PVD	CBN					
	(2) Grade code	P7	G1	G4	P3	G6	R1	G4	P3	G6	L5	L6	G1	G4	P3	G6	10	D6	P3	G6	P7	D4					
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PH7740	PHM740	PH7920	PH7930	PH7740	PH5705	PH5320	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PH7930	PH7740	PH7603	PBH910	iC	S	I	R	F
1112148	WDET 120420-MS			○	◈	◈			◈	◈									◈	◈			0.472	0.187	0.469	0.079	-
1111123	WDMW 120420-T		○	◈		◈							○	◈		◈							0.472	0.187	0.469	0.079	-

◈ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción
◈ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance PH7910	PH7920	PH7930	Toughness → PH7740
P	1	Unalloyed Steel	125-220	✓	✓	✓	✓
	2	Low-Alloyed Steel	220-280	✓	✓	✓	✓
	3	High-Alloyed Steel	280-380	✓	✓	✓	✓
M	4	SS - Ferritic / Martensitic	200-330			✓	✓
	5	SS - Austenitic / Duplex	200-330			✓	✓
	6	SS - Duplex	230-260			✓	✓
K	7	Malleable Cast Iron	130-230	✓	✓		✓
	8	Grey Cast Iron	180-245	✓	✓		✓
	9	Nodular Cast iron	160-250	✓	✓		✓
S	11	Heat Resistant Super Alloys	200-320			✓	✓

Good Conditions
Average Conditions
Difficult Conditions

HIFEED WD60-12

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (m/min) ← Wear Resistance			Toughness →	Feed fz (mm/t)	
				PH7910	PH7920	PH7930	PH7740	WDMW 12...	WDET 12...
P	1	Unalloyed Steel	125-220	525-919	492-755	460-722	328-591	0.012-0.060	0.012-0.052
	2	Low-Alloyed Steel	220-280	492-755	460-722	427-591	296-558	0.012-0.060	0.012-0.052
	3	High-Alloyed Steel	280-380	460-624	427-591	328-558	263-460	0.012-0.052	0.012-0.040
M	4	SS - Ferritic / Martensitic	200-330	-	-	427-722	328-591	-	0.012-0.052
	5	SS - Austenitic / Duplex	200-330	-	-	394-591	296-492	-	0.012-0.052
	6	SS - Duplex	230-260	-	-	230-460	230-394	-	0.012-0.040
K	7	Malleable Cast Iron	130-230	525-1148	492-1017	-	394-788	0.012-0.060	-
	8	Grey Cast Iron	180-245	492-984	460-853	-	328-656	0.012-0.060	-
	9	Nodular Cast iron	160-250	394-853	328-722	-	263-492	0.012-0.056	-
S	11	Heat Resistant Super Alloys	200-320	-	-	115-214	82-148	-	0.012-0.040

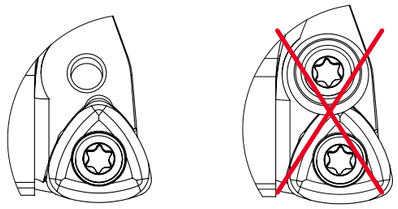
(Note 1) Cutting conditions a_e/Dc=70%.

(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) PH5... can be used wet or dry. PH7... only air thru.

(Note 4) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

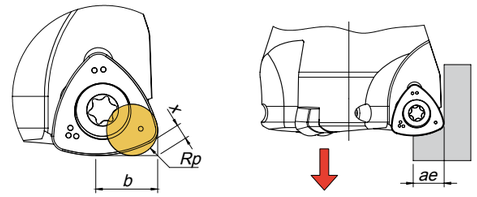
When using WDET insert, please remove the washer and the washer screw
Otherwise will breakage the insert.



CHIP-BREAKER SELECTION GUIDE

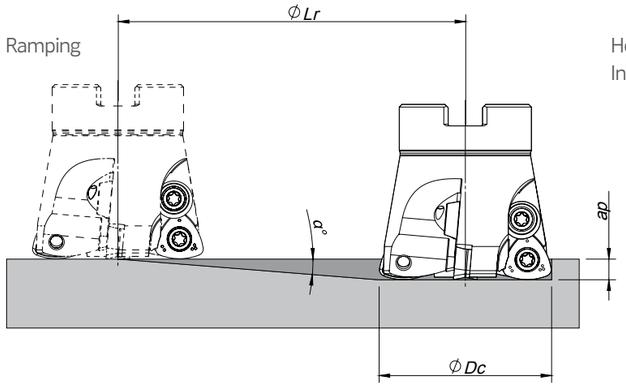
ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application	
				1st choise	Dificult Operations
P	1	Unalloyed Steel	125-220	WDET 12...	WDMW 12...
	2	Low-Alloyed Steel	220-280	WDMW 12...	-
	3	High-Alloyed Steel	280-380	WDMW 12...	-
M	4	SS - Ferritic / Martensitic	200-330	WDET 12...	-
	5	SS - Austenitic / Duplex	200-330	WDET 12...	-
	6	SS - Duplex	230-260	WDET 12...	-
K	7	Malleable Cast Iron	130-230	WDMW 12...	-
	8	Grey Cast Iron	180-245	WDMW 12...	-
	9	Nodular Cast iron	160-250	WDMW 12...	-
S	11	Heat Resistant Super Alloys	200-320	WDET 12...	-

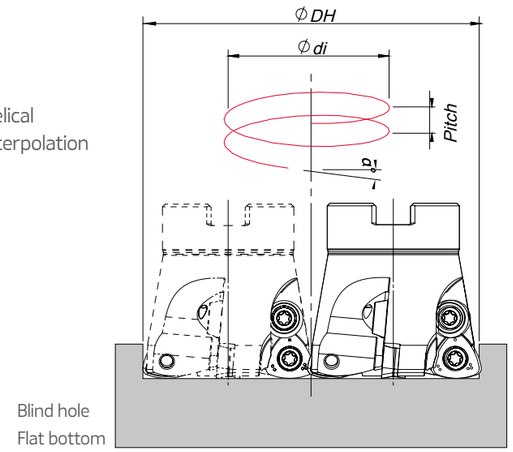
PROGRAMMING DATA



Insert	Programming Data			
	Rp	x	b	a_e
WD... 1204	0.126	0.028	0.283	0.276

RAMPING AND HELICAL INTERPOLATION



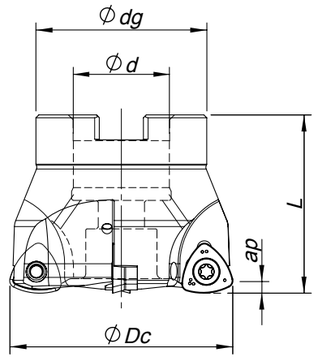


Ødi = ØDH - ØDc

ØDc	Ramping			Helical Interpolation		
	Max Ramp a°	Max a_p	Min Lr	ØDHmin	ØDHmax	Max Pitch/Rev.
2.000	0.8	0.059	4.225	3.434 -	- 3.921	0.062 0.084
2.500	0.4	0.059	8.451	4.434 -	- 4.921	0.042 0.053
3.000	0.3	0.059	11.268	5.434 -	- 5.921	0.040 0.048

Note: During helical interpolation do not exceed max Pitch.

HIFEED WN60-12

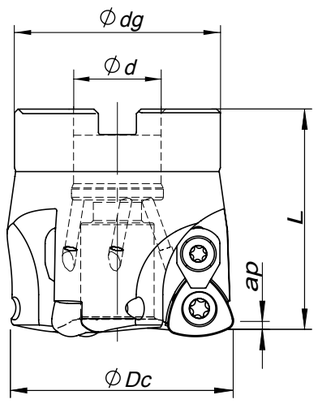


Arbor Mounting

γ_p=0° | R_p=0.138

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	Ødg	L	lbs	Specifications Ap max (in)	Arbor Type	Insert Pastilha Inserto	Stock
181054600	WN60 D2.00-A.750/1.75-03-12	3	2.000	0.750	1.772	1.750	0.79	0.071	A	WN... 1207	●
181054700	WN60 D2.50-A.750/1.75-04-12	4	2.500	0.750	1.772	1.750	1.10	0.071	A	WN... 1207	○
181080700	WN60 D2.50-A1.00/1.75-04-12	4	2.500	1.000	1.772	1.750	1.08	0.071	A	WN... 1207	●
181054800	WN60 D3.00-A1.00/2.00-05-12	5	3.000	1.000	2.283	2.000	1.99	0.071	A	WN... 1207	●
181072900	WN60 D4.00-A1.25/2.00-05-12	5	4.000	1.250	2.874	2.000	3.30	0.071	A	WN... 1207	●

● Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
◇ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplazado por nuevo iten.

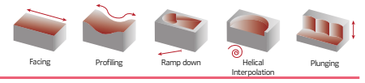


Clamp Version

γ_p=0° | R_p=0.138

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	Ødg	L	lbs	Specifications Ap max (in)	Arbor Type	Insert Pastilha Inserto	Stock
181083700	WN60 D2.00-A.750/1.97-03-12	3	2.000	0.750	1.772	1.969	0.81	0.071	A	WN... 1207	●
181083800	WN60 D2.50-A1.00/2.00-04-12	4	2.500	1.000	2.205	2.000	1.08	0.071	A	WN... 1207	●
181083900	WN60 D3.00-A1.00/2.50-05-12	5	3.000	1.000	2.283	2.500	1.97	0.071	A	WN... 1207	●
181084000	WN60 D4.00-A1.50/2.50-05-12	5	4.000	1.500	2.874	2.500	3.24	0.071	A	WN... 1207	●

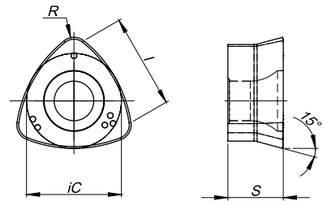
● Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
◇ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplazado por nuevo iten.



WNMW 1207 | Inserts | Pastilhas | Plaquitas

WNMW

WNMW



		P							M				K						N		S		H		Dimensions (in)				
		PVD							CVD	PVD			CVD		PVD				UNC	PCD	PVD		PVD	CBN					
	(2) Grade code	P7	G1	G4	P3	78	86	G6	R1	G4	P3	G6	L5	L6	G1	G4	P3	G6	10	D6	P3	G6	P7	D4					
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PH6125	PH6135	PH7740	PHM740	PH7920	PH7930	PH7740	PH5705	PH5320	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PH7930	PH7740	PH7603	PBH910	iC	S	I	R	F
1121148	WNMW 1207-SP		●	●		●	●	○							●	●		○							0.472	0.276	0.469	0.079	-

● Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción
● Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta
Disponible bajo consulta

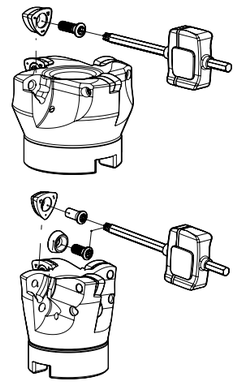
Insert order code = (1) Geometry Code + (2) Grade Code

SPARE PARTS | Complementos | Complementos

Clamp Version

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value lbf/in	Clamp Set	Clamp Key (Torx)
WN60-A-12 - 2.00-3.00	P0451400	XT20	44.3	GS40140	XT15
WN60-A-12 - 4.00	P0451400	PT20	44.3	GS40140	XT15

Note: Please check the procedures for the clamping screws on the page A-149



GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance PH7910	PH7920	PH6125	Toughness → PH6135
P	1	Unalloyed Steel	125-220	✓	✓	✓	✓
	2	Low-Alloyed Steel	220-280	✓	✓	✓	✓
	3	High-Alloyed Steel	280-380	✓	✓	✓	✓
K	7	Malleable Cast Iron	130-230	✓	✓		
	8	Grey Cast Iron	180-245	✓	✓		
	9	Nodular Cast iron	160-250	✓	✓		

● Good Conditions
● Average Conditions
● Difficult Conditions

HIFEED WN60-12

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance			Toughness →	Feed fz (in/t)
				PH7910	PH7920	PH6125	PH6135	WNMW 12...
P	1	Unalloyed Steel	125-220	525-919	492-755	525-624	328-591	0.012-0.060
	2	Low-Alloyed Steel	220-280	492-755	460-722	460-591	296-558	0.012-0.060
	3	High-Alloyed Steel	280-380	460-624	427-591	427-525	263-460	0.012-0.052
K	7	Malleable Cast Iron	130-230	525-1148	492-1017	-	-	0.012-0.060
	8	Grey Cast Iron	180-245	492-984	460-853	-	-	0.012-0.060
	9	Nodular Cast iron	160-250	394-853	328-722	-	-	0.012-0.056

(Note 1) Cutting conditions a_e/Dc=70%.

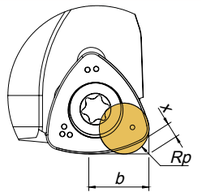
(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

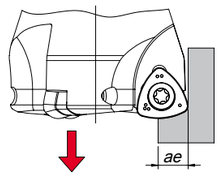
(Note 3) PH5... can be used wet or dry. PH7... only air thru.

(Note 4) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

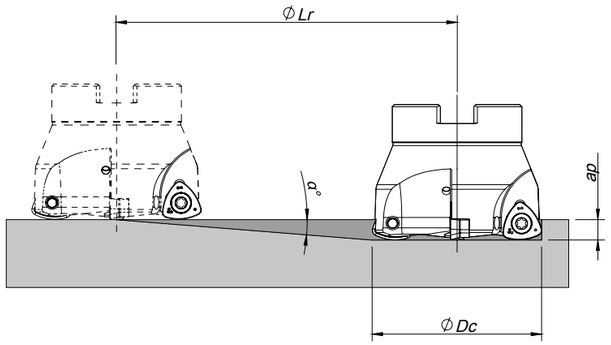
PROGRAMMING DATA

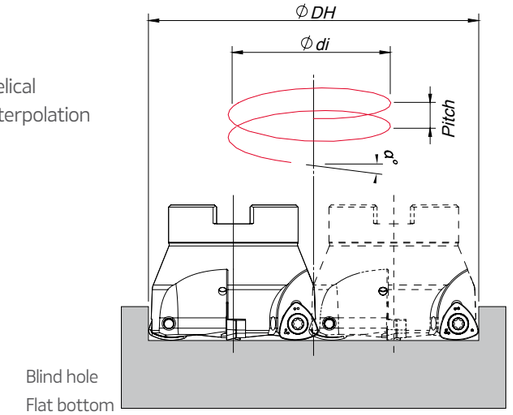
Insert	Programming Data			
	Rp	X	b	a_e
WNMW 12	0.138	0.035	0.331	0.315





RAMPING AND HELICAL INTERPOLATION





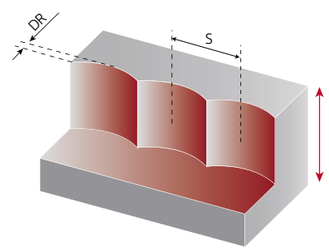
Ødi = ØDH - ØDc

ØDc	Ramping			Helical Interpolation		
	Max Ramp a°	Max a_p	Min Lr	ØDHmin	ØDHmax	Max Pitch/Rev.
2.000	1.8	0.138	4.391	3.338 -	- 3.921	0.130 0.180
2.500	1.2	0.138	6.588	4.338 -	- 4.921	0.120 0.150
3.000	0.9	0.138	8.785	5.338 -	- 5.921	0.110 0.140
4.000	0.4	0.138	19.767	7.338 -	- 7.921	0.070 0.080

Note: During helical interpolation do not exceed max Pitch.

PLUNGING

L≤3Dc	L>3Dc	S max.
f_z (in/t)		
0.004-0.008	0.003-0.006	$S_{max} = \sqrt{DC.DR-DR^2}$



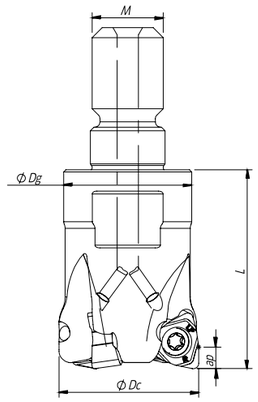
S max and DR corrsponding cutting diameter Dc (in)				
DR (in)	Dc (in)			
	2.000	2.500	3.000	4.000
0.039	0.277	0.310	0.340	0.393
0.079	0.390	0.437	0.480	0.557
0.118	0.471	0.530	0.583	0.677
0.157	0.538	0.607	0.668	0.777
0.197	0.596	0.674	0.743	0.866
0.236	0.645	0.731	0.808	0.942
0.276	0.690	0.783	0.867	1.014
0.315	0.729	0.830	0.920	1.077

Note: Recommended for L ≤ 4 Dc. forL > 4DC steps must be reduced to 40%.

PLUS WN90-04

NEW

Proprietary milling line



Threaded coupling

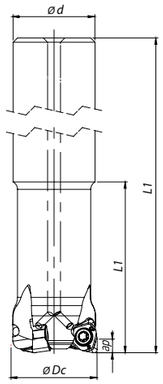
$K_r = 90°$ | $\gamma_p = -7°$

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	M	Ødg	L	Ibs	Specification Ap max (in)	Insert Pastilha Inserto	Stock
181140000	WN90 D.625-R-08/.800-02-04	2	0.625	M8	0.512	0.800	0.09	0.118	WNHU 04T308-LP	◯
181140100	WN90 D.750-R-10/1.00-03-04	3	0.750	M10	0.709	1.000	0.18	0.118	WNHU 04T308-LP	◯
181140200	WN90 D1.00-R-12/1.25-04-04	4	1.000	M12	1.142	1.250	0.22	0.118	WNHU 04T308-LP	◯

Stock item | Produto de stock | Itens de stock

◯ Available under request | Disponível sobre consulta | Disponible bajo consulta

Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.



Cylindrical Shank

$K_r = 90°$ | $\gamma_p = -7°$

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	L	L1	Ibs	Specifications Ap max	Insert Pastilha Inserto	Stock
181140300	WN90 D.625-C.625/4.00-02-04	2	0.625	0.625	4.000	2.000	0.53	0.118	WNHU 04T308-LP	◯
181140400	WN90 D.750-C.750/5.00-03-04	3	0.750	0.750	5.000	3.000	0.62	0.118	WNHU 04T308-LP	◯
181140500	WN90 D1.00-C1.00/6.00-04-04	4	1.000	1.000	6.000	3.750	0.77	0.118	WNHU 04T308-LP	◯

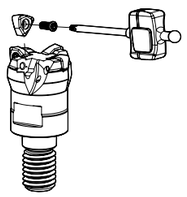
Stock item | Produto de stock | Itens de stock

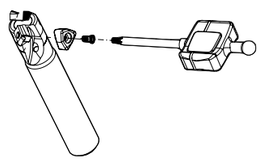
◯ Available under request | Disponível sobre consulta | Disponible bajo consulta

Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value lbf/in
WN90-R-04 - 0.625-1.00	P0250704	XT08	10.6
WN90-C-04 - 0.625-1.00	P0250704	XT08	10.6





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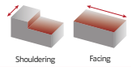
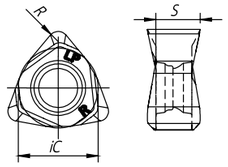
PLUS WN90-04

WNHU

NEW



WNHU 04T308 | Inserts | Pastilhas | Plaquitas



		P					M			K						N		S		H		Dimensions (in)				
		PVD					CVD	PVD		CVD		PVD				UNC	PCD	PVD		PVD	CBN					
(1) Geometry code	(2) Grade code / ISO Reference	M6	G1	G4	P3	G6	R1	G4	G6	L5	L9	G1	G4	P3	G6	10	D6	P3	G6	M6	D4	iC	S	I	R	F
		PH6103	PH7910	PH7920	PH7930	PH7740	PHM740	PH7920	PH7740	PH5705	PH5740	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PH7930	PH7740	PH6103	PBH910					
1112277	WNHU 04T308 PNER-LP			◉	◉								◉	◉								0,250	0,138	-	0,031	-

◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◉ Stock item | Produto de stock | Itens de stock

◯ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH7920	PH7930
P	1	Unalloyed Steel	125-220	✓	✓
	2	Low-Alloyed Steel	220-280	✓	✓
	3	High-Alloyed Steel	280-380	✓	✓
K	7	Malleable Cast Iron	130-230	✓	✓
	8	Grey Cast Iron	180-245	✓	✓
	9	Nodular Cast iron	160-250	✓	✓

Good Conditions
Average Conditions
Difficult Conditions

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance — Toughness → PH7920	PH7930
P	1	Unalloyed Steel	125-220	525-820	460-755
	2	Low-Alloyed Steel	220-280	492-755	427-689
	3	High-Alloyed Steel	280-380	460-656	394-591
K	7	Malleable Cast Iron	130-230	558-952	492-886
	8	Grey Cast Iron	180-245	460-820	394-755
	9	Nodular Cast iron	160-250	296-722	230-656

Insert	Feed f_z (in/t) Roughing	Finishing)	a_p Rec.
WNHU 04T308-LP	0.006-0.012	0.004-0.01	0.02-0.119

(Note 1) Cutting conditions should be adjusted according to the machine and work rigidity.

(Note 2) If chattering occurs. reduce a_p and V_c by 30% and keep the same f_z per tooth.

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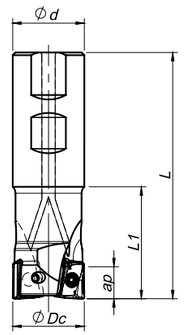
PLUS AN90-10

Proprietary milling line



Weldon Shank

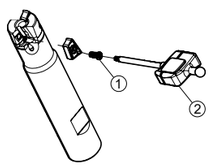
K_r = 90° | γ_p = -7° (-6°*)

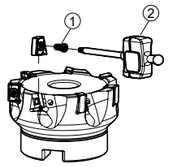
Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	L	L1	lbs	Specifications Ap max (in)	Insert Pastilha Inserto	Stock
181071200	AN90 D.750-W.750/3.94-02-10*	2	0.750	0.750	3.937	1.181	0.46	0.354	ANHX 1004...	◎
181071300	AN90 D.750-W.750/3.94-03-10*	3	0.750	0.750	3.937	1.181	0.44	0.354	ANHX 1004...	◎
181077000	AN90 D1.00-W1.00/4.53-02-10*	2	1.000	1.000	4.528	1.378	0.86	0.354	ANHX 1004...	◎
181064300	AN90 D1.00-W1.00/4.53-03-10*	3	1.000	1.000	4.528	1.378	0.85	0.354	ANHX 1004...	◎
181077100	AN90 D1.25-W1.25/4.92-03-10*	3	1.250	1.250	4.921	1.575	1.54	0.354	ANHX 1004...	◎
181077200	AN90 D1.25-W1.25/4.92-04-10*	4	1.250	1.250	4.921	1.575	1.53	0.354	ANHX 1004...	◎
NEW 181138200	AN90 D1.50-W1.25/5.00-04-10	4	1.500	1.250	5.000	1.500	1.69	0.354	ANHX 1004...	◎
NEW 181138300	AN90 D1.50-W1.25/5.00-05-10	5	1.500	1.250	5.000	1.500	1.69	0.354	ANHX 1004...	○
181077300	AN90 D1.50-W1.50/5.12-04-10	4	1.500	1.500	5.118	1.654	1.69	0.354	ANHX 1004...	◇
181077500	AN90 D2.00-W1.50/5.32-05-10	5	2.000	1.500	5.315	1.772	1.72	0.354	ANHX 1004...	◇

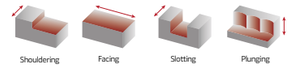
◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta ◇ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplazado por nuevo iten.

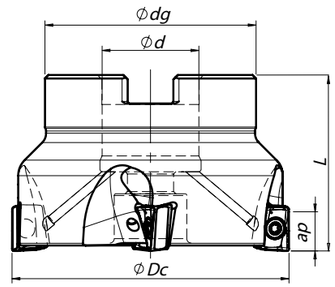
SPARE PARTS || Complementos | Repuestos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value lbf/in
AN90-W-10 - 0.75-2.00	P0300800	XT09	26.6
AN90-A-10 - 1.50-4.00	P0300800	XT09	26.6









Arbor Mounting

K_r = 90° | γ_p = -7°

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	ØDg	L	lbs	Specifications Arbor Type	Ap max (in)	Insert Pastilha Inserto	Stock
181077700	AN90 D1.50-A.500/1.50-04-10	4	1.500	0.500	1.417	1.500	0.45	A	0.354	ANHX 1004...	◎
181077800	AN90 D1.50-A.500/1.50-05-10	5	1.500	0 .500	1.417	1.500	0.44	A	0.354	ANHX 1004...	○
181077900	AN90 D2.00-A.750/1.75-05-10	5	2.000	0.750	1.772	1.750	0.72	A	0.354	ANHX 1004...	◎
181078000	AN90 D2.00-A.750/1.75-07-10	7	2.000	0.750	1.772	1.750	0.70	A	0.354	ANHX 1004...	○
181078100	AN90 D2.50-A1.00/1.75-07-10	7	2.500	1.000	2.205	1.750	1.19	A	0.354	ANHX 1004...	◎
181078200	AN90 D2.50-A1.00/1.75-09-10	9	2.500	1.000	2.205	1.750	1.16	A	0.354	ANHX 1004...	○
181078300	AN90 D3.00-A1.00/2.00-08-10	8	3.000	1.000	2.205	2.000	2.18	A	0.354	ANHX 1004...	◎
181078400	AN90 D3.00-A1.00/2.00-10-10	10	3.000	1.000	2.205	2.000	2.13	A	0.354	ANHX 1004...	○
181078500	AN90 D4.00-A1.25/2.00-09-10	9	4.000	1.250	2.874	2.000	3.97	A	0.354	ANHX 1004...	◇
NEW 181138000	AN90 D4.00-A1.50/2.50-09-10	9	4.000	1.500	2.874	2.500	3.88	A	0.354	ANHX 1004...	◎
NEW 181138100	AN90 D4.00-A1.50/2.50-12-10	12	4.000	1.500	2.874	2.500	3.88	A	0.354	ANHX 1004...	○

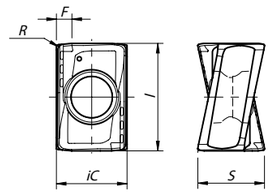
◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta ◇ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplazado por nuevo iten.

ANHX 1004.. INSERTS || Pastilhas | Plaquitas

ANHX-LP

ANHX-LM

ANHX-LN



		P					M			K							N		S		H	Dimensions (in)				
				PVD			CVD	PVD		CVD			PVD				UNC	PCD	PVD		PVD					
	(2) Grade code	P7	G1	G4	P3	G6	R1	P3	G6	L5	L6	L9	G1	G4	P3	G6	10	D6	P3	G6	P7					
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PH7740	PHM740	PH7930	PH7740	PH5705	PH5320	PH5740	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PH7930	PH7740	PH7603	iC	S	I	R	F
1111652	ANHX 100405 PNR-LP		◎	◎	◎								◎	◎	◎							0.260	0.244	0.394	0.020	0.039
NEW 1112106	ANHX 100408 PNR-LP			◎	◎									◎	◎							0.260	0.244	0.394	0.031	0.039
1111908	ANHX 100412 PNR-LP			◎	◎									◎	◎	◎						0.260	0.244	0.394	0.047	0.039
1112005	ANHX 100405 PNER-LM			◎	◎	◎		◎	◎					◎	◎	◎			◎	◎		0.260	0.244	0.394	0.020	0.039
NEW 1112162	ANHX 100408 PNER-LM			◎	◎			◎						◎	◎				◎			0.260	0.244	0.394	0.031	0.039
1112103	ANHX 100412 PNER-LM			◎	◎	◎		◎	◎					◎	◎	◎			◎	◎		0.260	0.244	0.394	0.047	0.039
1111997	ANHX 100405 PNFR-LN																◎					0.260	0.244	0.394	0.020	0.039
1112102	ANHX 100412 PNR-LN																◎					0.260	0.244	0.394	0.047	0.039

◎ Stock item | Produto de stock | Itens de stock First choice | Primeira opção | 1ª opción ◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

PLUS AN90-10

GRADES SELECTION GUIDE | Guia para selecção de graus | Tabla para selección de calidades

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH0910	PH7910	PH7920	PH7930	PH7740
P	1	Unalloyed Steel	125-220		✓	✓	✓	✓
	2	Low-Alloyed Steel	220-280		✓	✓	✓	✓
	3	High-Alloyed Steel	280-380		✓	✓	✓	✓
M	4	SS - Ferritic / Martensitic	200-330				✓	✓
	5	SS - Austenitic / Duplex	200-330				✓	✓
	6	SS - Duplex	230-260				✓	✓
K	7	Malleable Cast Iron	130-230			✓		✓
	8	Grey Cast Iron	180-245			✓		✓
	9	Nodular Cast iron	160-250		✓	✓		✓
N	10	Aluminum and Non Ferrous	30-130	✓	✓			✓
S	11	Heat Resistant Super Alloys	200-320		✓			✓

Good Conditions
Average Conditions
Difficult Conditions

RECOMMENDED CUTTING CONDITIONS | Condições de corte recomendadas | Condiciones de corte recomendables

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance — Toughness → Grade PH0910	PH7910	PH7920	PH7930	PH7740	Feed f_z (in/t) Insert ANHX 10... LP	ANHX 10... LM	ANHX 10... LN
P	1	Unalloyed steel	125-220	-	624-919	591-820	525-722	460-558	0.004-0.008	0.004-0.008	-
	2	Low-alloyed steel	220-280	-	591-788	558-689	492-591	427-525	0.004-0.008	0.004-0.006	-
	3	High-alloy steel	280-380	-	558-722	525-656	427-525	361-460	0.004-0.006	0.004-0.006	-
M	4	SS - Ferritic/martensitic	200-330	-	-	-	394-656	296-460	-	0.004-0.008	-
	5	SS - Austenitic	200-330	-	-	-	328-624	263-394	-	0.004-0.006	-
	6	SS - Austetenitic-ferretic (Duplex)	230-260	-	-	-	296-394	230-328	-	0.004-0.006	-
K	7	Malleable cast iron	130-230	-	591-1050	558-984	525-919	427-820	0.004-0.010	0.004-0.008	-
	8	Grey cast iron	180-245	-	558-919	492-820	460-788	361-722	0.004-0.010	0.004-0.008	-
	9	Nodular cast iron	160-250	-	328-788	296-689	296-656	263-558	0.004-0.008	0.004-0.006	-
N	10	Aluminum and Non Ferrous	30-130	1148-4560	-	-	-	-	-	-	0.004-0.008
S	11	Heat Resistant Super Alloys		-	-	-	115-230	99-197	-	0.004-0.004	-

(Note 1) Cutting conditions a_e/Dc=70%.

(Note 2)

Operation	a_e	Vc & fz	a_p (in)
Slotting	100%	<20%	0.079-0.138
Shouldering	<50%	>8%	0.118-0.236
	≤25%	>12%	0.236-0.335

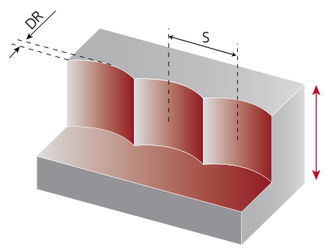
(Note 3)
It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

CHIP-BREAKER SELECTION GUIDE | Guia de selecção do quebra-aparas | Guía de selección del rompevirutas

ISO	PSM	Material	HB (Brinell)	Chip Breaker Application 1st choice	Difficult Operations
P	1	Unalloyed steel	125-220	ANHX 10... -LM	ANHX 10... -LP
	2	Low-alloyed steel	220-280	ANHX 10... -LM	ANHX 10... -LP
	3	High-alloy steel	280-380	ANHX 10... -LM	ANHX 10... -LP
M	4	SS - Ferritic/martensitic	200-330	ANHX 10... -LM	-
	5	SS - Austenitic	200-330	ANHX 10... -LM	-
	6	SS - Austetenitic-ferretic (Duplex)	220-260	ANHX 10... -LM	-
K	7	Malleable cast iron	130-230	ANHX 10... -LM	ANHX 10... -LP
	8	Grey cast iron	180-245	ANHX 10... -LM	ANHX 10... -LP
	9	Nodular cast iron	160-250	ANHX 10... -LP	-
N	10	Aluminum and Non Ferrous	30-130	ANHX 10... -LN	-
S	11	Heat Resistant Super Alloys	200-320	ANHX 10... -LM	-

PLUNGING | Mergulho | Plunge

L≤3Dc	L>3Dc	S max.
f_z (in/t)		
0.004-0.008	0.004-0.006	$S_{max} = \sqrt{DC.Dr - Dr^2}$



S max and DR corresponding cutting diameter Dc (in)								
DR (in)	Dc (in) 0.750	1.000	1.250	1.500	2.000	2.500	3.000	4.000
0.039	0.167	0.194	0.217	0.239	0.277	0.310	0.340	0.393
0.079	0.230	0.270	0.304	0.335	0.390	0.437	0.480	0.557
0.118	0.273	0.323	0.365	0.404	0.471	0.530	0.583	0.677

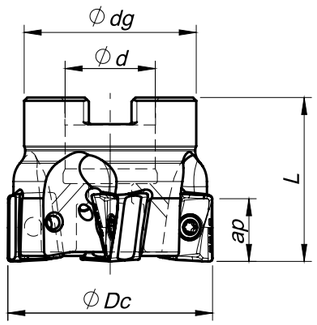
PLUS AN90-12

NEW

Proprietary milling line

Arbor Mounting

$K_r = 90°$ | $\gamma_p = -6°$



Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				Ibs	Specifications		Insert Pastilha Inserto	Stock
			ØDc	Ød/M	Ødg	L		Arbor Type	Ap max (in)		
181140600	AN90 D2.00-A.750/1.57-05-12	5	2.000	0.750	1.772	1.570	0.66	A	0.433	ANHX 1206...	○
181140700	AN90 D2.50-A.750/1.57-06-12	6	2.500	0.750	1.772	1.570	1.17	A	0.433	ANHX 1206...	○
181140800	AN90 D3.00-A1.00/1.75-07-12	7	3.000	1.000	2.283	1.750	2.09	A	0.433	ANHX 1206...	○
181140900	AN90 D4.00-A1.50/2.38-11-12	11	4.000	1.500	2.874	2.375	3.64	A	0.433	ANHX 1206...	○

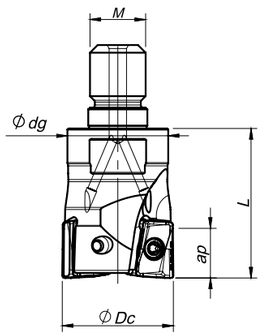
Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

Threaded coupling

$K_r = 90°$ | $\gamma_p = -6°$



Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				Ibs	Specifications	Insert Pastilha Inserto	Stock
			ØDc	Ød/M	Ødg	L		Ap max (in)		
181141300	AN90 D1.00-R-12/1.50-02-12	2	1.000	M12	1.142	1.500	0.22	0.433	ANHX 1206...	○
181141400	AN90 D1.25-R-16/1.75-03-12	3	1.250	M16	1.142	1.750	0.44	0.433	ANHX 1206...	○
181141500	AN90 D1.50-R-16/1.75-04-12	4	1.500	M16	1.142	1.750	0.57	0.433	ANHX 1206...	○

Stock item | Produto de stock | Itens de stock

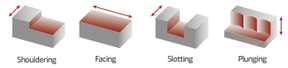
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

PLUS AN90-12

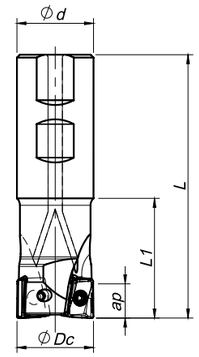
ANHX

NEW



Weldon Shank

$K_r = 90°$ | $\gamma_p = -6°$



Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				Ibs	Specifications	Insert Pastilha Inserto	Stock
			ØDc	Ød/M	L	L1		Ap max (in)		
181141000	AN90 D1.00-W1.00/6.00-02-12	2	1.000	1.000	6.000	3.550	0.82	0.433	ANHX 1206...	○
181141100	AN90 D1.25-W1.25/6.50-03-12	3	1.250	1.250	6.500	4.220	1.76	0.433	ANHX 1206...	○
181141200	AN90 D1.50-W1.25/4.50-04-12	4	1.500	1.250	4.500	2.250	1.94	0.433	ANHX 1206...	○

Stock item | Produto de stock | Itens de stock

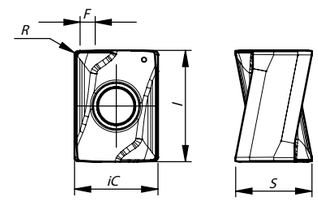
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

ANHX 1206.. INSERTS | Pastilhas | Plaquitas

ANHX-LS

ANHX-MP



		P					M			K							N		S		H		Dimensions (in)				
		PVD					CVD	PVD		CVD			PVD				UNC	PCD	PVD		PVD	CBN					
	(2) Grade code	P7	G1	G4	P3	G6	R1	P3	G6	L5	L6	L9	G1	G4	P3	G6	10	D6	P3	G6	P7	D4					
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PH7740	PHM740	PH7930	PH7740	PH5705	PH5320	PH5740	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PH7930	PH7740	PH7603	PBH910	iC	S	I	R	F
1112474	ANHX 120604 PNER-LS																						0.354	0.327	0.472	0.016	0.063
1112237	ANHX 120608 PNER-LS																						0.354	0.327	0.472	0.031	0.047
1112429	ANHX 120616 PNER-LS																						0.354	0.327	0.472	0.063	0.016
1112473	ANHX 120604 PNSR-MP																						0.354	0.327	0.472	0.016	0.063
1112238	ANHX 120608 PNSR-MP																						0.354	0.327	0.472	0.031	0.047
1112430	ANHX 120616 PNSR-MP																						0.354	0.327	0.472	0.063	0.016

Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

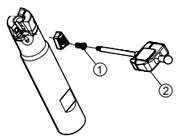
Insert order code = (1) Geometry Code + (2) Grade Code

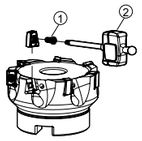
PLUS AN90-12

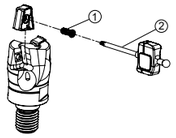
NEW

SPARE PARTS | Complementos | Repuestos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
			lbf/in
AN90-A-12 - 2.00-3.00	P0350904	XT10	26.6
AN90-A-12 - 4.00	P0350904	PT10	26.6
AN90-R-12 - 1.00-1.50	P0350904	XT10	26.6
AN90-W-12 - 1.00-1.50	P0350904	XT10	26.6







GRADES SELECTION GUIDE | Guia para selecção de graus | Tabla para selección de calidades

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance			Toughness →
				PH5320	PH7920	PH7930	PH7740
P	1	Unalloyed steel	125-220		✓	✓	✓
	2	Low-alloyed steel	220-280		✓	✓	✓
	3	High-alloy steel	280-380		✓	✓	✓
M	4	SS - Ferritic/martensitic	200-330			✓	✓
	5	SS - Austenitic	200-330			✓	✓
	6	SS - Austetenitic-ferretic (Duplex)	230-260			✓	✓
K	7	Malleable cast iron	130-230	✓	✓		✓
	8	Grey cast iron	180-245	✓	✓		✓
	9	Nodular cast iron	160-250	✓	✓		✓
S	11	Heat Resistant Super Alloys	200-320			✓	✓

Good Conditions
Average Conditions
Difficult Conditions

RECOMMENDED CUTTING CONDITIONS | Condições de corte recomendadas | Condiciones de corte recomendables

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance			Toughness →	Feed f_z (in/t)	
				PH5320	PH7920	PH7930	PH7740	ANHX 12... LS	ANHX 12... MP
P	1	Unalloyed steel	125-220	-	492-755	492-591	427-525	0.004-0.008	0.004-0.012
	2	Low-alloyed steel	220-280	-	460-722	460-558	394-492	0.004-0.008	0.004-0.010
	3	High-alloy steel	280-380	-	427-591	394-492	328-427	0.004-0.006	0.004-0.008
M	4	SS - Ferritic/martensitic	200-330	-	-	296-492	328-394	0.004-0.008	-
	5	SS - Austenitic	200-330	-	-	263-427	263-361	0.004-0.006	-
	6	SS - Austetenitic-ferretic (Duplex)	230-260	-	-	230-328	230-328	0.004-0.006	-
K	7	Malleable cast iron	130-230	558-984	492-919	-	427-820	0.004-0.010	0.004-0.012
	8	Grey cast iron	180-245	492-820	427-755	-	328-656	0.004-0.010	0.004-0.012
	9	Nodular cast iron	160-250	296-689	263-624	-	164-492	0.004-0.008	0.004-0.010
S	11	Heat Resistant Super Alloys	200-320	-	-	82-328	66-263	0.003-0.004	-

(Note 1)
Cutting conditions a_e/Dc=70%.

(Note 2)

Operation	a_e	Vc & fz	a_p (in)
Slotting	100%	<20%	0.099-0.158
Shouldering	<50%	>8%	0.158-0.276
	≤25%	>12%	0.276-0.394

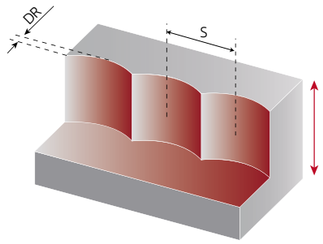
(Note 3)
It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

CHIP-BREAKER SELECTION GUIDE | Guia de selecção do quebra-aparas | Guía de selección del rompevirutas

ISO	PSM	Material	HB (Brinell)	Chip Breaker Application	
				1st choice	Difficult Operations
P	1	Unalloyed steel	125-220	ANHX 12... -LS	ANHX 12... -MP
	2	Low-alloyed steel	220-280	ANHX 12... -MP	-
	3	High-alloy steel	280-380	ANHX 12... -MP	-
M	4	SS - Ferritic/martensitic	200-330	ANHX 12... -LS	-
	5	SS - Austenitic	200-330	ANHX 12... -LS	-
	6	SS - Austetenitic-ferretic (Duplex)	220-260	ANHX 12... -LS	-
K	7	Malleable cast iron	130-230	ANHX 12... -LS	ANHX 12... -MP
	8	Grey cast iron	180-245	ANHX 12... -MP	-
	9	Nodular cast iron	160-250	ANHX 12... -MP	-
S	11	Heat Resistant Super Alloys	200-320	ANHX 12... -LS	-

PLUNGING | Mergulho | Plunge

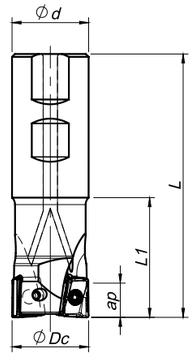
L≤3Dc	L>3Dc	S max.
f_z (in/t)		
0.004-0.008	0.004-0.006	$S_{max} = \sqrt{DC.Dr - Dr^2}$



S max and DR corresponding cutting diameter Dc (in)							
DR (in)	Dc (in)						
	1.000	1.250	1.500	2.000	2.500	3.000	4.000
0.039	0.194	0.217	0.239	0.277	0.310	0.340	0.393
0.079	0.270	0.304	0.335	0.390	0.437	0.480	0.557
0.118	0.323	0.365	0.404	0.471	0.530	0.583	0.677
0.157	0.364	0.414	0.459	0.538	0.607	0.668	0.777
0.197	0.398	0.455	0.507	0.596	0.674	0.743	0.866
0.236	0.425	0.489	0.546	0.645	0.731	0.808	0.942
0.276	0.447	0.518	0.581	0.690	0.783	0.867	1.014

PLUS AN90-16

Proprietary milling line



Weldon Shank

$K_r = 90°$ | $\gamma_p = -4°$

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	L	L1	Ibs	Specifications Ap max (in)	Insert Pastilha Inserto	Stock
181060100	AN90 D1.25-W1.25/4.92-02-16	2	1.250	1.250	4.921	1.575	1.41	0.591	ANHX 1607...	◈
181060200	AN90 D1.50-W1.25/5.12-03-16	3	1.500	1.250	5.118	1.654	1.54	0.591	ANHX 1607...	◈
181060300	AN90 D2.00-W1.25/5.32-04-16	4	2.000	1.250	5.315	1.772	1.90	0.591	ANHX 1607...	◈

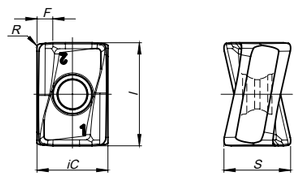
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request | Disponível sobre consulta | Disponible bajo consulta ◇ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

ANHX 1607... INSERTS | Pastilhas | Plaquitas

ANHX-LP

ANHX-MP

ANHX-LN



		P					M			K							N		S		H	
		PVD					CVD	PVD		CVD			PVD				UNC	PCD	PVD		PVD	CBN
	(2) Grade code	P7	G1	G4	P3	G6	R1	P3	G6	L5	L6	L9	G1	G4	P3	G6	10	D6	P3	G6	P7	D4
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PH7740	PHM740	PH7930	PH7740	PH5705	PH5320	PH5740	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PH7930	PH7740	PH7603	PBH910
1111519	ANHX 160708 PNR-LP		◈	◈	◈								◈	◈	◈							
1111596	ANHX 160712 PNR-LP		◯	◈	◈								◯	◈	◈							
1111595	ANHX 160708 PNER-MP		◈	◈	◈								◈	◈	◈							
1111598	ANHX 160712 PNER-MP		◯	◈	◈								◯	◈	◈							
1111659	ANHX 160708 PNFR-LN																◈					
1111597	ANHX 160712 PNFR-LN																◈					

Dimensions (in) iC	S	I	R	F
0.441	0.425	0.630	0.031	0.055
0.441	0.413	0.630	0.047	0.047
0.441	0.425	0.630	0.031	0.055
0.441	0.413	0.630	0.047	0.047
0.441	0.425	0.630	0.031	0.055
0.441	0.413	0.630	0.047	0.047

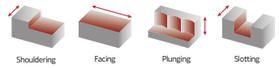
◈ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

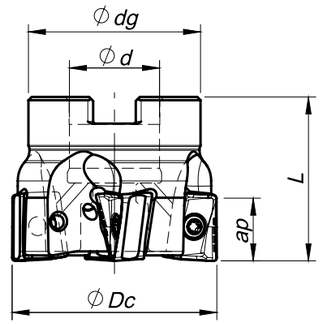
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

PLUS AN90-16

ANHX





Arbor Mounting

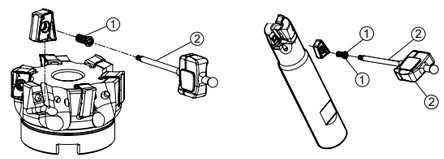
$K_r = 90°$ | $\gamma_p = -4°$

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	ØDg	L	Ibs	Specifications Arbor Type	Ap max	Insert Pastilha Inserto	Stock
181058900	AN90 D2.00-A.750/1.75-03-16	3	2.000	0.750	1.772	1.750	0.77	A	0.591	ANHX 1607...	◈
181059000	AN90 D2.00-A.750/1.75-04-16	4	2.000	0.750	1.772	1.750	0.79	A	0.591	ANHX 1607...	◈
181059100	AN90 D2.50-A1.00/1.75-04-16	4	2.500	1.000	2.205	1.750	1.25	A	0.591	ANHX 1607...	◈
181059200	AN90 D2.50-A1.00/1.75-06-16	6	2.500	1.000	2.205	1.750	1.23	A	0.591	ANHX 1607...	◈
181059300	AN90 D3.00-A1.00/2.00-05-16	5	3.000	1.000	2.205	2.000	1.93	A	0.591	ANHX 1607...	◈
181059400	AN90 D3.00-A1.00/2.00-06-16	6	3.000	1.000	2.205	2.000	2.00	A	0.591	ANHX 1607...	◈
NEW 181136400	AN90 D4.00-A1.50/2.50-05-16	5	4.000	1.500	3.386	2.500	3.66	A	0.591	ANHX 1607...	◈
NEW 181136500	AN90 D4.00-A1.50/2.50-08-16	8	4.000	1.500	3.386	2.500	3.75	A	0.591	ANHX 1607...	◈
181059500	AN90 D4.00-A1.25/2.00-05-16	5	4.000	1.250	2.874	2.000	3.66	A	0.591	ANHX 1607...	◇
181059600	AN90 D4.00-A1.25/2.00-08-16	8	4.000	1.250	2.874	2.000	3.75	A	0.591	ANHX 1607...	◇
181059700	AN90 D5.00-A1.50/2.50-07-16	7	5.000	1.500	3.386	2.500	7.38	A	0.591	ANHX 1607...	◈
181059800	AN90 D5.00-A1.50/2.50-10-16	10	5.000	1.500	3.386	2.500	7.49	A	0.591	ANHX 1607...	◈
181059900	AN90 D6.00-A2.00/2.50U-08-16	8	6.000	2.000	4.882	2.500	8.83	B	0.591	ANHX 1607...	◈
181060000	AN90 D6.00-A2.00/2.50U-11-16	11	6.000	2.000	4.882	2.500	8.91	B	0.591	ANHX 1607...	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request | Disponível sobre consulta | Disponible bajo consulta ◇ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

SPARE PARTS | Complementos | Repuestos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value lbf/in
AN90-W-16 - 1.25-2.00	P0401200	XT15	26.6
AN90-A-16 - 2.00-3.00	P0401200	XT15	26.6
AN90-A-16 - 4.00-6.00	P0401200	PT15	26.6



PLUS AN90-16

GRADES SELECTION GUIDE | Guia para selecção de graus | Guía para selección de calidades

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH0910	PH7910	PH7930	PH7920	PH7930
P	1	Unalloyed Steel	125-220		✓	✓	✓	✓
	2	Low-Alloyed Steel	220-280		✓	✓	✓	✓
	3	High-Alloyed Steel	280-380		✓	✓	✓	✓
K	7	Malleable Cast Iron	130-230		✓	✓	✓	✓
	8	Grey Cast Iron	180-245		✓	✓	✓	✓
	9	Nodular Cast iron	160-250		✓	✓	✓	✓
N	10	Aluminum and Non Ferrous	30-130	✓				

Good Conditions
Average Conditions
Difficult Conditions

RECOMMENDED CUTTING CONDITIONS | Condições de corte recomendadas | Condiciones de corte recomendas

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance — Toughness → PH0910	PH7910	PH7920	PH7930	Feed f_z (in/t) ANHX 16... LP	ANHX 16... MP	ANHX 16... LN
P	1	Unalloyed steel	125-220	-	624-919	591-820	525-722	0.004-0.009	0.004-0.010	-
	2	Low-alloyed steel	220-280	-	591-788	558-689	492-591	0.004-0.009	0.004-0.010	-
	3	High-alloy steel	280-380	-	558-722	525-656	427-525	0.004-0.008	0.004-0.009	-
K	7	Malleable cast iron	130-230	-	591-1050	558-984	525-919	0.004-0.010	0.004-0.010	-
	8	Grey cast iron	180-245	-	558-919	492-820	460-788	0.004-0.010	0.004-0.010	-
	9	Nodular cast iron	160-250	-	328-788	296-689	296-656	0.004-0.008	0.004-0.009	-
N	10	Aluminum and Non Ferrous	30-130	984-656	-	-	-	-	-	0.004-0.016

(Note 1)
Cutting conditions a_e/Dc=70%.

(Note 2)

Operation	a_e	Vc & fz	ap (in)
Slotting	100%	<20%	0.079-0.177
Shouldering	<50%	>8%	0.236-0.315
	≤25%	>12%	0.315-0.531

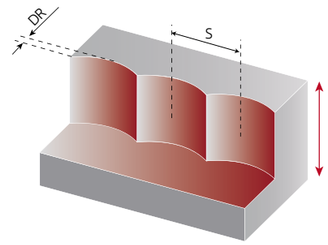
(Note 3)
It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

CHIP-BREAKER SELECTION GUIDE | Guia para aplicações do quebra-aparas | Guía para aplicación del rompevirutas

ISO	PSM	Material	HB (Brinell)	Chip Breaker Application 1st choice	Difficult Operations
P	1	Unalloyed steel	125-220	ANHX 16... LP	ANHX 16... MP
	2	Low-alloyed steel	220-280	ANHX 16... LP	ANHX 16... MP
	3	High-alloy steel	280-380	ANHX 16... LP	ANHX 16... MP
K	7	Malleable cast iron	130-230	ANHX 16... LP	ANHX 16... MP
	8	Grey cast iron	180-245	ANHX 16... LP	ANHX 16... MP
	9	Nodular cast iron	160-250	ANHX 16... LP	ANHX 16... MP
N	10	Aluminum and Non Ferrous	30-130	ANHX 16... LN	-

PLUNGING | Mergulho | Plunge

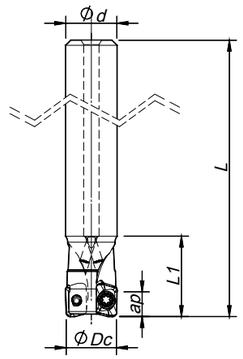
L≤3Dc	L>3Dc	S max.
f_z (in/t)		
0.004-0.008	0.004-0.005	$S_{max} = \sqrt{DC.DR - DR^2}$



DR (in)	S max and DR corresponding cutting diameter Dc (in) Dc (in) 1.250	1.500	2.000	2.500	3.000	4.000	5.000	6.000
0.039	0.217	0.239	0.277	0.310	0.340	0.393	0.440	0.482
0.079	0.304	0.335	0.390	0.437	0.480	0.557	0.624	0.684
0.118	0.365	0.404	0.471	0.530	0.583	0.677	0.759	0.833
0.157	0.414	0.459	0.538	0.607	0.668	0.777	0.872	0.958
0.197	0.455	0.507	0.596	0.674	0.743	0.866	0.973	1.069

LINEPRO XP90-06

Proprietary milling line



Cylindrical Shank

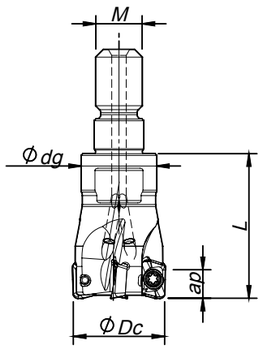
K_r=90° | γ_p=+4° | R_p-HF=0.043

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				Ibs	Max ap (in)		Insert Pastilha Inserto	Stock
			ØDc	Ød/M	L	L1		LP	HF		
181105500	XP90 D.375-C.375/2.16-02-06	2	0.375	0.375	2.165	0.669	0.05	0.157	0.012	XP... 0602...	
181105600	XP90 D.500-C.500/3.15-02-06	2	0.500	0.500	3.150	0.709	0.15	0.157	0.012	XP... 0602...	
181105700	XP90 D.625-C.625/3.54-03-06	3	0.625	0.625	3.543	0.787	0.26	0.157	0.012	XP... 0602...	
181105800	XP90 D.625-C.625/3.54-04-06	4	0.625	0.625	3.543	0.787	0.25	0.157	0.012	XP... 0602...	

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

Inventory maintained. To be replaced by new item. | Iten em stock.
Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.



Threaded Coupling

K_r=90° | γ_p=+4°

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				Ibs	Max ap (in)		Insert Pastilha Inserto	Stock
			ØDc	Ød/M	Ødg	L		LP	HF		
181105900	XP90 D.625-R-08/0.90-04-06	4	0.625	M08	0.531	0.906	0.13	0.157	0.012	XP... 0602...	
181106000	XP90 D.750-R-10/1.18-05-06	5	0.750	M10	0.708	1.181	0.19	0.157	0.012	XP... 0602...	
181106100	XP90 D1.00-R-12/1.37-07-06	7	1.000	M12	0.905	1.378	0.22	0.157	0.012	XP... 0602...	
181106200	XP90 D1.25-R-16/1.37-08-06	8	1.250	M16	1.102	1.378	0.39	0.157	0.012	XP... 0602...	

Stock item | Produto de stock | Itens de stock

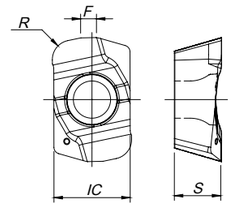
Available under request | Disponível sobre consulta | Disponible bajo consulta

Inventory maintained. To be replaced by new item. | Iten em stock.
Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

XPET 0602... | Inserts | Pastilhas | Plaquitas

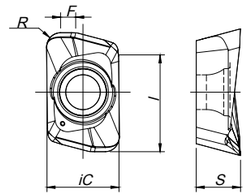
XPET-HF

XPET-HF



XPET-LP

XPET-LP



		P					M			K						N		S		H		Dimensions (in)				
		PVD					CVD	PVD		CVD		PVD				UNC	PCD	PVD		PVD	CBN					
	(2) Grade code	P7	G1	G4	P3	G6	R1	G4	P3	L6	L9	G1	G4	P3	G6	10	D6	P3	G6	P7	D4					
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PH7740	PHM740	PH7920	PH7930	PH5320	PH5740	PH7910	PH7920	PH7930	PH7740	PHO910	PDP410	PH7930	PH7740	PH7603	PBH910	iC	S	l	R	F
1112049	XPET 060210 ZER-HF																					0.154	0.094	-	0.039	0.031
1112002	XPET 060204 PDER-LP																					0.154	0.094	0.209	0.016	0.031
1112003	XPET 060208 PDER-LP																					0.154	0.094	0.209	0.031	0.024
1112004	XPET 060216 PDER-LP																					0.154	0.094	0.209	0.063	0.020

Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

Stock item | Produto de stock | Itens de stock

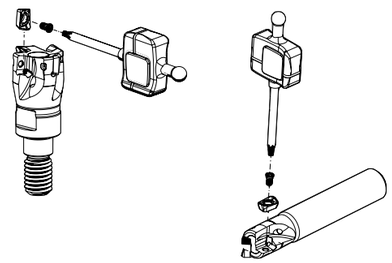
Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
			lbf/in
XP90-C-06 - 0.375	P0180300	XT06IP	2.66
XP90-C-06 - 0.500-0.625	P0180400	XT06IP	2.66
XP90-R-06 - 0.625-1.250	P0180400	XT06IP	2.66

Note: Please check the procedures for the clamping screws on the page A-149



LINEPRO XP90-06

GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance	Toughness →
				PH7920	PH7930
P	1	Unalloyed Steel	125-220	✓	✓
	2	Low-Alloyed Steel	220-280	✓	✓
	3	High-Alloyed Steel	280-380	✓	✓
M	4	SS - Ferritic / Martensitic	200-330		✓
	5	SS - Austenitic / Duplex	200-330		✓
	6	SS - Duplex	230-260		✓
K	7	Malleable Cast Iron	130-230	✓	✓
	8	Grey Cast Iron	180-245	✓	✓
	9	Nodular Cast iron	160-250	✓	✓
S	11	Heat Resistant Super Alloys	200-320		✓

Good Conditions
Average Conditions
Difficult Conditions

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance	Toughness →	Feed fz (in/t)	
				PH7920	PH7930	XPET 0602...LP	XPET 0602...HF
P	1	Unalloyed Steel	125-220	591-788	525-722	0.002-0.003	0.016-0.031
	2	Low-Alloyed Steel	220-280	558-820	492-755	0.002-0.003	0.016-0.031
	3	High-Alloyed Steel	280-380	525-689	460-624	0.002-0.003	0.016-0.023
M	4	SS - Ferritic / Martensitic	200-330	-	-	0.002-0.003	0.016-0.031
	5	SS - Austenitic / Duplex	200-330	-	-	0.002-0.003	0.016-0.023
	6	SS - Duplex	230-260	-	-	0.002-0.003	0.016-0.023
K	7	Malleable Cast Iron	130-230	-	525-1148	0.002-0.003	0.020-0.031
	8	Grey Cast Iron	180-245	-	492-984	0.002-0.003	0.020-0.031
	9	Nodular Cast iron	160-250	-	394-853	0.002-0.003	0.020-0.031
S	11	Heat Resistant Super Alloys	200-320	-	115-214	0.002-0.003	0.016-0.023

(Note 1) Cutting conditions a_e/Dc=70%.

(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) PH5... can be used wet or dry. PH7... only air thru.

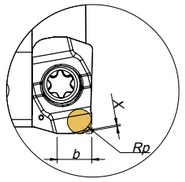
(Note 4) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

Operation	a_e	Vc & fz	a_p (in)
Slotting	100%	<20%	0.039-0.118
Shouldering	<50%	>8%	0.039-0.157
	≤25%	>12%	0.039-0.157

(Note5) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

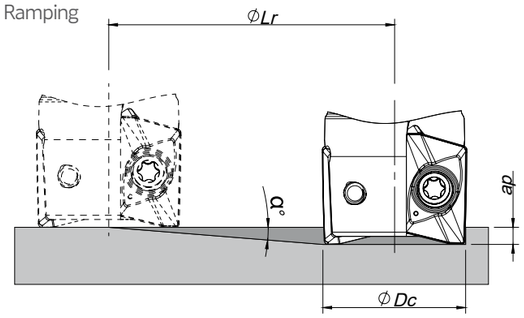
PROGRAMMING DATA

Insert	Programming Data		
	Rp	X	b
XPET 06 HF	0.043	0.033	0.091

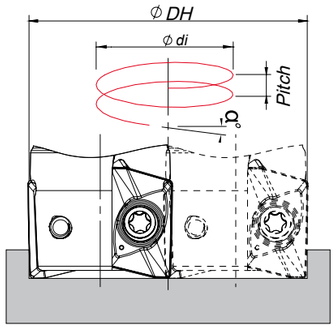


RAMPING AND HELICAL INTERPOLATION

Ramping



Helical Interpolation



Blind hole
Flat bottom

Ødi = ØDH - ØDc

ØDc	Ramping			Helical Interpolation		
				Diameter for Blind Hole. Flat Bottom Face (1)		Max Pitch/Rev.
	Max Ramp a°	Max a_p	Min Lr	ØDHmin	ØDHmax	
0.375	5.5	0.012	0.125	0.568 -	- 0.671	0.050 0.080
0.500	4.0	0.012	0.172	0.818 -	- 0.921	0.060 0.090
0.625	2.5	0.012	0.275	1.068 -	- 1.171	0.060 0.070
0.750	1.9	0.012	0.362	1.318 -	- 1.421	0.050 0.060
1.000	1.3	0.012	0.529	1.818 -	- 1.921	0.050 0.060
1.250	1.0	0.012	0.700	2.318 -	- 2.421	0.050 0.060

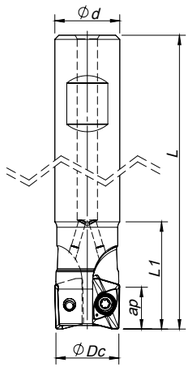
(1) using LP insert with radius 0.0.31 in

Note: During helical interpolation do not exceed maximum pitch

When using HF insert or other different insert radius to calculate the ØDHmin and ØDHmax use the below equation:
- Minimum Diameter: ØDHmin = 2 x (ØDc - (R corner radius + F width of edge wiper))
- Maximum Diameter: ØDHmax = 2 x (ØDc - R corner radius)
(On HF insert the corner radius should be corner radius programming)

LINEPRO XP90-10

Proprietary milling line



Weldon Shank

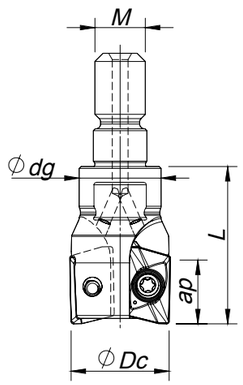
K_r=90° | γ_p=+5° | R_p-HF=0.063

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				Ibs	Max ap (in)		Insert Pastilha Inserto	Stock
			ØDc	Ød/M	L	L1		LP/MP	HF		
181106300	XP90 D.625-W.625/3.25-02-10	2	0.625	0.625	3.252	1.083	0.23	0.394	0.031	XP... 1003...	
181106400	XP90 D.750-W.750/3.39-02-10	2	0.750	0.750	3.390	1.189	0.34	0.394	0.031	XP... 1003...	
181106500	XP90 D1.00-W1.00/3.78-03-10	3	1.000	1.000	3.780	1.280	0.68	0.394	0.031	XP... 1003...	

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.



Threaded Coupling

K_r=90° | γ_p=+5° ~+6°

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				Ibs	Max ap (in)		Insert Pastilha Inserto	Stock
			ØDc	Ød/M	Ødg	L		LP/MP	HF		
181106600	XP90 D.625-R-08/1.00-02-10	2	0.625	M8	0.531	1.000	0.05	0.394	0.031	XP... 1003...	
181106700	XP90 D.750-R-10/1.37-03-10	3	0.750	M10	0.728	1.378	0.23	0.394	0.031	XP... 1003...	
181106800	XP90 D1.00-R-12/1.57-04-10	4	1.000	M12	0.906	1.575	0.27	0.394	0.031	XP... 1003...	
181106900	XP90 D1.25-R-16/1.57-05-10	5	1.250	M16	1.181	1.575	0.47	0.394	0.031	XP... 1003...	

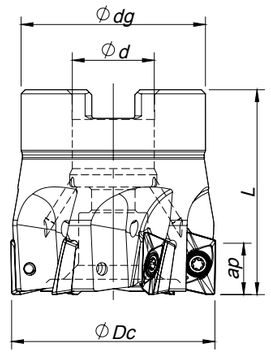
Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

LINEPRO XP90-10

XPET



Arbor Mounting

K_r=90° | γ_p=+7° ~+8°

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				Ibs	Max ap (in)		Arbor Style	Insert Pastilha Inserto	Stock
			ØDc	Ød/M	Ødg	L		LP/MP	HF			
181107000	XP90 D1.50-A.500/1.57-06-10	6	1.500	0.500	1.417	1.575	0.22	0.394	0.031	A	XP... 1003...	
181107100	XP90 D2.00-A.750/1.57-07-10	7	2.000	0.750	1.772	1.575	0.31	0.394	0.031	A	XP... 1003...	
181107200	XP90 D2.50-A.750/1.57-08-10	8	2.500	0.750	2.205	1.575	0.43	0.394	0.031	A	XP... 1003...	

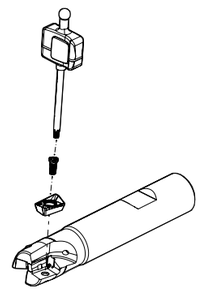
Stock item | Produto de stock | Itens de stock

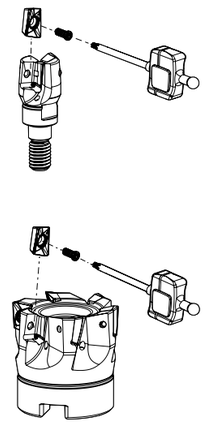
Available under request | Disponível sobre consulta | Disponible bajo consulta

Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
			lbf/in
XP90-W-10 - 0.625-1.00	P0250704	XT08	10.6
XP90-R-10 - 0.625-1.25	P0250704	XT08	10.6
XP90-A-10 - 1.50-2.50	P0250704	XT08	10.6





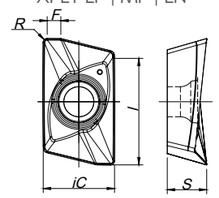
XPET... | Inserts | Pastilhas | Plaquitas

XPET-LP

XPET-MP

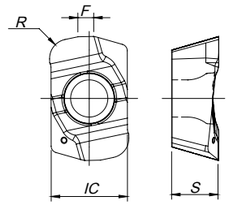
XPET-LN

XPET-LP | MP | LN



XPET-HF NEW

XPET-HF



		P					M		K							N		S		H	
		PVD					PVD		CVD			PVD				UNC	PCD	PVD		PVD	CBN
	(2) Grade code	P7	G1	G4	P3	G6	P3	G6	L5	L6	L9	G1	G4	P3	G6	10	D6	P3	G6	P7	D4
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PH7740	PH7930	PH7740	PH5705	PH5320	PH5740	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PH7930	PH7740	PH7603	PBH910
1111980	XPET 100304 PDER-LP			●	○		○						●	○				○			
1111981	XPET 100308 PDER-LP			●	○		○						●	○				○			
1112022	XPET 100316 PDER-LP			●	○		○						●	○				○			
1111982	XPET 100304 PDSR-MP		○	●	○		○		●		○	○	○	○							
1111983	XPET 100308 PDSR-MP		○	●	○		○		●		○	○	○	○							
1111984	XPET 100304 PDFR-LN															○					
1111985	XPET 100312 PDFR-LN															○					
NEW 1112376	XPET 100312 ZDR-HF		○	●	○		○					○	●	○				○			

		Dimensions (in)																			
(1) Geometry code	ISO Reference	iC	S	I	R	F															
1111980	XPET 100304 PDER-LP	0.274	0.156	0.413	0.016	0.047															
1111981	XPET 100308 PDER-LP	0.274	0.156	0.413	0.031	0.055															
1112022	XPET 100316 PDER-LP	0.274	0.156	0.413	0.031	0.020															
1111982	XPET 100304 PDSR-MP	0.274	0.156	0.413	0.016	0.047															
1111983	XPET 100308 PDSR-MP	0.274	0.156	0.413	0.031	0.055															
1111984	XPET 100304 PDFR-LN	0.274	0.156	0.413	0.016	0.047															
1111985	XPET 100312 PDFR-LN	0.274	0.156	0.413	0.047	0.047															
1112376	XPET 100312 ZDR-HF	0.274	0.156	-	0.047	0.031															

● Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

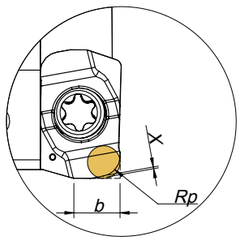
○ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

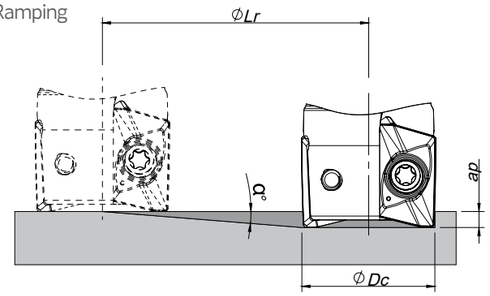
PROGRAMMING DATA

Insert	Programming Data		
	Rp	X	b
XPET 10 HF	0.063	0.013	0.136

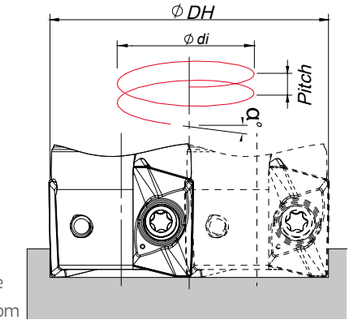


RAMPING AND HELICAL INTERPOLATION

Ramping



Helical Interpolation



Blind hole
Flat bottom

Ødi = ØDH - ØDc

ØDc	Ramping			Helical Interpolation		
				Diameter for Blind Hole. Flat Bottom Face (1)		Max Pitch/Rev.
	Max Ramp a°	Max a_p	Min Lr	ØDHmin	ØDHmax	
0.625	7.5	0.394	2.993	0.978 -	- 1.171	0.140 0.220
0.750	5.0	0.394	4.503	1.228 -	- 1.421	0.130 0.180
1.000	3.5	0.394	6.442	1.728 -	- 1.921	0.130 0.170
1.250	2.5	0.394	9.024	2.228 -	- 2.421	0.130 0.160
1.500	1.7	0.394	13.275	2.728 -	- 2.921	0.110 0.130
2.000	1.3	0.394	17.362	3.728 -	- 3.921	0.120 0.130
2.500	1.0	0.394	22.572	4.728 -	- 4.921	0.120 0.130

(1) using LP insert with radius 0.031 in

Note: During helical interpolation do not exceed maximum pitch
When using HF insert or other different insert radius to calculate the ØDHmin and ØDHmax use the below equation:
-Minium Diameter: ØDHmin = 2 x (ØDc - (R corner radius + F width of edge wiper))
- Maximum Diameter: ØDHmax = 2 x (ØDc - R corner radius)

LINEPRO XP90-10

GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance					Toughness →
				PH0910	PH7910	PH5705	PH7920	PH7930	PH5740
P	1	Unalloyed Steel	125-220		✓		✓	✓	
	2	Low-Alloyed Steel	220-280		✓		✓	✓	
	3	High-Alloyed Steel	280-380		✓		✓	✓	
M	4	SS - Ferritic / Martensitic	200-330					✓	
	5	SS - Austenitic / Duplex	200-330					✓	
	6	SS - Duplex	230-260					✓	
K	7	Malleable Cast Iron	130-230		✓	✓	✓		✓
	8	Grey Cast Iron	180-245		✓	✓	✓		✓
	9	Nodular Cast iron	160-250		✓	✓	✓		✓
N	10	Aluminum and Non Ferrous	30-130	✓					
S	11	Heat Resistant Super Alloys	200-320					✓	

Good Conditions
Average Conditions
Difficult Conditions

CHIP-BREAKER SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application	
				1st choise	Dificult Operations
P	1	Unalloyed Steel	125-220	XPET 10 ... LP/HF	XPET 10 ... MP
	2	Low-Alloyed Steel	220-280	XPET 10 ... LP/HF	XPET 10 ... MP
	3	High-Alloyed Steel	280-380	XPET 10 ... MP/HF	-
M	4	SS - Ferritic / Martensitic	200-330	XPET 10 ... LP/HF	-
	5	SS - Austenitic / Duplex	200-330	XPET 10 ... LP/HF	-
	6	SS - Duplex	230-260	XPET 10 ... LP/HF	-
K	7	Malleable Cast Iron	130-230	XPET 10 ... LP/HF	XPET 10 ... MP
	8	Grey Cast Iron	180-245	XPET 10 ... MP/HF	-
	9	Nodular Cast iron	160-250	XPET 10 ... MP/HF	-
N	10	Aluminum and Non Ferrous	30-130	XPET 10 ... LN	-
S	11	Heat Resistant Super Alloys	200-320	XPET 10 ... LP/HF	-

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance					Toughness →	Feed fz (in/t)			
				PH0910	PH7910	PH5705	PH7920	PH7930	PH5740	XPET 10... LP	XPET 10... MP	XPET 10... LN	XPET 10... HF
P	1	Unalloyed Steel	125-220	-	591-788	-	525-722	460-656	-	0.004-0.008	0.004-0.010	-	0.016-0.032
	2	Low-Alloyed Steel	220-280	-	558-820	-	492-755	427-591	-	0.004-0.008	0.004-0.008	-	0.016-0.032
	3	High-Alloyed Steel	280-380	-	525-689	-	460-624	328-558	-	0.004-0.006	0.004-0.008	-	0.016-0.024
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	427-722	-	0.004-0.008	0.004-0.008	-	0.016-0.028
	5	SS - Austenitic / Duplex	200-330	-	-	-	-	394-591	-	0.004-0.008	0.004-0.008	-	0.016-0.028
	6	SS - Duplex	230-260	-	-	-	-	230-460	-	0.004-0.006	0.004-0.008	-	0.016-0.024
K	7	Malleable Cast Iron	130-230	-	558-1247	525-1280	525-1148	460-853	394-788	0.004-0.008	0.004-0.010	-	0.020-0.032
	8	Grey Cast Iron	180-245	-	525-1083	492-1050	492-984	427-722	361-656	0.004-0.008	0.004-0.010	-	0.020-0.032
	9	Nodular Cast iron	160-250	-	427-919	394-919	394-853	328-591	296-558	0.004-0.008	0.004-0.008	-	0.020-0.024
N	10	Aluminum and Non Ferrous	30-130	1148-4592	-	-	-	-	-	-	-	0.003-0.010	-
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	115-214	-	0.002-0.003	-	-	0.016-0.024

(Note 1) Cutting conditions a_e/Dc=70%.

(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

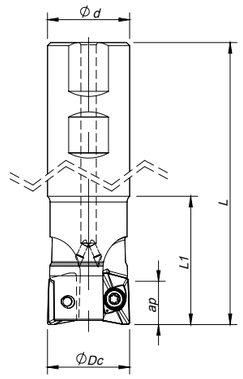
(Note 3) PH5... can be used wet or dry. PH7... only air thru.

Operation	a_e	Vc & fz	a_p (in)
Slotting	100%	<20%	0.079-0.157
Shouldering	<50%	>8%	0.118-0.236
	≤25%	>12%	0.276-0.354

(Note 4) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

LINEPRO XP90-17

Proprietary milling line

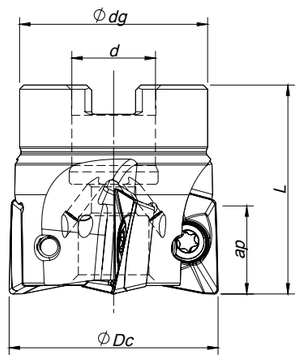


Weldon Shank

K_r=90° | γ_p=+6° ~+7°

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	L	L1	lbs	Specifications Ap max (in)	Insert Pastilha Inserto	Stock
181107300	XP90 D1.25-W1.25/4.33-02-17	2	1.250	1.250	4.330	1.570	1.00	0.669	XPET 1706...	◎
181107400	XP90 D1.25-W1.25/4.33-03-17	3	1.250	1.250	4.330	1.570	1.00	0.669	XPET 1706...	◎
181107500	XP90 D1.50-W1.25/4.72-03-17	3	1.500	1.250	4.720	1.570	1.70	0.669	XPET 1706...	◎
181107600	XP90 D1.50-W1.25/4.72-04-17	4	1.500	1.250	4.720	1.570	1.70	0.669	XPET 1706...	◎

◎ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.



Arbor Mounting

K_r=90° | γ_p=+7° ~+8°

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	Ødg	L	lbs	Specifications Arbor Type	Ap max (in)	Insert Pastilha Inserto	Stock
181107700	XP90 D1.50-A.500/1.57-04-17	4	1.500	0.500	1.417	1.575	0.50	A	0.669	XPET 1706...	◎
181107800	XP90 D2.00-A.750/1.57-05-17	5	2.000	0.750	1.772	1.575	0.70	A	0.669	XPET 1706...	◎
181107900	XP90 D2.50-A.750/1.57-06-17	6	2.500	0.750	2.205	1.575	1.10	A	0.669	XPET 1706...	◎
181108000	XP90 D3.00-A1.00/1.97-07-17	7	3.000	1.000	2.205	1.970	2.20	A	0.669	XPET 1706...	◎
181108100	XP90 D4.00-A1.25/1.97-08-17	8	4.000	1.250	2.874	1.970	3.74	A	0.669	XPET 1706...	◎
181108200	XP90 D5.00-A1.25/2.48-09-17	9	5.000	1.500	3.386	2.480	6.83	A	0.669	XPET 1706...	◎

◎ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

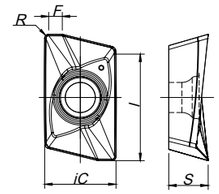
XPET 1706... | Inserts | Pastilhas | Plaquitas

XPET-LP

XPET-MP

XPET-LN

XPET-LP | MP | LN

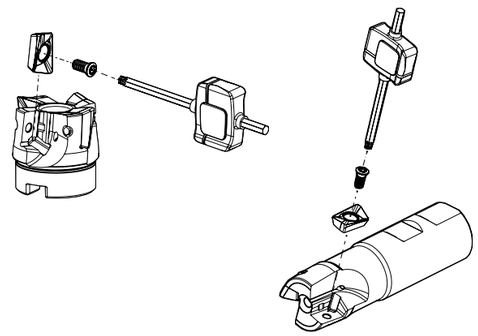


		P				M			K							N		S		H		Dimensions (in)				
		PVD				CVD	PVD		CVD			PVD				UNC	PCD	PVD		PVD	CBN					
	(2) Grade code	P7	G4	P3	G6	R1	G4	G6	L5	L6	L9	G1	G4	P3	G6	10	D6	P3	G6	P7	D4					
(1) Geometry code	ISO Reference	PH7603	PH7920	PH7930	PH7740	PHM740	PH7920	PH7740	PH5705	PH5320	PH5740	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PH7930	PH7740	PH7603	PBH910	iC	S	l	R	F
1111986	XPET 170608 PDER-LP		◎		◎			◎					◎		◎				◎			0.445	1/4	0.689	0.031	0.071
1111987	XPET 170616 PDER-LP		◎		◎			◎					◎		◎				◎			0.445	1/4	0.689	0.063	0.047
1111988	XPET 170608 PDSR-MP		◎		◎			◎	◎		◎		◎		◎							0.445	1/4	0.689	0.031	0.071
1111989	XPET 170616 PDSR-MP		◎		◎			◎	◎		◎		◎		◎							0.445	1/4	0.689	0.063	0.039
1111990	XPET 170608 PDFR-LN															◎						0.445	1/4	0.689	0.031	0.047
1111991	XPET 170620 PDFR-LN															◎						0.445	1/4	0.689	0.079	0.039
1111992	XPET 170632 PDFR-LN															◎						0.445	1/4	0.689	0.126	0.031

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción
◎ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta
Disponible bajo consulta
Insert order code = (1) Geometry Code + (2) Grade Code

SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value lbf/in
XP-90-W-17 - 1.25-1.50	P0451001	XT20	44.3
XP90-A-17 - 1.50-3.00	P0451001	XT20	44.3
XP90-A-17 - 4.00-5.00	P0451001	PT20	44.3



LINEPRO XP90-17

GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH0910	PH5705	PH7920	PH7740	PH5740
P	1	Unalloyed Steel	125-220			✓	✓	
	2	Low-Alloyed Steel	220-280			✓	✓	
	3	High-Alloyed Steel	280-380			✓	✓	
M	4	SS - Ferritic / Martensitic	200-330				✓	
	5	SS - Austenitic / Duplex	200-330				✓	
	6	SS - Duplex	230-260				✓	
K	7	Malleable Cast Iron	130-230		✓	✓	✓	✓
	8	Grey Cast Iron	180-245		✓	✓	✓	✓
	9	Nodular Cast iron	160-250		✓	✓	✓	✓
N	10	Aluminum and Non Ferrous	30-130	✓				
S	11	Heat Resistant Super Alloys	200-320				✓	

Good Conditions
Average Conditions
Difficult Conditions

CHIP-BREAKER SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application: 1st choise	Dificult Operations
P	1	Unalloyed Steel	125-220	XPET 17 ... LP	XPET 17 ... MP
	2	Low-Alloyed Steel	220-280	XPET 17 ... LP	XPET 17 ... MP
	3	High-Alloyed Steel	280-380	XPET 17 ... MP	-
M	4	SS - Ferritic / Martensitic	200-330	XPET 17 ... LP	-
	5	SS - Austenitic / Duplex	200-330	XPET 17 ... LP	-
	6	SS - Duplex	230-260	XPET 17 ... LP	-
K	7	Malleable Cast Iron	130-230	XPET 17 ... LP	XPET 17 ... MP
	8	Grey Cast Iron	180-245	XPET 17 ... MP	-
	9	Nodular Cast iron	160-250	XPET 17 ... MP	-
N	10	Aluminum and Non Ferrous	30-130	XPET 17 ... LN	-
S	11	Heat Resistant Super Alloys	200-320	XPET 17 ... LP	-

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance — Toughness → PH0910	PH5705	PH7920	Vc (sfm) ← Wear Resistance — Toughness → PH7740	PH5740	Feed fz (in/t) XPET 17... LP	XPET 17... MP	XPET 17... LN
P	1	Unalloyed Steel	125-220	-	-	525-919	460-722	-	0.004-0.014	0.004-0.014	-
	2	Low-Alloyed Steel	220-280	-	-	492-755	427-591	-	0.004-0.014	0.004-0.014	-
	3	High-Alloyed Steel	280-380	-	-	460-624	328-558	-	0.004-0.012	0.004-0.012	-
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	427-722	-	0.004-0.012	0.004-0.012	-
	5	SS - Austenitic / Duplex	200-330	-	-	-	394-591	-	0.004-0.012	0.004-0.012	-
	6	SS - Duplex	230-260	-	-	-	230-460	-	0.004-0.010	0.004-0.010	-
K	7	Malleable Cast Iron	130-230	-	525-1247	525-1148	460-853	492-984	0.004-0.014	0.004-0.014	-
	8	Grey Cast Iron	180-245	-	492-1050	492-984	427-722	460-820	0.004-0.014	0.004-0.014	-
	9	Nodular Cast iron	160-250	-	394-919	394-853	328-591	394-722	0.004-0.012	0.004-0.012	-
N	10	Aluminum and Non Ferrous	30-130	1148-4592	-	-	-	-	-	-	0.004-0.014
S	11	Heat Resistant Super Alloys	200-320	-	-	-	99-214	-	0.004-0.008	-	-

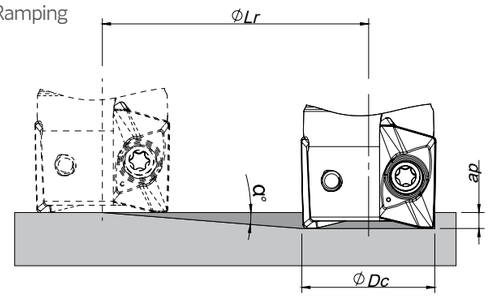
(Note 1) Cutting conditions ae/DC=70%
(Note 2) Cutting conditions should be ajusted according to the machine and work rigidity.
(Note 3):

Operation	a_e	Vc & fz	a_p (in)
Slotting	100%	<20%	0.079-0.236
Shouldering	<50%	>8%	0.276-0.512
	≤25%	>12%	0.512-0.630

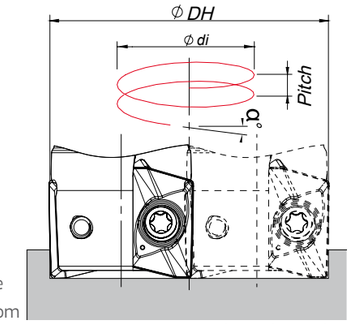
(Note 4) It's possible to occur vibrations in certain cases.
Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

RAMPING AND HELICAL INTERPOLATION

Ramping



Helical Interpolation



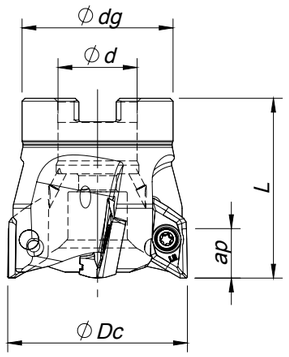
Ødi = ØDH - ØDc

ØDc	Ramping: Max Ramp a°	Max a_p	Min Lr	Helical Interpolation: Diameter for Blind Hole. Flat Bottom Face (1) ØDHmin	ØDHmax	Max Pitch/Rev.
1.250	3.8	0.669	10.072	2.228	2.421	0.200 0.240
1.500	2.7	0.669	14.186	2.728	2.921	0.180 0.210
2.000	2.0	0.669	19.158	3.728	3.921	0.180 0.210
2.500	1.5	0.669	25.548	4.728	4.921	0.180 0.190
3.000	1.0	0.669	38.327	5.728	5.921	0.140 0.160
4.000	0.8	0.669	47.910	7.728	7.921	0.160 0.170
5.000	0.7	0.669	54.756	9.728	9.921	0.180 0.180

(1) using LP insert with radius 0.031 in
Note: During helical interpolation do not exceed maximum pitch
When using HF insert or other different insert radius to calculate the ØDHmin and ØDHmax use the below equation:
-Minium Diameter: ØDHmin = 2 x (ØDc - (R corner radius + F width of edge wiper))
- Maximum Diameter: ØDHmax = 2 x (ØDc - R corner radius)

ALUPRO XD90-15

Proprietary milling line



Arbor Mounting

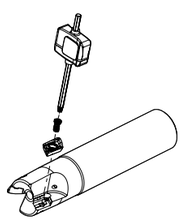
K_r=90° | γ_p=+11°

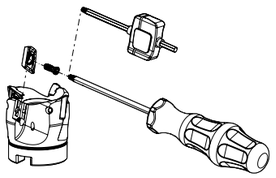
Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				lbs	Specifications			Insert radius Raio da pastilha Rayo del Inserto	Stock
			ØDc	Ød	Ødg	L		Arbor Type	Max ap (in)	rpm max		
181104600	XD90 D1.50-A.500/2.00-03-15	3	1.500	0.500	1.440	2.000	0.66	A	0.551	29 000	0.016~0.126	●
181104700	XD90 D2.00-A.750/2.00-04-15	4	2.000	0.750	1.772	2.000	0.88	A	0.551	24 000	0.016~0.126	●
181104800	XD90 D2.50-A.750/2.50-05-15	5	2.500	0.750	2.205	2.500	1.54	A	0.551	21 000	0.016~0.126	●
181104900	XD90 D3.00-A1.00/2.50-05-15	5	3.000	1.000	2.874	2.500	2.42	A	0.551	19 000	0.016~0.126	●
181105000	XD90 D4.00-A1.50/2.50-06-15	6	4.000	1.500	3.180	2.500	4.41	A	0.551	16 000	0.016~0.126	●

● Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
◇ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

SPARE PARTS ‖ Complementos | Complementos

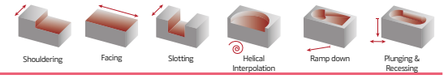
Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
			lbf/in
XD90-C-15 - 0.75-1.00	P0400803	XT15	26.6
XD90-C-15 - 1.25-1.50	P0400900	XT15	26.6
XD90-A-15 - 1.50-3.00	P0400900	XT15	26.6
XD90-A-15 - 4.00	P0400900	PT15	26.6

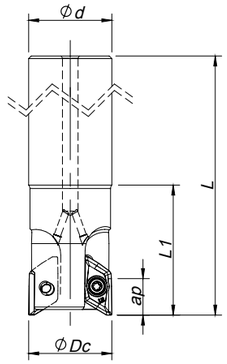




ALUPRO XD90-15

XDGX





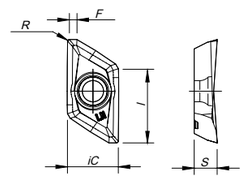
Cylindrical Shank

K_r=90° | γ_p=+6° ~+11°

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				lbs	Specifications			Insert radius Raio da pastilha Rayo del Inserto	Stock
			ØDc	Ød	L	L1		Arbor Type	Max ap (in)	rpm max		
181105100	XD90 D0.75-C0.75/6.00-01-15	1	0.750	0.750	6.000	2.000	0.44	A	0.591	40 000	0.016~0.126	●
181105200	XD90 D1.00-C1.00/6.00-02-15	2	1.000	1.000	6.000	2.000	0.88	A	0.591	38 000	0.016~0.126	●
181105300	XD90 D1.25-C1.25/6.00-02-15	2	1.250	1.250	6.000	2.000	1.54	A	0.591	33 000	0.016~0.126	●
181105400	XD90 D1.50-C1.50/6.00-03-15	3	1.500	1.500	6.000	2.000	3.08	A	0.591	29 000	0.016~0.126	◇
NEW 181139000	XD90 D1.50-C1.25/8.00-03-15	3	1.500	1.250	8.000	2.500	3.08	B	0.591	40 000	0.157~0.197	○

● Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
◇ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

XDGX 15M5... ‖ Inserts | Pastilhas | Plaquitas



		P				M				K					N		S		H		Dimensions (in)					Holder Type
		PVD				CVD	PVD			CVD		PVD			UNC	PCD	PVD		PVD	CBN						
	(2) Grade code	P7	G1	G4	P3	R1	G4	P3	G6	L5	L6	G1	P3	G6	10	D6	P3	G6	P7	D4						
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PHM740	PH7920	PH7930	PH7740	PH5705	PH5320	PH7910	PH7930	PH7740	PH0910	PDP410	PH7930	PH7740	PH7603	PBH910	iC	S	l	R	F	
1111624	XDGX 15M504 PDFR-LN														●						0.441	0.197	0.630	0.016	0.059	A
1111625	XDGX 15M508 PDFR-LN														●						0.441	0.197	0.630	0.031	0.043	A
1111626	XDGX 15M512 PDFR-LN														●						0.441	0.197	0.630	0.047	0.028	A
1111627	XDGX 15M516 PDFR-LN														●						0.441	0.197	0.630	0.063	0.016	A
1111628	XDGX 15M520 PDFR-LN														●						0.441	0.197	0.630	0.079	0.008	A
1112154	XDGX 15M530 PDFR-LN														○						0.441	0.197	0.630	0.118	0.024	A
1111629	XDGX 15M532 PDFR-LN														●						0.441	0.197	0.630	0.126	0.024	A
1111630	XDGX 15M540 PDFR-LN														●						0.441	0.197	0.630	0.157	0.020	B
1111631	XDGX 15M550 PDFR-LN														●						0.441	0.197	0.630	0.197	0.016	B

● Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción
● Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

ALUPRO XD90-15

RECOMMENDED CUTTING CONDITIONS FOR SHOULDERING

ISO	PSM	Material	HB (Brinell)	Vc (sfm) PH0910	Width of Cut ae (in)	Depth of Cut ap (in)	Feed fz(in/t)
N	10	Aluminum and Non Ferrous	30-130	1148-4592	≤ 25% ØDc	≤0.197	0.014 - 0.016
						0.197 - 0.394	0.012 - 0.014
						0.394 - 0.591	0.010 - 0.012
					< 50% ØDc	≤0.197	0.014 - 0.016
						0.197 - 0.394	0.012 - 0.014
						0.394 - 0.591	0.010 - 0.012
					≤ 75% ØDc	≤0.197	0.012 - 0.014
						0.197 - 0.394	0.010 - 0.012
						0.394 - 0.591	0.008 - 0.010

RECOMMENDED CUTTING CONDITIONS FOR SLOTTING

ISO	PSM	Material	HB (Brinell)	Vc (sfm) PH0910	Width of Cut ae (in)	Depth of Cut ap (in)	Feed fz(in/t)
N	10	Aluminum and Non Ferrous	30-130	1148-4592	100% ØDc	≤0.197	0.010 -0.014
						0.197 - 0.394	0.008 - 0.012
						0.394 - 0.591	0.006 - 0.010

(Note 1) Cutting conditions a_e/Dc=70%.

(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) Use internal coolant supply

OPERATIONAL GUIDE

- The maximum allowable revolutions are shown in Table 1. Ensure that the cutter operates under the maximum allowable revolutions. The maximum allowable revolutions for safety purposes are determined in accordance with ISO 15641 (Milling Cutters for high speed machining – Safety requirements).

Table 1 - Maximum allowable revolutions:

ØDc	Ø0.750	Ø1.000	Ø1.250	Ø1.500	Ø2.000	Ø2.500	Ø3.000	Ø4.000
RPM (min^{-1})	40 000	38 000	33 000	29 000	24 000	21 000	19 000	16 000

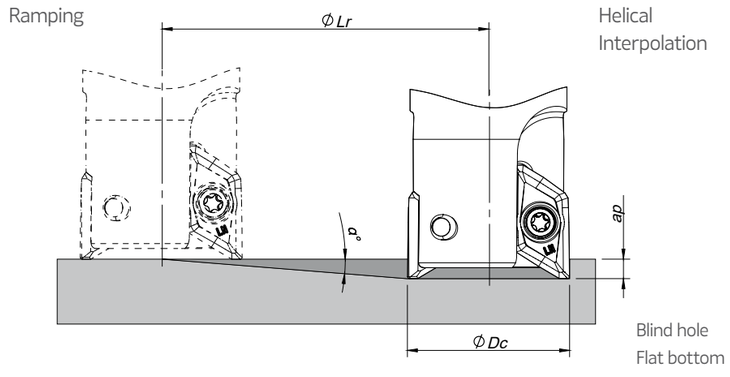
- Even when operating under the maximum allowable spindle speed, if the spindle speed is equal or higher than the values shown in Table 2, it is recommended that the balance quality (with the arbor or chuck) according ISO 1940.

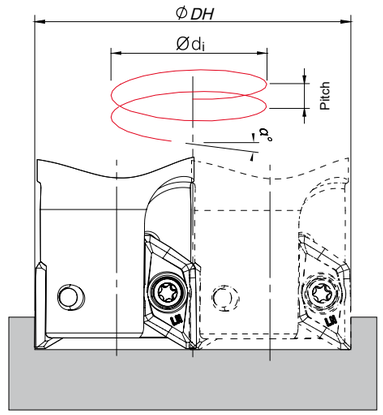
Table 2 - Maximum revolutions when balancing with the arbor or chuck has not been achieved:

ØDc	Ø0.750	Ø1.000	Ø1.250	Ø1.500	Ø2.000	Ø2.500	Ø3.000	Ø4.000
RPM (min^{-1})	15 000	12 000	9 500	8 500	7 600	6 800	6 000	5 400

- When setting the spindle speed, take into consideration the maximum allowable revolutions of arbor or chuck.
- Use the specified set bolt when using the arbor type with internal coolant supply.

RAMPING AND HELICAL INTERPOLATION





Ødi = ØDH - ØDc

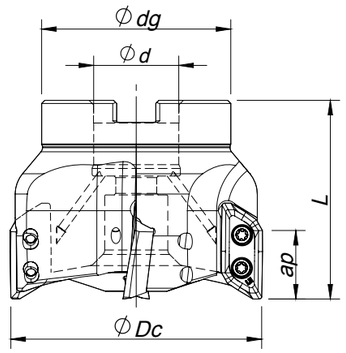
ØDc	Ramping			Helical Interpolation		
				Diameter for Blind Hole. Flat Bottom Face (1)		Max Pitch/Rev.
	Max Ramp a°	Max a_p	Min Lr	ØDHmin	ØDHmax	
0.750	23	0.551	1.299	1.342 -	- 1.421	0.780 0.890
1.000	21	0.551	1.436	1.842 -	- 1.921	1.010 1.110
1.250	15	0.551	2.057	2.342 -	- 2.421	0.910 0.980
1.500	10	0.551	3.126	2.842 -	- 2.921	0.740 0.780
2.000	8	0.551	3.922	3.842 -	- 3.921	0.810 0.840
2.500	6	0.551	5.244	4.842 -	- 4.921	0.770 0.790
3.000	4	0.551	7.883	5.842 -	- 5.921	0.620 0.640
4.000	2.5	0.551	12.625	7.842 -	- 7.921	0.520 0.530

(1) using insert radius 0.031 in

Note: During helical interpolation do not exceed maximum pitch.
When using different insert radius to calculate the ØDHmin and ØDHmax use the below equation:
-Minium Diameter: ØDHmin = 2 x (ØDc - (R corner radius + F width of edge wiper))
- Maximum Diameter: ØDHmax = 2 x (ØDc - R corner radius)

ALUPRO XD90-22

Proprietary milling line



Arbor Mounting

K_r=90° | γ_p=+7°

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød	Ødg	L	Ibs	Specifications Arbor Type	Max ap (in)	rpm max	Insert radius Raio da pastilha Rayo del Inserto	Stock
181079500	XD90 D2.00-A.750/2.00-03-22	3	2.000	0.750	1.772	2.000	0.98	A	0.846	30 000	0.031~0.126	✪
181079600	XD90 D2.50-A1.00/2.00-03-22	3	2.500	1.000	2.205	2.000	1.41	A	0.846	25 000	0.031~0.126	✪
181071700	XD90 D3.00-A1.00/2.50-04-22	4	3.000	1.000	2.205	2.500	2.96	A	0.846	23 000	0.031~0.126	✪
181079700	XD90 D4.00-A1.25/2.50-05-22	5	4.000	1.250	2.874	2.500	5.43	A	0.846	19 000	0.031~0.126	◬
NEW 181138600	XD90 D4.00-A1.50/2.50-05-22	5	4.000	1.500	3.000	2.500	5.43	A	0.846	16 000	0.031~0.126	○
181079800	XD90 D5.00-A1.50/2.50-06-22	6	5.000	1.500	3.180	2.500	6.72	A	0.846	30 000	0.031~0.126	✪

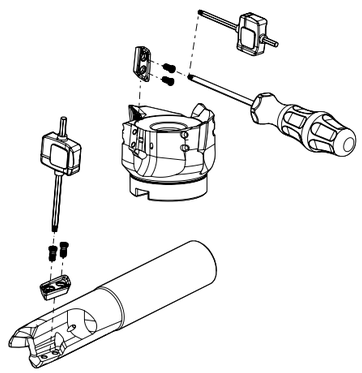
✪ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

◬ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituído por novo item | Iten en stock. Será reemplazado por nuevo iten.

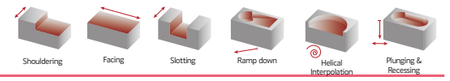
SPARE PARTS ‖ Complementos | Complementos

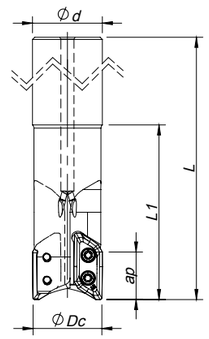
Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
XD90-A-22 - 2.00-3.00	P0401200	XT15	26.6
XD90-A-22 - 4.00-5.00	P0401200	PT15	26.6
XD90-C-22 - 1.25-1.50	P0401200	XT15	26.6



ALUPRO XD90-22

XDGX





Cylindrical Shank

K_r=90° | γ_p=+6°

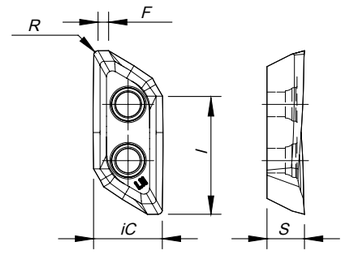
Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød	L	L1	Ibs	Specifications Arbor Type	Max ap (in)	rpm max	Insert radius Raio da pastilha Rayo del Inserto	Stock
181069900	XD90 D1.25-C1.25/6.69-02-22	2	1.250	1.250	6.693	3.150	1.67	A	0.846	41 000	0.031~0.126	✪
181079900	XD90 D1.50-C1.50/6.69-02-22	2	1.500	1.500	6.693	3.150	1.82	A	0.846	36 000	0.031~0.126	◬
NEW 181138700	XD90 D1.50-C1.25/8.00-02-22	2	1.500	1.250	8.000	3.000	1.82	A	0.846	41 000	0.031~0.126	○

✪ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

◬ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituído por novo item | Iten en stock. Será reemplazado por nuevo iten.

XDGX 22M7... ‖ Inserts | Pastilhas | Plaquitas



		P				M				K					N		S		H		Dimensions (in)					Holder Type
		PVD				CVD	PVD			CVD		PVD			UNC	PCD	PVD		PVD	CBN						
	(2) Grade code	P7	G1	G4	P3	R1	G4	P3	G6	L5	L6	G1	G4	G6	10	D6	P3	G6	P7	D4						
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PHM740	PH7920	PH7930	PH7740	PH5705	PH5320	PH7910	PH7920	PH7740	PH0910	PDP410	PH7930	PH7740	PH7603	PBH910	iC	S	l	R	F	
1111618	XDGX 22M708 PDFR-LN														✪						0.512	0.276	0.866	0.031	0.079	A
1111619	XDGX 22M716 PDFR-LN														✪						0.512	0.276	0.866	0.063	0.047	A
1111620	XDGX 22M720 PDFR-LN														✪						0.512	0.276	0.866	0.079	0.031	A
1111621	XDGX 22M732 PDFR-LN														✪						0.512	0.276	0.866	0.126	0.024	A

✪ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

✪ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

ALUPRO XD90-22

RECOMMENDED CUTTING CONDITIONS FOR SHOULDERING

ISO	PSM	Material	HB (Brinell)	Vc (sfm) PH0910	Width of Cut ae (in)	Depth of Cut ap (in)	Feed fz(in/t)
N	10	Aluminum and Non Ferrous	30-130	1148-4592	≤ 25% ØDc	≤0.197	0.014-0.016
						0.197 - 0.394	0.012-0.014
						0.394 - 0.591	0.010-0.012
						0.591 - 0.787	0.008-0.010
					< 50% ØDc	≤0.197	0.014-0.016
						0.197 - 0.394	0.012-0.014
						0.394 - 0.591	0.010-0.012
						0.591 - 0.787	0.008-0.010
					≤ 75% ØDc	≤0.197	0.012-0.014
						0.197 - 0.394	0.010-0.012
						0.394 - 0.591	0.008-0.010
						0.591 - 0.787	0.006-0.008

RECOMMENDED CUTTING CONDITIONS FOR SLOTTING

ISO	PSM	Material	HB (Brinell)	Vc (sfm) PH0910	Width of Cut ae (in)	Depth of Cut ap (in)	Feed fz(in/t)
N	10	Aluminum and Non Ferrous	30-130	1148-4592	100% ØDc	≤0.197	0.010-0.014
						0.197 - 0.394	0.008-0.012
						0.394 - 0.591	0.006-0.010
						0.591 - 0.787	0.004-0.008

(Note 1) Cutting conditions a_e/Dc=70%.
(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) Use internal coolant supply.

OPERATIONAL GUIDE

- Only use the inserts and parts provided by Palbit with this tool. Use of the correct insert clamp screws is especially important to ensure overall tool safety. Do not use damaged or worn clamp screws.
- When tightening the clamp screws, follow the order in Figure 1. The recommended torque value is 30.0 lbf/in.
- The maximum allowable revolutions are shown in Table 1. Ensure that the cutter operates under the maximum allowable revolutions.

The maximum allowable revolutions for safety purposes are determined in accordance with ISO 15641 (Milling Cutters for high speed machining–Safety requirements).

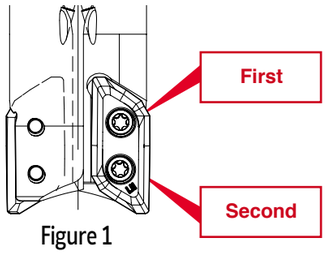


Figure 1

Table 1 - Maximum allowable revolutions:

ØDc	Ø1.250	Ø1.500	Ø2.000	Ø2.500	Ø3.000	Ø4.000	Ø5.000
RPM (min^{-1})	41 000	36 000	30 000	25 000	23 000	19 000	16 000

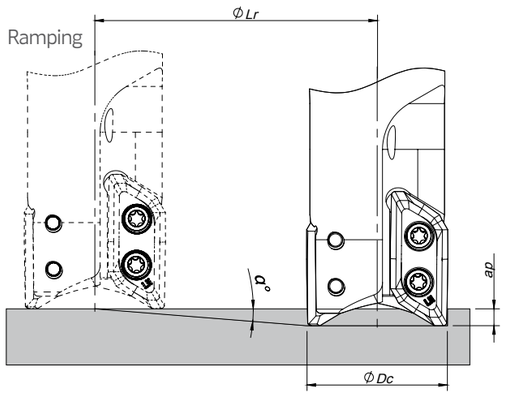
- Even when operating under the maximum allowable spindle speed, if the spindle speed is equal or higher than the values shown in Table 2, it is recommended that the balance quality (with the arbor or chuck) according ISO 1940.

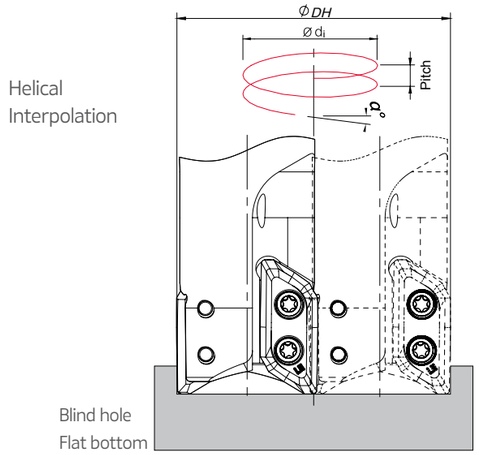
Table 2 - Maximum revolutions when balancing with the arbor or chuck has not been achieved:

ØDc	Ø1.250	Ø1.500	Ø2.000	Ø2.500	Ø3.000	Ø4.000	Ø5.000
RPM (min^{-1})	9 500	7 600	6 000	4 800	3 800	3 000	2 400

- When setting the spindle speed, take into consideration the maximum allowable revolutions of arbor or chuck.
- Use the specified set bolt when using the arbor type with internal coolant supply.

RAMPING AND HELICAL INTERPOLATION



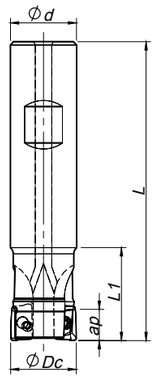


Ødi = ØDH - ØDc

ØDc	Ramping			Helical Interpolation		
				Diameter for Blind Hole. Flat Bottom Face (1)		Max Pitch/Rev.
	Max Ramp a°	Max a_p	Min Lr	ØDHmin	ØDHmax	
1.250	19.0	0.827	2.401	2.303 -	- 2.421	1.130 1.260
1.500	13.0	0.827	3.581	2.803 -	- 2.921	0.940 1.030
2.000	9.0	0.827	5.220	3.803 -	- 3.921	0.890 0.950
2.500	7.0	0.827	6.734	4.803 -	- 4.921	0.880 0.930
3.000	5.0	0.827	9.450	5.803 -	- 5.921	0.770 0.800
4.000	4.0	0.827	11.824	7.803 -	- 7.921	0.830 0.860
5.000	3.0	0.827	15.776	9.803 -	- 9.921	0.790 0.810

(1) using insert radius 0.031 in
Note: During helical interpolation do not exceed maximum pitch.
When using different insert radius to calculate the ØDHmin and ØDHmax use the below equation:
- Minium Diameter: ØDHmin = 2 x (ØDc - (R corner radius + F width of edge wiper))
- Maximum Diameter: ØDHmax = 2 x (ØDc - R corner radius)

LINEPRO AP90-10



Weldon Shank

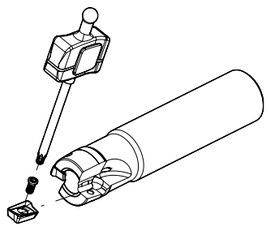
K_r=90° | γ_p=+7° ~+9°

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	L	L1	lbs	Specifications Ap max (in)	Insert Pastilha Inserto	Stock
181060400	AP90 D.500-W.500/3.94-01-10	1	0.500	0.500	3.937	0.850	0.40	0.354	AP... 1003...	○
181060500	AP90 D.625-W.625/3.94-02-10	2	0.625	0.625	3.937	1.024	0.28	0.354	AP... 1003...	●
181060700	AP90 D.750-W.750/3.94-02-10	2	0.750	0.750	3.937	1.181	0.40	0.354	AP... 1003...	●
181060800	AP90 D.750-W.750/7.87-02-10	2	0.750	0.750	7.874	1.575	0.85	0.354	AP... 1003...	●
181068800	AP90 D1.00-W1.00/4.53-03-10	3	1.000	1.000	4.528	1.378	0.84	0.354	AP... 1003...	●
181061000	AP90 D1.00-W1.00/9.84-03-10	3	1.000	1.000	9.843	1.575	1.95	0.354	AP... 1003...	●
181069000	AP90 D1.25-W1.25/4.92-04-10	4	1.250	1.250	4.921	1.575	1.46	0.354	AP... 1003...	○
181061200	AP90 D1.25-W1.25/9.84-04-10	4	1.250	1.250	9.843	1.575	3.11	0.354	AP... 1003...	○
181061300	AP90 D1.50-W1.25/7.87-03-10	3	1.500	1.250	7.874	1.575	2.57	0.354	AP... 1003...	○
181061400	AP90 D1.50-W1.25/9.84-05-10	5	1.500	1.250	9.843	1.575	3.20	0.354	AP... 1003...	○

● Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
△ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
AP90-W-10 - 0.50-1.50	P0250503	XT08	10.6

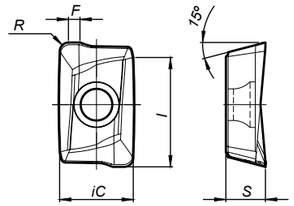


AP... 1003... | Inserts | Pastilhas | Plaquitas

APET

APKT - X

APKT - X1



		P					M			K						N		S		H	
		PVD					CVD	PVD		CVD		PVD				UNC	PCD	PVD		PVD	CBN
	(2) Grade code	P7	54	68	66	I5	R1	68	66	L5	L6	54	68	66	I5	10	D6	66	I5	P7	D4
(1) Geometry code	ISO Reference	PH7603	PH6910	PH6920	PH6930	PH6740	PHM740	PH6920	PH6930	PH5705	PH5320	PH6910	PH6920	PH6930	PH6740	PH0910	PDP410	PH6930	PH6740	PH7603	PBH910
1112043	APET 100305 PDFR-LN															●					
1112168	APKT 100305 PDER-X1			○	●				●				○	●							
1112167	APKT 100305 PDSR-X1			○	●								○	●							
1111071	APKT 100308 PDER-X			○	●				●				○	●							
1111044	APKT 100308 PDSR-X			●									●								
1111042	APKT 100308 PDTR-X			○	●								○	●							
1111072	APKT 100312 PDER-X			○	●				●				○	●							
1110987	APKT 100312 PDSR-X			●									●								
1111045	APKT 100312 PDTR-X			○	●								○	●							

		iC	S	I	R	B	F
1112043	APET 100305 PDFR-LN	0.264	0.138	0.394	0.020	-	0.047
1112168	APKT 100305 PDER-X1	0.264	0.138	0.394	0.020	-	0.047
1112167	APKT 100305 PDSR-X1	0.264	0.138	0.394	0.020	-	0.047
1111071	APKT 100308 PDER-X	0.264	0.138	0.394	0.031	-	0.035
1111044	APKT 100308 PDSR-X	0.264	0.138	0.394	0.031	-	0.035
1111042	APKT 100308 PDTR-X	0.264	0.138	0.394	0.031	-	0.035
1111072	APKT 100312 PDER-X	0.264	0.138	0.394	0.047	-	-
1110987	APKT 100312 PDSR-X	0.264	0.138	0.394	0.047	-	-
1111045	APKT 100312 PDTR-X	0.264	0.138	0.394	0.047	-	-

● Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción
● Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH0910	PH6920	PH6930
P	1	Unalloyed Steel	125-220		✓	✓
	2	Low-Alloyed Steel	220-280		✓	✓
	3	High-Alloyed Steel	280-380		✓	✓
M	4	SS - Ferritic / Martensitic	200-330			✓
	5	SS - Austenitic / Duplex	200-330			✓
	6	SS - Duplex	230-260			✓
K	7	Malleable Cast Iron	130-230		✓	✓
	8	Grey Cast Iron	180-245		✓	✓
	9	Nodular Cast iron	160-250		✓	✓
N	10	Aluminum and Non Ferrous	30-130	✓		

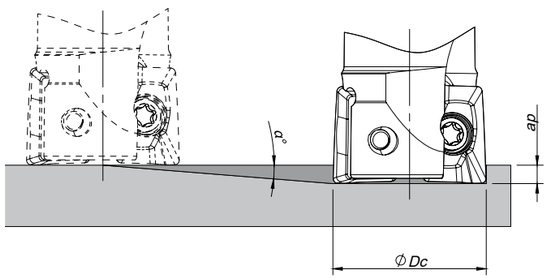
● Good Conditions
● Average Conditions
● Difficult Conditions

CHIP-BREAKER SELECTION GUIDE

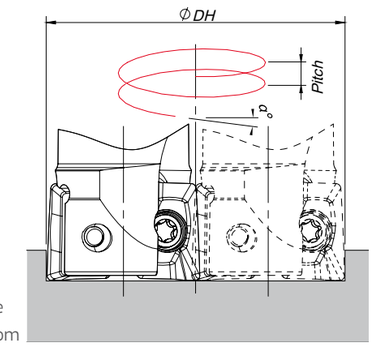
ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application	
				1st choise	Dificult Operations
P	1	Unalloyed Steel	125-220	APKT 10... PDER-X	APKT 10... PDTR-X
	2	Low-Alloyed Steel	220-280	APKT 10... PDSR-X	APKT 10... PDSR-X
	3	High-Alloyed Steel	280-380	APKT 10... PDSR-X	-
M	4	SS - Ferritic / Martensitic	200-330	APKT 10... PDER-X	-
	5	SS - Austenitic / Duplex	200-330	APKT 10... PDER-X	-
	6	SS - Duplex	230-260	APKT 10... PDER-X	-
K	7	Malleable Cast Iron	130-230	APKT 10... PDER-X	APKT 10... PDSR-X
	8	Grey Cast Iron	180-245	APKT 10... PDSR-X	-
	9	Nodular Cast iron	160-250	APKT 10... PDSR-X	-
N	10	Aluminum and Non Ferrous	30-130	APET 10... PDFR-LN	-

RAMPING AND HELICAL INTERPOLATION

Ramping



Helical Interpolation



Blind hole
Flat bottom

Ødi = ØDH - ØDc

ØDc	Ramping			Helical Interpolation		
				Diameter for Blind Hole. Flat Bottom Face (1)		Max Pitch/Rev.
	Max Ramp a°	Max ap	Min Lr	ØDHmin	ØDHmax	
0.500	1.5	0.354	13.519	0.866 -	- 0.921	0.030 0.034
0.625	1.4	0.354	14.485	1.116 -	- 1.171	0.037 0.041
0.750	1.0	0.354	20.281	1.366 -	- 1.421	0.033 0.036
1.000	0.7	0.354	28.974	1.866 -	- 1.921	0.033 0.035
1.250	0.6	0.354	33.803	2.366 -	- 2.421	0.036 0.038
1.500	0.5	0.354	40.564	2.866 -	- 2.921	0.037 0.038

(1) using LP insert with radius 0.020 in
Note: During helical interpolation do not exceed maximum pitch
When using HF insert or other different insert radius to calculate the ØDHmin and ØDHmax use the below equation:
- Minium Diameter: ØDHmin = 2 x (ØDc - (R corner radius + F width of edge wiper))
- Maximum Diameter: ØDHmax = 2 x (ØDc - R corner radius)

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RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance Toughness →			Feed fz (in/t)		
				PH0910	PH6920	PH6930	APKT 10... PDER-X/X1	APKT 10... PDS(T) R-X/X1	APET 10... PDFR-LN
P	1	Unalloyed Steel	125-220	-	492-755	492-591	0.003-0.006	0.004-0.01	-
	2	Low-Alloyed Steel	220-280	-	460-722	460-558	0.003-0.004	0.004-0.008	-
	3	High-Alloyed Steel	280-380	-	427-591	394-492	0.003-0.004	0.004-0.008	-
M	4	SS - Ferritic / Martensitic	200-330	-	-	296-492	0.003-0.004	0.004-0.008	-
	5	SS - Austenitic / Duplex	200-330	-	-	263-427	0.003-0.004	0.004-0.008	-
	6	SS - Duplex	230-260	-	-	230-328	0.003-0.004	0.004-0.008	-
K	7	Malleable Cast Iron	130-230	-	492-919	263-755	0.003-0.006	0.004-0.010	-
	8	Grey Cast Iron	180-245	-	427-755	394-738	0.003-0.006	0.004-0.010	-
	9	Nodular Cast iron	160-250	-	263-624	263-591	-	0.004-0.008	-
N	10	Aluminum and Non Ferrous	30-130	1148-4592	-	-	-	-	0.003-0.008

(Note 1) Cutting conditions a_e/Dc=70%.
(Note 2) Cutting conditions for slotting and shouldering operations:

Operation	a_e	Vc & fz	a_p (in)
Slotting	100%	<20%	0.118-0.157
Shouldering	<50%	>8%	0.197-0.236
	≤25%	>12%	0.276-0.315

(Note 3) Cutting conditions should be adjusted according to the machine and work rigidity.
(Note 4) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 5) If chattering occurs, reduce ap and Vc by 30% and keep the same fz per tooth.

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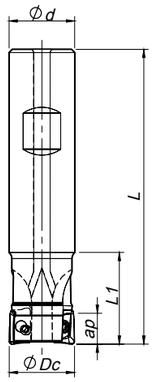

Weldon Shank

K_r=90° | γ_p=+6° ~+8°

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød	L	L1	lbs	Specifications Ap max (in)	Insert Pastilha Inserto	Stock
181061500	AP90 D.875-W.750/3.94-02-16	2	0.875	0.750	3.937	1.378	0.39	0.571	AP... 1604	●
NEW 181136800	AP90 D1.00-W1.00/4.00-02-16	2	1.000	1.000	4.000	1.750	0.67	0.571	AP... 1604	●
NEW 181136900	AP90 D1.00-W1.00/6.00-02-16	2	1.000	1.000	6.000	3.750	1.02	0.571	AP... 1604	●
NEW 181137000	AP90 D1.00-W1.00/8.00-02-16	2	1.000	1.000	8.000	5.750	1.48	0.571	AP... 1604	●
181061600	AP90 D1.00-W1.00/3.94-02-16	2	1.000	1.000	3.937	1.575	0.67	0.571	AP... 1604	◬
181062000	AP90 D1.00-W1.00/5.91-02-16	2	1.000	1.000	5.906	3.150	1.02	0.571	AP... 1604	◬
181061900	AP90 D1.00-W1.00/7.87-02-16	2	1.000	1.000	7.874	1.968	1.48	0.571	AP... 1604	◬
181061800	AP90 D1.25-W1.00/4.92-03-16	3	1.250	1.000	4.921	1.575	0.93	0.571	AP... 1604	●
181061700	AP90 D1.25-W1.25/4.92-03-16	3	1.250	1.250	4.921	1.968	1.37	0.571	AP... 1604	●
181062200	AP90 D1.25-W1.25/6.30-03-16	3	1.250	1.250	6.300	3.937	1.74	0.571	AP... 1604	●
181062100	AP90 D1.25-W1.25/9.84-03-16	3	1.250	1.250	9.843	1.968	3.02	0.571	AP... 1604	●
181062300	AP90 D1.50-W1.25/7.87-03-16	3	1.500	1.250	7.874	1.575	2.51	0.571	AP... 1604	●
181062400	AP90 D1.50-W1.25/9.84-03-16	3	1.500	1.250	9.843	1.575	3.16	0.571	AP... 1604	●

● Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
◬ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

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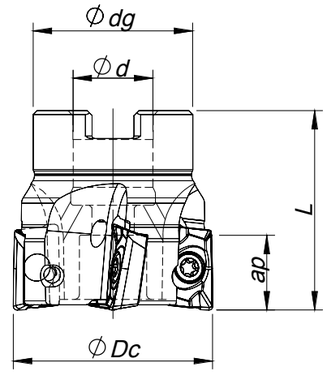
APKT | APHT



Arbor Mounting

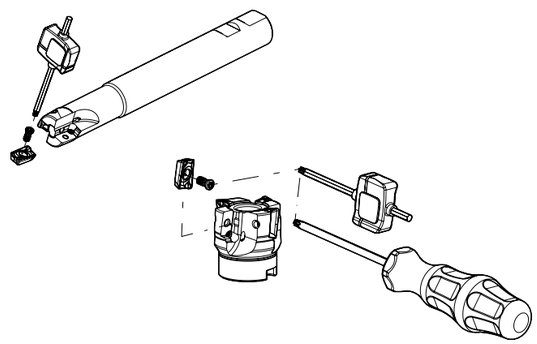
K_r=90° | γ_p=+8° ~+10°

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød	Ødg	L	lbs	Specifications Arbor Type	Ap max (in)	Insert Pastilha Inserto	Stock
NEW 181137100	AP90 D1.50-A.500/1.50-04-16	4	1.500	0.500	1.417	1.500	0.37	A	0.571	AP... 1604	●
NEW 181137200	AP90 D2.00-A.750/1.75-05-16	5	2.000	0.750	1.772	1.750	0.66	A	0.571	AP... 1604	●
NEW 181137300	AP90 D2.50-A.750/1.75-06-16	6	2.500	0.750	1.772	1.750	1.17	A	0.571	AP... 1604	●
NEW 181137400	AP90 D3.00-A1.00/2.00-07-16	7	3.000	1.000	2.205	2.000	1.87	A	0.571	AP... 1604	●
NEW 181137500	AP90 D4.00-A1.25/2.00-08-16	8	4.000	1.250	2.874	2.000	3.75	A	0.571	AP... 1604	●
NEW 181137600	AP90 D5.00-A1.50/2.50-09-16	9	5.000	1.500	3.386	2.500	6.94	A	0.571	AP... 1604	○
NEW 181137700	AP90 D6.00-A2.00/2.50-10-16	10	6.000	2.000	4.882	2.500	9.37	A	0.571	AP... 1604	○

● Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
◬ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value lbf/in
AP90-W-16 - 0.875-1.50	P0400900	XT15	26.6
AP90-A-16 - 1.50-3.00	P0400900	XT15	26.6
AP90-A-16 - 4.00-6.00	P0400900	PT15	26.6



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AP...T 1604... ‖ Inserts | Pastilhas | Plaquitas

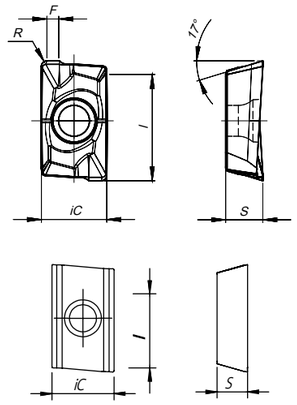
APKT - X

APKT - X1

APKT - X2

APKT - LN

APHT - LN



			P				M				K					N		S		H						
			PVD				CVD	PVD			CVD	PVD				UNC	PCD	PVD		PVD	CBN					
		(2) Grade code	P7	68	G4	66	P3	R1	66	P3	G6	L5	68	G4	66	P3	10	D6	P3	G6	P7	D4					
	(1) Geometry code	ISO Reference	PH7603	PH6920	PH7920	PH6930	PH7930	PHM740	PH6930	PH7930	PH7740	PH5705	PH6920	PH7920	PH6930	PH7930	PH0910	PDP410	PH7930	PH7740	PH7603	PBH910	Dimensions (in) iC	S	l	R	B	F
	1112159	APKT 160408 PDER-X1		◉		◉			◉				◉		◉								0.372	0.211	0.630	0.031	-	0.071
NEW	1112464	APKT 160408 PDER-X2			◉		◉			◉				◉		◉							0.372	0.211	0.630	0.031	-	0.071
	1112158	APKT 160408 PDSR-X1		◉		◉							◉		◉								0.372	0.211	0.630	0.031	-	0.071
NEW	1112367	APKT 160408 PDSR-X2			◉		◉							◉		◉							0.372	0.211	0.630	0.031	-	0.071
	1111074	APKT 160416 PDER-X		◉									◉										0.372	0.211	0.630	0.063	-	0.047
	1111050	APKT 160416 PDSR-X		◉		◉							◉		◉								0.372	0.211	0.630	0.063	-	0.047
	1111075	APKT 160432 PDER-X		◉									◉										0.372	0.211	0.630	1.260	-	-
	1111052	APKT 160432 PDSR-X		◉									◉										0.372	0.211	0.630	1.260	-	-
	1111924	APHT 1604 PDFR-LN															◉						0.372	0.211	0.630	-	-	0.069
	1111923	APKT 160408 PDFR-LN															◉						0.372	0.211	0.630	0.031	-	0.069

◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

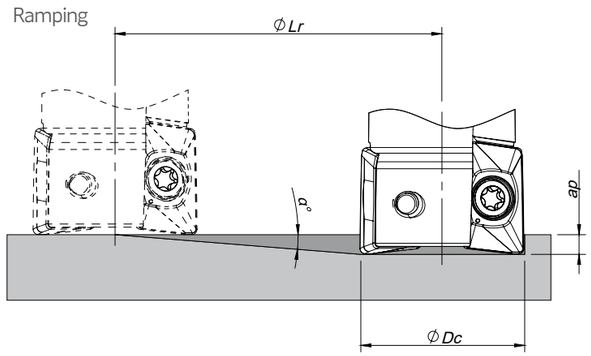
◉ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

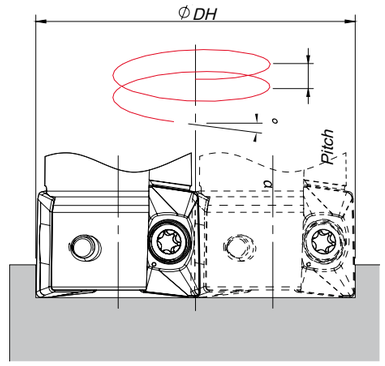
Insert order code = (1) Geometry Code + (2) Grade Code

RAMPING AND HELICAL INTERPOLATION

Ramping



Helical Interpolation



Ødi = ØDH - ØDc

ØDc	Ramping			Helical Interpolation		
				Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
	Max Ramp a°	Max a_p	Min Lr	ØDHmin	ØDHmax	
0.875	3.4	0.571	9.611	1.596 -	- 1.671	0.134 0.148
1.000	3.0	0.571	10.895	1.846 -	- 1.921	0.139 0.151
1.250	2.1	0.571	15.572	2.346 -	- 2.421	0.126 0.134
1.500	1.6	0.571	20.442	2.846 -	- 2.921	0.118 0.124
2.000	1.1	0.571	29.738	3.846 -	- 3.921	0.111 0.115
2.500	0.85	0.571	38.486	4.846 -	- 4.921	0.109 0.112
3.000	0.70	0.571	46.735	5.846 -	- 5.921	0.100 0.110
4.000	0.50	0.571	65.430	7.846 -	- 7.921	0.100 0.100
5.000	0.35	0.571	93.473	9.846 -	- 9.921	0.093 0.094

(1) Using insert radius 0.0.31 in
Note: During helical interpolation do not exceed maximum pitch
When using different insert radius to calculate the ØDHmin and ØDHmax use the below equation:
- Minium Diameter: ØDHmin = 2 x (ØDc - (R corner radius + F width of edge wiper))
- Maximum Diameter: ØDHmax = 2 x (ØDc - R corner radius)

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GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance		Toughness →
				PH0910	PH7(6)920	PH7 (6)30
P	1	Unalloyed Steel	125-220		✓	✓
	2	Low-Alloyed Steel	220-280		✓	✓
	3	High-Alloyed Steel	280-380		✓	✓
M	4	SS - Ferritic / Martensitic	200-330			✓
	5	SS - Austenitic / Duplex	200-330			✓
	6	SS - Duplex	230-260			✓
K	7	Malleable Cast Iron	130-230		✓	✓
	8	Grey Cast Iron	180-245		✓	✓
	9	Nodular Cast iron	160-250		✓	✓
N	10	Aluminum and Non Ferrous	30-130	✓		

Good Conditions
Average Conditions
Difficult Conditions

CHIP-BREAKER SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application	
				1st choise	Dificult Operations
P	1	Unalloyed Steel	125-220	APKT 16... PDER-X(X2)	APKT 16... PDSR-X(X2)
	2	Low-Alloyed Steel	220-280	APKT 16... PDSR-X(X2)	-
	3	High-Alloyed Steel	280-380	APKT 16... PDSR-X(X2)	-
M	4	SS - Ferritic / Martensitic	200-330	APKT 16... PDER-X(X2)	-
	5	SS - Austenitic / Duplex	200-330	APKT 16... PDER-X(X2)	-
	6	SS - Duplex	230-260	APKT 16... PDSR-X(X2)	-
K	7	Malleable Cast Iron	130-230	APKT 16... PDSR-X(X2)	APKT 16... PDSR-X(X2)
	8	Grey Cast Iron	180-245	APKT 16... PDSR-X(X2)	-
	9	Nodular Cast iron	160-250	APKT 16... PDSR-X(X2)	-
N	10	Aluminum and Non Ferrous	30-130	AP...T 16... PDFR-LN	APHT 16.... PDFR-LN

RECOMMENDED CUTTING CONDITION

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance		Toughness →
				PH0910	PH7(6)920	PH7(6)930
P	1	Unalloyed Steel	125-220	-	492-755	492-591
	2	Low-Alloyed Steel	220-280	-	460-722	460-558
	3	High-Alloyed Steel	280-380	-	427-591	394-492
M	4	SS - Ferritic / Martensitic	200-330	-	-	296-492
	5	SS - Austenitic / Duplex	200-330	-	-	263-427
	6	SS - Duplex	230-260	-	-	230-328
K	7	Malleable Cast Iron	130-230	-	492-919	263-755
	8	Grey Cast Iron	180-245	-	427-755	394-738
	9	Nodular Cast iron	160-250	-	263-624	263-591
N	10	Aluminum and Non Ferrous	30-130	1148-4592	-	-

ISO	PSM	Material	HB (Brinell)	Feed fz (in/t)		
				APKT 16... PDER-X/X2	APKT 16... PDS(T)R-X/X2	AP...T 16... PDFR-LN
P	1	Unalloyed Steel	125-220	0.003-0.006	0.004-0.010	-
	2	Low-Alloyed Steel	220-280	0.003-0.004	0.004-0.008	-
	3	High-Alloyed Steel	280-380	0.003-0.004	0.004-0.008	-
M	4	SS - Ferritic / Martensitic	200-330	0.003-0.004	-	-
	5	SS - Austenitic / Duplex	200-330	0.003-0.004	-	-
	6	SS - Duplex	230-260	0.003-0.004	-	-
K	7	Malleable Cast Iron	130-230	0.003-0.006	0.004-0.010	-
	8	Grey Cast Iron	180-245	0.003-0.006	0.004-0.010	-
	9	Nodular Cast iron	160-250	-	0.004-0.008	-
N	10	Aluminum and Non Ferrous	30-130	-	-	0.003-0.008

(Note 1) Cutting conditions a_e/Dc=70%.
(Note 2) Cutting conditions for slotting and shouldering operations:

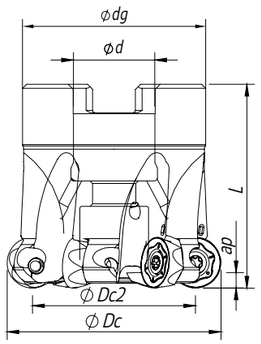
Operation	a_e	Vc & fz	a_p (in)
Slotting	100%	<20%	0.197-0.236
Shouldering	<50%	>8%	0.236-0.354
	≤25%	>12%	0.394-0.492

(Note 3) Cutting conditions should be adjusted according to the machine and work rigidity.
(Note 4) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

TOROMILL RP90-10 | RP90-12 | RP90-16

NEW

Proprietary milling line



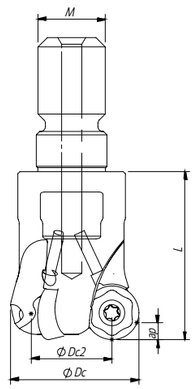
Arbor Mounting

γ_p= +5º

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	ØDc2	Ød/M	Ødg	L	lbs	Specifications Arbor Type	Ap max (in)	Insert Pastilha Inserto	Stock
					RP90-10							
181141600	RP90 D1.50-A.500/1.75-05-10	5	1.500	1.110	0.500	1.420	1.750	0.31	A	0.197	RP...10T3 M0E	○
181141700	RP90 D2.00-A.750/1.75-06-10	6	2.000	1.610	0.750	1.750	1.750	0.57	A	0.197	RP...10T3 M0E	⚙
					RP90-12							
181142300	RP90 D2.00-A.750/1.75-05-12	5	2.000	1.530	0.750	1.750	1.750	0.44	A	0.236	RP...1204 M0E	⚙
181142400	RP90 D2.50-A1.00/2.00-06-12	6	2.500	2.030	1.000	2.250	2.000	0.79	A	0.236	RP...1204 M0E	○
181142500	RP90 D3.00-A1.00/2.00-07-12	7	3.000	2.530	1.000	2.250	2.000	1.50	A	0.236	RP...1204 M0E	⚙
181142600	RP90 D4.00-A1.25/2.00-10-12	10	4.000	3.530	1.250	2.750	2.000	1.87	A	0.236	RP...1204 M0E	○
					RP90-16							
181142700	RP90 D3.00-A1.00/2.00-06-16	6	3.000	2.370	1.000	2.250	2.000	1.87	A	0.315	RP...1605 M0E	⚙
181142800	RP90 D5.00-A1.50/2.00-08-16	8	5.000	4.370	1.500	3.750	2.000	4.67	A	0.315	RP...1605 M0E	○

⚙ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Inventory maintained. To be replaced by new item. | Iten em stock.
Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.



Threaded Coupling

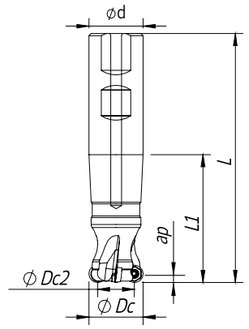
γ_p= +5º

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	ØDc2	Ød/M	L	lbs	Specifications Ap max (in)	Insert Pastilha Inserto	Stock
					RP90-10					
181142100	RP90 D1.00-R-12/1.25-03-10	3	1.000	0.610	M12	1.250	0.42	0.197	RP...10T3 M0E	○
181142200	RP90 D1.50-R-16/1.75-05-10	5	1.500	1.110	M16	1.750	0.68	0.197	RP...10T3 M0E	○

⚙ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Inventory maintained. To be replaced by new item. | Iten em stock.
Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

NEW



Weldon Shank

γ_p=+5º

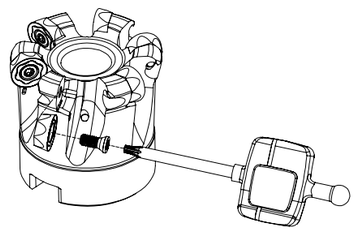
Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	ØDc2	Ød/M	L	L1	lbs	Specifications Ap max (in)	Insert Pastilha Inserto	Stock
					RP90-10						
181141800	RP90 D1.00-W1.00/4.50-03-10	3	1.000	0.610	1.000	4.500	2.250	0.75	0.197	RP...10T3 M0E	○
181141900	RP90 D1.25-W1.25/5.25-04-10	4	1.250	0.860	1.250	5.250	2.750	1.23	0.197	RP...10T3 M0E	○
181142000	RP90 D1.50-W1.25/6.00-05-10	5	1.500	1.110	1.250	6.000	3.250	1.65	0.197	RP...10T3 M0E	○

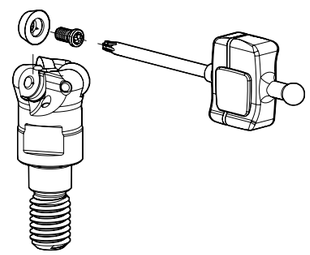
⚙ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

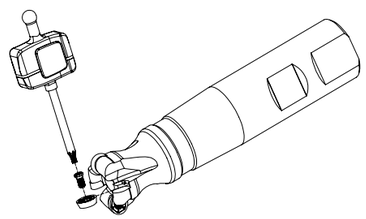
Inventory maintained. To be replaced by new item. | Iten em stock.
Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value lbf/in
RP90-10 - 1.00-2.00	P0300800	XT09	12.4
RP90-12 - 2.00-4.00	P0350800	XT15	26.6
RP90-16 - 3.00-5.00	P0451100	XT20	44.3







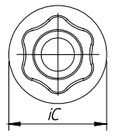
A
MILLING
Overview
News
Face milling
Hifeed milling
Shoulder milling
Profile milling
Hardmill
Center & Chamfer
Spare parts
Technical Data

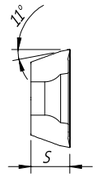
TOROMILL RP90-10 | RP90-12 | RP90-16 NEW

RD... | RP... | Inserts | Pastilhas | Plaquitas

RPHT (PH7930 grade)

RPHT (PHM grade) NEW





		P				M				K						N		S			H	
		PVD				CVD	PVD			CVD			PVD			UNC	PCD	CVD	PVD		PVD	CBN
	(2) Grade code	P7	G1	G4	P3	R1	G4	P3	G6	L5	L6	L9	54	68	66	10	D6	R1	P3	G6	M6	D4
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PHM740	PH7920	PH7930	PH7740	PH5705	PH5320	PH5740	PH6910	PH6920	PH6930	PH0910	PDP410	PHM740	PH7930	PH7740	PH6103	PBH910
1112253	RPHT 10T3 M0E-MS			○		◉		◉	○									◉	◉	○		
1112186	RPHT 1204 M0E-MS			○		◉		◉	○									◉	◉	○		
1112254	RPHT 1605 M0E-MS			○		◉		◉	○									◉	◉	○		

Dimensions (in)					
iC	S	l	F	B	R
0.394	0.156	-	-	-	-
0.472	0.187	-	-	-	-
0.630	0.219	-	-	-	-

◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◉ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

PHM NEW GRADE | Novo grau PHM | Nuevo calidad PHM

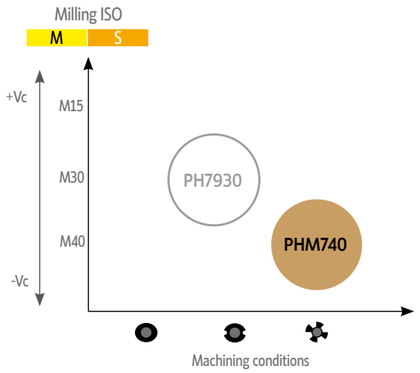
NEW MT CVD coated carbide grade, named PHM.

Developed to provide a better performance in milling of stainless-steels and high temperature alloys.

M | S

Main features:

- Extraordinary heat resistance
- High toughness
- Excellent resistance to notching
- CVD high-performance coating with maximum hardness and extremely smooth surface



Good Conditions
Average Conditions
Difficult Conditions

GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance	Toughness →
				PH7930	PHM740
P	1	Unalloyed Steel	125-220		
P	2	Low-Alloyed Steel	220-280		
P	3	High-Alloyed Steel	280-380		
M	4	SS - Ferritic / Martensitic	200-330	✓	✓
M	5	SS - Austenitic / Duplex	200-330	✓	✓
M	6	SS - Duplex	230-260	✓	✓
S	11	Heat Resistant Super Alloys	200-320	✓	✓

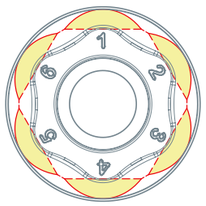
Good Conditions
Average Conditions
Difficult Conditions

RECOMMENDED CUTTING CONDITIONS

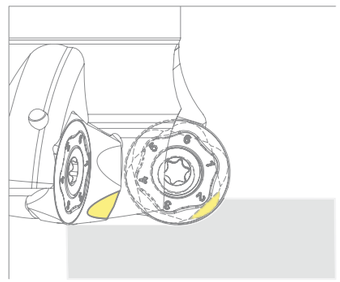
ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance	Toughness →	RP... 10		RP... 12		RP... 16	
				PH7930	PHM740	fz (in/t)	ap (in)	fz (in/t)	ap (in)	fz (in/t)	ap (in)
P	1	Unalloyed Steel	125-220	-	-	0.004-0.016	≤0.197	0.006-0.020	≤0.237	0.006-0.024	≤0.315
P	2	Low-Alloyed Steel	220-280	-	-	0.004-0.016		0.006-0.020		0.006-0.024	
P	3	High-Alloyed Steel	280-380	-	-	0.004-0.016		0.006-0.020		0.006-0.024	
M	4	SS - Ferritic / Martensitic	200-330	328-394	328-427	0.002-0.012		0.002-0.014		0.004-0.018	
M	5	SS - Austenitic / Duplex	200-330	263-361	263-394	0.002-0.012		0.002-0.014		0.004-0.018	
M	6	SS - Duplex	230-260	230-328	230-361	0.002-0.002		0.002-0.014		0.004-0.018	
S	11	Heat Resistant Super Alloys	200-320	66-263	66-296	0.002-0.010		0.002-0.0120		0.004-0.014	

INSERT INFORMATION | Informação de pastilha | Información del inserto

The maximum depth of cut for using 6 cutting edges

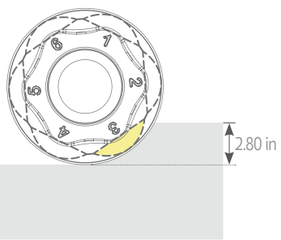


6 cutting edges



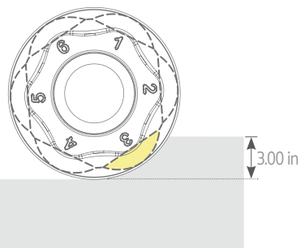
TOROMILL RP90-10

RPHT 10T3...



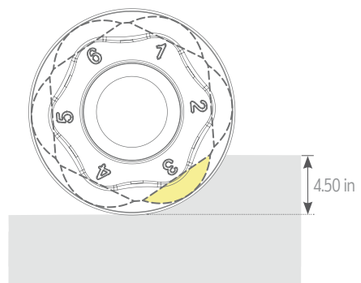
TOROMILL RP90-12

RPHT 1204...



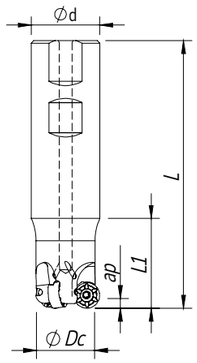
TOROMILL RP90-16

RPHT 1605...



TOROMILL RN90-12 NEW

Proprietary milling line

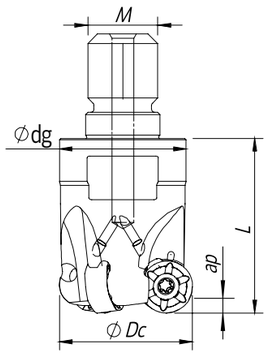


Weldon Shank

γ_p=+7

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	L	L1	lbs	Specifications Ap max (in)	Insert Pastilha Inserto	Stock
181143300	RN90 D1.25-W1.00/4.28-03-12	3	1.250	1.000	4.280	2.117	2.16	0.118	RNHX 1204 M0E...	○

Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.



Threaded Coupling

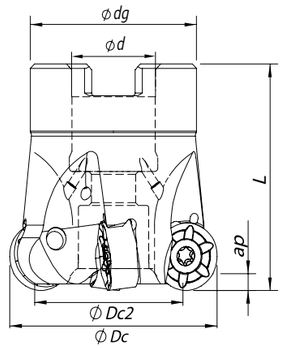
γ_p=+7

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød/M	Ødg	L	lbs	Specifications Ap max (in)	Insert Pastilha Inserto	Stock
181143400	RN90 D1.25-R-M16/1.50-03-12	3	1.250	M16	1.142	1.500	0.35	0.118	RNHX 1204 M0E...	○
181143500	RN90 D1.50-R-M16/1.50-04-12	4	1.500	M16	1.142	1.500	0.44	0.118	RNHX 1204 M0E...	○

Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

TOROMILL RN90-12 NEW

RNHX



Arbor Mounting

γ_p=+7

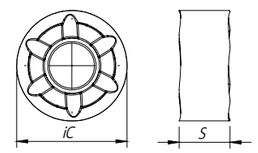
Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	ØDc2	Ød/M	Ødg	L	lbs	Specifications Arbor Type	Ap max (in)	Insert Pastilha Inserto	Stock
181142900	RN90 D1.50-A0.50/1.57-04-12	4	1.500	1.030	0.500	1.300	1.570	0.44	A	0.118	RNHX 1204 M0E...	○
181143000	RN90 D2.00-A0.75/2.00-05-12	5	2.000	1.530	0.750	1.750	2.000	0.55	A	0.118	RNHX 1204 M0E...	○
181143100	RN90 D2.50-A0.75/2.00-06-12	6	2.500	2.030	0.750	1.750	2.000	1.21	A	0.118	RNHX 1204 M0E...	○
181143200	RN90 D3.00-A1.00/2.00-07-12	7	3.000	2.530	1.000	2.189	2.000	1.72	A	0.118	RNHX 1204 M0E...	○

Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

RNHX 1204 M0E... | Inserts | Pastilhas | Plaquitas

RNHX - LP

RNHX - MP



		P					M				K							N		S			H		Dimensions (in)				
		PVD					CVD	PVD			CVD			PVD				UNC	PCD	CVD	PVD		PVD	CBN					
	(2) Grade code	P7	G1	G4	P3	G6	R1	G4	P3	G6	L5	L6	L9	G1	G4	P3	G6	10	D6	R1	P3	G6	P7	D4					
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PH7740	PHM740	PH7920	PH7930	PH7740	PH5705	PH5320	PH5740	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PHM740	PH7930	PH7740	PH7603	PBH910	IC	S	I	F	B
1112030	RNHX 1204 M0E-LP			◎	◎		◎		◎											◎	◎				0.472	0.187	-	-	-
1112052	RNHX 1204 M0E-MP			◎	◎				◎						◎										0.472	0.187	-	-	-

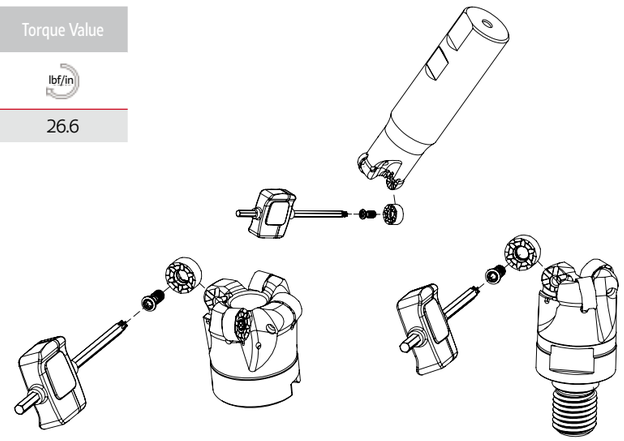
◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción ◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

TOROMILL RN90-12 NEW

SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
			lbf/in
RN90-12 - 1.25-3.00	P0401065	XT15	26.6



GRADES SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance		Toughness →
				PH7920	PH7930	PHM740
P	1	Unalloyed Steel	125-220	✓	✓	
	2	Low-Alloyed Steel	220-280	✓	✓	
	3	High-Alloyed Steel	280-380	✓	✓	
M	4	SS - Ferritic / Martensitic	200-330		✓	✓
	5	SS - Austenitic / Duplex	200-330		✓	✓
	6	SS - Duplex	230-260		✓	✓
K	7	Malleable Cast Iron	130-230	✓		
	8	Grey Cast Iron	180-245	✓		
	9	Nodular Cast iron	160-250	✓		
S	11	Heat Resistant Super Alloys	200-320		✓	✓

Good Conditions
Average Conditions
Difficult Conditions

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance		Toughness →	RNHX... 12	
				PH7920	PH7930	PHM740	fz (in/t)	ap (in)
P	1	Unalloyed Steel	125-220	492-755	427-689	-	0.006-0.02	0.02-0.119
	2	Low-Alloyed Steel	220-280	460-722	394-656	-	0.006-0.02	0.02-0.119
	3	High-Alloyed Steel	280-380	427-591	361-525	-	0.006-0.02	0.02-0.119
M	4	SS - Ferritic / Martensitic	200-330	-	328-394	328-427	0.004-0.014	0.02-0.119
	5	SS - Austenitic / Duplex	200-330	-	263-361	263-394	0.004-0.014	0.02-0.119
	6	SS - Duplex	230-260	-	230-328	230-361	0.004-0.014	0.02-0.119
K	7	Malleable Cast Iron	130-230	-	492-919	-	0.006-0.022	0.02-0.119
	8	Grey Cast Iron	180-245	-	427-755	-	0.006-0.022	0.02-0.119
	9	Nodular Cast iron	160-250	-	263-624	-	0.006-0.022	0.02-0.119
S	11	Heat Resistant Super Alloys	200-320	-	66-263	66-296	0.002-0.012	0.02-0.119

CHIP-BREAKER SELECTION GUIDE

ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application	
				1st choise	Dificult Operations
P	1	Unalloyed Steel	125-220	LP	MP
	2	Low-Alloyed Steel	220-280	LP	MP
	3	High-Alloyed Steel	280-380	MP	-
M	4	SS - Ferritic / Martensitic	200-330	LP	-
	5	SS - Austenitic / Duplex	200-330	LP	-
	6	SS - Duplex	230-260	LP	MP
K	7	Malleable Cast Iron	130-230	MP	-
	8	Grey Cast Iron	180-245	MP	-
	9	Nodular Cast iron	160-250	MP	-
S	11	Heat Resistant Super Alloys	200-320	LP	-

HARDMILL XN90-12 NEW

INSERTS CODIFICATION SYSTEM | Sistema de codificação de pastilhas | Sistema de codificación de insertos

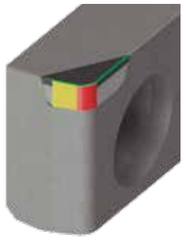
ISO CODE	Insert size	Insert thickness	Insert radius	Cutting edge position angle	Cutting edge relief angle	Cutting edge conditions	Cut direction		Wiper edge lenght (mm)	Máx. Ap (mm)
XNHW	12	05	04	P	Z	F	R	-	015	030

PCD RANGE | Gama de produtos PCD | Rango de productos PCD

XNHW 120504 PZFR-0150045

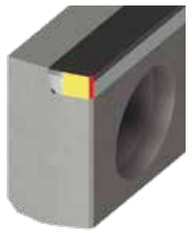
XNHW 120504 PZFR-000080

XNHW 120508 PZFR-015045

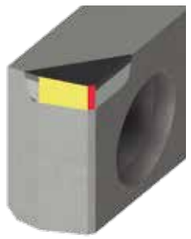


XNHW 120508 PZTR-015045

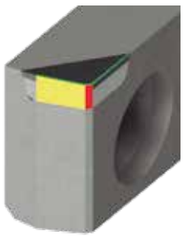
XNHW 120508 PZTR-000080



XNHW 1205 PZFR-020120



XNHW 1205 PZFR-030045



XNHW 1205 PZTR-030045

Cutting edge Type (radius, chamfer)

Wipper cutting edge

Edge Preparation (F, T)

HARDMILL
NEW
PCD | CBN

XNHW 1205 PZFR-020120

NEW

XNHW 120508 PZTR-000080

NEW

XNHW 120508 PZTR-015045

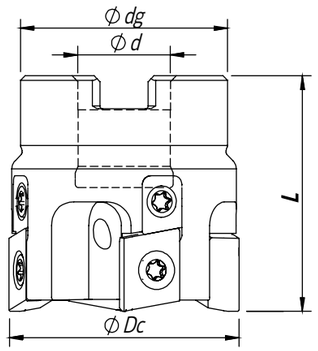
NEW

HARDMILL XN90-12

NEW

Arbor Mounting

γ_p=7



Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in) ØDc	Ød	Ødg	L	lbs	Specifications Arbor Type	N max (in)	Insert Pastilha Inserto	Stock
181143600	XN90 D1.50-A0.50/1.57-04-12	4	1.500	0.500	1.300	1.570	0.66	A	32 000	XNHW 1205...	○
181143700	XN90 D2.00-A0.75/1.57-04-12	4	2.000	0.750	1.750	1.570	0.86	A	32 000	XNHW 1205...	○
181143800	XN90 D2.50-A0.75/1.57-05-12	5	2.500	0.750	1.750	1.570	1.39	A	29 000	XNHW 1205...	○
181143900	XN90 D3.00-A1.00/2.00-06-12	6	3.000	1.000	2.189	2.000	2.64	A	26 000	XNHW 1205...	○
181144000	XN90 D4.00-A1.25/2.00-07-12	7	4.000	1.250	2.750	2.000	4.08	A	24 000	XNHW 1205...	○

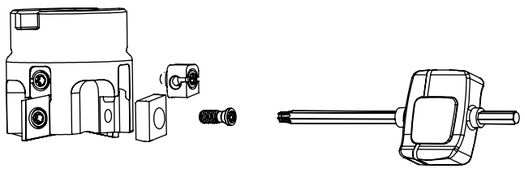
Stock item | Produto de stock | Itens de stock

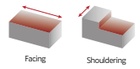
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Inventory maintained. To be replaced by new item. | Iten em stock. Será substituido por novo item | Iten en stock. Será reemplezado por nuevo iten.

SPARE PARTS | Complementos | Complementos

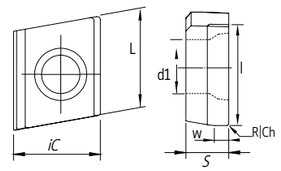
Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
XN90-12 - 1.50-4.00	P0401100 SETDEV AS 04 00	XT15	26.6





XNHW 1205... | Inserts | Pastilhas | Plaquitas

XNHW 1205 PZFR-020120 XNHW 120508 PZTR-000080 XNHW 120508 PZTR-015045



		P		M				K						N			H		Dimensions (in)					
		PVD		CVD	PVD			CBN	UNC	PVD				PCD		UNC	CBN							
	(2) Grade code	P7	G1	R1	G4	P3	G6	D4	10	G1	G4	P3	G6	I3	D6	10	S6	D4						
(1) Geometry code	ISO Reference	PH7603	PH7910	PHM740	PH7920	PH7930	PH7740	PBH910	PH0910	PH7910	PH7920	PH7930	PH7740	PDP403	PDP410	PH0910	PBL603	PBH910	L	S	l	d1	r	W
1112564	XNHW 120504 PZFR-015045													○	○				0.482	0.213	0.177	0.189	0.016	0.059
1112565	XNHW 120504 PZTR-000080													○	○				0.482	0.213	0.315	0.189	0.016	-
1112566	XNHW 120508 PZFR-015045													○	○				0.482	0.213	0.177	0.189	0.031	0.059
1112551	XNHW 120508 PZTR-015045													◎	○				0.482	0.213	0.177	0.189	0.031	0.059
1112552	XNHW 120508 PZTR-000080													◎	○				0.482	0.213	0.315	0.189	0.031	-
1112553	XNHW 1205 PZFR-020120													◎	○				0.482	0.213	0.472	0.189	-	0.079
1112567	XNHW 1205 PZFR-030045							○						○	○				0.482	0.213	0.177	0.189	-	0.118
1112568	XNHW 1205 PZTR-030045							○						○	○				0.482	0.213	0.177	0.189	-	0.118

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

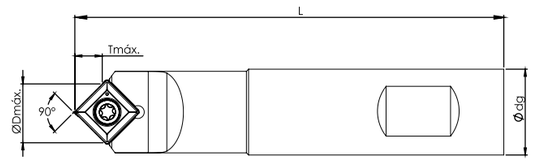
Insert order code = (1) Geometry Code + (2) Grade Code

RECOMMENDED CUTTING CONDITIONS

ISO	Material: Work piece material	Material: Type of treatment / alloy	HB (Brinell)	Vc (sfm) PDP403	Feed fz (in/t) XNHW 1205...
N	Aluminum wrought alloys		80	984 - 13120	0.002 - 0.016
			90	984 - 4920	
	Aluminum cast alloys	< 12% Si	130	984 - 16400	
		< 12% Si	90	984 - 9840	
		> 12% Si	100	984 - 3280	
		brass. red bronze	100	328 - 2296	
		bronze	-	328 - 4920	
		lead-free copper and electrolytic copper	-	984 - 9840	
	Non-metallic materials	thermosetting plastics	-	263-984	
		fibre-reinforced plastics	200-320	263-984	
		hard rubber		263-984	

CENTER & CHAMFER TOOL NEW

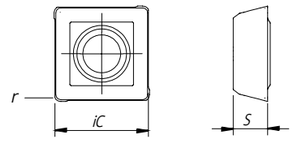
CENTER & CHAMFER TOOL NEW



Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)					lbs	Insert Pastilha Inserto	Stock
			ØMáx.	Tmáx.	Ødg	L	Angle º			
211231600	CHT S.625H N11-45	1	0.512	0.256	5/8	3.937	45	0.322	SOMT 11T308	◎
211231700	CHT S.625M N11-45	1	0.512	0.256	5/8	5.906	45	0.397	SOMT 11T308	○

◎ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta | Disponible bajo consulta
◎ Inventory maintained. To be replaced by new item. | Iten em stock. Será substituído por novo item | Iten en stock. Será reemplazado por nuevo iten.

SOMT 11T308... | Inserts | Pastilhas | Plaquitas



		P					M				K							N		S			H		Dimensions (in)				
		PVD					CVD	PVD			CVD			PVD				UNC	PCD	CVD	PVD		PVD	CBN					
	(2) Grade code	P7	G1	G4	P3	G6	R1	G4	P3	G6	L5	L6	L9	G1	G4	P3	G6	10	D6	R1	P3	G6	P7	D4					
(1) Geometry code	ISO Reference	PH7603	PH7910	PH7920	PH7930	PH7740	PHM740	PH7920	PH7930	PH7740	PH5705	PH5320	PH5740	PH7910	PH7920	PH7930	PH7740	PH0910	PDP410	PHM740	PH7930	PH7740	PH7603	PBH910	iC	S	l	r	F
1112425	SOMT 11T308			◎				◎							◎										0.428	0.144	0.433	0.031	-

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción
◎ Stock item | Produto de stock | Itens de stock
○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

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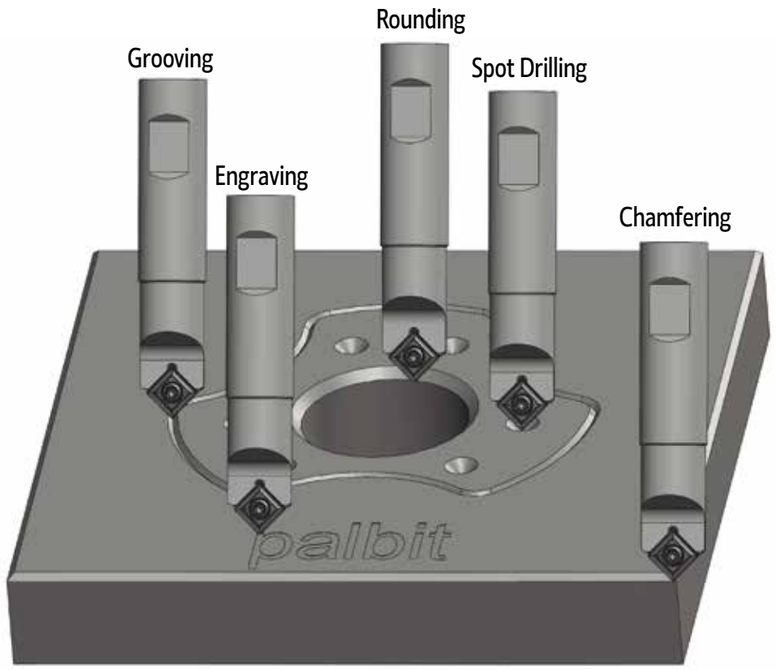
A
MILLING
Overview
News
Face milling
Hifeed milling
Shoulder milling
Profile milling
Hardmill
Center & Chamfer
Spare parts
Technical Data

TOOL SELECTION | Selecção de ferramenta | Selección de herramienta



SPARE PARTS | Complementos | Complementos

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
			lbf/in
CHT S16...	P0350800	XT15	26.6

RECOMMENDED CUTTING CONDITIONS

ISO	PSM	Material	HB (Brinell)	Vc (sfm)	Feed Fz (in/t)
				PH7920	SOMT 11T308
P	1	Unalloyed Steel	125-220	394-492	0.002-0.004
	2	Low-Alloyed Steel	220-280	328-394	0.002-0.003
	3	High-Alloyed Steel	280-380	197-328	0.002-0.003
M	4	SS - Ferritic / Martensitic	200-330	328-492	0.002-0.003
	5	SS - Austenitic / Duplex	200-330	263-394	0.002-0.003
	6	SS - Duplex	230-260	164-296	0.002-0.003
K	7	Malleable Cast Iron	130-230	296-492	0.002-0.004
	8	Grey Cast Iron	180-245	263-394	0.002-0.004
	9	Nodular Cast iron	160-250	230-361	0.002-0.004

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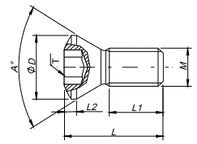
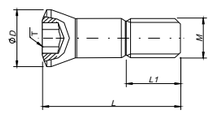
SPARE PARTS | ACESSÓRIOS | ACCESORIOS

INSERT SCREW



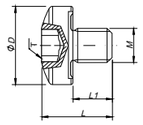
order code	Screw	T (torx)	Dimensions (in)					
			M (mm)	ØD	A°	L	L1	L2
290078800	P0180300	T-GIP	M1.8 x 0.35	0.096	60°	0.134	0.059	0.020
290058400	P0180400	T-GIP	M1.8 x 0.35	0.096	60°	0.146	0.071	0.020
290011300	P0180401	T-6	M1.8 x 0.35	0.108	55°	0.142	0.075	0.016
290031400	P0200500	T-6	M2 x 0.4	0.110	60°	0.185	0.114	0.024
290030600	P0220500	T-7	M2.2 x 0.45	0.126	60°	0.197	0.118	0.024
290033100	P0250503	T-8	M2.5 x 0.45	0.136	60°	0.217	0.110	0.028
290048900	P0250601	T-8	M2.5 x 0.45	0.136	60°	0.236	0.138	0.031
290031300	P0250704	T-8	M2.5 x 0.45	0.136	60°	0.256	0.157	0.028
290009100	P0300800	T-9	M3 x 0.5	0.173	60°	0.291	0.165	0.031
290019900	P0350800	T-15	M3.5 x 0.6	0.217	60°	0.303	0.146	0.039
290027100	P0350902	T-10	M3.5 x 0.6	0.185	60°	0.354	0.217	0.016
290030900	P0350903	T-15	M3.5 x 0.6	0.215	60°	0.354	0.236	0.024
290075200	P0350904	T-15	M3.5 x 0.6	0.189	60°	0.354	0.197	0.031
290005800	P0351200	T-15	M3.5 x 0.6	0.209	60°	0.472	0.315	0.055
119198800	P0400803	T-15	M4 x 0.7	0.217	60°	0.315	0.217	0.039
290048200	P0400900	T-15	M4 x 0.7	0.217	60°	0.354	0.217	0.039
290047500	P0401200	T-15	M4 x 0.7	0.217	60°	0.433	0.236	0.047
290026900	P0451001	T-20	M4.5 x 0.75	0.260	55°	0.413	0.217	0.039
290006700	P0451400	T-20	M4.5 x 0.75	0.283	60°	0.551	0.354	0.039
290017500	P0501100	T-20	M5 x 0.8	0.252	43°	0.433	0.232	0.020
290026200	P0501200	T-20	M5 x 0.8	0.276	55°	0.472	0.228	0.047
290031700	P0501300	T-20	M5 x 0.8	0.276	60°	0.504	0.315	0.051
290078900	P0501302	T-20	M5 x 0.5	0.276	60°	0.512	0.323	0.031
290048300	P0601402	T-20	M6 x 1.0	0.331	60°	0.551	0.354	0.035

INSERT SCREW



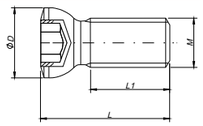
order code	Screw	T (torx)	Dimensions (in)			
			M (mm)	ØD	L	L1
290013900	P0400925	T-15	M4 x 0.5	0.228	0.339	0.138
290010600	P0500925	T-20	M5 x 0.5	0.264	0.374	0.134
290014400	P0501325	T-20	M5 x 0.5	0.295	0.504	0.177
290014000	P0501525	T-20	M5 x 0.5	0.295	0.610	0.177

ADJUSTMENT SCREW



order code	Screw	T (torx)	Dimensions (in)			
			M (mm)	ØD	L	L1
290014200	P0350750	T-15	M3.5 x 0.6	0.315	0.283	0.157

WASHER SCREW

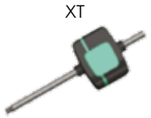


order code	Screw	Dimensions (in)			
		M (mm)	ØD	L	L1
290075600	P0401065	M4 x 0,6	0.224	0.394	0.236
290018500	P0601265	M6 x 1,0	0.354	0.488	0.256
290011000	P0601765	M6 x 1,0	0.354	0.669	0.433
290028400	P0802265	M8 x 1,25	0.433	0.866	0.591

OTHERS

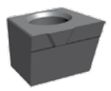
Washer	Order Code	Reference
	290012100	HC01200
	290060200	HC01400
	290002900	HC01800

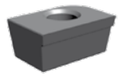
Cartridge Screw	Order Code	Reference
	119169600	D0602096

Torx Keys	Order Code	Reference
XT 	290058600	XT 06IP
	290011400	XT 06
	290012900	XT07
PT 	290011700	XT 08
	290025700	XT 09
	290013100	XT 10
TT 	290012400	XT 15
	290013200	XT 20
	290014800	PT 15
LT 	290014900	PT 20
	290056000	TT 20
	290059500	LT 30

Shim	Order Code	Reference
	212074100	CS130300
	290060400	CT160300
	290060300	CT220300

Spring Pin	Order Code	Reference
	290060600	BE02500
	290060500	BE04000

Wedge (Insert)	Order Code	Reference
	290060900	WA7001
	290061100	WA7003

Wedge (Cartridge)	Order Code	Reference
	290061000	WA7002
	290061200	WA7004

Cartridge	Order Code	Reference
	290060700	KR030450
	290060800	KR040750

Hex Key	Order Code	Reference
SS 	290021200	SS40
TS 	290021300	SS50
	290058700	TS40

Torx Keys	Order Code	Reference	Torx	Lbf/in
	290078300	DT0606IP	6IP	5.3
	290059600	DT0606	6	5.3
	290059700	DT0709	7	8.0
	290059800	DT0812	8	10.6
	290059900	DT0914	9	12.4
	290060000	DT1020	10	17.7
	290047800	DT1530	15	26.6
	290078400	DT2050	20	44.3

Screw for Coolant Supply	Order Code	Reference
	119163000	J0123510
	119163100	J0164110
	119163200	J0204610

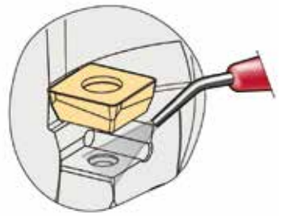
DIN 6368 Wrench	Order Code	Reference
	290058000	SD6368-12
	290058100	SD6368-16
	290058200	SD6368-20

Clamp Set	Order Code	Reference
	290074600	GS40140

PROCEDURES FOR CLAMPING SCREWS

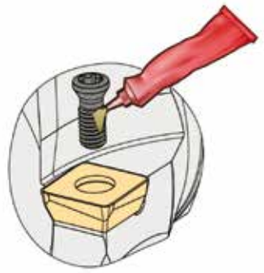
1. Always use a torque wrench to ensure that screws are correctly tightened (please confirm torques data on catalogue). Torque that is too high will negatively affect the performance of the tool and can cause screw and insert breakage. Torque that is too low will cause insert movement, vibration and degrade the cutting result. Dedicated adjustable torque wrench can be ordered separately (please see above).

2. Clean the insert seat.
Make sure that the insert seat is free from dust or chips from the machining. If necessary, clean the insert seat with compressed air.



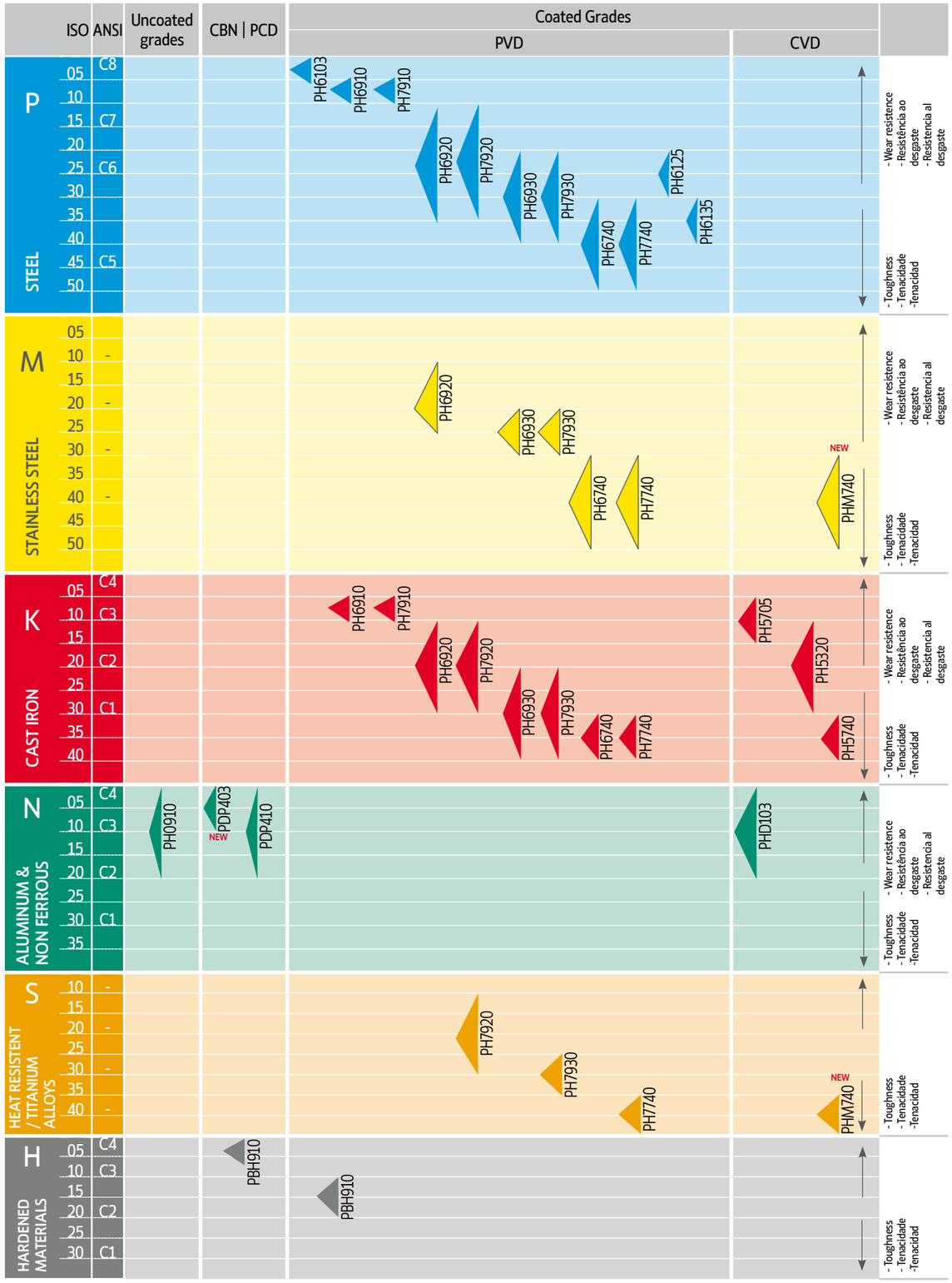
3. Check the insert seat.
Before assembly cutter it is important to ensure that the insert seat has not been damaged during machining or handling.

4. Apply sufficient screw lubrication to prevent seizure. Lubricant should be applied to the screw threads as well as to the screw head face.



5. Replace worn or damaged screws.

MILLING GRADES



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

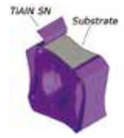
Centre of the field of application

Recommended field of application

PVD GRADES

PH6103

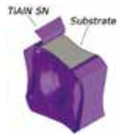
(P01-P05)
(H10-H20)



PVD coated sub micro-grain grade suitable for light finishing operations on steels & hardened steels. This is the first choice for finishing on mould steel.

PH7603

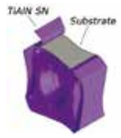
(P01-P05)
(H10-H20)



PVD coated sub micro-grain grade suitable for light finishing operations on steels & hardened steels. This is the first choice for finishing on mould steel.

PH6910

(P05-P10)
(K05-K10)



PVD (TiAlN SN) coated carbide grade with a very hard micro grain substrate for light milling of steels, cast irons and some hardened steels.

PH6920

(P10-P35)
(M10-M25)
(K10-K30)
(S10-S30)

An advanced PVD TiAlN coated grade over atough wear resistance sub-micro substrate for general purpose machining of stainless steels & titanium alloys.

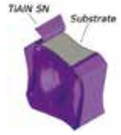
PH6930

(P20-P40)
(M20-M30)
(K20-K40)

Micro-grain carbide grade suitable for applications with instability conditions. Excellent solution for medium cutting speed applications

PH6740

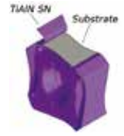
(P30-P50)
(M30-M50)
(K30-K40)



PVD (TiAlN SN) large thickness coated grade for heavy roughing applications. Can work on all type of materials and endures a lot of vibration.

PH6125

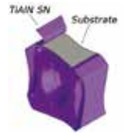
(P20-P30)



PVD coated carbide grade for light to heavy milling (wet and dry) in steel at elevates temperature (e.g. in hardened steels or prehardened steels). Excellent grade to milling of mould steels at high productivity.

PH6135

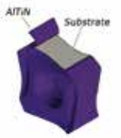
(P30-P40)



PVD coated carbide four toughness demanding operations in milling of steels. Excellent solutions for instable applications and can be apply in wet or dry.

PH7910

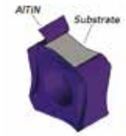
(P05-P10)
(K05-K10)



A highly wear-resistant AlTiN-PVD-coated grade primarily for light machining and semi-finishing in steels and hardened steels.

PH7920

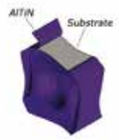
(P10-P35) (S10-S30)
(M10-M25)
(K10-K30)



Advanced AlTiN-PVD coated carbide over a tough wear resistance submicro susbtrate for general puporse machining of steels and cast irons at high cutting speeds.

PH7930

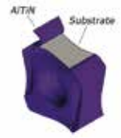
(P20-P40) (S25-S35)
(M20-M30)
(K20-K40)



AlTiN-PVD coated carbide developed to provide better performance in general machining of stainless-steels and high-temp alloys. Resistant to breakage and offer improved wear resistance and increased strength.

PH7740

(P30-P50) (S30-S40)
(M30-M50)
(K30-K40)



Very tough, general-purpose AlTiN-PVD coated carbide grade for medium to heavy milling applications and on instable conditions.
Recomended for high-temp alloys, all steels and cast irons. Can be used either wet or dry.

MILLING GRADES | Graus de fresagem | Calidades de fresado

CVD GRADES

PH5705

(K05-K15)

MT-CVD coated carbide grade with a hard substrate and very smooth surface. Ideal for high speed cutting of cast irons.

PH5740

(K30-K40)

Substrate grade binary (Wc & Co) with medium grain size combined with the medium temperature coating. Suitable for heavy roughing to roughing operations of cast irons with interruped cut at medium to low cutting speeds.

PH5320

(K10-K30)

MT-CVD coated carbide grade with fine substrate. ideal for medium to high speed cutting of cast irons.
Can be used wet or dry.

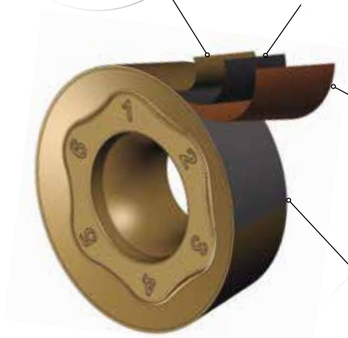
NEW

TiBN

Due to its high hardness. considerable mechanical strength and good wear resistance, it is well suited to be used as a protective coating for cutting tools

Al2O3

High-strength alumina coating. The top surface is smooth and doesn't stick to the chip.



Ti (C.N)

Fine grain TiCN (titanium carbide) coating with columnar structure which is hard and wear resistant against abrasive wear.

SUBSTRATE

Cemented-carbide substrate that combines high strength with reliable toughness.

PHM

NEW GRADE

PHM740

M30-40

S30-S40

A new MT-CVD coated carbide grade for medium to heavy milling applications on instable conditions.
Recomended for high-temp alloys and stainless steel materials.
Can be used either wet or dry.

CUBIC BORON NITRITE

PBH910

(H01-H05)

Cubic Boron Nitride grade for finishing of hardened steel and cast iron.

CRYSTALLINE DIAMOND

PHD103

(N05-N15)

Carbide with highly abrasion-resistant diamond coating for graphite machining.

POLYCRYSTALLINE DIAMOND

PDP410

(N01-N20)

Polycrystalline diamond grade for finishing and semi finishing of non-ferrous metallic materials. It is a excellent solution for aluminum alloys with low content of Si.

PDP403

(N01-N10)

Polycrystalline diamond grade for finishing and semi finishing of non-ferrous metallic materials. It is a excellent solution for aluminum alloys with high content of Si.

UNCOATED CARBIDE GRADE

PH0910

(K01-K10)
(N01-N20)

Uncoated carbide micro-grain grade combining a good abrasive wear resistance and toughness. Suitable for rough to finish operations of HRSA, Titanium alloys, Cast irons and Aluminum alloys.

COMPARATIVE GRADES CHART | Tabela comparativa de graus | Tabla de comparación de calidad

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

ISO	Material	Palbit	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Hitachi	Walter	Kyocera	Taegutec	Dijet	Ceratizit
P STEEL	P01	**PH7603 PH6103**	GC1010	KC505M KC510M KC515M	IC903				ATH80D JP4105			TT2510 TT5505	JC8003	
P STEEL	P10	**PH7910 PH6910**	GC1010 GC1025	KC505M KC510M KC515M KC610M KC715M	IC903 IC907 IC950 IC908 IC910 IC380 IC900	CP200 TS2001	MP6120 VP15TF	ACP200	ATH80D PN08M ATH10E PN15M JP4105 JP4115 JP4120	WHH15 WXM15	PR830 PR1225 PR1230 PR1525	TT2510 TT5505 TT5515 TT7080	JC8003 JC8015 JC5015 JC5118	
P STEEL	P20	**PH7920 PH6920 PH6125**	GC1025 GC1030 GC2030	KC522M KC525M KC527M KC530M KC610M KC620M KC635M KC715M KC720M KC730M	IC907 IC950 IC908 IC910 IC380 IC900 IC830 IC928 IC1008	CP250 TS2500	MP6120 VP15TF MP6130 UP20M VP20RT	ACP200 ACP300	JP4120 JS4045 CY250	WHH15 WXM15	PR830 PR1225 PR1230 PR1525	TT2510 TT5505 TT5525 TT7080 TT9030 TT9080	JC8015 JC5015 JC5118 JC5040	CTP1235 CTP1625
P STEEL	P30	**PH7930 PH6930 PH6135**	GC1025 GC1125	KC525M KC527M KC530M KC537M KC610M KC620M KC720M KC725M KC730M KC735M	IC907 IC950 IC908 IC910 IC380 IC900 IC830 IC928 IC1008	MP3000 F25M F30M F40M	MP6120 VP15TF MP6130 UP20M VP20RT VP30RT	ACP200 ACP300	JS4045 CY250 JM4160	WSP45 WSP46	PR830 PR1225 PR1230 PR1525	TT5525 TT7080 TT8020 TT8080 TT9030 TT9080	JC5118 JC5040 JC8050 JC7560	CTP1235 CTP1625 CTP2235
P STEEL	P40	**PH7740 PH6740**		KC537M KC720M KC725M KC735M	IC830 IC928 IC1008	MP3000 F40M T60M	VP30RT	ACP300	JM4160	WSP45 WSP46		TT8020	JC5118 JC5040 JC8050 JC7560	CTP1235 CTP2235
M STAINESS STEEL	M01		GC1010		IC907 IC903			ACM100 ACK300	PCS08M					
M STAINESS STEEL	M10	**PH7910 PH6910**	GC1010 GC1025 GC1030 GC2030	KC515M KC610M KC635M KC720M	IC907 IC903		VP15TF	ACM100 ACK300 ACP300	PCS08M CY150	WXM15	PR830 PR1225 PR1525 PR1535			
M STAINESS STEEL	M20	**PH7920 PH6920**	GC1025 GC1030 GC1040 GC2030	KC522M KC525M KC530M KC610M KC635M KC720M KC730M	IC380 IC900 IC908 IC928 IC1008	MP3000 MS2050 F25M F30M	VP15TF MP7130 MP7030 UP20M VP20RT	ACM300 ACP300	CY150 CY250	WXM15 WSM35 WSM36	PR830 PR1225 PR1525 PR1535	TT8020 TT8080	JC8015 JC5015 JC5118	CTP1235 CTP1625
M STAINESS STEEL	M30	**PH7930 PH6930 PH6135**	GC1040 GC2030	KC522M KC525M KC530M KC537M KC725M KC730M KC735M	IC380 IC900 IC908 IC928 IC1008 IC328 IC330	MP3000 MS2050 F30M F40M	VP15TF MP7130 MP7030 UP20M VP20RT MP7140 VP30RT	ACM300	CY250 JM4160	WSM35 WSM36 WSP45 WSP46	PR830 PR1225 PR1525 PR1535	TT8020 TT8080	JC8015 JC5015 JC5118 JC8050 JC7560	CTP1235 CTP2235
M STAINESS STEEL	M40	**PH7740 PH6740**	GC1040	KC725M	IC1008 IC328 IC330	MS2050 F40M	MP7140 VP30RT	ACM300	JM4160	WSM35 WSM36 WSP45 WSP46	PR1225 PR1525 PR1535	TT8020	JC5015 JC5118 JC8050 JC7560	CTP2235
K CAST IRON	K01		GC1010		IC380 IC900		MP8010		ATH80D JP4105		PR1510	TT6080	JC8003	AMZ
K CAST IRON	K10	**PH7910 PH6910**	GC1010 GC1020	KC514M KC515M KC520M KC620M	IC380 IC900 IC810 IC910	MK2050	MP8010 VP15TF		ATH80D JP4105 JP4120 CY150	WHH15 WXM15 WKK25	PR1210 PR1510	TT6080	JC8015	AMZ CTP3220 CTP6215
K CAST IRON	K20	**PH7920 PH6920**	GC1020	KC514M KC520M KC522M KC524M KC527M KC610M KC620M KC635M	IC810 IC910 IC950 IC350 IC830 IC928	MK2050	MP8010 VP15TF VP20RT	ACK300	JP4120 CY150 CY250	WHH15 WXM15 WKK25	PR1210 PR1510		JC8015 JC5015	CTP3220 CTP1625
K CAST IRON	K30	**PH7740 PH6740**		KC522M KC524M KC527M KC537M KC610M KC620M KC635M	IC830 IC928 IC1008 IC808 IC908	MK2050	VP15TF VP20RT	ACK300	CY250	WKK25	PR1510		JC8015 JC5015	

COMPARATIVE GRADES CHART | Tabela comparativa de graus | Tabla de comparación de calidad

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

ISO Material		Palbit	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Hitachi	Walter	Kyocera	Taegutec	Dijet	Ceratizit
N ALUMINUM	N01			KC410M KC510M KC5410								TT6080		AMZ
N ALUMINUM	N10		GC1025 GC1030	KC410M KC510M KC5410 KC620M				DL1000	SD5010 HD7010	WXN15		TT6080 TT8020		AMZ
N ALUMINUM	N20		GC1025 GC1030	KC422M KC620M		F15M	LC15TF	DL1000	SD5010 HD7010	WXN15		TT8020		
S HEAT RESISTENT / TITANIUM ALLOYS	S01		GC1010	KC510M	IC808 IC907 IC908			ACM100 ACK300			PR905 PR1210 PR1535		JC8003 JC8015	AMZ
S HEAT RESISTENT / TITANIUM ALLOYS	S10	**PH7910** **PH6910**	S30T GC1010 GC1030 GC2030	KC510M KC610M	IC808 IC907 IC908 IC903	MS2050	MP9120 VP15TF MP9130 MP9030	ACM100 ACK300	PTH13S JS1025		PR905 PR1210 PR1535	TT9030 TT9080 TT8080	JC8003 JC8015 JC5015 JC5118	AMZ CTP1625
S HEAT RESISTENT / TITANIUM ALLOYS	S20	**PH7920** **PH6920**	S30T GC1030 GC1040 GC2030 GC2040	KC522M KC525M KC610M	IC300 IC900 IC830 IC928	MS2050 F40M	MP9120 VP15TF MP9130 MP9030	ACM300	PTH13S JS1025	WSM35 WSM36	PR905 PR1210 PR1535	TT8080 TT8020	JC8015 JC5015 JC5118 JC8050 JC7560	CTP1235 CTP1625
S HEAT RESISTENT / TITANIUM ALLOYS	S30	**PH7930** **PH6930**	S30T GC1040 GC2040	KC522M KC525M KC725M	IC830 IC928	MS2050 F40M	MP9130 MP9030	ACM300		WSM35 WSM36 WSP45 WSP46	PR1535	TT8020	JC5118 JC8050 JC7560	CTP1235 CTP2235
S HEAT RESISTENT / TITANIUM ALLOYS	S40	**PH7740** **PH6740**	GC2040 S40T GC1040	KC725M	IC830 IC928	MS2050 F40M				WSP45 WSP46			JC5118 JC8050 JC7560	
H HARDENED MATERIAL	H01	**PH7603** **PH6103**	GC1010	KC510M	IC903		MP8010					TT2510 TT5505	DH102 JC6102 JC8003 JC8008	
H HARDENED MATERIAL	H10	**PH7603** **PH6103** **PH7910**	GC1010 GC1025 GC1030	KC505M KC510M KC635M	IC903 IC808 IC907 IC908	MH1000 F15M	MP8010 VP15TF		PTH08M JP4105	WHH15		TT5515 TT6080	JC6102 JC8003 JC8008 JC8015 JC5118	CTP6215
H HARDENED MATERIAL	H20		GC1025 GC1030	KC635M	IC808 IC907 IC908 IC380 IC900	F15M	VP15TF		JP4105	WHH15		TT5515 TT6080	JC8015 JC5118	CTP6215
H HARDENED MATERIAL	K10				IC380 IC900 IC1008	MP3000 F30M								

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

ISO Material		Palbit	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Hitachi	Walter	Kyocera	Taegutec	Dijet	Ceratizit
M STAINESS STEEL	M10		GC2015	KCPM20	IC9250 IC520M IC9350			ACM200					JC730U	
M STAINESS STEEL	M20		GC4230	KCPM20 KCPM30 KC927M	IC9250 IC520M IC9350 IC4050 IC635	MP2500 T350M T25M	F7030	ACM200			CA6535	TT7800	JC730U	CTC5235 GM226+
M STAINESS STEEL	M30	**PHM740**	GC2040 GC4230 GC4240 S40T	KCPM30 KC927M	IC9350 IC4050 IC635	MP2500 T350M T25M	F7030	ACM200	GX2160		CA6535	TT7800	JC730U	CTC5235 CTC5240 GM226+ GM246 GM43+
M STAINESS STEEL	M40	**PHM740**	GC2040 GC4240 S40T		IC635	In4500 T350M			GX2160		CA6535			CTC5235 CTC5240 GM246 GM43+
K CAST IRON	K01	**PH5705**		KC907M	IC8080 IC4100 IC5100 IC9150		MC5020	ACK200		WKP15	CA420M		JC605W	CTC3215
K CAST IRON	K10	**PH5705**	GC3220	KC907M KC914M KC917M KC924M KCK15	IC8080 IC4100 IC5100 IC9150 IC9080 IC520M	MK1500	MC5020	ACK200	GX2120	WKP15 WKP25	CA420M	TT6800	JC605W JC608X JC610	CTC3215 SR216 SR226+
K CAST IRON	K20	**PH5320**	GC3220 GC3330 GC3040 GC4220 GC4230	KC917M KC924M KCK15 KCPM20 KCPK30 KC927M	IC5100 IC9150 IC9080 IC520M IC4050	MK1500 MP1500	MC5020	ACK200	GX2120 GX2140	WKP15 WKP25 WKP35 WKP35S	CA420M	TT6800	JC605W JC608X JC610	SR216 SR226+
K CAST IRON	K30	**PH5740**	GC3330 GC3040 GC4220 GC4230 GC4240	KCPM20 KCPK30 KC927M	IC520M IC4050	MK1500 MP1500	MC5020		GX2140	WKP25 WKP35 WKP35S			JC610	

UNCOATED GRADES | GRAUS NÃO REVESTIDOS | GRADOS SÍN RECUBRIMIENTO

ISO Material		Palbit	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Hitachi	Walter	Kyocera	Taegutec	Dijet	Ceratizit
N ALUMINUM	N01	**PH0910**	H10	K115M KC313	IC20		HTi 10	H1 G10E	PCS08M CY100H		PCS08M CY100H			H210T
N ALUMINUM	N10	**PH0910**	H13A H10F	K115M KC313	IC08	H15	HTi 10	H1 G10E	PCS08M CY100H CY10H	WK10	PCS08M CY100H CY10H	K10 UF10		H210T
N ALUMINUM	N20	**PH0910**	H13A H10F	K125M	IC08 IC28	HX H15 H25	HTi 10					K10		H216T

CUTTING DATA CALCULATION

Cálculo de condições de corte | Cálculo de datos de corte

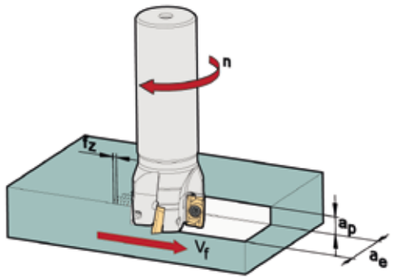
Formulas

Spindle Speed (rev/min)

$$n = \frac{v_c \cdot 12}{\pi \cdot D_c}$$

Cutting Speed (sfm)

$$v_c = \frac{n \cdot \pi \cdot D_c}{12}$$



Feed Speed (inch/min)

$$v_f = n \cdot Z_n \cdot f_z$$

Feed per Revolution (inch/rev)

$$f = Z_n \cdot f_z$$

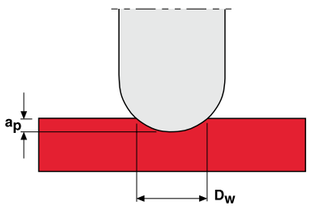
Feed per Tooth (inch/tooth)

$$f_z = \frac{v_f}{n \cdot Z_n}$$

Metal removal Rate (cc/min)

$$Q = a_e \cdot a_p \cdot v_f$$

Cutting Speed and Spindle Speed for Copying



$$v_c = \frac{n \cdot \pi \cdot D_w}{12} \quad \text{(inch/min)}$$

$$n = \frac{v_c \cdot 12}{\pi \cdot D_w} \quad \text{(RPM)}$$

$$D_w = 2 \cdot \sqrt{a_p (D_c - a_p)} \quad \text{(inch)}$$

Nomenclature

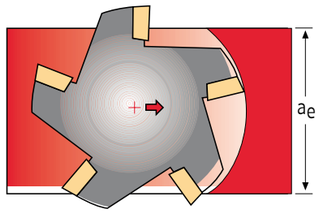
a_e	- Width of cut inch/radial depth of cut	(inch)
a_p	- Depth of cut inch/radial depth of cut	(inch)
D_c	- Cutter diameter	(inch)
f	- Feed per Revolution	(inch/rev)
f_z	- Feed per Tooth	(inch/tooth)
n	- Spindle Speed	(rev/min)
Q	- Material removal Rate	(cc/min)
V_c	- Cutting Speed	(sfm)
V_f	- Feed Speed	(inch/min)
Z_n	- Nº of theeth	

POWER REQUIREMENT CALCULATION

Cálculo de potência requerida | Cálculo del requerimiento de potencia

Calculating the power demand

$$P_c = \frac{a_p \times a_e \times v_f}{396{,}000 \times \eta} \cdot k_c$$



P_c - Power (kW)
a_p - Depth of cut (inch)
a_e - Width of cut (inch)
v_f - Feed speed (inch/min)
η - Efficiency
k_c - Cutting force per inch² (Lbf/inch²)

Calculating average chip thickness (h_m) and cutting force per inch² (k_c)

$$h_m = \frac{360 \times f_z \times a_e}{\pi \times Dc \times \omega_e} \cdot \sin k_r$$

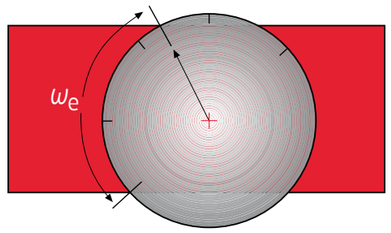
h_m - Average chip thickness (inch)
f_z - Feed per tooth (inch/tooth)
D_c - Cutter diameter (inch)
ω_e - Engagement angle
k_r - Lead angle

$$k_c = \frac{1}{\left(\frac{h_m}{0.04}\right)^{m_c}} \cdot k_c x$$

m_c* - Exponent
$k_c x$* - Cutting force for 0.04 inch chip thickness (Lbf/inch²)

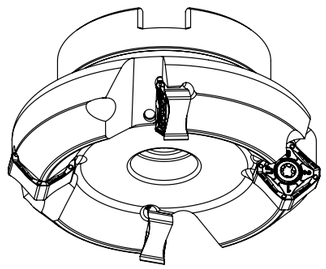
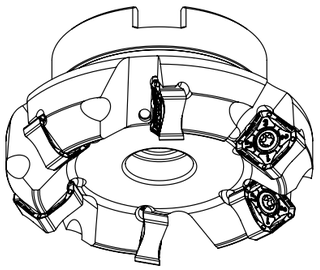
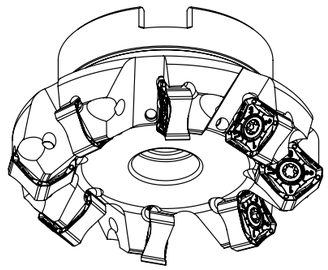
* Please see these values on page 405.

Engagement angle



Engagement a_e / D_c	Engagement angle ω_e
70%	89º
100%	180º

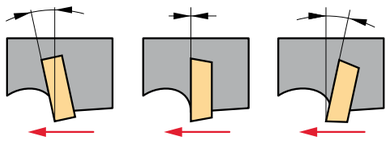
Engagement a_e / D_c	Engagement angle ω_e
5%	26º
10%	37º
75%	60º

Coarse Pitch Type	Normal Pitch Type	Fine Pitch Type
First choice for cutting aluminum (long-chipping material - ISO N). First choice for unstable operations due to lowest cutting forces. Smoth cutting allows longer overhang applications. First choice for deep cutting and high feed rates.	First choice for roughing in stable conditions. Good productivity. Good chip space for roughing in steels. stainless steel and super alloys. First choice for shallow cutting with low feed rates.	First choice for cast iron. First choice for high productivity with low width of cut (Ae). Roughing in super alloys materials in combination with round inserts. For cutting operations where chip dischange volume is small and high table feed is desired.
		

Standard Inserts

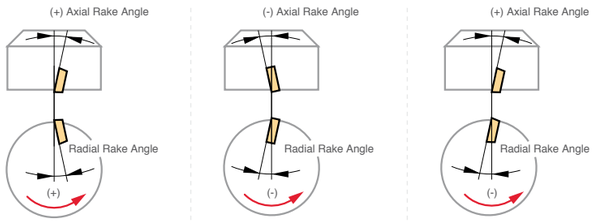
Positive and Negative Rake Angle

- Insert shape whose cutting edge precedes is a positive rake angle.
- Insert shape whose cutting edge follows is a negative rake angle.



Negative Rake Angle | Neutral Rake Angle | Positive Rake Angle

Standard Cutting Edge Shape

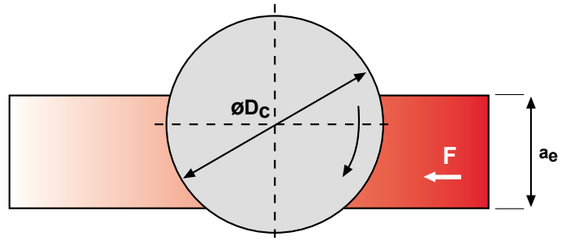


	Standard Cutting Edge Combinations	Double Positive (DP Edge Type)	Double Negative (DN Edge Type)	Negative/Positive (NP Edge Type)
	Axial Rake Angle γ_p	Positive (+)	Negative (-)	Positive (+)
	Radial Rake Angle γ_f	Positive (+)	Negative (-)	Negative (-)
	Insert Used	Positive Insert (One Sided Use)	Negative Insert (Double Sided Use)	Positive Insert (One Sided Use)
Work Material	Steel	✪	-	✪
Work Material	Cast Iron	-	✪	✪
Work Material	Aluminum Alloy	✪	-	-
Work Material	Hardened Materials	✪	-	✪

Choosing Cutter Diameter

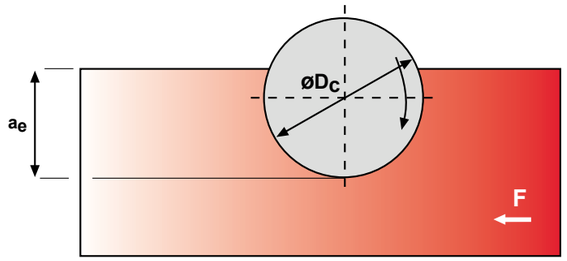
The Best Cutter Diameter (ØDc) should be selected upon the workpiece dimensions

$D_C \cong 1.3 - 1.5\ a_e$



If the machine power is limited or the workpiece is too wide, select a cutter diameter that takes more than two passes or that matches the power of machine. When the appropriate cutter diameter is not available, proper cutter position will give good results.

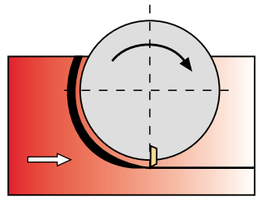
$a_e = 3/4\ D_C$



Cutter Position

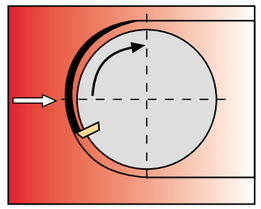
Conventional Milling (Up Milling)

The feed direction of the workpiece is opposite to that of cutter rotation. The chip thickness starts at zero and increases to the maximum at the end of cut. In Up Milling, the insert wear is severe with excessive friction and high temperature caused by the rubbing or burnishing effect in the insert.



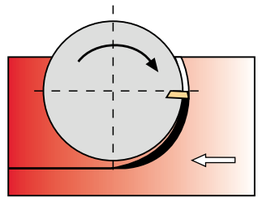
Channel Milling (Up and Down Milling)

The cutter position is in the middle of the workpiece and the cutting force is alternately changed in the radial direction. It causes vibration when the spindle structure is weak. Channel Milling is a combination of conventional and climb milling. When Channel Milling is necessary use positive geometry cutters at reduced speeds and feeds with coolant.



Climb Milling (Down Milling)

Climb Milling is normally recommended.
The feed direction of workpiece is the same as that of cutter rotation. So the chip thickness starts from the maximum and decreases to zero at the end of cut. The tool life is long with less heat and minimum work hardening of workpiece.



EDGE WEAR

Corrective action
- *Increase feed rate*
- *Reduce cutting speed*
- *Use more wear resistant grade*
- *Apply coated grade*

DESGASTE DA ARESTA

Possível solução
- Aumentar o avanço
- Reduzir a Vc
- Usar grau mais resistente ao desgaste
- Aplicar grau revestido

DESGASTE DEL FLANCO

Solución posible
- Aumentar el avance
- Reduzca la velocidad de corte
- Seleccione una calidade más resistente al desgaste
- Utilice metales duros recubiertos

HEAT DEFORMATION (UPSET)

Corrective action
- *Reduce cutting speed*
- *Reduce feed*
- *Reduce depth of cut*
- *Use grade with higher hot hardness*

DEFORMAÇÃO ARESTA

Possível solução
- Reduzir a Vc
- Reduzir o avanço
- Reduzir a profundidade corte
- Usar grau com maior dureza a quente

DEFORMACIÓN PLÁSTICA

Solución posible
- Reduzca la velocidad de corte
- Reduzca el avance
- Seleccione una calidade más resistente al desgaste
- Reduzca el ap

THERMAL CRACKING

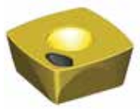
Corrective action
- *Properly apply coolant*
- *Reduce cutting speed*
- *Reduce feed*
- *Apply coated grade*

FENDAS TÉRMICAS

Possível solução
- Aplicação correcta do fluido de corte
- Reduzir a Vc
- Reduzir o avanço
- Aplicar grau revestido

FISSURAS TÉRMICAS

Solución posible
- Preste atención al uso del refrigerante
- Reduzca la velocidad de corte
- Reduzca el avance
- Utilice metales duros recubiertos



CRATER

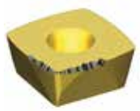
Corrective action
- *Reduce feed rate*
- *Reduce speed*
- *Apply coated grades*
- *Utilize coolante*

CRATERA FACE ATAQUE

Possível solução
- Reduzir o avanço
- Reduzir a Vc
- Aplicar grau revestido
- Usar fluido de corte

DESGASTE DE CRÁTER

Solución posible
- Reduzca el avance
- Reduzca la velocidad de corte
- Utilice metales duros recubiertos
- Preste atención al uso del refrigerante



CHIPPING

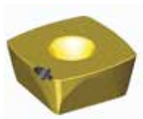
Corrective action
- *Utilize stronger grade*
- *Consider edge preparation*
- *Check rigidity of system*
- *Increase lead angle*

ESMILHAMENTO

Possível solução
- Usar grau mais resistente
- Considerar a preparação da aresta
- Verificar a rigidez do sistema
- Aumentar o ângulo de ataque

FILOS ASTILLADOS

Solución possible
- Seleccione una calidade más resistente al desgaste
- Utilice un inserto con una geometria de filo de corte más estable
- Modifique el ángulo de posicion
- Modifique la geometria de rompevirutas



DEPTH-OF-CUT NOTCHING

Corrective action
- *Change lead angle*
- *Consider edge preparation*
- *Apply different grade*
- *Adjust feed*

FRACTURA

Possível solução
- Alterar o ângulo de ataque
- Considerar a preparação da aresta
- Aplicar outro grau
- Ajustar o avanço

DESGASTE POR ENTALLA

Solución posible
- Escoja un ángulo de posición mas pequeño
- Ajuste el avance
- Cambie de calidad
- Utilice un inserto con una geometria de filo de corte más estable

BUILT-UP EDGE

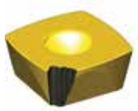
Corrective action
- *Increase cutting speed*
- *Increase feed rate*
- *Apply PVD coated grades*
- *Utilize coolant*
- *Edge preparation (smaller hone)*

ARESTA POSTIÇA CORTE

Possível solução
- Aumentar a Vc
- Aumentar o avanço
- Aplicar grau revestido
- Usar fluido de corte
- Reduzir boleamento

FILOS RECRECIDOS

Solución posible
- Aumente la velocidad de corte
- Aumentar el avance
- Utilice metales duros recubiertos
- Aplique refrigerante con mayor concentración de aceite
- Seleccione una geometría de corte positiva



CATASTROPHIC BREAKAGE

Corrective action
- *Utilize stronger grade / geometry*
- *Reduce feed rate*
- *Reduce depth of cut*
- *Check rigidity of system*
- *Examine edge prep / nose radius*

FRACTURA CATASTRÓFICA

Possível solução
- Aplicar grau / geometria mais resistente
- Reduzir o avanço
- Reduzir a profundidade de corte
- Aplicar grau revestido
- Usar fluido de corte

ROTURA DE INSERTO

Solución posible
- Seleccione un material más tenaz
- Utilice insertos más robustos con ángulos de arista más grandes
- Selecione una geometria de rompe virutas para secciones de corte más amplias
- Reduzca en avance

PROBLEMS / PROBLEMAS I PROBLEMAS	Possible causes and areas of investigation Causas possíveis e áreas de intervenção Possibles causas y las áreas intervención	cutting speed | velocidade de corte | velocidad corte	feed | avanço | avance	depth-of-cut | profundidade de corte | profundidad de corte	grade | grau da pastilha | calidad inserto	coolant | óleo de corte | refrigerante	rake angle | ângulo de ataque | ángulo de posición	edge preparation | preparação da aresta | preparación del filo	material (type / condition) | material (tipo / condições) | material	center height | altura do centro | altura al centro	geometry (insert) | geometria da pastilha | geometría del inserto	insert finish | acabamento na pastilha | acabado del inserto	insert thickness | espessura da pastilha | espesura inserto	nose radius | raio de canto | radio punta	lead angle | ângulo da aresta de ataque | ángulo filo corte	holder (type / condition) | suporte (tipo / condições) | soporte (condiciones)	machine condition | estado do equipamento - torno | condición de maquina	chip flow direction | direcção de fluxo da apara | dirección de la viruta	horsepower | potência | fuerza	excessive overhang | excessivo comprimento livre da ferramenta | sobresaliendo ausiamento excesivo	spindle bearings | rolamentos do eixo | cojinetes del husillo	turret | torreta | torreta	machine anchored | fundações da máquina | anclajes de la maquina	workholding | fixação da peça | sujeción pieza	rigidity | rigidez | estabilidad	chatter | vibração | vibraciones
• UNACCEPTABEL CHIPS • APARA DESADEQUADA • VIRUTA INACEPTABLE	• stringer / ribbons (light silver colo) • demasiado longas (cor de prata suave) • mucho larga (color plata suave)	P↑	P↑	◎		◎	◎	◎	◎		P			◎	◎			◎								
	• corrugated / tight (dark blue or black color) • ondulado / firme (cor azul escuro ou preto) • corrugado / firme (azul / negra)	◎	P↓	◎	◎	◎	◎	◎	◎		P			◎	◎											
• WORKPIECE CONCERNS • MATERIAL • MATERIAL	• finish / rms tolerance • tolerância e rugosidades	P	P	◎	◎	◎	◎	◎	◎	◎		◎		P			◎	◎								
	• interrupted cuts • corte interrompido	P↑	P↓	P↓	◎		◎	◎	◎		◎		◎	◎	↑		◎		◎	◎	◎			◎	◎	◎
• MACHINE CONCERNS • MÁQUINA FERRAMENTA • MAQUINA HERRAMIENTA	• areas of investigation • áreas de intervenção	◎	◎	◎	◎	◎				◎							◎		◎	◎	◎	◎	◎	◎	P	
• INSERT FAILURE MODES • MODOS DE RUÍNA DA PASTILHA • RUÍNA DEL INSERTO	• edge wear • desgaste da aresta • desgaste de flanco	P	P	◎	P	◎				◎																
	• heat deformation (upset) • deformação plástica • deformación plástica	P↓	P↓	P↓	◎	◎	◎							◎	◎											
	• thermal cracking • fendas térmicas • fissuras térmicas	◎	◎	◎	P	P	◎							◎												
	• crater • cratera na face de ataque • desgaste de cráter	P↓	P↓		◎	◎	◎				◎							◎								
	• chipping • esmilhamento • filos astillados	◎	◎		P	◎	◎	P	◎	◎	◎		◎	◎	◎	◎	◎							◎	◎	◎
	• depth-of-cut notching • fractura • desgaste por entalla	◎	◎		◎		◎	◎	P				◎	P												
	• built-up edge • aresta postiça de corte • filos recrescidos	P↑	P↑		PVD	◎	◎	P	P	◎	◎	◎														
	• catastrophic breakage • fractura catastrófica • rotura de inserto	◎	◎	◎	◎	◎	◎	◎	◎		◎		◎	◎	◎	◎	◎			◎				◎	P	P

↑↓ *Arrows indicate direction of adjustment* | As setas indicam a direcção do ajustamento I Las flechas indican la dirección de ajuste

P *Indicate areas of primary investigation* | Indica as áreas de primeira intervenção I Indica las áreas de intervención primaria

DRILLING

B

DRILLS CODE KEY | Sistema de codificação para brocas | Sistema de codificación para brocas

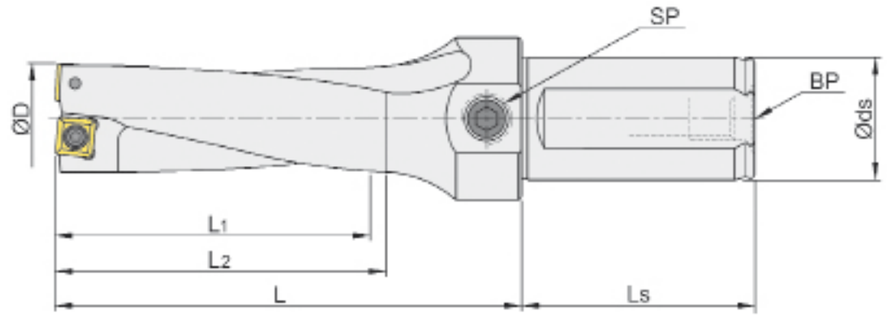
SCI	0750	0531	3D
Drill group	Shank diameter: ø0.750	Drilling diameter; ø0.531	Drilling depth: Dia x 3

MDO	085090	27
Drill group	Drilling diameter; ø85 TILL ø90	Shank diameter: ø27

MDS	32	115	130
Drill group adapter	Shank diameter: ø32	Flute lenght: 115mm	Shank diameter for MDO: ø13

MDE	13	115	280
Drill group adapter	Shank diameter: ø13	Flute lenght: 115mm	Shank diameter for MDO: ø28

NOMENCLATURE | Nomenclatura | Nomenclatura



ØD - Drill diameter	L - Length	L1 - Cut length	SP - Side plug
Øds - Shank diameter	Ls - Shank Length	L2 - Safety cut length	BP - Back plug

COOLANT SUPPLY | Furos de refrigeração | Agujeros de refrigeración

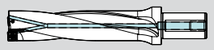
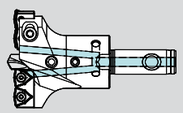
New version / Standard version *

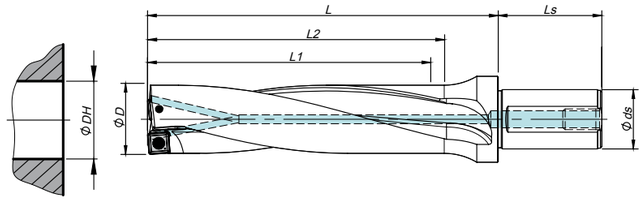
Type	BP	SP
SCI	✓ / ✓	✗ / ✓
MDS	✓ / ✓	✓ / ✓

BP - Back Plug
SP - Side Plug
✗ - Not Available
✓ - Available

* The new Drill version will replace the standard version when this type will be sold out.

OVERVIEW | Vista genérica | Información general

	Diameter (in)									
	0.118	0.472	0.787	1.260	1.969	2.362	2.756	3.150	4.331	... 7.087
Jet Drills			SCI Drill (3D-4D)  L1 max = 7.752 in							
Vortex Drills						Vortex Drill  L1 max = 900 mm				



Øds	Ls	BP / SP
0.750	1.969	1/8 - 27 NPT
1.000	2.205	1/8 - 27 NPT
1.250	2.362	1/4 - 18 NPT
1.500	2.756	1/4 - 18 NPT

ØDH tolerance (in)	
ØD	3D
0.531 - 0.844	-0.004 / +0.006
0.875 - 1.938	-0.005 / +0.008

Order separatly

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Insert (ISO)	Screw	Torx key	Stock
		ØD	Ø ds	L1	L2	L				
184197900	SCI 07500531-3D	0.531	0.750	1.593	1.693	2.756	SPKX 050204	P0200500	XT06	○
184198000	SCI 07500563-3D	0.563	0.750	1.689	1.811	2.874	SPKX 050204	P0200500	XT06	○
184198100	SCI 07500594-3D	0.594	0.750	1.782	1.890	2.953	SPKX 050204	P0200500	XT06	○
184198200	SCI 10000625-3D	0.625	1.000	1.875	2.008	3.189	SPKX 060204	P0220500	XT07	○
184198300	SCI 10000656-3D	0.656	1.000	1.968	2.087	3.268	SPKX 060204	P0220500	XT07	○
184198400	SCI 10000688-3D	0.688	1.000	2.064	2.165	3.346	SPKX 060204	P0220500	XT07	○
184198500	SCI 10000703-3D	0.703	1.000	2.109	2.244	3.425	SPKX 060204	P0220500	XT07	○
184198600	SCI 10000734-3D	0.734	1.000	2.202	2.323	3.504	SPKX 060204	P0220500	XT07	○
184198700	SCI 10000750-3D	0.750	1.000	2.250	2.362	3.543	SPKX 060204	P0220500	XT07	○
184198800	SCI 10000781-3D	0.781	1.000	2.343	2.480	3.661	SPKX 060204	P0220500	XT07	○
184198900	SCI 10000813-3D	0.813	1.000	2.439	2.559	3.740	SPKX 060204	P0220500	XT07	○
184199000	SCI 10000844-3D	0.844	1.000	2.532	2.638	3.819	SPKX 060204	P0220500	XT07	○
194199100	SCI 12500875-3D	0.875	1.250	2.625	2.756	4.134	SPKX 07T308	P0250704	XT08	○
184199200	SCI 12500906-3D	0.906	1.250	2.718	2.835	4.213	SPKX 07T308	P0250704	XT08	○
184199300	SCI 12500938-3D	0.938	1.250	2.814	2.913	4.291	SPKX 07T308	P0250704	XT08	○
184199400	SCI 12500969-3D	0.969	1.250	2.907	3.031	4.409	SPKX 07T308	P0250704	XT08	○
184199500	SCI 12500984-3D	0.984	1.250	2.952	3.071	4.449	SPKX 07T308	P0250704	XT08	○
184199600	SCI 12501000-3D	1.000	1.250	3.000	3.110	4.488	SPKX 07T308	P0250704	XT08	○
184199700	SCI 12501031-3D	1.031	1.250	3.093	3.228	4.606	SPKX 07T308	P0250704	XT08	○
184199800	SCI 12501063-3D	1.063	1.250	3.189	3.307	4.685	SPKX 07T308	P0250704	XT08	○
184199900	SCI 12501094-3D	1.094	1.250	3.282	3.386	4.764	SPKX 07T308	P0250704	XT08	○

Stock item | Produto de stock | Itens de stock

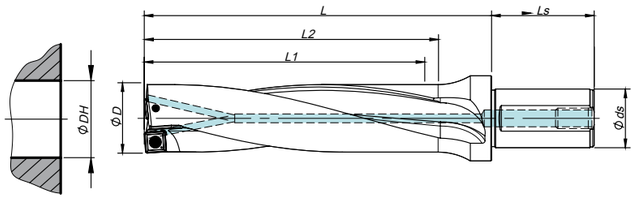
○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Order separatly

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Insert (ISO)	Screw	Torx key	Stock
		ØD	Ø ds	L1	L2	L				
184200000	SCI 12501125-3D	1.125	1.250	3.375	3.504	4.882	SPKX 090408	P0350903	XT15	○
184200100	SCI 12501156-3D	1.156	1.250	3.468	3.583	4.961	SPKX 090408	P0350903	XT15	○
184200200	SCI 12501188-3D	1.188	1.250	3.564	3.701	5.079	SPKX 090408	P0350903	XT15	○
184200300	SCI 12501219-3D	1.219	1.250	3.657	3.780	5.157	SPKX 090408	P0350903	XT15	○
184200400	SCI 12501250-3D	1.250	1.250	3.750	3.858	5.236	SPKX 090408	P0350903	XT15	○
184200500	SCI 12501281-3D	1.281	1.250	3.843	3.976	5.354	SPKX 090408	P0350903	XT15	○
184200600	SCI 12501313-3D	1.313	1.250	3.939	4.055	5.433	SPKX 090408	P0350903	XT15	○
184200700	SCI 15001375-3D	1.375	1.500	4.125	4.331	5.906	SPKX 110408	P0401200	XT15	○
184200800	SCI 15001406-3D	1.406	1.500	4.218	4.409	5.984	SPKX 110408	P0401200	XT15	○
184200900	SCI 15001438-3D	1.438	1.500	4.314	4.528	6.102	SPKX 110408	P0401200	XT15	○
184201000	SCI 15001469-3D	1.469	1.500	4.407	4.606	6.181	SPKX 110408	P0401200	XT15	○
184201100	SCI 15001500-3D	1.500	1.500	4.500	4.685	6.260	SPKX 110408	P0401200	XT15	○
184201200	SCI 15001531-3D	1.531	1.500	4.593	4.803	6.378	SPKX 110408	P0401200	XT15	○
184201300	SCI 15001563-3D	1.563	1.500	4.689	4.882	6.457	SPKX 110408	P0401200	XT15	○
184201400	SCI 15001625-3D	1.625	1.500	4.875	5.079	6.654	SPKX 110408	P0401200	XT15	○
184201500	SCI 15001688-3D	1.688	1.500	5.064	5.276	6.850	SPKX 140512	P0501300	XT20	○
184201600	SCI 15001750-3D	1.750	1.500	5.250	5.433	7.008	SPKX 140512	P0501300	XT20	○
184201700	SCI 15001813-3D	1.813	1.500	5.439	5.630	7.205	SPKX 140512	P0501300	XT20	○
184201800	SCI 15001875-3D	1.875	1.500	5.625	5.827	7.402	SPKX 140512	P0501300	XT20	○
184201900	SCI 15001938-3D	1.938	1.500	5.814	6.024	7.598	SPKX 140512	P0501300	XT20	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta



Øds	Ls	BP / SP
0.750	1.969	1/8 - 27 NPT
1.250	2.205	1/8 - 27 NPT
1.500	2.362	1/4 - 18 NPT
1.500	2.756	1/4 - 18 NPT

ØDH tolerance (in)	
ØD	4D
0.531 - 0.844	-0.005 / +0.008
0.875 - 1.938	-0.005 / +0.010

Order separatly

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Insert (ISO)	Screw	Torx key	Stock
		ØD	Ø ds	L1	L2	L				
184202000	SCI 07500531-4D	0.531	0.750	2.124	2.244	3.307	SPKX 050204	P0200500	XT06	○
184202100	SCI 07500563-4D	0.563	0.750	2.252	2.362	3.425	SPKX 050204	P0200500	XT06	○
184202200	SCI 07500594-4D	0.594	0.750	2.376	2.480	3.543	SPKX 050204	P0200500	XT06	○
184202300	SCI 10000625-4D	0.625	1.000	2.500	2.638	3.819	SPKX 060204	P0220500	XT07	○
184202400	SCI 10000656-4D	0.656	1.000	2.624	2.756	3.937	SPKX 060204	P0220500	XT07	○
184202500	SCI 10000688-4D	0.688	1.000	2.752	2.874	4.055	SPKX 060204	P0220500	XT07	○
184202600	SCI 10000703-4D	0.703	1.000	2.812	2.913	4.094	SPKX 060204	P0220500	XT07	○
184202700	SCI 10000734-4D	0.734	1.000	2.936	3.071	4.252	SPKX 060204	P0220500	XT07	○
184202800	SCI 10000750-4D	0.750	1.000	3.000	3.110	4.291	SPKX 060204	P0220500	XT07	○
184202900	SCI 10000781-4D	0.781	1.000	3.124	3.228	4.409	SPKX 060204	P0220500	XT07	○
184203000	SCI 10000813-4D	0.813	1.000	3.252	3.386	4.567	SPKX 060204	P0220500	XT07	○
184203100	SCI 10000844-4D	0.844	1.000	3.376	3.504	4.685	SPKX 060204	P0220500	XT07	○
184203200	SCI 12500875-4D	0.875	1.250	3.500	3.622	5.000	SPKX 07T308	P0250704	XT08	○
184203300	SCI 12500906-4D	0.906	1.250	3.624	3.740	5.118	SPKX 07T308	P0250704	XT08	○
184203400	SCI 12500938-4D	0.938	1.250	3.752	3.858	5.236	SPKX 07T308	P0250704	XT08	○
184203500	SCI 12500969-4D	0.969	1.250	3.876	3.976	5.354	SPKX 07T308	P0250704	XT08	○
184203600	SCI 12500984-4D	0.984	1.250	3.936	4.055	5.433	SPKX 07T308	P0250704	XT08	○
184203700	SCI 12501000-4D	1.000	1.250	4.000	4.134	5.512	SPKX 07T308	P0250704	XT08	○
184203800	SCI 12501031-4D	1.031	1.250	4.124	4.252	5.630	SPKX 07T308	P0250704	XT08	○
184203900	SCI 12501063-4D	1.063	1.250	4.252	4.370	5.748	SPKX 07T308	P0250704	XT08	○
184204000	SCI 12501094-4D	1.094	1.250	4.376	4.488	5.866	SPKX 07T308	P0250704	XT08	○

Stock item | Produto de stock | Itens de stock

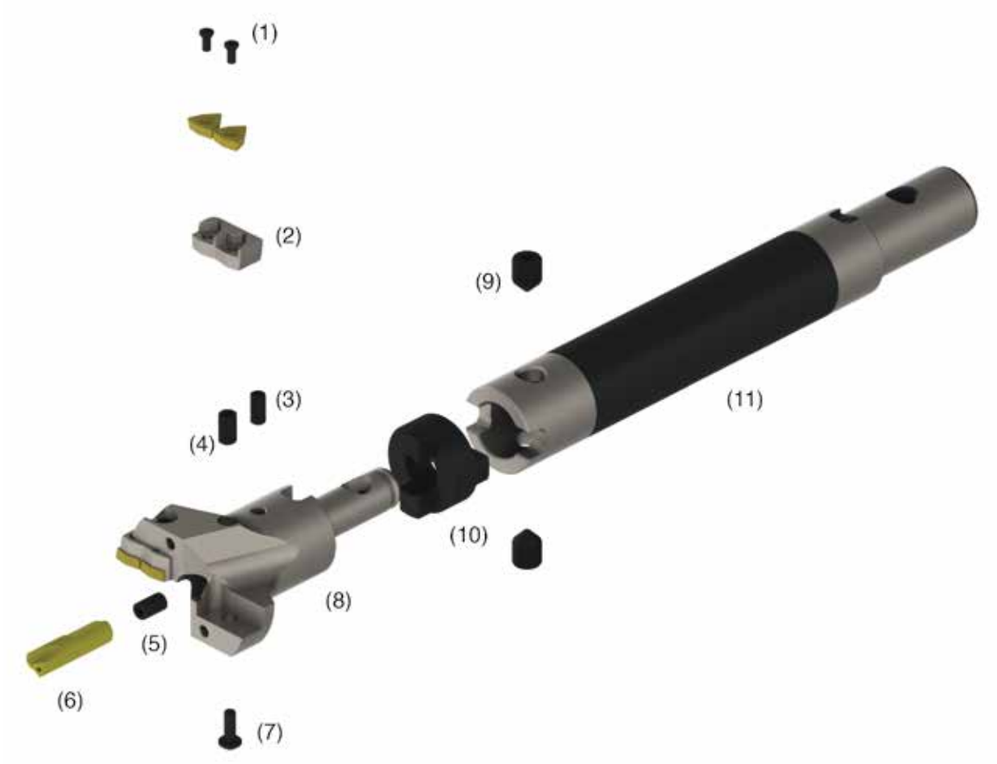
○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Order separatly

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Insert (ISO)	Screw	Torx key	Stock
		ØD	Ø ds	L1	L2	L				
184204100	SCI 12501125-4D	1.125	1.250	4.500	4.606	5.984	SPKX 090408	P0350903	XT15	○
184204200	SCI 12501156-4D	1.156	1.250	4.624	4.724	6.102	SPKX 090408	P0350903	XT15	○
184204300	SCI 12501188-4D	1.188	1.250	4.752	4.882	6.260	SPKX 090408	P0350903	XT15	○
184204400	SCI 12501219-4D	1.219	1.250	4.876	5.000	6.378	SPKX 090408	P0350903	XT15	○
184204500	SCI 12501250-4D	1.250	1.250	5.000	5.118	6.496	SPKX 090408	P0350903	XT15	○
184204600	SCI 12501281-4D	1.281	1.250	5.124	5.236	6.614	SPKX 090408	P0350903	XT15	○
184204700	SCI 12501313-4D	1.313	1.250	5.252	5.354	6.732	SPKX 090408	P0350903	XT15	○
184204800	SCI 15001375-4D	1.375	1.500	5.500	5.709	7.283	SPKX 110408	P0401200	XT15	○
184204900	SCI 15001406-4D	1.406	1.500	5.624	5.827	7.402	SPKX 110408	P0401200	XT15	○
184205000	SCI 15001438-4D	1.438	1.500	5.752	5.945	7.520	SPKX 110408	P0401200	XT15	○
184205100	SCI 15001469-4D	1.469	1.500	5.876	6.063	7.638	SPKX 110408	P0401200	XT15	○
184205200	SCI 15001500-4D	1.500	1.500	6.000	6.181	7.756	SPKX 110408	P0401200	XT15	○
184205300	SCI 15001531-4D	1.531	1.500	6.124	6.339	7.913	SPKX 110408	P0401200	XT15	○
184205400	SCI 15001563-4D	1.563	1.500	6.252	6.457	8.031	SPKX 110408	P0401200	XT15	○
184205500	SCI 15001625-4D	1.625	1.500	6.500	6.693	8.268	SPKX 110408	P0401200	XT15	○
184205600	SCI 15001688-4D	1.688	1.500	6.752	6.969	8.543	SPKX 140512	P0501300	XT20	○
184205700	SCI 15001750-4D	1.750	1.500	7.000	7.205	8.780	SPKX 140512	P0501300	XT20	○
184205800	SCI 15001813-4D	1.813	1.500	7.252	7.441	9.016	SPKX 140512	P0501300	XT20	○
184205900	SCI 15001875-4D	1.875	1.500	7.500	7.717	9.291	SPKX 140512	P0501300	XT20	○
184206000	SCI 15001938-4D	1.938	1.500	7.752	7.953	9.528	SPKX 140512	P0501300	XT20	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta



(1) - Insert Screw

(2) - Cartridge Inner / Outer

(3) - Fixing Screw for Pilot Drill

(4) - Clamping Bolt for Pilot Drill

(5) -Adjustment Screw for Pilot Drill

(6) - Pilot Drill

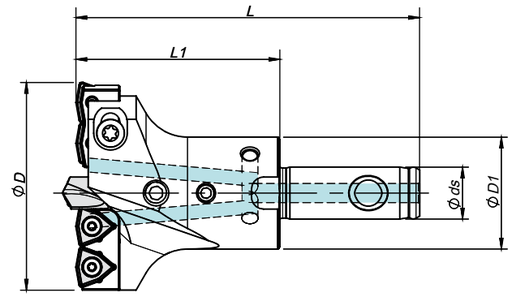
(7) - Screw for cartridge

(8) -Vortex Drill

(9) - Fixation Screw

(10) - Drive Ring

(11) - MSD Shank or MDE Extension



Order code Código	Reference Referência Referencia	Dimensions | Dimensões Dimensiones (mm)					Cartridge	Insert (ISO)	Screw	Torx key	Pilot drill	Stock
								Order separatly			Order separatly	
		ØD	Ø ds	L1	L	ØD1						
184031000	MDO 04505013	45-50	13	50	85	28	MDC 045050-I/O	WCKX 030204	P0220500	XT07	MDP 3510	◎
184031100	MDO 05005513	50-55	13	50	85	28	MDC 050055-I/O	WCKX 030204	P0220500	XT07	MDP 3510	◎
184031200	MDO 05506016	55-60	16	60	100	32	MDC 055060-I/O	WCKX 040204	P0250503	XT08	MDP 3812	◎
184031300	MDO 06006516	60-65	16	60	100	32	MDC 060065-I/O	WCKX 050308	P0300701	XT08	MDP 3812	◎
184031500	MDO 06507016	65-70	16	60	100	32	MDC 065070-I/O	WCKX 050308	P0300701	XT08	MDP 3812	◎
184032400	MDO 07007522	70-75	22	70	115	40	MDC 070075-I/O	WCKX 050308	P0300701	XT08	MDP 3812	◎
184032500	MDO 07508022	75-80	22	70	115	40	MDC 075080-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	◎
184032600	MDO 08008522	80-85	22	70	115	40	MDC 080085-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	◎
184032700	MDO 08509027	85-90	27	70	120	48	MDC 085090-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	◎
184032800	MDO 09009527	90-95	27	70	120	48	MDC 090095-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	◎
184032900	MDO 09510027	95-100	27	70	120	48	MDC 090095-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	◎
184033000	MDO 10010532	100-105	32	80	130	58	MDC 100105-I/O	WCKX 050308	P0300701	XT08	MDP 4520	◎
184066400	MDO 10511032	105-110	32	80	130	58	MDC 105110-I/O	WCKX 06T308	P0350903	XT15	MDP 4520	◎
184066500	MDO 11011532	110-115	32	80	130	58	MDC 110115-I/O	WCKX 06T308	P0350903	XT15	MDP 4520	◎
184066600	MDO 11512040	115-120	40	90	145	70	MDC 115120-I/O	WCKX 06T308	P0350903	XT15	MDP 4520	◎
184066700	MDO 12012540	120-125	40	90	145	70	MDC 120125-I/O	WCKX 06T308	P0350903	XT15	MDP 5625	◎
184066800	MDO 12513040	125-130	40	90	145	70	MDC 125130-I/O	WCKX 06T308	P0350903	XT15	MDP 5625	◎
184066900	MDO 13013540	130-135	40	90	145	70	MDC 130135-I/O	WCKX 06T308	P0350903	XT15	MDP 5625	◎
184067000	MDO 13514040	135-140	40	90	145	70	MDC 135140-I/O	WCKX 06T308	P0350903	XT15	MDP 5625	◎
184067100	MDO 14015050	140-150	50	100	160	80	MDC 140150-I/O	WCKX 080408	P0401101	XT15	MDP 5625	◎
184067200	MDO 15016050	150-160	50	100	160	80	MDC 150160-I/O	WCKX 080408	P0401101	XT15	MDP 5625	◎
184067300	MDO 16017050	160-170	50	100	160	80	MDC 160170-I/O	WCKX 080408	P0401101	XT15	MDP 6830	◎
184067400	MDO 17018050	170-180	50	100	160	80	MDC 170180-I/O	WCKX 080408	P0401101	XT15	MDP 6830	◎

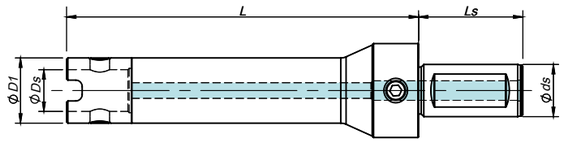
◎ Stock item | Produto de stock
Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Note:This type of drills are supplied without pilot drills. Please order them separately.

Please see Page B-178 for setting pilot drill.

page B-172 page B-175 page B-180 page B-182



New version / Standard version*

Øds	Ls	BP / SP
32	70	PT - 1/4
40	80	PT - 1/4
50	80 / 100	PT - 1/4

Order separatly

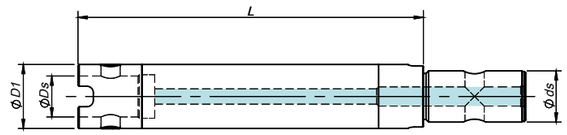
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (mm)				Drive Ring	Stock
		Øds	ØDs	ØD1	L		
184121900	MDS 32115130	32	13	28	115	MDR 1028	●
184253700	MDS 32200130	32	13	28	200	MDR 1028	●
184255400	MDS 32300130	32	13	28	300	MDR 1028	●
184122100	MDS 40125160	40	16	32	125	MDR 1032	●
184253800	MDS 40200160	40	16	32	200	MDR 1032	●
184255500	MDS 40300160	40	16	32	300	MDR 1032	●
184122300	MDS 40148220	40	22	40	148	MDR 1240	●
184122400	MDS 40200220	40	22	40	200	MDR 1240	●
184122500	MDS 40300220	40	22	40	300	MDR 1240	●
184122600	MDS 40168270	40	27	48	168	MDR 1248	●
184122700	MDS 40300270	40	27	48	300	MDR 1248	●
184122800	MDS 40186320	40	32	58	186	MDR 1458	●
184122900	MDS 40300320	40	32	58	300	MDR 1458	●
184123000	MDS 50186400	50	40	70	186	MDR 1470	●
184123100	MDS 50300400	50	40	70	300	MDR 1470	●
184123200	MDS 50184500	50	50	80	184	MDR 1680	●
184123300	MDS 50300500	50	50	80	300	MDR 1680	●

● Stock item | Produto de stock
Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

* The new Drill version will replace the standard version when this type will be sold out.

Note: This shanks type are supplied without drive ring. Please order them separately.



Order separatly

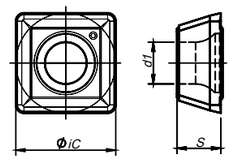
Order code	Reference	Dimensions | Dimensões | Dimensiones (mm)				Drive Ring	Stock
		Øds	ØDs	ØD1	L		
184023500	MDE 13115280	13	13	28	115	MDR 1028	●
184023600	MDE 13150280	13	13	28	150	MDR 1028	●
184023700	MDE 13200280	13	13	28	200	MDR 1028	●
184021800	MDE 13300280	13	13	28	300	MDR 1028	●
184023800	MDE 16115320	16	16	32	115	MDR 1032	●
184021900	MDE 16200320	16	16	32	200	MDR 1032	●
184023900	MDE 16300320	16	16	32	300	MDR 1032	●
184024000	MDE 22113400	22	22	40	113	MDR 1240	●
184024100	MDE 22200400	22	22	40	200	MDR 1240	●
184024200	MDE 22300400	22	22	40	300	MDR 1240	●
184024300	MDE 27113480	27	27	48	113	MDR 1248	●
184024400	MDE 27200480	27	27	48	200	MDR 1248	●
184024500	MDE 27300480	27	27	48	300	MDR 1248	●
184024600	MDE 32186580	32	32	58	186	MDR 1458	●
184024700	MDE 32300580	32	32	58	300	MDR 1458	●
184024800	MDE 40186700	40	40	70	186	MDR 1470	●
184024900	MDE 40300700	40	40	70	300	MDR 1470	●
184025000	MDE 40500700	40	40	70	500	MDR 1470	●
184025100	MDE 50204800	50	50	80	204	MDR 1680	●
184025200	MDE 50300800	50	50	80	300	MDR 1680	●
184025300	MDE 50500800	50	50	80	500	MDR 1680	●

● Stock item | Produto de stock
Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Note: This shanks type are supplied without drive ring. Please order them separately.

SPKX | Inserts | Pastilhas | Plaquitas



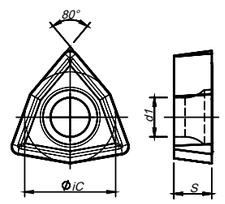
		P							M				K				N		S			H		Dimensions (in)			
		PVD							PVD				PVD	CVD			UNC	DP	PVD			PVD					
	(2) Grade code	64	54	68	66	I5	78	86	68	66	78	86	54	68	66	D2	10	D6	54	68	66	64	D4				
(1) Geometry code	ISO Reference	PH6903	PH6910	PH6920	PH6930	PH6740	PH6125	PH6135	PH6920	PH6930	PH6125	PH6135	PH6910	PH6920	PH6930	PH6705	PH0910	PDP410	PH6910	PH6920	PH6930	PH6903	PBH910	IC	S	d1	R
1111281	SPKX 050204			✪	✪	○	○		✪	✪				✪	✪					✪	✪			0.197	0.094	0.087	0.016
1111282	SPKX 060204			✪	✪	○	○		✪	✪				✪	✪					✪	✪			0.236	0.094	0.100	0.016
1111283	SPKX 07T308			✪	✪	○	○		✪	✪				✪	✪					✪	✪			0.313	0.156	0.112	0.031
1111284	SPKX 090408			✪	✪	○	○		✪	✪				✪	✪					✪	✪			0.386	0.169	0.161	0.031
1111285	SPKX 110408			✪	✪	○	○		✪	✪				✪	✪					✪	✪			0.453	0.189	0.173	0.031
1111286	SPKX 140512			✪	✪	○	○		✪	✪				✪	✪					✪	✪			0.563	0.205	0.226	0.047

✪ Stock item | Produto de stock
Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert Order Code = (1) Geometry Code + (2) Grade Code

WCKX | Inserts | Pastilhas | Plaquitas



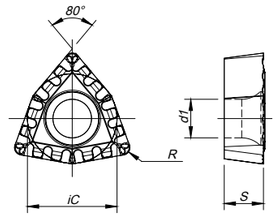
		P							M				K				N		S			H		Dimensions (in)			
		PVD							PVD				PVD	CVD			UNC	DP	PVD			PVD					
	(2) Grade code	64	54	68	66	I5	78	86	68	66	78	86	54	68	66	D2	10	D6	54	68	66	64	D4				
(1) Geometry code	ISO Reference	PH6903	PH6910	PH6920	PH6930	PH6740	PH6125	PH6135	PH6920	PH6930	PH6125	PH6135	PH6910	PH6920	PH6930	PH6705	PH0910	PDP410	PH6910	PH6920	PH6930	PH6903	PBH910	IC	S	d1	R
1140300	WCKX 02T104			✪	✪	○	○		✪	✪				✪	✪					✪	✪			0.187	0.078	0.079	0.016
1140276	WCKX 030204			✪	✪	○	○		✪	✪				✪	✪					✪	✪			0.219	0.094	0.100	0.016
1140277	WCKX 040204			✪	✪	○	○		✪	✪				✪	✪					✪	✪			0.250	0.094	0.112	0.016
1140278	WCKX 050308			✪	✪	○	○		✪	✪				✪	✪					✪	✪			0.313	0.125	0.138	0.031
1140279	WCKX 06T308			✪	✪	○	○		✪	✪				✪	✪					✪	✪			0.376	0.156	0.161	0.031
1140280	WCKX 080408			✪	✪	○	○		✪	✪				✪	✪					✪	✪			0.500	0.187	0.220	0.031

✪ Stock item | Produto de stock
Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert Order Code = (1) Geometry Code + (2) Grade Code

WCKX-LC for low carbon steels Inserts | Pastilhas | Plaquitas



		P							M				K				N		S			H		Dimensions (in)			
		PVD							PVD				PVD	CVD			UNC	DP	PVD			PVD					
	(2) Grade code	64	54	68	66	I5	78	86	68	66	78	86	54	68	66	D2	10	D6	54	68	66	64	D4				
(1) Geometry code	ISO Reference	PH6903	PH6910	PH6920	PH6930	PH6740	PH6125	PH6135	PH6920	PH6930	PH6125	PH6135	PH6910	PH6920	PH6930	PH6705	PH0910	PDP410	PH6910	PH6920	PH6930	PH6903	PBH910	IC	S	d1	R
1142068	WCKX 050308-LC			✪	✪																			0.313	0.125	0.138	0.031
1142069	WCKX 06T308-LC			✪	✪																			0.376	0.156	0.161	0.031

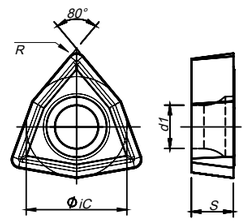
✪ Stock item | Produto de stock
Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert Order Code = (1) Geometry Code + (2) Grade Code

WCMX | Inserts | Pastilhas | Plaquitas

ISO references for other drilling systems



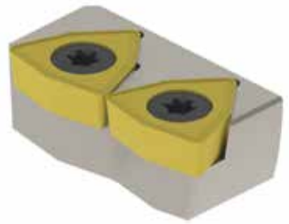
		P							M				K				N		S			H		Dimensions (in)			
		PVD							PVD				PVD	CVD			UNC	DP	PVD			PVD					
	(2) Grade code	64	54	68	66	J3	78	86	68	J3	78	86	54	68	J3	D2	10	D6	54	68	J3	64	D4				
(1) Geometry code	ISO Reference	PH6903	PH6910	PH6920	PH6930	PHC930	PH6125	PH6135	PH6920	PHC930	PH6125	PH6135	PH6910	PH6920	PHC930	PH6705	PH0910	PDP410	PH6910	PH6920	PHC930	PH6903	PBH910	IC	S	d1	R
1120827	WCMX 030204			○		○			○	○				○	○					○	○			0.219	0.094	0.110	0.016
1120828	WCMX 030208			✪		✪			✪	✪				✪	✪					✪	✪			0.219	0.094	0.110	0.031
1120829	WCMX 040208			✪		✪			✪	✪				✪	✪					✪	✪			0.250	0.094	0.122	0.031
1120830	WCMX 050308			✪		✪			✪	✪				✪	✪					✪	✪			0.313	0.125	0.126	0.031
1120831	WCMX 06T308			✪		✪			✪	✪				✪	✪					✪	✪			0.375	0.156	0.146	0.031
1120832	WCMX 080408			✪		✪			✪	✪				✪	✪					✪	✪			0.500	0.187	0.169	0.031
1120833	WCMX 080412			✪		✪			✪	✪				✪	✪					✪	✪			0.500	0.187	0.169	0.047

✪ Stock item | Produto de stock
Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert Order Code = (1) Geometry Code + (2) Grade Code

MDO CARTRIDGE



Order separatly

ØD	Inner Cartridge		Outer Cartridge		Insert (ISO)	Screw	Torx key	For Drill
	Order Code	Reference	Order Code	Reference				
45-50	184062000	MDC 045050-I	184252600	MDC 045050-O	WCKX 030204	P0220500	XT07	MDO 04505013
50-55	184250400	MDC 050055-I	184252700	MDC 050055-O	WCKX 030204	P0220500	XT07	MDO 05005513
55-60	184250500	MDC 055060-I	184252800	MDC 055060-O	WCKX 040204	P0250503	XT08	MDO 05506016
60-65	184250600	MDC 060065-I	184252900	MDC 060065-O	WCKX 050308	P0300701	XT08	MDO 06006516
65-70	184250700	MDC 065070-I	184253000	MDC 065070-O	WCKX 050308	P0300701	XT08	MDO 06507016
70-75	184250800	MDC 070075-I	184063700	MDC 070075-O	WCKX 050308	P0300701	XT08	MDO 07007522
75-80	184250900	MDC 075080-I	184063800	MDC 075080-O	WCKX 06T308	P0350903	XT15	MDO 07508022
80-85	184251000	MDC 080085-I	184063900	MDC 080085-O	WCKX 06T308	P0350903	XT15	MDO 08008522
85-90	184251100	MDC 085090-I	184064000	MDC 085090-O	WCKX 06T308	P0350903	XT15	MDO 08509027
90-95	184251200	MDC 090095-I	184064100	MDC 090095-O	WCKX 06T308	P0350903	XT15	MDO 09009527
95-100	184251300	MDC 095100-I	184064200	MDC 095100-O	WCKX 06T308	P0350903	XT15	MDO 09510027
100-105	184251400	MDC 100105-I	184064300	MDC 100105-O	WCKX 050308	P0300701	XT08	MDO 10010532
105-110	184251500	MDC 105110-I	184253100	MDC 105110-O	WCKX 06T308	P0350903	XT15	MDO 10511032
110-115	184251600	MDC 110115-I	184253200	MDC 110115-O	WCKX 06T308	P0350903	XT15	MDO 11011532
115-120	184251700	MDC 115120-I	184253300	MDC 115120-O	WCKX 06T308	P0350903	XT15	MDO 11512040
120-125	184251800	MDC 120125-I	184253400	MDC 120125-O	WCKX 06T308	P0350903	XT15	MDO 12012540
125-130	184251900	MDC 125130-I	184253500	MDC 125130-O	WCKX 06T308	P0350903	XT15	MDO 12513040
130-135	184252000	MDC 130135-I	184068900	MDC 130135-O	WCKX 06T308	P0350903	XT15	MDO 13013540
135-140	184252100	MDC 135140-I	184069000	MDC 135140-O	WCKX 06T308	P0350903	XT15	MDO 13514040
140-150	184252200	MDC 140150-I	184253600	MDC 140150-O	WCKX 080408	P0401101	XT15	MDO 14015050
150-160	184252300	MDC 150160-I	184069200	MDC 150160-O	WCKX 080408	P0401101	XT15	MDO 15016050
160-170	184252400	MDC 160170-I	184069300	MDC 160170-O	WCKX 080408	P0401101	XT15	MDO 16017050
170-180	184252500	MDC 170180-I	184069400	MDC 170180-O	WCKX 080408	P0401101	XT15	MDO 17018050

SCREWS & KEYS

Order Code	Reference Referência Referencia
290031400	P0200500
290030600	P0220500
290031300	P0250704
290030900	P0350903
290047500	P0401200
290031700	P0501300
290025800	P0180500
290033100	P0250503
290030800	P0300701
290031000	P0401101

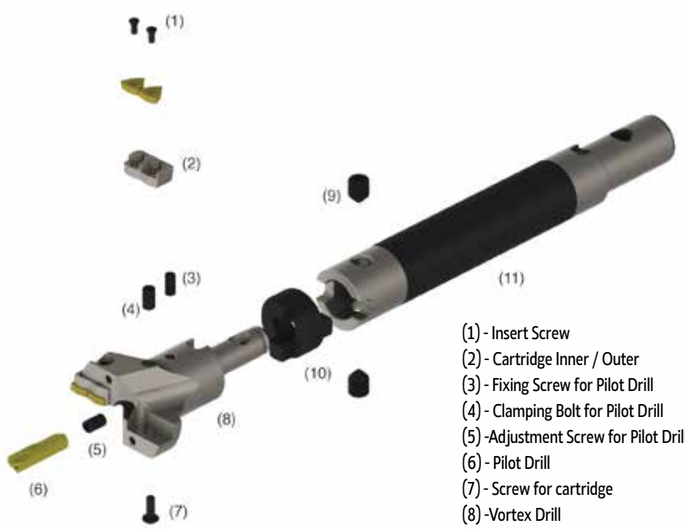
Order Code	Reference Referência Referencia
290075700	P012013
290075800	P014015
290075900	P016017
290076000	P018019
290076100	P020021
290076200	P022023
290076300	P024025
290076400	P026027
290076500	P028029
290076600	P030031

Order Code	Reference Referência Referencia
290011400	XT06
290012900	XT07
290011700	XT08
290025700	XT09
290012400	XT15
290013200	XT20
290074700	TT15
290056000	TT20
290056100	TT25

VORTEX SPARE SCREWS

Vortex Drill	(3) Fixing Screw for Pilot Drill		(4) Clamping Bolt for Pilot Drill		(5) Adjustment Screw for Pilot Drill		(7) Screw for Cartridge	
	Order Code	Screw	Order Code	Screw	Order Code	Screw	Order Code	Screw
MDO 04505013	290040100	P0400875	290040400	P0601075	290041400	P0601076	290042500	P0401078
MDO 05005513	290040100	P0400875	290040400	P0601075	290041400	P0601076	290042500	P0401078
MDO 05506016	290040100	P0400875	290040600	P0801275	290041500	P0801576	290042700	P0501278
MDO 06006516	290040200	P0500875	290040600	P0801275	290041500	P0801576	290042700	P0501278
MDO 06507016	290040200	P0500875	290040600	P0801275	290041500	P0801576	290042700	P0501278
MDO 07007522	290040200	P0500875	290040700	P0801575	290041500	P0801576	290042700	P0501278
MDO 07508022	290040400	P0601075	290040900	P1002075	290041600	P1001676	290043000	P0601279
MDO 08008522	290040400	P0601075	290040900	P1002075	290041600	P1001676	290043100	P0601479
MDO 08509027	290040400	P0601075	290040900	P1002075	290041700	P1001876	290043600	P0601679
MDO 09009527	290040400	P0601075	290040900	P1002075	290041700	P1001876	290043600	P0601679
MDO 09510027	290040400	P0601075	290040900	P1002075	290041700	P1001876	290043600	P0601679
MDO 10010532	290040400	P0601075	290041000	P1202075	290041800	P1202076	290043300	P0801879
MDO 10511032	290040400	P0601075	290041000	P1202075	290041800	P1202076	290043300	P0801879
MDO 11011532	290040400	P0601075	290041000	P1202075	290041800	P1202076	290043300	P0801879
MDO 11512040	290040400	P0601075	290041100	P1202575	290041900	P1402076	290043400	P0802079
MDO 12012540	290040400	P0601075	290041200	P1402575	290041900	P1402076	290043500	P0802579
MDO 12513040	290040400	P0601075	290041200	P1402575	290041900	P1402076	290043500	P0802579
MDO 13013540	290040400	P0601075	290041200	P1402575	290041900	P1402076	290043500	P0802579
MDO 13514040	290040400	P0601075	290041200	P1402575	290041900	P1402076	290043500	P0802579
MDO 14015050	290040400	P0601075	290041200	P1402575	290041900	P1402076	290043500	P0802579
MDO 15016050	290040400	P0601075	290041200	P1402575	290041900	P1402076	290043500	P0802579
MDO 16017050	290040400	P0601075	290041300	P1602575	290041900	P1402076	290043500	P0802579
MDO 17018050	290040400	P0601075	290041300	P1602575	290041900	P1402076	290043500	P0802579

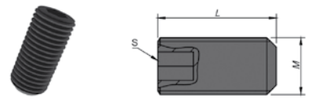
(9) Fixation Screw for MDE Extension, MDM Reducer		
ØD / ØD1	Order Code Código	Screw
28	290032400	P0801280
32	290032400	P0801280
40	290032500	P1001580
48	290032600	P1201880
58	290039600	P1202080
70	290032800	P1602780
80	290032800	P1602780



(1) - Insert Screw
(2) - Cartridge Inner / Outer
(3) - Fixing Screw for Pilot Drill
(4) - Clamping Bolt for Pilot Drill
(5) -Adjustment Screw for Pilot Drill
(6) - Pilot Drill
(7) - Screw for cartridge
(8) -Vortex Drill
(9) - Fixation Screw
(10) - Drive Ring
(11) - MSD Shank or MDE Extension

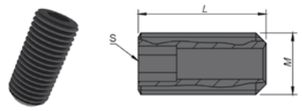
VORTEX SPARE PARTS

Fixing Screw and Clamping Bolt for Pilot Drill (DIN 916)



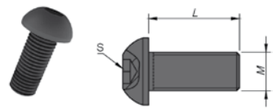
Order Code Código	Screw	Dimensions (mm) Dimensões (mm) Dimensiones (mm)		
		M	L	S
290040100	P0400875	M4 x 0,7	8,0	2,0
290040200	P0500875	M5 x 0,8	8,0	2,5
290040300	P0501075	M5 x 0,8	10,0	2,5
290040400	P0601075	M6 x 1,0	10,0	3,0
290040500	P0601275	M6 x 1,0	12,0	3,0
290040600	P0801275	M8 x 1,25	12,0	4,0
290040700	P0801575	M8 x 1,25	15,0	4,0
290040800	P1001575	M10 x 1,5	15,0	5,0
290040900	P1002075	M10 x 1,5	20,0	5,0
290041000	P1202075	M12 x 1,75	20,0	6,0
290041100	P1202575	M12 x 1,75	25,0	6,0
290041200	P1402575	M14 x 2,0	25,0	6,0
290041300	P1602575	M16 x 2,0	25,0	8,0

Adjustment Screw for Pilot Drill (DIN 916 w/ hole)



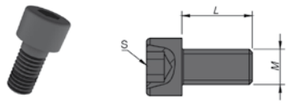
Order Code Código	Screw	Dimensions (mm) Dimensões (mm) Dimensiones (mm)		
		M	L	S
290041400	P0601076	M6 x 1,0	10,0	3,0
290041500	P0801576	M8 x 1,25	15,0	4,0
290041600	P1001676	M10 x 1,5	16,0	5,0
290041700	P1001876	M10 x 1,5	18,0	5,0
290041800	P1202076	M12 x 1,75	20,0	6,0
290041900	P1402076	M14 x 2,0	20,0	6,0

Screw for Cartridge (ISO 7380)



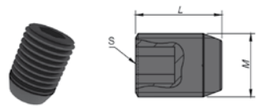
Order Code Código	Screw	Dimensions (mm) Dimensões (mm) Dimensiones (mm)		
		M	L	S
290042500	P0401078	M4 x 0,7	10,0	2,0
290042600	P0501078	M5 x 0,8	10,0	2,5
290042700	P0501278	M5 x 0,8	12,0	2,5

Screw for Cartridge (DIN 912)



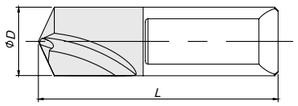
Order Code Código	Screw	Dimensions (mm) Dimensões (mm) Dimensiones (mm)		
		M	L	S
290042800	P0501079	M4 x 0,7	10,0	2,0
290042900	P0501279	M5 x 0,8	12,0	2,5
290043000	P0601279	M6 x 1,0	12,0	2,5
290043100	P0601479	M6 x 1,0	14,0	3,0
290043600	P0601679	M6 x 1,0	16,0	3,0
290043300	P0801879	M8 x 1,25	18,0	4,0
290043400	P0802079	M8 x 1,25	20,0	4,0
290043500	P0802579	M8 x 1,25	25,0	4,0

Fixation Screw for MDS Shank, MDE Extension, MDM Reducer



Order Code Código	Screw	Dimensions (mm) Dimensões (mm) Dimensiones (mm)		
		M	L	S
290032400	P0801280	M8	12,0	4,0
290032500	P1001580	M10	15,0	5,0
290032600	P1201880	M12	18,0	6,0
290039600	P1202080	M12	20,0	6,0
290032800	P1602780	M16	27,0	8,0

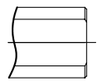
PILOT DRILL



Shank Type

A (with cone)

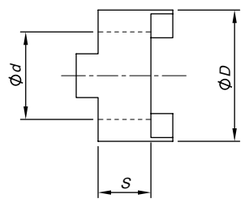
B (with chamfer)



C

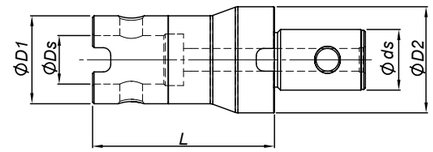
Order Code	Reference	Dimensions (mm)		Type	Oil Hole	For Drill
		ØD	L			
184104100	MDP 3006	6	30	B	X	DHS (Ø25 - Ø30)
184104400	MDP 3508	8	35	B	V	DHS (Ø31 - Ø40)
184033100	MDP 3510	10	35	B	V	DHC (Ø41 - Ø50) , MDO (Ø45-Ø55)
184033200	MDP 3812	12	38	B	V	DHC (Ø51 - Ø75) , MDO (Ø55-Ø75)
184033300	MDP 4516	16	45	B	V	DHC (Ø75 - Ø80) , MDO (Ø75-Ø100)
184033400	MDP 4520	20	45	C	V	MDO (Ø100-Ø120)
184033500	MDP 5625	25	56	C	V	MDO (Ø120-Ø160)
184033600	MDP 6830	30	68	C	V	MDO (Ø160-Ø180)
184150900	MDP 2006	6	20	A	X	TFD (Ø18,0 - Ø25,0)
184151000	MDP 2508	8	25	A	V	TFD (Ø25,5 - Ø30,0)

DRIVE RING



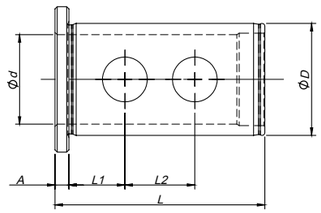
Order Code	Reference	Dimensions (mm) Dimensões (mm) Dimensiones (mm)		
		ØD	Ød	S
184021600	MDR 1028	28	13	10
184021700	MDR 1032	32	16	10
184022100	MDR 1240	40	22	12
184022200	MDR 1248	48	27	12
184022300	MDR 1458	58	32	14
184022400	MDR 1470	70	40	14
184022500	MDR 1680	80	50	16

MDM - REDUCER



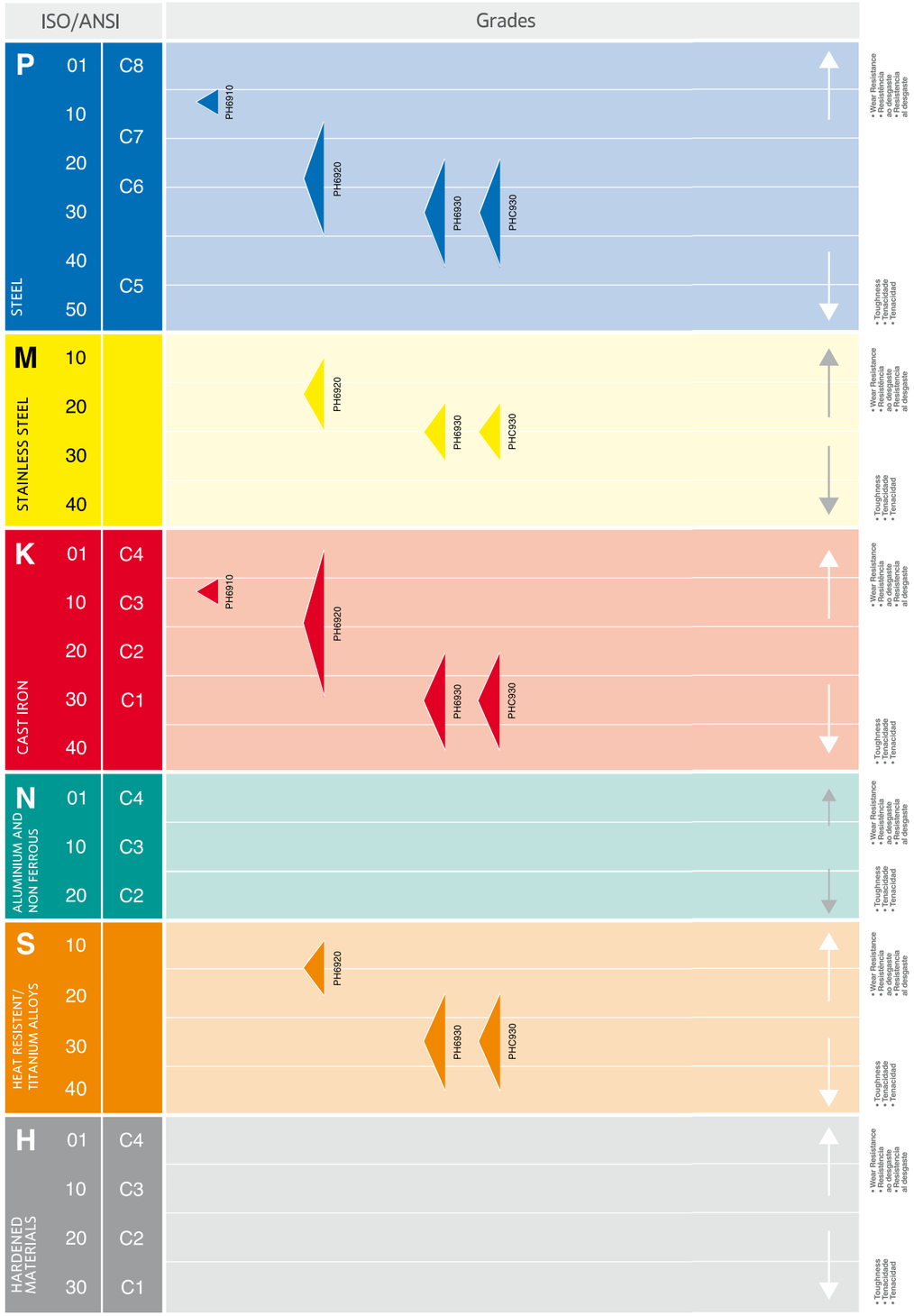
Order Code	Reference	Dimensions / Dimensões / Dimensiones (mm)					Drive Ring D1	Drive Ring D2
		ØDs	Ød	ØD1	ØD2	L		
184253900	MDM 16100130	13	16	28	32	100	MDR 1028	MDR 1032
184254000	MDM 22100160	16	22	32	40	100	MDR 1032	MDR 1240
184254100	MDM 27100220	22	27	40	48	100	MDR 1240	MDR 1248
184254200	MDM 32100130	13	32	28	58	100	MDR 1028	MDR 1458
184254300	MDM 32100160	16	32	32	58	100	MDR 1032	MDR 1458
184254400	MDM 32100220	22	32	40	58	100	MDR 1240	MDR 1458
184254500	MDM 32100270	27	32	48	58	100	MDR 1248	MDR 1458
184254600	MDM 40100320	32	40	58	70	100	MDR 1458	MDR 1470
184254700	MDM 50080130	13	50	28	80	80	MDR 1028	MDR 1680
184254800	MDM 50080160	16	50	32	80	80	MDR 1032	MDR 1680
184254900	MDM 50080220	22	50	40	80	80	MDR 1240	MDR 1680
184255000	MDM 50080270	27	50	48	80	80	MDR 1248	MDR 1680
184255100	MDM 50080320	32	50	58	80	80	MDR 1458	MDR 1680
184250200	MDM 50150400	40	50	70	80	150	MDR 1470	MDR 1680

RDS - DRILL SLEEVE



Order Code	Reference	Dimensions / Dimensões / Dimensiones (mm)					
		ØD	Ød	L	L1	L2	A
184258900	RDS 203265	32	20	65	20	-	5
184259000	RDS 253265	32	25	65	20	20	5
184259100	RDS 204075	40	20	75	20	-	5
184259200	RDS 254075	40	25	75	20	25	5
184259300	RDS 324075	40	32	75	20	25	5
184259400	RDS 205095	50	20	95	35	-	5
184259500	RDS 255095	50	25	95	35	-	5
184259600	RDS 325095	50	32	95	35	35	5
184259700	RDS 405095	50	40	95	35	35	5

DRILLING GRADES | Graus de furação | Grados para prefuración



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

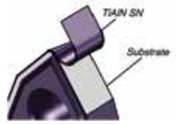
Centre of the field of application ◀ Recommended field of application

DRILLING GRADES | Graus de furação | Grados de furacción

Coated Carbide Grades

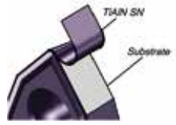
PVD Grades

PH6910
(P05-P10)
(K05-K10)



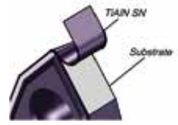
PVD (TiAlN SN) coated carbide grade with avery hard micro grain substrate for drilling of steels and cast irons.

PH6920
(P10-P35)
(M10-M25)
(K10-K30)
(S10-S30)



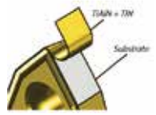
An advanced PVD TiAlN coated grade over atough wear resistance sub-micro substrate for general purpose machining.

PH6930
(P20-P40)
(M20-M30)
(K20-K40)
(S20-S40)



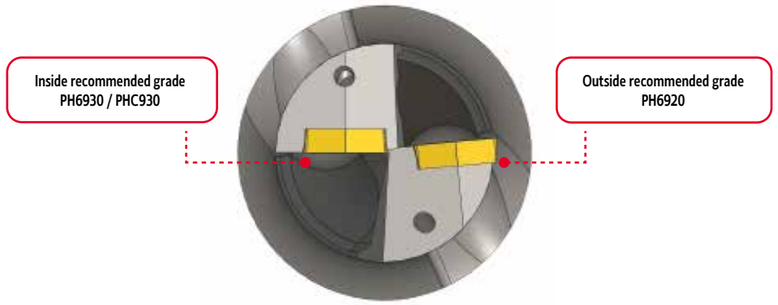
Micro-grain carbide grade suitable forapplications with instability conditions. Excellentsolution for medium cutting speed applications.

PHC930
(P20-P40)
(M20-M30)
(K20-K40)
(S20-S40)



An advanced PVD (TiAlN + Tin) coated grade overa tough wear resistance sub-micro substrate for general purpose machining of steel, stainless steel, cast iron, & super alloys at high cutting speeds.

Grades recommendation for drilling systems

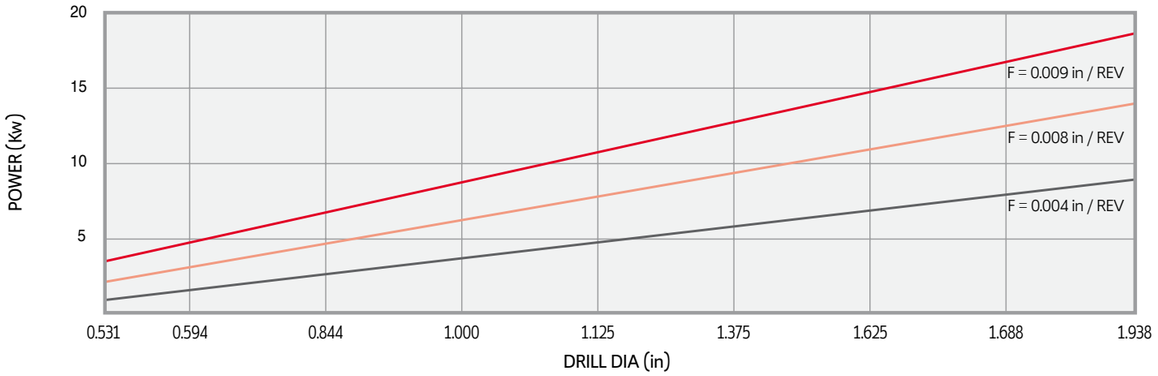


Note: This recommendation should be applied on High Alloy Steels, Stainless Steels and HRSA materials.

Recommended Speeds and Feeds | Parâmetros de Corte Recomendados | Recomendaciones de Datos de Corte

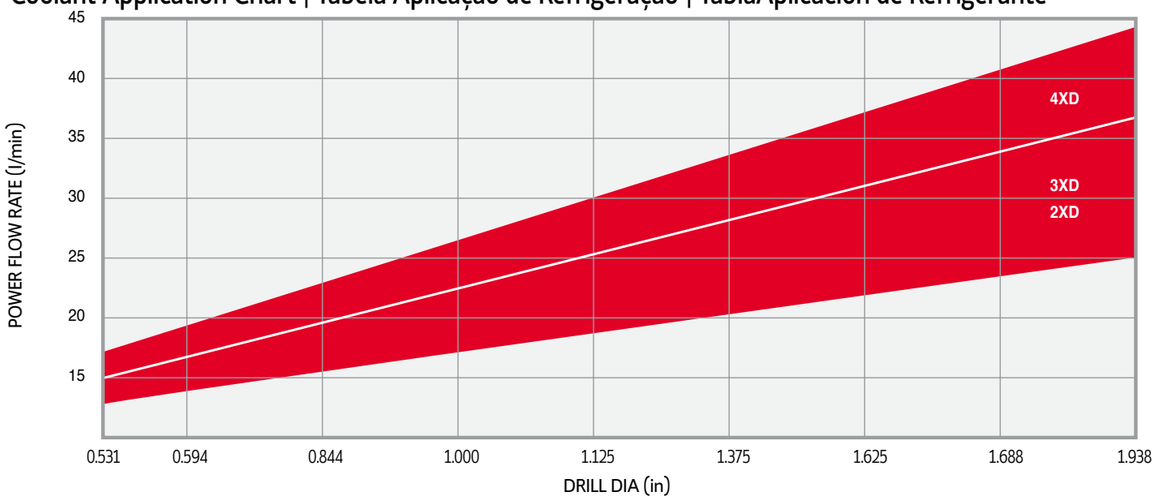
ISO	Material Group Grupo Materiais Grupo Materiales	Vc (sfm)	Ø0.310~0.594	Ø0.625~0.844	Ø0.875~1.094	Ø1.125~1.313	Ø1.375~1.625	Ø1.688~1.938
P	CARBON STEEL	525-722	0.002-0.005	0.003-0.006	0.004-0.007	0.005-0.009	0.005-0.009	0.005-0.010
	ALLOY STEEL	492-656	0.002-0.005	0.003-0.006	0.004-0.007	0.005-0.009	0.005-0.009	0.005-0.010
	HARDENED STEEL	426-590	0.002-0.004	0.003-0.006	0.004-0.008	0.005-0.009	0.005-0.009	0.005-0.009
M	STAINLESS STEEL	558-722	0.002-0.004	0.002-0.005	0.003-0.006	0.004-0.006	0.004-0.007	0.004-0.007
K	GREY CAST IRON	590-820	0.002-0.005	0.003-0.006	0.005-0.008	0.006-0.010	0.006-0.011	0.007-0.012
	NODULAR CAST IRON	426-656	0.002-0.004	0.003-0.006	0.004-0.007	0.005-0.008	0.006-0.009	0.006-0.010
S	HEAT RESISTANT SUPER ALLOYS	98-197	0.002-0.004	0.002-0.006	0.003-0.007	0.004-0.009	0.006-0.009	0.006-0.009

Power Requirements | Requisitos de Potência | Requisitos de Potencia



• These chart is based on machining experiences using steels with a hardness of 200-250HB and cutting speed of 328 sfm.
• For cast iron the effective power requirement is around 30% lower.

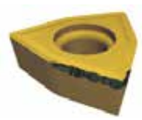
Coolant Application Chart | Tabela Aplicação de Refrigeração | TablaAplicación de Refrigerante



Hole Tolerance and Maximum Hole Size With Radial Adjustment
Tolerância do Furo e Dimensão Máxima do Furo com Ajuste Radial
Tolerancia de los Agujeros y el Tamaño Delagujero Máximo con AjusteRadial

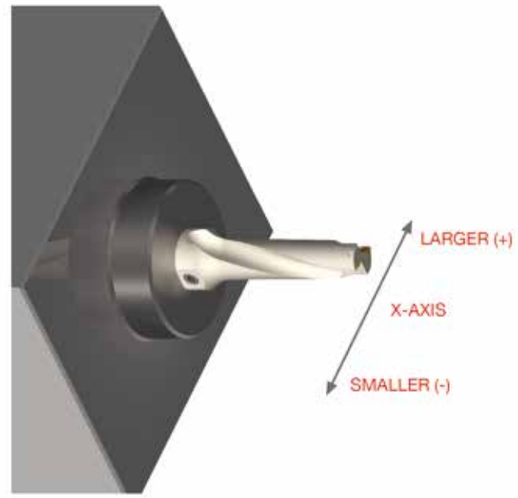
Drill D	3xD		
	Normal	Radial Adjust	Max. Hole D
0.512	0.518	0.020	0.551
0.551	0.555	0.020	0.591
0.591	0.594	0.020	0.630
0.630	0.633	0.020	0.669
0.669	0.672	0.020	0.709
0.709	0.711	0.020	0.748
0.748	0.751	0.020	0.787
0.787	0.790	0.020	0.827
0.827	0.826	0.010	0.846
0.866	0.864	0.020	0.906
0.906	0.909	0.020	0.945
0.945	0.949	0.020	0.984
0.984	0.987	0.020	1.024
1.024	1.025	0.010	1.043
1.063	1.065	0.010	1.083
1.102	1.107	0.020	1.142
1.142	1.124	0.020	1.181
1.181	1.190	0.020	1.220
1.220	1.223	0.010	1.240
1.260	1.262	0.010	1.280
1.299	1.304	0.010	1.319
1.339	1.343	0.020	1.378
1.378	1.381	0.020	1.417
1.417	1.419	0.020	1.457
1.457	1.462	0.020	1.496
1.496	1.498	0.020	1.535
1.535	1.537	0.020	1.575
1.575	1.575	0.010	1.594
1.614	1.614	0.010	1.634
1.654	1.655	0.020	1.693
1.693	1.693	0.020	1.732
1.732	1.739	0.020	1.772
1.772	1.780	0.020	1.811
1.811	1.818	0.020	1.850
1.850	1.856	0.020	1.890
1.890	1.894	0.010	1.909
1.929	1.929	0.010	1.949
1.969	1.969	0.010	1.988

Drill D	3xD		
	Normal	Radial Adjust	Max. Hole D
0.512	0.520	0.020	0.551
0.551	0.557	0.020	0.591
0.591	0.597	0.020	0.630
0.630	0.633	0.020	0.669
0.669	0.674	0.020	0.709
0.709	0.717	0.020	0.748
0.748	0.755	0.020	0.787
0.787	0.789	0.020	0.827
0.827	0.827	0.010	0.846
0.866	0.867	0.020	0.906
0.906	0.909	0.020	0.945
0.945	0.951	0.020	0.984
0.984	0.989	0.020	1.024
1.024	1.027	0.010	1.043
1.063	1.061	0.010	1.083
1.102	1.101	0.020	1.142
1.142	1.144	0.020	1.181
1.181	1.186	0.020	1.220
1.220	1.225	0.010	1.240
1.260	1.264	0.010	1.280
1.299	1.306	0.010	1.319
1.339	1.344	0.020	1.378
1.378	1.383	0.020	1.417
1.417	1.420	0.020	1.457
1.457	1.464	0.020	1.496
1.496	1.499	0.020	1.535
1.535	1.539	0.020	1.575
1.575	1.577	0.010	1.594
1.614	1.616	0.010	1.634
1.654	1.657	0.020	1.693
1.693	1.694	0.020	1.732
1.732	1.741	0.020	1.772
1.772	1.782	0.020	1.811
1.811	1.820	0.020	1.850
1.850	1.858	0.020	1.890
1.890	1.896	0.010	1.909
1.929	1.931	0.010	1.949
1.969	1.971	0.010	1.988

Problem | Problema	Corrective Action	Possível Solução	Solución Posible
INNER CUTTING EDGE CRACKING 	**On Lathes:** • Check machine alignment. • Check clamping accuracy. If tool clamping cannot be improved and/or optimum machine stability is doubtful, reduce feed by 30%. • User tougher carbide grade. **TIP:** Grades can be mixed to achieve optimum performance. **Example:** Use grade PH6125 in the inside pocket with PH6135 in the outside pocket.	**Em Tornos:** • Verifique o alinhamento máquina. • Verifique a precisão do aperto. Se o aperto não puder ser melhorado e/ou a optimização da estabilidade da máquina é duvidosa, reduza o avanço em 30%. • Usar classes de graus mais duras. **DICA:** Misture classes Graus para alcançar o desempenho ideal. **Exemplo:** Utilize PH6125 na pastilhainterior e PH6135 na pastilha exterior.	**Tornos en:** • Compruebe la alineación de máquinas. • Verificar la precisión de sujeción. Si la herramienta de sujeción no puede mejorar y/o optimizar la estabilidad de la máquina es dudosa, reducir los piensos en un 30%. • El usuario de carburo de calidad es más estrictas. **SUGERENCIA:** Las calificaciones se pueden mezclar para lograr un rendimiento óptimo. **Ejemplo:** Utilice PH6125 en el inserto interior e PH6135 en el inserto exterior.
CHIP EVACUATION NOT OPTIMAL 	• Increase coolant pressure and volume (coolant helps support chip evacuation as well as cooling the cutting edges). • Optimize chip control for a given application. • Increase cutting speed by 20%.	• Aumente a pressão e volume do líquido de refrigeração (este permite uma melhor evacuação da apara, bem como um arrefecimento das arestas de corte). • Optimize o controlo das aparas para cada operação. • Aumentar a velocidade de corte de 20%.	• Aumentar la presión del refrigerante y el volumen (el líquido de refrigeración de chips de apoyo ayuda a la evacuación, así como el enfriamiento de la corte de los bordes). • Optimizar el control de chip para una aplicación determinada. • Aumentar la velocidad de corte un 20%.
EXCESSIVE INSERT WEAR 	• Increase coolant pressure and volume. • Reduce cutting speed by 20%. • Use a more wear – resistant grade.	• Aumente o volume e a pressão do líquido de refrigeração. • Reduzir a velocidade de corte de 20%. • Utilize um grau mais resistente ao desgaste.	• Aumentar la presión del refrigerante y el volumen. • Reducir la velocidad de corte en un 20%. • Utilice un mayor desgaste - resistente grado.
POOR DRILL HOLE QUALITY 	• Increase coolant pressure and volume. • Increase cutting speed by 20% • Check clamping accuracy (tool and workpiece) for possible improvement. **TIP:** Use higher speed with lighter feed to produce better hole quality.	• Aumente o volume e a pressão do líquido de refrigeração. • Aumentar a velocidade de cortede 20% • Verifique a precisão do aperto (ferramenta e peça). **DICA:** Utilize velocidades com avanços menores para produzir uma melhor qualidade do furo.	• Aumentar la presión del refrigerante y el volumen. • Aumentar la velocidad de corte en un 20% • Verificar la precisión de sujeción(herramienta y pieza de trabajo) para una posible mejora. **SUGERENCIA:** El uso ligero con mayor velocidad de alimentación para producir una mejor calidad agujero.

Informação técnica para aplicações | Información técnica para aplicaciones

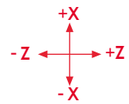
Initial Drill Set Up and Check | Ajuste Inicial da Broca e Verificação | Ajuste Inicial de la Broca e su Verificación

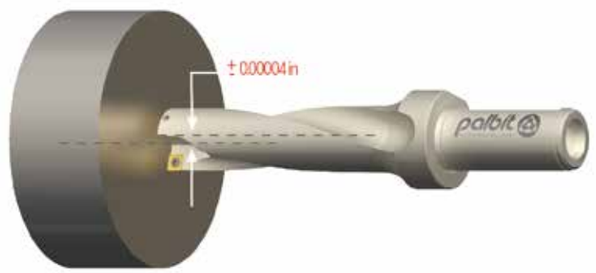


- The cutting edge of insert should be parallel to X-axis to make it possible to do offset cutting. Since a flat part on shank for side lock clamping has been made parallel with the cutting edge line of insert, operator can set the drill as per flat part of shank.

- A aresta de corte da pastilha deve ser paralela ao eixo X tornando possível o alinhamento de corte.

- El hilo de corte del inserto se debe posicionar paralelamente al axis-X tornando posible el aliñamiento de corte.

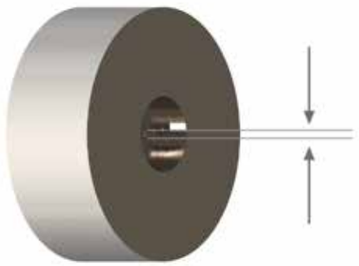




- The outer insert should be located in the direction (+) of X-axis to allow offset cutting and then the inner insert should face the operator.

- A pastilha exterior deve estar localizada na direcção (+) do eixo-X, permitindo assim o alinhamento do corte, a pastilha interior deve estar virada ao operador.

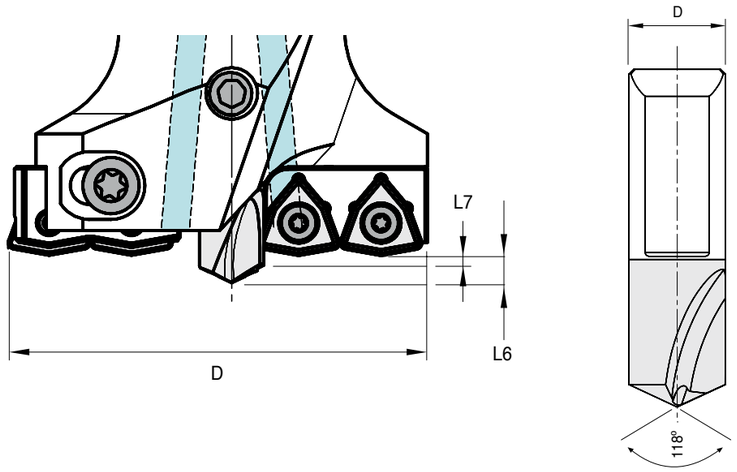
- El inserto exterior se debe localizar en la dirección (+) del axis-X, permitiendo el aliñamiento del corte, el inserto interior debe quedar-se virado para el operador.



- To check up the setting of drill before use, test it by drilling about 0.2 in depth and then measure the core size if it is around 0.008 in - 0.027 in.
- Para verificar o ajuste faça o teste furando cerca de 0.2 in de profundidade medindo depois o núcleo verificando se este tem aproximadamente 0.008 in - 0.027 in.

- Para comprobar el ajuste hacer un taladro de cerca de 0.2 in de profundidad, medido después su núcleo si se trata de 0.008 in - 0.02 in.

Pilot Drill Adjustement | Ajuste da Broca Piloto | Ajuste de la Broca Piloto

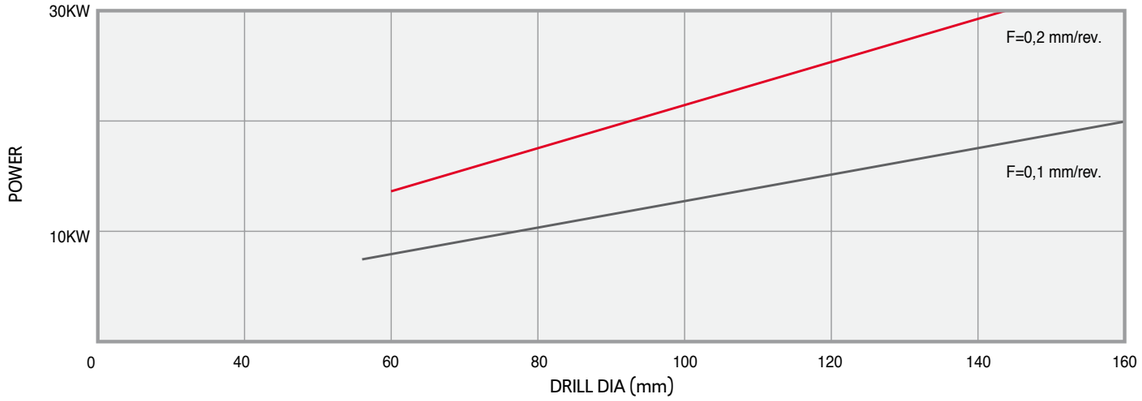


Dc (mm)	2D to 4D		4D to 6D		> 6D	
	L7	L6	L7	L6	L7	L6
45-55	1,6	4,0	1,8	4,2	2,0	4,4
55-75	1,8	5,4	2,0	5,6	2,2	5,8
75-100	2,2	6,5	2,5	6,8	2,8	7,1
100-120	2,4	7,7	2,8	8,1	3,2	8,5
120-170	3,2	9,9	3,6	10,3	4,0	10,7
170-180	3,5	12,2	3,9	12,6	4,3	13,0

Recommended Speeds and Feeds | Parâmetros de Corte Recomendados Recomendaciones de Datos de Corte

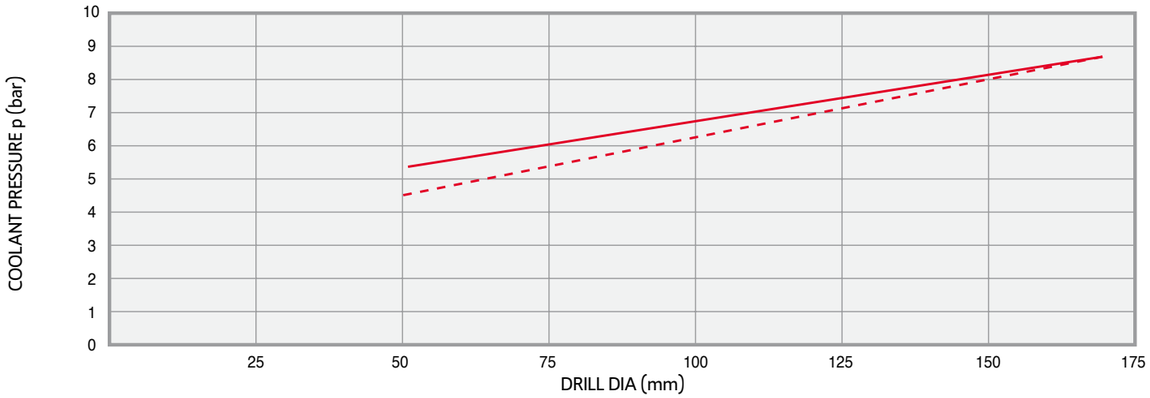
ISO	Material Group Grupo Materiais Grupo Materiales	Vc (m/min)	Ø45~55	Ø55~60	Ø60~75	Ø75~100	Ø100~105	Ø105~150	Ø150~180
P	UNALLOYED STEEL (-0,25%)	120-180	0,06-0,10	0,07-0,11	0,08-0,12	0,10-0,14	0,14-0,20	0,08-0,12	0,10-0,14
	LOW-ALLOY STEEL (0,25%-)	110-170	0,06-0,10	0,07-0,11	0,08-0,12	0,10-0,14	0,12-0,18	0,08-0,12	0,10-0,14
	LOW-ALLOY STEEL (-HB300)	90-130	0,06-0,10	0,07-0,11	0,08-0,12	0,10-0,14	0,12-0,18	0,08-0,12	0,10-0,14
	HIGH-ALLOY STEEL (HB300-)	60-100	0,05-0,07	0,05-0,07	0,06-0,08	0,06-0,10	0,09-0,13	0,06-0,08	0,06-0,10
M	STAINLESS STEEL	60-110	0,04-0,07	0,04-0,11	0,06-0,12	0,08-0,14	0,10-0,18	0,06-0,12	0,08-0,14
K	GREY CAST IRON	120-180	0,07-0,13	0,07-0,15	0,08-0,16	0,10-0,18	0,12-0,22	0,08-0,16	0,10-0,18
	CAST IRON WITH NODULAR CAST	100-180	0,04-0,13	0,07-0,15	0,08-0,16	0,10-0,25	0,12-0,26	0,08-0,16	0,10-0,25
N	ALUMINUM FORGING ALLOYS	180-280	0,04-0,06	0,07-0,12	0,08-0,13	0,09-0,15	0,12-0,20	0,08-0,13	0,09-0,15
	ALUMINUM CAST ALLOYS	120-270	0,04-0,06	0,06-0,12	0,08-0,13	0,09-0,15	0,12-0,20	0,08-0,13	0,09-0,15

Power Requirements | Requisitos de Potência | Requisitos de Potencia

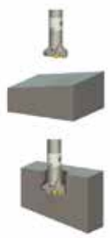


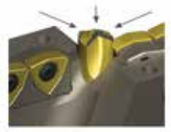
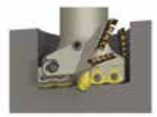
• These chart is based on machining experiences using steels with a hardness of 200-250HB and cutting speed of 100m/min.

Coolant Application Chart | Tabela Aplicação de Refrigeração | TablaAplicación de Refrigerante



Rules & Tips | Regras e Dicas | Normas e Consejos

WRONG	CORRECT	EN	PT	ES
		**Spot Drilling** For plain/straight surfaces, no spot drilling is required. For centering, the center drill diameter should be considerably smaller than the pilot drill diameter.	**Perfuração Localizada** Para superfícies planas a perfuração localizada não é necessária. O diâmetro da broca de pré-furação deve ser consideravelmente menor do que o diâmetro da broca-piloto.	**Perforación Localizada** Para superficies planas, no se requiere la perforación in situ. Para centrar el diámetro de pré-perforación debe ser considerablemente más pequeño que el diámetro de la broca piloto.
		**Spot drilling and drilling throughon inclined surfaces.** Up to an 8º inclination angle is possible. Drilling through at a maximum of 4º is possible; otherwise, a pre-facing operation is necessary.	**Perfuração localizada e perfuração através de superfícies inclinadas.** Até 8 º ângulo de inclinação é possível. Perfuração até a um máximo de 4º é possível, caso contrário, é necessária uma pré-operação.	**Perforación localizada y perforación sobre superficies inclinadas.** Hasta un ángulo de inclinación de 8º es posible. Através de la perforación en un máximo de 4º es posible, de otro modo, es necesaria pre-operación.
		**Multi-Stage Drill Hole** Vortex series drills are not recommended for boring operations. First, use the Integrex drill to drill a larger diameter hole. Then, use a solid carbide drill for smaller holes. Optimum centering of the solid carbide drill is possible on the drill hole of the pilot drill.	**Furo Multi-Estágio** As brocas Vortex não são recomendadas para operações de mandrilagem. Primeiro utilize a Integrex para o furo de diâmetro maior, então use uma broca Metal Duro Integrex para o furo de diâmetro mais reduzido.	**Multi-etapa taladro** Las brocas Vortex no son recomendadas para las operaciones de mandrilagen. En primer lugar, utilizar la Integrex para perforar un agujero de diámetro mayor. A continuación,utilice una broca de carburo sólido para los pequeños agujeros. Centrado óptimo del taladro de carburo sólido es posible en el taladro de la broca piloto.
		**Drilling of stacked plates** This is not possible with Integrex series drills because a final disc forms when the drill breaks through. **Caution:** During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect all bystanders.	**Perfuração de chapas empilhadas** Isso não é possível com a Integrex porque um disco final forma-se quando a broca passa **Cuidado:** Durante operações de trespassar uma placa, uma apara ou disco é produzido quando a broca rompe através da peça. Quando a broca está parada e é a peça rotativa, este disco pode ser arremessado da brecha pela força centrífuga. Proporcionar adequada blindagem para proteger todos os transeuntes.	**Perforación de placas apiladas** Esto no es posible con la Integrex debido a un disco que se forma cuando el taladro a través de las placas. **Precaución:** Durante las operaciones a través de agujeros, una babosa o disco se produce como la herramienta provocando saltos de la pieza. Cuando la perforación es estacionaria y la pieza está girando, este disco puede ser lanzado desde el plato por la fuerza centrífuga. Proporcionar la protección adecuada para proteger a todos los transeúntes.

Problem | Problema	Corrective Action	Possível Solução	Solución Posible
PILOT DRILL CRACKING 	**On Lathes:** • Verify that the tool is centered correctly. Readjust machine, if necessary. • Check clamping accuracy (tool andworkpiece).	**Em Tornos:** • Verifique se a ferramenta está centrada correctamente. Reajustar a máquina caso necessário. • Verifique a precisão do aperto (ferramento e peça).	**Tornos en:** • Compruebe que la herramienta se centra correctamente. Reajustar la máquina, si es necesario. • Verificar la precisión de sujeción (herramienta y pieza de trabajo) para una posible mejora.
INSERT CRACKING 	• Use tougher carbide grade. • Check clamping accuracy (tool and workpiece) for possible run out.	• Use classes de graus mais duras. • Verifique a precisão do aperto (ferramento e peça).	• Uso más duras de carburo de grado. • Verificar la precisión de sujeción (herramienta y pieza de trabajo) para su posible run out.
EXCESSIVE INSERT WEAR 	• Use coated pilot drill. • Increase coolant pressure and volume. • Reduce speed by 20% • Use wear & resistant carbide grade.	• Utilizar uma broca piloto revestida. • Aumentar o volume e a pressão do liquido de refrigeração. • Reduzir a velocidade de corte em 20%. • Utilizar classes de graus mais resistentes ao desgaste.	• Utilice broca piloto revestida. • Aumentar la presión del refrigerante y el volumen. • Reduzca la velocidad en un 20% • Utilice el desgaste y resistentes de carburo de grado.
CHIP BREAKING NOT OPTIMAL 	• Optimize chip control for given application by using diferent chipbreaker geometry. • Increase cutting speed by 20%; reduce feed by 20%.	• Optimizar o controlo da apara numa determinada operação outra geometria de quebra aparas. • Aumentar a velocidade de corte em 20% e reduzir o avanço em 20%.	• Optimizar el control de viruta numa dada aplicación mediante utilizacion de otra geometría quebra viruta • Aumentar la velocidad de corte en un 20%, reducir la alimentación en un 20%.
CHIP EVACUATION NOT OPTIMAL, POOR DRILL HOLE QUALITY 	• Increase coolant pressure and volume. • Increase cutting speed by 20%.	• Aumentar o volume e a pressão do líquido de refrigeração. • Aumentar a velocidade de corte em 20%.	• Aumentar la presión del refrigerante y el volumen. • Aumentar la velocidad de corte en un 20%.

SAFETY

Caution:
• During trough-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect all bystanders.

• When drilling through, a small shoulder will be produced on breakthrough as the pilot drill is no longer cutting.

TURNING

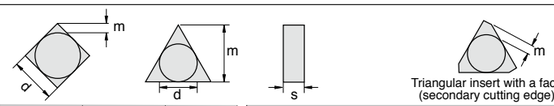
C

ISO TURNING INSERTS CODE KEY

Sistema de codificação para pastilhas de torneamento ISO
Codificación para plaquitas de torneado ISO

H	120º	M	86º
O	135º	V	35º
P	108º	W	80º
S	90º	L	90º
T	60º	A	85º
C	80º	B	82º
D	55º	K	55º
E	75º	R	
F	50º		

Symbol for insert shape (1)



Triangular insert with a facet (secondary cutting edge).

Symbol	m (in)	d (in)	s (in)
A	±0.0002	±0.0010	±0.0010
F	±0.0002	±0.0005	±0.0010
C	±0.0005	±0.0010	±0.0010
H	±0.0005	±0.0005	±0.0010
E	±0.0010	±0.0010	±0.0010
G	±0.0010	±0.0010	±0.0050
J	±0.0002	±0.002~±0.006	±0.0010
K*	±0.0005	±0.002~±0.006	±0.0010
L*	±0.0010	±0.002~±0.006	±0.0010
M*	±0.003~±0.008	±0.002~±0.006	±0.0050
N*	±0.003~±0.008	±0.002~±0.006	±0.0010
U*	±0.005~±0.015	±0.003~±0.010	±0.0050

* 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
Tolerances of insert height (in)

Inscribed circle	T	S	C	D	V
1/4	±0.003	-	-	-	-
3/8	±0.003	±0.003	±0.003	±0.004	±0.005
1/2	±0.005	±0.005	±0.005	±0.006	-
5/8	±0.006	±0.006	±0.006	±0.007	-
3/4	±0.006	±0.006	±0.006	±0.007	-
1	-	±0.007	-	-	-
11/4	-	±0.010	-	-	-

Tolerances of inscribed circle (in)

Inscribed circle	T	S	C	D	V	R
1/4	±0.002	-	-	-	-	-
3/8	±0.002	±0.002	±0.002	±0.002	±0.002	±0.002
1/2	±0.003	±0.003	±0.003	±0.003	-	±0.003
5/8	±0.004	±0.004	±0.004	±0.004	-	±0.004
3/4	-	-	-	-	-	±0.004
1	-	±0.005	-	-	-	±0.004
11/4	-	±0.008	-	-	-	±0.005

Symbol for tolerances (3)

A	B	C	D	E	
3°	5°	7°	15°	20°	
F	G	N	P	O	
25°	30°	0	11°	Other clearance angle	

Symbol for normal Clearance (5)

ISO	T	N	M	G
ANSI	T	N	M	G

(1) (2) (3) (4)

Type of chip breaker and/or clamping (4)

Metrical

Symbol	Type	Type of hole	Chipbreaker	Shape	Symbol	Type	Type of hole	Chipbreaker	Shape	Symbol	Type	Type of hole	Chipbreaker	Shape
W	With Hole	Round hole / one countersink (40°~60°)	Without chipbreaker		H	With Hole	Round hole / double countersink (70°~90°)	Chipbreaker on one side		G	With Hole	Round hole	Chipbreaker on both sides	
T	With Hole		Chipbreaker on one side		C	With Hole		Without chipbreaker		N	With-out Hole	-	Without chipbreaker	
Q	With Hole	Round hole / double countersink (40°~60°)	Without chipbreaker		J	With Hole		Chipbreaker on both sides		R	With-out Hole	-	Chipbreaker on one side	
U	With Hole		Chipbreaker on both sides		A	With Hole	Round hole	Without chipbreaker		F	With-out Hole	-	Chipbreaker on both sides	
B	With Hole	Round hole / double countersink (70°~90°)	Without chipbreaker		M	With Hole	Round hole	Chipbreaker on one side		X	-	-	-	On request

R's	V's	D's	C's	S's	T's	W's	Ø IC mm	Ø IC inch	ANSI 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	

Symbol for insert size (5)

* ANSI designation only (Radius Designation is 00)
**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

symbol for insert thikness (6)

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

(5) (6) (10) (7) (8) (9)

Chipbreaker geometries (9)

NEGATIVE Chip-breakers

MF	MS	SF	LC	MR
NEW	MW	SS	ST	FLAT
HR	RP NEW	HY	HZ	

POSITIVE Chip-breakers

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

Symbol for insert corner configuration (7)

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

Symbol for insert with secondary edges (7b) *

For inserts having secondary edges two digits are user:

1st Digit is secondary edge		2nd Digit is secondary relief angle	
A	45º	A	3º
D	60º	B	5º
E	75º	C	7º
F	85º	D	15º
P	90º	E	20º
Z	special	F	25º
		G	30º
		N	0º
		P	11º
		Z	special

Cutting edge condition (8)

Shape	Honing	Symbol
	No honing	F
	With honing	E
	Chamfred no honing	T
	Chamfred with honing	S

Direction of cutting (9)

Shape	Hand	Symbol
	Right	R
	Left	L
	None	N

* Used only when required.

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 & page \ Operation	Longitudinal turning	Profiling	Facing	Plunging
Rhombic 80º	●●		●	
Rhombic 55º	●	●●	●	
Parallelogram 55º	●	●		●
Round	●	●	●	●●
Square 90º	●		●●	
Triangular 60º	●	●	●	●
Rhombic 35º		●		
Trigon 80º	●		●	

●● Recomended Insert Shape ● Alternative Insert Shape

INTERNAL MACHINING | MAQUINAÇÃO INTERNA | MAQUINACIÓN INTERNA

General Recommendation:

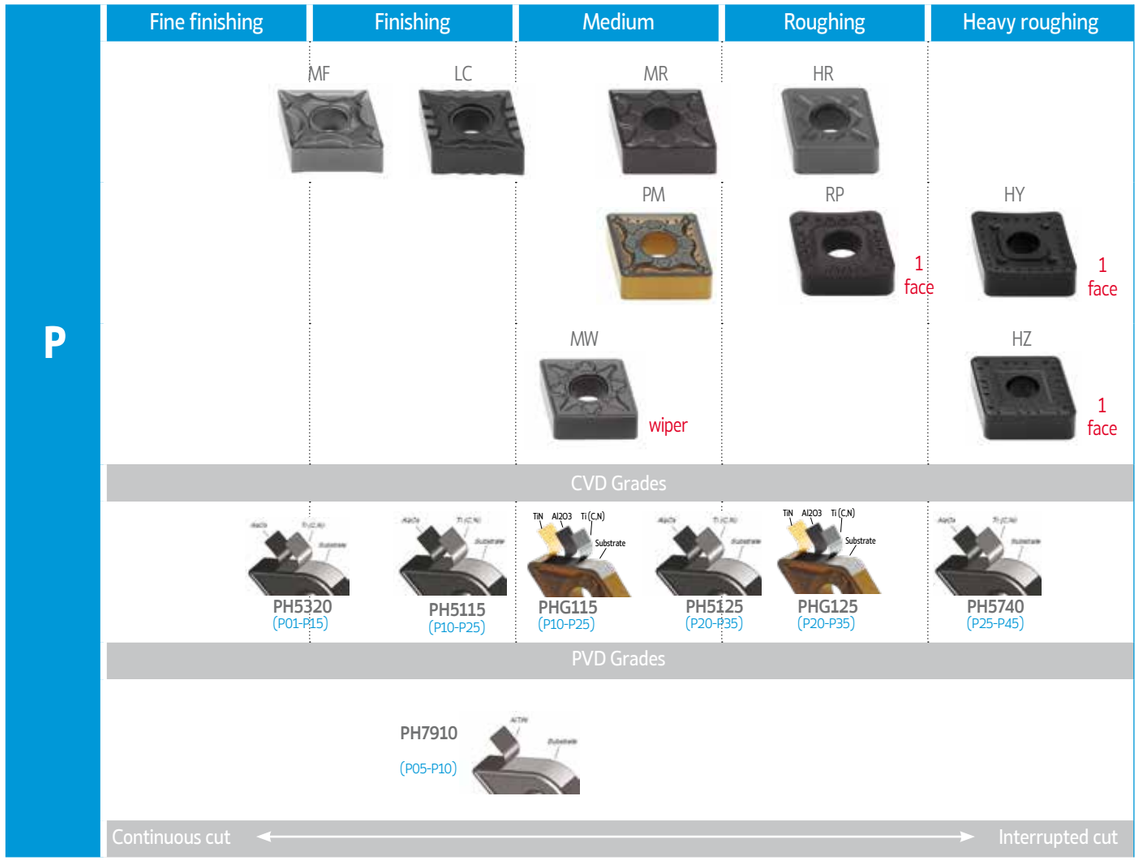
1. The choice of the insert shape depends of the operation.
2. The insert shape should be selected to the required lead angle and the accessibility or versatility required of the tool.
3. Select the largest suitable point angle on the insert for strenght and economy.

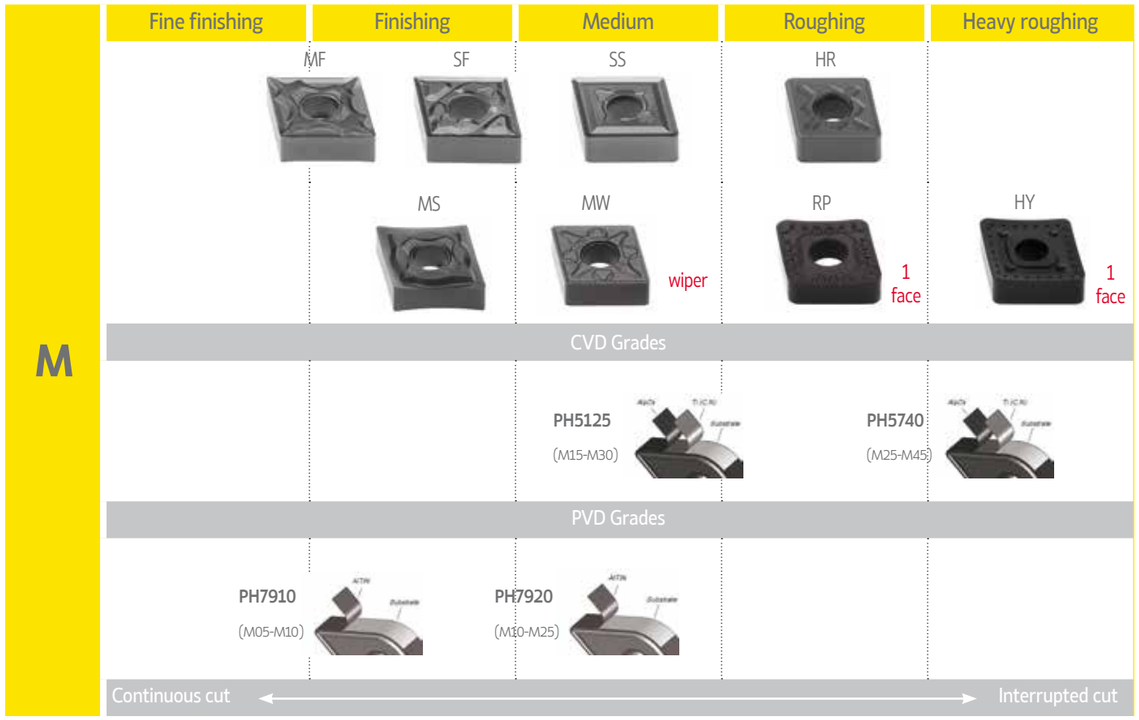
Insert Shape & page \ Operation	Longitudinal turning	Profiling	Facing
Rhombic 80º	●		●●
Rhombic 55º	●	●●	●
Parallelogram 55º	●●		
Round	●		●
Square 90º	●		
Triangular 60º	●●	●	●
Trigon 80º	●		●
Rhombic 35º		●	

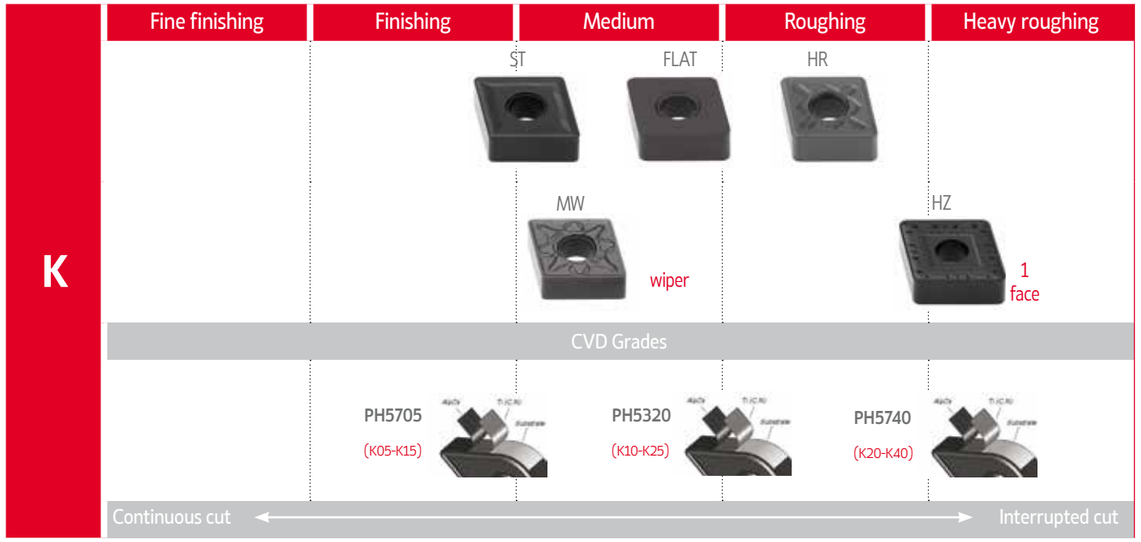
●● Recomended Insert Shape ● Alternative Insert Shape

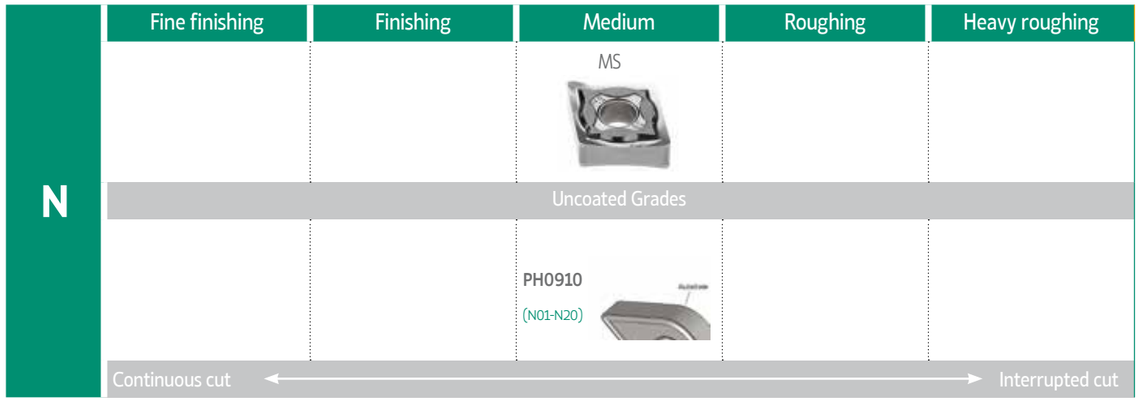
NEGATIVE TURNING Application Range Overview

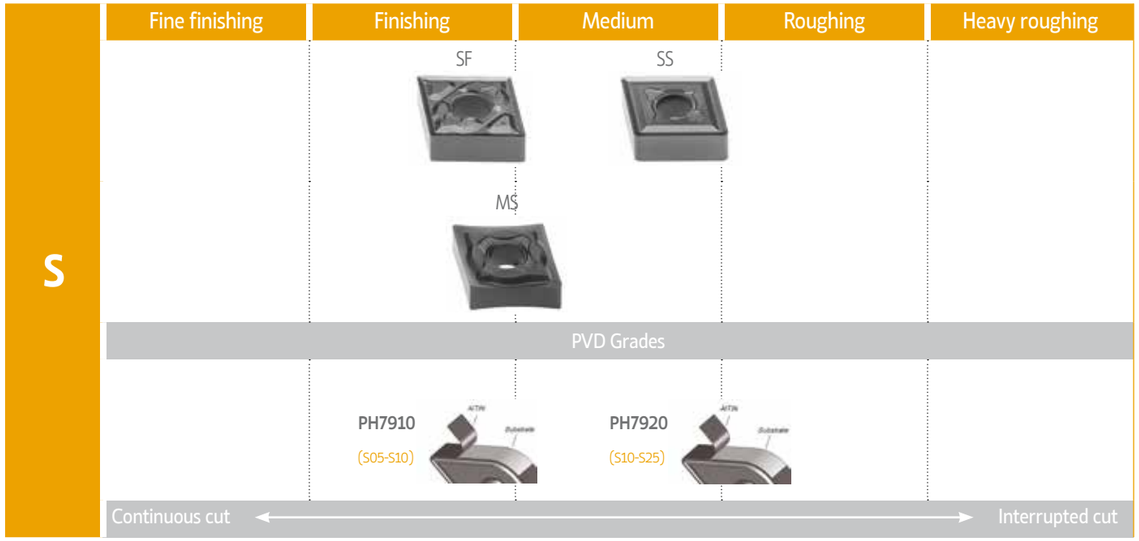
Vista geral de aplicações
Vista general de aplicaciones











P — 5º & 7º

Fine finishing	Finishing	Medium	Roughing	Heavy roughing
FS	FP	MP	RF, RM	
BO	FW (wiper)	MW (wiper)	ST, RR	

CVD Grades

PH5115 (P10-P25)	PH5125 (P20-P35)	PH5740 (P25-P45)

PVD Grades

PH7910 (P05-P10)	PH7920 (P10-P35)

Continuous cut ⟷ Interrupted cut

M — 5º & 7º

Fine finishing	Finishing	Medium	Roughing	Heavy roughing
FS	FM, LM	MM	RF, RM	
BO	FW	MW (wiper)	RR	

CVD Grades

PH5125 (M15-M30)	PH5740 (M25-M45)

PVD Grades

PH7910 (M05-M10)	PH7920 (M10-M25)

Continuous cut ⟷ Interrupted cut

P — 11º

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

K — 5º & 7º

Fine finishing	Finishing	Medium	Roughing	Heavy roughing
FK	MK	FLAT	RM	
FW (wiper)	MW (wiper)	ST		

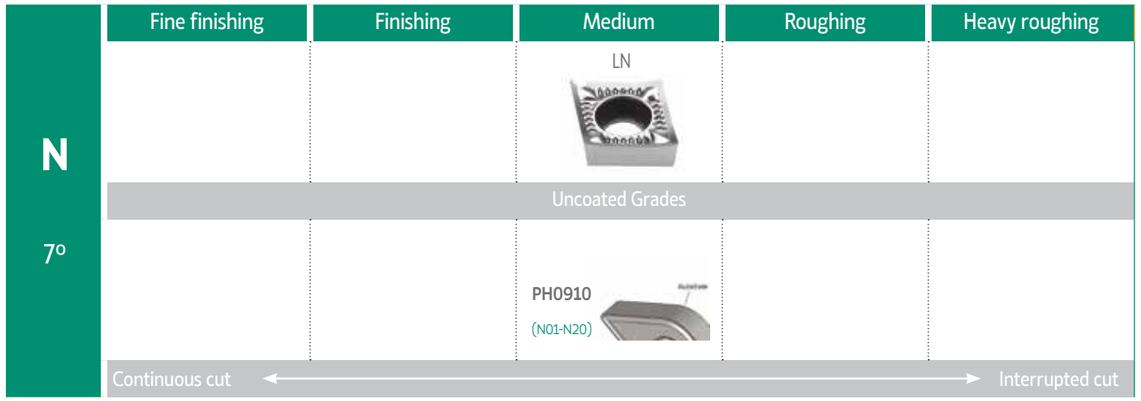
CVD Grades

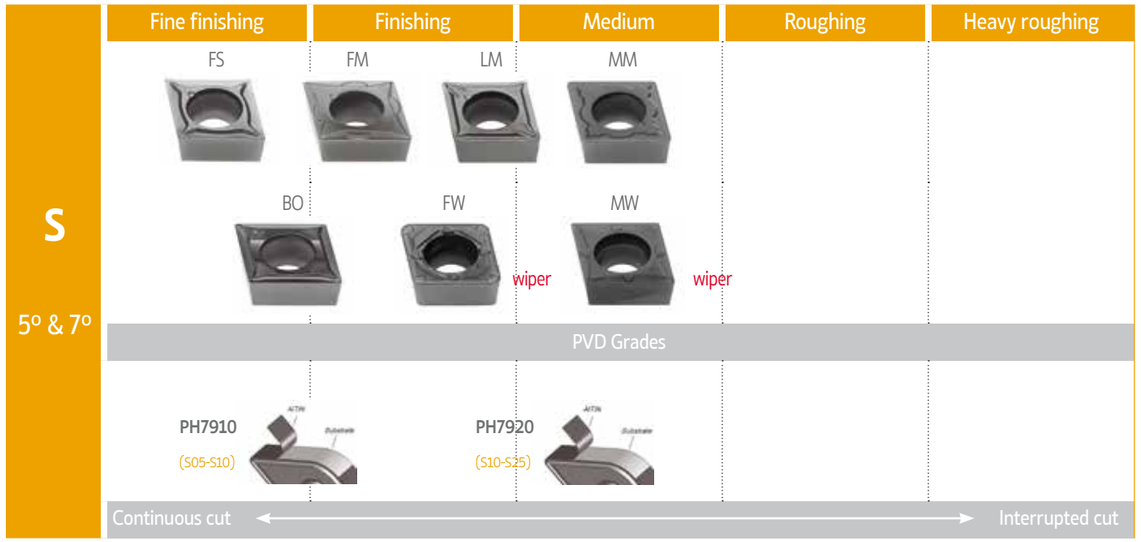
PH5705 (K05-K15)	PH5320 (K10-K25)

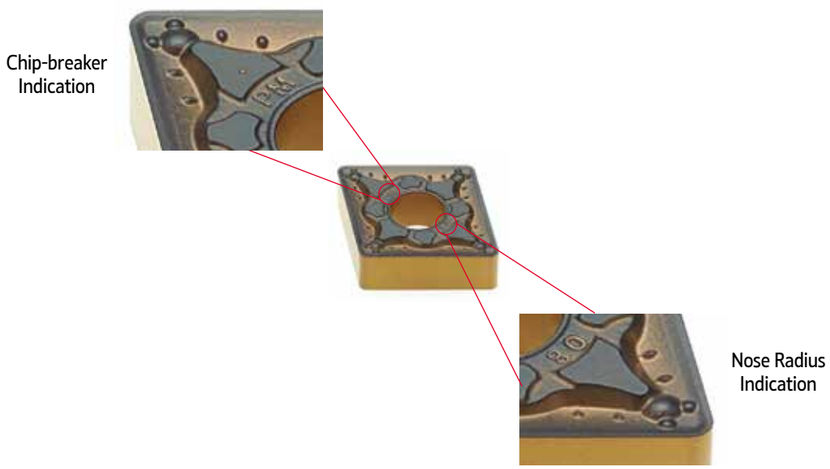
Uncoated Grades

PH0705 (K05-K15)

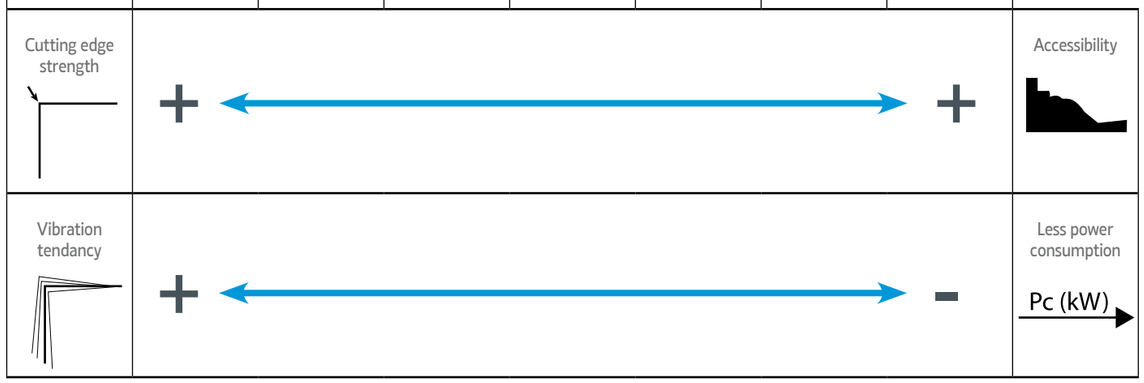
Continuous cut ⟷ Interrupted cut







Shape angle		90º	80º	80º	60º	55º	35º
Geometry shape code	R	S	C	W	T	D	V
Geometry shape design							



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

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

CNMA Roughing Page C - 206 Rhombic 80º	CNMG-MF Finishing Page C - 206 Rhombic 80º	CNMG-MS Medium to Finishing Page C - 206 Rhombic 80º	CNMG-SF Medium to Finishing Page C - 206 Rhombic 80º	CNMG-LC Medium to Finishing Page C - 206 Rhombic 80º	CNMG-MR Medium Page C - 208 Rhombic 80º
CNMG-PM NEW Medium Page C - 208 Rhombic 80º	CNMG-MW Medium wiper Page C - 208 Rhombic 80º	CNMG-SS Roughing to Medium Page C - 208 Rhombic 80º	CNMG-ST Medium Page C - 210 Rhombic 80º	CNMG-HR Roughing Page C - 210 Rhombic 80º	
CNMM-RP NEW Roughing Page C - 210 Rhombic 80º	CNMM-HY Heavy to Roughing Page C - 210 Rhombic 80º	CNMM-HZ Heavy to Roughing Page C - 210 Rhombic 80º			
DNMA Roughing Page C - 212 Rhombic 55º	DNMG-MF Finishing Page C - 212 Rhombic 55º	DNMG-MS Medium to Finishing Page C - 212 Rhombic 55º	DNMG-SF Medium to Finishing Page C - 212 Rhombic 55º	DNMG-LC Medium to Finishing Page C - 212 Rhombic 55º	DNMG-MR Medium Page C - 214 Rhombic 55º
DNMG-PM NEW Medium Page C - 214 Rhombic 55º	DNMG-MW Medium wiper Page C - 214 Rhombic 55º	DNMG-SS Roughing to medium Page C - 214 Rhombic 55º	DNMG-ST Medium Page C - 214 Rhombic 55º	DNMG-HR Roughing Page C - 216 Rhombic 55º	
DNMX-02 Medium to Finishing Page C - 216 Rhombic 55º	DNMX-03 NEW Medium Page C - 216 Rhombic 55º	DNMX-01 Roughing to medium Page C - 216 Rhombic 55º			
KNUX-01 Finishing Page C - 218 Parallelogram 55º	KNUX-02 Medium Page C - 218 Parallelogram 55º				
RNMG-ST Medium Page C - 220 Round Rº	RNMA Roughing to medium Page C - 220 Round Rº				

SNMA Roughing Page C - 222 Rhombic 55º	SNMG-MF Finishing Page C - 222 Rhombic 55º	SNMG-SF NEW Finishing Page C - 222 Rhombic 55º	SNMG-MR Medium Page C - 222 Rhombic 55º	SNMG-SS Roughing to medium Page C - 224 Rhombic 55º	SNMG-ST Medium Page C - 224 Rhombic 55º
SNMG-HR Roughing Page C - 224 Rhombic 55º	SNMM-RP NEW Roughing Page C - 224 Square 90º	SNMM-HY Heavy to roughing Page C - 224 Square 90º	SNMM-HZ Heavy to roughing Page C - 226 Square 90º	SNGN Medium to Finishing Page C - 226 Square 90º	SNUN Roughing to Medium Page C - 226 Square 90º
TNMA Roughing Page C - 228 Triangular 90º	TNMG-MF Finishing Page C - 228 Triangular 90º	TNMG-MS Medium to Finishing Page C - 228 Triangular 90º	TNMG-SF Medium to Finishing Page C - 228 Triangular 90º	TNMG-LC Medium to Finishing Page C - 228 Triangular 90º	TNMG-MR Medium Page C - 230 Triangular 90º
TNMG-PM NEW Roughing Page C - 230 Triangular 90º	TNMG-MW Medium wiper Page C - 230 Triangular 90º	TNMG-SS Roughing to Medium Page C - 230 Triangular 90º	TNMG-ST Medium Page C - 232 Triangular 90º	TNMG-HR Roughing Page C - 232 Triangular 90º	TNMX-01 Medium to finishing Page C - 232 Triangular 90º
VNMA Roughing Page C - 234 Rhombic 35º	VNMG-MF Finishing Page C - 234 Rhombic 35º	VNMG-MS Medium to Finishing Page C - 234 Rhombic 35º	VNMG-SF Medium to Finishing Page C - 234 Rhombic 35º	VNMG-LC Medium to Finishing Page C - 234 Rhombic 35º	VNMG-MR Medium Page C - 234 Rhombic 35º
VNMG-SS Roughing to medium Page C - 234 Rhombic 35º	VNMG-ST Medium Page C - 234 Rhombic 35º				
WNMA Roughing Page C - 236 Trigon 80º	WNMG-MF Finishing Page C - 236 Trigon 80º	WNMG-MS Medium to finishing Page C - 236 Trigon 80º	WNMG-SF Medium to finishing Page C - 236 Trigon 80º	WNMG-LC Medium to finishing Page C - 236 Trigon 80º	WNMG-MR Medium Page C - 236 Trigon 80º
WNMG-PM NEW Medium Page C - 238 Trigon 80º	WNMG-MW Medium wiper Page C - 238 Trigon 80º	WNMG-SS Roughing to medium Page C - 238 Trigon 80º	WNMG-ST Medium Page C - 238 Trigon 80º	WNMG-HR Roughing Page C - 238 Trigon 80º	

POSITIVE TURNING INSERTS OVERVIEW

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

CCMW Finishing Page C - 240 Rhombic 80º	CCMT-FP Fine finishing Page C -240 Rhombic 80º	CCMT-BO Fine finishing Page C - 240 Rhombic 80º	CCMT-FM Fine finishing Page C - 240 Rhombic 80º	CCMT-FK Fine finishing Page C - 240 Rhombic 80º	CCMT-FW Fine finishing wiper Page C - 242 Rhombic 80º
CCMT-LM NEW Finishing Page C - 242 Rhombic 80º	CCMT-MP Finishing Page C - 242 Rhombic 80º	CCMT-MM Finishing Page C - 242 Rhombic 80º	CCMT-MK Finishing Page C - 242 Rhombic 80º	CCMT-MW Finishing wiper Page C - 242 Rhombic 80º	
CCGT-FS Finishing to fine finishing Page C - 244 Rhombic 80º	CCGT-LN Finishing to fine finishing Page C - 244 Rhombic 80º				
DCMW Finishing Page C - 246 Rhombic 55º	DCMT-FP Fine finishing Page C - 246 Rhombic 55º	DCMT-FM Fine finishing Page C - 246 Rhombic 55º	DCMT-FK Fine finishing Page C - 246 Rhombic 55º	DCMT-FW Fine finishing wiper Page C - 246 Rhombic 55º	DCMT-LM NEW Finishing Page C - 246 Rhombic 55º
DCMT-MP Finishing Page C - 246 Rhombic 55º	DCMT-MM Finishing Page C - 248 Rhombic 55º	DCMT-MK Finishing Page C - 248 Rhombic 55º	DCMT-MW Finishing wiper Page C - 248 Rhombic 55º	DCGT-FS NEW Finishing to fine finishing Page C - 248 Rhombic 55º	DCGT-LN Finishing to fine finishing Page C - 248 Rhombic 55º
RCMT-CP Medium Page C - 250 Round Rº	RCMT-ST Roughing to medium Page C - 250 Round Rº	RCMT-RF NEW Roughing to medium Page C - 250 Round Rº	RCMT-RM NEW Roughing to medium Page C - 250 Round Rº		
RCMX-ST Roughing to medium Page C - 250 Round Rº	RCMX-RM Roughing to medium Page C - 250 Round Rº	RCMX-RR Roughing to medium Page C - 250 Round Rº		RCGT-LN Finishing to fine finishing Page C - 250 Round Rº	
SCMW Finishing Page C - 252 Square 90º	SCMT-FP Fine finishing Page C - 252 Square 90º	SCMT-FM Fine finishing Page C - 252 Square 90º	SCMT-FK Fine finishing Page C - 252 Square 90º	SCMT-MP Finishing Page C - 252 Square 90º	SCMT-MM Finishing Page C - 252 Square 90º

SCMT-MK Finishing Page C - 252 Square 90º	SCGT-LN Finishing to fine finishing Page C - 254 Square 90º		SPUN Medium to finishing Page C - 254 Square 90º	SPMR-12 Finishing to fine finishing Page C - 254 Square 90º	SPMR-13 Medium Page C - 254 Square 90º
TCMW Finishing Page C - 256 Triangular 60º	TCMT-FP Fine finishing Page C - 256 Triangular 60º	TCMT-FM Fine finishing Page C - 256 Triangular 60º	TCMT-FK Fine finishing Page C - 258 Triangular 60º	TCMT-FW Fine finishing wiper Page C - 258 Triangular 60º	TCMT-MP Finishing Page C - 258 Triangular 60º
TCMT-MM Finishing Page C - 260 Triangular 60º	TCMT-MK Finishing Page C - 260 Triangular 60º	TCMT-MW Finishing wiper Page C - 260 Triangular 60º		TCGT-FS NEW Finishing to fine finishing Page C - 260 Triangular 60º	TCGT-LN Finishing to fine finishing Page C - 262 Triangular 60º
TPUN Medium to Finishing Page C - 264 Triangular 90º	TPMR-12 Finishing to fine finishing Page C - 264 Triangular 90º	TPMR-13 Medium Page C - 266 Triangular 90º			
VBMW Finishing Page C - 268 Rhombic 35º	VBMT-FP Fine finishing Page C - 268 Rhombic 35º	VBMT-FM Fine finishing Page C - 268 Rhombic 35º	VBMT-FK Fine finishing Page C - 268 Rhombic 35º	VBMT-MP Finishing Page C - 268 Rhombic 35º	VBMT-MM Finishing Page C - 268 Rhombic 35º
VBMT-MK Finishing Page C - 270 Rhombic 35º					
VCMW Finishing Page C - 272 Rhombic 35º	VCMT-FP Fine finishing Page C - 272 Rhombic 35º	VCMT-FM Fine finishing Page C - 272 Rhombic 35º	VCMT-FK Fine finishing Page C - 272 Rhombic 35º	VCMT-MP Finishing Page C - 272 Rhombic 35º	VCMT-MM Finishing Page C - 272 Rhombic 35º
VCMT-MK Finishing Page C - 272 Rhombic 35º		VCGT-FS NEW Finishing to fine finishing Page C - 274 Rhombic 35º	VCGT-LN Finishing to fine finishing Page C - 274 Rhombic 35º		

CN - RHOMBIC 80º NEGATIVE

RÔMBICA 80º NEGATIVA | RÓMBICA 80º NEGATIVA

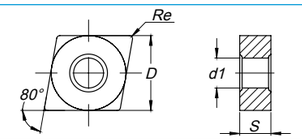
Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
CNMA  Roughing	1120974	CNMA 321														○	○				
	1120218	CNMA 322														○	○				
	1120219	CNMA 431														◎	◎				
	1120220	CNMA 432														◎	◎				
	1120221	CNMA 433														◎	◎				
	1120223	CNMA 434														◎	◎				
	1120224	CNMA 542														◎	◎				
	1120225	CNMA 543														◎	◎				
	1121470	CNMA 544														◎	◎				
	1120226	CNMA 643														◎	◎				
	1120227	CNMA 644														◎	◎				
	1121471	CNMA 646														○	◎				
CNMG-MF  Finishing	1121472	CNMG 321-MF				◎	◎				◎	◎									
	1121318	CNMG 322-MF				◎	◎				◎	◎									
	1121320	CNMG 32.51-MF				◎	○				◎	○									
	1121317	CNMG 32.52-MF				◎	○				◎	○									
	1121478	CNMG 431-MF				◎	◎		◎		◎	◎		◎							
	1121480	CNMG 432-MF				◎	◎		◎		◎	◎		◎							
	1121482	CNMG 433-MF				◎	◎				◎	◎									
CNMG-MS  Medium to Finishing	1121479	CNMG 431-MS													◎				◎		◎
	1121481	CNMG 432-MS													◎				◎		◎
	1121483	CNMG 433-MS													◎				◎		◎
	1121486	CNMG 434-MS													◎				○		◎
CNMG-SF  Medium to Finishing	1123747	CNMG 431-SF												◎	◎					◎	◎
	1123717	CNMG 432-SF												◎	◎					◎	◎
	1123748	CNMG 433-SF												◎	◎					◎	◎
CNMG-LC  Medium to Finishing	1122024	CNMG 431-LC				◎	◎														
	1122021	CNMG 432-LC				◎	◎														
	NEW 1124029	CNMG 433-LC				◎	◎														

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

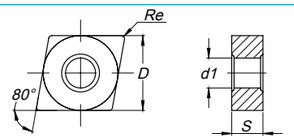


ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
CNMA 090304	CNMA 321	3/8	1/8	1/64	0.150	0.059	0.006	0.118	0.006	0.004	0.008
CNMA 090308	CNMA 322	3/8	1/8	1/32	0.150	0.059	0.006	0.118	0.010	0.004	0.012
CNMA 120404	CNMA 431	1/2	3/16	1/64	0.203	0.098	0.008	0.197	0.008	0.004	0.012
CNMA 120408	CNMA 432	1/2	3/16	1/32	0.203	0.157	0.008	0.315	0.014	0.006	0.024
CNMA 120412	CNMA 433	1/2	3/16	3/64	0.203	0.157	0.012	0.315	0.018	0.008	0.031
CNMA 120416	CNMA 434	1/2	3/16	1/16	0.203	0.157	0.012	0.315	0.022	0.008	0.039
CNMA 160608	CNMA 542	5/8	1/4	1/32	0.250	0.197	0.012	0.394	0.018	0.008	0.031
CNMA 160612	CNMA 543	5/8	1/4	3/64	0.250	0.197	0.012	0.394	0.018	0.008	0.031
CNMA 160616	CNMA 544	5/8	1/4	1/16	0.250	0.197	0.012	0.394	0.022	0.008	0.039
CNMA 190612	CNMA 643	3/4	1/4	3/64	0.313	0.236	0.012	0.472	0.018	0.008	0.031
CNMA 190616	CNMA 644	3/4	1/4	1/16	0.313	0.236	0.012	0.472	0.022	0.008	0.039
CNMA 190624	CNMA 646	3/4	1/4	1/32	0.313	0.236	0.016	0.472	0.024	0.008	0.055
CNMG 090304-MF	CNMG 321-MF	3/8	1/8	1/64	0.150	0.014	0.004	0.059	0.006	0.002	0.010
CNMG 090308-MF	CNMG 322-MF	3/8	1/8	1/32	0.150	0.014	0.004	0.059	0.008	0.004	0.016
CNMG 09T304-MF	CNMG 32.51-MF	3/8	5/32	1/64	0.150	0.014	0.004	0.059	0.006	0.002	0.010
CNMG 09T308-MF	CNMG 32.52-MF	3/8	5/32	1/32	0.150	0.014	0.004	0.059	0.008	0.004	0.016
CNMG 120404-MF	CNMG 431-MF	1/2	3/16	1/64	0.203	0.016	0.004	0.059	0.006	0.002	0.010
CNMG 120408-MF	CNMG 432-MF	1/2	3/16	1/32	0.203	0.016	0.004	0.059	0.008	0.004	0.016
CNMG 120412-MF	CNMG 433-MF	1/2	3/16	3/64	0.203	0.031	0.020	0.098	0.010	0.006	0.020
CNMG 120404-MS	CNMG 431-MS	1/2	3/16	1/64	0.203	0.059	0.008	0.142	0.006	0.004	0.008
CNMG 120408-MS	CNMG 432-MS	1/2	3/16	1/32	0.203	0.079	0.012	0.142	0.010	0.004	0.016
CNMG 120412-MS	CNMG 433-MS	1/2	3/16	3/64	0.203	0.094	0.016	0.142	0.012	0.006	0.024
CNMG 120416-MS	CNMG 434-MS	1/2	3/16	1/16	0.203	0.094	0.016	0.142	0.016	0.006	0.031
CNMG 120404-SF	CNMG 431-SF	1/2	3/16	1/64	0.203	0.059	0.024	0.118	0.006	0.004	0.009
CNMG 120408-SF	CNMG 432-SF	1/2	3/16	1/32	0.203	0.059	0.024	0.118	0.010	0.005	0.015
CNMG 120412-SF	CNMG 433-SF	1/2	3/16	3/64	0.203	0.059	0.024	0.118	0.014	0.006	0.022
CNMG 120404-LC	CNMG 431-LC	1/2	3/16	1/64	0.203	0.039	0.016	0.098	0.004	0.003	0.012
CNMG 120408-LC	CNMG 432-LC	1/2	3/16	1/32	0.203	0.059	0.016	0.098	0.006	0.004	0.016
CNMG 120412-LC	CNMG 433-LC	1/2	3/16	3/64	0.203	0.059	0.016	0.098	0.008	0.006	0.016

CN - RHOMBIC 80° NEGATIVE

RÔMBICA 80° NEGATIVA | RÓMBICA 80° NEGATIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
CNMG-MR  Medium	1121473	CNMG 321-MR				◎	◎	○													
	1121293	CNMG 322-MR				◎	◎	○													
	1121431	CNMG 332-MR				○	○	○													
	1121180	CNMG 431-MR	◎			◎	◎	◎													
	1121174	CNMG 432-MR	◎			◎	◎	◎													
	1121198	CNMG 433-MR	◎			◎	◎	◎													
	1121485	CNMG 434-MR				◎	◎	◎													
	1121239	CNMG 542-MR	◎			◎	◎	◎													
	1121355	CNMG 543-MR	◎			◎	◎	◎													
	1121490	CNMG 544-MR				◎	◎	◎													
	1121302	CNMG 643-MR	◎			◎	◎	◎													
	1121301	CNMG 644-MR				◎	◎	◎													
CNMG-PM NEW  Medium	1123919	CNMG 431-PM		◎	◎																
	1123790	CNMG 432-PM		◎	◎																
	1123920	CNMG 433-PM		◎	◎																
	1123921	CNMG 434-PM		◎	◎																
CNMG-MW  Medium Wiper	1121339	CNMG 432-MW	◎			◎	◎	◎			◎	◎	◎			○	◎				
	1121191	CNMG 433-MW	◎			◎	◎	◎			◎	◎	◎			○	◎				
CNMG-SS  Roughing to Medium	1121474	CNMG 321-SS										◎		◎	◎					◎	◎
	1121476	CNMG 322-SS										◎		◎	◎					◎	◎
	1121243	CNMG 431-SS									◎	◎	◎	◎	◎					◎	◎
	1121201	CNMG 432-SS									◎	◎	◎	◎	◎					◎	◎
	1121202	CNMG 433-SS									◎	◎	◎	◎	◎					◎	◎
	1121487	CNMG 434-SS										◎		○	◎					○	◎
	1121332	CNMG 542-SS										◎		○	◎					○	◎
	1121333	CNMG 543-SS										◎		○	◎					○	◎
	1121363	CNMG 643-SS										◎		○	◎					○	◎
	1121364	CNMG 644-SS										◎		○	◎					○	◎



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
CNMG 090304-MR	CNMG 321-MR	3/8	1/8	1/64	0.150	0.079	0.016	0.157	0.008	0.004	0.012
CNMG 090308-MR	CNMG 322-MR	3/8	1/8	1/32	0.150	0.079	0.020	0.157	0.012	0.006	0.020
CNMG 090408-MR	CNMG 332-MR	3/8	3/16	1/32	0.150	0.079	0.020	0.157	0.012	0.006	0.020
CNMG 120404-MR	CNMG 431-MR	1/2	3/16	1/64	0.203	0.118	0.016	0.217	0.008	0.004	0.012
CNMG 120408-MR	CNMG 432-MR	1/2	3/16	1/32	0.203	0.118	0.020	0.217	0.012	0.006	0.020
CNMG 120412-MR	CNMG 433-MR	1/2	3/16	3/64	0.203	0.118	0.031	0.217	0.014	0.007	0.024
CNMG 120416-MR	CNMG 434-MR	1/2	3/16	1/16	0.203	0.118	0.039	0.217	0.016	0.009	0.026
CNMG 160608-MR	CNMG 542-MR	5/8	1/4	1/32	0.250	0.157	0.020	0.283	0.012	0.006	0.020
CNMG 160612-MR	CNMG 543-MR	5/8	1/4	3/64	0.250	0.157	0.031	0.283	0.014	0.007	0.024
CNMG 160616-MR	CNMG 544-MR	5/8	1/4	1/16	0.250	0.157	0.039	0.283	0.016	0.009	0.026
CNMG 190612-MR	CNMG 643-MR	3/4	1/4	3/64	0.313	0.157	0.031	0.339	0.014	0.007	0.024
CNMG 190616-MR	CNMG 644-MR	3/4	1/4	1/16	0.313	0.157	0.039	0.339	0.016	0.009	0.026
CNMG 120404-PM	CNMG 431-PM	1/2	3/16	1/64	0.203	0.118	0.016	0.217	0.008	0.004	0.012
CNMG 120408-PM	CNMG 432-PM	1/2	3/16	1/32	0.203	0.118	0.020	0.217	0.012	0.006	0.020
CNMG 120412-PM	CNMG 433-PM	1/2	3/16	3/64	0.203	0.118	0.031	0.217	0.014	0.007	0.024
CNMG 120416-PM	CNMG 434-PM	1/2	3/16	1/16	0.203	0.118	0.039	0.217	0.016	0.009	0.026
CNMG 120408-MW	CNMG 432-MW	1/2	3/16	1/32	0.203	0.118	0.020	0.197	0.012	0.006	0.024
CNMG 120412-MW	CNMG 433-MW	1/2	3/16	3/64	0.203	0.138	0.031	0.236	0.020	0.008	0.035
CNMG 090304-SS	CNMG 321-SS	3/8	1/8	1/64	0.150	0.079	0.020	0.098	0.008	0.004	0.010
CNMG 090308-SS	CNMG 322-SS	3/8	1/8	1/32	0.150	0.079	0.020	0.098	0.010	0.005	0.018
CNMG 120404-SS	CNMG 431-SS	1/2	3/16	1/64	0.203	0.118	0.020	0.224	0.008	0.004	0.010
CNMG 120408-SS	CNMG 432-SS	1/2	3/16	1/32	0.203	0.118	0.020	0.224	0.010	0.005	0.018
CNMG 120412-SS	CNMG 433-SS	1/2	3/16	3/64	0.203	0.118	0.020	0.224	0.012	0.006	0.024
CNMG 120416-SS	CNMG 434-SS	1/2	3/16	1/16	0.203	0.118	0.020	0.224	0.015	0.007	0.026
CNMG 160608-SS	CNMG 542-SS	5/8	1/4	1/32	0.250	0.157	0.020	0.283	0.010	0.005	0.018
CNMG 160612-SS	CNMG 543-SS	5/8	1/4	3/64	0.250	0.157	0.020	0.283	0.012	0.006	0.024
CNMG 190612-SS	CNMG 643-SS	3/4	1/4	3/64	0.313	0.157	0.020	0.335	0.012	0.006	0.024
CNMG 190616-SS	CNMG 644-SS	3/4	1/4	1/16	0.313	0.157	0.020	0.335	0.015	0.007	0.026

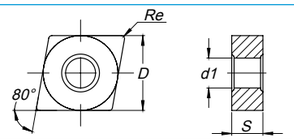
◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RÔMBICA 80° NEGATIVA | RÓMBICA 80° NEGATIVA



Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
CNMG-ST  Medium	1121475	CNMG 321-ST														○	○				
	1121477	CNMG 322-ST														○	○				
	1121344	CNMG 431-ST														◎	◎				
	1121165	CNMG 432-ST														◎	◎				
	1121166	CNMG 433-ST														◎	◎				
	1121488	CNMG 434-ST														◎	◎				
	1121335	CNMG 542-ST														◎	◎				
	1121303	CNMG 543-ST														◎	◎				
	1121491	CNMG 544-ST														◎	◎				
	1121336	CNMG 643-ST														◎	◎				
	1121345	CNMG 644-ST														◎	◎				
CNMG-HR  Roughing	1121193	CNMG 432-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121192	CNMG 433-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121484	CNMG 434-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121331	CNMG 542-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121358	CNMG 543-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121489	CNMG 544-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121359	CNMG 643-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121360	CNMG 644-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121636	CNMG 866-HR				○	◎	◎			○	◎	◎				○	◎			
CNMM-RP NEW  Roughing	1124000	CNMM 643-RP	○			◎	◎				◎	◎					○				
	1123999	CNMM 644-RP	○			◎	◎				◎	◎					○				
	1123676	CNMM 646-RP	○			◎	◎				◎	◎					○				
CNMM-HY  Heavy to Roughing	1121608	CNMM 643-HY				◎	◎	◎			◎	◎	◎								
	1121252	CNMM 644-HY				◎	◎	◎			◎	◎	◎								
	1121434	CNMM 646-HY				◎	◎	◎			◎	◎	◎								
	1121248	CNMM 866-HY				◎	◎	◎			◎	◎	◎								
CNMM-HZ  Heavy to Roughing	1121607	CNMM 643-HZ	◎			◎	◎	◎									◎	◎			
	1121251	CNMM 644-HZ	◎			◎	◎	◎									◎	◎			
	1121435	CNMM 646-HZ				◎	◎	◎									◎	◎			
	1121247	CNMM 866-HZ				◎	◎	◎									◎	◎			

ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
CNMG 090304-ST	CNMG 321-ST	3/8	1/8	1/64	0.150	0.079	0.006	0.157	0.009	0.006	0.010
CNMG 090308-ST	CNMG 322-ST	3/8	1/8	1/32	0.150	0.079	0.006	0.157	0.014	0.006	0.020
CNMG 120404-ST	CNMG 431-ST	1/2	3/16	1/64	0.203	0.098	0.008	0.197	0.009	0.006	0.010
CNMG 120408-ST	CNMG 432-ST	1/2	3/16	1/32	0.203	0.118	0.008	0.236	0.014	0.006	0.020
CNMG 120412-ST	CNMG 433-ST	1/2	3/16	3/64	0.203	0.118	0.012	0.236	0.016	0.006	0.024
CNMG 120416-ST	CNMG 434-ST	1/2	3/16	1/16	0.203	0.118	0.012	0.236	0.018	0.008	0.028
CNMG 160608-ST	CNMG 542-ST	5/8	1/4	1/32	0.250	0.157	0.008	0.315	0.014	0.006	0.020
CNMG 160612-ST	CNMG 543-ST	5/8	1/4	3/64	0.250	0.157	0.012	0.315	0.016	0.006	0.024
CNMG 160616-ST	CNMG 544-ST	5/8	1/4	1/16	0.250	0.157	0.012	0.315	0.018	0.008	0.028
CNMG 190612-ST	CNMG 643-ST	3/4	1/4	3/64	0.313	0.177	0.012	0.354	0.016	0.006	0.024
CNMG 190616-ST	CNMG 644-ST	3/4	1/4	1/16	0.313	0.177	0.012	0.354	0.018	0.008	0.028
CNMG 120408-HR	CNMG 432-HR	1/2	3/16	1/32	0.203	0.157	0.039	0.276	0.014	0.008	0.022
CNMG 120412-HR	CNMG 433-HR	1/2	3/16	3/64	0.203	0.157	0.039	0.276	0.016	0.010	0.024
CNMG 120416-HR	CNMG 434-HR	1/2	3/16	1/16	0.203	0.157	0.059	0.276	0.020	0.013	0.030
CNMG 160608-HR	CNMG 542-HR	5/8	1/4	1/32	0.250	0.197	0.039	0.315	0.014	0.008	0.022
CNMG 160612-HR	CNMG 543-HR	5/8	1/4	3/64	0.250	0.197	0.039	0.315	0.016	0.010	0.024
CNMG 160616-HR	CNMG 544-HR	5/8	1/4	1/16	0.250	0.197	0.059	0.315	0.020	0.013	0.030
CNMG 190612-HR	CNMG 643-HR	3/4	1/4	3/64	0.313	0.217	0.079	0.394	0.016	0.010	0.028
CNMG 190616-HR	CNMG 644-HR	3/4	1/4	1/16	0.313	0.217	0.079	0.394	0.020	0.013	0.031
CNMG 250924-HR	CNMG 866-HR	1	3/8	3/32	0.359	0.236	0.079	0.591	0.024	0.016	0.039
CNMM 190612-RP	CNMM 643-RP	3/4	1/4	3/64	0.313	0.217	0.079	0.394	0.016	0.010	0.028
CNMM 190616-RP	CNMM 644-RP	3/4	1/4	1/16	0.313	0.217	0.079	0.394	0.020	0.013	0.031
CNMM 190624-RP	CNMM 646-RP	3/4	1/4	3/32	0.313	0.236	0.079	0.472	0.024	0.014	0.047
CNMM 190612-HY	CNMM 643-HY	3/4	1/4	3/64	0.313	0.236	0.079	0.472	0.020	0.014	0.031
CNMM 190616-HY	CNMM 644-HY	3/4	1/4	1/16	0.313	0.236	0.079	0.472	0.024	0.014	0.039
CNMM 190624-HY	CNMM 646-HY	3/4	1/4	3/32	0.313	0.236	0.079	0.472	0.024	0.014	0.047
CNMM 250924-HY	CNMM 866-HY	1	3/8	3/32	0.359	0.315	0.098	0.591	0.028	0.016	0.055
CNMM 190612-HZ	CNMM 643-HZ	3/4	1/4	3/64	0.313	0.394	0.094	0.472	0.026	0.020	0.031
CNMM 190616-HZ	CNMM 644-HZ	3/4	1/4	1/16	0.313	0.394	0.094	0.472	0.031	0.020	0.043
CNMM 190624-HZ	CNMM 646-HZ	3/4	1/4	3/32	0.313	0.394	0.126	0.472	0.039	0.024	0.063
CNMM 250924-HZ	CNMM 866-HZ	1	3/8	3/32	0.359	0.394	0.126	0.669	0.039	0.024	0.063

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

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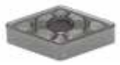
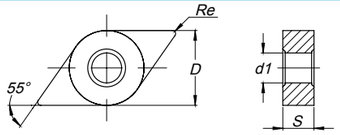
RÔMBICA 55° NEGATIVA | RÓMBICA 55° NEGATIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
DNMA  Roughing	1120975	DNMA 331														◉	◉				
	1120312	DNMA 431														◉	◉				
	1120313	DNMA 432														◉	◉				
	1121178	DNMA 433														◉	◉				
	1121496	DNMA 434														◉	◉				
	1120314	DNMA 441														◉	◉				
	1120315	DNMA 442														◉	◉				
	1120316	DNMA 443														◉	◉				
	1120317	DNMA 444														◉	◉				
DNMG-MF  Finishing	1121497	DNMG 331-MF				◉	◉				◉	◉									
	1121499	DNMG 332-MF				◉	◉				◉	◉									
	1121502	DNMG 431-MF				◉	◉	○	◉		◉	◉	○	◉							
	1121504	DNMG 432-MF				◉	◉	○	◉		◉	◉	○	◉							
	1121507	DNMG 433-MF				◉	◉	○	○		◉	◉	○	○							
	1121515	DNMG 441-MF				◉	◉		◉		◉	◉		◉							
	1121516	DNMG 442-MF				◉	◉		◉		◉	◉		◉							
	1121517	DNMG 443-MF				◉	◉		○		◉	◉		○							
DNMG-MS  Medium to Finishing	1121503	DNMG 431-MS													◉				◉		◉
	1121505	DNMG 432-MS													◉				◉		◉
	1121509	DNMG 433-MS													◉				◉		◉
	1121513	DNMG 434-MS													◉				○		◉
	1121927	DNMG 441-MS													◉				◉		◉
	1121928	DNMG 442-MS													◉				◉		◉
	1122030	DNMG 443-MS													◉				○		◉
DNMG-SF  Medium to Finishing	1123749	DNMG 331-SF												◉	◉					◉	◉
	1123750	DNMG 332-SF												◉	◉					◉	◉
	1123751	DNMG 431-SF												◉	◉					◉	◉
	1123752	DNMG 432-SF												◉	◉					◉	◉
	1123753	DNMG 433-SF												◉	◉					◉	◉
	1123754	DNMG 441-SF												◉	◉					◉	◉
	1123755	DNMG 442-SF												◉	◉					◉	◉
	1123756	DNMG 443-SF												◉	◉					◉	◉
DNMG-LC  Medium to Finishing	1123662	DNMG 431-LC				◉	◉														
	1123663	DNMG 432-LC				◉	◉														
	1123664	DNMG 433-LC				◉	◉														
	1122020	DNMG 441-LC				◉	◉														
	1122007	DNMG 442-LC				◉	◉														
	1123655	DNMG 443-LC				◉	◉														



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
DNMA 110404	DNMA 331	3/8	3/16	1/64	0.150	0.079	0.008	0.138	0.006	0.004	0.012
DNMA 150404	DNMA 431	1/2	3/16	1/64	0.203	0.118	0.008	0.157	0.006	0.004	0.012
DNMA 150408	DNMA 432	1/2	3/16	1/32	0.203	0.118	0.008	0.236	0.014	0.006	0.024
DNMA 150412	DNMA 433	1/2	3/16	3/64	0.203	0.118	0.012	0.236	0.018	0.008	0.031
DNMA 150416	DNMA 434	1/2	3/16	1/16	0.203	0.118	0.012	0.236	0.022	0.008	0.039
DNMA 150604	DNMA 441	1/2	1/4	1/64	0.203	0.118	0.008	0.157	0.006	0.004	0.012
DNMA 150608	DNMA 442	1/2	1/4	1/32	0.203	0.118	0.008	0.236	0.014	0.006	0.024
DNMA 150612	DNMA 443	1/2	1/4	3/64	0.203	0.118	0.012	0.236	0.018	0.008	0.031
DNMA 150616	DNMA 444	1/2	1/4	1/16	0.203	0.118	0.012	0.236	0.022	0.008	0.039
DNMG 110404-MF	DNMG 331-MF	3/8	3/16	1/64	0.150	0.016	0.004	0.059	0.006	0.002	0.010
DNMG 110408-MF	DNMG 332-MF	3/8	3/16	1/32	0.150	0.016	0.004	0.059	0.008	0.004	0.016
DNMG 150404-MF	DNMG 431-MF	1/2	3/16	1/64	0.203	0.016	0.004	0.059	0.006	0.002	0.010
DNMG 150408-MF	DNMG 432-MF	1/2	3/16	1/32	0.203	0.016	0.004	0.059	0.008	0.004	0.016
DNMG 150412-MF	DNMG 433-MF	1/2	3/16	3/64	0.203	0.031	0.008	0.098	0.010	0.006	0.020
DNMG 150604-MF	DNMG 441-MF	1/2	1/4	1/64	0.203	0.016	0.004	0.059	0.006	0.002	0.010
DNMG 150608-MF	DNMG 442-MF	1/2	1/4	1/32	0.203	0.016	0.004	0.059	0.008	0.004	0.016
DNMG 150612-MF	DNMG 443-MF	1/2	1/4	3/64	0.203	0.031	0.008	0.098	0.010	0.006	0.020
DNMG 150404-MS	DNMG 431-MS	1/2	3/16	1/64	0.203	0.059	0.008	0.142	0.006	0.004	0.008
DNMG 150408-MS	DNMG 432-MS	1/2	3/16	1/32	0.203	0.079	0.012	0.150	0.010	0.004	0.016
DNMG 150412-MS	DNMG 433-MS	1/2	3/16	3/64	0.203	0.098	0.016	0.157	0.012	0.006	0.024
DNMG 150416-MS	DNMG 434-MS	1/2	3/16	1/16	0.203	0.110	0.016	0.177	0.016	0.006	0.031
DNMG 150604-MS	DNMG 441-MS	1/2	1/4	1/64	0.203	0.059	0.008	0.142	0.006	0.004	0.008
DNMG 150608-MS	DNMG 442-MS	1/2	1/4	1/32	0.203	0.079	0.012	0.157	0.010	0.004	0.016
DNMG 150612-MS	DNMG 443-MS	1/2	1/4	3/64	0.203	0.110	0.016	0.177	0.012	0.006	0.024
DNMG 110404-SF	DNMG 331-SF	3/8	3/16	1/64	0.150	0.059	0.024	0.118	0.006	0.004	0.009
DNMG 110408-SF	DNMG 332-SF	3/8	3/16	1/32	0.150	0.059	0.024	0.118	0.010	0.005	0.015
DNMG 150404-SF	DNMG 431-SF	1/2	3/16	1/64	0.203	0.059	0.024	0.118	0.006	0.004	0.009
DNMG 150408-SF	DNMG 432-SF	1/2	3/16	1/32	0.203	0.059	0.024	0.118	0.010	0.005	0.015
DNMG 150412-SF	DNMG 433-SF	1/2	3/16	3/64	0.203	0.059	0.024	0.118	0.014	0.006	0.022
DNMG 150604-SF	DNMG 441-SF	1/2	1/4	1/64	0.203	0.059	0.024	0.118	0.006	0.004	0.009
DNMG 150608-SF	DNMG 442-SF	1/2	1/4	1/32	0.203	0.059	0.024	0.118	0.010	0.005	0.015
DNMG 150612-SF	DNMG 443-SF	1/2	1/4	3/64	0.203	0.059	0.024	0.118	0.014	0.006	0.022
DNMG 150404-LC	DNMG 431-LC	1/2	3/16	1/64	0.203	0.039	0.016	0.098	0.006	0.003	0.012
DNMG 150408-LC	DNMG 432-LC	1/2	3/16	1/32	0.203	0.059	0.016	0.098	0.008	0.004	0.016
DNMG 150412-LC	DNMG 433-LC	1/2	3/16	3/64	0.203	0.079	0.031	0.118	0.010	0.006	0.020
DNMG 150604-LC	DNMG 441-LC	1/2	1/4	1/64	0.203	0.079	0.016	0.118	0.006	0.003	0.012
DNMG 150608-LC	DNMG 442-LC	1/2	1/4	1/32	0.203	0.079	0.016	0.118	0.008	0.004	0.016
DNMG 150612-LC	DNMG 443-LC	1/2	1/4	3/64	0.203	0.098	0.031	0.138	0.010	0.006	0.020

◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◉ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

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DN - RHOMBIC 55° NEGATIVE

RÔMBICA 55° NEGATIVA | RÓMBICA 55° NEGATIVA

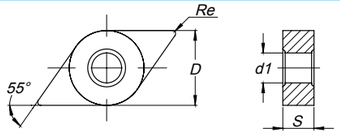
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
		(2) Grade code	L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
			PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
DNMG- MR  Medium	1121498	DNMG 331-MR				◎	◎	○													
	1121500	DNMG 332-MR				◎	◎	○													
	1121218	DNMG 431-MR	○			◎	◎	◎													
	1121219	DNMG 432-MR	○			◎	◎	◎													
	1121508	DNMG 433-MR	○			◎	◎	◎													
	1121224	DNMG 441-MR	○			◎	◎	◎													
	1121328	DNMG 442-MR	○			◎	◎	◎													
	1121518	DNMG 443-MR	○			◎	◎	◎													
	1121522	DNMG 444-MR				○	◎	○													
DNMG- PM NEW  Medium	1123924	DNMG 431-PM		◎	◎																
	1123916	DNMG 432-PM		◎	◎																
	1123925	DNMG 433-PM		◎	◎																
	1123926	DNMG 434-PM		◎	◎																
	1124065	DNMG 441-PM		◎	◎																
	1123777	DNMG 442-PM		◎	◎																
	1124066	DNMG 443-PM		◎	◎																
DNMG- MW  Medium Wiper	1121374	DNMG 432-MW	◎			◎	◎	◎			◎	◎	◎			○	◎				
	1121510	DNMG 433-MW	◎			◎	◎	◎			◎	◎	◎			○	◎				
	1121375	DNMG 442-MW	◎			◎	◎	◎			◎	◎	◎			○	◎				
	1121519	DNMG 443-MW	◎			◎	◎	◎			◎	◎	◎			○	◎				
DNMG- SS  Roughing to Medium	1121501	DNMG 332-SS									○	◎		◎	◎					◎	◎
	1121291	DNMG 431-SS									◎	◎	◎	◎	◎					◎	◎
	1121292	DNMG 432-SS									◎	◎	◎	◎	◎					◎	◎
	1121511	DNMG 433-SS									◎	◎	◎	◎	◎					◎	◎
	1121284	DNMG 441-SS									◎	◎	◎	◎	◎					◎	◎
	1121285	DNMG 442-SS									◎	◎	◎	◎	◎					◎	◎
	1121520	DNMG 443-SS									◎	◎	◎	◎	◎					◎	◎
	1121287	DNMG 444-SS										◎		○	◎					○	◎
DNMG- ST  Medium	1121346	DNMG 331-ST														◎	◎				
	1121347	DNMG 332-ST														◎	◎				
	1121255	DNMG 431-ST														◎	◎				
	1121256	DNMG 432-ST														◎	◎				
	1121512	DNMG 433-ST														◎	◎				
	1121514	DNMG 434-ST														◎	◎				
	1121257	DNMG 441-ST														◎	◎				
	1121258	DNMG 442-ST														◎	◎				
	1121521	DNMG 443-ST														◎	◎				
	1121523	DNMG 444-ST														◎	◎				

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

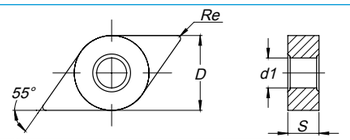


ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
DNMG 110404-MR	DNMG 331-MR	3/8	3/16	1/64	0.150	0.079	0.016	0.197	0.008	0.004	0.012
DNMG 110408-MR	DNMG 332-MR	3/8	3/16	1/32	0.150	0.079	0.020	0.197	0.012	0.006	0.020
DNMG 150404-MR	DNMG 431-MR	1/2	3/16	1/64	0.203	0.118	0.016	0.236	0.008	0.004	0.012
DNMG 150408-MR	DNMG 432-MR	1/2	3/16	1/32	0.203	0.118	0.020	0.236	0.012	0.006	0.020
DNMG 150412-MR	DNMG 433-MR	1/2	3/16	3/64	0.203	0.118	0.031	0.236	0.014	0.007	0.024
DNMG 150604-MR	DNMG 441-MR	1/2	1/4	1/64	0.203	0.118	0.016	0.236	0.008	0.004	0.012
DNMG 150608-MR	DNMG 442-MR	1/2	1/4	1/32	0.203	0.118	0.020	0.236	0.012	0.006	0.020
DNMG 150612-MR	DNMG 443-MR	1/2	1/4	3/64	0.203	0.118	0.031	0.236	0.014	0.007	0.024
DNMG 150616-MR	DNMG 444-MR	1/2	1/4	1/16	0.203	0.118	0.039	0.236	0.016	0.009	0.026
DNMG 150404-PM	DNMG 431-PM	1/2	3/16	1/64	0.203	0.118	0.016	0.236	0.008	0.004	0.012
DNMG 150408-PM	DNMG 432-PM	1/2	3/16	1/32	0.203	0.118	0.020	0.236	0.012	0.006	0.020
DNMG 150412-PM	DNMG 433-PM	1/2	3/16	3/64	0.203	0.118	0.031	0.236	0.014	0.007	0.024
DNMG 150416-PM	DNMG 434-PM	1/2	3/16	1/16	0.203	0.118	0.039	0.236	0.016	0.009	0.026
DNMG 150604-PM	DNMG 441-PM	1/2	1/4	1/64	0.203	0.098	0.020	0.197	0.010	0.006	0.016
DNMG 150608-PM	DNMG 442-PM	1/2	1/4	1/32	0.203	0.118	0.020	0.236	0.012	0.006	0.020
DNMG 150612-PM	DNMG 443-PM	1/2	1/4	3/64	0.203	0.138	0.020	0.276	0.014	0.008	0.024
DNMG 150408-MW	DNMG 432-MW	1/2	3/16	1/32	0.203	0.098	0.012	0.157	0.014	0.006	0.024
DNMG 150412-MW	DNMG 433-MW	1/2	3/16	3/64	0.203	0.118	0.020	0.197	0.020	0.010	0.035
DNMG 150608-MW	DNMG 442-MW	1/2	1/4	1/32	0.203	0.118	0.012	0.177	0.014	0.006	0.024
DNMG 150612-MW	DNMG 443-MW	1/2	1/4	3/64	0.203	0.138	0.020	0.217	0.020	0.010	0.035
DNMG 110408-SS	DNMG 332-SS	3/8	3/16	1/32	0.150	0.079	0.020	0.173	0.010	0.005	0.018
DNMG 150404-SS	DNMG 431-SS	1/2	3/16	1/64	0.203	0.118	0.012	0.236	0.010	0.004	0.012
DNMG 150408-SS	DNMG 432-SS	1/2	3/16	1/32	0.203	0.118	0.020	0.252	0.010	0.005	0.018
DNMG 150412-SS	DNMG 433-SS	1/2	3/16	3/64	0.203	0.118	0.020	0.252	0.012	0.006	0.024
DNMG 150604-SS	DNMG 441-SS	1/2	1/4	1/64	0.203	0.118	0.012	0.236	0.010	0.004	0.012
DNMG 150608-SS	DNMG 442-SS	1/2	1/4	1/32	0.203	0.118	0.020	0.252	0.010	0.005	0.018
DNMG 150612-SS	DNMG 443-SS	1/2	1/4	3/64	0.203	0.118	0.020	0.252	0.012	0.006	0.024
DNMG 150616-SS	DNMG 444-SS	1/2	1/4	1/16	0.203	0.118	0.020	0.252	0.020	0.008	0.039
DNMG 110404-ST	DNMG 331-ST	3/8	3/16	1/64	0.150	0.079	0.008	0.138	0.008	0.006	0.012
DNMG 110408-ST	DNMG 332-ST	3/8	3/16	1/32	0.150	0.079	0.008	0.138	0.014	0.006	0.020
DNMG 150404-ST	DNMG 431-ST	1/2	3/16	1/64	0.203	0.098	0.008	0.197	0.008	0.006	0.012
DNMG 150408-ST	DNMG 432-ST	1/2	3/16	1/32	0.203	0.098	0.020	0.197	0.014	0.006	0.020
DNMG 150412-ST	DNMG 433-ST	1/2	3/16	3/64	0.203	0.118	0.020	0.236	0.020	0.010	0.028
DNMG 150416-ST	DNMG 434-ST	1/2	3/16	1/16	0.203	0.118	0.012	0.236	0.024	0.010	0.039
DNMG 150604-ST	DNMG 441-ST	1/2	1/4	1/64	0.203	0.098	0.008	0.197	0.008	0.006	0.012
DNMG 150608-ST	DNMG 442-ST	1/2	1/4	1/32	0.203	0.098	0.008	0.197	0.014	0.006	0.020
DNMG 150612-ST	DNMG 443-ST	1/2	1/4	3/64	0.203	0.118	0.012	0.236	0.020	0.006	0.028
DNMG 150616-ST	DNMG 444-ST	1/2	1/4	1/16	0.203	0.118	0.012	0.236	0.024	0.010	0.039

DN - RHOMBIC 55° NEGATIVE

RÔMBICA 55° NEGATIVA | RÓMBICA 55° NEGATIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
DNMG- HR  Roughing	1121253	DNMG 432-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121506	DNMG 433-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121254	DNMG 442-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121362	DNMG 443-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121340	DNMG 444-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
DNMX-02  Medium to Finishing	1120351	DNMX 441-L02				◎	◎				◎	◎									
	1120353	DNMX 441-R02				◎	◎				◎	◎									
	1120355	DNMX 442-L02				◎	◎				◎	◎									
	1120357	DNMX 442-R02				◎	◎				◎	◎									
NEW DNMX-03  Medium	1123983	DNMX 441-L03				◎	◎				◎	◎									
	1123815	DNMX 441-R03				◎	◎				◎	◎									
	1123796	DNMX 442-L03				◎	◎				◎	◎									
	1123795	DNMX 442-R03				◎	◎				◎	◎									
DNMX-01  Roughing to Medium	1120348	DNMX 432-L01				◎	◎				◎	◎									
	1120349	DNMX 432-R01				◎	◎				◎	◎									
	1120350	DNMX 441-L01				◎	◎				◎	◎									
	1120352	DNMX 441-R01				◎	◎				◎	◎									
	1120354	DNMX 442-L01				◎	◎				◎	◎									
	1120356	DNMX 442-R01				◎	◎				◎	◎									



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
DNMG 150408-HR	DNMG 432-HR	1/2	3/16	1/32	0.203	0.157	0.031	0.236	0.014	0.008	0.022
DNMG 150412-HR	DNMG 433-HR	1/2	3/16	3/64	0.203	0.157	0.039	0.236	0.016	0.010	0.028
DNMG 150608-HR	DNMG 442-HR	1/2	1/4	1/32	0.203	0.157	0.031	0.236	0.014	0.008	0.022
DNMG 150612-HR	DNMG 443-HR	1/2	1/4	3/64	0.203	0.157	0.039	0.236	0.016	0.010	0.028
DNMG 150616-HR	DNMG 444-HR	1/2	1/4	1/16	0.203	0.157	0.059	0.236	0.020	0.012	0.031
DNMX 150604-L02	DNMX 441-L02	1/2	1/4	1/64	0.203	0.098	0.028	0.197	0.008	0.006	0.010
DNMX 150604-R02	DNMX 441-R02	1/2	1/4	1/64	0.203	0.098	0.028	0.197	0.008	0.006	0.010
DNMX 150608-L02	DNMX 442-L02	1/2	1/4	1/32	0.203	0.118	0.031	0.197	0.014	0.006	0.020
DNMX 150608-R02	DNMX 442-R02	1/2	1/4	1/32	0.203	0.118	0.031	0.197	0.014	0.006	0.020
DNMX 150604-L03	DNMX 441-L03	1/2	1/4	1/64	0.203	0.106	0.031	0.217	0.008	0.006	0.010
DNMX 150604-R03	DNMX 441-R03	1/2	1/4	1/64	0.203	0.106	0.031	0.217	0.008	0.006	0.010
DNMX 150608-L03	DNMX 442-L03	1/2	1/4	1/32	0.203	0.126	0.039	0.236	0.014	0.006	0.020
DNMX 150608-R03	DNMX 442-R03	1/2	1/4	1/32	0.203	0.126	0.039	0.236	0.014	0.006	0.020
DNMX 150408-L01	DNMX 432-L01	1/2	3/16	1/32	0.203	0.098	0.039	0.197	0.014	0.008	0.020
DNMX 150408-R01	DNMX 432-R01	1/2	3/16	1/32	0.203	0.098	0.039	0.197	0.014	0.008	0.020
DNMX 150604-L01	DNMX 441-L01	1/2	1/4	1/64	0.203	0.118	0.059	0.236	0.010	0.006	0.012
DNMX 150604-R01	DNMX 441-R01	1/2	1/4	1/64	0.203	0.118	0.059	0.236	0.010	0.006	0.012
DNMX 150608-L01	DNMX 442-L01	1/2	1/4	1/32	0.203	0.138	0.079	0.256	0.014	0.008	0.020
DNMX 150608-R01	DNMX 442-R01	1/2	1/4	1/32	0.203	0.138	0.079	0.256	0.014	0.008	0.020

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

KN - PARALLELOGRAM 55° NEGATIVE

PARALELOGRAMA 55° NEGATIVA | PARALELOGRAMO 55° NEGATIVA

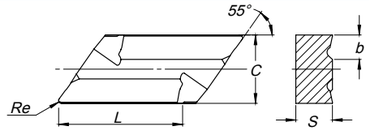
Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
KNUX-01  Finishing	1120368	KNUX 160405-L01				◉	◉				◉	◉					○				
	1120371	KNUX 160405-R01				◉	◉				◉	◉					○				
KNUX-02  Medium	1120374	KNUX 160410-L02				◉	◉				◉	◉					○				
	1120376	KNUX 160410-R02				◉	◉				◉	◉					○				

◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◉ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

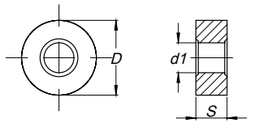


ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)					Cutting Conditions Condições de Corte Condiciones de Corte					
		L	C	Re	S	b	ap (in)	Min	Max	fn (in/rev)	Min	Max
KNUX 160405-L01	KNUX 160405-L01	0.650	3/8	0.020	3/16	0.098	0.118	0.039	0.236	0.012	0.008	0.014
KNUX 160405-R01	KNUX 160405-R01	0.650	3/8	0.020	3/16	0.098	0.118	0.039	0.236	0.012	0.008	0.014
KNUX 160410-L02	KNUX 160410-L02	0.650	3/8	0.039	3/16	0.126	0.157	0.059	0.236	0.020	0.016	0.028
KNUX 160410-R02	KNUX 160410-R02	0.650	3/8	0.039	3/16	0.126	0.157	0.059	0.236	0.020	0.016	0.028

RN - ROUND R° NEGATIVE

REDONDA R° NEGATIVA | REDONDA R° NEGATIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
RNMG-ST  Medium	1120439	RNMG 320-ST					◎	○				◎	○				○	○			
	1120440	RNMG 430-ST					◎	○				◎	○				○	○			
	1120441	RNMG 540-ST					◎	○				◎	○				○	○			
	1120442	RNMG 640-ST				○	◎	○			○	◎	○			○	○	○			
	1120443	RNMG 860-ST	◎			◎	◎	○			◎	◎	○				◎	○			
RNMA  Roughing to Medium	1120437	RNMA 540															○				
	1112262	RNMA 2006M0															○				
	1123665	RNMA 860															○				



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
RNMG 090300-ST	RNMG 320-ST	3/8	1/8	-	1/8	0.091	0.035	0.177	0.012	0.004	0.035
RNMG 120400-ST	RNMG 430-ST	1/2	3/16	-	0.203	0.118	0.047	0.189	0.016	0.005	0.047
RNMG 150600-ST	RNMG 540-ST	5/8	1/4	-	1/4	0.150	0.059	0.295	0.020	0.006	0.059
RNMG 190600-ST	RNMG 640-ST	3/4	1/4	-	5/16	0.177	0.075	0.299	0.026	0.008	0.075
RNMG 250900-ST	RNMG 860-ST	1	3/8	-	0.359	0.248	0.098	0.394	0.031	0.010	0.098
RNMA 150600	RNMA 540	5/8	1/4	-	1/4	0.157	0.059	0.315	0.020	0.006	0.059
RNMA 2006M0	RNMA 2006M0	0.787	0.236	-	0.236	0.197	0.079	0.335	0.024	0.008	0.079
RNMA 250900	RNMA 860	1	3/8	-	0.359	0.236	0.079	0.354	0.031	0.010	0.098

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

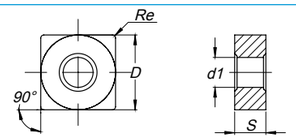
◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

SN = SQUARE 90° NEGATIVE

QUADRADA 90° NEGATIVA | ESQUADRA 90° NEGATIVA



Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
SNMA  Roughing	1121070	SNMA 321														Stock item	Stock item				
	1120474	SNMA 322														Stock item	Stock item				
	1120475	SNMA 431														Stock item	First choice				
	1120476	SNMA 432														Stock item	First choice				
	1120478	SNMA 433														Stock item	First choice				
	1120479	SNMA 434														Stock item	First choice				
	1120481	SNMA 533														Stock item	First choice				
	1121525	SNMA 543														Stock item	First choice				
	1120482	SNMA 643														Stock item	First choice				
	1120483	SNMA 644														Stock item	First choice				
	1120485	SNMA 646														Stock item	First choice				
	1120486	SNMA 856														Stock item	First choice				
SNMG-MF  Finishing	1121528	SNMG 431-MF				First choice	Stock item	Available under request	Stock item		Stock item	First choice	Available under request	Stock item							
	1121530	SNMG 432-MF				First choice	Stock item	Available under request	Stock item		Stock item	First choice	Available under request	Stock item							
	1121531	SNMG 433-MF				First choice	Stock item	Available under request			Stock item	First choice	Available under request								
SNMG-SF NEW  Medium to Finishing	1123874	SNMG 431-SF												First choice	Stock item					Stock item	First choice
	1123875	SNMG 432-SF												First choice	Stock item					Stock item	First choice
	1123876	SNMG 433-SF												First choice	Stock item					Stock item	First choice
SNMG-MR  Medium	1121529	SNMG 431-MR	Available under request			Stock item	First choice	Stock item													
	1121179	SNMG 432-MR	Available under request			Stock item	First choice	Stock item													
	1121311	SNMG 433-MR	Available under request			Stock item	First choice	Stock item													
	1121357	SNMG 434-MR				Available under request	First choice	Stock item													
	1121533	SNMG 542-MR	Available under request			Stock item	First choice	Stock item													
	1121536	SNMG 543-MR	Available under request			Stock item	First choice	Stock item													
	1121540	SNMG 544-MR				Available under request	Available under request	Available under request													
	1121543	SNMG 643-MR				Stock item	First choice	Stock item													
	1121546	SNMG 644-MR				Stock item	First choice	Stock item													

ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
SNMA 090304	SNMA 321	3/8	1/8	1/64	0.150	0.098	0.008	0.177	0.008	0.006	0.012
SNMA 090308	SNMA 322	3/8	1/8	1/32	0.150	0.098	0.016	0.177	0.016	0.008	0.024
SNMA 120404	SNMA 431	1/2	3/16	1/64	0.203	0.157	0.008	0.315	0.008	0.006	0.012
SNMA 120408	SNMA 432	1/2	3/16	1/32	0.203	0.157	0.008	0.315	0.016	0.008	0.024
SNMA 120412	SNMA 433	1/2	3/16	3/64	0.203	0.157	0.012	0.315	0.018	0.008	0.031
SNMA 120416	SNMA 434	1/2	3/16	1/16	0.203	0.157	0.012	0.315	0.022	0.008	0.039
SNMA 150412	SNMA 533	5/8	3/16	3/64	0.250	0.197	0.012	0.354	0.018	0.008	0.031
SNMA 150612	SNMA 543	5/8	1/4	3/64	0.250	0.197	0.012	0.394	0.018	0.008	0.031
SNMA 190612	SNMA 643	3/4	1/4	3/64	0.313	0.236	0.012	0.472	0.018	0.008	0.031
SNMA 190616	SNMA 644	3/4	1/4	1/16	0.313	0.236	0.012	0.472	0.022	0.008	0.039
SNMA 190624	SNMA 646	3/4	1/4	3/32	0.313	0.236	0.012	0.472	0.024	0.008	0.047
SNMA 250724	SNMA 856	1	5/16	3/32	0.359	0.236	0.016	0.472	0.024	0.008	0.055
SNMG 120404-MF	SNMG 431-MF	1/2	3/16	1/64	0.203	0.016	0.004	0.059	0.004	0.002	0.010
SNMG 120408-MF	SNMG 432-MF	1/2	3/16	1/32	0.203	0.016	0.004	0.059	0.008	0.004	0.016
SNMG 120412-MF	SNMG 433-MF	1/2	3/16	3/64	0.203	0.031	0.006	0.098	0.012	0.008	0.024
SNMG 120404-SF	SNMG 431-SF	1/2	3/16	1/64	0.203	0.079	0.039	0.157	0.006	0.004	0.009
SNMG 120408-SF	SNMG 432-SF	1/2	3/16	1/32	0.203	0.079	0.039	0.157	0.008	0.005	0.015
SNMG 120412-SF	SNMG 433-SF	1/2	3/16	3/64	0.203	0.098	0.039	0.157	0.010	0.006	0.022
SNMG 120404-MR	SNMG 431-MR	1/2	3/16	1/64	0.203	0.118	0.016	0.236	0.008	0.004	0.012
SNMG 120408-MR	SNMG 432-MR	1/2	3/16	1/32	0.203	0.118	0.020	0.236	0.012	0.006	0.020
SNMG 120412-MR	SNMG 433-MR	1/2	3/16	3/64	0.203	0.118	0.031	0.236	0.014	0.007	0.024
SNMG 120416-MR	SNMG 434-MR	1/2	3/16	1/16	0.203	0.118	0.039	0.236	0.016	0.009	0.026
SNMG 150608-MR	SNMG 542-MR	5/8	1/4	1/32	0.250	0.157	0.024	0.295	0.012	0.006	0.020
SNMG 150612-MR	SNMG 543-MR	5/8	1/4	3/64	0.250	0.157	0.031	0.295	0.014	0.007	0.024
SNMG 150616-MR	SNMG 544-MR	5/8	1/4	1/16	0.250	0.157	0.039	0.295	0.016	0.009	0.026
SNMG 190612-MR	SNMG 643-MR	3/4	1/4	3/64	0.313	0.197	0.031	0.354	0.014	0.007	0.024
SNMG 190616-MR	SNMG 644-MR	3/4	1/4	1/16	0.313	0.197	0.039	0.354	0.016	0.009	0.026

Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

Stock item | Produto de stock | Itens de stock

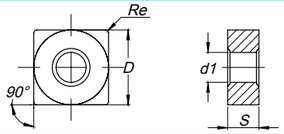
Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

SN - SQUARE 90° NEGATIVE

QUADRADA 90° NEGATIVA | ESQUADRA 90° NEGATIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
SNMG-SS  Roughing to Medium	1121526	SNMG 321-SS										○		◉	◉					◉	◉
	1121527	SNMG 322-SS										○		◉	◉					◉	◉
	1121365	SNMG 431-SS										◉		◉	◉					◉	◉
	1121315	SNMG 432-SS										◉		◉	◉					◉	◉
	1121366	SNMG 433-SS										◉		◉	◉					◉	◉
	1121532	SNMG 434-SS										◉		○	○					○	○
	1121534	SNMG 542-SS										◉		○	○					○	○
	1121537	SNMG 543-SS										◉		○	○					○	○
	1121547	SNMG 644-SS										◉		○	○					○	○
SNMG-ST  Medium	1121337	SNMG 321-ST														○	○				
	1121338	SNMG 322-ST														◉	◉				
	1121241	SNMG 431-ST														○	◉				
	1121181	SNMG 432-ST														◉	◉				
	1121310	SNMG 433-ST														◉	◉				
	1121242	SNMG 434-ST														◉	◉				
	1121538	SNMG 543-ST														○	○				
	1121541	SNMG 544-ST														○	○				
	1121544	SNMG 643-ST														◉	◉				
	1121548	SNMG 644-ST														◉	◉				
SNMG-HR  Roughing	1121194	SNMG 432-HR	◉			◉	◉	◉			◉	◉	◉			○	◉	◉			
	1121195	SNMG 433-HR	◉			◉	◉	◉			◉	◉	◉			○	◉	◉			
	1121361	SNMG 434-HR	○			◉	◉	◉			◉	◉	◉			○	◉	◉			
	1121535	SNMG 543-HR				○	◉	◉			○	◉	◉			○	○	◉			
	1121539	SNMG 544-HR				○	◉	◉			○	◉	◉			○	○	◉			
	1121542	SNMG 643-HR				◉	◉	◉			◉	◉	◉			○	○	◉			
	1121545	SNMG 644-HR				◉	◉	◉			◉	◉	◉			○	○	◉			
	1124184	SNMG 856-HR					◉					◉									
	1121638	SNMG 866-HR					◉	◉				◉	◉					◉			
SNMM-RP NEW  Roughing	1124001	SNMM 643-RP	○			◉	◉				◉	◉					○				
	1124002	SNMM 644-RP	○			◉	◉				◉	◉					○				
	1124003	SNMM 646-RP	○			◉	◉				◉	◉					○				
SNMM-HY  Heavy to Roughing	1121606	SNMM 643-HY				◉	◉	◉			◉	◉	◉								
	1121250	SNMM 644-HY				◉	◉	◉			◉	◉	◉								
	1121452	SNMM 646-HY				◉	◉	◉			◉	◉	◉								
	1121160	SNMM 856-HY				◉	◉	◉			◉	◉	◉								
	1121161	SNMM 866-HY				◉	◉	◉			◉	◉	◉								



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
SNMG 090304-SS	SNMG 321-SS	3/8	1/8	1/64	0.150	0.079	0.020	0.177	0.008	0.004	0.012
SNMG 090308-SS	SNMG 322-SS	3/8	1/8	1/32	0.150	0.079	0.020	0.177	0.010	0.005	0.018
SNMG 120404-SS	SNMG 431-SS	1/2	3/16	1/64	0.203	0.118	0.020	0.252	0.008	0.005	0.012
SNMG 120408-SS	SNMG 432-SS	1/2	3/16	1/32	0.203	0.118	0.020	0.252	0.010	0.005	0.018
SNMG 120412-SS	SNMG 433-SS	1/2	3/16	3/64	0.203	0.118	0.020	0.252	0.012	0.006	0.024
SNMG 120416-SS	SNMG 434-SS	1/2	3/16	1/16	0.203	0.118	0.020	0.252	0.018	0.006	0.031
SNMG 150608-SS	SNMG 542-SS	5/8	1/4	1/32	0.250	0.157	0.020	0.315	0.010	0.005	0.018
SNMG 150612-SS	SNMG 543-SS	5/8	1/4	3/64	0.250	0.157	0.020	0.315	0.012	0.006	0.024
SNMG 190616-SS	SNMG 644-SS	3/4	1/4	1/16	0.313	0.157	0.020	0.315	0.018	0.006	0.031
SNMG 090304-ST	SNMG 321-ST	3/8	1/8	1/64	0.150	0.098	0.008	0.177	0.008	0.006	0.012
SNMG 090308-ST	SNMG 322-ST	3/8	1/8	1/32	0.150	0.098	0.008	0.177	0.014	0.006	0.020
SNMG 120404-ST	SNMG 431-ST	1/2	3/16	1/64	0.203	0.118	0.008	0.236	0.008	0.006	0.012
SNMG 120408-ST	SNMG 432-ST	1/2	3/16	1/32	0.203	0.118	0.008	0.236	0.014	0.006	0.020
SNMG 120412-ST	SNMG 433-ST	1/2	3/16	3/64	0.203	0.118	0.012	0.236	0.016	0.006	0.024
SNMG 120416-ST	SNMG 434-ST	1/2	3/16	1/16	0.203	0.118	0.012	0.236	0.018	0.008	0.028
SNMG 150612-ST	SNMG 543-ST	5/8	1/4	3/64	0.250	0.157	0.012	0.315	0.016	0.006	0.024
SNMG 150616-ST	SNMG 544-ST	5/8	1/4	1/16	0.250	0.157	0.012	0.315	0.018	0.008	0.028
SNMG 190612-ST	SNMG 643-ST	3/4	1/4	3/64	0.313	0.177	0.012	0.354	0.016	0.006	0.024
SNMG 190616-ST	SNMG 644-ST	3/4	1/4	1/16	0.313	0.177	0.012	0.354	0.018	0.008	0.028
SNMG 120408-HR	SNMG 432-HR	1/2	3/16	1/32	0.203	0.157	0.031	0.276	0.014	0.008	0.022
SNMG 120412-HR	SNMG 433-HR	1/2	3/16	3/64	0.203	0.157	0.039	0.276	0.016	0.010	0.028
SNMG 120416-HR	SNMG 434-HR	1/2	3/16	1/16	0.203	0.157	0.059	0.276	0.020	0.013	0.031
SNMG 150612-HR	SNMG 543-HR	5/8	1/4	3/64	0.250	0.157	0.039	0.315	0.016	0.010	0.028
SNMG 150616-HR	SNMG 544-HR	5/8	1/4	1/16	0.250	0.157	0.059	0.315	0.020	0.013	0.031
SNMG 190612-HR	SNMG 643-HR	3/4	1/4	3/64	0.313	0.197	0.039	0.394	0.016	0.010	0.028
SNMG 190616-HR	SNMG 644-HR	3/4	1/4	1/16	0.313	0.197	0.059	0.394	0.020	0.013	0.031
SNMG 250724-HR	SNMG 856-HR	1	5/16	3/32	0.359	0.236	0.079	0.591	0.039	0.016	0.047
SNMG 250924-HR	SNMG 866-HR	1	3/8	3/32	0.359	0.236	0.079	0.591	0.039	0.016	0.047
SNMM 190612-RP	SNMM 643-RP	3/4	1/4	3/64	0.313	0.217	0.079	0.472	0.024	0.012	0.033
SNMM 190616-RP	SNMM 644-RP	3/4	1/4	1/16	0.313	0.236	0.079	0.472	0.024	0.014	0.039
SNMM 190624-RP	SNMM 646-RP	3/4	1/4	3/32	0.313	0.236	0.079	0.472	0.031	0.020	0.059
SNMM 190612-HY	SNMM 643-HY	3/4	1/4	3/64	0.313	0.236	0.079	0.472	0.024	0.014	0.035
SNMM 190616-HY	SNMM 644-HY	3/4	1/4	1/16	0.313	0.236	0.079	0.472	0.024	0.014	0.047
SNMM 190624-HY	SNMM 646-HY	3/4	1/4	3/32	0.313	0.236	0.079	0.472	0.039	0.024	0.063
SNMM 250724-HY	SNMM 856-HY	1	5/16	3/32	0.359	0.335	0.098	0.591	0.039	0.024	0.063
SNMM 250924-HY	SNMM 866-HY	1	3/8	3/32	0.359	0.335	0.118	0.591	0.039	0.024	0.063

◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

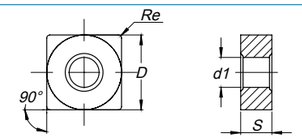
◉ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

SN - SQUARE 90° NEGATIVE

QUADRADA 90° NEGATIVA | ESQUADRA 90° NEGATIVA



Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
SNMM-HZ  Heavy to Roughing	1121605	SNMM 643-HZ	○			◎	◎	◎									◎	◎			
	1121249	SNMM 644-HZ	○			◎	◎	◎									◎	◎			
	1121440	SNMM 646-HZ	○			◎	◎	◎									◎	◎			
	1121158	SNMM 856-HZ				◎	◎	◎									◎	◎			
	1123786	SNMM 858-HZ				○	◎	○									○	○			
	1121159	SNMM 866-HZ				◎	◎	◎									◎	◎			
SNGN  Medium to Finishing	1110595	SNGN 322					○														
	1110261	SNGN 422					○														
	1110262	SNGN 423					○														
	1110266	SNGN 432					○														
	1110267	SNGN 433					○														
	1110596	SNGN 434					○														
	1110719	SNGN 532					○														
	1110268	SNGN 533					○														
	1110597	SNGN 633					○														
	1110598	SNGN 634					○														
SNUN  Roughing to Medium	1120535	SNUN 321					○								○						
	1120536	SNUN 322					○														
	1120538	SNUN 421					○														
	1120539	SNUN 422					○														
	1120540	SNUN 423					○														
	1120541	SNUN 431					○														
	1120542	SNUN 432					○														
	1120544	SNUN 433					○														
	1120547	SNUN 434					○														
	1120549	SNUN 532					○														
	1120550	SNUN 533					○														
	1120551	SNUN 534					○														
	1120553	SNUN 632					○														
	1120554	SNUN 633					○														
	1120556	SNUN 634					○														
	1120557	SNUN 642					○														
	1121111	SNUN 845					○														
	1120558	SNUN 855					○														

ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
SNMM 190612-HZ	SNMM 643-HZ	3/4	1/4	3/64	0.313	0.394	0.094	0.512	0.024	0.014	0.035
SNMM 190616-HZ	SNMM 644-HZ	3/4	1/4	1/16	0.313	0.394	0.094	0.512	0.024	0.014	0.047
SNMM 190624-HZ	SNMM 646-HZ	3/4	1/4	3/32	0.313	0.394	0.126	0.512	0.039	0.024	0.063
SNMM 250724-HZ	SNMM 856-HZ	1	5/16	3/32	0.359	0.394	0.126	0.669	0.039	0.024	0.063
SNMM 250732-HZ	SNMM 858-HZ	1	5/16	1/8	0.359	0.394	0.126	0.669	0.047	0.031	0.071
SNMM 250924-HZ	SNMM 866-HZ	1	3/8	3/32	0.359	0.394	0.126	0.669	0.039	0.024	0.063
SNGN 090308	SNGN 322	3/8	1/8	1/32	-	0.079	0.047	0.138	0.007	0.004	0.021
SNGN 120308	SNGN 422	1/2	1/8	1/32	-	0.118	0.051	0.197	0.008	0.005	0.021
SNGN 120312	SNGN 423	1/2	1/8	3/64	-	0.118	0.079	0.197	0.012	0.007	0.031
SNGN 120408	SNGN 432	1/2	3/16	1/32	-	0.118	0.059	0.197	0.008	0.005	0.021
SNGN 120412	SNGN 433	1/2	3/16	3/64	-	0.118	0.079	0.197	0.012	0.008	0.031
SNGN 120416	SNGN 434	1/2	3/16	1/16	-	0.118	0.087	0.197	0.014	0.010	0.042
SNGN 150408	SNGN 532	5/8	3/16	1/32	-	0.138	0.094	0.315	0.009	0.006	0.021
SNGN 150412	SNGN 533	5/8	3/16	3/64	-	0.138	0.102	0.315	0.014	0.008	0.031
SNGN 190412	SNGN 633	3/4	3/16	3/64	-	0.177	0.118	0.394	0.014	0.010	0.031
SNGN 190416	SNGN 634	3/4	3/16	1/16	-	0.177	0.126	0.394	0.024	0.012	0.042
SNUN 090304	SNUN 321	3/8	1/8	1/64	-	0.079	0.039	0.138	0.006	0.004	0.012
SNUN 090308	SNUN 322	3/8	1/8	1/32	-	0.079	0.047	0.138	0.014	0.009	0.024
SNUN 120304	SNUN 421	1/2	1/8	1/64	-	0.118	0.051	0.197	0.006	0.004	0.012
SNUN 120308	SNUN 422	1/2	1/8	1/32	-	0.118	0.059	0.197	0.014	0.009	0.024
SNUN 120312	SNUN 423	1/2	1/8	3/64	-	0.118	0.079	0.197	0.018	0.010	0.039
SNUN 120404	SNUN 431	1/2	3/16	1/64	-	0.118	0.051	0.197	0.006	0.004	0.012
SNUN 120408	SNUN 432	1/2	3/16	1/32	-	0.118	0.059	0.197	0.014	0.009	0.024
SNUN 120412	SNUN 433	1/2	3/16	3/64	-	0.118	0.079	0.197	0.018	0.010	0.039
SNUN 120416	SNUN 434	1/2	3/16	1/16	-	0.118	0.087	0.197	0.024	0.010	0.047
SNUN 150408	SNUN 532	5/8	3/16	1/32	-	0.138	0.094	0.315	0.014	0.009	0.024
SNUN 150412	SNUN 533	5/8	3/16	3/64	-	0.138	0.102	0.315	0.018	0.010	0.024
SNUN 150416	SNUN 534	5/8	3/16	1/16	-	0.138	0.114	0.315	0.024	0.010	0.047
SNUN 190408	SNUN 632	3/4	3/16	1/32	-	0.177	0.106	0.394	0.014	0.009	0.024
SNUN 190412	SNUN 633	3/4	3/16	3/64	-	0.177	0.118	0.394	0.024	0.012	0.039
SNUN 190416	SNUN 634	3/4	3/16	1/16	-	0.177	0.126	0.394	0.026	0.010	0.047
SNUN 190608	SNUN 642	3/4	1/4	1/32	-	0.177	0.106	0.394	0.014	0.009	0.024
SNUN 250620	SNUN 845	1	1/4	0.079	-	0.217	0.118	0.472	0.039	0.012	0.059
SNUN 250720	SNUN 855	1	5/16	0.079	-	0.217	0.079	0.472	0.039	0.012	0.059

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

TRIANGULAR 60º NEGATIVA | TRIANGULAR 60º NEGATIVA

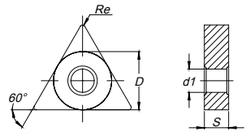
Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
TNMA  Roughing	1120624	TNMA 221														◎	◎				
	1120625	TNMA 222														◎	◎				
	1120626	TNMA 321														◎	◎				
	1120627	TNMA 322														◎	◎				
	1120629	TNMA 331														◎	◎				
	1120630	TNMA 332														◎	◎				
	1120632	TNMA 333														◎	◎				
	1121921	TNMA 334														◎	◎				
	1120634	TNMA 431														◎	◎				
	1120635	TNMA 432														◎	◎				
	1120636	TNMA 433														◎	◎				
	1120637	TNMA 434														◎	◎				
	1121288	TNMA 438														○	◎				
	1121554	TNMA 542														◎	◎				
	1121555	TNMA 543														◎	◎				
	1120639	TNMA 544														◎	◎				
	1120640	TNMA 656														◎	◎				
TNMG -MF  Finishing	1121556	TNMG 331-MF				◎	◎		◎		◎	◎		◎							
	1121558	TNMG 332-MF				◎	◎		◎		◎	◎		◎							
	1121560	TNMG 333-MF				◎	◎		○		◎	◎		○							
	1121369	TNMG 432-MF				◎	○				◎	○									
TNMG -MS  Medium to Finishing	1121557	TNMG 331-MS													◎				◎		◎
	1121559	TNMG 332-MS													◎				◎		◎
	1121561	TNMG 333-MS													◎				◎		◎
TNMG -SF  Medium to Finishing	1123757	TNMG 331-SF												◎	◎					◎	◎
	1123719	TNMG 332-SF												◎	◎					◎	◎
	1123758	TNMG 333-SF												◎	◎					◎	◎
	1124070	TNMG 431-SF												◎	◎					◎	◎
	1123759	TNMG 432-SF												◎	◎					◎	◎
	1124028	TNMG 433-SF												◎	◎					◎	◎
TNMG -LC  Medium to Finishing	1123638	TNMG 331-LC				◎	◎														
	1122025	TNMG 332-LC				◎	◎														
	1123656	TNMG 333-LC				◎	◎														
	1123660	TNMG 432-LC				◎	◎														
	1123657	TNMG 433-LC				◎	◎														

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
TNMA 110304	TNMA 221	1/4	1/8	1/64	0.089	0.079	0.006	0.157	0.008	0.004	0.012
TNMA 110308	TNMA 222	1/4	1/8	1/32	0.089	0.079	0.006	0.157	0.014	0.006	0.024
TNMA 160304	TNMA 321	3/8	1/8	1/64	0.150	0.098	0.008	0.197	0.008	0.004	0.012
TNMA 160308	TNMA 322	3/8	1/8	1/32	0.150	0.098	0.008	0.197	0.014	0.006	0.024
TNMA 160404	TNMA 331	3/8	3/16	1/64	0.150	0.098	0.008	0.197	0.008	0.004	0.012
TNMA 160408	TNMA 332	3/8	3/16	1/32	0.150	0.138	0.008	0.276	0.014	0.006	0.024
TNMA 160412	TNMA 333	3/8	3/16	3/64	0.150	0.138	0.012	0.276	0.018	0.008	0.031
TNMA 160416	TNMA 334	3/8	3/16	1/16	0.150	0.138	0.012	0.276	0.022	0.008	0.039
TNMA 220404	TNMA 431	1/2	3/16	1/64	0.203	0.157	0.008	0.394	0.008	0.004	0.012
TNMA 220408	TNMA 432	1/2	3/16	1/32	0.203	0.197	0.008	0.394	0.014	0.006	0.024
TNMA 220412	TNMA 433	1/2	3/16	3/64	0.203	0.197	0.012	0.394	0.018	0.008	0.031
TNMA 220416	TNMA 434	1/2	3/16	1/16	0.203	0.197	0.012	0.394	0.022	0.008	0.039
TNMA 220432	TNMA 438	1/2	3/16	1/8	0.203	0.197	0.020	0.394	0.024	0.020	0.047
TNMA 270608	TNMA 542	5/8	1/4	1/32	0.250	0.197	0.012	0.472	0.014	0.006	0.024
TNMA 270612	TNMA 543	5/8	1/4	3/64	0.250	0.197	0.012	0.472	0.018	0.008	0.031
TNMA 270616	TNMA 544	5/8	1/4	1/16	0.250	0.197	0.012	0.472	0.022	0.008	0.039
TNMA 330724	TNMA 656	3/4	5/16	3/32	0.313	0.256	0.012	0.591	0.024	0.012	0.079
TNMG 160404-MF	TNMG 331-MF	3/8	3/16	1/64	0.150	0.016	0.004	0.059	0.006	0.002	0.010
TNMG 160408-MF	TNMG 332-MF	3/8	3/16	1/32	0.150	0.016	0.004	0.059	0.008	0.004	0.016
TNMG 160412-MF	TNMG 333-MF	3/8	3/16	3/64	0.150	0.039	0.008	0.098	0.012	0.006	0.024
TNMG 220408-MF	TNMG 432-MF	1/2	3/16	1/32	0.203	0.059	0.010	0.098	0.008	0.004	0.016
TNMG 160404-MS	TNMG 331-MS	3/8	3/16	1/64	0.150	0.079	0.012	0.150	0.006	0.004	0.008
TNMG 160408-MS	TNMG 332-MS	3/8	3/16	1/32	0.150	0.079	0.012	0.150	0.010	0.004	0.016
TNMG 160412-MS	TNMG 333-MS	3/8	3/16	3/64	0.150	0.079	0.016	0.150	0.012	0.006	0.024
TNMG 160404-SF	TNMG 331-SF	3/8	3/16	1/64	0.150	0.059	0.024	0.118	0.006	0.004	0.009
TNMG 160408-SF	TNMG 332-SF	3/8	3/16	1/32	0.150	0.059	0.024	0.118	0.010	0.005	0.015
TNMG 160412-SF	TNMG 333-SF	3/8	3/16	3/64	0.150	0.059	0.024	0.118	0.014	0.006	0.022
TNMG 220404-SF	TNMG 431-SF	1/2	3/16	1/64	0.203	0.059	0.024	0.118	0.008	0.004	0.014
TNMG 220408-SF	TNMG 432-SF	1/2	3/16	1/32	0.203	0.059	0.024	0.118	0.010	0.005	0.016
TNMG 220412-SF	TNMG 433-SF	1/2	3/16	3/64	0.203	0.059	0.024	0.118	0.014	0.006	0.022
TNMG 160404-LC	TNMG 331-LC	3/8	3/16	1/64	0.150	0.039	0.016	0.098	0.006	0.003	0.012
TNMG 160408-LC	TNMG 332-LC	3/8	3/16	1/32	0.150	0.059	0.016	0.098	0.008	0.004	0.016
TNMG 160412-LC	TNMG 333-LC	3/8	3/16	3/64	0.150	0.079	0.031	0.118	0.010	0.006	0.020
TNMG 220408-LC	TNMG 432-LC	1/2	3/16	1/32	0.203	0.079	0.016	0.118	0.008	0.004	0.016
TNMG 220412-LC	TNMG 433-LC	1/2	3/16	3/64	0.203	0.098	0.031	0.138	0.010	0.006	0.020

TN = TRIANGULAR 60° NEGATIVE

TRIANGULAR 60° NEGATIVA | TRIANGULAR 60° NEGATIVA

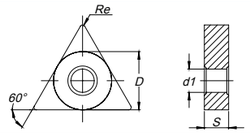
Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
TNMG-MR  Medium	1122000	TNMG 322-MR				◎	◎														
	1121281	TNMG 331-MR	○			◎	◎	◎													
	1121269	TNMG 332-MR	○			◎	◎	◎													
	1121282	TNMG 333-MR	○			◎	◎	◎													
	1121562	TNMG 334-MR				○	○	○													
	1121625	TNMG 431-MR	○			◎	◎	◎													
	1121305	TNMG 432-MR	○			◎	◎	◎													
	1121307	TNMG 433-MR	○			◎	◎	◎													
	1121564	TNMG 434-MR					◎	◎													
TNMG-PM NEW  Medium	1123991	TNMG 331-PM		◎	◎																
	1123917	TNMG 332-PM		◎	◎																
	1123992	TNMG 333-PM		◎	◎																
	1123993	TNMG 334-PM		◎	◎																
	1123922	TNMG 431-PM		◎	◎																
	1123923	TNMG 432-PM		◎	◎																
	1123994	TNMG 433-PM		◎	◎																
	1123995	TNMG 434-PM		◎	◎																
TNMG-MW  Medium Wiper	1121376	TNMG 332-MW	◎			◎	◎	◎			◎	◎	◎			○	◎				
	1121343	TNMG 333-MW	◎			◎	◎	◎			◎	◎	◎			○	◎				
TNMG-SS  Roughing to Medium	1121289	TNMG 331-SS									◎	◎	◎	◎	◎					◎	◎
	1121271	TNMG 332-SS									◎	◎	◎	◎	◎					◎	◎
	1121290	TNMG 333-SS									◎	◎	◎	◎	◎					◎	◎
	1121330	TNMG 432-SS									◎	◎	◎	◎	◎					◎	◎
	1121368	TNMG 433-SS										◎		○	◎					○	◎

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
TNMG 160308-MR	TNMG 322-MR	3/8	1/8	1/32	0.150	0.110	0.012	0.197	0.012	0.006	0.020
TNMG 160404-MR	TNMG 331-MR	3/8	3/16	1/64	0.150	0.118	0.016	0.197	0.008	0.004	0.012
TNMG 160408-MR	TNMG 332-MR	3/8	3/16	1/32	0.150	0.118	0.020	0.197	0.012	0.006	0.020
TNMG 160412-MR	TNMG 333-MR	3/8	3/16	3/64	0.150	0.118	0.031	0.197	0.014	0.007	0.024
TNMG 160416-MR	TNMG 334-MR	3/8	3/16	1/16	0.150	0.118	0.031	0.197	0.016	0.009	0.028
TNMG 220404-MR	TNMG 431-MR	1/2	3/16	1/64	0.203	0.157	0.016	0.260	0.008	0.004	0.012
TNMG 220408-MR	TNMG 432-MR	1/2	3/16	1/32	0.203	0.157	0.020	0.260	0.012	0.006	0.020
TNMG 220412-MR	TNMG 433-MR	1/2	3/16	3/64	0.203	0.157	0.031	0.260	0.014	0.007	0.024
TNMG 220416-MR	TNMG 434-MR	1/2	3/16	1/16	0.203	0.157	0.039	0.260	0.016	0.009	0.028
TNMG 160404-PM	TNMG 331-PM	3/8	3/16	1/64	0.150	0.118	0.016	0.197	0.008	0.004	0.012
TNMG 160408-PM	TNMG 332-PM	3/8	3/16	1/32	0.150	0.118	0.020	0.197	0.012	0.006	0.020
TNMG 160412-PM	TNMG 333-PM	3/8	3/16	3/64	0.150	0.118	0.031	0.197	0.014	0.007	0.024
TNMG 160416-PM	TNMG 334-PM	3/8	3/16	1/16	0.150	0.118	0.039	0.197	0.016	0.009	0.026
TNMG 220404-PM	TNMG 431-PM	1/2	3/16	1/64	0.203	0.157	0.016	0.260	0.008	0.004	0.012
TNMG 220408-PM	TNMG 432-PM	1/2	3/16	1/32	0.203	0.157	0.020	0.260	0.012	0.006	0.020
TNMG 220412-PM	TNMG 433-PM	1/2	3/16	3/64	0.203	0.157	0.031	0.260	0.014	0.007	0.024
TNMG 220416-PM	TNMG 434-PM	1/2	3/16	1/16	0.203	0.157	0.039	0.260	0.016	0.009	0.024
TNMG 160408-MW	TNMG 332-MW	3/8	3/16	1/32	0.150	0.079	0.020	0.177	0.014	0.006	0.024
TNMG 160412-MW	TNMG 333-MW	3/8	3/16	3/64	0.150	0.098	0.020	0.197	0.020	0.010	0.035
TNMG 160404-SS	TNMG 331-SS	3/8	3/16	1/64	0.150	0.079	0.020	0.157	0.008	0.004	0.012
TNMG 160408-SS	TNMG 332-SS	3/8	3/16	1/32	0.150	0.118	0.020	0.189	0.010	0.005	0.018
TNMG 160412-SS	TNMG 333-SS	3/8	3/16	3/64	0.150	0.118	0.020	0.189	0.012	0.006	0.024
TNMG 220408-SS	TNMG 432-SS	1/2	3/16	1/32	0.203	0.157	0.020	0.260	0.010	0.005	0.018
TNMG 220412-SS	TNMG 433-SS	1/2	3/16	3/64	0.203	0.157	0.020	0.260	0.012	0.006	0.024

TRIANGULAR 60º NEGATIVA | TRIANGULAR 60º NEGATIVA

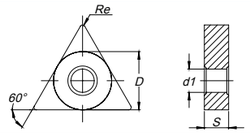
Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
TNMG-ST  Medium	1121209	TNMG 221-ST															○				
	1121210	TNMG 222-ST															◎				
	1121211	TNMG 321-ST															◎				
	1121212	TNMG 322-ST															◎				
	1121294	TNMG 331-ST														◎	◎				
	1121268	TNMG 332-ST														◎	◎				
	1121348	TNMG 333-ST														◎	◎				
	1121563	TNMG 334-ST														◎	◎				
	1121349	TNMG 431-ST														◎	◎				
	1121350	TNMG 432-ST														◎	◎				
	1121354	TNMG 433-ST														◎	◎				
	1121351	TNMG 434-ST														◎	◎				
	1121566	TNMG 542-ST															○				
	1121569	TNMG 543-ST															○				
	1121571	TNMG 544-ST															○				
	1121572	TNMG 666-ST															○				
TNMG-HR  Roughing	1121270	TNMG 332-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121283	TNMG 333-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121306	TNMG 432-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121308	TNMG 433-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121309	TNMG 434-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121567	TNMG 543-HR				○	○	◎				◎	◎			○	○	◎			
	1121570	TNMG 544-HR				○	○					○	◎			○	○	◎			
	1121631	TNMG 666-HR				○	○					○	○				○	○			
TNMX-01  Medium to Finishing	1121004	TNMX 331-L01				◎	◎	○			◎	◎	○								
	1120713	TNMX 331-R01				◎	◎	○			◎	◎	○								
	1121005	TNMX 332-L01				◎	◎	○			◎	◎	○								
	1121006	TNMX 332-R01				◎	◎	○			◎	◎	○								

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

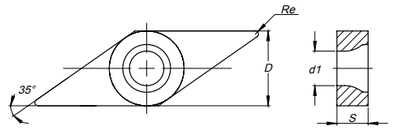
Insert order code = (1) Geometry Code + (2) Grade Code



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
TNMG 110304-ST	TNMG 221-ST	1/4	1/8	1/64	0.089	0.079	0.006	0.177	0.009	0.006	0.012
TNMG 110308-ST	TNMG 222-ST	1/4	1/8	1/32	0.089	0.079	0.006	0.177	0.014	0.006	0.020
TNMG 160304-ST	TNMG 321-ST	3/8	1/8	1/64	0.150	0.118	0.008	0.217	0.009	0.006	0.012
TNMG 160308-ST	TNMG 322-ST	3/8	1/8	1/32	0.150	0.118	0.008	0.217	0.014	0.006	0.020
TNMG 160404-ST	TNMG 331-ST	3/8	3/16	1/64	0.150	0.118	0.008	0.217	0.009	0.006	0.012
TNMG 160408-ST	TNMG 332-ST	3/8	3/16	1/32	0.150	0.118	0.008	0.217	0.014	0.006	0.020
TNMG 160412-ST	TNMG 333-ST	3/8	3/16	3/64	0.150	0.118	0.012	0.217	0.016	0.006	0.024
TNMG 160416-ST	TNMG 334-ST	3/8	3/16	1/16	0.150	0.118	0.012	0.217	0.016	0.006	0.024
TNMG 220404-ST	TNMG 431-ST	1/2	3/16	1/64	0.203	0.157	0.008	0.315	0.009	0.006	0.012
TNMG 220408-ST	TNMG 432-ST	1/2	3/16	1/32	0.203	0.157	0.008	0.315	0.014	0.006	0.020
TNMG 220412-ST	TNMG 433-ST	1/2	3/16	3/64	0.203	0.157	0.012	0.315	0.016	0.006	0.024
TNMG 220416-ST	TNMG 434-ST	1/2	3/16	1/16	0.203	0.157	0.012	0.315	0.018	0.008	0.028
TNMG 270608-ST	TNMG 542-ST	5/8	1/4	1/32	0.250	0.173	0.012	0.346	0.014	0.006	0.020
TNMG 270612-ST	TNMG 543-ST	5/8	1/4	3/64	0.250	0.173	0.012	0.346	0.016	0.006	0.024
TNMG 270616-ST	TNMG 544-ST	5/8	1/4	1/16	0.250	0.173	0.012	0.346	0.018	0.008	0.028
TNMG 330924-ST	TNMG 666-ST	3/4	3/8	3/32	0.313	0.189	0.012	0.413	0.024	0.010	0.055
TNMG 160408-HR	TNMG 332-HR	3/8	3/16	1/32	0.150	0.118	0.031	0.236	0.014	0.008	0.022
TNMG 160412-HR	TNMG 333-HR	3/8	3/16	3/64	0.150	0.118	0.039	0.236	0.016	0.010	0.028
TNMG 220408-HR	TNMG 432-HR	1/2	3/16	1/32	0.203	0.157	0.031	0.256	0.014	0.008	0.022
TNMG 220412-HR	TNMG 433-HR	1/2	3/16	3/64	0.203	0.157	0.039	0.276	0.016	0.010	0.028
TNMG 220416-HR	TNMG 434-HR	1/2	3/16	1/16	0.203	0.157	0.059	0.276	0.024	0.010	0.035
TNMG 270612-HR	TNMG 543-HR	5/8	1/4	3/64	0.250	0.236	0.079	0.394	0.016	0.010	0.028
TNMG 270616-HR	TNMG 544-HR	5/8	1/4	1/16	0.250	0.236	0.079	0.394	0.024	0.014	0.035
TNMG 330924-HR	TNMG 666-HR	3/4	3/8	3/32	0.313	0.276	0.079	0.472	0.031	0.016	0.047
TNMX 160404-L01	TNMX 331-L01	3/8	3/16	1/64	0.150	0.098	0.039	0.138	0.006	0.005	0.012
TNMX 160404-R01	TNMX 331-R01	3/8	3/16	1/64	0.150	0.098	0.039	0.138	0.006	0.005	0.012
TNMX 160408-L01	TNMX 332-L01	3/8	3/16	1/32	0.150	0.098	0.051	0.138	0.012	0.006	0.020
TNMX 160408-R01	TNMX 332-R01	3/8	3/16	1/32	0.150	0.098	0.051	0.138	0.012	0.006	0.020

VN - RHOMBIC 35° NEGATIVE

RÔMBICA 35° NEGATIVA | RÓMBICA 35° NEGATIVA



Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
VNMA Roughing	1120819	VNMA 331														●	●				
	1121077	VNMA 332														●	●				
VNMG-MF Roughing	1123635	VNMG 331-MF				○	●		●		●	○		●							
	1123636	VNMG 332-MF				○	●		●		●	○		●							
VNMG-MS Medium to Finishing	1121579	VNMG 331-MS													●				●		●
	1121580	VNMG 332-MS													●				●		●
VNMG-SF Medium to Finishing	1123760	VNMG 331-SF												○	●					●	○
	1123761	VNMG 332-SF												○	●					●	○
	1123762	VNMG 333-SF												○	●					●	○
VNMG-LC Medium to Finishing	1123659	VNMG 332-LC				○	●														
VNMG-MR Medium	1121278	VNMG 331-MR	◯			●	○	●													
	1121279	VNMG 332-MR	◯			●	○	●													
	1121581	VNMG 432-MR	◯			●	○	●													
VNMG-SS Roughing to Medium	1121367	VNMG 331-SS										●		●	○					●	○
	1121295	VNMG 332-SS										●		●	○					●	○
VNMG-ST Medium	1121276	VNMG 331-ST														●	○				
	1121277	VNMG 332-ST														●	○				

ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
VNMA 160404	VNMA 331	3/8	3/16	1/64	0.150	0.008	0.004	0.130	0.006	0.003	0.010
VNMA 160408	VNMA 332	3/8	3/16	1/32	0.150	0.008	0.004	0.130	0.012	0.004	0.020
VNMG 160404-MF	VNMG 331-MF	3/8	3/16	1/64	0.150	0.016	0.004	0.059	0.006	0.002	0.010
VNMG 160408-MF	VNMG 332-MF	3/8	3/16	1/32	0.150	0.016	0.004	0.059	0.008	0.004	0.016
VNMG 160404-MS	VNMG 331-MS	3/8	3/16	1/64	0.150	0.079	0.008	0.157	0.006	0.004	0.008
VNMG 160408-MS	VNMG 332-MS	3/8	3/16	1/32	0.150	0.098	0.008	0.157	0.010	0.006	0.016
VNMG 160404-SF	VNMG 331-SF	3/8	3/16	1/64	0.150	0.059	0.024	0.118	0.006	0.004	0.009
VNMG 160408-SF	VNMG 332-SF	3/8	3/16	1/32	0.150	0.059	0.024	0.118	0.010	0.005	0.015
VNMG 160412-SF	VNMG 333-SF	3/8	3/16	3/64	0.150	0.059	0.024	0.118	0.014	0.006	0.022
VNMG 160408-LC	VNMG 332-LC	3/8	3/16	1/32	0.150	0.039	0.014	0.079	0.005	0.003	0.014
VNMG 160404-MR	VNMG 331-MR	3/8	3/16	1/64	0.150	0.118	0.039	0.157	0.010	0.004	0.012
VNMG 160408-MR	VNMG 332-MR	3/8	3/16	1/32	0.150	0.118	0.039	0.157	0.012	0.006	0.020
VNMG 220408-MR	VNMG 432-MR	1/2	3/16	1/32	0.203	0.157	0.059	0.197	0.014	0.006	0.020
VNMG 160404-SS	VNMG 331-SS	3/8	3/16	1/64	0.150	0.059	0.020	0.157	0.008	0.004	0.012
VNMG 160408-SS	VNMG 332-SS	3/8	3/16	1/32	0.150	0.079	0.020	0.157	0.010	0.005	0.018
VNMG 160404-ST	VNMG 331-ST	3/8	3/16	1/64	0.150	0.079	0.008	0.138	0.012	0.006	0.016
VNMG 160408-ST	VNMG 332-ST	3/8	3/16	1/32	0.150	0.079	0.012	0.138	0.014	0.006	0.020

● Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

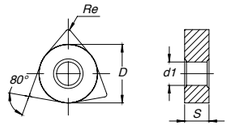
○ Stock item | Produto de stock | Itens de stock

◯ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

WN - TRIGON 80° NEGATIVE

TRIGONAL 80° NEGATIVA | TRIGONA 80° NEGATIVA



Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
		ANSI Reference	PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
WNMA  Roughing	1122002	WNMA 332														◉	◉				
	1120834	WNMA 431														◉	◉				
	1120835	WNMA 432														◉	◉				
	1121076	WNMA 433														◉	◉				
	1121582	WNMA 434														◉	◉				
WNMG-MF  Finishing	1121205	WNMG 32.51-MF				◉	◉		○		◉	◉		○							
	1121206	WNMG 32.52-MF				◉	◉		○		◉	◉		○							
	1121586	WNMG 32.53-MF				◉	◉				◉	◉		○							
	1121207	WNMG 331-MF				◉	◉		○		◉	◉		○							
	1121208	WNMG 332-MF				◉	◉		○		◉	◉		○							
	1121583	WNMG 333-MF				◉	◉		○		◉	◉		○							
	1121213	WNMG 431-MF				◉	◉		◉		◉	◉		◉							
	1121214	WNMG 432-MF				◉	◉		◉		◉	◉		◉							
	1121589	WNMG 433-MF				◉	◉		○		◉	◉		○							
WNMG-MS  Medium to Finishing	1121910	WNMG 331-MS													◉						◉
	1121911	WNMG 332-MS													◉						◉
	1121588	WNMG 432-MS													◉				◉		◉
	1121590	WNMG 433-MS													◉				◉		◉
WNMG-SF  Medium to Finishing	1123763	WNMG 331-SF												◉	◉					◉	◉
	1123764	WNMG 332-SF												◉	◉					◉	◉
	1123765	WNMG 333-SF												◉	◉					◉	◉
	1123766	WNMG 431-SF												◉	◉					◉	◉
	1123721	WNMG 432-SF												◉	◉					◉	◉
	1123767	WNMG 433-SF												◉	◉					◉	◉
WNMG-LC  Medium to Finishing	1123658	WNMG 432-LC				◉	◉														
WNMG-MR  Medium	1121262	WNMG 32.51-MR				◉	◉	○													
	1121167	WNMG 32.52-MR				◉	◉	○													
	1121587	WNMG 32.53-MR				◉	◉	○													
	1121240	WNMG 331-MR				◉	◉	○													
	1121168	WNMG 332-MR				◉	◉	○													
	1121584	WNMG 333-MR				◉	◉	○													
	1121356	WNMG 431-MR	○			◉	◉	◉													
	1121327	WNMG 432-MR	◉			◉	◉	◉													
	1121261	WNMG 433-MR	○			◉	◉	◉													
	1121592	WNMG 434-MR				◉	◉	◉													

ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
WNMA 060408	WNMA 332	3/8	3/16	1/32	0.150	0.098	0.008	0.157	0.014	0.006	0.024
WNMA 080404	WNMA 431	1/2	3/16	1/64	0.203	0.110	0.008	0.197	0.009	0.006	0.012
WNMA 080408	WNMA 432	1/2	3/16	1/32	0.203	0.118	0.008	0.197	0.014	0.006	0.024
WNMA 080412	WNMA 433	1/2	3/16	3/64	0.203	0.118	0.012	0.197	0.018	0.008	0.031
WNMA 080416	WNMA 434	1/2	3/16	1/16	0.203	0.118	0.012	0.197	0.022	0.008	0.039
WNMG 06T304-MF	WNMG 32.51-MF	3/8	5/32	1/64	0.150	0.016	0.004	0.059	0.006	0.002	0.012
WNMG 06T308-MF	WNMG 32.52-MF	3/8	5/32	1/32	0.150	0.016	0.004	0.059	0.008	0.004	0.016
WNMG 06T312-MF	WNMG 32.53-MF	3/8	5/32	3/64	0.150	0.016	0.006	0.059	0.012	0.006	0.024
WNMG 060404-MF	WNMG 331-MF	3/8	3/16	1/64	0.150	0.016	0.004	0.059	0.006	0.002	0.012
WNMG 060408-MF	WNMG 332-MF	3/8	3/16	1/32	0.150	0.016	0.004	0.059	0.008	0.004	0.016
WNMG 060412-MF	WNMG 333-MF	3/8	3/16	3/64	0.150	0.016	0.006	0.059	0.012	0.006	0.024
WNMG 080404-MF	WNMG 431-MF	1/2	3/16	1/64	0.203	0.024	0.004	0.079	0.006	0.002	0.012
WNMG 080408-MF	WNMG 432-MF	1/2	3/16	1/32	0.203	0.024	0.004	0.079	0.008	0.004	0.016
WNMG 080412-MF	WNMG 433-MF	1/2	3/16	3/64	0.203	0.024	0.006	0.079	0.012	0.006	0.024
WNMG 060404-MS	WNMG 331-MS	3/8	3/16	1/64	0.150	0.047	0.012	0.087	0.006	0.004	0.008
WNMG 060408-MS	WNMG 332-MS	3/8	3/16	1/32	0.150	0.047	0.012	0.087	0.010	0.008	0.016
WNMG 080408-MS	WNMG 432-MS	1/2	3/16	1/32	0.203	0.098	0.028	0.157	0.010	0.008	0.016
WNMG 080412-MS	WNMG 433-MS	1/2	3/16	3/64	0.203	0.098	0.039	0.157	0.012	0.010	0.022
WNMG 060404-SF	WNMG 331-SF	3/8	3/16	1/64	0.150	0.059	0.024	0.118	0.006	0.004	0.009
WNMG 060408-SF	WNMG 332-SF	3/8	3/16	1/32	0.150	0.059	0.024	0.118	0.010	0.005	0.015
WNMG 060412-SF	WNMG 333-SF	3/8	3/16	3/64	0.150	0.059	0.024	0.118	0.014	0.006	0.022
WNMG 080404-SF	WNMG 431-SF	1/2	3/16	1/64	0.203	0.059	0.024	0.118	0.006	0.004	0.009
WNMG 080408-SF	WNMG 432-SF	1/2	3/16	1/32	0.203	0.059	0.024	0.118	0.010	0.005	0.015
WNMG 080412-SF	WNMG 433-SF	1/2	3/16	3/64	0.203	0.059	0.024	0.118	0.014	0.006	0.022
WNMG 080408-LC	WNMG 432-LC	1/2	3/16	1/64	0.203	0.059	0.016	0.098	0.006	0.004	0.014
WNMG 06T304-MR	WNMG 32.51-MR	3/8	5/32	1/64	0.150	0.079	0.020	0.118	0.009	0.004	0.012
WNMG 06T308-MR	WNMG 32.52-MR	3/8	5/32	1/32	0.150	0.079	0.020	0.118	0.012	0.006	0.020
WNMG 06T312-MR	WNMG 32.53-MR	3/8	5/32	3/64	0.150	0.079	0.031	0.118	0.014	0.007	0.024
WNMG 060404-MR	WNMG 331-MR	3/8	3/16	1/64	0.150	0.079	0.020	0.118	0.009	0.004	0.012
WNMG 060408-MR	WNMG 332-MR	3/8	3/16	1/32	0.150	0.079	0.020	0.118	0.012	0.006	0.020
WNMG 060412-MR	WNMG 333-MR	3/8	3/16	3/64	0.150	0.079	0.031	0.118	0.014	0.007	0.024
WNMG 080404-MR	WNMG 431-MR	1/2	3/16	1/64	0.203	0.098	0.020	0.157	0.009	0.004	0.012
WNMG 080408-MR	WNMG 432-MR	1/2	3/16	1/32	0.203	0.098	0.020	0.157	0.012	0.006	0.020
WNMG 080412-MR	WNMG 433-MR	1/2	3/16	3/64	0.203	0.098	0.031	0.157	0.014	0.007	0.024
WNMG 080416-MR	WNMG 434-MR	1/2	3/16	1/16	0.203	0.118	0.039	0.157	0.016	0.009	0.026

◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

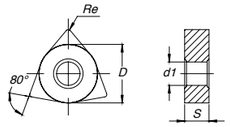
◉ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

WN = TRIGON 80° NEGATIVE

TRIGONAL 80° NEGATIVA | TRIGONA 80° NEGATIVA



Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P								M					K			N	S	
			CVD-MT						PVD		CVD-MT			PVD		CVD-MT			UNC	PVD	
			L6	R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	L5	L6	L9	10	G1	G4
			PH5320	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
WNMG-PM NEW  Medium	1123988	WNMG 431-PM		◎	◎																
	1123918	WNMG 432-PM		◎	◎																
	1123989	WNMG 433-PM		◎	◎																
	1123990	WNMG 434-PM		◎	◎																
WNMG-MW  Medium Wiper	1121370	WNMG 332-MW	◎			◎	◎	◎			◎	◎	◎			○	◎				
	1121585	WNMG 333-MW	◎			◎	◎	◎			◎	◎	◎			○	◎				
	1121372	WNMG 432-MW	◎			◎	◎	◎			◎	◎	◎			○	◎				
	1121371	WNMG 433-MW	◎			◎	◎	◎			◎	◎	◎			○	◎				
WNMG-SS  Roughing to Medium	1121321	WNMG 32.51-SS										○		○	○					○	○
	1121324	WNMG 32.52-SS										○		○	○					○	○
	1121322	WNMG 331-SS									◎	◎		◎	◎					◎	◎
	1121325	WNMG 332-SS									◎	◎	◎	◎	◎					◎	◎
	1121323	WNMG 431-SS									◎	◎	◎	◎	◎					◎	◎
	1121326	WNMG 432-SS									◎	◎	◎	◎	◎					◎	◎
	1121591	WNMG 433-SS									◎	◎	◎	◎	◎					◎	◎
WNMG-ST  Medium	1121162	WNMG 431-ST														◎	◎				
	1121163	WNMG 432-ST														◎	◎				
	1121164	WNMG 433-ST														◎	◎				
	1121593	WNMG 434-ST														◎	◎				
WNMG-HR  Roughing	1121127	WNMG 432-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			
	1121128	WNMG 433-HR	◎			◎	◎	◎			◎	◎	◎			◎	◎	◎			

ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
WNMG 080404-PM	WNMG 431-PM	1/2	3/16	1/64	0.203	0.098	0.020	0.157	0.009	0.004	0.012
WNMG 080408-PM	WNMG 432-PM	1/2	3/16	1/32	0.203	0.098	0.020	0.157	0.012	0.006	0.020
WNMG 080412-PM	WNMG 433-PM	1/2	3/16	3/64	0.203	0.098	0.031	0.157	0.014	0.007	0.024
WNMG 080416-PM	WNMG 434-PM	1/2	3/16	1/16	0.203	0.118	0.039	0.177	0.014	0.008	0.026
WNMG 060408-MW	WNMG 332-MW	3/8	3/16	1/32	0.150	0.059	0.020	0.138	0.012	0.006	0.024
WNMG 060412-MW	WNMG 333-MW	3/8	3/16	3/64	0.150	0.059	0.031	0.138	0.020	0.008	0.035
WNMG 080408-MW	WNMG 432-MW	1/2	3/16	1/32	0.203	0.118	0.020	0.197	0.012	0.006	0.024
WNMG 080412-MW	WNMG 433-MW	1/2	3/16	3/64	0.203	0.138	0.031	0.236	0.020	0.008	0.035
WNMG 06T304-SS	WNMG 32.51-SS	3/8	5/32	1/64	0.150	0.079	0.020	0.118	0.008	0.005	0.012
WNMG 06T308-SS	WNMG 32.52-SS	3/8	5/32	1/32	0.150	0.079	0.020	0.118	0.010	0.005	0.018
WNMG 060404-SS	WNMG 331-SS	3/8	3/16	1/64	0.150	0.079	0.020	0.118	0.008	0.005	0.012
WNMG 060408-SS	WNMG 332-SS	3/8	3/16	1/32	0.150	0.079	0.020	0.118	0.010	0.005	0.018
WNMG 080404-SS	WNMG 431-SS	1/2	3/16	1/64	0.203	0.079	0.020	0.118	0.008	0.005	0.012
WNMG 080408-SS	WNMG 432-SS	1/2	3/16	1/32	0.203	0.098	0.020	0.157	0.010	0.005	0.018
WNMG 080412-SS	WNMG 433-SS	1/2	3/16	3/64	0.203	0.098	0.020	0.157	0.012	0.006	0.024
WNMG 080404-ST	WNMG 431-ST	1/2	3/16	1/64	0.203	0.098	0.008	0.197	0.009	0.006	0.012
WNMG 080408-ST	WNMG 432-ST	1/2	3/16	1/32	0.203	0.098	0.008	0.197	0.014	0.006	0.020
WNMG 080412-ST	WNMG 433-ST	1/2	3/16	3/64	0.203	0.098	0.012	0.197	0.016	0.006	0.024
WNMG 080416-ST	WNMG 434-ST	1/2	3/16	1/16	0.203	0.098	0.012	0.197	0.018	0.008	0.028
WNMG 080408-HR	WNMG 432-HR	1/2	3/16	1/32	0.203	0.157	0.031	0.197	0.014	0.008	0.022
WNMG 080412-HR	WNMG 433-HR	1/2	3/16	3/64	0.203	0.157	0.059	0.197	0.016	0.010	0.028

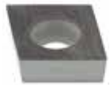
◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RÔMBICA 80º POSITIVA | RÓMBICA 80º POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K				N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT			UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9	10	G1	G4
		ANSI Reference	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
CCMW  Finishing	1120205	CCMW 21.50.5														○					
	1120206	CCMW 21.51														◎					
	1120207	CCMW 21.52														○					
	1120208	CCMW 2.51.51														○					
	1120209	CCMW 2.521														○					
	1120871	CCMW 2.522														○					
	1120210	CCMW 321														○					
	1120211	CCMW 322														○					
	1121746	CCMW 32.50.5														○					
	1120212	CCMW 32.51														◎					
	1120213	CCMW 32.52														○					
	1120214	CCMW 431														○					
	1120215	CCMW 432														○					
	1121421	CCMW 433														○					
CCMT-FP  Fine Finishing	1121655	CCMT 21.50.5-FP				◎		○	○												
	1121658	CCMT 21.51-FP			◎	◎		○	◎												
	1121690	CCMT 32.50.5-FP				◎		○	○												
	1121666	CCMT 32.51-FP			◎	◎		○	◎												
	1121652	CCMT 32.52-FP			◎	◎		○	◎												
	1121665	CCMT 431-FP			◎	◎		○	○												
CCMT-BO  Fine Finishing	1121620	CCMT 21.50.5-BO						◎	◎				◎	◎						◎	◎
	1121621	CCMT 21.51-BO						◎	◎				◎	◎						◎	◎
	1121601	CCMT 32.51-BO						◎	◎				◎	◎						◎	◎
	1121622	CCMT 32.52-BO						◎	◎				◎	◎						◎	◎
	1121624	CCMT 431-BO						◎	◎				◎	◎						◎	◎
	1121623	CCMT 432-BO						◎	◎				◎	◎						◎	◎
CCMT-FM  Fine Finishing	1121654	CCMT 21.50.5-FM											○	◎						○	◎
	1121657	CCMT 21.51-FM									◎		◎	◎						◎	◎
	1121689	CCMT 32.50.5-FM											○	◎						○	◎
	1121692	CCMT 32.51-FM									◎		◎	◎						◎	◎
	1121651	CCMT 32.52-FM									◎		◎	◎						◎	◎
	1121664	CCMT 431-FM									◎		○	◎						○	◎
CCMT-FK  Fine Finishing	1121653	CCMT 21.50.5-FK														◎	○				
	1121656	CCMT 21.51-FK														◎	○				
	1121688	CCMT 32.50.5-FK														◎	○				
	1121691	CCMT 32.51-FK														◎	○				
	1121663	CCMT 431-FK														◎	○				

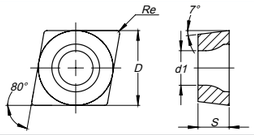
◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 7º



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
CCMW 060202	CCMW 21.50.5	1/4	3/32	0 .008	0.110	0.059	0.002	0.118	0.004	0.002	0.005
CCMW 060204	CCMW 21.51	1/4	3/32	1/64	0.110	0.059	0.002	0.118	0.008	0.003	0.010
CCMW 060208	CCMW 21.52	1/4	3/32	1/32	0.110	0.059	0.002	0.118	0.016	0.006	0.021
CCMW 080204	CCMW 2.51.51	5/16	3/32	1/64	0.134	0.059	0.002	0.118	0.008	0.003	0.010
CCMW 080304	CCMW 2.521	5/16	1/8	1/64	0.134	0.059	0.002	0.118	0.008	0.003	0.010
CCMW 080308	CCMW 2.522	5/16	1/8	1/32	0.134	0.059	0.002	0.118	0.016	0.006	0.021
CCMW 090304	CCMW 321	3/8	1/8	1/64	0.173	0.059	0.002	0.118	0.008	0.003	0.010
CCMW 090308	CCMW 322	3/8	1/8	1/32	0.173	0.059	0.002	0.118	0.016	0.006	0.021
CCMW 09T302	CCMW 32.50.5	3/8	5/32	0 .008	0.173	0.059	0.002	0.118	0.004	0.002	0.005
CCMW 09T304	CCMW 32.51	3/8	5/32	1/64	0.173	0.091	0.002	0.177	0.008	0.003	0.010
CCMW 09T308	CCMW 32.52	3/8	5/32	1/32	0.173	0.091	0.002	0.177	0.016	0.006	0.021
CCMW 120404	CCMW 431	1/2	3/16	1/64	0.217	0.122	0.002	0.236	0.008	0.003	0.010
CCMW 120408	CCMW 432	1/2	3/16	1/32	0.217	0.122	0.002	0.236	0.016	0.006	0.021
CCMW 120412	CCMW 433	1/2	3/16	3/64	0.217	0.122	0.002	0.236	0.024	0.009	0.031
CCMT 060202-FP	CCMT 21.50.5-FP	1/4	3/32	0 .008	0.110	0.012	0.002	0.067	0.002	0.001	0.004
CCMT 060204-FP	CCMT 21.51-FP	1/4	3/32	1/64	0.110	0.012	0.004	0.067	0.003	0.002	0.007
CCMT 09T302-FP	CCMT 32.50.5-FP	3/8	5/32	0 .008	0.173	0.014	0.003	0.079	0.003	0.002	0.005
CCMT 09T304-FP	CCMT 32.51-FP	3/8	5/32	1/64	0.173	0.014	0.004	0.079	0.004	0.002	0.009
CCMT 09T308-FP	CCMT 32.52-FP	3/8	5/32	1/32	0.173	0.014	0.006	0.079	0.008	0.003	0.018
CCMT 120404-FP	CCMT 431-FP	1/2	3/16	1/64	0.217	0.017	0.006	0.094	0.006	0.003	0.011
CCMT 060202-BO	CCMT 21.50.5-BO	1/4	3/32	0 .008	0.110	0.020	0.012	0.039	0.003	0.002	0.005
CCMT 060204-BO	CCMT 21.51-BO	1/4	3/32	1/64	0.110	0.020	0.012	0.039	0.005	0.003	0.008
CCMT 09T304-BO	CCMT 32.51-BO	3/8	5/32	1/64	0.173	0.031	0.020	0.047	0.005	0.003	0.008
CCMT 09T308-BO	CCMT 32.52-BO	3/8	5/32	1/32	0.173	0.031	0.020	0.047	0.008	0.004	0.012
CCMT 120404-BO	CCMT 431-BO	1/2	3/16	1/64	0.217	0.039	0.020	0.059	0.005	0.003	0.008
CCMT 120408-BO	CCMT 432-BO	1/2	3/16	1/32	0.217	0.039	0.020	0.059	0.008	0.004	0.012
CCMT 060202-FM	CCMT 21.50.5-FM	1/4	3/32	0 .008	0.110	0.012	0.002	0.067	0.002	0.001	0.004
CCMT 060204-FM	CCMT 21.51-FM	1/4	3/32	1/64	0.110	0.012	0.004	0.067	0.003	0.002	0.007
CCMT 09T302-FM	CCMT 32.50.5-FM	3/8	5/32	0 .008	0.173	0.014	0.003	0.079	0.003	0.002	0.005
CCMT 09T304-FM	CCMT 32.51-FM	3/8	5/32	1/64	0.173	0.014	0.004	0.079	0.004	0.002	0.009
CCMT 09T308-FM	CCMT 32.52-FM	3/8	5/32	1/32	0.173	0.014	0.006	0.079	0.008	0.003	0.018
CCMT 120404-FM	CCMT 431-FM	1/2	3/16	1/64	0.217	0.017	0.006	0.094	0.006	0.003	0.011
CCMT 060202-FK	CCMT 21.50.5-FK	1/4	3/32	0 .008	0.110	0.012	0.002	0.067	0.002	0.001	0.004
CCMT 060204-FK	CCMT 21.51-FK	1/4	3/32	1/64	0.110	0.012	0.004	0.067	0.003	0.002	0.007
CCMT 09T302-FK	CCMT 32.50.5-FK	3/8	5/32	0 .008	0.173	0.014	0.003	0.079	0.003	0.002	0.005
CCMT 09T304-FK	CCMT 32.51-FK	3/8	5/32	1/64	0.173	0.014	0.004	0.079	0.004	0.002	0.009
CCMT 120404-FK	CCMT 431-FK	1/2	3/16	1/64	0.217	0.017	0.006	0.094	0.006	0.003	0.011

CC - RHOMBIC 80º POSITIVE

RÔMBICA 80º POSITIVA | RÓMBICA 80º POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K				N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT			UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9	10	G1	G4
		ANSI Reference	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
CCMT-FW  Fine Finishing Wiper	1121398	CCMT 21.51-FW			◉				⊛					⊛		⊛					⊛
	1121743	CCMT 21.52-FW			◉				⊛					⊛		⊛					⊛
	1121399	CCMT 32.51-FW			◉				⊛					⊛		⊛					⊛
	1121744	CCMT 32.52-FW			◉				⊛					⊛		⊛					⊛
CCMT-LM NEW  Finishing	1123801	CCMT 21.51-LM											◉	⊛						⊛	◉
	1123773	CCMT 32.51-LM											◉	⊛						⊛	◉
	1123804	CCMT 431-LM											◉	⊛						⊛	◉
CCMT-MP  Finishing	1121697	CCMT 21.51-MP			⊛	⊛		○	◉												
	1121661	CCMT 21.52-MP			⊛	◉		○	○												
	1121700	CCMT 32.51-MP			⊛	⊛		○	◉												
	1121687	CCMT 32.52-MP			⊛	⊛		○	◉												
	1121719	CCMT 431-MP			⊛	◉		○	○												
	1121722	CCMT 432-MP			⊛	⊛		○	◉												
	1121724	CCMT 433-MP			⊛	◉		○	○												
CCMT-MM  Finishing	1121696	CCMT 21.51-MM								⊛			◉	⊛						⊛	◉
	1121660	CCMT 21.52-MM								⊛			○	◉						○	⊛
	1121699	CCMT 32.51-MM								⊛			◉	⊛						⊛	◉
	1121686	CCMT 32.52-MM								⊛			◉	⊛						⊛	◉
	1121718	CCMT 431-MM								⊛			○	◉						○	⊛
	1121721	CCMT 432-MM								⊛			⊛	◉						⊛	◉
	1121723	CCMT 433-MM								⊛			○	◉						○	⊛
CCMT-MK  Finishing	1121695	CCMT 21.51-MK														⊛	◉				
	1121659	CCMT 21.52-MK														⊛	◉				
	1121698	CCMT 32.51-MK														⊛	◉				
	1121685	CCMT 32.52-MK														⊛	◉				
	1121717	CCMT 431-MK														⊛	◉				
	1121720	CCMT 432-MK														⊛	◉				
CCMT-MW  Finishing Wiper	1121462	CCMT 21.52-MW			◉				⊛	⊛				⊛			⊛				⊛
	1121400	CCMT 32.51-MW			◉				⊛	⊛				⊛			⊛				⊛
	1121411	CCMT 32.52-MW			◉				⊛	⊛				⊛			⊛				⊛
	1121412	CCMT 431-MW			◉				⊛	⊛				⊛			⊛				⊛
	1121413	CCMT 432-MW			◉				⊛	⊛				⊛			⊛				⊛

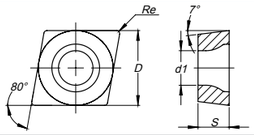
◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

⊛ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 7º



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
CCMT 060204-FW	CCMT 21.51-FW	1/4	3/32	1/64	0.110	0.031	0.012	0.079	0.005	0.002	0.012
CCMT 060208-FW	CCMT 21.52-FW	1/4	3/32	1/32	0.110	0.031	0.012	0.079	0.006	0.004	0.014
CCMT 09T304-FW	CCMT 32.51-FW	3/8	5/32	1/64	0.173	0.039	0.012	0.118	0.008	0.003	0.012
CCMT 09T308-FW	CCMT 32.52-FW	3/8	5/32	1/32	0.173	0.039	0.012	0.118	0.010	0.005	0.020
CCMT 060204-LM	CCMT 21.51-LM	1/4	3/32	1/64	0.110	0.020	0.008	0.079	0.004	0.003	0.008
CCMT 09T304-LM	CCMT 32.51-LM	3/8	5/32	1/64	0.173	0.020	0.010	0.098	0.006	0.004	0.012
CCMT 120404-LM	CCMT 431-LM	1/2	3/16	1/64	0.217	0.031	0.012	0.118	0.007	0.005	0.014
CCMT 060204-MP	CCMT 21.51-MP	1/4	3/32	1/64	0.110	0.025	0.008	0.094	0.004	0.002	0.007
CCMT 060208-MP	CCMT 21.52-MP	1/4	3/32	1/32	0.110	0.025	0.016	0.094	0.007	0.003	0.014
CCMT 09T304-MP	CCMT 32.51-MP	3/8	5/32	1/64	0.173	0.025	0.010	0.118	0.006	0.003	0.009
CCMT 09T308-MP	CCMT 32.52-MP	3/8	5/32	1/32	0.173	0.031	0.020	0.118	0.008	0.004	0.016
CCMT 120404-MP	CCMT 431-MP	1/2	3/16	1/64	0.217	0.038	0.012	0.142	0.007	0.004	0.011
CCMT 120408-MP	CCMT 432-MP	1/2	3/16	1/32	0.217	0.038	0.024	0.142	0.009	0.005	0.018
CCMT 120412-MP	CCMT 433-MP	1/2	3/16	3/64	0.217	0.038	0.028	0.142	0.014	0.006	0.024
CCMT 060204-MM	CCMT 21.51-MM	1/4	3/32	1/64	0.110	0.025	0.008	0.094	0.004	0.002	0.007
CCMT 060208-MM	CCMT 21.52-MM	1/4	3/32	1/32	0.110	0.025	0.016	0.094	0.007	0.003	0.014
CCMT 09T304-MM	CCMT 32.51-MM	3/8	5/32	1/64	0.173	0.025	0.010	0.118	0.006	0.003	0.009
CCMT 09T308-MM	CCMT 32.52-MM	3/8	5/32	1/32	0.173	0.031	0.020	0.118	0.008	0.004	0.016
CCMT 120404-MM	CCMT 431-MM	1/2	3/16	1/64	0.217	0.038	0.012	0.142	0.007	0.004	0.011
CCMT 120408-MM	CCMT 432-MM	1/2	3/16	1/32	0.217	0.038	0.024	0.142	0.009	0.005	0.018
CCMT 120412-MM	CCMT 433-MM	1/2	3/16	3/64	0.217	0.038	0.028	0.142	0.014	0.006	0.024
CCMT 060204-MK	CCMT 21.51-MK	1/4	3/32	1/64	0.110	0.025	0.008	0.094	0.004	0.002	0.007
CCMT 060208-MK	CCMT 21.52-MK	1/4	3/32	1/32	0.110	0.025	0.016	0.094	0.007	0.003	0.014
CCMT 09T304-MK	CCMT 32.51-MK	3/8	5/32	1/64	0.173	0.025	0.010	0.118	0.006	0.003	0.009
CCMT 09T308-MK	CCMT 32.52-MK	3/8	5/32	1/32	0.173	0.031	0.020	0.118	0.008	0.004	0.016
CCMT 120404-MK	CCMT 431-MK	1/2	3/16	1/64	0.217	0.038	0.012	0.142	0.007	0.004	0.011
CCMT 120408-MK	CCMT 432-MK	1/2	3/16	1/32	0.217	0.038	0.024	0.142	0.009	0.005	0.018
CCMT 060208-MW	CCMT 21.52-MW	1/4	3/32	1/32	0.110	0.047	0.020	0.098	0.008	0.004	0.016
CCMT 09T304-MW	CCMT 32.51-MW	3/8	5/32	1/64	0.173	0.059	0.020	0.157	0.010	0.005	0.016
CCMT 09T308-MW	CCMT 32.52-MW	3/8	5/32	1/32	0.173	0.059	0.028	0.157	0.012	0.006	0.020
CCMT 120404-MW	CCMT 431-MW	1/2	3/16	1/64	0.217	0.079	0.020	0.157	0.010	0.006	0.016
CCMT 120408-MW	CCMT 432-MW	1/2	3/16	1/32	0.217	0.079	0.028	0.157	0.012	0.006	0.020

RÔMBICA 80º POSITIVA | RÓMBICA 80º POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K				N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT			UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9	10	G1	G4
		ANSI Reference	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
CCGT-FS  Finishing to Fine Finishing	1121725	CCGT 21.50-FS						◉	◎				◉	◎						◎	◉
	1121726	CCGT 21.50.5-FS						◉	◎				◉	◎						◎	◉
	1121727	CCGT 21.51-FS						◉	◎				◉	◎						◎	◉
	1121455	CCGT 32.50-FS						◉	◎				◉	◎						◎	◉
	1121456	CCGT 32.50.5-FS						◉	◎				◉	◎						◎	◉
	1121457	CCGT 32.51-FS						◉	◎				◉	◎						◎	◉
CCGT-LN  Finishing to Fine Finishing	1121884	CCGT 21.50.5-LN																	◎		
	1121885	CCGT 21.51-LN																	◎		
	1121886	CCGT 32.50.5-LN																	◎		
	1121887	CCGT 32.51-LN																	◎		
	1121888	CCGT 32.52-LN																	◎		
	1123679	CCGT 430.5-LN																	◎		
	1123681	CCGT 431-LN																	◎		
	1123682	CCGT 432-LN																	◎		

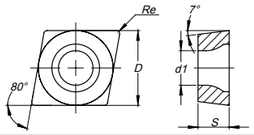
◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 7º



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
CCGT 060201-FS	CCGT 21.50-FS	1/4	3/32	0.004	0.110	0.012	0.004	0.039	0.001	0.001	0.002
CCGT 060202-FS	CCGT 21.50.5-FS	1/4	3/32	0.008	0.110	0.020	0.004	0.059	0.003	0.001	0.005
CCGT 060204-FS	CCGT 21.51-FS	1/4	3/32	1/64	0.110	0.031	0.006	0.059	0.008	0.003	0.010
CCGT 09T301-FS	CCGT 32.50-FS	3/8	5/32	0.004	0.173	0.020	0.004	0.059	0.001	0.001	0.002
CCGT 09T302-FS	CCGT 32.50.5-FS	3/8	5/32	0.008	0.173	0.039	0.004	0.079	0.003	0.001	0.005
CCGT 09T304-FS	CCGT 32.51-FS	3/8	5/32	1/64	0.173	0.049	0.006	0.098	0.006	0.003	0.010
CCGT 060202-LN	CCGT 21.50.5-LN	1/4	3/32	0.008	0.110	0.039	0.002	0.118	0.003	0.002	0.005
CCGT 060204-LN	CCGT 21.51-LN	1/4	3/32	1/64	0.110	0.061	0.004	0.118	0.006	0.004	0.008
CCGT 09T302-LN	CCGT 32.50.5-LN	3/8	5/32	0.008	0.173	0.060	0.002	0.118	0.003	0.002	0.005
CCGT 09T304-LN	CCGT 32.51-LN	3/8	5/32	1/64	0.173	0.100	0.004	0.197	0.006	0.004	0.009
CCGT 09T308-LN	CCGT 32.52-LN	3/8	5/32	1/32	0.173	0.100	0.004	0.197	0.009	0.006	0.018
CCGT 120402-LN	CCGT 430.5-LN	1/2	3/16	0.008	0.217	0.080	0.002	0.157	0.003	0.002	0.005
CCGT 120404-LN	CCGT 431-LN	1/2	3/16	1/64	0.217	0.100	0.004	0.197	0.007	0.004	0.010
CCGT 120408-LN	CCGT 432-LN	1/2	3/16	1/32	0.217	0.110	0.004	0.217	0.010	0.006	0.020

DC - RHOMBIC 55º POSITIVE

RÔMBICA 55º POSITIVA | RÓMBICA 55º POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K					N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT				UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9		10	G1	G4
		ANSI Reference	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740		PH0910	PH7910	PH7920
DCMW  Finishing	1120302	DCMW 21.50.5														●						
	1120303	DCMW 21.51														●						
	1121422	DCMW 21.52														●						
	1120304	DCMW 32.50.5														●						
	1120305	DCMW 32.51														●						
	1120306	DCMW 32.52														●						
	1120878	DCMW 431														●						
	1120307	DCMW 432														●						
DCMT-FP  Fine Finishing	1121675	DCMT 21.50.5-FP			○	●		○	○													
	1121678	DCMT 21.51-FP			◉	●		○	○													
	1121668	DCMT 32.50.5-FP			○	●		○	◉													
	1121711	DCMT 32.51-FP			◉	●		○	○													
	1121713	DCMT 32.52-FP			◉	●		○	○													
DCMT-FM  Fine Finishing	1121674	DCMT 21.50.5-FM											○	●							○	●
	1121677	DCMT 21.51-FM									●		○	◉							○	●
	1121667	DCMT 32.50.5-FM											●	◉							●	◉
	1121710	DCMT 32.51-FM									●		●	◉							●	◉
	1121712	DCMT 32.52-FM									●		●	◉							●	◉
DCMT-FK  Fine Finishing	1121673	DCMT 21.50.5-FK														●						
	1121676	DCMT 21.51-FK														●						
	1121714	DCMT 32.50.5-FK														●						
	1121709	DCMT 32.51-FK														●						
DCMT-FW  Fine Finishing Wiper	1121749	DCMT 21.51-FW			●									●		●						●
	1121750	DCMT 21.52-FW			●									●		●						●
	1121745	DCMT 32.51-FW			●									●		●						●
	1121755	DCMT 32.52-FW			●									●		●						●
DCMT-LM NEW  Finishing	1123802	DCMT 32.51-LM											◉	●							●	◉
	1123803	DCMT 32.52-LM											◉	●							●	◉
DCMT-MP  Finishing	1121681	DCMT 21.51-MP			●	●		○	◉													
	1121684	DCMT 21.52-MP			●	◉		○	○													
	1121648	DCMT 32.51-MP			●	●		○	◉													
	1121706	DCMT 32.52-MP			●	●		○	◉													
	1121708	DCMT 32.53-MP			●	◉		○	○													

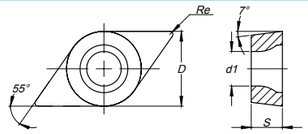
◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

● Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 7º



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
DCMW 070202	DCMW 21.50.5	1/4	3/32	0.008	0.110	0.063	0.002	0.126	0.004	0.002	0.005
DCMW 070204	DCMW 21.51	1/4	3/32	1/64	0.110	0.063	0.002	0.126	0.008	0.003	0.010
DCMW 070208	DCMW 21.52	1/4	3/32	1/32	0.110	0.063	0.002	0.126	0.016	0.006	0.021
DCMW 11T302	DCMW 32.50.5	3/8	5/32	0.008	0.173	0.094	0.002	0.189	0.004	0.002	0.005
DCMW 11T304	DCMW 32.51	3/8	5/32	1/64	0.173	0.094	0.002	0.189	0.008	0.003	0.010
DCMW 11T308	DCMW 32.52	3/8	5/32	1/32	0.173	0.094	0.002	0.189	0.016	0.006	0.021
DCMW 150404	DCMW 431	1/2	3/16	1/64	0.217	0.110	0.004	0.217	0.008	0.004	0.010
DCMW 150408	DCMW 432	1/2	3/16	1/32	0.217	0.110	0.004	0.217	0.016	0.006	0.021
DCMT 070202-FP	DCMT 21.50.5-FP	1/4	3/32	0.008	0.110	0.010	0.002	0.059	0.002	0.001	0.004
DCMT 070204-FP	DCMT 21.51-FP	1/4	3/32	1/64	0.110	0.010	0.003	0.059	0.003	0.002	0.007
DCMT 11T302-FP	DCMT 32.50.5-FP	3/8	5/32	0.008	0.173	0.014	0.003	0.079	0.003	0.002	0.006
DCMT 11T304-FP	DCMT 32.51-FP	3/8	5/32	1/64	0.173	0.014	0.004	0.079	0.004	0.002	0.009
DCMT 11T308-FP	DCMT 32.52-FP	3/8	5/32	1/32	0.173	0.014	0.006	0.079	0.006	0.003	0.012
DCMT 070202-FM	DCMT 21.50.5-FM	1/4	3/32	0.008	0.110	0.010	0.002	0.059	0.002	0.001	0.004
DCMT 070204-FM	DCMT 21.51-FM	1/4	3/32	1/64	0.110	0.010	0.003	0.059	0.003	0.002	0.007
DCMT 11T302-FM	DCMT 32.50.5-FM	3/8	5/32	0.008	0.173	0.014	0.003	0.079	0.003	0.002	0.006
DCMT 11T304-FM	DCMT 32.51-FM	3/8	5/32	1/64	0.173	0.014	0.004	0.079	0.004	0.002	0.009
DCMT 11T308-FM	DCMT 32.52-FM	3/8	5/32	1/32	0.173	0.014	0.006	0.079	0.006	0.003	0.012
DCMT 070202-FK	DCMT 21.50.5-FK	1/4	3/32	0.008	0.110	0.010	0.002	0.059	0.002	0.001	0.004
DCMT 070204-FK	DCMT 21.51-FK	1/4	3/32	1/64	0.110	0.010	0.003	0.059	0.003	0.002	0.007
DCMT 11T302-FK	DCMT 32.50.5-FK	3/8	5/32	0.008	0.173	0.014	0.003	0.079	0.003	0.002	0.006
DCMT 11T304-FK	DCMT 32.51-FK	3/8	5/32	1/64	0.173	0.014	0.004	0.079	0.004	0.002	0.009
DCMT 070204-FW	DCMT 21.51-FW	1/4	3/32	1/64	0.110	0.028	0.012	0.079	0.005	0.002	0.010
DCMT 070208-FW	DCMT 21.52-FW	1/4	3/32	1/32	0.110	0.028	0.012	0.079	0.006	0.004	0.014
DCMT 11T304-FW	DCMT 32.51-FW	3/8	5/32	1/64	0.173	0.039	0.012	0.118	0.008	0.003	0.012
DCMT 11T308-FW	DCMT 32.52-FW	3/8	5/32	1/32	0.173	0.039	0.012	0.118	0.010	0.005	0.016
DCMT 11T304-LM	DCMT 32.51-LM	3/8	5/32	1/64	0.173	0.020	0.006	0.098	0.006	0.003	0.010
DCMT 11T308-LM	DCMT 32.52-LM	3/8	5/32	1/32	0.173	0.020	0.008	0.098	0.008	0.004	0.014
DCMT 070204-MP	DCMT 21.51-MP	1/4	3/32	1/64	0.110	0.024	0.007	0.089	0.004	0.002	0.007
DCMT 070208-MP	DCMT 21.52-MP	1/4	3/32	1/32	0.110	0.024	0.015	0.089	0.008	0.003	0.014
DCMT 11T304-MP	DCMT 32.51-MP	3/8	5/32	1/64	0.173	0.031	0.010	0.118	0.006	0.003	0.009
DCMT 11T308-MP	DCMT 32.52-MP	3/8	5/32	1/32	0.173	0.031	0.020	0.118	0.010	0.004	0.016
DCMT 11T312-MP	DCMT 32.53-MP	3/8	5/32	3/64	0.173	0.031	0.024	0.118	0.014	0.005	0.024

DC - RHOMBIC 55° POSITIVE

RÔMBICA 55° POSITIVA | RÓMBICA 55° POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K					N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT				UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9		10	G1	G4
		ANSI Reference	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740		PH0910	PH7910	PH7920
DCMT-MM  Finishing	1121680	DCMT 21.51-MM								◉			◉	◉							◉	◉
	1121683	DCMT 21.52-MM								◉			○	◉							○	◉
	1121647	DCMT 32.51-MM								◉			◉	◉							◉	◉
	1121705	DCMT 32.52-MM								◉			◉	◉							◉	◉
	1121707	DCMT 32.53-MM								◉			○	◉							○	◉
DCMT-MK  Finishing	1121679	DCMT 21.51-MK														◉	◉					
	1121682	DCMT 21.52-MK														◉	◉					
	1121646	DCMT 32.51-MK														◉	◉					
	1121704	DCMT 32.52-MK														◉	◉					
	1121955	DCMT 32.53-MK														◉	◉					
DCMT-MW  Finishing Wiper	1121414	DCMT 32.51-MW			◉					◉				◉		○	◉					◉
	1121756	DCMT 32.52-MW			◉					◉				◉		○	◉					◉
DCGT-FS NEW  Finishing to Fine Finishing	1121747	DCGT 21.50-FS						◉	◉				◉	◉							◉	◉
	1121748	DCGT 21.50.5-FS						◉	◉				◉	◉							◉	◉
	1121872	DCGT 21.51-FS						◉	◉				◉	◉							◉	◉
	1121873	DCGT 32.50-FS						◉	◉				◉	◉							◉	◉
	1121874	DCGT 32.50.5-FS						◉	◉				◉	◉							◉	◉
	1121875	DCGT 32.51-FS						◉	◉				◉	◉							◉	◉
DCGT-LN  Finishing to Fine Finishing	1121900	DCGT 21.50.5-LN																		◉		
	1121901	DCGT 21.51-LN																		◉		
	1111540	DCGT 32.50.5-LN																		◉		
	1111534	DCGT 32.51-LN																		◉		
	1121904	DCGT 32.52-LN																		◉		
	1124004	DCGT 32.53-LN																		◉		

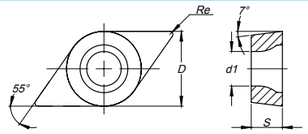
◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◉ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 7°



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
DCMT 070204-MM	DCMT 21.51-MM	1/4	3/32	1/64	0.110	0.024	0.007	0.089	0.004	0.002	0.007
DCMT 070208-MM	DCMT 21.52-MM	1/4	3/32	1/32	0.110	0.024	0.015	0.089	0.008	0.003	0.014
DCMT 11T304-MM	DCMT 32.51-MM	3/8	5/32	1/64	0.173	0.031	0.010	0.118	0.006	0.003	0.009
DCMT 11T308-MM	DCMT 32.52-MM	3/8	5/32	1/32	0.173	0.031	0.020	0.118	0.010	0.004	0.016
DCMT 11T312-MM	DCMT 32.53-MM	3/8	5/32	3/64	0.173	0.031	0.024	0.118	0.014	0.005	0.024
DCMT 070204-MK	DCMT 21.51-MK	1/4	3/32	1/64	0.110	0.024	0.007	0.089	0.004	0.002	0.007
DCMT 070208-MK	DCMT 21.52-MK	1/4	3/32	1/32	0.110	0.024	0.015	0.089	0.008	0.003	0.014
DCMT 11T304-MK	DCMT 32.51-MK	3/8	5/32	1/64	0.173	0.031	0.010	0.118	0.006	0.003	0.009
DCMT 11T308-MK	DCMT 32.52-MK	3/8	5/32	1/32	0.173	0.031	0.020	0.118	0.010	0.004	0.016
DCMT 11T312-MK	DCMT 32.53-MK	3/8	5/32	3/64	0.173	0.031	0.020	0.118	0.014	0.005	0.024
DCMT 11T304-MW	DCMT 32.51-MW	3/8	5/32	1/64	0.173	0.059	0.020	0.157	0.010	0.005	0.016
DCMT 11T308-MW	DCMT 32.52-MW	3/8	5/32	1/32	0.173	0.059	0.020	0.157	0.012	0.006	0.020
DCGT 070201-FS	DCGT 21.50-FS	1/4	3/32	0.004	0.110	0.012	0.004	0.039	0.001	0.001	0.002
DCGT 070202-FS	DCGT 21.50.5-FS	1/4	3/32	0.008	0.110	0.020	0.004	0.059	0.003	0.001	0.005
DCGT 070204-FS	DCGT 21.51-FS	1/4	3/32	1/64	0.110	0.031	0.006	0.059	0.006	0.003	0.010
DCGT 11T301-FS	DCGT 32.50-FS	3/8	5/32	0.004	0.173	0.020	0.004	0.059	0.001	0.001	0.002
DCGT 11T302-FS	DCGT 32.50.5-FS	3/8	5/32	0.008	0.173	0.039	0.004	0.079	0.003	0.001	0.005
DCGT 11T304-FS	DCGT 32.51-FS	3/8	5/32	1/64	0.173	0.059	0.006	0.118	0.006	0.003	0.010
DCGT 070202-LN	DCGT 21.50.5-LN	1/4	3/32	0.008	0.110	0.039	0.002	0.118	0.003	0.002	0.005
DCGT 070204-LN	DCGT 21.51-LN	1/4	3/32	1/64	0.110	0.081	0.004	0.157	0.006	0.004	0.008
DCGT 11T302-LN	DCGT 32.50.5-LN	3/8	5/32	0.008	0.173	0.080	0.002	0.157	0.003	0.002	0.005
DCGT 11T304-LN	DCGT 32.51-LN	3/8	5/32	1/64	0.173	0.100	0.004	0.197	0.006	0.004	0.009
DCGT 11T308-LN	DCGT 32.52-LN	3/8	5/32	1/32	0.173	0.100	0.004	0.197	0.009	0.006	0.020
DCGT 11T312-LN	DCGT 32.53-LN	3/8	5/32	3/64	0.173	0.106	0.006	0.197	0.014	0.006	0.028

REDONDA R° POSITIVA | REDONDA R° POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K				N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT			UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9	10	G1	G4
			PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
RCMT-CP  Medium	1120384	RCMT 0602M0-CP			◎	◎				◎	◎					◎					
RCMT-ST  Roughing to Medium	1120385	RCMT 0803M0-ST			◎	◎				◎	◎					◎					
	1120386	RCMT 1003M0-ST			◎	◎				◎	◎					◎					
	1120387	RCMT 10T3M0-ST			◎	◎				◎	◎					◎					
	1120388	RCMT 1204M0-ST			◎	◎				◎	◎					◎					
	1120389	RCMT 1606M0-ST			◎	◎				◎	◎					◎					
	1120390	RCMT 2006M0-ST			◎	◎				◎	◎					◎	◎				
RCMT-RF NEW  Roughing to Medium	1123848	RCMT 2507M0-RF	◎	◎						○	○						○				
RCMT-RM NEW  Roughing to Medium	1123856	RCMT 2006M0-RM	◎	◎						○	○						○				
RCMX-ST  Roughing to Medium	1121425	RCMX 1003M0-ST			○	◎	○										○				
	1121426	RCMX 1204M0-ST			○	◎	○										○				
	1121427	RCMX 1606M0-ST			○	◎	○										○				
	1121428	RCMX 2006M0-ST			○	◎	○										○				
	1121429	RCMX 2507M0-ST			◎	◎	○										○				
	1121430	RCMX 3209M0-ST			◎	◎	○										○				
RCMX-RM  Roughing to Medium	1123678	RCMX 3209M0-RM			◎	◎	○			◎	◎	○				○	○				
RCMX-RR  Roughing to Medium	1123667	RCMX 2507M0-RR			◎	◎	○			◎	◎	○									
	1123666	RCMX 3209M0-RR			◎	◎	○			◎	◎	○					○				
RCGT-LN  Finishing to Fine Finishing	1124005	RCGT 0602M0-LN																	◎		
	1124006	RCGT 0803M0-LN																	◎		
	1124007	RCGT 1003M0-LN																	◎		
	1123684	RCGT 1204M0-LN																	◎		

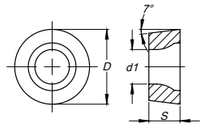
◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 7°



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
RCMT 0602M0-CP	RCMT 0602M0-CP	0.236	3/32	-	0.110	0.059	0.020	0.094	0.006	0.002	0.007
RCMT 0803M0-ST	RCMT 0803M0-ST	0.315	1/8	-	0.134	0.079	0.031	0.126	0.008	0.004	0.031
RCMT 1003M0-ST	RCMT 1003M0-ST	0.394	1/8	-	0.134	0.098	0.039	0.157	0.010	0.005	0.039
RCMT 10T3M0-ST	RCMT 10T3M0-ST	0.394	5/32	-	0.173	0.098	0.039	0.157	0.010	0.006	0.055
RCMT 1204M0-ST	RCMT 1204M0-ST	0.472	3/16	-	0.173	0.118	0.047	0.189	0.012	0.008	0.071
RCMT 1606M0-ST	RCMT 1606M0-ST	0.630	1/4	-	0.217	0.138	0.063	0.252	0.015	0.010	0.091
RCMT 2006M0-ST	RCMT 2006M0-ST	0.787	1/4	-	0.256	0.157	0.079	0.315	0.018	0.012	0.118
RCMT 2507M0-RF	RCMT 2507M0-RF	0.984	5/16	-	0.283	0.248	0.098	0.394	0.031	0.010	0.098
RCMT 2006M0-RM	RCMT 2006M0-RM	0.787	1/4	-	0.256	0.157	0.079	0.315	0.018	0.005	0.025
RCMX 1003M0-ST	RCMX 1003M0-ST	0.394	1/8	-	0.142	0.098	0.039	0.157	0.013	0.004	0.039
RCMX 1204M0-ST	RCMX 1204M0-ST	0.472	3/16	-	0.165	0.118	0.047	0.189	0.015	0.005	0.047
RCMX 1606M0-ST	RCMX 1606M0-ST	0.630	1/4	-	0.205	0.157	0.063	0.252	0.020	0.006	0.063
RCMX 2006M0-ST	RCMX 2006M0-ST	0.787	1/4	-	0.256	0.197	0.079	0.315	0.025	0.008	0.079
RCMX 2507M0-ST	RCMX 2507M0-ST	0.984	5/16	-	0.283	0.248	0.098	0.394	0.031	0.010	0.098
RCMX 3209M0-ST	RCMX 3209M0-ST	1.260	0.375	-	0.374	0.315	0.126	0.504	0.040	0.013	0.126
RCMX 3209M0-RM	RCMX 3209M0-RM	1.260	0.375	-	0.374	0.256	0.126	0.512	0.071	0.031	0.098
RCMX 2507M0-RR	RCMX 2507M0-RR	0.984	5/16	-	0.283	0.197	0.126	0.315	0.071	0.031	0.098
RCMX 3209M0-RR	RCMX 3209M0-RR	1.260	0.375	-	0.374	0.256	0.126	0.512	0.071	0.031	0.098
RCGT 0602M0-LN	RCGT 0602M0-LN	0.236	3/32	-	0.110	0.049	0.020	0.079	0.005	0.002	0.008
RCGT 0803M0-LN	RCGT 0803M0-LN	0.315	1/8	-	0.134	0.059	0.020	0.098	0.006	0.002	0.010
RCGT 1003M0-LN	RCGT 1003M0-LN	0.394	1/8	-	0.173	0.079	0.039	0.118	0.008	0.004	0.012
RCGT 1204M0-LN	RCGT 1204M0-LN	0.472	3/16	-	0.173	0.089	0.039	0.138	0.009	0.004	0.014

SC - SQUARE 90º POSITIVE

QUADRADA 90º POSITIVA | ESCUADRA 90º POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K					N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT				UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9		10	G1	G4
		ANSI Reference	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740		PH0910	PH7910	PH7920
SCMW  Finishing	1121088	SCMW 21.50.5														○						
	1121087	SCMW 21.51														○						
	1121105	SCMW 2.51.50.5														○						
	1121100	SCMW 2.520.5														○						
	1120467	SCMW 321														○						
	1120468	SCMW 32.50.5														○						
	1120469	SCMW 32.51														◎						
	1120470	SCMW 32.52														◎						
	1120471	SCMW 431														○						
	1120472	SCMW 432														◎						
	1121424	SCMW 433														○						
SCMT-FP  Fine Finishing	1121759	SCMT 32.51-FP			◎	◎		○	○													
	1121765	SCMT 32.52-FP			◎	◎		○	○													
SCMT-FM  Fine Finishing	1121758	SCMT 32.51-FM									◎			◎								◎
	1121764	SCMT 32.52-FM									◎			◎								◎
SCMT-FK  Fine Finishing	1121757	SCMT 32.51-FK														◎						
	1121763	SCMT 32.52-FK														◎						
SCMT-MP  Finishing	1121762	SCMT 32.51-MP			◎	◎		○	○													
	1121768	SCMT 32.52-MP			◎	◎		○	○													
	1121770	SCMT 431-MP			◎	◎		○	○													
	1121783	SCMT 432-MP			◎	◎		○	○													
	1121785	SCMT 433-MP			◎	◎		○	○													
SCMT-MM  Finishing	1121761	SCMT 32.51-MM								◎			◎									◎
	1121767	SCMT 32.52-MM								◎			◎									◎
	1121769	SCMT 431-MM								◎			◎									◎
	1121782	SCMT 432-MM								◎			◎									◎
	1121784	SCMT 433-MM								◎			◎									◎
SCMT-MK  Finishing	1121760	SCMT 32.51-MK													◎	◎	◎					
	1121766	SCMT 32.52-MK														◎	◎					
	1121781	SCMT 432-MK														◎	◎	◎				

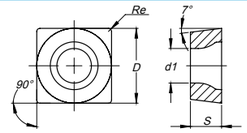
◎ Stock item | Produto de stock | Ítens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Ítens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 7º



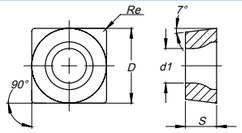
ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
SCMW 060202	SCMW 21.50.5	1/4	3/32	0.008	0.110	0.059	0.002	0.118	0.004	0.002	0.005
SCMW 060204	SCMW 21.51	1/4	3/32	1/64	0.110	0.059	0.002	0.118	0.008	0.003	0.010
SCMW 070202	SCMW 2.51.50.5	5/16	3/32	0.008	0.134	0.071	0.002	0.138	0.004	0.002	0.005
SCMW 070302	SCMW 2.520.5	5/16	1/8	0.008	0.134	0.071	0.002	0.138	0.004	0.002	0.005
SCMW 090304	SCMW 321	3/8	1/8	1/64	0.173	0.079	0.002	0.157	0.008	0.003	0.010
SCMW 09T302	SCMW 32.50.5	3/8	5/32	0.008	0.173	0.094	0.002	0.185	0.004	0.002	0.005
SCMW 09T304	SCMW 32.51	3/8	5/32	1/64	0.173	0.094	0.002	0.185	0.008	0.003	0.010
SCMW 09T308	SCMW 32.52	3/8	5/32	1/32	0.173	0.094	0.002	0.185	0.016	0.006	0.021
SCMW 120404	SCMW 431	1/2	3/16	1/64	0.217	0.126	0.002	0.248	0.008	0.003	0.010
SCMW 120408	SCMW 432	1/2	3/16	1/32	0.217	0.126	0.002	0.248	0.016	0.006	0.021
SCMW 120412	SCMW 433	1/2	3/16	3/64	0.217	0.126	0.002	0.248	0.024	0.009	0.031
SCMT 09T304-FP	SCMT 32.51-FP	3/8	5/32	1/64	0.173	0.014	0.004	0.079	0.004	0.002	0.009
SCMT 09T308-FP	SCMT 32.52-FP	3/8	5/32	1/32	0.173	0.014	0.006	0.079	0.006	0.003	0.012
SCMT 09T304-FM	SCMT 32.51-FM	3/8	5/32	1/64	0.173	0.014	0.004	0.079	0.004	0.002	0.009
SCMT 09T308-FM	SCMT 32.52-FM	3/8	5/32	1/32	0.173	0.014	0.006	0.079	0.006	0.003	0.012
SCMT 09T304-FK	SCMT 32.51-FK	3/8	5/32	1/64	0.173	0.014	0.004	0.079	0.004	0.002	0.009
SCMT 09T308-FK	SCMT 32.52-FK	3/8	5/32	1/32	0.173	0.014	0.006	0.079	0.006	0.003	0.012
SCMT 09T304-MP	SCMT 32.51-MP	3/8	5/32	1/64	0.173	0.031	0.010	0.118	0.006	0.003	0.009
SCMT 09T308-MP	SCMT 32.52-MP	3/8	5/32	1/32	0.173	0.031	0.020	0.118	0.010	0.004	0.016
SCMT 120404-MP	SCMT 431-MP	1/2	3/16	1/64	0.217	0.038	0.012	0.142	0.007	0.004	0.011
SCMT 120408-MP	SCMT 432-MP	1/2	3/16	1/32	0.217	0.038	0.024	0.142	0.010	0.005	0.018
SCMT 120412-MP	SCMT 433-MP	1/2	3/16	3/64	0.217	0.038	0.028	0.142	0.014	0.006	0.024
SCMT 09T304-MM	SCMT 32.51-MM	3/8	5/32	1/64	0.173	0.031	0.010	0.118	0.006	0.003	0.009
SCMT 09T308-MM	SCMT 32.52-MM	3/8	5/32	1/32	0.173	0.031	0.020	0.118	0.010	0.004	0.016
SCMT 120404-MM	SCMT 431-MM	1/2	3/16	1/64	0.217	0.038	0.012	0.142	0.007	0.004	0.011
SCMT 120408-MM	SCMT 432-MM	1/2	3/16	1/32	0.217	0.038	0.024	0.142	0.010	0.005	0.018
SCMT 120412-MM	SCMT 433-MM	1/2	3/16	3/64	0.217	0.038	0.028	0.142	0.014	0.006	0.024
SCMT 09T304-MK	SCMT 32.51-MK	3/8	5/32	1/64	0.173	0.031	0.010	0.118	0.006	0.003	0.009
SCMT 09T308-MK	SCMT 32.52-MK	3/8	5/32	1/32	0.173	0.031	0.020	0.118	0.010	0.004	0.016
SCMT 120408-MK	SCMT 432-MK	1/2	3/16	1/32	0.217	0.038	0.024	0.142	0.010	0.005	0.018

SC - SQUARE 90º POSITIVE

QUADRADA 90º POSITIVA | ESCUADRA 90º POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P CVD-MT R2 PHG115	P CVD-MT R3 PHG125	P CVD-MT L7 PH5115	P CVD-MT L8 PH5125	P CVD-MT L9 PH5740	P PVD G1 PH7910	P PVD G4 PH7920	M CVD-MT L7 PH5115	M CVD-MT L8 PH5125	M CVD-MT L9 PH5740	M PVD G1 PH7910	M PVD G4 PH7920	K UNC 25 PH0705	K CVD-MT L5 PH5705	K CVD-MT L6 PH5320	K CVD-MT L9 PH5740	N UNC 10 PH0910	S PVD G1 PH7910	S PVD G4 PH7920
SCGT-LN  Finishing to fine Finishing	1124008	SCGT 32.51-LN																	◎		
	1124009	SCGT 32.52-LN																	◎		
	1124010	SCGT 431-LN																	◎		
	1123685	SCGT 432-LN																	◎		

RELIEF ANGLE 7º



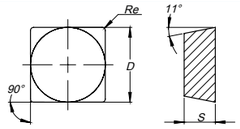
ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in) D	S	Re	d1	Cutting Conditions Condições de Corte Condiciones de Corte ap (in)	Min	Max	fn (in/rev)	Min	Max
SCGT 09T304-LN	SCGT 32.51-LN	3/8	5/32	1/64	0,173	0,081	0,004	0,157	0,006	0,004	0,010
SCGT 09T308-LN	SCGT 32.52-LN	3/8	5/32	1/32	0,173	0,100	0,004	0,197	0,009	0,006	0,016
SCGT 120404-LN	SCGT 431-LN	1/2	3/16	1/64	0,217	0,100	0,004	0,197	0,008	0,004	0,010
SCGT 120408-LN	SCGT 432-LN	1/2	3/16	1/32	0,217	0,100	0,004	0,197	0,012	0,006	0,020

SP - SQUARE 90º POSITIVE

QUADRADA 90º POSITIVA | ESCUADRA 90º POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P CVD-MT R2 PHG115	P CVD-MT R3 PHG125	P CVD-MT L7 PH5115	P CVD-MT L8 PH5125	P CVD-MT L9 PH5740	P PVD G1 PH7910	P PVD G4 PH7920	M CVD-MT L7 PH5115	M CVD-MT L8 PH5125	M CVD-MT L9 PH5740	M PVD G1 PH7910	M PVD G4 PH7920	K UNC 25 PH0705	K CVD-MT L5 PH5705	K CVD-MT L6 PH5320	K CVD-MT L9 PH5740	N UNC 10 PH0910	S PVD G1 PH7910	S PVD G4 PH7920
SPUN  Medium to Finishing	1120578	SPUN 321				○															
	1120579	SPUN 322				○															
	1120580	SPUN 421				◎															
	1120581	SPUN 422				◎															
	1120583	SPUN 423				◎															
	1120926	SPUN 424				○															
	1120589	SPUN 432				○															
	1120590	SPUN 433				○															
	1120592	SPUN 434				○															
	1120594	SPUN 532				○															
	1120595	SPUN 533				○															
	1120597	SPUN 632				○															
	1120598	SPUN 633				○															
	1120601	SPUN 634				○															
	1120603	SPUN 845				○															
SPMR-12  Finishing to Fine Finishing	1120561	SPMR 322-12			◎	◎															
	1120563	SPMR 421-12			◎	◎															
	1120565	SPMR 422-12			◎	◎															
SPMR-13  Finishing	1120560	SPMR 321-13			◎	◎															
	1120562	SPMR 322-13			◎	◎															
	1120564	SPMR 421-13			◎	◎															
	1120566	SPMR 422-13			◎	◎															
	1120567	SPMR-423-13			◎	◎															

RELIEF ANGLE 11º



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in) D	S	Re	d1	Cutting Conditions Condições de Corte Condiciones de Corte ap (in)	Min	Max	fn (in/rev)	Min	Max
SPUN 090304	SPUN 321	3/8	1/8	1/64	-	0.079	0.039	0.118	0.006	0.003	0.008
SPUN 090308	SPUN 322	3/8	1/8	1/32	-	0.079	0.039	0.118	0.009	0.005	0.014
SPUN 120304	SPUN 421	1/2	1/8	1/64	-	0.118	0.039	0.197	0.008	0.004	0.012
SPUN 120308	SPUN 422	1/2	1/8	1/32	-	0.118	0.039	0.197	0.010	0.006	0.016
SPUN 120312	SPUN 423	1/2	1/8	3/64	-	0.118	0.039	0.197	0.014	0.008	0.020
SPUN 120316	SPUN 424	1/2	1/8	1/16	-	0.118	0.039	0.197	0.018	0.010	0.031
SPUN 120408	SPUN 432	1/2	3/16	1/32	-	0.118	0.039	0.197	0.010	0.006	0.016
SPUN 120412	SPUN 433	1/2	3/16	3/64	-	0.118	0.039	0.197	0.014	0.008	0.020
SPUN 120416	SPUN 434	1/2	3/16	1/16	-	0.118	0.039	0.197	0.018	0.010	0.031
SPUN 150408	SPUN 532	5/8	3/16	1/32	-	0.118	0.039	0.197	0.011	0.006	0.016
SPUN 150412	SPUN 533	5/8	3/16	3/64	-	0.118	0.039	0.197	0.014	0.008	0.020
SPUN 190408	SPUN 632	3/4	3/16	1/32	-	0.157	0.059	0.276	0.010	0.006	0.016
SPUN 190412	SPUN 633	3/4	3/16	3/64	-	0.157	0.059	0.276	0.014	0.008	0.020
SPUN 190416	SPUN 634	3/4	3/16	1/16	-	0.177	0.079	0.276	0.018	0.010	0.031
SPUN 250620	SPUN 845	1	1/4	0.079	-	0.236	0.118	0.394	0.022	0.012	0.039
SPMR 090308-12	SPMR 322-12	3/8	1/8	1/32	-	0.039	0.012	0.079	0.008	0.004	0.012
SPMR 120304-12	SPMR 421-12	1/2	1/8	1/64	-	0.051	0.020	0.079	0.006	0.003	0.010
SPMR 120308-12	SPMR 422-12	1/2	1/8	1/32	-	0.051	0.020	0.079	0.009	0.004	0.012
SPMR 090304-13	SPMR 321-13	3/8	1/8	1/64	-	0.087	0.039	0.138	0.004	0.002	0.008
SPMR 090308-13	SPMR 322-13	3/8	1/8	1/32	-	0.087	0.039	0.138	0.010	0.004	0.016
SPMR 120304-13	SPMR 421-13	1/2	1/8	1/64	-	0.102	0.059	0.157	0.004	0.003	0.008
SPMR 120308-13	SPMR 422-13	1/2	1/8	1/32	-	0.102	0.059	0.157	0.012	0.008	0.016
SPMR 120312-13	SPMR-423-13	1/2	1/8	3/64	-	0.102	0.059	0.157	0.016	0.010	0.022

◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

TC - TRIANGULAR 60º POSITIVE

TRIANGULAR 60º POSITIVA | TRIANGULAR 60º POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K				N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT			UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9	10	G1	G4
			PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
TCMW  Finishing	1121845	TCMW 1.21.20.5														○					
	1120856	TCMW 1.51.50.5														○					
	1120859	TCMW 1.81.50.5														○					
	1120618	TCMW 1.81.51														○					
	1120619	TCMW 21.50.5														○					
	1120620	TCMW 21.51														◎					
	1120879	TCMW 21.52														○					
	1120621	TCMW 322														○					
	1120622	TCMW 32.51														◎					
	1120623	TCMW 32.52														◎					
	1121846	TCMW 432														○					
TCMT-FP  Fine Finishing	1121788	TCMT 1.21.20.5-FP				◎		○	○												
	1121798	TCMT 1.21.21-FP			◎	◎		○	○												
	1121801	TCMT 1.21.22-FP			◎	◎		○	○												
	1121804	TCMT 1.81.50.5-FP				◎		○	○												
	1121807	TCMT 1.81.51-FP			◎	◎		○	○												
	1121961	TCMT 21.50.5-FP				◎		○	○												
	1121962	TCMT 21.51-FP			◎	◎		○	○												
	1121963	TCMT 21.52-FP			◎	◎		○	○												
	1121669	TCMT 220.5-FP				◎		○	○												
	1121816	TCMT 221-FP			◎	◎		○	○												
	1121823	TCMT 222-FP			◎	◎		○	○												
	1121832	TCMT 32.51-FP			◎	◎		○	○												
TCMT-FM  Fine Finishing	1121787	TCMT 1.21.20.5-FM								◎			◎								◎
	1121797	TCMT 1.21.21-FM								◎			◎								◎
	1123637	TCMT 1.21.22-FM								◎			◎								◎
	1121803	TCMT 1.81.50.5-FM								◎			◎								◎
	1121806	TCMT 1.81.51-FM								◎			◎								◎
	1121960	TCMT 21.50.5-FM								◎			◎								◎
	1121958	TCMT 21.51-FM								◎			◎								◎
	1121959	TCMT 21.52-FM								◎			◎								◎
	1121881	TCMT 220.5-FM								◎			◎								◎
	1121815	TCMT 221-FM								◎			◎								◎
	1121822	TCMT 222-FM								◎			◎								◎
	1121831	TCMT 32.51-FM								◎			◎								◎

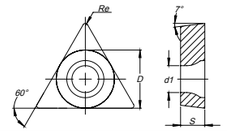
◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 7º



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
TCMW 06T102	TCMW 1.21.20.5	5/32	0.078	0.008	0.085	0.035	0.002	0.075	0.004	0.002	0.005
TCMW 080202	TCMW 1.51.50.5	3/16	3/32	0.008	0.085	0.039	0.002	0.079	0.004	0.002	0.005
TCMW 090202	TCMW 1.81.50.5	7/32	3/32	0.008	0.098	0.051	0.002	0.106	0.004	0.002	0.005
TCMW 090204	TCMW 1.81.51	7/32	3/32	1/64	0.098	0.051	0.002	0.106	0.008	0.003	0.010
TCMW 110202	TCMW 21.50.5	1/4	3/32	0.008	0.110	0.059	0.002	0.122	0.004	0.002	0.005
TCMW 110204	TCMW 21.51	1/4	3/32	1/64	0.110	0.059	0.002	0.122	0.008	0.003	0.010
TCMW 110208	TCMW 21.52	1/4	3/32	1/32	0.110	0.059	0.002	0.122	0.016	0.006	0.021
TCMW 160308	TCMW 322	3/8	1/8	1/32	0.173	0.079	0.002	0.173	0.016	0.006	0.021
TCMW 16T304	TCMW 32.51	3/8	5/32	1/64	0.173	0.091	0.002	0.185	0.008	0.003	0.010
TCMW 16T308	TCMW 32.52	3/8	5/32	1/32	0.173	0.091	0.002	0.185	0.016	0.006	0.021
TCMW 220408	TCMW 432	1/2	3/16	1/32	0.217	0.122	0.002	0.248	0.016	0.006	0.021
TCMT 06T102-FP	TCMT 1.21.20.5-FP	5/32	0.078	0.008	0.085	0.010	0.002	0.059	0.002	0.001	0.004
TCMT 06T104-FP	TCMT 1.21.21-FP	5/32	0.078	1/64	0.085	0.010	0.003	0.059	0.003	0.002	0.007
TCMT 06T108-FP	TCMT 1.21.22-FP	5/32	0.078	1/32	0.085	0.010	0.004	0.059	0.004	0.002	0.009
TCMT 090202-FP	TCMT 1.81.50.5-FP	7/32	3/32	0.008	0.098	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 090204-FP	TCMT 1.81.51-FP	7/32	3/32	1/64	0.098	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 110202-FP	TCMT 21.50.5-FP	1/4	3/32	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 110204-FP	TCMT 21.51-FP	1/4	3/32	1/64	0.110	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 110208-FP	TCMT 21.52-FP	1/4	3/32	1/32	0.110	0.012	0.005	0.067	0.005	0.003	0.010
TCMT 110302-FP	TCMT 220.5-FP	1/4	1/8	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 110304-FP	TCMT 221-FP	1/4	1/8	1/64	0.110	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 110308-FP	TCMT 222-FP	1/4	1/8	1/32	0.110	0.012	0.005	0.067	0.005	0.003	0.010
TCMT 16T304-FP	TCMT 32.51-FP	3/8	5/32	1/64	0.173	0.014	0.004	0.079	0.004	0.002	0.009
TCMT 06T102-FM	TCMT 1.21.20.5-FM	5/32	0.078	0.008	0.085	0.010	0.002	0.059	0.002	0.001	0.004
TCMT 06T104-FM	TCMT 1.21.21-FM	5/32	0.078	1/64	0.085	0.010	0.003	0.059	0.003	0.002	0.007
TCMT 06T108-FM	TCMT 1.21.22-FM	5/32	0.078	1/32	0.085	0.010	0.004	0.059	0.004	0.002	0.009
TCMT 090202-FM	TCMT 1.81.50.5-FM	7/32	3/32	0.008	0.098	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 090204-FM	TCMT 1.81.51-FM	7/32	3/32	1/64	0.098	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 110202-FM	TCMT 21.50.5-FM	1/4	3/32	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 110204-FM	TCMT 21.51-FM	1/4	3/32	1/64	0.110	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 110208-FM	TCMT 21.52-FM	1/4	3/32	1/32	0.110	0.012	0.005	0.067	0.005	0.003	0.010
TCMT 110302-FM	TCMT 220.5-FM	1/4	1/8	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 110304-FM	TCMT 221-FM	1/4	1/8	1/64	0.110	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 110308-FM	TCMT 222-FM	1/4	1/8	1/32	0.110	0.012	0.005	0.067	0.005	0.003	0.010
TCMT 16T304-FM	TCMT 32.51-FM	3/8	5/32	1/64	0.173	0.014	0.004	0.079	0.004	0.002	0.009

TRIANGULAR 60º POSITIVA | TRIANGULAR 60º POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K				N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT			UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9	10	G1	G4
			PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
TCMT-FK  Fine Finishing	1121786	TCMT 1.21.20.5-FK														◎					
	1121789	TCMT 1.21.21-FK														◎					
	1121800	TCMT 1.21.22-FK														◎					
	1123668	TCMT 1.81.50.5-FK														◎					
	1121805	TCMT 1.81.51-FK														◎					
	1121956	TCMT 21.50.5-FK														◎					
	1121957	TCMT 21.51-FK														◎					
	1121813	TCMT 220.5-FK														◎					
	1121814	TCMT 221-FK														◎					
	1121830	TCMT 32.51-FK														◎					
TCMT-FW  Fine Finishing Wiper	1121808	TCMT 1.81.51-FW			◎									◎		◎					◎
	1121809	TCMT 1.81.52-FW			◎									◎		◎					◎
	1121964	TCMT 21.51-FW			◎									◎		◎					◎
	1121965	TCMT 21.52-FW			◎									◎		◎					◎
	1121817	TCMT 221-FW			◎									◎		◎					◎
	1121824	TCMT 222-FW			◎									◎		◎					◎
	1121833	TCMT 32.51-FW			◎									◎		◎					◎
	1121837	TCMT 32.52-FW			◎									◎		◎					◎
TCMT-MP  Finishing	1121703	TCMT 1.81.51-MP			◎	◎		○	○												
	1121812	TCMT 1.81.52-MP			◎	◎		○	○												
	1121970	TCMT 21.51-MP			◎	◎		○	◎												
	1121971	TCMT 21.52-MP			◎	◎		○	○												
	1121972	TCMT 21.53-MP			◎	◎		○	○												
	1121820	TCMT 221-MP			◎	◎		○	○												
	1121827	TCMT 222-MP			◎	◎		○	○												
	1121829	TCMT 223-MP			◎	◎		○	○												
	1121836	TCMT 32.51-MP			◎	◎		○	○												
	1121840	TCMT 32.52-MP			◎	◎		○	◎												
	1121844	TCMT 32.53-MP			◎	◎		○	○												
	1121849	TCMT 432-MP			◎	◎		○	○												

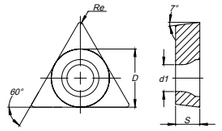
◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 7º



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
TCMT 06T102-FK	TCMT 1.21.20.5-FK	5/32	6/77	0.008	0.085	0.010	0.002	0.059	0.002	0.001	0.004
TCMT 06T104-FK	TCMT 1.21.21-FK	5/32	6/77	1/64	0.085	0.010	0.003	0.059	0.003	0.002	0.007
TCMT 06T108-FK	TCMT 1.21.22-FK	5/32	6/77	1/32	0.085	0.010	0.004	0.059	0.004	0.002	0.009
TCMT 090202-FK	TCMT 1.81.50.5-FK	7/32	3/32	0.008	0.098	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 090204-FK	TCMT 1.81.51-FK	7/32	3/32	1/64	0.098	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 110202-FK	TCMT 21.50.5-FK	1/4	3/32	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 110204-FK	TCMT 21.51-FK	1/4	3/32	1/64	0.110	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 110302-FK	TCMT 220.5-FK	1/4	1/8	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 110304-FK	TCMT 221-FK	1/4	1/8	1/64	0.110	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 16T304-FK	TCMT 32.51-FK	3/8	5/32	1/64	0.173	0.014	0.004	0.079	0.004	0.002	0.009
TCMT 090204-FW	TCMT 1.81.51-FW	7/32	3/32	1/64	0.098	0.028	0.012	0.079	0.005	0.002	0.012
TCMT 090208-FW	TCMT 1.81.52-FW	7/32	3/32	1/32	0.098	0.028	0.012	0.079	0.010	0.004	0.014
TCMT 110204-FW	TCMT 21.51-FW	1/4	3/32	1/64	0.110	0.039	0.012	0.098	0.008	0.003	0.012
TCMT 110208-FW	TCMT 21.52-FW	1/4	3/32	1/32	0.110	0.039	0.012	0.098	0.010	0.005	0.016
TCMT 110304-FW	TCMT 221-FW	1/4	1/8	1/64	0.110	0.039	0.012	0.098	0.008	0.003	0.012
TCMT 110308-FW	TCMT 222-FW	1/4	1/8	1/32	0.110	0.039	0.012	0.098	0.010	0.005	0.016
TCMT 16T304-FW	TCMT 32.51-FW	3/8	5/32	1/64	0.173	0.047	0.012	0.138	0.008	0.003	0.014
TCMT 16T308-FW	TCMT 32.52-FW	3/8	5/32	1/32	0.173	0.047	0.012	0.138	0.010	0.005	0.020
TCMT 090204-MP	TCMT 1.81.51-MP	7/32	3/32	1/64	0.098	0.024	0.007	0.089	0.004	0.002	0.007
TCMT 090208-MP	TCMT 1.81.52-MP	7/32	3/32	1/32	0.098	0.024	0.015	0.089	0.006	0.003	0.009
TCMT 110204-MP	TCMT 21.51-MP	1/4	3/32	1/64	0.110	0.026	0.008	0.098	0.005	0.002	0.007
TCMT 110208-MP	TCMT 21.52-MP	1/4	3/32	1/32	0.110	0.026	0.017	0.098	0.007	0.004	0.010
TCMT 110212-MP	TCMT 21.53-MP	1/4	3/32	3/64	0.110	0.026	0.020	0.098	0.008	0.004	0.016
TCMT 110304-MP	TCMT 221-MP	1/4	1/8	1/64	0.110	0.026	0.008	0.098	0.005	0.002	0.007
TCMT 110308-MP	TCMT 222-MP	1/4	1/8	1/32	0.110	0.026	0.017	0.098	0.008	0.004	0.016
TCMT 110312-MP	TCMT 223-MP	1/4	1/8	3/64	0.110	0.026	0.020	0.098	0.012	0.004	0.020
TCMT 16T304-MP	TCMT 32.51-MP	3/8	5/32	1/64	0.173	0.031	0.010	0.118	0.006	0.003	0.010
TCMT 16T308-MP	TCMT 32.52-MP	3/8	5/32	1/32	0.173	0.031	0.020	0.118	0.009	0.004	0.018
TCMT 16T312-MP	TCMT 32.53-MP	3/8	5/32	3/64	0.173	0.031	0.024	0.118	0.014	0.005	0.024
TCMT 220408-MP	TCMT 432-MP	1/2	3/16	1/32	0.217	0.038	0.024	0.142	0.010	0.005	0.018

TC - TRIANGULAR 60º POSITIVE

TRIANGULAR 60º POSITIVA | TRIANGULAR 60º POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K				N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT			UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9	10	G1	G4
		ANSI Reference	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
TCMT-MM  Finishing	1121702	TCMT 1.81.51-MM								◎				⊙							◎
	1121811	TCMT 1.81.52-MM								◎				⊙							◎
	1121968	TCMT 21.51-MM								◎			◎	⊙						◎	⊙
	1121969	TCMT 21.52-MM								◎				⊙							◎
	1121819	TCMT 221-MM								◎				⊙							◎
	1121826	TCMT 222-MM								◎				⊙							◎
	1121835	TCMT 32.51-MM								◎				⊙							◎
	1121839	TCMT 32.52-MM								◎			◎	⊙						◎	⊙
	1121843	TCMT 32.53-MM								◎				⊙							◎
	1121848	TCMT 432-MM								◎				⊙							◎
TCMT-MK  Finishing	1121701	TCMT 1.81.51-MK														◎	⊙				
	1121810	TCMT 1.81.52-MK													◎	◎	⊙				
	1121966	TCMT 21.51-MK														◎	⊙				
	1121967	TCMT 21.52-MK														◎	⊙				
	1121818	TCMT 221-MK														◎	⊙				
	1121825	TCMT 222-MK														◎	⊙				
	1121834	TCMT 32.51-MK														◎	⊙				
	1121838	TCMT 32.52-MK														◎	⊙				
	1121842	TCMT 32.53-MK														◎	⊙				
	1121847	TCMT 432-MK														◎	⊙				
TCMT-MW  Finishing Wiper	1121974	TCMT 21.52-MW		◎						⊙				◎		○	◎				◎
	1121828	TCMT 222-MW		◎						⊙				◎		○	◎				◎
	1121841	TCMT 32.52-MW		◎						⊙				◎		○	◎				◎
NEW TCGT-FS  Finishing to Fine Finishing	1123865	TCGT 1.81.50.5-FS						⊙	◎				⊙	◎						◎	⊙
	1123866	TCGT 1.81.51-FS						⊙	◎				⊙	◎						◎	⊙
	1123867	TCGT 21.50-FS						⊙	◎				⊙	◎						◎	⊙
	1123868	TCGT 21.50.5-FS						⊙	◎				⊙	◎						◎	⊙
	1123869	TCGT 21.51-FS						⊙	◎				⊙	◎						◎	⊙
	1123870	TCGT 220-FS						⊙	◎				⊙	◎						◎	⊙
	1123871	TCGT 220.5-FS						⊙	◎				⊙	◎						◎	⊙
	1123872	TCGT 221-FS						⊙	◎				⊙	◎						◎	⊙

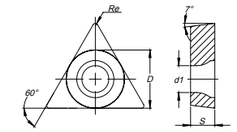
⊙ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 7º



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
TCMT 090204-MM	TCMT 1.81.51-MM	7/32	3/32	1/64	0.098	0.024	0.007	0.089	0.004	0.002	0.007
TCMT 090208-MM	TCMT 1.81.52-MM	7/32	3/32	1/32	0.098	0.024	0.015	0.089	0.006	0.003	0.009
TCMT 110204-MM	TCMT 21.51-MM	1/4	3/32	1/64	0.110	0.026	0.008	0.098	0.005	0.002	0.007
TCMT 110208-MM	TCMT 21.52-MM	1/4	3/32	1/32	0.110	0.026	0.017	0.098	0.007	0.004	0.010
TCMT 110304-MM	TCMT 221-MM	1/4	1/8	1/64	0.110	0.026	0.008	0.098	0.005	0.002	0.007
TCMT 110308-MM	TCMT 222-MM	1/4	1/8	1/32	0.110	0.026	0.017	0.098	0.008	0.004	0.016
TCMT 16T304-MM	TCMT 32.51-MM	3/8	5/32	1/64	0.173	0.031	0.010	0.118	0.006	0.003	0.009
TCMT 16T308-MM	TCMT 32.52-MM	3/8	5/32	1/32	0.173	0.031	0.020	0.118	0.009	0.004	0.018
TCMT 16T312-MM	TCMT 32.53-MM	3/8	5/32	3/64	0.173	0.031	0.024	0.118	0.014	0.005	0.024
TCMT 220408-MM	TCMT 432-MM	1/2	3/16	1/32	0.217	0.038	0.024	0.142	0.010	0.005	0.018
TCMT 090204-MK	TCMT 1.81.51-MK	7/32	3/32	1/64	0.098	0.024	0.007	0.089	0.004	0.002	0.007
TCMT 090208-MK	TCMT 1.81.52-MK	7/32	3/32	1/32	0.098	0.024	0.015	0.089	0.006	0.003	0.009
TCMT 110204-MK	TCMT 21.51-MK	1/4	3/32	1/64	0.110	0.026	0.008	0.098	0.005	0.003	0.007
TCMT 110208-MK	TCMT 21.52-MK	1/4	3/32	1/32	0.110	0.026	0.017	0.098	0.007	0.004	0.010
TCMT 110304-MK	TCMT 221-MK	1/4	1/8	1/64	0.110	0.026	0.008	0.098	0.005	0.002	0.007
TCMT 110308-MK	TCMT 222-MK	1/4	1/8	1/32	0.110	0.026	0.017	0.098	0.008	0.004	0.016
TCMT 16T304-MK	TCMT 32.51-MK	3/8	5/32	1/64	0.173	0.031	0.010	0.118	0.006	0.003	0.009
TCMT 16T308-MK	TCMT 32.52-MK	3/8	5/32	1/32	0.173	0.031	0.020	0.118	0.009	0.004	0.018
TCMT 16T312-MK	TCMT 32.53-MK	3/8	5/32	3/64	0.173	0.031	0.024	0.118	0.014	0.005	0.024
TCMT 220408-MK	TCMT 432-MK	1/2	3/16	1/32	0.217	0.038	0.024	0.142	0.010	0.005	0.018
TCMT 110208-MW	TCMT 21.52-MW	1/4	3/32	1/32	0.110	0.047	0.020	0.118	0.012	0.006	0.020
TCMT 110308-MW	TCMT 222-MW	1/4	1/8	1/32	0.110	0.047	0.020	0.118	0.012	0.006	0.020
TCMT 16T308-MW	TCMT 32.52-MW	3/8	5/32	1/32	0.173	0.059	0.020	0.157	0.012	0.006	0.020
TCGT 090202-FS	TCGT 1.81.50.5-FS	7/32	3/32	0.008	0.098	0.020	0.004	0.059	0.003	0.001	0.005
TCGT 090204-FS	TCGT 1.81.51-FS	7/32	3/32	1/64	0.098	0.039	0.020	0.079	0.006	0.003	0.010
TCGT 110201-FS	TCGT 21.50-FS	1/4	3/32	0.004	0.110	0.012	0.004	0.039	0.001	0.001	0.003
TCGT 110202-FS	TCGT 21.50.5-FS	1/4	3/32	0.008	0.110	0.020	0.004	0.059	0.003	0.001	0.005
TCGT 110204-FS	TCGT 21.51-FS	1/4	3/32	1/64	0.110	0.051	0.012	0.098	0.006	0.003	0.010
TCGT 110301-FS	TCGT 220-FS	3/8	1/8	0.004	0.110	0.012	0.004	0.039	0.001	0.001	0.003
TCGT 110302-FS	TCGT 220.5-FS	3/8	1/8	0.008	0.110	0.020	0.004	0.059	0.003	0.001	0.005
TCGT 110304-FS	TCGT 221-FS	3/8	1/8	1/64	0.110	0.051	0.020	0.098	0.006	0.003	0.010

TC - TRIANGULAR 60º POSITIVE

TRIANGULAR 60º POSITIVA | TRIANGULAR 60º POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K				N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT			UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9	10	G1	G4
		ANSI Reference	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
TCGT-LN  Finishing to Fine Finishing	1124011	TCGT 1.81.50.5-LN																	◎		
	1123683	TCGT 1.81.51-LN																	◎		
	1121895	TCGT 21.50.5-LN																	◎		
	1121896	TCGT 21.51-LN																	◎		
	1124012	TCGT 21.52-LN																	◎		
	1121897	TCGT 32.50.5-LN																	◎		
	1121898	TCGT 32.51-LN																	◎		
	1121899	TCGT 32.52-LN																	◎		
	1124013	TCGT 32.53-LN																	◎		
	1124014	TCGT 32.54-LN																	◎		

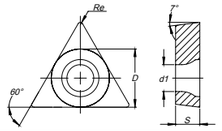
◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 7º



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
TCGT 090202-LN	TCGT 1.81.50.5-LN	7/32	3/32	0.008	0.098	0.039	0.002	0.098	0.004	0.003	0.006
TCGT 090204-LN	TCGT 1.81.51-LN	7/32	3/32	1/64	0.098	0.039	0.002	0.098	0.006	0.004	0.008
TCGT 110202-LN	TCGT 21.50.5-LN	1/4	3/32	0.008	0.110	0.080	0.002	0.157	0.005	0.003	0.006
TCGT 110204-LN	TCGT 21.51-LN	1/4	3/32	1/64	0.110	0.081	0.004	0.157	0.006	0.004	0.008
TCGT 110208-LN	TCGT 21.52-LN	1/4	3/32	1/32	0.110	0.081	0.004	0.157	0.010	0.006	0.020
TCGT 16T302-LN	TCGT 32.50.5-LN	3/8	5/32	0.008	0.173	0.100	0.002	0.197	0.004	0.003	0.006
TCGT 16T304-LN	TCGT 32.51-LN	3/8	5/32	1/64	0.173	0.110	0.004	0.217	0.006	0.004	0.008
TCGT 16T308-LN	TCGT 32.52-LN	3/8	5/32	1/32	0.173	0.110	0.004	0.217	0.010	0.006	0.020
TCGT 16T312-LN	TCGT 32.53-LN	3/8	5/32	1.20	0.173	0.118	0.006	0.217	0.018	0.006	0.028
TCGT 16T316-LN	TCGT 32.54-LN	3/8	5/32	1.60	0.173	0.118	0.006	0.217	0.026	0.008	0.035

TP - TRIANGULAR 60° POSITIVE

TRIANGULAR 60° POSITIVA | TRIANGULAR 60° POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K				N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT			UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9	10	G1	G4
		ANSI Reference	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
TPUN  Medium to Finishing	1120757	TPUN 21.51				○															
	1120759	TPUN 21.52				○															
	1120760	TPUN 220.5				○															
	1120761	TPUN 221				○															
	1120762	TPUN 222				○															
	1120853	TPUN 223				○															
	1120765	TPUN 321				◎	◎		◎												
	1120766	TPUN 322				◎	◎		◎												
	1120770	TPUN 323				◎	◎														
	1120772	TPUN 324				○															
	1120773	TPUN 326.5				○															
	1120774	TPUN 332				○															
	1120775	TPUN 333				○															
	1120777	TPUN 431				◎	◎		○												
	1120779	TPUN 432				◎	◎		○												
	1120783	TPUN 433				◎	◎														
	1120786	TPUN 434				○															
	1120789	TPUN 435				○															
	1121059	TPUN 4310				○															
	1120791	TPUN 544					○														
	1120793	TPUN 545					○														
	1121594	TPUN 645				◎	○														
TPMR-12  Finishing to Fine Finishing	1120733	TPMR 1.81.51-12			○	○															
	1120736	TPMR 1.821-12			○	○															
	1120738	TPMR 220.5-12			○	○															
	1120740	TPMR 221-12			◎	◎															
	1120743	TPMR 222-12			◎	◎															
	1120745	TPMR 321-12			◎	◎															
	1120748	TPMR 322-12			◎	◎															
	1120751	TPMR 323-12			○	○															

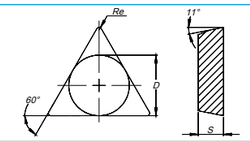
◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 11°



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
TPUN 110204	TPUN 21.51	1/4	3/32	1/64	-	0.079	0.039	0.118	0.006	0.004	0.012
TPUN 110208	TPUN 21.52	1/4	3/32	1/32	-	0.079	0.039	0.118	0.012	0.006	0.016
TPUN 110302	TPUN 220.5	1/4	1/8	0.008	-	0.079	0.039	0.118	0.004	0.002	0.005
TPUN 110304	TPUN 221	1/4	1/8	1/64	-	0.079	0.039	0.118	0.006	0.004	0.012
TPUN 110308	TPUN 222	1/4	1/8	1/32	-	0.079	0.039	0.118	0.012	0.006	0.016
TPUN 110312	TPUN 223	1/4	1/8	3/64	-	0.079	0.039	0.118	0.014	0.008	0.020
TPUN 160304	TPUN 321	3/8	1/8	1/64	-	0.138	0.039	0.197	0.006	0.004	0.012
TPUN 160308	TPUN 322	3/8	1/8	1/32	-	0.138	0.039	0.197	0.012	0.006	0.016
TPUN 160312	TPUN 323	3/8	1/8	3/64	-	0.138	0.059	0.197	0.014	0.008	0.020
TPUN 160316	TPUN 324	3/8	1/8	1/16	-	0.138	0.059	0.197	0.020	0.010	0.028
TPUN 160326	TPUN 326.5	3/8	1/8	0.102	-	0.138	0.059	0.197	0.031	0.010	0.055
TPUN 160408	TPUN 332	3/8	3/16	1/32	-	0.138	0.039	0.197	0.012	0.006	0.016
TPUN 160412	TPUN 333	3/8	3/16	3/64	-	0.138	0.059	0.197	0.014	0.008	0.020
TPUN 220404	TPUN 431	1/2	3/16	1/64	-	0.177	0.059	0.276	0.006	0.004	0.012
TPUN 220408	TPUN 432	1/2	3/16	1/32	-	0.177	0.059	0.276	0.012	0.006	0.016
TPUN 220412	TPUN 433	1/2	3/16	3/64	-	0.177	0.059	0.276	0.014	0.008	0.020
TPUN 220416	TPUN 434	1/2	3/16	1/16	-	0.177	0.059	0.276	0.020	0.010	0.028
TPUN 220420	TPUN 435	1/2	3/16	0.079	-	0.177	0.059	0.276	0.024	0.012	0.039
TPUN 220440	TPUN 4310	1/2	3/16	0.157	-	0.177	0.059	0.276	0.047	0.016	0.087
TPUN 270616	TPUN 544	5/8	1/4	1/16	-	0.217	0.079	0.315	0.020	0.010	0.028
TPUN 270620	TPUN 545	5/8	1/4	0.079	-	0.217	0.079	0.315	0.024	0.012	0.039
TPUN 330620	TPUN 645	3/4	1/4	0.079	-	0.256	0.118	0.394	0.024	0.012	0.039
TPMR 090204-12	TPMR 1.81.51-12	7/32	3/32	1/64	-	0.024	0.004	0.039	0.004	0.002	0.006
TPMR 090304-12	TPMR 1.821-12	7/32	1/8	1/64	-	0.024	0.004	0.039	0.004	0.002	0.006
TPMR 110302-12	TPMR 220.5-12	1/4	1/8	0.008	-	0.035	0.004	0.059	0.003	0.001	0.004
TPMR 110304-12	TPMR 221-12	1/4	1/8	1/64	-	0.035	0.012	0.059	0.004	0.002	0.008
TPMR 110308-12	TPMR 222-12	1/4	1/8	1/32	-	0.035	0.012	0.059	0.008	0.002	0.014
TPMR 160304-12	TPMR 321-12	3/8	1/8	1/64	-	0.051	0.020	0.079	0.005	0.003	0.008
TPMR 160308-12	TPMR 322-12	3/8	1/8	1/32	-	0.059	0.020	0.118	0.009	0.003	0.014
TPMR 160312-12	TPMR 323-12	3/8	1/8	3/64	-	0.059	0.020	0.118	0.014	0.003	0.022

TP - TRIANGULAR 60° POSITIVE

TRIANGULAR 60° POSITIVA | TRIANGULAR 60° POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K				N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT			UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9	10	G1	G4
			PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
TPMR-13  Finishing	1120732	TPMR 1.81.50.5-13			○	○															
	1120734	TPMR 1.81.51-13			⊛	⊛															
	1120735	TPMR 1.81.52-13			○	○															
	1120737	TPMR 1.821-13			○	○															
	1120739	TPMR 220.5-13			○	○															
	1120741	TPMR 221-13			⊛	⊛															
	1120744	TPMR 222-13			⊛	⊛															
	1120746	TPMR 321-13			⊛	⊛															
	1120749	TPMR 322-13			⊛	⊛															
	1120752	TPMR 323-13			⊛	⊛															
	1120753	TPMR 432-13			⊛	⊛															

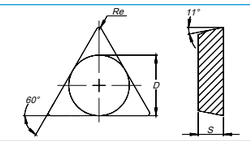
⊛ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

⊛ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 11°



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
TPMR 090202-13	TPMR 1.81.50.5-13	7/32	3/32	0 .008	-	0.031	0.008	0.059	0.002	0.001	0.004
TPMR 090204-13	TPMR 1.81.51-13	7/32	3/32	1/64	-	0.039	0.008	0.059	0.004	0.003	0.008
TPMR 090208-13	TPMR 1.81.52-13	7/32	3/32	1/32	-	0.039	0.008	0.059	0.010	0.005	0.016
TPMR 090304-13	TPMR 1.821-13	7/32	1/8	1/64	-	0.039	0.008	0.059	0.004	0.003	0.008
TPMR 110302-13	TPMR 220.5-13	1/4	1/8	0 .008	-	0.059	0.008	0.079	0.002	0.001	0.004
TPMR 110304-13	TPMR 221-13	1/4	1/8	1/64	-	0.079	0.039	0.118	0.005	0.004	0.008
TPMR 110308-13	TPMR 222-13	1/4	1/8	1/32	-	0.079	0.039	0.118	0.010	0.005	0.016
TPMR 160304-13	TPMR 321-13	3/8	1/8	1/64	-	0.118	0.039	0.197	0.006	0.004	0.008
TPMR 160308-13	TPMR 322-13	3/8	1/8	1/32	-	0.118	0.039	0.197	0.012	0.005	0.016
TPMR 160312-13	TPMR 323-13	3/8	1/8	3/64	-	0.118	0.039	0.197	0.016	0.006	0.022
TPMR 220408-13	TPMR 432-13	1/2	3/16	1/32	-	0.197	0.059	0.276	0.012	0.006	0.016

VB - RHOMBIC 35° POSITIVE

RÔMBICA 35° POSITIVA | RÓMBICA 35° POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K				N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT			UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9	10	G1	G4
		ANSI Reference	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
VBMW  Finishing	1120932	VBMW 21.50.5														○					
	1121771	VBMW 220.5														○					
	1121772	VBMW 221														○					
	1121773	VBMW 222														○					
	1120802	VBMW 330.5														○					
	1120804	VBMW 331														◎					
	1120805	VBMW 332														◎					
	1121774	VBMW 333														○					
VBMT-FP  Fine Finishing	1121852	VBMT 220.5-FP			○	◎															
	1121855	VBMT 221-FP			◎	◎															
	1121858	VBMT 222-FP			◎	◎															
	1121859	VBMT 223-FP			◎	◎															
	1121862	VBMT 330.5-FP			○	◎															
	1121865	VBMT 331-FP			◎	◎															
	1121670	VBMT 332-FP			◎	◎															
	1121793	VBMT 333-FP			◎	◎															
VBMT-FM  Fine Finishing	1121851	VBMT 220.5-FM									◎			◎							◎
	1121854	VBMT 221-FM									◎			◎							◎
	1121857	VBMT 222-FM									◎			◎							◎
	1121861	VBMT 330.5-FM									◎			◎							◎
	1121864	VBMT 331-FM									◎			◎							◎
	1121870	VBMT 332-FM									◎			◎							◎
	1121792	VBMT 333-FM									◎			◎							◎
VBMT-FK  Fine Finishing	1121850	VBMT 220.5-FK														◎					
	1121853	VBMT 221-FK														◎					
	1121856	VBMT 222-FK														◎					
	1121860	VBMT 330.5-FK														◎					
	1121863	VBMT 331-FK														◎					
	1121869	VBMT 332-FK														◎					
VBMT-MP  Finishing	1121868	VBMT 331-MP			◎	◎		◎	◎												
	1121791	VBMT 332-MP			◎	◎		◎	◎												
	1121796	VBMT 333-MP			◎	◎		○	○												
VBMT-MM  Finishing	1121867	VBMT 331-MM								◎			◎	◎						◎	◎
	1121790	VBMT 332-MM								◎			◎	◎						◎	◎
	1121795	VBMT 333-MM								◎			○	◎						○	◎

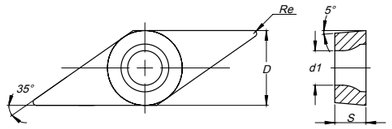
◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 5°



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
VBMW 110202	VBMW 21.50.5	1/4	3/32	0.008	0.110	0.039	0.002	0.110	0.004	0.002	0.005
VBMW 110302	VBMW 220.5	1/4	1/8	0.008	0.110	0.059	0.002	0.122	0.004	0.002	0.005
VBMW 110304	VBMW 221	1/4	1/8	1/64	0.110	0.059	0.002	0.122	0.008	0.004	0.010
VBMW 110308	VBMW 222	1/4	1/8	1/32	0.110	0.059	0.002	0.122	0.016	0.006	0.021
VBMW 160402	VBMW 330.5	3/8	3/16	0.008	0.173	0.079	0.002	0.146	0.004	0.002	0.005
VBMW 160404	VBMW 331	3/8	3/16	1/64	0.173	0.091	0.002	0.185	0.008	0.004	0.010
VBMW 160408	VBMW 332	3/8	3/16	1/32	0.173	0.091	0.002	0.185	0.016	0.006	0.021
VBMW 160412	VBMW 333	3/8	3/16	3/64	0.173	0.091	0.002	0.185	0.024	0.009	0.031
VBMT 110302-FP	VBMT 220.5-FP	1/4	1/8	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
VBMT 110304-FP	VBMT 221-FP	1/4	1/8	1/64	0.110	0.012	0.004	0.067	0.004	0.002	0.007
VBMT 110308-FP	VBMT 222-FP	1/4	1/8	1/32	0.110	0.012	0.005	0.067	0.005	0.003	0.010
VBMT 110312-FP	VBMT 223-FP	1/4	1/8	3/64	0.110	0.012	0.005	0.067	0.006	0.003	0.012
VBMT 160402-FP	VBMT 330.5-FP	3/8	3/16	0.008	0.173	0.013	0.003	0.071	0.003	0.002	0.006
VBMT 160404-FP	VBMT 331-FP	3/8	3/16	1/64	0.173	0.013	0.004	0.071	0.004	0.002	0.008
VBMT 160408-FP	VBMT 332-FP	3/8	3/16	1/32	0.173	0.013	0.006	0.071	0.006	0.003	0.011
VBMT 160412-FP	VBMT 333-FP	3/8	3/16	3/64	0.173	0.013	0.006	0.071	0.006	0.004	0.013
VBMT 110302-FM	VBMT 220.5-FM	1/4	1/8	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
VBMT 110304-FM	VBMT 221-FM	1/4	1/8	1/64	0.110	0.012	0.004	0.067	0.004	0.002	0.007
VBMT 110308-FM	VBMT 222-FM	1/4	1/8	1/32	0.110	0.012	0.005	0.067	0.005	0.003	0.010
VBMT 160402-FM	VBMT 330.5-FM	3/8	3/16	0.008	0.173	0.013	0.003	0.071	0.003	0.002	0.006
VBMT 160404-FM	VBMT 331-FM	3/8	3/16	1/64	0.173	0.013	0.004	0.071	0.004	0.002	0.008
VBMT 160408-FM	VBMT 332-FM	3/8	3/16	1/32	0.173	0.013	0.006	0.071	0.006	0.003	0.011
VBMT 160412-FM	VBMT 333-FM	3/8	3/16	3/64	0.173	0.013	0.006	0.071	0.006	0.004	0.013
VBMT 110302-FK	VBMT 220.5-FK	1/4	1/8	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
VBMT 110304-FK	VBMT 221-FK	1/4	1/8	1/64	0.110	0.012	0.004	0.067	0.004	0.002	0.007
VBMT 110308-FK	VBMT 222-FK	1/4	1/8	1/32	0.110	0.012	0.005	0.067	0.005	0.003	0.010
VBMT 160402-FK	VBMT 330.5-FK	3/8	3/16	0.008	0.173	0.013	0.003	0.071	0.003	0.002	0.006
VBMT 160404-FK	VBMT 331-FK	3/8	3/16	1/64	0.173	0.013	0.004	0.071	0.004	0.002	0.008
VBMT 160408-FK	VBMT 332-FK	3/8	3/16	1/32	0.173	0.013	0.006	0.071	0.006	0.003	0.011
VBMT 160404-MP	VBMT 331-MP	3/8	3/16	1/64	0.173	0.028	0.009	0.106	0.006	0.003	0.008
VBMT 160408-MP	VBMT 332-MP	3/8	3/16	1/32	0.173	0.028	0.018	0.106	0.007	0.004	0.011
VBMT 160412-MP	VBMT 333-MP	3/8	3/16	3/64	0.173	0.028	0.021	0.106	0.009	0.004	0.013
VBMT 160404-MM	VBMT 331-MM	3/8	3/16	1/64	0.173	0.028	0.009	0.106	0.006	0.003	0.008
VBMT 160408-MM	VBMT 332-MM	3/8	3/16	1/32	0.173	0.028	0.018	0.106	0.007	0.004	0.011
VBMT 160412-MM	VBMT 333-MM	3/8	3/16	3/64	0.173	0.028	0.021	0.106	0.009	0.004	0.013

VB - RHOMBIC 35° POSITIVE

RÔMBICA 35° POSITIVA | RÓMBICA 35° POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K					N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT				UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9		10	G1	G4
		ANSI Reference	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740		PH0910	PH7910	PH7920
VBMT-MK	1121866	VBMT 331-MK														◎	◎					
	1121871	VBMT 332-MK														◎	◎					
Finishing	1121794	VBMT 333-MK														◎	◎					

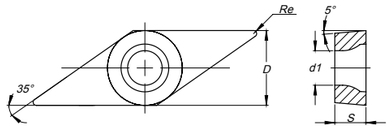
◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 5°



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
VBMT 160404-MK	VBMT 331-MK	3/8	3/16	1/64	0.173	0.028	0.009	0.106	0.006	0.003	0.008
VBMT 160408-MK	VBMT 332-MK	3/8	3/16	1/32	0.173	0.028	0.018	0.106	0.007	0.004	0.011
VBMT 160412-MK	VBMT 333-MK	3/8	3/16	3/64	0.173	0.028	0.021	0.106	0.009	0.004	0.013

VC - RHOMBIC 35° POSITIVE

RÔMBICA 35° POSITIVA | RÓMBICA 35° POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K					N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT				UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9		10	G1	G4
		ANSI Reference	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740		PH0910	PH7910	PH7920
VCMW  Finishing	1121215	VCMW 21.50.5														○	○					
	1120812	VCMW 220.5														○	○					
	1120814	VCMW 221														○	○					
	1120815	VCMW 2.521														○	○					
	1121190	VCMW 330.5														○	○					
	1120816	VCMW 331														◎	○					
	1121189	VCMW 332														○	○					
VCMT-FP  Fine Finishing	1121776	VCMT 220.5-FP			○	◎			○													
	1121779	VCMT 221-FP			◎	◎			○													
	1121977	VCMT 330.5-FP			○	◎			○													
	1121978	VCMT 331-FP			◎	◎			○													
	1121979	VCMT 332-FP			◎	◎			○													
	1121980	VCMT 333-FP			◎	○			○													
VCMT-FM  Fine Finishing	1121775	VCMT 220.5-FM									◎			◎								◎
	1121778	VCMT 221-FM									◎			◎								◎
	1121981	VCMT 330.5-FM									◎			◎								◎
	1121982	VCMT 331-FM									◎			◎								◎
	1121983	VCMT 332-FM									◎			◎								◎
	1121984	VCMT 333-FM									◎			◎								◎
VCMT-FK  Fine Finishing	1121777	VCMT 221-FK														◎	○					
	1121985	VCMT 330.5-FK														◎	○					
	1121986	VCMT 331-FK														◎	○					
	1121987	VCMT 332-FK														◎	○					
VCMT-MP  Finishing	1121754	VCMT 221-MP			◎	◎			○													
	1121752	VCMT 222-MP			◎	◎			○													
	1121988	VCMT 331-MP			◎	◎			○													
	1121989	VCMT 332-MP			◎	◎			○													
	1121990	VCMT 333-MP			◎	◎			○													
VCMT-MM  Finishing	1121780	VCMT 221-MM								◎				◎								◎
	1121751	VCMT 222-MM								◎				◎								◎
	1121991	VCMT 331-MM								◎				◎								◎
	1121992	VCMT 332-MM								◎				◎								◎
	1121993	VCMT 333-MM								◎				◎								◎
VCMT-MK  Finishing	1121753	VCMT 222-MK														◎	◎					
	1121994	VCMT 331-MK														◎	◎					
	1121995	VCMT 332-MK														◎	◎					
	1121996	VCMT 333-MK														◎	◎					

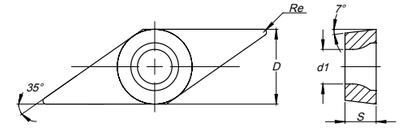
◎ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 7°



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
VCMW 110202	VCMW 21.50.5	1/4	3/32	0.008	0.110	0.047	0.002	0.114	0.004	0.002	0.005
VCMW 110302	VCMW 220.5	1/4	1/8	0.008	0.110	0.059	0.002	0.122	0.004	0.002	0.005
VCMW 110304	VCMW 221	1/4	1/8	1/64	0.110	0.059	0.002	0.122	0.008	0.003	0.010
VCMW 130304	VCMW 2.521	5/16	1/8	1/64	0.134	0.079	0.002	0.150	0.008	0.003	0.010
VCMW 160402	VCMW 330.5	3/8	3/16	0.008	0.173	0.079	0.002	0.165	0.004	0.002	0.005
VCMW 160404	VCMW 331	3/8	3/16	1/64	0.173	0.091	0.002	0.185	0.008	0.003	0.010
VCMW 160408	VCMW 332	3/8	3/16	1/32	0.173	0.091	0.002	0.185	0.016	0.006	0.021
VCMT 110302-FP	VCMT 220.5-FP	1/4	1/8	0.008	0.110	0.012	0.003	0.059	0.003	0.001	0.005
VCMT 110304-FP	VCMT 221-FP	1/4	1/8	1/64	0.110	0.012	0.004	0.059	0.004	0.002	0.008
VCMT 160402-FP	VCMT 330.5-FP	3/8	3/16	0.008	0.173	0.013	0.003	0.071	0.003	0.002	0.006
VCMT 160404-FP	VCMT 331-FP	3/8	3/16	1/64	0.173	0.013	0.004	0.071	0.004	0.002	0.008
VCMT 160408-FP	VCMT 332-FP	3/8	3/16	1/32	0.173	0.013	0.006	0.071	0.006	0.003	0.011
VCMT 160412-FP	VCMT 333-FP	3/8	3/16	3/64	0.173	0.013	0.006	0.071	0.006	0.004	0.013
VCMT 110302-FM	VCMT 220.5-FM	1/4	1/8	0.008	0.110	0.012	0.003	0.059	0.003	0.001	0.005
VCMT 110304-FM	VCMT 221-FM	1/4	1/8	1/64	0.110	0.012	0.004	0.059	0.004	0.002	0.008
VCMT 160402-FM	VCMT 330.5-FM	3/8	3/16	0.008	0.173	0.013	0.003	0.071	0.003	0.002	0.006
VCMT 160404-FM	VCMT 331-FM	3/8	3/16	1/64	0.173	0.013	0.004	0.071	0.004	0.002	0.008
VCMT 160408-FM	VCMT 332-FM	3/8	3/16	1/32	0.173	0.013	0.006	0.071	0.006	0.003	0.011
VCMT 160412-FM	VCMT 333-FM	3/8	3/16	3/64	0.173	0.013	0.006	0.071	0.006	0.004	0.013
VCMT 110304-FK	VCMT 221-FK	1/4	1/8	1/64	0.110	0.012	0.004	0.059	0.004	0.002	0.008
VCMT 160402-FK	VCMT 330.5-FK	3/8	3/16	0.008	0.173	0.013	0.003	0.071	0.003	0.002	0.006
VCMT 160404-FK	VCMT 331-FK	3/8	3/16	1/64	0.173	0.013	0.004	0.071	0.004	0.002	0.008
VCMT 160408-FK	VCMT 332-FK	3/8	3/16	1/32	0.173	0.013	0.006	0.071	0.006	0.003	0.011
VCMT 110304-MP	VCMT 221-MP	1/4	1/8	1/64	0.110	0.030	0.012	0.100	0.006	0.004	0.010
VCMT 110308-MP	VCMT 222-MP	1/4	1/8	1/32	0.110	0.030	0.024	0.100	0.008	0.005	0.013
VCMT 160404-MP	VCMT 331-MP	3/8	3/16	1/64	0.173	0.028	0.009	0.106	0.006	0.003	0.008
VCMT 160408-MP	VCMT 332-MP	3/8	3/16	1/32	0.173	0.028	0.018	0.106	0.007	0.004	0.011
VCMT 160412-MP	VCMT 333-MP	3/8	3/16	3/64	0.173	0.028	0.021	0.106	0.009	0.004	0.013
VCMT 110304-MM	VCMT 221-MM	1/4	1/8	1/64	0.110	0.030	0.012	0.100	0.006	0.004	0.010
VCMT 110308-MM	VCMT 222-MM	1/4	1/8	1/32	0.110	0.030	0.024	0.100	0.008	0.005	0.013
VCMT 160404-MM	VCMT 331-MM	3/8	3/16	1/64	0.173	0.028	0.009	0.106	0.006	0.003	0.008
VCMT 160408-MM	VCMT 332-MM	3/8	3/16	1/32	0.173	0.028	0.018	0.106	0.007	0.004	0.011
VCMT 160412-MM	VCMT 333-MM	3/8	3/16	3/64	0.173	0.028	0.021	0.106	0.009	0.004	0.013
VCMT 110308-MK	VCMT 222-MK	1/4	1/8	1/32	0.110	0.030	0.024	0.100	0.008	0.005	0.013
VCMT 160404-MK	VCMT 331-MK	3/8	3/16	1/64	0.173	0.028	0.009	0.106	0.006	0.003	0.008
VCMT 160408-MK	VCMT 332-MK	3/8	3/16	1/32	0.173	0.028	0.018	0.106	0.007	0.004	0.011
VCMT 160412-MK	VCMT 333-MK	3/8	3/16	3/64	0.173	0.028	0.021	0.106	0.009	0.004	0.013

VC - RHOMBIC 35° POSITIVE

RÔMBICA 35° POSITIVA | RÓMBICA 35° POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code / ANSI Reference	P							M					K				N	S	
			CVD-MT					PVD		CVD-MT			PVD		UNC	CVD-MT			UNC	PVD	
			R2	R3	L7	L8	L9	G1	G4	L7	L8	L9	G1	G4	25	L5	L6	L9	10	G1	G4
		ANSI Reference	PHG115	PHG125	PH5115	PH5125	PH5740	PH7910	PH7920	PH5115	PH5125	PH5740	PH7910	PH7920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PH7920
VCGT-FS NEW  Finishing to Fine Finishing	1123861	VCGT 220-FS						◉	◉				◉	◉						◉	◉
	1123862	VCGT 220.5-FS						◉	◉				◉	◉						◉	◉
	1123863	VCGT 221-FS						◉	◉				◉	◉						◉	◉
VCGT-LN  Finishing to Fine Finishing	1123689	VCGT 220-LN																	◉		
	1121889	VCGT 220.5-LN																	◉		
	1121890	VCGT 221-LN																	◉		
	1121891	VCGT 222-LN																	◉		
	1124015	VCGT 2.520.5-LN																	◉		
	1124016	VCGT 2.521-LN																	◉		
	1111878	VCGT 330.5-LN																	◉		
	1111533	VCGT 331-LN																	◉		
	1121893	VCGT 332-LN																	◉		
	1121894	VCGT 333-LN																	◉		
	1121929	VCGT 43.57.5-LN																	◉		

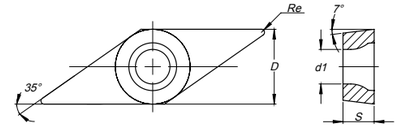
◉ Stock item | Produto de stock | Itens de stock
First choice | Primeira opção | 1ª opción

◉ Stock item | Produto de stock | Itens de stock

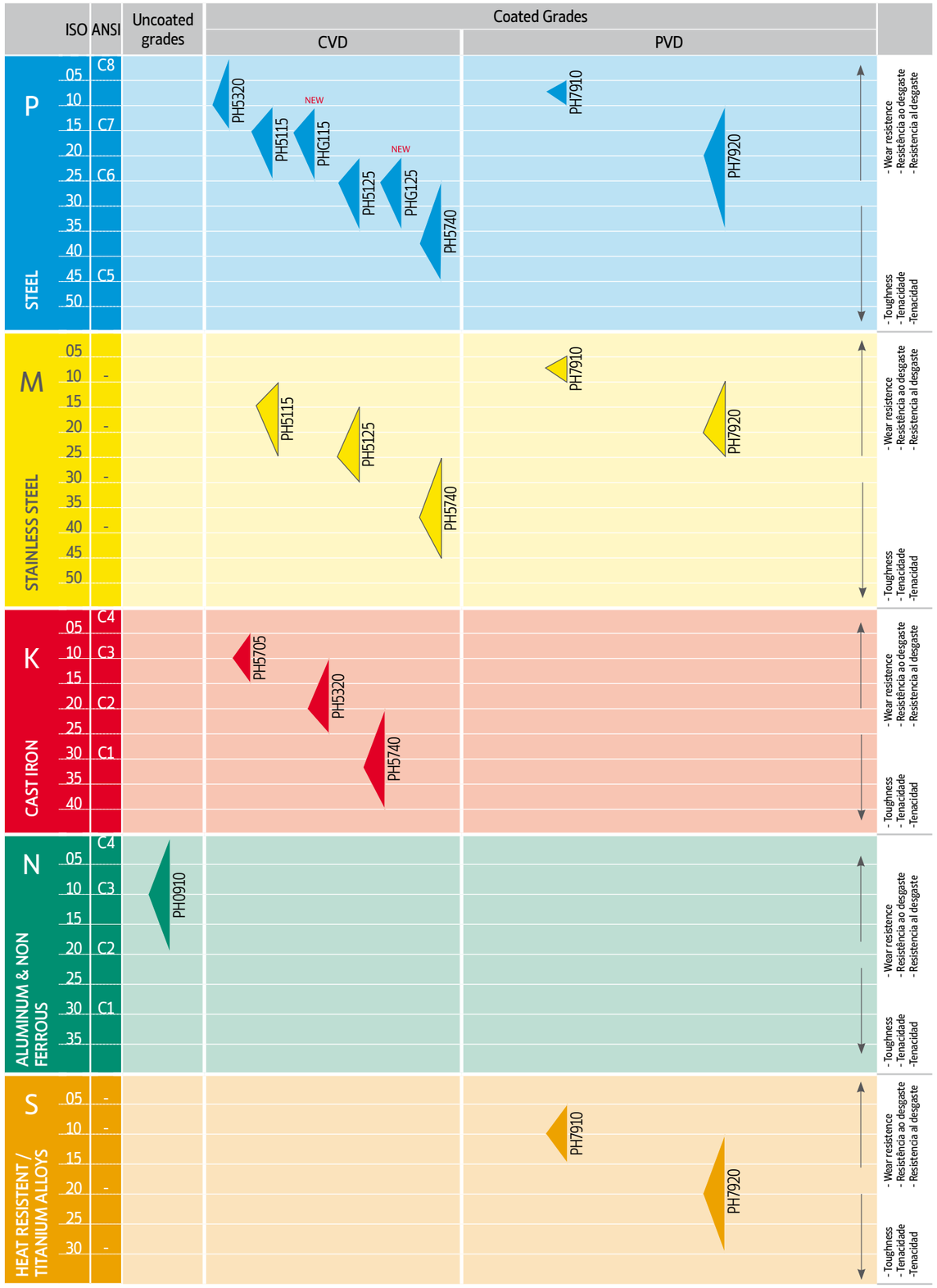
○ Available under request | Disponível sobre consulta
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

RELIEF ANGLE 7°



ISO Reference	ANSI Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		D	S	Re	d1	ap (in)	Min	Max	fn (in/rev)	Min	Max
VCGT 110301-FS	VCGT 220-FS	1/4	1/8	0.004	0.110	0.012	0.004	0.039	0.001	0.001	0.003
VCGT 110302-FS	VCGT 220.5-FS	1/4	1/8	0.008	0.110	0.020	0.004	0.059	0.003	0.001	0.005
VCGT 110304-FS	VCGT 221-FS	1/4	1/8	1/64	0.110	0.039	0.012	0.098	0.006	0.003	0.010
VCGT 110301-LN	VCGT 220-LN	1/4	1/8	0.004	0.110	0.060	0.002	0.118	0.002	0.001	0.002
VCGT 110302-LN	VCGT 220.5-LN	1/4	1/8	0.008	0.110	0.060	0.002	0.118	0.003	0.002	0.005
VCGT 110304-LN	VCGT 221-LN	1/4	1/8	1/64	0.110	0.060	0.002	0.118	0.006	0.004	0.010
VCGT 110308-LN	VCGT 222-LN	1/4	1/8	1/32	0.110	0.060	0.002	0.118	0.009	0.006	0.018
VCGT 130302-LN	VCGT 2.520.5-LN	5/16	1/8	0.008	0.134	0.079	0.004	0.157	0.003	0.002	0.005
VCGT 130304-LN	VCGT 2.521-LN	5/16	1/8	1/64	0.134	0.079	0.004	0.157	0.006	0.004	0.010
VCGT 160402-LN	VCGT 330.5-LN	3/8	3/16	0.008	0.173	0.091	0.004	0.197	0.003	0.002	0.005
VCGT 160404-LN	VCGT 331-LN	3/8	3/16	1/64	0.173	0.100	0.004	0.197	0.006	0.004	0.010
VCGT 160408-LN	VCGT 332-LN	3/8	3/16	1/32	0.173	0.100	0.004	0.197	0.009	0.006	0.018
VCGT 160412-LN	VCGT 333-LN	3/8	3/16	3/64	0.173	0.100	0.004	0.197	0.016	0.006	0.024
VCGT 220530-LN	VCGT 43.57.5-LN	1/2	7/32	0.118	0.217	0.140	0.004	0.276	0.031	0.006	0.063

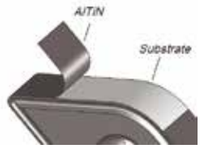


Position and grade symbols shape indicate the suitable field of application.

PVD GRADES

PH7910

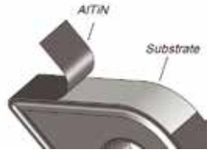
P05-P10
M05-M10
S05-S15



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

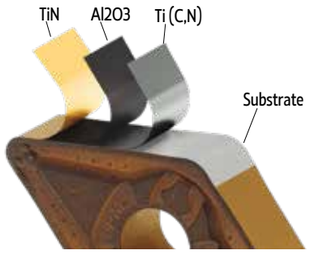


A micro grain size combined with the AlTiN PVD coating make it suitable for Roughing to Finishing operations under good cutting conditions to light interrupted cuts at medium cutting speeds. Suitable for steels, stainless steel, HRSA.

CVD GRADES

NEW

PHG
NEW
GRADE



PHG115

P10-P25

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

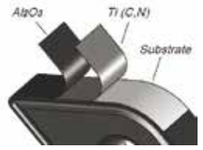
PHG125

P20-P35

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+TiN) medium temperature - CVD, improving the tool life.

PH5115

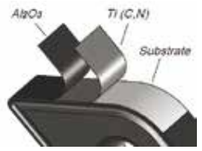
P10-P25
M10-M25



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

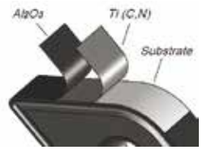
P20-P35
M15-M30



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

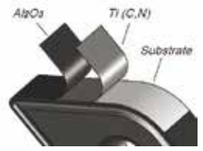
P25-P45
M25-M45
K20-K40



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

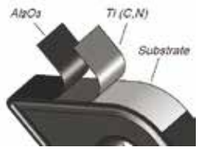
K05-K15



The substract 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
K05-K15



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 thoughness. Suitable for rough to finish turning of HRSA, Titanium alloys, cast irons and Aluminum alloys.

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

ISO Material		Palbit	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Tungaloy	Walter	Kyocera	Taegutec	Korloy	Ceratizit
P STEEL	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
	P40	PH7740		KC7040 KV7140 KV7030	IC228 IC328 IC330 IC528 IC1008 IC1028 IC3028	CP500		AC530U	AH740 J740			TT7080 TT8030 TT7070	PC3545	CTP2440 GM40 CTP1235 CTP2235
M STAINESS 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	AH710 AH725 AH120 SH730 GH730 GH130 GH330 AH60	WSM30	PR1025 PR1125 PR1225 PR915 PR930	TT5030 PV3030 TT9020 TT9030	PC9030 PC8110 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
	M40	PH7740	GC2035		IC328 IC928 IC1008 IC1028 IC3028		MP7035	AC530U	J740			TT8010 TT8020 TT8030	PC5400	CM40 CM45 CTP2440

PH7910 = Best available choice

ISO Material		Palbit	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Tungaloy	Walter	Kyocera	Taegutec	Korloy	Ceratizit
K CAST IRON	K10			KC5010 KC7210	IC350 IC1008	CP200 TS2000		AC510U	GH110 AH110 AH710		PR905	PV3010 PV3030	PC5300	SR216 SR226
	K20			KC7015 KC7215 KC7315	IC228 IC350 IC808 IC908 IC1008	CP200 CP250 TS2000 TS2500	VP10RT VP20RT VP15TF		GH110 AH110 AH710 AH725 AH120 GH730 GH130		PR905	TT6060 TT8020 TT8030	PC5300	CTP2120 CTP2440 SR216 SR226
	K30			KC7225	IC228 IC350 IC808 IC908 IC1008	CP500	VP10RT VP20RT VP15TF		AH725 AH120 GH730 GH130			TT9030 TT6290 TT9030 TT8030		CTP2440
S HEAT RESISTENT / TITANIUM ALLOYS	S01	PH7910			IC507 IC907		MP9005 VP05RT		AH905 AH905 SH730	WDSM10	PR915		PC8110	
	S10	PH7910	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	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	GC1125				VP15TF	AC520U	AH725		PR1125	TT8020	PC5400	CTP2135

PH7910 = Best available choice

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

ISO Material		Palbit	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Tungaloy	Walter	Kyocera	Taegutec	Korloy	Ceratizit
P STEEL	P01	**PH5320**	GC4205 GC4005	KCP05 KC9105	IC9150 IC8150 IC428	TP0500 TP1500	UE6105	AC810P AC700G	T9105 T9005	WPP01	CA510 CA5505	TT1300	NC3010	
	P10	**PH5320** **PH5115** **PHG115**	GC4315 GC4215 GC4015 GC4325	KCP10B KCP10 KCP25 KC9110	IC9150 IC9015 IC8150 IC8250	TP1500 TP2500	UE6105 MC6015 UE6110 MY5015	AC810P AC700G AC820P AC2000	T9105 T9005 T9115	WPP01 WPP05	CAS510 CA5505 CA515 CA5515	TT1300 TT7310 TT7400	NC3215	CTC1110 CTC1115 CTC3110 TCC410
	P20	**PH5115** **PHG115** **PH5125** **PHG125**	GC4315 GC4215 GC4015 GC4325 GC4225 GC4025	KCP25B KCP25 KC9125	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	**PH5740**	GC4235 GC4035	KCP30 KCP40 KC9140 KC9040 KC9240 KC9245	IC9350	TP3500 TP3000	UE6035 UH6400	AC630M	T9135 T9035		CA530 CA5535	TT5100 TT7100 KT7300 TT7800	NC500H NC5330	CTC1135 CTC1435 CTC2135
M STAINESS STEEL	M10	**PH5115**	GC2015	KCM15	IC9250 IC6015 IC8250	TM2000	MC7015 US7020	AC610M	T9115	WAM20	CA6515		NC9020	CTC1110 CTC1115
	M20	**PH5115** **PH5125**	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	**PH5125** **PH5740**	GC2025	KCM25 KC9230	IC9350 IC6025 IC635	TM4000	MC7025 US735	AC6030M AC630M	T6030		CA6525	TT5100 TT7100	NC9025	CTC1125 CTC1135 CTC1425 CTC1435 CTC2135
	M40	**PH5740**	GC2025	KCM35 KC9240 KC9245	IC6025 IC9350	TM4000	US735	AC6030M AC630M				TT7100	NC9025	CTC2135
K CAST IRON	K01	**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
S HEAT RESISTENT / TITANIUM ALLOYS	S01		S05F				US905				CA6515 CA6525 CA6535			

UNCOATED GRADES | GRAUS NÃO REVESTIDOS | CALIDADES SIN RECUBRIMIENTO

ISO Material		Palbit	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Tungaloy	Walter	Kyocera	Taegutec	Korloy	Ceratizit
N ALLUMINIUM	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	
	N30				IC28									

PH7910 = Best available choice

CHIP BREAKER COMPARATIVE CHART | Tabela de equivalências de quebra-aparas | Tabla de comparación de rompevirutas

NEGATIVES | NEGATIVAS | NEGATIVAS

Application		Palbit	Sandvik	Kennametal	Iscar	Seco	Tungaloy	Mitsubishi	Sumitomo	Walter	Kyocera	Taegutec	Korloy	Ceratizit
Mat.	Operations													
P STEEL	Finishing	**MF**	QF	FS, LF	SF, PP TF		01 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**	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"**	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
M STAINLESS STEEL	Finishing	**MF, SF**	MF, 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**	MM , QM, 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
K 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 chipbre-aker	Without chipbreaker		MR7, M5	CH Without chip-breaker	RK Without chip-bre-aker	Without chip-bre-aker	Without chip-bre-aker	GC Without chip-bre-aker	RT	GR	TMR , TR R28, R58, R88
N ALUMINUM	Medium	MS	MF, QM	MS , MP MG	PP	-	P		AX		AH , A3	ML	HA	F32
S HRSA	Finishing	**SF, MS**	SF 01	FS , LS MS		MF1, M1	HRF	FJ , LS	EF EX	NFT NF4	MQ	SF	VP1	
	Medium	**SF, SS**	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-aparas | 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													
P 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		
M 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		
K 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		
N ALUMINUM	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
S 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				

NEGATIVES | NEGATIVAS | NEGATIVAS

Insert Type	Application	Tolerance Class	Major field of Application	Geometry	Cutting Edge* at the nose radius	Cutting Edge* at the flank	Cutting Conditions** Feed Fn (inch/rev)	Cutting Conditions** Deph of cut DOC (inch)	KN _ _	CN _ _	DN _ _	RN _ _	SN _ _	TN _ _	VN _ _	WN _ _
Knux´s	Finishing	U	P, M, K	01	0.102, 4°	0.039, 12°	0.008 to 0.014	0.039 to 0.236	●							
Knux´s	Medium	U	P, M, K	02	0.146, 4°	0.012, 12°	0.016 to 0.028	0.059 to 0.236	●							
NEGATIVES - double side	Medium Finishing	M	P, M	01	6°	12°	0.005 to 0.020	0.039 to 0.256			●			●		
NEGATIVES - double side	Roughing to Medium	M	P, M	02	10°	12°	0.006 to 0.020	0.028 to 0.197			●					
NEGATIVES - double side	Medium Finishing	M	P, M	NEW 03	0.008, 15°	0.008, 15°	0.006 to 0.020	0.031 to 0.236			●					
NEGATIVES - double side	Medium Finishing	M	P, M	MF	15°	0.009, 12°	0.002 to 0.236	0.004 to 0.098		●	●		●	●	●	●
NEGATIVES - double side	Medium Finishing	M	M, N, S	MS	13°	13°	0.004 to 0.031	0.008 to 0.177		●	●			●	●	●
NEGATIVES - double side	Medium Finishing	M	M, S	SF	0.012, 20° 10°	0.012, 20° 10°	0.004 to 0.022	0.024 to 0.118		●	●		●	●	●	●
NEGATIVES - double side	Medium Finishing	M	P	LC	0.006, 18°	0.008, 10°	0.003 to 0.020	0.024 to 0.118		●	●			●	●	●
NEGATIVES - double side	Medium Finishing	M	K	ST	0.008, 15°	0.008, 15°	0.004 to 0.098	0.006 to 0.413		●	●	●	●	●	●	●
NEGATIVES - double side	Medium Finishing	M	P	MR	0.008, 22° 6°	0.008, 22° 6°	0.004 to 0.028	0.012 to 0.354		●	●		●	●	●	●
NEGATIVES - double side	Medium Finishing	M	P	NEW PM	0.010, 15° 7°	0.010, 15° 7°	0.004 to 0.024	0.012 to 0.354		●	●			●		●

* T-Land varies according to the IC (IC reference used: 1/2 inch)
** 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* at the nose radius	Cutting Edge* at the flank	Cutting Conditions** Feed Fn (inch/rev)	Cutting Conditions** Deph of cut DOC (inch)	KN _ _	CN _ _	DN _ _	RN _ _	SN _ _	TN _ _	VN _ _	WN _ _
NEGATIVES - double side	Medium Finishing	M	K	Flat	0°	0°	0.003 to 0.098	0.004 to 0.591		●	●	●	●	●	●	●
NEGATIVES - double side	Medium Wiper	M	P, M, K	MW	0.012, 16°	0.012, 16°	0.006 to 0.035	0.012 to 0.236		●	●			●		●
NEGATIVES - double side	Roughing to Medium roughing	M	M, S	SS	0.012, 20° 10°	0.012, 20° 10°	0.004 to 0.039	0.012 to 0.335		●	●		●	●	●	●
NEGATIVES - double side	Roughing	M	P, M, K	HR	0.013, 18°	0.013, 18°	0.008 to 0.047	0.031 to 0.591		●	●		●	●		●
NEGATIVES - Single side	Roughing	M	P, M	NEW RP	0.010, 20°	0.012, 20°	0.012 to 0.059	0.079 to 0.472		●			●			
NEGATIVES - Single side	Heavy Roughing to Roughing	M	P, M	HY	0.020, 0.008, 17° 8°	0.020, 0.008, 17° 8°	0.014 to 0.063	0.079 to 0.591		●			●			
NEGATIVES - Single side	Heavy Finishing	M	P, K	HZ	0.021, 0.008, 18° 15°	0.021, 0.008, 18° 15°	0.014 to 0.063	0.094 to 0.669		●			●			

* T-Land varies according to the IC (IC reference used: 1/2 inch)
** 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* at the nose radius	Cutting Edge* at the flank	Cutting Conditions** Feed Fn (inch/rev)	Cutting Conditions** Deph of cut DOC (inch)	CC _ _	DC _ _	RC _ _	SC _ _	TC _ _	VC _ _	VB _ _
POSITIVES - Clearance angle 5º and 7º	Fine Finishing	M	P	FP	6°	6°	0.001 to 0.018	0.002 to 0.094	●	●		●	●	●	●
		M	P, M, S	BO	5°	5°	0.002 to 0.012	0.012 to 0.059	●						
		M	M, S	FM	6°	6°	0.001 to 0.018	0.002 to 0.094	●	●		●	●	●	●
		M	K	FK	6°	6°	0.001 to 0.012	0.002 to 0.094	●	●		●	●	●	●
	Fine Finishining wiper	M	P, M, K, S	FW	0.003 18°	0.004 18°	0.002 to 0.020	0.012 to 0.138	●	●			●		
	Finishing	M	NEW M, S	LM	0.004 20° 8°	6°	0.003 to 0.014	0.008 to 0.118	●	●					
	Finishing to fine finishing	G	P, M, S	FS	0.005 8°	6°	0.001 to 0.010	0.004 to 0.118	●	●			●	●	
		G	N	LN	~25°	20°	0.002 to 0.063	0.002 to 0.276	●	●	●	●	●	●	
	Finishing	M	K	Flat	0°	0°	0.002 to 0.031	0.002 to 0.248	●	●		●	●	●	●
		M	P	MP	0.005 24° 8°	7°	0.002 to 0.024	0.007 to 0.142	●	●		●	●	●	●
		M	M, S	MM	0.005 24° 8°	7°	0.002 to 0.024	0.007 to 0.142	●	●		●	●	●	●
		M	K	MK	0.005 24° 8°	7°	0.002 to 0.024	0.007 to 0.142	●	●		●	●	●	●

* T-Land varies according to the IC (IC reference used: 1/2 inch)
** 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* at the nose radius	Cutting Edge* at the flank	Cutting Conditions** Feed Fn (inch/rev)	Cutting Conditions** Deph of cut DOC (inch)	CC _ _	DC _ _	RC _ _	SC _ _	TC _ _	VC _ _	VB _ _
POSITIVES - Clearance angle 5º and 7º	Finishing Wiper	M	P, M, K, S	MW	0.006 18°	0.008 18°	0.004 to 0.020	0.020 to 0.157	●	●			●		
	Medium	M	P, M, S	CP	0.003 13°	0.003 13°	0.002 to 0.007	0.020 to 0.094			●				
	Medium to finishing		NEW P, M	RF	0.010 9° 2°	0.010 9° 2°	0.010 to 0.098	0.098 to 0.394			●				
	Roughing to Medium	M	P, M, K	ST	0.012 15° 15°	0.012 15° 15°	0.002 to 0.126	0.031 to 0.504			●				
			NEW P, M, K	RM	0.016 15° 15°	0.016 15° 15°	0.031 to 0.098	0.126 to 0.512			●				
			P, M	RR	0.022 11°	0.022 11°	0.031 to 0.098	0.126 to 0.512			●				

* T-Land varies according to the IC (IC reference used: 1/2 inch)
** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

Insert Type	Application	Tolerance Class	Major field of Application	Geometry	Cutting Edge* at the nose radius	Cutting Edge* at the flank	Cutting Conditions** Feed Fn (inch/rev)	Cutting Conditions** Deph of cut DOC (inch)	CC _ _	DC _ _
POSITIVES - Clearance angle 11º	Medium to Finishing	U	P, M, K, S	Flat	0°	0°	0.002 to 0.087	0.039 to 0.394	●	●
	Finishing to Fine Finishing	M	P, M, K	12	0.008 10°	0.016	0.001 to 0.022	0.004 to 0.118	●	●
	Medium	M	P, M	13	0.008	0.016	0.001 to 0.022	0.008 to 0.276	●	●

* T-Land varies according to the IC (IC reference used: 1/2 inch)
** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

CUTTING SPEED (sfm) | Velocidade de corte (sfm) | Velocidad de corte (sfm)

ISO	Material	HB (brinell)	CVD Coating ← Wear Resistance Toughness →											
			PH5115			PHG115			PH5125			PHG125		
			0.008	0.016	0.031	0.008	0.016	0.031	0.008	0.016	0.031	0.008	0.016	0.031
P	Unalloyed steel	125-170	820-1148	591-886	558-722	820-1148	591-886	558-722	656-968	558-788	492-706	656-968	558-788	492-706
	Low-alloy steel	180-350	624-820	558-755	460-591	624-820	558-755	460-591	558-755	460-689	394-624	558-755	460-689	394-624
	High-alloy stel	200-325	443-722	394-673	361-656	443-722	394-673	361-656	410-706	361-607	328-558	410-706	361-607	328-558

ISO	Material	HB (brinell)	CVD Coating			PVD Coating ← Wear Resistance Toughness →					
			PH5740			PH7910			PH7920		
			0.008	0.016	0.031	0.008	0.016	0.031	0.008	0.016	0.031
P	Unalloyed steel	125-170	443-755	394-689	378-656	460-804	427-738	378-722	427-755	394-722	361-689
	Low-alloy steel	180-350	410-673	345-607	312-607	427-755	410-738	410-706	410-722	378-689	328-656
	High-alloy stel	200-325	345-673	246-574	164-443	-	-	-	-	-	-

ISO	Material	HB (brinell)	CVD Coating ← Wear Resistence Toughness →								
			PH5115			PH5125			PH5740		
			0.008	0.016	0.024	0.008	0.016	0.024	0.008	0.016	0.024
M	SS - Ferretic/martensitic	200-330	410-853	328-722	263-656	361-755	230-574	164-443	279-591	214-525	148-443
	SS - Austenitic	180-330	427-952	328-788	263-624	328-788	230-574	181-427	279-558	214-476	148-410
	SS - Austenitic-ferretic (Duplex)	230-260	624-722	492-607	394-476	492-624	394-492	296-361	427-525	361-443	279-345

ISO	Material	HB (brinell)	PVD Coating ← Wear Resistence Toughness →					
			PH7910			PH7920		
			0.008	0.016	0.024	0.008	0.016	0.024
M	SS - Ferretic/martensitic	200-330	420-755	394-722	378-706	437-771	427-738	394-722
	SS - Austenitic	180-330	407-738	378-706	345-673	424-732	410-722	378-706
	SS - Austenitic-ferretic (Duplex)	230-260	397-696	361-673	328-640	410-709	378-689	328-656

ISO	Material	HB (brinell)	CVD Coating ← Wear Resistence Toughness →								
			PH5705			PH5320			PH5740		
			0.008	0.016	0.024	0.008	0.016	0.024	0.008	0.016	0.024
K	Marble cast iron	130-230	525-1181	460-919	394-771	492-1083	427-788	361-722	361-755	328-706	328-624
	Grey cast iron	180-220	722-1247	624-1083	492-952	656-1083	558-919	492-755	492-755	460-722	361-689
	Modular cast iron	160-380	492-919	443-870	394-722	460-820	410-755	361-722	410-722	378-673	345-607

ISO	Material	HB (brinell)	Uncoated	
			PH0910	
			0.006	0.031
N	Aluminum alloys	60-130	1230-7872	132-788
	Cooper and cooper alloys	90-110	1230-2067	115-214

ISO	Material	HB (brinell)	PVD Coating ← Wear Resistence Toughness →					
			PH7910			PH7920		
			0.004	0.012	0.020	0.004	0.012	0.020
S	Heat resistent super alloys (Iron base)	200-280	246-427	204-417	181-378	230-394	181-378	164-361
	Heat resistent super alloys (Nickel base)	250-320	181-312	132-296	109-279	115-263	89-246	76-230
	Heat resistent super alloys (Cobalt base)	200-320	181-312	132-296	109-279	115-263	89-246	76-230
	Titanium alloys (400<or<1050[MPa])	-	263-565	230-532	214-509	214-499	164-476	148-443

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
			Geometry	Grade	Geometry	Grade	Geometry	Grade	Type			Type
P	Unalloy steel HB 110 DIN C15 C45	●	RP	PH5125	RP	PH5125	HZ	PH5125	Negative single side 0°	Conventional Nose Radius	#NMM	D##N M##N M##N-K
		◐	RP	PH5125	HY	PH5125	HZ	PH5125				
		✱	RP	PH5125	HY	PH5740	HZ	PH5740				
	Low Alloyed Steel HB180 DIN 21NiCrM02 36CrNiM04	●	RP	PH5125	RP	PH5125	HZ	PH5125	Negative single side 0°	Conventional Nose Radius	#NMM	D##N M##N M##N-K
		◐	RP	PH5125	HY	PH5125	HZ	PH5125				
		✱	RP	PH5125	HY	PH5125	HZ	PH5125				
	High alloyed steel HB 200 DIN 34CrNiMo6 42CrMo4	●	RP	PH5125	RP	PH5125	HZ	PH5125	Negative single side 0°	Conventional Nose Radius	#NMM	D##N M##N M##N-K
		◐	RP	PH5125	HY	PH5125	HZ	PH5125				
		✱	RP	PH5125	HZ	PH5740	HZ	PH5740				
	High alloyed steel HB 400 DIN X40CrMoV5 X45GrSi93	●	RP	PH5125	RP	PH5125	HZ	PH5125	Negative single side 0°	Conventional Nose Radius	#NMM	D##N M##N M##N-K
		◐	RP	PH5125	HY	PH5125	HZ	PH5125				
		✱	RP	PH5125	HZ	PH5125	HZ	PH5125				
M	Ferritic/ martensitic stainless steel DIN X12CrMoS17 X6CrMo17	●	RP	PH5125	RP	PH5125	HY	PH5125	Negative single side 0°	Conventional Nose Radius	#NMM	D##N M##N M##N-K
		◐	RP	PH5125	HY	PH5125	HY	PH5125				
		✱	RP	PH5125	HY	PH5740	HY	PH5740				
	Austenitic stainless steel DIN X5CrNi189 X5CrNiMo18	●	RP	PH5125	RP	PH5125	HS	PH5125	Negative single side 0°	Conventional Nose Radius	#NMM	D##N M##N M##N-K
		◐	RP	PH5125	RP	PH5125	HY	PH5125				
		✱	RP	PH5125	HY	PH5740	HY	PH5740				
	Duplex stainless steel DIN X2CrNiMoSi19 X8CrNiMo27	●	RP	PH5125	RP	PH5125	HY	PH5125	Negative single side 0°	Conventional Nose Radius	#NMM	D##N M##N M##N-K
		◐	RP	PH5125	RP	PH5125	HY	PH5740				
		✱	RP	PH5125	HY	PH5740	HY	PH5740				
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				

● Stable cutting ◐ General cutting ✱ Unstable cutting

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

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

ISO	Material workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holders
			Geometry	Grade	Geometry	Grade	Geometry	Grade	Type			Type
P	Unalloyed steel HB 110 DIN C15 C45 C60	●	MF	PH5115	LC	PH5115	MR PM	PH5115 PHG115	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		◐	MF	PH5115	LC	PH5125	MR PM	PH5125 PHG125				
		✤	MF	PH5125	LC	PH5125	MR	PH5740				
		●	MW	PH5115	MW	PH5115	MW	PH5115	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
		◐	MW	PH5115	MW	PH5115	MW	PH5115				
		✤	MW	PH5125	MW	PH5125	MW	PH5740			DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
	Low alloyed Steel HB 180 DIN 21NiCrMo2 36CrNiMo4 34CrMo4	●	MF	PH7910	MR PM	PH5115 PHG115	HR	PH5115	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		◐	MF	PH5115	MR PM	PH5125 PHG125	HR	PH5125				
		✤	MF	PH5125	MR / PM	PH5740	HR	PH5740				
		●	MW	PH5115	MW	PH5115	MW	PH5115	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
		◐	MW	PH5115	MW	PH5115	MW	PH5115				
		✤	MW	PH5125	MW	PH5125	MW	PH5740			DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
	High alloyed steel HB 200 DIN 34CrNiMo6 42CrMo4	●	MF	PH7910	MR / PM	PH5115 PHG115	HR	PH5115	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		◐	MF	PH5115	MR / PM	PH5125 PHG125	HR	PH5125				
		✤	MF	PH5125	MR / PM	PH5740	HR	PH5740				
		●	MW	PH5115	MW	PH5115	MW	PH5115	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
		◐	MW	PH5115	MW	PH5115	MW	PH5115				
		✤	MW	PH5125	MW	PH5125	MW	PH5740			DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
	High alloyed steel HB 400 DIN X40CrMoV5 X45GrSi93	●	MF ST	PH7910 PH5705	MR PM	PH5115 PHG115	HR	PH5115	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		◐	MF ST	PH5115 PH5320	MR PM	PH5115 PHG125	HR	PH5115				
		✤	MF	PH5115	MR PM	PH5125 PHG125	HR	PH5125				
		●	MW	PH5115	MW	PH5115	MW	PH5115	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
		◐	MW	PH5115	MW	PH5115	MW	PH5115				
		✤	MW	PH5115	MW	PH5125	MW	PH5125			DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
M	Ferritic/ martensitic stainless steel DIN X12CrMoS17 X6CrMo17	●	SF	PH7910	SS	PH7910	HR	PH5125	Negative double side	Conventional Nose Radius	#NMM	D##N M##N M##N-K
		◐	SF	PH7910	SS	PH7910	HR	PH5125				
		✤	SF	PH7920	SS	PH7920	HR	PH5740				
		●	MW	PH5115	MW	PH5115	-	-	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
		◐	MW	PH5115	MW	PH5125	-	-				
		✤	MW	PH5125	MW	PH5740	-	-			DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°

● Stable cutting ◐ General cutting ✤ Unstable cutting

DOUBLE SIDE ...NMG'S

ISO	Material workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holders
			Geometry	Grade	Geometry	Grade	Geometry	Grade	Type			Type
M	Austenitic stainless steel DIN X5CrNi189 X5CrNiMo18 X15CrNiSi20	●	SF	PH7910	SS	PH7910	HR	PH5125	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		◐	SF	PH7910	SS	PH7910	HR	PH5125				
		✤	SF	PH7920	SS	PH7920	HR	PH5740				
		●	MW	PH5115	MW	PH5115	-	-	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
		◐	MW	PH5115	MW	PH5125	-	-				
		✤	MW	PH5125	MW	PH5740	-	-			DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
	Duplex stainless steel DIN X2CrNiMoSi19 X8CrNiMo27 X2CrNiMoN22	●	SF	PH7910	SS	PH7910	HR	PH5125	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		◐	SF	PH7920	SS	PH7920	HR	PH5125				
		✤	SF	PH7920	SS HR	PH5740	HR	PH5740				
		●	MW	PH5115	-	-	-	-	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
		◐	-	-	-	-	-	-				
		✤	-	-	-	-	-	-			DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
K	Grey cast iron HB 220 DIN GG15 GG25 GG35	●	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	-	-			DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
	Nodular cast iron HB 180 DIN GGG40 GGG50 GGG70	●	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	-	-			DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
S	Titanium Alloys DIN TiAl5Sn2.5 TiAl6V4 TiAl6V4ELI	●	SF	PH7920	MS	PH7920	SS	PH7920	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		◐	SF	PH7920	MS	PH7920	SS	PH7920				
		✤	SF	PH7920	MS	PH7920	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
			Geometry	Grade	Geometry	Grade	Geometry	Grade	Type			Type
S	Super Alloys DIN NiCr19Co11MoTi NiFe35Cr14MoTi CoCr20W15Ni	●	SF	PH7920	MS	PH7920	SS	PH7920	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		◐	SF	PH7920	MS SS	PH7920	SS	PH7920				
		✱	SF	PH7920	MS SS	PH7920	SS	PH7920				
N	Aluminum Alloys DIN AW7075 AlSi12 CuZn37	●	MS	PH0910	MS	PH0910	-	-	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		◐	MS	PH0910	MS	PH0910	-	-				
		✱	MS	PH0910	MS	PH0910	-	-				

● 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
			Geometry	Grade	Geometry	Grade	Geometry	Grade	Type			Type
P	Unalloyed steel HB 110 DIN C15 C45 C60	●	FP	PH5115	MP	PH5115	MP	PH5115	Positive single side	Conventional nose radius	#CMT #BMT	S##C S##B
		◐	FP	PH5115	MP	PH5125	MP	PH5125				
		✱	FP	PH5125	MP	PH5125	MP	PH5125				
		●	FW	PH5115	MW	PH5115	-	-	Positive single side	Wiper nose radius	CCMT	S##C 95º
		◐	FW	PH5115	MW	PH5115	-	-			DCMT TCMT	S##C 93º
		✱	FW	PH5115	MW	PH5115	-	-				
	Low alloyed Steel HB 180 DIN 21NiCrMo2 36CrNiMo4 34CrMo4	●	FP	PH5115	MP	PH5115	MP	PH5115	Positive single side	Conventional nose radius	#CMT #BMT	S##C S##B
		◐	FP	PH5115	MP	PH5125	MP	PH5125				
		✱	FP	PH5125	MP	PH5125	MP	PH5125				
		●	FW	PH5115	MW	PH5115	-	-	Positive single side	Wiper nose radius	CCMT	S##C 95º
		◐	FW	PH5115	MW	PH5115	-	-			DCMT TCMT	S##C 93º
		✱	FW	PH5115	MW	PH5115	-	-				
	High alloyed Steel HB 200 DIN 34CrNiMo6 42CrMo4	●	FP	PH5115	MP	PH5115	MP	PH5115	Positive single side	Conventional nose radius	#CMT #BMT	S##C S##B
		◐	FP	PH5115	MP	PH5125	MP	PH5125				
		✱	FP	PH5125	MP	PH5125	MP	PH5125				
		●	FW	PH5115	MW	PH5115	-	-	Positive single side	Wiper nose radius	CCMT	S##C 95º
		◐	FW	PH5115	MW	PH5115	-	-			DCMT TCMT	S##C 93º
		✱	FW	PH5115	MW	PH5115	-	-				
	High alloyed Steel HB 400 DIN X40CrMoV5 X45GrSi93	●	FP FK	PH5115 PH5705	MP MK	PH5115 PH5320	MP	PH5115	Positive single side	Conventional nose radius	#CMT #BMT	S##C S##B
		◐	FP FK	PH5115 PH5320	MP MK	PH5115 PH5320	MP	PH5115				
		✱	FP	PH5115	MP	PH5125	MP	PH5125				
		●	FW	PH5115	MW	PH5115	-	-	Positive single side	Wiper nose radius	CCMT	S##C 95º
		◐	FW	PH5115	MW	PH5115	-	-			DCMT TCMT	S##C 93º
		✱	FW	PH5115	MW	PH5115	-	-				
M	Duplex stainless steel DIN X2CrNiMoSi19 X8CrNiMo27 X2CrNiMoN22	●	FM	PH7910	LM MM	PH7910	MM	PH5115	Positive single side	Conventional nose radius	#CMT #BMT	S##C S##B
		◐	FM LM	PH7910	MM	PH7910	MM	PH5115				
		✱	FM LM	PH7920	MM	PH7920	MM	PH5115				
		●	FW	PH7920	MW	PH5115	-	-	Positive single side	Wiper nose radius	CCMT	S##C 95º
		◐	FW	PH7920	MW	PH5125	-	-			DCMT TCMT	S##C 93º
		✱	-	-	-	-	-	-				
	Austenitic stainless steel DIN X2CrNiMoSi19 X8CrNiMo27 X2CrNiMoN22	●	FM LM	PH7910	LM MM	PH7910	MM	PH5115	Positive single side	Conventional nose radius	#CMT #BMT	S##C S##B
		◐	FM LM	PH7920	MM	PH7920	MM	PH5115				
		✱	FM LM	PH5125	MM	PH5115	MM	PH5115				
		●	MW	PH7920	MW	PH7920	-	-	Positive single side	Wiper nose radius	CCMT	S##C 95º
		◐	MW	PH5115	MW	PH5115	-	-			DCMT TCMT	S##C 93º
		✱	MW	PH5115	MW	PH5115	-	-				

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

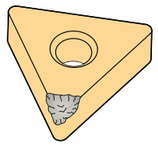
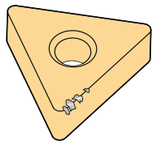
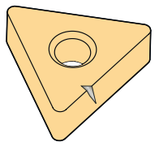
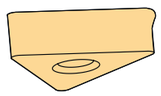
ISO	Material Workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holders
			Geometry	Grade	Geometry	Grade	Geometry	Grade	Type			Type
M	Duplex stainless steel DIN X2CrNiMoSi19 X8CrNiMo27 X2CrNiMoN22	●	FM LM	PH7910	LM MM	PH7910	MM	PH5115	Positive single side	Conventional nose radius	#CMT #BMT	S##C S##B
		◐	FM LM	PH7910	MM	PH7910	MM	PH5115				
		✤	FM LM	PH5125	MM	PH5115	MM	PH5115				
		●	-	-	-	-	-	-	Positive single side	Wiper nose radius	CCMT	S##C 95º
		◐	-	-	-	-	-	-			DCMT TCMT	S##C 93º
		✤	-	-	-	-	-	-				
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 95º
		◐	FW	PH5705	MW	PH5320	-	-			DCMT TCMT	S##C 93º
		✤	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				
		●	FW	PH5705	MW	PH5320	-	-	Positive single side	Wiper nose radius	CCMT	S##C 95º
		◐	FW	PH5705	MW	PH5320	-	-			DCMT TCMT	S##C 93º
		✤	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				
		●	FW	PH7920	FW	PH7920	-	-	Positive single side	Wiper nose radius	CCMT	S##C 95º
		◐	FW	PH7920	MW	PH7920	-	-			DCMT TCMT	S##C 93º
		✤	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				
		●	FW	PH7920	FW	PH7920	-	-	Positive single side	Wiper nose radius	CCMT	S##C 95º
		◐	FW	PH7920	MW	PH7920	-	-			DCMT TCMT	S##C 93º
		✤	MW	PH7920	MW	PH7920	-	-				
N	Aluminum Alloys DIN AW7075 AlSi12 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

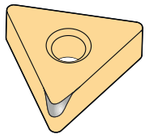
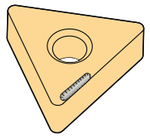
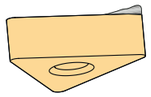
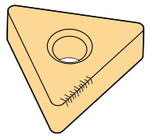
TROUBLESHOOTING

Solução De Problemas | Solución De Problemas

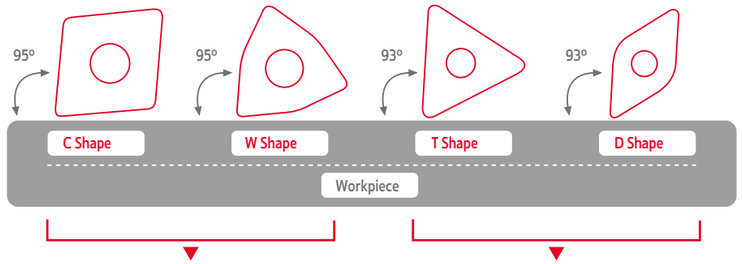
TOOL LIFE PROBLEMS | PROBLEMAS NA VIDA ÚTIL DA FERRAMENTA | PROBLEMAS CON LA VIDA ÚTIL DE LA HERRAMIENTA

Problem I Problema	Possible Solution I Solução I Solución	
• **Breakage or too short tool life** • **Rotura ou vida útil muito curta** • **Rotura o vida de la herramienta demasiado corto**	• 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. Verique 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.	
• **Insert fracture** • **Fratura da Pastilha** • **Fractura de la Plaquita** 	• Reduce the feed rate (Fn). • Reduza o avanço/rotação (Fn). • Reducir el avance (Fn). • Reduce the depth of cut (Ap). • Reduza a profundidade de corte (Ap). • Reducir la profundidad de corte (Ap). • Select a tougher grade (ex: P10 -> ... -> P40). • Selecione uma classe mais tenaz (ex: P10 -> ... -> P40). • Seleccionar una calidad más tenaz (ex: P10 -> ... -> P40). • Use a more rigid toolholder. • Use um suporte mais rigido. • Utilice un portaherramientas más rígido.	• Increase nose radius (Re). • Aumente o raio de canto (Re). • Aumente el radio de punta (Re). • Select a stronger chipbreaker. • Selecione um quebra-aparas mais resistente. • Seleccionar un rompevirutas más robusto. • Reduce the toolholder length. • Reduza o comprimento do suporte. • Reducir la longitud del portaherramientas. • Select larger shank size. • Escolha uma largura de haste superior. • Elija un ancho de vara superior.
• **Edge chipping** • **Fragmentação da aresta** • **Fragmentación de la arista** 	• Increase the cutting speed (Vc). • Aumente a velocidade de corte (Vc). • Aumentar la velocidad de corte (Vc). • Reduce the feed rate (Fn). • Reduza o avanço/rotação (Fn). • Reducir el avance (Fn). • Select a stronger chipbreaker. • Selecione um quebra-aparas mais resistente. • Seleccionar un rompevirutas más robusto. • Select a tougher grade (ex: P10 -> ... -> P40). • Selecione uma classe mais tenaz (ex: P10 -> ... -> P40). • Seleccionar una calidad más tenaz (ex: P10 -> ... -> P40).	• Reduce the rake angle. • Diminua o ângulo de ataque. • Reducir el ángulo de ataque. • Increase horning edges. • Aumente arestas boleadas. • Aumentar aristas redondeadas. • Reduce the toolholder length. • Reduza o comprimento do suporte. • Reducir la longitud del portaherramientas. • Select larger shank size. • Escolha uma largura de haste superior. • Elija un ancho de vara superior.
• **Notch wear** • **Desgaste de entalhe** • **Mellado** 	• Reduce the cutting speed (Vc). • Reduza a velocidade de corte (Vc). • Reducir la velocidad de corte (Vc). • Reduce the feed rate (Fn). • Reduza o avanço/rotação (Fn). • Reducir el avance (Fn). • Select a tool with a smaller setting angle (Krº). • Selecione uma ferramenta com um ângulo de posição menor (Krº). • Seleccionar una herramienta con un ángulo de posición menor (Krº).	• Select a more wear-resistant grade (ex: P40 -> ... -> P10). • Selecione uma classe mais resistente ao desgaste (ex: P40 -> ... -> P10). • Seleccionar una calidad más resistente al desgaste (ex: P40 -> ... -> P10).
• **Plastic deformation** • **Deformação plástica** • **Deformación plástica** 	• Reduce the cutting speed (Vc). • Reduza a velocidade de corte (Vc). • Reducir la velocidad de corte (Vc). • Reduce the feed rate (Fn). • Reduza o avanço/rotação (Fn). • Reducir el avance (Fn). • Select a more wear-resistant grade (ex: P40 -> ... -> P10). • Selecione uma classe mais resistente ao desgaste (ex: P40 -> ... -> P10). • Seleccionar una calidad más resistente al desgaste (ex: P40 -> ... -> P10). • Use more coolant and correct it volume/accuracy. • Utilize refrigeração em abundância e corrija o seu volume/precisão. • Usar abundante caudal de refrigerante y corregir el volumen / precisión.	• Choose grade with better heat conductivity. • Escolha um grau com melhor condutividade térmica. • Elija un grado con una mejor conductividad térmica. • Increase the rake angle. • Aumente o ângulo de ataque. • Aumente el ángulo de ataque. • Increase nose radius (Re). • Aumente o raio de canto (Re). • Aumente el radio de punta (Re). • Increase relief angle. • Aumente o ângulo de alívio superior. • Aumente el ángulo de alivio superior.

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

Problem I Problema	Possible Solution I Solução I Solución	
• **Flank wear** • **Desgaste do flanco** • **Desgaste de la superficie** 	• Reduce the cutting speed (Vc). • Reduza a velocidade de corte (Vc). • Reducir la velocidad de corte (Vc). • Select a more wear-resistant grade (ex: P40 -> ... -> P10). • Selecione uma classe mais resistente ao desgaste (ex: P40 -> ... -> P10). • Seleccionar una calidad más resistente al desgaste (ex: P40 -> ... -> P10). • Select a toolholder or chipbreaker which allow a bigger relief angle. • Selecione um suporte ou quebra-aparas que permita um ângulo de alívio superior. • Seleccione un portaherramientas o rompevirutas que permiten un ángulo de alivio superior.	• Increase the rake angle. • Aumente o ângulo de ataque. • Aumente el ángulo de ataque. • Increase nose radius (Re). • Aumente o raio de canto (Re). • Aumente el radio de punta (Re). • Reduce horning edges. • Reduza arestas boleadas. • Reducir aristas redondeadas.
• **Crater wear** • **Craterização** • **Craterización** 	• Reduce the cutting speed (Vc). • Reduza a velocidade de corte (Vc). • Reducir la velocidad de corte (Vc). • Reduce the feed rate (Fn). • Reduza o avanço/rotação (Fn). • Reducir el avance (Fn). • Select a more wear-resistant grade (ex: P40 -> ... -> P10). • Selecione uma classe mais resistente ao desgaste (ex: P40 -> ... -> P10). • Seleccionar una calidad más resistente al desgaste (ex: P40 -> ... -> P10).	• Use coolant. • Utilize refrigeração. • Usar refrigerante. • Increase the rake angle. • Aumente o ângulo de ataque. • Aumente el ángulo de ataque. • Increase nose radius (Re). • Aumente o raio de canto (Re). • Aumente el radio de punta (Re).
• **Built-up edge** • **Aresta postiça** • **Recrecimiento del filo** 	• Increase the cutting speed (Vc). • Aumente a velocidade de corte (Vc). • Aumentar la velocidad de corte (Vc). • Reduce the feed rate (Fn). • Reduza o avanço/rotação (Fn). • Reducir el avance (Fn). • Use water-insoluble coolant fluid. • Utilize fluido refrigerante insolúvel em água. • Utilice fluido refrigerante insoluble en agua. • Select a more easy-cutting chipbreaker. • Selecione um quebra-aparas mais positivo. • Seleccionar un rompevirutas de corte más suave.	• Increase the rake angle. • Aumente o ângulo de ataque. • Aumente el ángulo de ataque. • Reduce horning edges. • Reduza arestas boleadas. • Reducir aristas redondeadas. • Select grade with low tendency to adhesion. • Selecione um grau com baixa tendência a aderência. • Seleccione un grado con baja tendencia a la adhesión.
• **Thermal cracks** • **Trincas térmicas** • **Grietas en el filo** 	• Reduce the cutting speed (Vc). • Reduza a velocidade de corte (Vc). • Reducir la velocidad de corte (Vc). • Increase the feed rate (Fn). • Aumente o avanço/rotação (Fn). • Aumentar el avance (Fn). • Use more coolant and correct it volume/accuracy. • Utilize refrigeração em abundância e corrija o seu volume/precisão. • Usar abundante caudal de refrigerante y corregir el volumen / precisión.	• Reduce horning edges. • Reduza arestas boleadas. • Reducir aristas redondeadas. • Select a tougher grade (ex: P10 -> ... -> P40). • Selecione uma classe mais tenaz (ex: P10 -> ... -> P40). • Seleccionar una calidad más tenaz (ex: P10 -> ... -> P40). • Increase the rake angle. • Aumente o ângulo de ataque. • Aumente el ángulo de ataque.

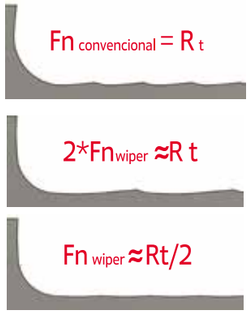
THE ANGLE POSITION (KR°)



Note: C and W shapes has 2 wiper radius. While one makes longitudinal turning the opposite one makes face turning.

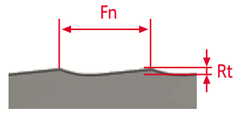
Note: Due to shape restritions (basic angles of 60° and 55°), T and D shapes has 4 wiper radius that works in couple. That is needed to not loose the wiper effect when the insert is turned around.

THE WIPER PURPOSE IS BASED ON PRODUCTIVITY:

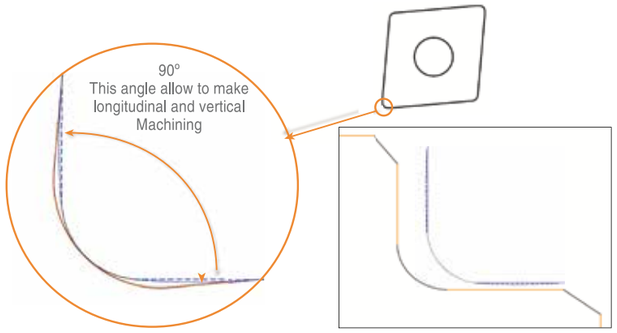


CNMG 432 - ##
VS
CNMG 432-MW

Holder Angle Position (Kr°) = 95°



EXAMPLE CNMG 432-MW WITH ANGLE POSITION OF 95°



- Wiper nose radius
- Regular nose radius
- Wiper radius profile
- Wiper radius length
- Workpiece machinable areas with wiper insert.

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

GROOVING & PARTING OFF

D

For R or L Insert type

GP	0300	B	020	-	050	R	02	-	MC
1	2	3	4		5	6	7		8

For N Insert type

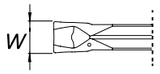
GP	0300	B	020	-	N	02	-	MC
1	2	3	4		6	7		8

1 - Product Line

GP - Grooving Plus

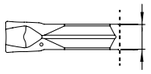
2 - Cutting Width

0200 - 0.079 in | 0300 - 0.118 in | 0400 - 0.157 in | 0500 - 0.197 in | 0600 - 0.236 in



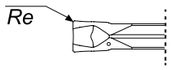
3 - Seat Size

A -1/16 in | B - 0.091 in | C - 0.130 in | D - 0.169 in | E - 0.193 in | F - 0.260 in

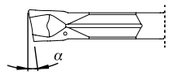


4 - Cutting Radius

020 - 0.008 in | 025 - 0.010 in | 040 - 0.016 in | 080 - 0.031 in | 300 - 0.118 in | 400 - 0.157 in

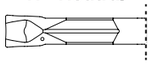


5 - Relief Angle

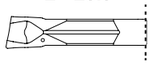


6 - Insert Type

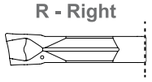
N - Neutral



L - Left

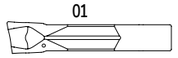


R - Right

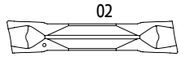


7 - Nº of Cutting Edges

01

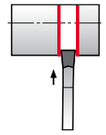
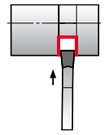
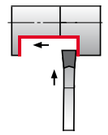
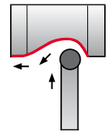


02



8 - Cutting Geometry

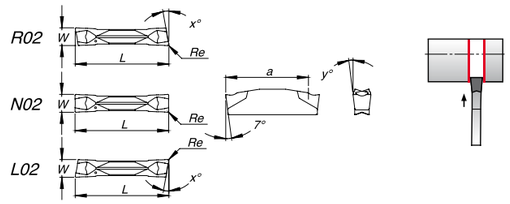
MC - Medium Cut Off | MG - Medium Grooving | MM - Medium Multi Function | MP - Medium Profiling | NP - Non-Ferrous Profiling

		Parting Off	General Grooving	Turning	Profiling
					
	GP...02-MC	First choice	Alternative		
	GP...01-MC	First choice	Alternative		
	GP...02-MG	Alternative	First choice		
	GP...02-MM		Alternative	First choice	
	GP...02-MP				First choice
	GP...02-NP				First choice
	GTN-...	Alternative	Alternative		
	SANCAR-...	Alternative	Alternative		

First choice | Primeira opção
1ª opción

Alternative | Alternativa
Alternativa

GP...02-MC | Medium Cut Off

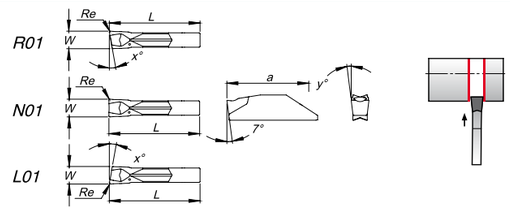


		P			M			K				N	S											
		CVD-MT		PVD	CVD-MT		PVD	UNC	CVD-MT			UNC	PVD											
	(2) Grade code	L8	N2	G4	L8	N2	G4	25	L5	L6	N2	10	G4											
(1) Geometry code	ISO/ANSI Reference	PH5125	PH5135	PH7920	PH5125	PH5135	PH7920	PH0705	PH5705	PH5320	PH5135	PH0910	PH7920	Dimensions (in) W	Re	L	x°	a	y°	Seat[2] Size	Cutting Conditions fn (in/r)	Min	Max
1130383	GP0200A020-N02-MC		⚙	⚙		⚙	⚙			⚙	⚙		⚙	0.079	0.008	0.807	-	0.728	0.236	A	0.002	0.002	0.004
1130384	GP0300B020-N02-MC		⚙	⚙		⚙	⚙			⚙	⚙		⚙	0.118	0.008	0.803	-	0.728	0.315	B	0.003	0.002	0.006
1130397	GP0400C020-N02-MC		⚙	⚙		⚙	⚙			⚙	⚙		⚙	0.157	0.008	0.827	-	0.728	0.276	C	0.005	0.002	0.010
1130416	GP0200A020-050R02-MC		⚙	⚙		⚙	⚙			○	⚙		⚙	0.079	0.008	0.807	0.197	0.728	0.236	A	0.002	0.002	0.003
1130417	GP0300B020-050R02-MC		⚙	⚙		⚙	⚙			○	⚙		⚙	0.118	0.008	0.803	0.197	0.728	0.315	B	0.003	0.002	0.005
1130418	GP0400C020-050R02-MC		○	○		○	○			○	○		○	0.157	0.008	0.827	0.197	0.728	0.276	C	0.004	0.002	0.008
1130419	GP0200A020-050L02-MC		⚙	⚙		⚙	⚙			○	⚙		⚙	0.079	0.008	0.807	0.197	0.728	0.236	A	0.002	0.002	0.003
1130420	GP0300B020-050L02-MC		⚙	⚙		⚙	⚙			○	⚙		⚙	0.118	0.008	0.803	0.197	0.728	0.315	B	0.003	0.002	0.005
1130421	GP0400C020-050L02-MC		○	○		○	○			○	○		○	0.157	0.008	0.827	0.197	0.728	0.276	C	0.004	0.002	0.008

⚙ First choice | Primeira opção | 1ª opción ⚙ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta 2 - Correspond to a Specific Holder

Insert Order Code = (1) geometry Code + (2) Grade Code

GP...01-MC | Medium Cut Off



		P			M			K				N	S											
		CVD-MT		PVD	CVD-MT		PVD	UNC	CVD-MT			UNC	PVD											
	(2) Grade code	L8	N2	G4	L8	N2	G4	25	L5	L6	N2	10	G4											
(1) Geometry code	ISO/ANSI Reference	PH5125	PH5135	PH7920	PH5125	PH5135	PH7920	PH0705	PH5705	PH5320	PH5135	PH0910	PH7920	Dimensions (in) W	Re	L	x°	a[1]	y°	Seat[2] Size	Cutting Conditions fn (in/r)	Min	Max
1130422	GP0200A020-N01-MC		⚙	⚙		⚙	⚙			⚙	⚙		⚙	0.079	0.008	0.795	-	-	6.0	A	0.002	0.002	0.004
1130423	GP0300B020-N01-MC		⚙	⚙		⚙	⚙			⚙	⚙		⚙	0.118	0.008	0.791	-	-	8.0	B	0.003	0.002	0.006
1130424	GP0400C020-N01-MC		⚙	⚙		⚙	⚙			⚙	⚙		⚙	0.157	0.008	0.807	-	-	7.0	C	0.005	0.002	0.010
1130425	GP0200A020-050R01-MC		○	○		○	○			○	○		○	0.079	0.008	0.795	0.197	-	6.0	A	0.002	0.002	0.003
1130426	GP0300B020-050R01-MC		○	○		○	○			○	○		○	0.118	0.008	0.791	0.197	-	8.0	B	0.003	0.002	0.005
1130427	GP0400C020-050R01-MC		○	○		○	○			○	○		○	0.157	0.008	0.807	0.197	-	7.0	C	0.004	0.002	0.008
1130428	GP0200A020-050L01-MC		○	○		○	○			○	○		○	0.079	0.008	0.795	0.197	-	6.0	A	0.002	0.002	0.003
1130429	GP0300B020-050L01-MC		○	○		○	○			○	○		○	0.118	0.008	0.791	0.197	-	8.0	B	0.003	0.002	0.005
1130430	GP0400C020-050L01-MC		○	○		○	○			○	○		○	0.157	0.008	0.807	0.197	-	7.0	C	0.004	0.002	0.008

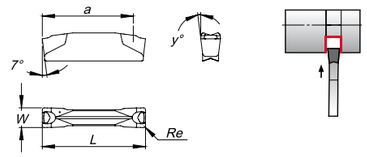
⚙ First choice | Primeira opção | 1ª opción ⚙ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

In some postions new grade PH7920, will be available when PH7325 stock ends.

Insert Order Code = (1) geometry Code + (2) Grade Code

1 - When using inserts with 1 Cutting edge, the "a" measure is given by the Toolholder | 2 - Correspond to a Specific Holder

GP...02-MG | Medium Grooving



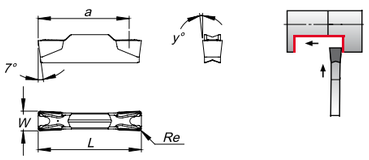
		P			M			K				N	S											
		CVD-MT		PVD	CVD-MT		PVD	UNC	CVD-MT			UNC	PVD											
	(2) Grade code	L8	N2	G4	L8	N2	G4	25	L5	L6	N2	10	G4											
(1) Geometry code	ISO/ANSI Reference	PH5125	PH5135	PH7920	PH5125	PH5135	PH7920	PH0705	PH5705	PH5320	PH5135	PH0910	PH7920	Dimensions (in) W	Re	L	x°	a	y°	Seat[2] Size	Cutting Conditions fn (in/r)	Min	Max
1130398	GP0300B020-N02-MG	⚙		⚙	⚙		⚙			⚙			⚙	0.118	0.008	0.827	-	0.728	0.256	B	0.002	0.002	0.004
1130399	GP0400C040-N02-MG	⚙		⚙	⚙		⚙			⚙			⚙	0.157	0.016	0.827	-	0.728	0.256	C	0.003	0.002	0.006
1130400	GP0500D040-N02-MG	⚙		⚙	⚙		⚙			⚙			⚙	0.197	0.016	0.827	-	0.728	0.236	D	0.005	0.002	0.010

⚙ First choice | Primeira opção | 1ª opción ⚙ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta 2 - Correspond to a Specific Holder

Insert Order Code = (1) geometry Code + (2) Grade Code

In some postions new grade PH7920, will be available when PH7325 stock ends.

GP...02-MM | Medium Multi Function



		P			M			K				N	S													
		CVD-MT		PVD	CVD-MT		PVD	UNC	CVD-MT			UNC	PVD													
	(2) Grade code	L8	N2	G4	L8	N2	G4	25	L5	L6	N2	10	G4													
(1) Geometry code	ISO/ANSI Reference	PH5125	PH5135	PH7920	PH5125	PH5135	PH7920	PH0705	PH5705	PH5320	PH5135	PH0910	PH7920	Dimensions (in) W	Re	L	x°	a[1]	y°	Seat[2] Size	Cutting Conditions Ap (in)	Min	Max	fn (in/r)	Min	Max
1130401	GP0300B040-N02-MM	⚙		⚙	⚙		⚙	⚙	○	⚙			⚙	0.118	0.016	0.827	-	0.728	0.236	B	0.031	0.016	0.059	0.004	0.002	0.005
1130402	GP0400C040-N02-MM	⚙		⚙	⚙		⚙	⚙	○	⚙			⚙	0.157	0.016	0.827	-	0.728	0.236	C	0.043	0.024	0.079	0.005	0.003	0.006
1130403	GP0500D040-N02-MM	⚙		⚙	⚙		⚙	⚙	○	⚙			⚙	0.197	0.016	0.827	-	0.728	0.217	D	0.059	0.031	0.098	0.006	0.004	0.007
1130410	GP0800F080-N02-MM	○		○	○		○	○	○	○			○	0.315	0.031	1.024	-	0.728	0.276	F	0.087	0.039	0.150	0.007	0.006	0.009

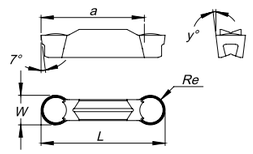
⚙ First choice | Primeira opção | 1ª opción ⚙ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

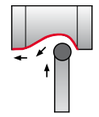
Insert Order Code = (1) geometry Code + (2) Grade Code

1 - When using inserts with 1 Cutting edge, the "a" measure is given by the Toolholder | 2 - Correspond to a Specific Holder

Proprietary grooving line

GP...02-MP | Medium Profiling





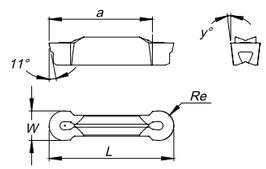
		P			M			K				N	S												
		CVD-MT		PVD	CVD-MT		PVD	UNC	CVD-MT			UNC	PVD												
	(2) Grade code	L8	N2	G4	L8	N2	G4	25	L5	L6	N2	10	G4												
(1) Geometry code	ISO/ANSI Reference	PH5125	PH5135	PH7920	PH5125	PH5135	PH7920	PH0705	PH5705	PH5320	PH5135	PH0910	PH7920	Dimensions (in)							Cutting Conditions					
														W	Re	L	x°	a	y°	Seat[2] Size	Ap (in)	Min	Max	fn (in/r)	Min	Max
1130404	GP0600E300-N02-MP	◎		◎	◎		◎	○		◎			◎	0.236	0.118	0.992	-	0.827	0.276	E	0.059	0.002	0.087	0.007	0.006	0.009

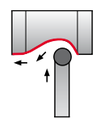
◎ First choice | Primeira opção | 1ª opción ◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta 2 - Correspond to a Specific Holder

Insert Order Code = (1) geometry Code + (2) Grade Code

In some postions new grade PH7920, will be available when PH6325 stock ends.

GP...02-NP | Non-Ferrous Profiling





		P			M			K				N	S												
		CVD-MT		PVD	CVD-MT		PVD	UNC	CVD-MT			UNC	PVD												
	(2) Grade code	L8	N2	G4	L8	N2	G4	25	L5	L6	N2	10	G4												
(1) Geometry code	ISO/ANSI Reference	PH5125	PH5135	PH7920	PH5125	PH5135	PH7920	PH0705	PH5705	PH5320	PH5135	PH0910	PH7920	Dimensions (in)							Cutting Conditions					
														W	Re	L	x°	a	y°	Seat[2] Size	Ap (in)	Min	Max	fn (in/r)	Min	Max
1130405	GP0600E300-N02-NP											◎		0.236	0.118	1.000	-	0.728	0.276	E	0.051	0.020	0.098	0.008	0.006	0.010
1130439	GP0800E400-N02-NP											○		0.315	0.157	1.000	-	0.728	0.276	E	0.059	0.024	0.102	0.008	0.006	0.012

◎ First choice | Primeira opção | 1ª opción ◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta 2 - Correspond to a Specific Holder

Insert Order Code = (1) geometry Code + (2) Grade Code

page D - 330 | page D - 331 | page D - 333

For Blades

GP	N	C	-	080	25	.A	.0
1	2	3		5	6	7	8

For Internal grooving

GP	R	C	-	100	010	25.25	.A	.1
1	2	3		4	5	6	7	8

1 - Product Line

GP - Grooving Plus

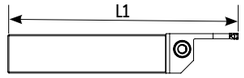
2 - Work Side

R - Right  N - Neutral   L - Left 

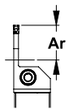
3 - Tool Type

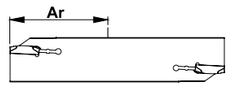
C - Frontal

4 - Total toolholder lenght

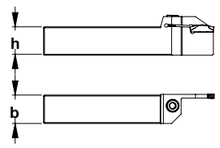


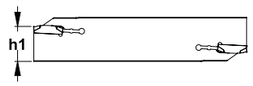
5 - Maximum Depth of Cut





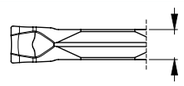
6 - Shaft | Cutting Unit Dimension



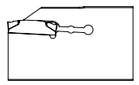
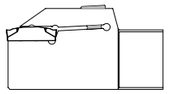


7 - Seat Size

A - 1/16 in | B - 0.091 in | C - 0.130 in | D - 0.169 in | E - 0.157 in | F - 0.260 in



8 - Clamping System

0 - Spring  1 - Screw 

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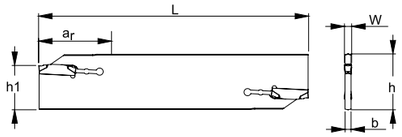
GPNC



Order separately

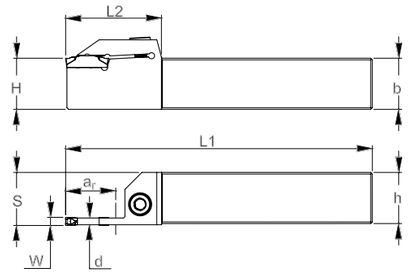
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)							Insert	Wrench	Stock
		ar	L1	h	h1	b	W	Seat Size			
213010000	GPNC-020 25.A.0	0.787	5.906	1.260	0.984	0.059	0.079	A	GP02...	LE25-30	◎
213009900	GPNC-055 25.B.0	2.165	5.906	1.260	0.984	0.091	0.118	B	GP03...	LE25-30	◎
213009700	GPNC-055 25.C.0	2.165	5.906	1.260	0.984	0.091	0.157	C	GP04...	LE25-30	◎

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Wrench must be ordered separately

Note: For inserts with 2 cutting edges, the ar is defined by the insert

GPRC

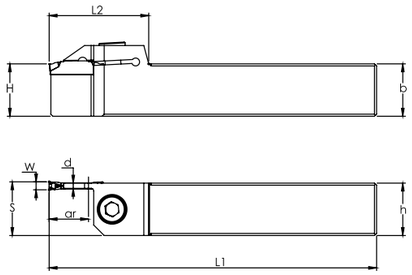


Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)								W (mm)	Seat Size	Insert	Screw	Wrench	Stock
		ar	L1	h	b	H	L2	S	d						
213025500	GPRC-4.00 0.59 0.625.0.625.A.1	0.59	4.00	0.625	0.625	0.625	1.496	0.640	0.059	2	A	GP02...	D0602200	SS50	○
213025600	GPRC-5.00 0.59 0.750.0.750.A.1	0.59	5.00	0.750	0.750	0.750	1.496	0.797	0.059	2	A	GP02...	D0602200	SS50	○
213025700	GPRC-6.00 0.39 1.000.1.000.A.1	0.39	6.00	1.000	1.000	1.000	1.339	0.994	0.059	2	A	GP02...	D0602200	SS50	○
213025800	GPRC-6.00 0.79 1.000.1.000.A.1	0.79	6.00	1.000	1.000	1.000	1.654	0.994	0.059	2	A	GP02...	D0602200	SS50	○
213025900	GPRC-4.00 0.59 0.625.0.625.B.1	0.59	4.00	0.625	0.625	0.625	1.496	0.650	0.079	3	B	GP03...	D0602200	SS50	○
213026000	GPRC-5.00 0.59 0.750.0.750.B.1	0.59	5.00	0.750	0.750	0.750	1.496	0.807	0.079	3	B	GP03...	D0602200	SS50	○
213026100	GPRC-6.00 0.39 1.000.1.000.B.1	0.39	6.00	1.000	1.000	1.000	1.339	1.004	0.079	3	B	GP03...	D0602200	SS50	○
213026200	GPRC-6.00 0.79 1.000.1.000.B.1	0.79	6.00	1.000	1.000	1.000	1.654	1.004	0.079	3	B	GP03...	D0602200	SS50	○
213026300	GPRC-5.00 0.75 0.750.0.750.C.1	0.75	5.00	0.750	0.750	0.750	1.496	0.807	0.118	4	C	GP04...	D0602200	SS50	○
213026400	GPRC-6.00 0.51 1.000.1.000.C.1	0.51	6.00	1.000	1.000	1.000	1.339	1.004	0.118	4	C	GP04...	D0602200	SS50	○
213026500	GPRC-6.00 0.91 1.000.1.000.C.1	0.91	6.00	1.000	1.000	1.000	1.654	1.004	0.118	4	C	GP04...	D0602200	SS50	○
213026600	GPRC-5.00 0.75 0.750.0.750.D.1	0.75	5.00	0.750	0.750	0.750	1.496	0.807	0.157	5	D	GP05...	D0602200	SS50	○
213026700	GPRC-6.00 0.51 1.000.1.000.D.1	0.51	6.00	1.000	1.000	1.000	1.339	1.004	0.157	5	D	GP05...	D0602200	SS50	○
213026800	GPRC-6.00 0.91 1.000.1.000.D.1	0.91	6.00	1.000	1.000	1.000	1.654	1.004	0.157	5	D	GP05...	D0602200	SS50	○
213026900	GPRC-6.00 0.59 1.000.1.000.E.1	0.59	6.00	1.000	1.000	1.000	1.339	1.024	0.157	6	E	GP06...	D0602200	SS50	○
213027000	GPRC-6.00 0.91 1.000.1.000.E.1	0.91	6.00	1.000	1.000	1.000	1.654	1.024	0.157	6	E	GP06...	D0602200	SS50	○

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: For inserts with 2 cutting edges, the ar is defined by the insert

GPLC



Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)								W (mm)	Seat Size	Insert	Screw	Wrench	Stock
		ar	L1	h	b	H	L2	S	d						
213027100	GPLC-4.00 0.59 0.625.0.625.A.1	0.59	4.00	0.625	0.625	0.625	1.496	0.640	0.059	2	A	GP02...	D0602200	SS50	○
213027200	GPLC-5.00 0.59 0.750.0.750.A.1	0.59	5.00	0.750	0.750	0.750	1.496	0.797	0.059	2	A	GP02...	D0602200	SS50	○
213027300	GPLC-6.00 0.39 1.000.1.000.A.1	0.39	6.00	1.000	1.000	1.000	1.339	0.994	0.059	2	A	GP02...	D0602200	SS50	○
213027400	GPLC-6.00 0.79 1.000.1.000.A.1	0.79	6.00	1.000	1.000	1.000	1.654	0.994	0.059	2	A	GP02...	D0602200	SS50	○
213027500	GPLC-4.00 0.59 0.625.0.625.B.1	0.59	4.00	0.625	0.625	0.625	1.496	0.650	0.079	3	B	GP03...	D0602200	SS50	○
213027600	GPLC-5.00 0.59 0.750.0.750.B.1	0.59	5.00	0.750	0.750	0.750	1.496	0.807	0.079	3	B	GP03...	D0602200	SS50	○
213027700	GPLC-6.00 0.39 1.000.1.000.B.1	0.39	6.00	1.000	1.000	1.000	1.339	1.004	0.079	3	B	GP03...	D0602200	SS50	○
213027800	GPLC-6.00 0.79 1.000.1.000.B.1	0.79	6.00	1.000	1.000	1.000	1.654	1.004	0.079	3	B	GP03...	D0602200	SS50	○
213027900	GPLC-5.00 0.75 0.750.0.750.C.1	0.75	5.00	0.750	0.750	0.750	1.496	0.807	0.118	4	C	GP04...	D0602200	SS50	○
213028000	GPLC-6.00 0.51 1.000.1.000.C.1	0.51	6.00	1.000	1.000	1.000	1.339	1.004	0.118	4	C	GP04...	D0602200	SS50	○
213028100	GPLC-6.00 0.91 1.000.1.000.C.1	0.91	6.00	1.000	1.000	1.000	1.654	1.004	0.118	4	C	GP04...	D0602200	SS50	○
213028200	GPLC-5.00 0.75 0.750.0.750.D.1	0.75	5.00	0.750	0.750	0.750	1.496	0.807	0.157	5	D	GP05...	D0602200	SS50	○
213028300	GPLC-6.00 0.51 1.000.1.000.D.1	0.51	6.00	1.000	1.000	1.000	1.339	1.004	0.157	5	D	GP05...	D0602200	SS50	○
213028400	GPLC-6.00 0.91 1.000.1.000.D.1	0.91	6.00	1.000	1.000	1.000	1.654	1.004	0.157	5	D	GP05...	D0602200	SS50	○
213028500	GPLC-6.00 0.59 1.000.1.000.E.1	0.59	6.00	1.000	1.000	1.000	1.339	1.024	0.157	6	E	GP06...	D0602200	SS50	○
213028600	GPLC-6.00 0.91 1.000.1.000.E.1	0.91	6.00	1.000	1.000	1.000	1.654	1.024	0.157	6	E	GP06...	D0602200	SS50	○

Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: For inserts with 2 cutting edges, the ar is defined by the insert

For GTN Inserts

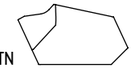
GTN	-	3	R	15
1		2	3	4

For SANCAR Inserts

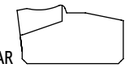
SANCAR	-	3	R	5
1		2	3	4

1 - Product Line

GTN

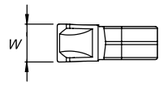


SANCAR



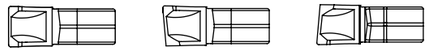
2 - Cutting Width

2 - 0.079 in | 2.4 - 0.094 in | 3 - 0.118 in | 4 - 0.157 in | 4.8 - 0.189 in | 5 - 0.197 in | 6 - 0.236 in | 8 - 0.315 in



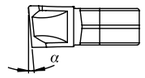
3 - Inserts Type

N - Neutral | R - Right | L - Left



4 - Relief Angle

4 - 4º | 5 - 5º | 8 - 8º | 15 - 15º

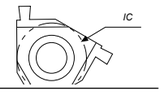


For Trigon 60º Inserts

16	-	ER	-	W	-	1.00
1		2		3		4

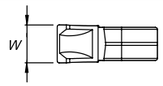
1 - Inscribed Circle

11 - 1/4 in | 16 - 3/8 in



2 - Insert Type

ER - External Right | IR - Internal Right



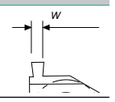
3 - Cutting Edge Type

W - Rectangular

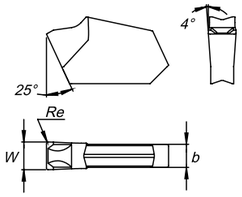
R - Rounded

4 - Cutting Edge Length

0.50 - 0.002 in | 2.25 - 0.089 in



GTN-N



			P		M		K								
			CVD-MT		CVD-MT		CVD-MT								
	(2) Grade code		L7	N2	L7	N2	L6	N2	Dimensions (in)				Cutting Conditions		
(1) Geometry code	ANSI Reference	ISO Reference	PH5115	PH5135	PH5115	PH5135	PH5320	PH5135	W	b	Re	α	fn (in/r)	Min	Max
1130165	GTN-2N	GCMX-2N	●	●	●	●	●	●	0.087	0.071	0.006	-	0.003	0.002	0.006
1130228	GTN-2.4N	GCMX-2.4N	○	○	○	○	○	○	0.094	0.079	0.006	-	0.004	0.002	0.007
1130169	GTN-3N	GCMX-3N	●	●	●	●	●	●	0.122	0.102	0.008	-	0.006	0.004	0.010
1130174	GTN-4N	GCMX-4N	●	●	●	●	●	●	0.161	0.138	0.010	-	0.007	0.004	0.012
1130229	GTN-4.8N	GCMX-4.8N	○	○	○	○	○	○	0.189	0.165	0.011	-	0.008	0.005	0.014
1130175	GTN-5N	GCMX-5N	●	●	●	●	●	●	0.201	0.177	0.011	-	0.008	0.005	0.014
1130176	GTN-6N	GCMX-6N	●	●	●	●	●	●	0.252	0.217	0.014	-	0.010	0.006	0.016
1130449	GTN-8N	GCMX-8N	○	○	○	○	○	○	0.315	0.280	0.016	-	0.011	0.007	0.018

● First choice | Primeira opção | 1ª opción ● Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Insert Order Code = (1) geometry Code + (2) Grade Code

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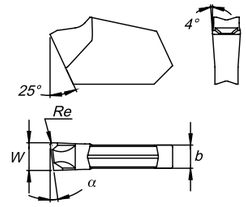
INSERTS || Pastilhas | Plaquitas

GTN-R



			P		M		K								
			CVD-MT		CVD-MT		CVD-MT								
	(2) Grade code		L7	N2	L7	N2	L6	N2	Dimensions (in)				Cutting Conditions		
(1) Geometry code	ANSI Reference	ISO Reference	PH5115	PH5135	PH5115	PH5135	PH5320	PH5135	W	b	Re	α	fn (in/r)	Min	Max
1130166	GTN-2R 4	GCMX-2R 4	○	○	○	○	○	○	0.087	0.071	0.006	0.157	0.003	0.002	0.005
1130167	GTN-2R 8	GCMX-2R 8	○	○	○	○	○	○	0.087	0.071	0.006	0.315	0.002	0.002	0.004
1130255	GTN-2R 15	GCMX-2R 15	○	○	○	○	○	○	0.087	0.071	0.006	0.591	0.002	0.002	0.004
1130257	GTN-2.4R 4	GCMX-2.4R 4	○	○	○	○	○	○	0.094	0.079	0.006	0.157	0.003	0.002	0.006
1130233	GTN-2.4R 8	GCMX-2.4R 8	○	○	○	○	○	○	0.094	0.079	0.006	0.315	0.003	0.002	0.005
1130258	GTN-2.4R 15	GCMX-2.4R 15	○	○	○	○	○	○	0.094	0.079	0.006	0.591	0.002	0.002	0.004
1130170	GTN-3R 4	GCMX-3R 4	○	○	○	○	○	○	0.122	0.102	0.008	0.157	0.003	0.002	0.006
1130171	GTN-3R 8	GCMX-3R 8	○	○	○	○	○	○	0.122	0.102	0.008	0.315	0.003	0.002	0.005
1130253	GTN-3R 15	GCMX-3R 15	○	○	○	○	○	○	0.122	0.102	0.008	0.591	0.002	0.002	0.004
1130261	GTN-4R 4	GCMX-4R 4	○	○	○	○	○	○	0.161	0.138	0.010	0.157	0.005	0.003	0.008
1130222	GTN-4R 8	GCMX-4R 8	○	○	○	○	○	○	0.161	0.138	0.010	0.315	0.004	0.003	0.005
1130262	GTN-4R 15	GCMX-4R 15	○	○	○	○	○	○	0.161	0.138	0.010	0.591	0.004	0.003	0.005
1130264	GTN-4.8R 4	GCMX-4.8R 4	○	○	○	○	○	○	0.189	0.165	0.011	0.157	0.007	0.004	0.010
1130230	GTN-4.8R 8	GCMX-4.8R 8	○	○	○	○	○	○	0.189	0.165	0.011	0.315	0.005	0.004	0.007
1130265	GTN-4.8R 15	GCMX-4.8R 15	○	○	○	○	○	○	0.189	0.165	0.011	0.591	0.005	0.004	0.006
1130268	GTN-5R 4	GCMX-5R 4	○	○	○	○	○	○	0.201	0.177	0.011	0.157	0.007	0.004	0.010
1130224	GTN-5R 8	GCMX-5R 8	○	○	○	○	○	○	0.201	0.177	0.011	0.315	0.005	0.004	0.007
1130269	GTN-5R 15	GCMX-5R 15	○	○	○	○	○	○	0.201	0.177	0.011	0.591	0.005	0.004	0.006
1130272	GTN-6R 4	GCMX-6R 4	○	○	○	○	○	○	0.252	0.217	0.014	0.157	0.008	0.004	0.012
1130227	GTN-6R 8	GCMX-6R 8	○	○	○	○	○	○	0.252	0.217	0.014	0.315	0.007	0.005	0.008
1130276	GTN-6R 15	GCMX-6R 15	○	○	○	○	○	○	0.252	0.217	0.014	0.591	0.006	0.004	0.007

● First choice | Primeira opção | 1ª opción ● Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Insert Order Code = (1) geometry Code + (2) Grade Code

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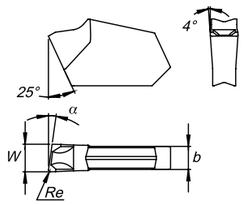
D
GROOVING &PARTING OFF
Grooving & Part Off
SAL Swiss Automatic Lathes
Technical Data

GTN-L

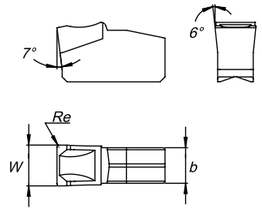


(1) Geometry code	(2) Grade code ANSI Reference	ISO Reference	P CVD-MT L7 PH5115	P CVD-MT N2 PH5135	M CVD-MT L7 PH5115	M CVD-MT N2 PH5135	K CVD-MT L6 PH5320	K CVD-MT N2 PH5135	Dimensions (in) W	b	Re	α	Cutting Conditions fn (in/r)	Min	Max
1130164	GTN-2L 4	GCMX-2L 4	○	○	○	○	○	○	0.087	0.071	0.006	0.157	0.003	0.002	0.005
1130220	GTN-2L 8	GCMX-2L 8	○	○	○	○	○	○	0.087	0.071	0.006	0.315	0.002	0.002	0.004
1130256	GTN-2L 15	GCMX-2L 15	○	○	○	○	○	○	0.087	0.071	0.006	0.591	0.002	0.002	0.004
1130259	GTN-2.4L 4	GCMX-2.4L 4	○	○	○	○	○	○	0.094	0.079	0.006	0.157	0.003	0.002	0.006
1130232	GTN-2.4L 8	GCMX-2.4L 8	○	○	○	○	○	○	0.094	0.079	0.006	0.315	0.003	0.002	0.005
1130260	GTN-2.4L 15	GCMX-2.4L 15	○	○	○	○	○	○	0.094	0.079	0.006	0.591	0.002	0.002	0.004
1130221	GTN-3L 4	GCMX-3L 4	○	○	○	○	○	○	0.122	0.102	0.008	0.157	0.003	0.002	0.006
1130168	GTN-3L 8	GCMX-3L 8	○	○	○	○	○	○	0.122	0.102	0.008	0.315	0.003	0.002	0.005
1130254	GTN-3L 15	GCMX-3L 15	○	○	○	○	○	○	0.122	0.102	0.008	0.591	0.002	0.002	0.004
1130173	GTN-4L 4	GCMX-4L 4	○	○	○	○	○	○	0.161	0.138	0.010	0.157	0.005	0.003	0.008
1130223	GTN-4L 8	GCMX-4L 8	○	○	○	○	○	○	0.161	0.138	0.010	0.315	0.004	0.003	0.005
1130263	GTN-4L 15	GCMX-4L 15	○	○	○	○	○	○	0.161	0.138	0.010	0.591	0.004	0.003	0.005
1130266	GTN-4.8L 4	GCMX-4.8L 4	○	○	○	○	○	○	0.189	0.165	0.011	0.157	0.007	0.004	0.010
1130231	GTN-4.8L 8	GCMX-4.8L 8	○	○	○	○	○	○	0.189	0.165	0.011	0.315	0.005	0.004	0.007
1130267	GTN-4.8L 15	GCMX-4.8L 15	○	○	○	○	○	○	0.189	0.165	0.011	0.591	0.005	0.004	0.006
1130270	GTN-5L 4	GCMX-5L 4	○	○	○	○	○	○	0.201	0.177	0.011	0.157	0.007	0.004	0.010
1130225	GTN-5L 8	GCMX-5L 8	○	○	○	○	○	○	0.201	0.177	0.011	0.315	0.005	0.004	0.007
1130271	GTN-5L 15	GCMX-5L 15	○	○	○	○	○	○	0.201	0.177	0.011	0.591	0.005	0.004	0.006
1130274	GTN-6L 4	GCMX-6L 4	○	○	○	○	○	○	0.252	0.217	0.014	0.157	0.008	0.004	0.012
1130226	GTN-6L 8	GCMX-6L 8	○	○	○	○	○	○	0.252	0.217	0.014	0.315	0.007	0.005	0.008
1130275	GTN-6L 15	GCMX-6L 15	○	○	○	○	○	○	0.252	0.217	0.014	0.591	0.006	0.004	0.007

First choice | Primeira opção | 1ª opción Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Insert Order Code = (1) geometry Code + (2) Grade Code

SANCAR-N

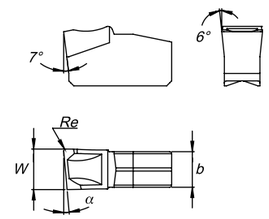


(1) Geometry code	(2) Grade code ANSI Reference	ISO Reference	P CVD-MT L7 PH5115	P CVD-MT N2 PH5135	M CVD-MT L7 PH5115	M CVD-MT N2 PH5135	K CVD-MT L6 PH5320	K CVD-MT N2 PH5135	Dimensions (in) W	b	Re	α	Cutting Conditions fn (in/r)	Min	Max
1130186	SANCAR-3N	SANCAR-3N	✪	✪	✪	✪	✪	✪	0.118	0.098	0.010	-	0.005	0.002	0.010
1130187	SANCAR-4N	SANCAR-4N	✪	✪	✪	✪	✪	✪	0.157	0.130	0.010	-	0.007	0.004	0.012
1130189	SANCAR-5N	SANCAR-5N	✪	✪	✪	✪	✪	✪	0.197	0.169	0.010	-	0.009	0.004	0.014

✪ First choice | Primeira opção | 1ª opción ✪ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Insert Order Code = (1) geometry Code + (2) Grade Code

SANCAR-R

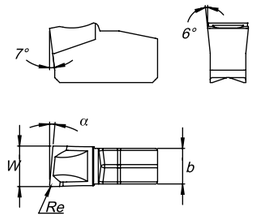


(1) Geometry code	(2) Grade code ANSI Reference	ISO Reference	P CVD-MT L7 PH5115	P CVD-MT N2 PH5135	M CVD-MT L7 PH5115	M CVD-MT N2 PH5135	K CVD-MT L6 PH5320	K CVD-MT N2 PH5135	Dimensions (in) W	b	Re	α	Cutting Conditions fn (in/r)	Min	Max
1130288	SANCAR-3R 5	SANCAR-3R 5	○	○	○	○	○	○	0.118	0.098	0.010	0.197	0.004	0.002	0.006
1130188	SANCAR-4R 5	SANCAR-4R 5	○	○	○	○	○	○	0.157	0.130	0.010	0.197	0.005	0.003	0.008
1130388	SANCAR-5R 5	SANCAR-5R 5	○	○	○	○	○	○	0.197	0.169	0.010	0.197	0.006	0.003	0.010

First choice | Primeira opção | 1ª opción Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Insert Order Code = (1) geometry Code + (2) Grade Code

SANCAR-L



			P		M		K								
			CVD-MT		CVD-MT		CVD-MT								
	(2) Grade code		L7	N2	L7	N2	L6	N2							
(1) Geometry code	ANSI Reference	ISO Reference	PH5115	PH5135	PH5115	PH5135	PH5320	PH5135	W	b	Re	α	fn (in/r)	Min	Max
1130185	SANCAR-3L 5	SANCAR-3L 5	○	○	○	○	○	○	0.118	0.098	0.010	0.197	0.004	0.002	0.006
1130390	SANCAR-4L 5	SANCAR-4L 5	○	○	○	○	○	○	0.157	0.130	0.010	0.197	0.005	0.003	0.008
1130389	SANCAR-5L 5	SANCAL-5L 5	○	○	○	○	○	○	0.197	0.169	0.010	0.197	0.006	0.003	0.010

Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Insert Order Code = (1) geometry Code + (2) Grade Code

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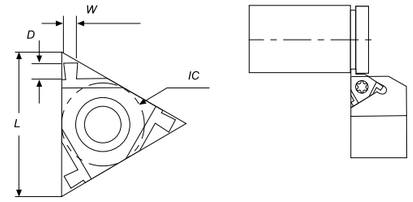
FLAT GROOVING

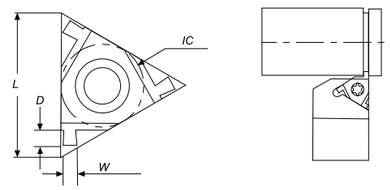
External



Order code Código	Reference Referência Referencia	Anvil	Dimensions | Dimensões | Dimensiones (in)				Stock - Grade Code (2)	
			IC	L	W	D	(68) PH6920	(D0) PH8920
1883721	11 ER W 0.50	-	1/4	0.433	0.020	0.055	○	○
1883722	11 ER W 0.60	-	1/4	0.433	0.024	0.055	○	○
1883723	11 ER W 0.70	-	1/4	0.433	0.028	0.055	○	○
1883724	11 ER W 0.80	-	1/4	0.433	0.031	0.055	○	○
1883725	11 ER W 1.00	-	1/4	0.433	0.039	0.051	○	○
1883726	16 ER W 0.50	EA 16	3/8	0.630	0.020	0.055	○	○
1881125	16 ER W 1.00	EA 16	3/8	0.630	0.039	0.055	◎	○
1883707	16 ER W 1.20	EA 16	3/8	0.630	0.047	0.063	◎	○
1883720	16 ER W 1.40	EA 16	3/8	0.630	0.055	0.071	◎	○
1881129	16 ER W 1.70	EA 16	3/8	0.630	0.067	0.079	◎	◎
1883711	16 ER W 1.95	EA 16	3/8	0.630	0.077	0.079	◎	◎
1883714	16 ER W 2.25	EA 16	3/8	0.630	0.089	0.089	◎	◎

Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Internal



Order code Código	Reference Referência Referencia	Anvil	Dimensions | Dimensões | Dimensiones (in)				Stock - Grade Code (2)	
			IC	L	W	D	(68) PH6920	(D0) PH8920
1881142	11 IR W 0.50	-	1/4	0.433	0.020	0.055	◎	○
1883727	11 IR W 0.60	-	1/4	0.433	0.024	0.055	○	○
1883728	11 IR W 0.70	-	1/4	0.433	0.028	0.055	○	○
1883729	11 IR W 0.80	-	1/4	0.433	0.031	0.055	○	○
1881144	11 IR W 1.00	-	1/4	0.433	0.039	0.051	◎	○
1883730	16 IR W 0.50	EA 16	3/8	0.630	0.020	0.055	○	○
1881134	16 IR W 1.00	EA 16	3/8	0.630	0.039	0.055	◎	○
1883731	16 IR W 1.20	EA 16	3/8	0.630	0.047	0.063	◎	○
1883712	16 IR W 1.40	EA 16	3/8	0.630	0.055	0.071	◎	○
1881138	16 IR W 1.70	EA 16	3/8	0.630	0.067	0.079	◎	○
1883710	16 IR W 1.95	EA 16	3/8	0.630	0.077	0.079	◎	○
1883713	16 IR W 2.25	EA 16	3/8	0.630	0.089	0.089	◎	○

Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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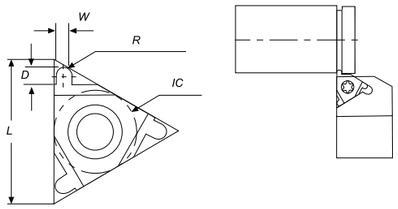
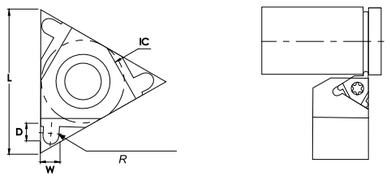
FULL RADIUS GROOVING



External

Order code Código	Reference Referência Referencia	Anvil	Dimensions | Dimensões | Dimensiones (in)					Stock - Grade Code (2)	
			IC	L	W	R	D	(68) PH6920	(D0) PH8920
1881149	16 ER R 0.50	EA 16	3/8	0.630	0.039	0.020	0.055	◎	○
1883732	16 ER R 0.60	EA 16	3/8	0.630	0.047	0.024	0.063	○	○
1883733	16 ER R 0.90	EA 16	3/8	0.630	0.071	0.035	0.079	○	○
1881151	16 ER R 1.00	EA 16	3/8	0.630	0.079	0.039	0.079	○	○
1883734	16 ER R 1.10	EA 16	3/8	0.630	0.087	0.043	0.085	○	○
1883735	16 ER R 1.20	EA 16	3/8	0.630	0.094	0.047	0.085	○	○

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta



Internal

Order code Código	Reference Referência Referencia	Anvil	Dimensions | Dimensões | Dimensiones (in)					Stock - Grade Code (2)	
			IC	L	W	R	D	(68) PH6920	(D0) PH8920
1881145	16 IR R 0.50	EA 16	3/8	0.630	0.039	0.020	0.055	○	○
1883736	16 IR R 0.60	EA 16	3/8	0.630	0.079	0.039	0.055	○	○
1883737	16 IR R 0.90	EA 16	3/8	0.630	0.094	0.047	0.063	○	○
1881147	16 IR R 1.00	EA 16	3/8	0.630	0.110	0.055	0.071	○	○
1883738	16 IR R 1.10	EA 16	3/8	0.630	0.134	0.067	0.079	○	○
1883739	16 IR R 1.20	EA 16	3/8	0.630	0.154	0.077	0.079	○	○

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

BL	ST	3	-	26
1	2	3		4

1 - Product Line

BL - Blade

2 - Blade Type

ST - Standard Blade

S - SANCAR Blade

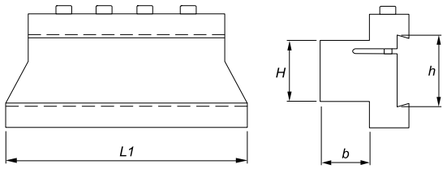
3 - Cutting Width

2 - 0.079 in | 3 - 0.118 in | 4 - 0.157 in | 5 - 0.197 in | 6 - 0.236 in

4 - Maximum Depth of Cut

19 - 0.748 in | 26 - 1.024 in | 32 - 1.260 in

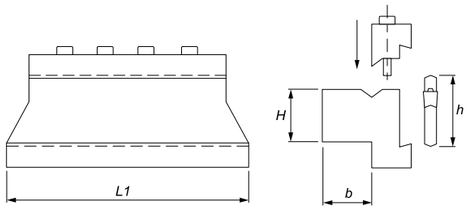
CPTS



Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				lbs	Screw	Wrench	Stock
		h	L1	H	b				
290009300	CPTS 1916	0.748	2.992	0.630	0.630	0.661	D0503000	SS40	●
290008200	CPTS 2616	1.024	2.992	0.630	0.630	0.992	D0603600	SS50	●
290006000	CPTS 2620	1.024	3.425	0.787	0.787	1.102	D0603600	SS50	●
290006100	CPTS 2625	1.024	3.425	0.984	0.984	1.433	D0603600	SS50	●
290006200	CPTS 3220	1.260	3.937	0.787	0.787	1.543	D0603600	SS50	●
290005000	CPTS 3225	1.260	4.331	0.984	0.984	2.094	D0603600	SS50	●
290006300	CPTS 3232	1,260	4.724	1.260	1.260	3.086	D0603600	SS50	●
290074000	CPTS 5250	2.047	5.315	1.969	1.969	7.494	D0804800	SS60	●

● Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

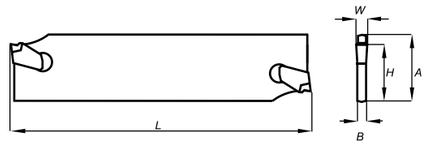
DPTS

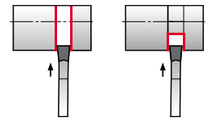


Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				lbs	Screw	Wrench	Stock
		h	L1	H	b				
290045400	DPTS 1916	0.748	2.992	0.630	0.630	0.551	D0503000	SS40	●
290045500	DPTS 2620	1.024	3.425	0.787	0.787	1.212	D0603600	SS50	●
290046600	DPTS 2625	1.024	3.425	0.984	0.984	1.543	D0603600	SS50	●
290073600	DPTS 3220	1.260	3.937	0.787	0.787	1.653	D0603600	SS50	●
290073700	DPTS 3225	1.260	4.331	0.984	0.984	2.204	D0603600	SS50	●
290073800	DPTS 3232	1.260	4.724	1.260	1.260	3.196	D0603600	SS50	●
290073900	DPTS 5250	2.047	5.315	1.969	1.969	7.604	D0804800	SS60	●

● Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

BLST (GTN)

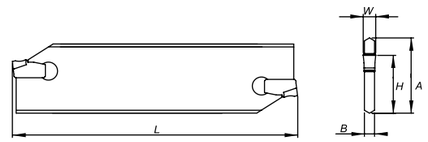


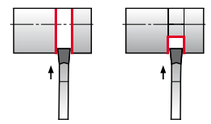


Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Inserts	Wrench	Stock
		A	W	H	B	L			
213008000	BLST 2-19	0.748	0.079	0.630	0.063	3.346	GTN-2...	LE05	●
213008100	BLST 2-26	1.024	0.079	0.843	0.063	4.331	GTN-2...	LE05	●
213008200	BLST 3-26	1.024	0.118	0.843	0.094	4.331	GTN-3...	LE05	●
213008300	BLST 4-26	1.024	0.157	0.843	0.126	4.331	GTN-4...	LE05	●
213008400	BLST 5-26	1.024	0.197	0.843	0.157	4.331	GTN-5...	LE05	●
213008500	BLST 6-26	1.024	0.236	0.843	0.205	4.331	GTN-6...	LE05	●
213008600	BLST 2-32	1.260	0.079	0.984	0.063	5.906	GTN-2...	LE05	●
213008700	BLST 3-32	1.260	0.118	0.984	0.094	5.906	GTN-3...	LE05	●
213008800	BLST 4-32	1.260	0.157	0.984	0.126	5.906	GTN-4...	LE05	●
213008900	BLST 5-32	1.260	0.197	0.984	0.157	5.906	GTN-5...	LE05	●
213009000	BLST 6-32	1.260	0.236	0.984	0.205	5.906	GTN-6...	LE05	●

● Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

BLS (SANCAR)





Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Inserts	Wrench	Stock
		A	W	H	B	L			
213004600	BLS 3-32	1.260	0.118	0.984	0.094	5.906	SANCAR 3...	LE05	●
213004700	BLS 4-32	1.260	0.157	0.984	0.126	5.906	SANCAR 4...	LE05	●
213005500	BLS 5-32	1.260	0.197	0.984	0.157	5.906	SANCAR 5...	LE05	●

● Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

NEW

MAIN APLICATIONS - Características principais | Características principales

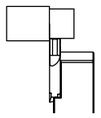
INSERTS

4 Different operations:

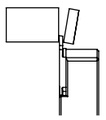
- Turning
- Parting off
- Grooving
- Threading

TOOLHOLDERS

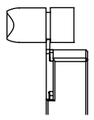
Metric:	Inches:
- 08x08mm	- 0,625 x 0,625”
- 10x10mm	- 0,500 x 0,500”
- 12x12mm	- 0,375 x 0,375”
- 16x16mm	- 0,312 x 0,312”



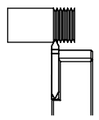
Turning



Parting off



Grooving



Threading

NEW

NEW

INSERTS CODE KEY - Chave de codificação para pastilhas | Llave de codificación de plaquitas

Grooving Inserts

1	2	5	6	8	-	11
SAL	25	G	050	R		GS

Parting Off Inserts

1	3	5	6	8	9	-	11
SAL	11	P	100	R	N		P07

Threading Inserts

1	4	5	7	8	10	-	11
SAL	100	H	010	R	60		PT

Turning Inserts

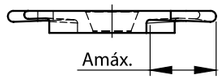
1	2	5	6	8	-	11
SAL	60	T	300	R		TP

1 - Product line

SAL - Swiss Automatic Lathes Line

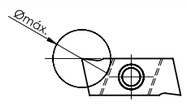
2 - Maximum depth of cut (Turning and Grooving inserts)

25 - 2,5mm | 60 - 6,0mm



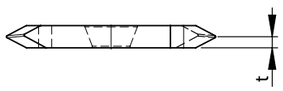
3 - Maximum Cutting Diameter (Parting Off Inserts)

11 - 11,0mm | 13 - 13,0mm



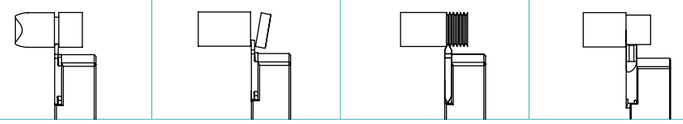
4 - Center distance (Threading Inserts)

050 - 0,5mm | 100 - 1,00mm



5 - Operations type

G - Grooving	P - Parting off	H - Threading	T - Turning

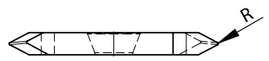


6 - Cut thickness (Grooving, Parting Off and Turning Inserts)

050 - 0,50mm | 070 - 0,70mm | 080 - 0,80mm
090 - 0,90mm | 100 - 1,00mm |110 - 1,10mm
130 - 1,30mm | 150 - 1,50mm | 160 - 1,60mm
185 - 1,85mm | 200 - 2,00 mm | 300 - 3,00 mm

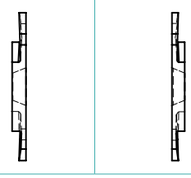
7 - Corner radius (Threading Inserts)

005 - 0,05mm | 010 - 0,10mm
012 - 0,12mm



8- Insert / toolholder side

L - Left hand	R - Right hand

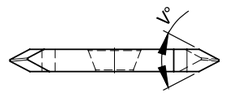


9 - Front angle (Parting off)

N - Neutral	R - Right	L - Left

10 - Angle (Threading Inserts)

55 - 55° | 60 - 60°



11 - Chip Breaker (Turning, Grooving, Parting Off and Threading Inserts)

Turning	TP - Turning steel
Grooving	GS - Square Grooving GR - Round Grooving
Parting Off	P00 - Front angle 0° P07 - Front angle 7°
Threading	PT - Partial Profile

NEW

TOOLHOLDERS CODE KEY - Chave de codificação para suportes | Llave de codificación de herramienta

For convencional Toolholders (Metric)

1	2	3	4	-	5	6	-	7	8
SAL	H	E	R		08	08		M	07

For Convencional Toolholders (Imperial)

1	2	3	4	-	8	9
SAL	H	E	L		07	05

1 - Product line

SAL - Swiss Automatic Lathes Line

2 - Tool type

H - Holder

3 - Internal or External

E - External

4 - Insert / toolholder side

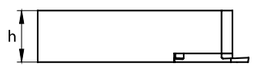
L - Left hand	R - Right hand

5 - Shank height (Metric)

Metric
08 - 8 mm
10 - 10 mm
12 - 12 mm
16 - 16 mm

6 - Shank widht (Metric)

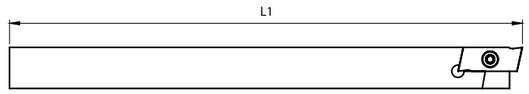
Metric
08 - 8 mm
10 - 10 mm
12 - 12 mm
16 - 16 mm



7 - Shank height (Metric or Imperial)

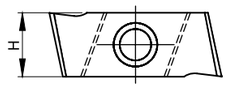
L - 140 mm

M - 150 mm



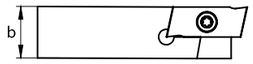
8 - Insert cutting edge lenght (mm)

07 - 7,0 mm



9 - Shank height (Imperial)

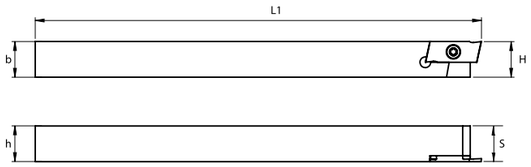
Imperial
05 - 5/16´´x 5/16´´
06 - 3/8´´x 3/8´´
08 - 1/2´´x 1/2´´
10 - 5/8´´ x 5/8´´



NEW

EXTERNAL TOOLHOLDERS | Suportes exteriores | herramientas de tronzado exterior

Left hand style show

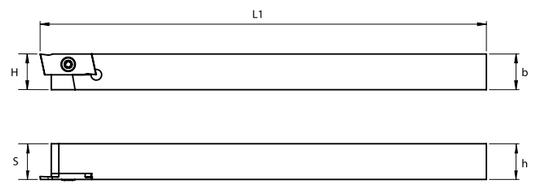


Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					* Insert	Screw	Wrench	Stock
		h	b	H	L1	S				
213024700	SALHEL 05-07	0.312	0.312	0.312	6.00	0.312	SAL...L	P0300900	XT 08	◎
213024800	SALHEL 06-07	0.375	0.375	0.375	6.00	0.375	SAL...L	P0300900	XT 08	◎
213024900	SALHEL 08-07	0.500	0.500	0.500	6.00	0.500	SAL...L	P0300900	XT 08	◎
213025000	SALHEL 10-07	0.625	0.625	0.625	6.00	0.625	SAL...L	P0300900	XT 08	◎

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

* Left insert only fits on left toolholder

Right hand style show



Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					* Insert	Screw	Wrench	Stock
		h	b	H	L1	S				
213024300	SALHER 05-07	0.312	0.312	0.312	6.00	0.312	SAL...R	P0300900	XT 08	◎
213024400	SALHER 06-07	0.375	0.375	0.375	6.00	0.375	SAL...R	P0300900	XT 08	◎
213024500	SALHER 08-07	0.500	0.500	0.500	6.00	0.500	SAL...R	P0300900	XT 08	◎
213024600	SALHER 10-07	0.625	0.625	0.625	6.00	0.625	SAL...R	P0300900	XT 08	◎

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

* Right insert only fits on right toolholder

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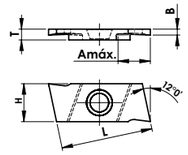
SAL - Swiss Automatic Lathes | Maquinação de precisão | Herramientas para tornos automáticos

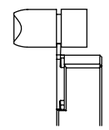
NEW

GS SERIES | Inserts | Pastilhas | Plaquitas

Right hand style show

Inserts for square grooving
Pastilhas para torneamento quadrado
Plaquitas para torneado quadrado





Grooving

(1) Geometry code	ANSI Reference	ISO Reference	(2) Grade code P G1 PH7910	P G4 PH7920	M G4 PH7920	M P8 PH7135	K G4 PH7920	K P8 PH7135	S G4 PH7920	S P8 PH7135	Dimensions (in) B	L	T	H	Amáx.	V°	Ømáx.	Cutting conditions fn (in/r)	Min.	Max.
1130441	SAL25G050R-GS	SAL25G050R-GS	○	◎	◎	○	◎	○	◎	○	0.020	0.669	0.079	0.276	0.098	-	-	0.002	0.001	0.002
1130475	SAL25G070R-GS	SAL25G070R-GS	○	◎	◎	○	◎	○	◎	○	0.028	0.669	0.079	0.276	0.098	-	-	0.002	0.001	0.003
1130477	SAL25G080R-GS	SAL25G080R-GS	○	◎	◎	○	◎	○	◎	○	0.031	0.669	0.079	0.276	0.098	-	-	0.002	0.001	0.004
1130479	SAL25G090R-GS	SAL25G090R-GS	○	◎	◎	○	◎	○	◎	○	0.035	0.669	0.079	0.276	0.098	-	-	0.002	0.001	0.004
1130488	SAL60G110R-GS	SAL60G110R-GS	○	◎	◎	○	◎	○	◎	○	0.043	0.669	0.079	0.276	0.236	-	-	0.002	0.001	0.004
1130490	SAL60G130R-GS	SAL60G130R-GS	○	◎	◎	○	◎	○	◎	○	0.051	0.669	0.079	0.276	0.236	-	-	0.003	0.001	0.005
1130442	SAL60G160R-GS	SAL60G160R-GS	○	◎	◎	○	◎	○	◎	○	0.063	0.669	0.079	0.276	0.236	-	-	0.003	0.001	0.005
1130495	SAL60G185R-GS	SAL60G185R-GS	○	◎	◎	○	◎	○	◎	○	0.073	0.669	0.079	0.276	0.236	-	-	0.003	0.001	0.006
1130473	SAL25G050L-GS	SAL25G050L-GS	○	◎	◎	○	◎	○	◎	○	0.020	0.669	0.079	0.276	0.098	-	-	0.002	0.001	0.002
1130474	SAL25G070L-GS	SAL25G070L-GS	○	◎	◎	○	◎	○	◎	○	0.028	0.669	0.079	0.276	0.098	-	-	0.002	0.001	0.003
1130476	SAL25G080L-GS	SAL25G080L-GS	○	◎	◎	○	◎	○	◎	○	0.031	0.669	0.079	0.276	0.098	-	-	0.002	0.001	0.004
1130478	SAL25G090L-GS	SAL25G090L-GS	○	◎	◎	○	◎	○	◎	○	0.035	0.669	0.079	0.276	0.098	-	-	0.002	0.001	0.004
1130487	SAL60G110L-GS	SAL60G110L-GS	○	◎	◎	○	◎	○	◎	○	0.043	0.669	0.079	0.276	0.236	-	-	0.002	0.001	0.004
1130489	SAL60G130L-GS	SAL60G130L-GS	○	◎	◎	○	◎	○	◎	○	0.051	0.669	0.079	0.276	0.236	-	-	0.003	0.001	0.005
1130493	SAL60G160L-GS	SAL60G160L-GS	○	◎	◎	○	◎	○	◎	○	0.063	0.669	0.079	0.276	0.236	-	-	0.003	0.001	0.005
1130494	SAL60G185L-GS	SAL60G185L-GS	○	◎	◎	○	◎	○	◎	○	0.073	0.669	0.079	0.276	0.236	-	-	0.003	0.001	0.006

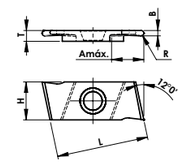
◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

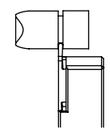
Order code = (1) Geometry code + (2) Grade code

GR SERIES | Inserts | Pastilhas | Plaquitas

Right hand style show

For round grooving
Para torneamento redondo
Para torneado redondo





Grooving

(1) Geometry code	ANSI Reference	ISO Reference	(2) Grade code P G1 PH7910	P G4 PH7920	M G4 PH7920	M P8 PH7135	K G4 PH7920	K P8 PH7135	S G4 PH7920	S P8 PH7135	Dimensions (in) B	L	T	H	Amáx.	V°	Ømáx.	Cutting conditions fn (mm/r)	Min.	Max.
1130443	SAL60G100R-GR	SAL60G100R-GR	○	◎	◎	○	◎	○	◎	○	0.039	0.669	0.079	0.276	0.236	-	-	0.002	0.001	0.004
1130492	SAL60G150R-GR	SAL60G150R-GR	○	◎	◎	○	◎	○	◎	○	0.059	0.669	0.079	0.276	0.236	-	-	0.003	0.001	0.005
1130497	SAL60G200R-GR	SAL60G200R-GR	○	◎	◎	○	◎	○	◎	○	0.079	0.669	0.079	0.276	0.236	-	-	0.003	0.001	0.006
1130486	SAL60G100L-GR	SAL60G100L-GR	○	◎	◎	○	◎	○	◎	○	0.039	0.669	0.079	0.276	0.236	-	-	0.002	0.001	0.004
1130491	SAL60G150L-GR	SAL60G150L-GR	○	◎	◎	○	◎	○	◎	○	0.059	0.669	0.079	0.276	0.236	-	-	0.003	0.001	0.005
1130496	SAL60G200L-GR	SAL60G200L-GR	○	◎	◎	○	◎	○	◎	○	0.079	0.669	0.079	0.276	0.236	-	-	0.003	0.001	0.006

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Order code = (1) Geometry code + (2) Grade code

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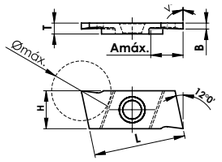
D
GROOVING &PARTING OFF
Grooving & Part Off
SAL Swiss Automatic Lathes
Technical Data

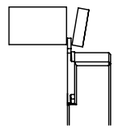
NEW

P(P00) SERIES | Inserts | Pastilhas | Plaquitas

Right hand style show

Without front angle
Sem ângulo frontal
Sín angulo frontal





Parting off

(1) Geometry code	(2) Grade code ANSI Reference	ISO Reference	P G1 PH7910	P G4 PH7920	M G4 PH7920	M P8 PH7135	K G4 PH7920	K P8 PH7135	S G4 PH7920	S P8 PH7135	Dimensions (in) B	L	T	H	Amáx.	V°	Ømáx.	Cutting conditions fn (in/r)	Min.	Max.
1130444	SAL11P100RN-P00	SAL11P100RN-P00	○	⊛	⊛	○	⊛	○	⊛	○	0.039	0.669	0.079	0.276	0.236	0	0.433	0.002	0.001	0.004
1130462	SAL11P150RN-P00	SAL11P150RN-P00	○	⊛	⊛	○	⊛	○	⊛	○	0.059	0.669	0.079	0.276	0.236	0	0.433	0.003	0.001	0.005
1130468	SAL13P200RN-P00	SAL13P200RN-P00	○	⊛	⊛	○	⊛	○	⊛	○	0.079	0.669	0.079	0.276	0.236	0	0.512	0.003	0.001	0.006
1130456	SAL11P100LN-P00	SAL11P100LN-P00	○	⊛	⊛	○	⊛	○	⊛	○	0.039	0.669	0.079	0.276	0.236	0	0.433	0.002	0.001	0.004
1130459	SAL11P150LN-P00	SAL11P150LN-P00	○	⊛	⊛	○	⊛	○	⊛	○	0.059	0.669	0.079	0.276	0.236	0	0.433	0.003	0.001	0.005
1130465	SAL13P200LN-P00	SAL13P200LN-P00	○	⊛	⊛	○	⊛	○	⊛	○	0.079	0.669	0.079	0.276	0.236	0	0.512	0.003	0.001	0.006

⊛ Stock item | Produto de stock | Itens de stock

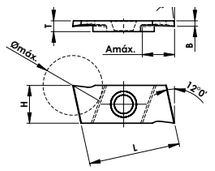
○ Available under request with delivery time 2 weeks
Disponível sobre consulta com prazo de entrega de 2 semanas
Disponible bajo consulta, con fecha de entrega en 2 semanas

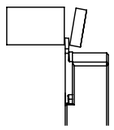
Order code = (1) Geometry code + (2) Grade code

P(P07) SERIES | Inserts | Pastilhas | Plaquitas

Right hand style show

Front angle 7º
Ângulo frontal de 7º
Angulo frontal de 7º





Parting off

(1) Geometry code	(2) Grade code ANSI Reference	ISO Reference	P G1 PH7910	P G4 PH7920	M G4 PH7920	M P8 PH7135	K G4 PH7920	K P8 PH7135	S G4 PH7920	S P8 PH7135	Dimensions (in) B	L	T	H	Amáx.	V°	Ømáx.	Cutting conditions fn (in/r)	Min.	Max.
1130445	SAL11P100RR-P07	SAL11P100RR-P07	○	⊛	⊛	○	⊛	○	⊛	○	0.039	0.669	0.079	0.276	0.236	0.276	0.433	0.002	0.001	0.003
1130446	SAL11P100RL-P07	SAL11P100RL-P07	○	⊛	⊛	○	⊛	○	⊛	○	0.039	0.669	0.079	0.276	0.236	0.276	0.433	0.002	0.001	0.003
1130463	SAL11P150RR-P07	SAL11P150RR-P07	○	⊛	⊛	○	⊛	○	⊛	○	0.059	0.669	0.079	0.276	0.236	0.276	0.433	0.002	0.001	0.004
1130461	SAL11P150RL-P07	SAL11P150RL-P07	○	⊛	⊛	○	⊛	○	⊛	○	0.059	0.669	0.079	0.276	0.236	0.276	0.433	0.002	0.001	0.004
1130469	SAL13P200RR-P07	SAL13P200RR-P07	○	⊛	⊛	○	⊛	○	⊛	○	0.079	0.669	0.079	0.276	0.236	0.276	0.512	0.002	0.001	0.005
1130467	SAL13P200RL-P07	SAL13P200RL-P07	○	⊛	⊛	○	⊛	○	⊛	○	0.079	0.669	0.079	0.276	0.236	0.276	0.512	0.002	0.001	0.005
1130457	SAL11P100LR-P07	SAL11P100LR-P07	○	⊛	⊛	○	⊛	○	⊛	○	0.039	0.669	0.079	0.276	0.236	0.276	0.433	0.002	0.001	0.003
1130455	SAL11P100LL-P07	SAL11P100LL-P07	○	⊛	⊛	○	⊛	○	⊛	○	0.039	0.669	0.079	0.276	0.236	0.276	0.433	0.002	0.001	0.003
1130460	SAL11P150LR-P07	SAL11P150LR-P07	○	⊛	⊛	○	⊛	○	⊛	○	0.059	0.669	0.079	0.276	0.236	0.276	0.433	0.002	0.001	0.004
1130458	SAL11P150LL-P07	SAL11P150LL-P07	○	⊛	⊛	○	⊛	○	⊛	○	0.059	0.669	0.079	0.276	0.236	0.276	0.433	0.002	0.001	0.004
1130466	SAL13P200LR-P07	SAL13P200LR-P07	○	⊛	⊛	○	⊛	○	⊛	○	0.079	0.669	0.079	0.276	0.236	0.276	0.512	0.002	0.001	0.005
1130464	SAL13P200LL-P07	SAL13P200LL-P07	○	⊛	⊛	○	⊛	○	⊛	○	0.079	0.669	0.079	0.276	0.236	0.276	0.512	0.002	0.001	0.005

⊛ Stock item | Produto de stock | Itens de stock

○ Available under request with delivery time 2 weeks
Disponível sobre consulta com prazo de entrega de 2 semanas
Disponible bajo consulta, con fecha de entrega en 2 semanas

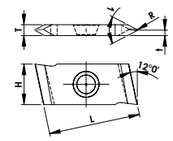
Order code = (1) Geometry code + (2) Grade code

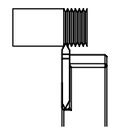
NEW

PT SERIES | Inserts | Pastilhas | Plaquitas

Right hand style show

For partial profile Threading
Para perfil parcial de roscagem
Para perfil parcial de roscado





Threading

(1) Geometry code	(2) Grade code ANSI Reference	ISO Reference	P G1 PH7910	P G4 PH7920	M G4 PH7920	M P8 PH7135	K G4 PH7920	K P8 PH7135	S G4 PH7920	S P8 PH7135	Dimensions (in) B	L	T	H	Amáx.	V°	Ømáx.	Cutting conditions fn (in/r)	Min.	Max.
1130472	SAL100H012R55-PT	SAL100H012R55-PT	○	⊛	⊛	○	⊛	○	⊛	○	0.039	0.669	0.079	0.276	0.005	2.165	-	0.031	0.008	0.079
1130447	SAL100H012R60-PT	SAL100H012R60-PT	○	⊛	⊛	○	⊛	○	⊛	○	0.039	0.669	0.079	0.276	0.005	2.362	-	0.031	0.008	0.079
1130470	SAL100H012L55-PT	SAL100H012L55-PT	○	⊛	⊛	○	⊛	○	⊛	○	0.039	0.669	0.079	0.276	0.005	2.165	-	0.031	0.008	0.079
1130471	SAL100H012L60-PT	SAL100H012L60-PT	○	⊛	⊛	○	⊛	○	⊛	○	0.039	0.669	0.079	0.276	0.005	2.362	-	0.031	0.008	0.079

⊛ Stock item | Produto de stock | Itens de stock

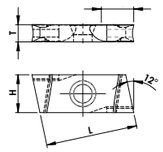
○ Available under request with delivery time 2 weeks
Disponível sobre consulta com prazo de entrega de 2 semanas
Disponible bajo consulta, con fecha de entrega en 2 semanas

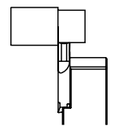
Order code = (1) Geometry code + (2) Grade code

TP SERIES | Inserts | Pastilhas | Plaquitas

Right hand style show

For turning
Para torneamento
Para torneado





Turning

(1) Geometry code	(2) Grade code ANSI Reference	ISO Reference	P G1 PH7910	P G4 PH7920	M G4 PH7920	M P8 PH7135	K G4 PH7920	K P8 PH7135	S G4 PH7920	S P8 PH7135	Dimensions (in) B	L	T	H	Amáx.	V°	Ømáx.	Cutting conditions fn (in/r)	Min.	Max.
1130501	SAL60T300R-TP	SAL60T300R-TP	○	⊛	⊛	○	⊛	○	⊛	○	-	0.669	0.125	0.276	0.236	-	-	0.003	0.001	0.005
1130499	SAL60T300L-TP	SAL60T300L-TP	○	⊛	⊛	○	⊛	○	⊛	○	-	0.669	0.125	0.276	0.236	-	-	0.003	0.001	0.005

⊛ Stock item | Produto de stock | Itens de stock

○ Available under request with delivery time 2 weeks
Disponível sobre consulta com prazo de entrega de 2 semanas
Disponible bajo consulta, con fecha de entrega en 2 semanas

Order code = (1) Geometry code + (2) Grade code

BLANKS FOR GRINDING | Blanks para personalizar | Blanks para personalizar

Right hand style show

Inserts blanks "do it yourself" grinding are available allowing modifications of the insert for any machining operation.

As pastilhas de blank "faça você mesmo" permitem a personalização da pastilha para qualquer operação de maquinação.

Las plaquitas de blank "haga usted mismo" permiten la personalización de la plaquita para qualquiera operación de maquinación.

(1) Geometry code	(2) Grade code ANSI/ ISO Reference	Uncoated 10 PH0910	12 PH0920	14 PH0135	Dimensions (in) B	L	T	H	Amáx.	V°	Ømáx.
1130440	BLANK SALR 17x7x2	⊛	⊛	⊛	-	0.689	0.079	0.295	-	-	-
1130504	BLANK SALR 17x7x3,17	⊛	⊛	⊛	-	0.689	0.125	0.295	-	-	-
1130453	BLANK SALL 17x7x2	⊛	⊛	⊛	-	0.689	0.079	0.295	-	-	-
1130505	BLANK SALL 17x7x3,17	⊛	⊛	⊛	-	0.689	0.125	0.295	-	-	-

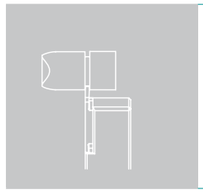
⊛ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Order code = (1) Geometry code + (2) Grade code

NEW

GROOVING | Canais | Ranurado

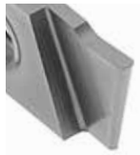


- High precision
- Close tolerances
- Wide variety of insert widths

GS

Square grooving

GR



Round grooving

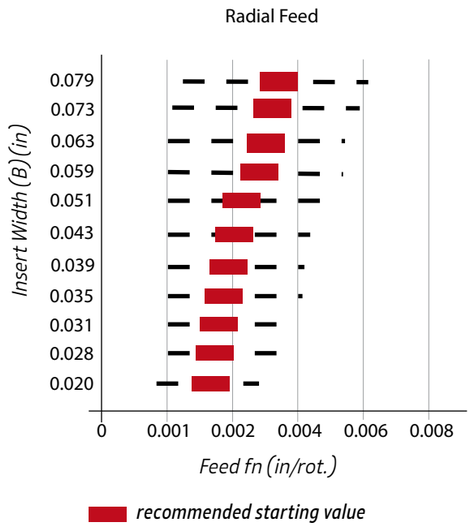
Recomended cutting conditions

P	M	K	S
197-656	197-591	197-492	66-164

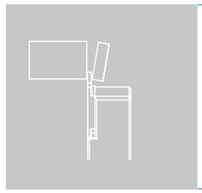
Recomended grade PH7920, (Vc) sfm.

Grade PH7910 and PH7135

Available under request (2 weeks delivery time)



PARTING OFF | Corte | Tronzado



- When parting off with a sub-spindle, it is more productive to use a straight cutting edge. This is a more stable parting method and will generate the best surface finish.
- When parting off without a sub-spindle, we recommend you use an insert with a maximum 7° front angle to minimize the risk of burr and pips on the component.
- When parting off with 7° front angled inserts, we recommend reducing the feed rate by approximately 30%.

P00

0º Relief angle

P07

7º Relief angle

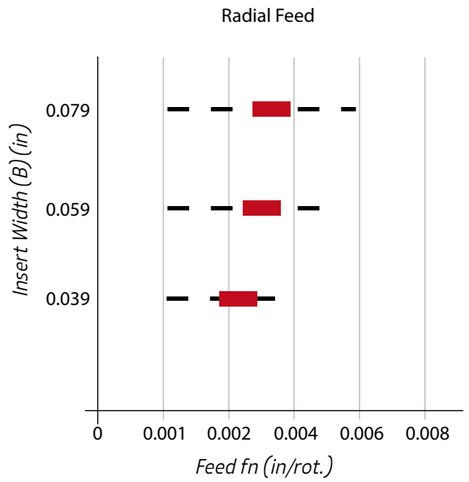
Recomended cutting conditions

P	M	K	S
197-656	197-591	197-492	66-164

Recomended grade PH7920, (Vc) sfm.

Grade PH7910 and PH7135

Available under request (2 weeks delivery time)



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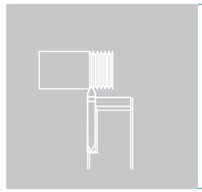
NEW

THREADING | Roscagem | Roscado

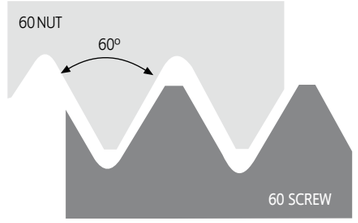


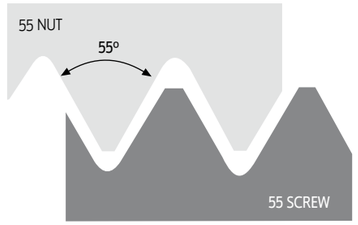
Two types of threading:

- Partial profile 55º
- Partial profile 60º

PT

Partial profile





Recomended cutting conditions

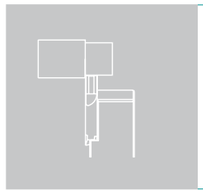
P	M	K	S
197-656	197-591	197-492	66-164

Recomended grade PH7920, (Vc) sfm.

Grade PH7910 and PH7135

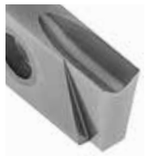
Available under request (2 weeks delivery time)

TURNING | Torneamento | Torneado



- Insert for turning
- Maximum deep of cut is 0.118 in
- Too low cutting speed will result in inadequate tool life and it is advisable to follow cutting speed recommendations.

TP



Turning steel

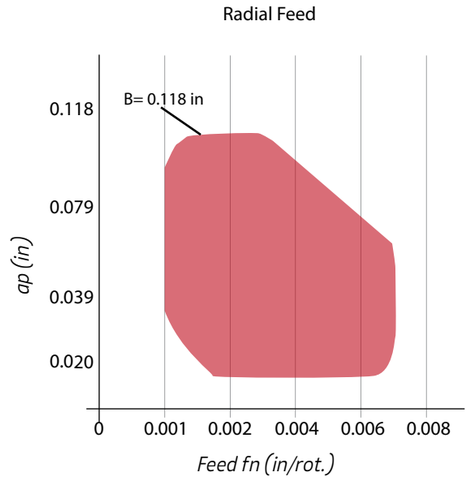
Recomended cutting conditions

P	M	K	S
197-656	197-591	197-492	66-164

Recomended grade PH7920, (Vc) sfm.

Grade PH7910 and PH7135

Available under request (2 weeks delivery time)



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SCREWS

Order code Código	Reference Referência Referencia	Sock
290074100	D0503000	◎
290020700	D0603600	◎
290074200	D0804800	◎
290062900	D0602200	◎

◎ Stock item | Produto de stock
Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta

WRENCHES

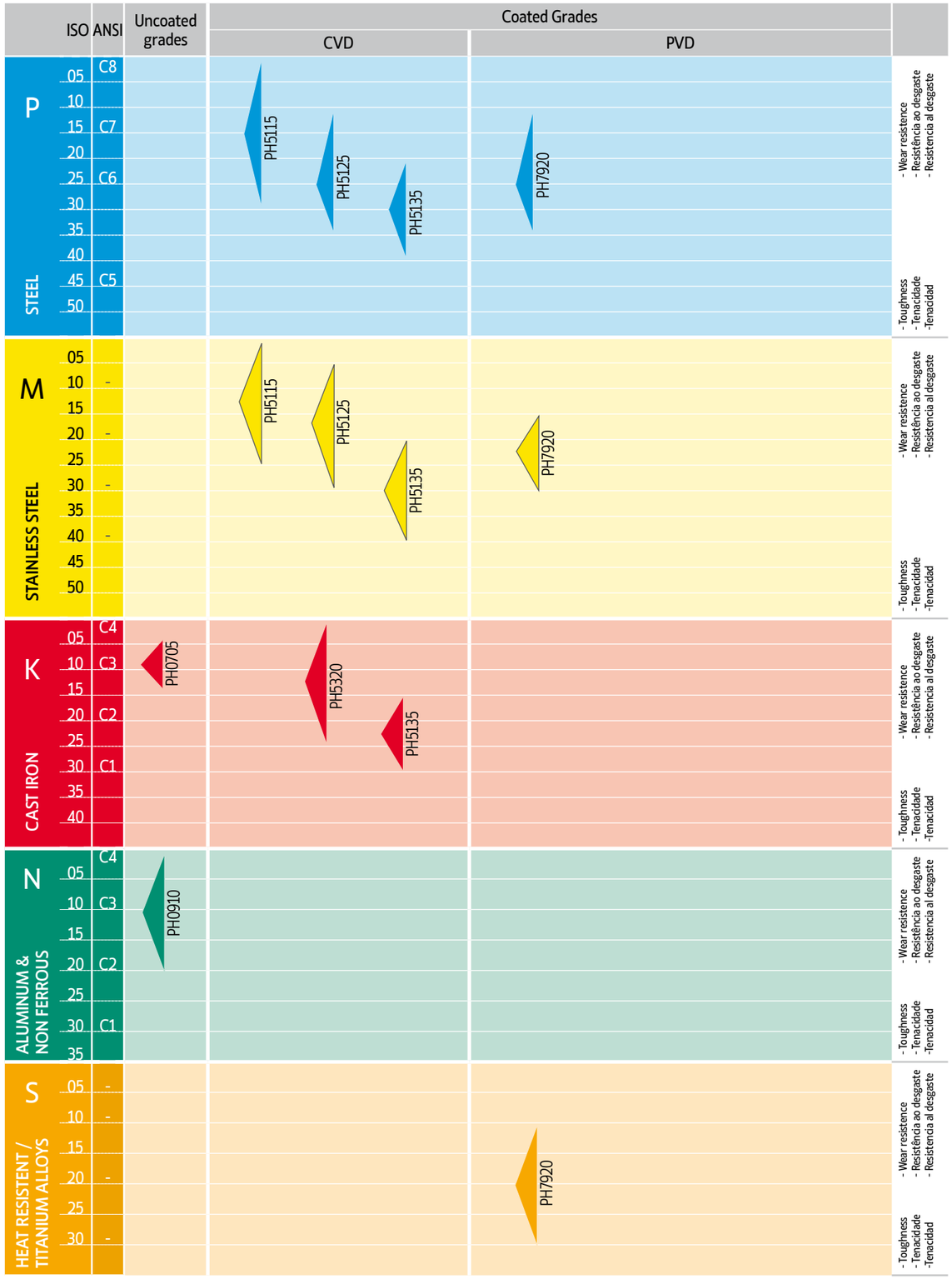
Order code Código	Reference Referência Referencia	Sock
290021200	SS40	◎
290021300	SS50	◎
290074300	SS60	◎

Order code Código	Reference Referência Referencia	Sock
290074400	LE05	◎

Order code Código	Reference Referência Referencia	Sock
290079600	LE25-30	◎

◎ Stock item | Produto de stock
Itens de stock

○ Available under request | Disponível sobre consulta
Disponible bajo consulta



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

Centre of the field of application.

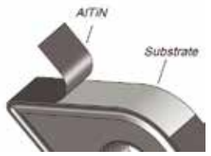
Recommended fiels of application

To be replaced by new grades

GROOVING & PARTING OFF GRADES DESCRIPTION

PVD GRADES

PH7920

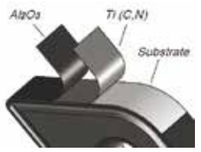


P10-P35
M10-M25
S10-S30

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

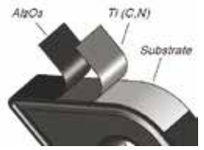
PH5115



P01-P30
M01-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.

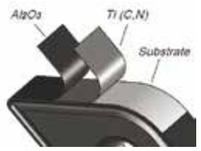
PH5125



P10-P35
M05-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.

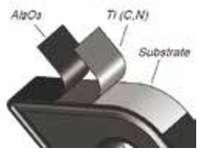
PH5135



P20-P40
M15-M35
K15-K30

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.

PH5320

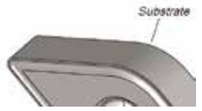


K01-K25

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 thoughness. Suitable for rough to finish turning of HRSA, Titanium alloys, cast irons and Aluminum alloys.

CUTTING SPEED (sfm)

ISO	Material	HB (brinell)	CVD Coating			PVD Coating
			← Wear Resistence			Toughness →
			PH5115	PH5125	PH5135	PH7920
			0.002 - 0.020	0.002 - 0.020	0.002 - 0.020	0.002 - 0.020
P	Unalloyed steel	125-170	279-542	230-492	230-460	148-394
	Low-alloy steel	180-350	197-460	181-427	181-410	164-378
	High-alloy stel	200-325	164-427	148-378	148-378	164-361

ISO	Material	HB (brinell)	CVD Coating			PVD Coating
			← Wear Resistence			Toughness →
			PH5115	PH5125	PH5135	PH7920
			0.002 - 0.020	0.002 - 0.020	0.002 - 0.020	0.002 - 0.020
M	SS - Ferretic/martensitic	200-330	214-574	181-542	148-509	148-460
	SS - Austenitic	180-330	214-492	181-460	164-427	164-410
	SS - Austenitic-ferretic (Duplex)	230-260	214-460	181-427	164-410	164-394

ISO	Material	HB (brinell)	CVD Coating		
			← Wear Resistence		Toughness →
			PH5705	PH5320	PH5135
			0.002 - 0.020	0.002 - 0.020	0.002 - 0.020
K	Marble cast iron	130-230	312-591	246-525	246-509
	Grey cast iron	180-220	296-574	230-509	230-460
	Modular cast iron	160-380	181-492	148-443	148-410

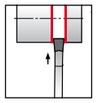
ISO	Material	HB (brinell)	Uncoated
			PH0910
			0.002 - 0.014
N	Aluminum alloys	60-130	624-5904
	Cooper and cooper alloys	90-110	132-1378

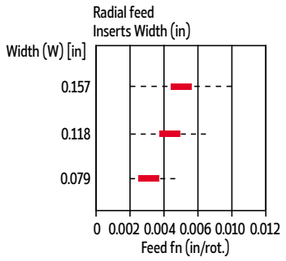
ISO	Material	HB (brinell)	PVD Coating
			PH7920
			0.002 - 0.012
S	Heat resistent super alloys (Iron base)	200-280	115-296
	Heat resistent super alloys (Nickel base)	250-320	73-197
	Heat resistent super alloys (Cobalt base)	200-320	89-263
	Titanium alloys (400<or<1050[MPa])	-	279-574

CUTTING PARAMETERS | Parâmetros de corte | Parámetros de corte

Feed recommendations and geometry descriptions	Grooving & Parting Off

GP...02-MC





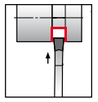
Medium Parting Off

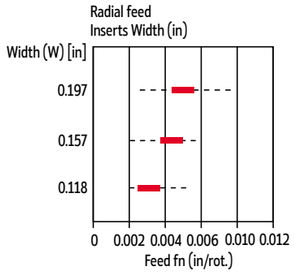
Recommended for parting off, thin walled tubes and small diameter components in all materials.

The positive geometry eliminates the risk of built-up edge.

Low cutting forces resulting in reducedvibration.

GP...02-MG





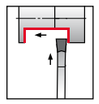
Medium Grooving

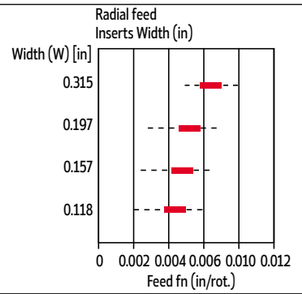
Outstanding chip control.

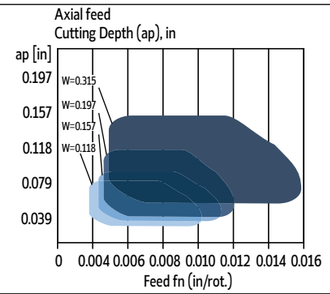
Reduces chip width giving good surfaces.

For all materials.

GP...02-MM





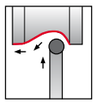


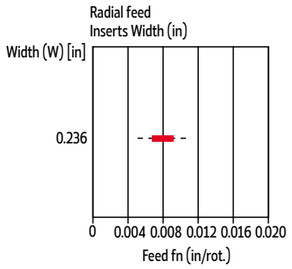
Medium Multi Function (Grooving & Turning)

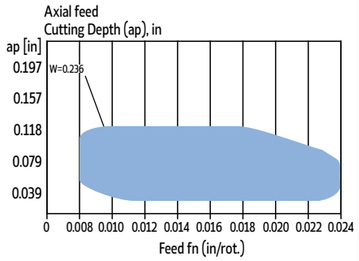
For grooving and turning in all materials.

Good chip control.

GP...02-MP







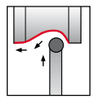
Medium Profiling

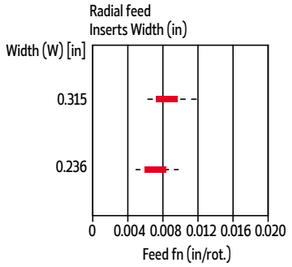
For profiling all materials.

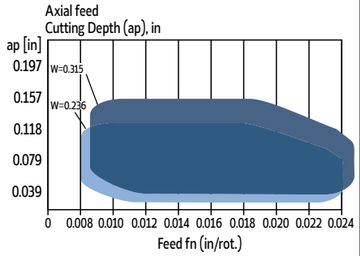
Outstanding chip control even at low feeds and small depths of cut.

Good surface finish.

GP...02-NP







Medium Aluminum profiling

First choice for profiling in non-ferrous materials.

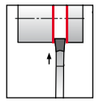
Good chip flow provides a better surface finishing.

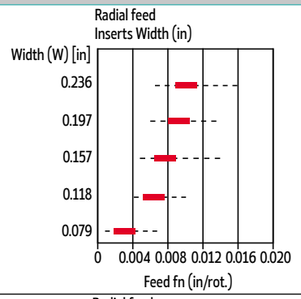
Sharp cutting edge.

CUTTING PARAMETERS | Parâmetros de corte | Parámetros de corte

Feed recommendations and geometry descriptions	Grooving & Parting Off

GTN-...

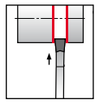


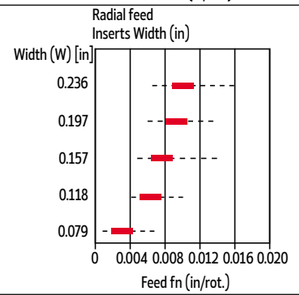


Medium Parting Off

Most efficient on stainless steel and most types of steel at moderate feed rates.
Superior straightness of cut

SANCAR-...





Medium Parting Off

Optimizer to minimize pips and burrs on components.
Recommended for steel, stainless steel and cast iron.

Recommended starting value.
For cutting speed recommendations, see page D - 333

THREADING

Partial Profile Example

16 | ER | A | 55 | PH6920

Insert Size

L	I.C.
06	4,00
08	5,00
11	6,35
16	9,525
22	12,70
27	15,875

Insert Size

ER= EX. R.H.
EL= EX. L.H.

IR= IN. R.H.
IL= IN. L.H.

Pitch

Partial Profile

	mm	tpi
A	0,5-1,5	48-16
G	1,75-3,0	14-8
AG	0,5-3,0	48-8
N	3,5-5,0	7-5
Q	5,5-6,0	4,5-4

Full Profile

mm	tpi
0,35-6,0	72-4

Profile

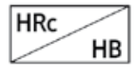
Partial Profile
60º
55º
Full Profile
ISO METRIC
UN
WHITWORTH
BSPT
MJ
NPT
NPTF
TRAPEZ
ACME
STUBACME
AM. BUTTRESS
ROUND (DIN 405)
DIN 20400
PG
SAGENGWINDE
UNJ
API
BUT. CASING
EXTREME LINE

Grades

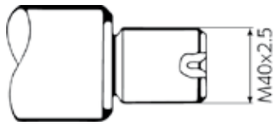
PH0920
PH6920

Full Profile Example

16 | ER | 1.5 | ISO | PH6920

Workpiece	Material Type	
	Material Dimension: Diameter and Length	
	Chipflow Character	
	Material Hardeness	
Thread Application	External or Internal	
	Profile Shape	
	Surface Finish	
Machine	Machine Stability	
	Max. RPM	
	Clamping System Stability	
Coolant	Coolant Type	
Holders	Holder Cross Section Area	
	Holder Overhang	
	Through Coolant Option	
	Shank Type: Carbide, Alloy, Carbide Implant	
Partial Profile	Grade	
	Profile Shape: Pitch and Depth	
	Nose Radius	
	Chipbreaker Style	

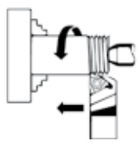
HOW TO CHOOSE THREAD TURNING - EXAMPLE



Application:

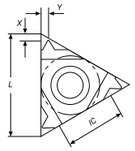
Thread: External Right Hand
ISO MetricM40x2,5
Material: 4140 (25HRc)

1 - Choose the Thread Turning Method



Feed direction towards the chuck was choosen.
Therefore, an external right hand insert and an external right hand holder will be used.

2 - Choose the Insert Size



Chosen insert: **16ER 2.50ISO**

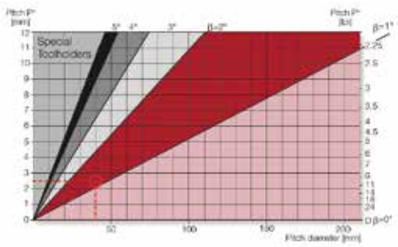
Insert Size		Pitch	Reference	Anvil	Toolholder
IC	L mm	mm		RH	
3/8	16	2.50	16ER 2.50ISO	EA16	STCNL 2525 M16

3 - Choose the Toolholder

Chosen toolholder: **SXANR 2525 M16**

Insert Size	Reference	Dimensions mm		
IC		H=H1=B	F	L
3/8	SXANR 2525 M16	25	25	150

4 - Find the Helix Angle



From the table, using a pitch of 2,5mm (10 tpi) and a workpiece diameter of 40mm (1,57"), we find the helix angle to be **1,5º**

5 - Choose the Correct Anvil

Anvil choosen: **EA16**

Resultant Helix Angle			3.5	2.5	**1.5**	0.5
Insert Size		Holder				
IC	L mm					
3/8	16	ER/IL	EA16+3.5	EA16+2.5	EA16	EA16+0.5

6 - Choose the Carbide Grade and Cutting Speed

Carbide grade choosen: **PH6920**
Cutting Speed: **460 sfm**

	Material:		Hardness Brinell HB	PH6920
P	Low alloy steel (alloying elements < 5%)	Non hardened	180	**279 - 476**
		Hardened	275	240 - 460
		Hardened	350	230 - 443

7 - Determine the Number of Passes

Number of passes: 10

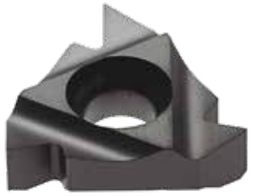
ISO External

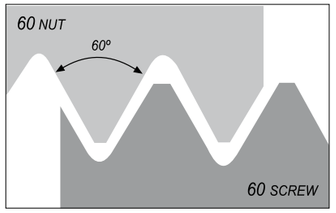
Pitch	mm	1.50	1.75	2.00	**2.50**	3.00	3.50	4.00
	tpi	16	14	12	10	8	7	6
No. of passes		6-10	7-12	7-12	**8-14**	9-16	10-18	11-18

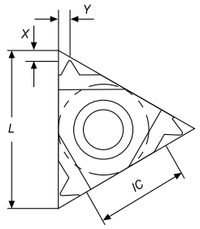
Summary

	Thread Type	ISO M40x2,5 External Right Hand
1	Feed Direction:	Towards the chuck
2	Insert and Grade:	16ER 2,5ISO PH6920
3	Toolholder:	SXANR 2525 M16
4	Helix Angle:	1,5º
5	Anvil:	EA16
6	Cutting Speed:	460 sfm
7	Number of Passes;	14

PARTIAL PROFILE 60°







External

Order code Código (1)	Reference Referência Referencia	Pitch		L (mm)	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)	
		MM	TPI		IC	X	Y	(68) PH6920	(D0) PH8920
1880592	11 ER A60	0.5-1.5	48-16	11	1/4	0.031	0.035	●	○
1880429	16 ER A60	0.5-1.5	48-16	16	3/8	0.031	0.035	●	○
1880431	16 ER G60	1.75-3.0	14-8	16	3/8	0.047	0.067	●	○
1880388	16 ER AG60	0.5-3.0	48-8	16	3/8	0.047	0.067	●	○
1880046	22 ER N60	3.5-5.0	7-5	22	1/2	0.067	0.098	●	○
1882486	27 ER Q60	5.5-6.0	4.5-4	27	5/8	0.083	0.122	○	○
1881851	11 EL A60	0.5-1.5	48-16	11	1/4	0.031	0.035	●	○
1880771	16 EL A60	0.5-1.5	48-16	16	3/8	0.031	0.035	●	○
1880773	16 EL G60	1.75-3.0	14-8	16	3/8	0.047	0.067	●	○
1880524	16 EL AG60	0.5-3.0	48-8	16	3/8	0.047	0.067	●	○
1880853	22 EL N60	3.5-5.0	7-5	22	1/2	0.067	0.098	●	○
1882155	27 EL Q60	5.5-6.0	4.5-4	27	5/8	0.083	0.122	○	○

● Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

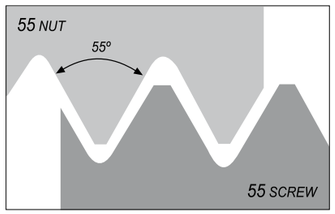
Internal

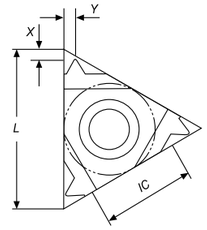
Order code Código (1)	Reference Referência Referencia	Pitch		L (mm)	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)	
		MM	TPI		IC	X	Y	(68) PH6920	(D0) PH8920
1881730	06 IR A60	0.5-1.25	48-20	0.236	5/32	0.024	0.024	○	○
1881773	08 IR A60	0.5-1.5	48-16	0.315	3/16	0.024	0.028	○	○
1880595	11 IR A60	0.5-1.5	48-16	0.433	1/4	0.031	0.035	●	○
1880045	16 IR A60	0.5-1.5	48-16	0.630	3/8	0.031	0.035	●	○
1880435	16 IR G60	1.75-3.0	14-8	0.630	3/8	0.047	0.067	●	○
1880437	16 IR AG60	0.5-3.0	48-8	0.630	3/8	0.047	0.067	●	○
1880769	22 IR N60	3.5-5.0	7-5	0.866	1/2	0.067	0.098	●	○
1882487	27 IR Q60	5.5-6.0	4.5-4	1.063	5/8	0.083	0.122	○	○
1881716	06 IL A60	0.5-1.25	48-20	0.236	5/32	0.024	0.024	○	○
1882199	08 IL A60	0.5-1.5	48-16	0.315	3/16	0.024	0.028	●	○
1880855	11 IL A60	0.5-1.5	48-16	0.433	1/4	0.031	0.035	●	○
1880772	16 IL A60	0.5-1.5	48-16	0.630	3/8	0.031	0.035	●	○
1880774	16 IL G60	1.75-3.0	14-8	0.630	3/8	0.047	0.067	●	○
1880775	16 IL AG60	0.5-3.0	48-8	0.630	3/8	0.047	0.067	●	○
1880854	22 IL N60	3.5-5.0	7-5	0.866	1/2	0.067	0.098	●	○
1882179	27 IL Q60	5.5-6.0	4.5-4	1.063	5/8	0.083	0.122	○	○

● Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

PARTIAL PROFILE 55°





External

Order code Código (1)	Reference Referência Referencia	Pitch		L (mm)	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)	
		MM	TPI		IC	X	Y	(68) PH6920	(D0) PH8920
1880598	11 ER A55	0.5-1.5	48-16	11	1/4	0.031	0.035	●	○
1880430	16 ER A55	0.5-1.5	48-16	16	3/8	0.031	0.035	●	○
1880432	16 ER G55	1.75-3.0	14-8	16	3/8	0.047	0.067	●	○
1880433	16 ER AG55	0.5-3.0	48-8	16	3/8	0.047	0.067	●	○
1880770	22 ER N55	3.5-5.0	7-5	22	1/2	0.067	0.098	●	○
1882167	27 ER Q55	5.5-6.0	4.5-4	27	5/8	0.079	0.114	○	○
1881850	11 EL A55	0.5-1.5	48-16	11	1/4	0.031	0.035	○	○
1880776	16 EL A55	0.5-1.5	48-16	16	3/8	0.031	0.035	○	○
1880778	16 EL G55	1.75-3.0	14-8	16	3/8	0.047	0.067	○	○
1880780	16 EL AG55	0.5-3.0	48-8	16	3/8	0.047	0.067	○	○
1880858	22 EL N55	3.5-5.0	7-5	22	1/2	0.067	0.098	○	○
1882154	27 EL Q55	5.5-6.0	4.5-4	27	5/8	0.079	0.114	○	○

● Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

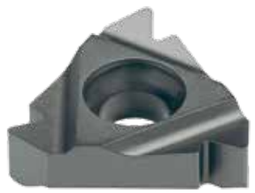
Note: Order Code = (1) + (2)
See page E - 385 for more detail information

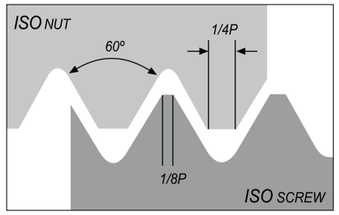
Internal

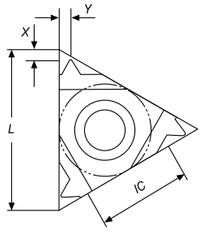
Order code Código (1)	Reference Referência Referencia	Pitch		L (mm)	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)	
		MM	TPI		IC	X	Y	(68) PH6920	(D0) PH8920
1881729	06 IR A55	0.5-1.25	48-20	06	5/32	0.020	0.024	○	○
1881772	08 IR A55	0.5-1.5	48-16	08	3/16	0.024	0.028	○	○
1880006	11 IR A55	0.5-1.5	48-16	11	1/4	0.031	0.035	●	○
1880434	16 IR A55	0.5-1.5	48-16	16	3/8	0.031	0.035	●	○
1880436	16 IR G55	1.75-3.0	14-8	16	3/8	0.047	0.067	●	○
1880438	16 IR AG55	0.5-3.0	48-8	16	3/8	0.047	0.067	●	○
1880047	22 IR N55	3.5-5.0	7-5	22	1/2	0.067	0.098	●	○
1882189	27 IR Q55	5.5-6.0	4.5-4	27	5/8	0.079	0.114	○	○
1881715	06 IL A55	0.5-1.25	48-20	06	5/32	0.020	0.024	○	○
1881751	08 IL A55	0.5-1.5	48-16	08	3/16	0.024	0.028	○	○
1880856	11 IL A55	0.5-1.5	48-16	11	1/4	0.031	0.035	○	○
1880777	16 IL A55	0.5-1.5	48-16	16	3/8	0.031	0.035	○	○
1880779	16 IL G55	1.75-3.0	14-8	16	3/8	0.047	0.067	○	○
1880781	16 IL AG55	0.5-3.0	48-8	16	3/8	0.047	0.067	●	○
1880857	22 IL N55	3.5-5.0	7-5	22	1/2	0.067	0.098	○	○
1882178	27 IL Q55	5.5-6.0	4.5-4	27	5/8	0.079	0.114	○	○

● Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information







External

Geometry code (1) Código	Reference Referência Referencia	Pitch MM	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881852	11 ER 0.35 ISO	0.35	11	1/4	0.031	0.016	○	○
1881853	11 ER 0.40 ISO	0.40	11	1/4	0.028	0.016	○	○
1881854	11 ER 0.45 ISO	0.45	11	1/4	0.028	0.016	○	○
1881855	11 ER 0.50 ISO	0.50	11	1/4	0.024	0.024	○	○
1881856	11 ER 0.60 ISO	0.60	11	1/4	0.024	0.024	○	○
1881857	11 ER 0.70 ISO	0.70	11	1/4	0.024	0.024	○	○
1881858	11 ER 0.75 ISO	0.75	11	1/4	0.024	0.024	◎	○
1881859	11 ER 0.80 ISO	0.80	11	1/4	0.024	0.024	○	○
1880602	11 ER 1.00 ISO	1.00	11	1/4	0.028	0.028	◎	○
1881861	11 ER 1.25 ISO	1.25	11	1/4	0.031	0.035	◎	○
1880603	11 ER 1.50 ISO	1.50	11	1/4	0.031	0.039	◎	○
1881864	11 ER 1.75 ISO	1.75	11	1/4	0.031	0.043	○	○
1881881	11 ER 2.00 ISO	2.00	11	1/4	0.031	0.043	○	○
1882030	16 ER 0.35 ISO	0.35	16	3/8	0.031	0.016	○	○
1882031	16 ER 0.40 ISO	0.40	16	3/8	0.028	0.016	○	○
1882032	16 ER 0.45 ISO	0.45	16	3/8	0.028	0.016	○	○
1880819	16 ER 0.50 ISO	0.50	16	3/8	0.024	0.024	○	○
1882033	16 ER 0.60 ISO	0.60	16	3/8	0.024	0.024	○	○
1882034	16 ER 0.70 ISO	0.70	16	3/8	0.024	0.024	○	○
1880447	16 ER 0.75 ISO	0.75	16	3/8	0.024	0.024	◎	○
1880804	16 ER 0.80 ISO	0.80	16	3/8	0.024	0.024	○	○
1880479	16 ER 1.00 ISO	1.00	16	3/8	0.028	0.028	◎	○
1880007	16 ER 1.25 ISO	1.25	16	3/8	0.031	0.035	◎	○
1880262	16 ER 1.50 ISO	1.50	16	3/8	0.031	0.039	◎	○
1880732	16 ER 1.75 ISO	1.75	16	3/8	0.035	0.047	◎	○
1880018	16 ER 2.00 ISO	2.00	16	3/8	0.039	0.051	◎	○
1880020	16 ER 2.50 ISO	2.50	16	3/8	0.043	0.059	◎	○
1880022	16 ER 3.00 ISO	3.00	16	3/8	0.047	0.063	◎	○
1883740	16 ER 3.50 ISO	3.50	16	3/8	0.047	0.067	○	○
1880823	22 ER 3.50 ISO	3.50	22	1/2	0.063	0.091	◎	○
1880811	22 ER 4.00 ISO	4.00	22	1/2	0.063	0.091	◎	○
1880824	22 ER 4.50 ISO	4.50	22	1/2	0.067	0.094	◎	○
1880649	22 ER 5.00 ISO	5.00	22	1/2	0.067	0.098	◎	○
1883741	22 ER 5.50 ISO	5.50	22	1/2	0.067	0.102	○	○
1883742	22 ER 6.00 ISO	6.00	22	1/2	0.075	0.106	○	○
1882163	27 ER 5.50 ISO	5.50	27	5/8	0.063	0.091	○	○
1882164	27 ER 6.00 ISO	6.00	27	5/8	0.071	0.098	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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External

Geometry code (1) Código	Reference Referência Referencia	Pitch MM	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881794	11 EL 0.35 ISO	0.35	11	1/4	0.031	0.016	○	○
1881795	11 EL 0.40 ISO	0.40	11	1/4	0.028	0.016	○	○
1881796	11 EL 0.45 ISO	0.45	11	1/4	0.028	0.016	○	○
1881797	11 EL 0.50 ISO	0.50	11	1/4	0.024	0.024	○	○
1881798	11 EL 0.60 ISO	0.60	11	1/4	0.024	0.024	○	○
1881799	11 EL 0.70 ISO	0.70	11	1/4	0.024	0.024	○	○
1881800	11 EL 0.75 ISO	0.75	11	1/4	0.024	0.024	○	○
1881801	11 EL 0.80 ISO	0.80	11	1/4	0.024	0.024	○	○
1881802	11 EL 1.00 ISO	1.00	11	1/4	0.028	0.028	○	○
1881803	11 EL 1.25 ISO	1.25	11	1/4	0.031	0.035	○	○
1881804	11 EL 1.50 ISO	1.50	11	1/4	0.031	0.039	○	○
1881806	11 EL 1.75 ISO	1.75	11	1/4	0.031	0.043	○	○
1880654	11 EL 2.00 ISO	2.00	11	1/4	0.031	0.043	○	○
1881977	16 EL 0.35 ISO	0.35	16	3/8	0.031	0.016	○	○
1881978	16 EL 0.40 ISO	0.40	16	3/8	0.028	0.016	○	○
1881979	16 EL 0.45 ISO	0.45	16	3/8	0.028	0.016	○	○
1881980	16 EL 0.50 ISO	0.50	16	3/8	0.024	0.024	○	○
1881981	16 EL 0.60 ISO	0.60	16	3/8	0.024	0.024	○	○
1881982	16 EL 0.70 ISO	0.70	16	3/8	0.024	0.024	○	○
1881983	16 EL 0.75 ISO	0.75	16	3/8	0.024	0.024	◎	○
1881984	16 EL 0.80 ISO	0.80	16	3/8	0.024	0.024	○	○
1880782	16 EL 1.00 ISO	1.00	16	3/8	0.028	0.028	◎	○
1880651	16 EL 1.25 ISO	1.25	16	3/8	0.031	0.035	◎	○
1880652	16 EL 1.50 ISO	1.50	16	3/8	0.031	0.039	○	○
1880653	16 EL 1.75 ISO	1.75	16	3/8	0.035	0.047	◎	○
1882519	16 EL 2.00 ISO	2.00	16	3/8	0.039	0.051	◎	○
1880788	16 EL 2.50 ISO	2.50	16	3/8	0.043	0.059	◎	○
1880488	16 EL 3.00 ISO	3.00	16	3/8	0.047	0.063	○	○
1883743	16 EL 3.50 ISO	3.50	16	3/8	0.047	0.067	○	○
1880844	22 EL 3.50 ISO	3.50	22	1/2	0.063	0.091	○	○
1880845	22 EL 4.00 ISO	4.00	22	1/2	0.063	0.091	○	○
1880846	22 EL 4.50 ISO	4.50	22	1/2	0.067	0.094	○	○
1880847	22 EL 5.00 ISO	5.00	22	1/2	0.067	0.098	○	○
1883744	22 EL 5.50 ISO	5.50	22	1/2	0.067	0.102	○	○
1883745	22 EL 6.00 ISO	6.00	22	1/2	0.075	0.106	○	○
1882150	27 EL 5.50 ISO	5.50	27	5/8	0.063	0.091	○	○
1882151	27 EL 6.00 ISO	6.00	27	5/8	0.071	0.098	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch MM	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881717	06 IR 0.50 ISO	0.50	06	5/32	0.035	0.020	○	○
1881718	06 IR 0.75 ISO	0.75	06	5/32	0.031	0.020	○	○
1881719	06 IR 1.00 ISO	1.00	06	5/32	0.028	0.024	○	○
1881720	06 IR 1.25 ISO	1.25	06	5/32	0.024	0.024	○	○
1881752	08 IR 0.35 ISO	0.35	08	3/16	0.028	0.016	○	○
1881753	08 IR 0.50 ISO	0.50	08	3/16	0.024	0.020	○	○
1881754	08 IR 0.75 ISO	0.75	08	3/16	0.024	0.020	○	○
1881755	08 IR 1.00 ISO	1.00	08	3/16	0.024	0.024	○	○
1881756	08 IR 1.25 ISO	1.25	08	3/16	0.024	0.028	○	○
1881757	08 IR 1.50 ISO	1.50	08	3/16	0.024	0.028	○	○
1881758	08 IR 1.75 ISO	1.75	08	3/16	0.024	0.031	○	○
1881937	11 IR 0.35 ISO	0.35	11	1/4	0.031	0.012	○	○
1881938	11 IR 0.40 ISO	0.40	11	1/4	0.031	0.016	○	○
1881939	11 IR 0.45 ISO	0.45	11	1/4	0.031	0.016	○	○
1880825	11 IR 0.50 ISO	0.50	11	1/4	0.024	0.024	○	○
1881940	11 IR 0.60 ISO	0.60	11	1/4	0.024	0.024	○	○
1881941	11 IR 0.70 ISO	0.70	11	1/4	0.024	0.024	○	○
1880762	11 IR 0.75 ISO	0.75	11	1/4	0.024	0.024	◎	○
1881942	11 IR 0.80 ISO	0.80	11	1/4	0.024	0.024	○	○
1880604	11 IR 1.00 ISO	1.00	11	1/4	0.031	0.028	◎	○
1880827	11 IR 1.25 ISO	1.25	11	1/4	0.031	0.031	◎	○
1880605	11 IR 1.50 ISO	1.50	11	1/4	0.031	0.039	◎	○
1880828	11 IR 1.75 ISO	1.75	11	1/4	0.031	0.043	◎	○
1880829	11 IR 2.00 ISO	2.00	11	1/4	0.031	0.035	◎	○
1883746	11 IR 2.50 ISO	2.50	11	1/4	0.031	0.047	○	○
1882108	16 IR 0.35 ISO	0.35	16	3/8	0.031	0.012	○	○
1882109	16 IR 0.40 ISO	0.40	16	3/8	0.031	0.016	○	○
1882110	16 IR 0.45 ISO	0.45	16	3/8	0.031	0.016	○	○
1880830	16 IR 0.50 ISO	0.50	16	3/8	0.024	0.024	○	○
1882112	16 IR 0.60 ISO	0.60	16	3/8	0.024	0.024	○	○
1882113	16 IR 0.70 ISO	0.70	16	3/8	0.024	0.024	○	○
1880831	16 IR 0.75 ISO	0.75	16	3/8	0.024	0.024	○	○
1880832	16 IR 0.80 ISO	0.80	16	3/8	0.024	0.024	○	○
1880025	16 IR 1.00 ISO	1.00	16	3/8	0.024	0.028	◎	○
1880026	16 IR 1.25 ISO	1.25	16	3/8	0.031	0.035	◎	○
1880619	16 IR 1.50 ISO	1.50	16	3/8	0.031	0.039	◎	○
1880733	16 IR 1.75 ISO	1.75	16	3/8	0.035	0.047	◎	○
1880039	16 IR 2.00 ISO	2.00	16	3/8	0.039	0.051	◎	○
1880041	16 IR 2.50 ISO	2.50	16	3/8	0.043	0.059	◎	○
1880042	16 IR 3.00 ISO	3.00	16	3/8	0.043	0.059	◎	○
1883747	16 IR 3.50 ISO	3.50	16	3/8	0.047	0.067	○	○
1880834	22 IR 3.50 ISO	3.50	22	1/2	0.063	0.091	◎	○
1880818	22 IR 4.00 ISO	4.00	22	1/2	0.063	0.091	◎	○
1880835	22 IR 4.50 ISO	4.50	22	1/2	0.063	0.094	○	○
1880650	22 IR 5.00 ISO	5.00	22	1/2	0.063	0.091	◎	○
1883748	22 IR 5.50 ISO	5.50	22	1/2	0.063	0.091	○	○
1883749	22 IR 6.00 ISO	6.00	22	1/2	0.063	0.094	○	○
1882185	27 IR 5.50 ISO	5.50	27	5/8	0.063	0.091	○	○
1882186	27 IR 6.00 ISO	6.00	27	5/8	0.071	0.098	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch MM	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881703	06 IL 0.50 ISO	0.50	06	5/32	0.035	0.020	○	○
1881704	06 IL 0.75 ISO	0.75	06	5/32	0.031	0.020	○	○
1881705	06 IL 1.00 ISO	1.00	06	5/32	0.028	0.024	○	○
1881706	06 IL 1.25 ISO	1.25	06	5/32	0.024	0.024	○	○
1881732	08 IL 0.50 ISO	0.50	08	3/16	0.024	0.020	○	○
1881733	08 IL 0.75 ISO	0.75	08	3/16	0.024	0.020	○	○
1881734	08 IL 1.00 ISO	1.00	08	3/16	0.024	0.024	○	○
1881735	08 IL 1.25 ISO	1.25	08	3/16	0.024	0.028	○	○
1881736	08 IL 1.50 ISO	1.50	08	3/16	0.024	0.028	○	○
1881737	08 IL 1.75 ISO	1.75	08	3/16	0.024	0.031	○	○
1881911	11 IL 0.35 ISO	0.35	11	1/4	0.031	0.012	○	○
1881912	11 IL 0.40 ISO	0.40	11	1/4	0.031	0.016	○	○
1881913	11 IL 0.45 ISO	0.45	11	1/4	0.031	0.016	○	○
1880837	11 IL 0.50 ISO	0.50	11	1/4	0.024	0.024	○	○
1881914	11 IL 0.60 ISO	0.60	11	1/4	0.024	0.024	○	○
1881915	11 IL 0.70 ISO	0.70	11	1/4	0.024	0.024	○	○
1880838	11 IL 0.75 ISO	0.75	11	1/4	0.024	0.024	○	○
1881916	11 IL 0.80 ISO	0.80	11	1/4	0.024	0.024	○	○
1880839	11 IL 1.00 ISO	1.00	11	1/4	0.031	0.028	○	○
1880840	11 IL 1.25 ISO	1.25	11	1/4	0.031	0.031	○	○
1880841	11 IL 1.50 ISO	1.50	11	1/4	0.031	0.039	○	○
1880842	11 IL 1.75 ISO	1.75	11	1/4	0.031	0.043	○	○
1880843	11 IL 2.00 ISO	2.00	11	1/4	0.031	0.035	◎	○
1883750	11 IL 2.50 ISO	2.50	11	1/4	0.031	0.047	○	○
1882058	16 IL 0.35 ISO	0.35	16	3/8	0.031	0.012	○	○
1882059	16 IL 0.40 ISO	0.40	16	3/8	0.031	0.016	○	○
1882060	16 IL 0.45 ISO	0.45	16	3/8	0.031	0.016	○	○
1882061	16 IL 0.50 ISO	0.50	16	3/8	0.024	0.024	○	○
1882062	16 IL 0.60 ISO	0.60	16	3/8	0.024	0.024	○	○
1882063	16 IL 0.70 ISO	0.70	16	3/8	0.024	0.024	○	○
1882064	16 IL 0.75 ISO	0.75	16	3/8	0.024	0.024	○	○
1882065	16 IL 0.80 ISO	0.80	16	3/8	0.024	0.024	○	○
1880783	16 IL 1.00 ISO	1.00	16	3/8	0.024	0.028	◎	○
1880784	16 IL 1.25 ISO	1.25	16	3/8	0.031	0.035	◎	○
1880785	16 IL 1.50 ISO	1.50	16	3/8	0.031	0.039	◎	○
1880786	16 IL 1.75 ISO	1.75	16	3/8	0.035	0.047	◎	○
1880787	16 IL 2.00 ISO	2.00	16	3/8	0.039	0.051	◎	○
1880789	16 IL 2.50 ISO	2.50	16	3/8	0.043	0.059	◎	○
1880790	16 IL 3.00 ISO	3.00	16	3/8	0.043	0.059	◎	○
1883751	16 IL 3.50 ISO	3.50	16	3/8	0.047	0.067	○	○
1880848	22 IL 3.50 ISO	3.50	22	1/2	0.063	0.091	○	○
1880849	22 IL 4.00 ISO	4.00	22	1/2	0.063	0.091	○	○
1880850	22 IL 4.50 ISO	4.50	22	1/2	0.063	0.094	○	○
1880851	22 IL 5.00 ISO	5.00	22	1/2	0.063	0.091	○	○
1883752	22 IL 5.50 ISO	5.50	22	1/2	0.063	0.091	○	○
1883753	22 IL 6.00 ISO	6.00	22	1/2	0.063	0.094	○	○
1882174	27 IL 5.50 ISO	5.50	27	5/8	0.063	0.091	○	○
1882175	27 IL 6.00 ISO	6.00	27	5/8	0.071	0.098	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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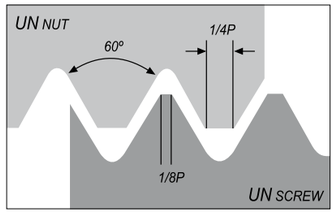
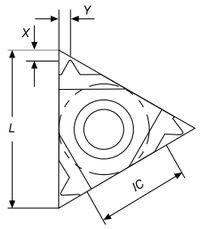
AMERICAN UN (UNC, UNF, UNEF) | ANSI B1.1-1982





External

Geometry code (1) Código	Reference Referência Referencia	Pitch MM	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881907	11 ER 72 UN	72	11	1/4	0.031	0.016	○	○
1881906	11 ER 64 UN	64	11	1/4	0.031	0.016	○	○
1881903	11 ER 56 UN	56	11	1/4	0.028	0.016	○	○
1881901	11 ER 48 UN	48	11	1/4	0.024	0.024	○	○
1881900	11 ER 44 UN	44	11	1/4	0.024	0.024	○	○
1881898	11 ER 40 UN	40	11	1/4	0.024	0.024	○	○
1881896	11 ER 36 UN	36	11	1/4	0.024	0.024	○	○
1881894	11 ER 32 UN	32	11	1/4	0.024	0.024	○	○
1881892	11 ER 28 UN	28	11	1/4	0.024	0.028	○	○
1881890	11 ER 27 UN	27	11	1/4	0.028	0.031	○	○
1881885	11 ER 24 UN	24	11	1/4	0.028	0.031	○	○
1881882	11 ER 20 UN	20	11	1/4	0.031	0.035	○	○
1881877	11 ER 18 UN	18	11	1/4	0.031	0.039	○	○
1881873	11 ER 16 UN	16	11	1/4	0.035	0.043	○	○
1881869	11 ER 14 UN	14	11	1/4	0.035	0.043	○	○
1882055	16 ER 72 UN	72	16	3/8	0.031	0.012	○	○
1882054	16 ER 64 UN	64	16	3/8	0.031	0.016	○	○
1882051	16 ER 56 UN	56	16	3/8	0.028	0.016	○	○
1882049	16 ER 48 UN	48	16	3/8	0.024	0.024	○	○
1882048	16 ER 44 UN	44	16	3/8	0.024	0.024	○	○
1882046	16 ER 40 UN	40	16	3/8	0.024	0.024	○	○
1882044	16 ER 36 UN	36	16	3/8	0.024	0.024	○	○
1880870	16 ER 32 UN	32	16	3/8	0.024	0.024	○	○
1880869	16 ER 28 UN	28	16	3/8	0.024	0.028	○	○
1882041	16 ER 27 UN	27	16	3/8	0.028	0.031	○	○
1880868	16 ER 24 UN	24	16	3/8	0.028	0.031	○	○
1880021	16 ER 20 UN	20	16	3/8	0.031	0.035	○	○
1880867	16 ER 18 UN	18	16	3/8	0.031	0.039	○	○
1880616	16 ER 16 UN	16	16	3/8	0.035	0.043	◎	○
1880014	16 ER 14 UN	14	16	3/8	0.039	0.047	◎	○
1880866	16 ER 13 UN	13	16	3/8	0.039	0.051	◎	○
1880865	16 ER 12 UN	12	16	3/8	0.043	0.055	○	○
1883754	16 ER 11.5 UN	11.5	16	3/8	0.043	0.059	○	○
1880864	16 ER 11 UN	11	16	3/8	0.043	0.059	○	○
1880863	16 ER 10 UN	10	16	3/8	0.043	0.059	◎	○
1880862	16 ER 9 UN	9	16	3/8	0.047	0.067	◎	○

◎ Stock item | Produto de stock | Itens de stock

○ Avaliable under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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External

Geometry code (1) Código	Reference Referência Referencia	Pitch MM	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1880024	16 ER 8 UN	8	16	3/8	0.047	0.063	○	○
1880861	22 ER 7 UN	7	22	1/2	0.063	0.091	○	○
1880860	22 ER 6 UN	6	22	1/2	0.063	0.091	◎	○
1880859	22 ER 5 UN	5	22	1/2	0.067	0.098	○	○
1882157	27 ER 4.5 UN	4.5	27	5/8	0.075	0.106	○	○
1882161	27 ER 4 UN	4	27	5/8	0.083	0.118	○	○
1881848	11 EL 72 UN	72	11	1/4	0.031	0.016	○	○
1881847	11 EL 64 UN	64	11	1/4	0.031	0.016	○	○
1882200	11 EL 56 UN	56	11	1/4	0.028	0.016	○	○
1881843	11 EL 48 UN	48	11	1/4	0.024	0.024	○	○
1881842	11 EL 44 UN	44	11	1/4	0.024	0.024	○	○
1881840	11 EL 40 UN	40	11	1/4	0.024	0.024	○	○
1881838	11 EL 36 UN	36	11	1/4	0.024	0.024	○	○
1881836	11 EL 32 UN	32	11	1/4	0.024	0.024	○	○
1881834	11 EL 28 UN	28	11	1/4	0.024	0.028	○	○
1881832	11 EL 27 UN	27	11	1/4	0.028	0.031	○	○
1881827	11 EL 24 UN	24	11	1/4	0.028	0.031	○	○
1881824	11 EL 20 UN	20	11	1/4	0.031	0.035	○	○
1881819	11 EL 18 UN	18	11	1/4	0.031	0.039	○	○
1881815	11 EL 16 UN	16	11	1/4	0.035	0.043	○	○
1881811	11 EL 14 UN	14	11	1/4	0.035	0.043	○	○
1882022	16 EL 72 UN	72	16	3/8	0.031	0.012	○	○
1882020	16 EL 64 UN	64	16	3/8	0.031	0.016	○	○
1882017	16 EL 56 UN	56	16	3/8	0.028	0.016	○	○
1882015	16 EL 48 UN	48	16	3/8	0.024	0.024	○	○
1882014	16 EL 44 UN	44	16	3/8	0.024	0.024	○	○
1882012	16 EL 40 UN	40	16	3/8	0.024	0.024	○	○
1882010	16 EL 36 UN	36	16	3/8	0.024	0.024	○	○
1880886	16 EL 32 UN	32	16	3/8	0.024	0.024	○	○
1880885	16 EL 28 UN	28	16	3/8	0.024	0.028	○	○
1882007	16 EL 27 UN	27	16	3/8	0.028	0.031	○	○
1880884	16 EL 24 UN	24	16	3/8	0.028	0.031	○	○
1880883	16 EL 20 UN	20	16	3/8	0.031	0.035	○	○
1880882	16 EL 18 UN	18	16	3/8	0.031	0.039	○	○
1880881	16 EL 16 UN	16	16	3/8	0.035	0.043	○	○
1880880	16 EL 14 UN	14	16	3/8	0.039	0.047	○	○
1880879	16 EL 13 UN	13	16	3/8	0.039	0.051	○	○
1880878	16 EL 12 UN	12	16	3/8	0.043	0.055	○	○
1883755	16 EL 11.5 UN	11.5	16	3/8	0.043	0.059	○	○
1880877	16 EL 11 UN	11	16	3/8	0.043	0.059	○	○
1880876	16 EL 10 UN	10	16	3/8	0.043	0.059	○	○
1880875	16 EL 9 UN	9	16	3/8	0.047	0.067	○	○
1880874	16 EL 8 UN	8	16	3/8	0.047	0.063	○	○
1880873	22 EL 7U N	7	22	1/2	0.063	0.091	○	○
1880872	22 EL 6 UN	6	22	1/2	0.063	0.091	○	○
1880871	22 EL 5 UN	5	22	1/2	0.067	0.098	○	○
1882144	27 EL 4.5 UN	4.5	27	5/8	0.075	0.106	○	○
1882148	27 EL 4 UN	4	27	5/8	0.083	0.118	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Avaliable under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch MM	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881726	06 IR 32 UN	32	06	5/32	0.031	0.020	○	○
1881725	06 IR 28 UN	28	06	5/32	0.031	0.024	○	○
1881722	06 IR 24 UN	24	06	5/32	0.028	0.024	○	○
1883756	06 IR 20 UN	20	06	5/32	0.024	0.024	○	○
1881721	06 IR 18 UN	18	06	5/32	0.024	0.028	○	○
1881769	08 IR 32 UN	32	08	3/16	0.024	0.020	○	○
1881768	08 IR 28 UN	28	08	3/16	0.024	0.024	○	○
1881765	08 IR 24 UN	24	08	3/16	0.024	0.024	○	○
1881764	08 IR 20 UN	20	08	3/16	0.024	0.028	◎	○
1881762	08 IR 18 UN	18	08	3/16	0.024	0.028	○	○
1881760	08 IR 16 UN	16	08	3/16	0.024	0.028	○	○
1881759	08 IR 14 UN	14	08	3/16	0.024	0.031	○	○
1881956	11 IR 72 UN	72	11	1/4	0.031	0.012	○	○
1881955	11 IR 64 UN	64	11	1/4	0.031	0.016	○	○
1881954	11 IR 56 UN	56	11	1/4	0.028	0.016	○	○
1881953	11 IR 48 UN	48	11	1/4	0.024	0.024	○	○
1881952	11 IR 44 UN	44	11	1/4	0.024	0.024	○	○
1881951	11 IR 40 UN	40	11	1/4	0.024	0.024	○	○
1881950	11 IR 36 UN	36	11	1/4	0.024	0.024	○	○
1880910	11 IR 32 UN	32	11	1/4	0.024	0.024	○	○
1880909	11 IR 28 UN	28	11	1/4	0.024	0.028	○	○
1881948	11 IR 27 UN	27	11	1/4	0.028	0.031	○	○
1880908	11 IR 24 UN	24	11	1/4	0.028	0.031	○	○
1880907	11 IR 20 UN	20	11	1/4	0.031	0.035	○	○
1880906	11 IR 18 UN	18	11	1/4	0.031	0.039	○	○
1880905	11 IR 16 UN	16	11	1/4	0.035	0.043	◎	○
1880904	11 IR 14 UN	14	11	1/4	0.035	0.043	◎	○
1880903	11 IR 13 UN	13	11	1/4	0.031	0.039	○	○
1880902	11 IR 12 UN	12	11	1/4	0.035	0.043	◎	○
1880901	11 IR 11 UN	11	11	1/4	0.031	0.043	○	○
1882126	16 IR 72 UN	72	16	3/8	0.031	0.012	○	○
1882124	16 IR 64 UN	64	16	3/8	0.031	0.016	○	○
1882123	16 IR 56 UN	56	16	3/8	0.028	0.016	○	○
1882122	16 IR 48 UN	48	16	3/8	0.024	0.024	○	○
1882121	16 IR 44 UN	44	16	3/8	0.024	0.024	○	○
1882120	16 IR 40 UN	40	16	3/8	0.024	0.024	○	○
1882118	16 IR 36 UN	36	16	3/8	0.024	0.024	○	○
1880900	16 IR 32 UN	32	16	3/8	0.024	0.024	○	○
1880899	16 IR 28 UN	28	16	3/8	0.024	0.028	○	○
1882117	16 IR 27 UN	27	16	3/8	0.028	0.031	○	○
1880898	16 IR 24 UN	24	16	3/8	0.028	0.031	○	○
1880618	16 IR 20 UN	20	16	3/8	0.031	0.035	◎	○
1880897	16 IR 18 UN	18	16	3/8	0.031	0.039	◎	○
1880037	16 IR 16 UN	16	16	3/8	0.035	0.043	○	○
1880034	16 IR 14 UN	14	16	3/8	0.039	0.047	○	○
1882116	16 IR 13 UN	13	16	3/8	0.039	0.051	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch MM	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1880894	16 IR 12 UN	12	16	3/8	0.043	0.055	◎	○
1883757	16 IR 11.5 UN	11.5	16	3/8	0.043	0.059	○	○
1880893	16 IR 11 UN	11	16	3/8	0.043	0.059	○	○
1880892	16 IR 10 UN	10	16	3/8	0.043	0.059	○	○
1880891	16 IR 9 UN	9	16	3/8	0.047	0.067	○	○
1880044	16 IR 8 UN	8	16	3/8	0.047	0.063	○	○
1880889	22 IR 7 UN	7	22	1/2	0.063	0.091	○	○
1880888	22 IR 6 UN	6	22	1/2	0.063	0.091	○	○
1880887	22 IR 5 UN	5	22	1/2	0.063	0.091	○	○
1882181	27 IR 4.5 UN	4.5	27	5/8	0.067	0.094	○	○
1882184	27 IR 4 UN	4	27	5/8	0.071	0.106	○	○
1881712	06 IL 32 UN	32	06	5/32	0.031	0.020	○	○
1881711	06 IL 28 UN	28	06	5/32	0.031	0.024	○	○
1881708	06 IL 24 UN	24	06	5/32	0.028	0.024	○	○
1883758	06 IL 20 UN	20	06	5/32	0.024	0.024	○	○
1881707	06 IL 18 UN	18	06	5/32	0.024	0.028	○	○
1881748	08 IL 32 UN	32	08	3/16	0.024	0.020	○	○
1881747	08 IL 28 UN	28	08	3/16	0.024	0.024	○	○
1881744	08 IL 24 UN	24	08	3/16	0.024	0.024	○	○
1881743	08 IL 20 UN	20	08	3/16	0.024	0.028	○	○
1881741	08 IL 18 UN	18	08	3/16	0.024	0.028	○	○
1881739	08 IL 16 UN	16	08	3/16	0.024	0.028	○	○
1881738	08 IL 14 UN	14	08	3/16	0.024	0.031	○	○
1881936	11 IL 72 UN	72	11	1/4	0.031	0.012	○	○
1881935	11 IL 64 UN	64	11	1/4	0.031	0.016	○	○
1881934	11 IL 56 UN	56	11	1/4	0.028	0.016	○	○
1881933	11 IL 48 UN	48	11	1/4	0.024	0.024	○	○
1881932	11 IL 44 UN	44	11	1/4	0.024	0.024	○	○
1881931	11 IL 40 UN	40	11	1/4	0.024	0.024	○	○
1881930	11 IL 36 UN	36	11	1/4	0.024	0.024	○	○
1880935	11 IL 32 UN	32	11	1/4	0.024	0.024	○	○
1880934	11 IL 28 UN	28	11	1/4	0.024	0.028	○	○
1881928	11 IL 27 UN	27	11	1/4	0.028	0.031	○	○
1880933	11 IL 24 UN	24	11	1/4	0.028	0.031	○	○
1880932	11 IL 20 UN	20	11	1/4	0.031	0.035	○	○
1880931	11 IL 18 UN	18	11	1/4	0.031	0.039	○	○
1880930	11 IL 16 UN	16	11	1/4	0.035	0.043	○	○
1880929	11 IL 14 UN	14	11	1/4	0.035	0.043	○	○
1880928	11 IL 13 UN	13	11	1/4	0.031	0.039	○	○
1880927	11 IL 12 UN	12	11	1/4	0.035	0.043	○	○
1880926	11 IL 11 UN	11	11	1/4	0.031	0.043	○	○
1882101	16 IL 72 UN	72	16	3/8	0.031	0.012	○	○
1882098	16 IL 64 UN	64	16	3/8	0.031	0.016	○	○
1882097	16 IL 56 UN	56	16	3/8	0.028	0.016	○	○
1882096	16 IL 48 UN	48	16	3/8	0.024	0.024	○	○
1882095	16 IL 44 UN	44	16	3/8	0.024	0.024	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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AMERICAN UN (UNC, UNF, UNEF) | ANSI B1.1-1982

Internal

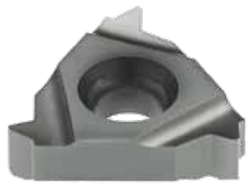
Geometry code (1) Código	Reference Referência Referencia	Pitch MM	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1882094	16 IL 40 UN	40	16	3/8	0.024	0.024	○	○
1882092	16 IL 36 UN	36	16	3/8	0.024	0.024	○	○
1880925	16 IL 32 UN	32	16	3/8	0.024	0.024	○	○
1880924	16 IL 28 UN	28	16	3/8	0.024	0.028	○	○
1882089	16 IL 27 UN	27	16	3/8	0.028	0.031	○	○
1880923	16 IL 24 UN	24	16	3/8	0.028	0.031	○	○
1880922	16 IL 20 UN	20	16	3/8	0.031	0.035	○	○
1880921	16 IL 18 UN	18	16	3/8	0.031	0.039	○	○
1880920	16 IL 16 UN	16	16	3/8	0.035	0.043	○	○
1880919	16 IL 14 UN	14	16	3/8	0.039	0.047	○	○
1882074	16 IL 13 UN	13	16	3/8	0.039	0.051	○	○
1880918	16 IL 12 UN	12	16	3/8	0.043	0.055	○	○
1883759	16 IL 11.5 UN	11.5	16	3/8	0.043	0.059	○	○
1880917	16 IL 11 UN	11	16	3/8	0.043	0.059	○	○
1880916	16 IL 10 UN	10	16	3/8	0.043	0.059	○	○
1880915	16 IL 9 UN	9	16	3/8	0.047	0.067	○	○
1880914	16 IL 8 UN	8	16	3/8	0.047	0.063	○	○
1880913	22 IL 7 UN	7	22	1/2	0.063	0.091	○	○
1880912	22 IL 6 UN	6	22	1/2	0.063	0.091	○	○
1880911	22 IL 5 UN	5	22	1/2	0.063	0.091	○	○
1882170	27 IL 4.5 UN	4.5	27	5/8	0.067	0.094	○	○
1882173	27 IL 4 UN	4	27	5/8	0.071	0.106	○	○

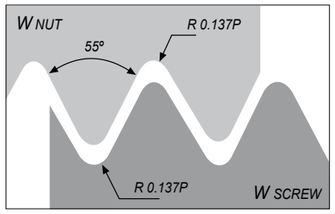
Stock item | Produto de stock | Itens de stock

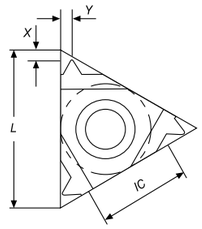
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

WITHWORTH FOR BSW, BSF, BSP, B.S.84: 1956, DIN 259, ISO 228-1:1994







External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881908	11 ER 72 W	72	11	1/4	0.028	0.016	○	○
1881905	11 ER 60 W	60	11	1/4	0.028	0.016	○	○
1881904	11 ER 56 W	56	11	1/4	0.028	0.016	○	○
1881902	11 ER 48 W	48	11	1/4	0.024	0.024	○	○
1881899	11 ER 40 W	40	11	1/4	0.024	0.024	○	○
1881897	11 ER 36 W	36	11	1/4	0.024	0.024	○	○
1881895	11 ER 32 W	32	11	1/4	0.024	0.024	○	○
1881893	11ER 28 W	28	11	1/4	0.024	0.028	○	○
1881887	11 ER 26 W	26	11	1/4	0.028	0.028	○	○
1881886	11 ER 24 W	24	11	1/4	0.028	0.031	○	○
1881884	11 ER 22 W	22	11	1/4	0.031	0.035	○	○
1881883	11 ER 20 W	20	11	1/4	0.031	0.035	○	○
1881880	11 ER 19 W	19	11	1/4	0.031	0.039	○	○
1881878	11 ER 18 W	18	11	1/4	0.031	0.039	○	○
1881874	11 ER 16 W	16	11	1/4	0.035	0.043	○	○
1881870	11 ER 14 W	14	11	1/4	0.035	0.043	○	○
1882056	16 ER 72 W	72	16	3/8	0.028	0.016	○	○
1882053	16 ER 60 W	60	16	3/8	0.028	0.016	○	○
1882052	16 ER 56 W	56	16	3/8	0.028	0.016	○	○
1882050	16 ER 48 W	48	16	3/8	0.024	0.024	○	○
1882047	16 ER 40 W	40	16	3/8	0.024	0.024	○	○
1882045	16 ER 36 W	36	16	3/8	0.024	0.024	○	○
1882043	16 ER 32 W	32	16	3/8	0.024	0.024	○	○
1880940	16 ER 28 W	28	16	3/8	0.024	0.028	○	○
1882040	16 ER 26 W	26	16	3/8	0.028	0.028	○	○
1880939	16 ER 24 W	24	16	3/8	0.028	0.031	○	○
1882039	16 ER 22 W	22	16	3/8	0.031	0.035	○	○
1880938	16 ER 20 W	20	16	3/8	0.031	0.035	◎	○
1880017	16 ER 19 W	19	16	3/8	0.031	0.039	◎	○
1880937	16 ER 18 W	18	16	3/8	0.031	0.039	○	○
1880609	16 ER 16 W	16	16	3/8	0.035	0.043	◎	○
1880015	16 ER 14 W	14	16	3/8	0.039	0.047	◎	○
1880611	16 ER 12 W	12	16	3/8	0.043	0.055	◎	○
1880613	16 ER 11 W	11	16	3/8	0.043	0.059	◎	○
1880614	16 ER 10 W	10	16	3/8	0.043	0.059	○	○
1880936	16 ER 9 W	9	16	3/8	0.047	0.067	○	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

Thread Inserts
Spare Parts
Technical Data
THREADING

External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1880646	16 ER 8 W	8	16	3/8	0.047	0.059	◎	○
1880941	22 ER 7 W	7	22	1/2	0.063	0.091	◎	○
1880942	22 ER 6 W	6	22	1/2	0.063	0.091	○	○
1880943	22 ER 5 W	5	22	1/2	0.067	0.094	○	○
1882158	27 ER 4.5 W	4.5	27	5/8	0.071	0.102	○	○
1882162	27 ER 4 W	4	27	5/8	0.079	0.114	○	○
1881849	11 EL 72 W	72	11	1/4	0.028	0.016	○	○
1881846	11 EL 60 W	60	11	1/4	0.028	0.016	○	○
1881845	11 EL 56 W	56	11	1/4	0.028	0.016	○	○
1881844	11 EL 48 W	48	11	1/4	0.024	0.024	○	○
1881841	11 EL 40 W	40	11	1/4	0.024	0.024	○	○
1881839	11 EL 36 W	36	11	1/4	0.024	0.024	○	○
1881837	11 EL 32 W	32	11	1/4	0.024	0.024	○	○
1881835	11 EL 28 W	28	11	1/4	0.024	0.028	○	○
1881829	11 EL 26 W	26	11	1/4	0.028	0.028	○	○
1881828	11 EL 24 W	24	11	1/4	0.028	0.031	○	○
1881826	11 EL 22 W	22	11	1/4	0.031	0.035	○	○
1881825	11 EL 20 W	20	11	1/4	0.031	0.035	○	○
1881822	11 EL 19 W	19	11	1/4	0.031	0.039	○	○
1881820	11 EL 18 W	18	11	1/4	0.031	0.039	○	○
1881816	11 EL 16 W	16	11	1/4	0.035	0.043	○	○
1881812	11 EL 14 W	14	11	1/4	0.035	0.043	○	○
1882023	16 EL 72 W	72	16	3/8	0.028	0.016	○	○
1882019	16 EL 60 W	60	16	3/8	0.028	0.016	○	○
1882018	16 EL 56 W	56	16	3/8	0.028	0.016	○	○
1882016	16 EL 48 W	48	16	3/8	0.024	0.024	○	○
1882013	16 EL 40 W	40	16	3/8	0.024	0.024	○	○
1882011	16 EL 36 W	36	16	3/8	0.024	0.024	○	○
1882009	16 EL 32 W	32	16	3/8	0.024	0.024	○	○
1880955	16 EL 28 W	28	16	3/8	0.024	0.028	○	○
1882004	16 EL 26 W	26	16	3/8	0.024	0.028	○	○
1880954	16 EL 24 W	24	16	3/8	0.028	0.031	○	○
1882003	16 EL 22 W	22	16	3/8	0.031	0.035	○	○
1880953	16 EL 20 W	20	16	3/8	0.031	0.035	○	○
1880952	16 EL 19 W	19	16	3/8	0.031	0.039	○	○
1880951	16 EL 18 W	18	16	3/8	0.031	0.039	○	○
1880950	16 EL 16 W	16	16	3/8	0.035	0.043	○	○
1880949	16 EL 14 W	14	16	3/8	0.039	0.047	◎	○
1880948	16 EL 12 W	12	16	3/8	0.043	0.055	○	○
1880947	16 EL 11 W	11	16	3/8	0.043	0.059	○	○
1880946	16 EL 10 W	10	16	3/8	0.043	0.059	○	○
1880945	16 EL 9 W	9	16	3/8	0.047	0.067	○	○
1880944	16 EL 8 W	8	16	3/8	0.047	0.059	○	○
1880956	22 EL 7 W	7	22	1/2	0.063	0.091	○	○
1880957	22 EL 6 W	6	22	1/2	0.063	0.091	○	○
1880958	22 EL 5 W	5	22	1/2	0.067	0.094	○	○
1882145	27 EL 4.5 W	4.5	27	5/8	0.071	0.102	○	○
1882149	27 EL 4 W	4	27	5/8	0.079	0.114	○	○

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1882203	06 IR 26 W	26	06	5/32	0.028	0.024	○	○
1882207	06 IR 22 W	22	06	5/32	0.024	0.024	○	○
1883760	06 IR 20 W	20	06	5/32	0.024	0.028	○	○
1882211	06 IR 18 W	18	06	5/32	0.024	0.028	○	○
1882213	08 IR 28 W	28	08	3/16	0.024	0.024	○	○
1882217	08 IR 24 W	24	08	3/16	0.024	0.024	○	○
1882219	08 IR 20 W	20	08	3/16	0.024	0.028	○	○
1882221	08 IR 19 W	19	08	3/16	0.024	0.028	○	○
1882223	08 IR 18 W	18	08	3/16	0.024	0.028	○	○
1882225	08 IR 16 W	16	08	3/16	0.024	0.028	○	○
1882227	11 IR 72 W	72	11	1/4	0.028	0.016	○	○
1882229	11 IR 60 W	60	11	1/4	0.028	0.016	○	○
1882231	11 IR 56 W	56	11	1/4	0.028	0.016	○	○
1882233	11 IR 48 W	48	11	1/4	0.024	0.024	○	○
1882235	11 IR 40 W	40	11	1/4	0.024	0.024	○	○
1883761	11 IR 36 W	36	11	1/4	0.024	0.024	○	○
1882237	11 IR 32 W	32	11	1/4	0.024	0.024	○	○
1880972	11 IR 28 W	28	11	1/4	0.024	0.028	○	○
1882239	11 IR 26 W	26	11	1/4	0.028	0.028	○	○
1880971	11 IR 24 W	24	11	1/4	0.028	0.031	○	○
1883762	11 IR 22 W	22	11	1/4	0.031	0.035	○	○
1880970	11 IR 20 W	20	11	1/4	0.031	0.035	○	○
1880005	11 IR 19 W	19	11	1/4	0.031	0.039	○	○
1880968	11 IR 18 W	18	11	1/4	0.031	0.039	◎	○
1880967	11 IR 16 W	16	11	1/4	0.035	0.043	○	○
1880004	11 IR 14 W	14	11	1/4	0.035	0.043	◎	○
1883763	11 IR 12 W	12	11	1/4	0.039	0.043	○	○
1883764	11 IR 11 W	11	11	1/4	0.035	0.047	○	○
1882241	16 IR 72 W	72	16	3/8	0.028	0.016	○	○
1882498	16 IR 60 W	60	16	3/8	0.028	0.016	○	○
1882244	16 IR 56 W	56	16	3/8	0.028	0.016	○	○
1882246	16 IR 48 W	48	16	3/8	0.024	0.024	○	○
1882248	16 IR 40 W	40	16	3/8	0.024	0.024	○	○
1882250	16 IR 36 W	36	16	3/8	0.024	0.024	○	○
1882252	16 IR 32 W	32	16	3/8	0.024	0.024	○	○
1880965	16 IR 28 W	28	16	3/8	0.024	0.028	○	○
1882254	16 IR 26 W	26	16	3/8	0.024	0.028	○	○
1880964	16 IR 24 W	24	16	3/8	0.028	0.031	○	○
1882256	16 IR 22 W	22	16	3/8	0.031	0.035	○	○
1880963	16 IR 20 W	20	16	3/8	0.031	0.035	◎	○
1880608	16 IR 19 W	19	16	3/8	0.031	0.039	◎	○
1880962	16 IR 18 W	18	16	3/8	0.031	0.039	○	○
1880610	16 IR 16 W	16	16	3/8	0.035	0.043	○	○
1880035	16 IR 14 W	14	16	3/8	0.039	0.047	◎	○
1880612	16 IR 12 W	12	16	3/8	0.043	0.055	○	○
1880031	16 IR 11 W	11	16	3/8	0.043	0.059	◎	○

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1880615	16 IR 10 W	10	16	3/8	0.043	0.059	○	○
1882258	16 IR 9 W	9	16	3/8	0.047	0.067	○	○
1880672	16 IR 8 W	8	16	3/8	0.047	0.059	◎	○
1880959	22 IR 7 W	7	22	1/2	0.063	0.091	○	○
1880960	22 IR 6 W	6	22	1/2	0.063	0.091	○	○
1880961	22 IR 5 W	5	22	1/2	0.067	0.094	○	○
1882259	27 IR 4.5 W	4.5	27	5/8	0.071	0.102	○	○
1882261	27 IR 4 W	4	27	5/8	0.079	0.114	○	○
1882204	06 IL 26 W	26	06	5/32	0.028	0.024	○	○
1882208	06 IL 22 W	22	06	5/32	0.024	0.024	○	○
1883765	06 IL 20 W	20	06	5/32	0.024	0.028	○	○
1882212	06 IL 18 W	18	06	5/32	0.024	0.028	○	○
1882214	08 IL 28 W	28	08	3/16	0.028	0.028	○	○
1882218	08 IL 24 W	24	08	3/16	0.028	0.028	○	○
1882220	08 IL 20 W	20	08	3/16	0.028	0.028	○	○
1882222	08 IL 19 W	19	08	3/16	0.028	0.028	○	○
1882224	08 IL 18 W	18	08	3/16	0.028	0.028	○	○
1882226	08 IL 16 W	16	08	3/16	0.028	0.028	○	○
1882228	11 IL 72 W	72	11	1/4	0.028	0.016	○	○
1882230	11 IL 60 W	60	11	1/4	0.028	0.016	○	○
1882232	11 IL 56 W	56	11	1/4	0.028	0.016	○	○
1882234	11 IL 48 W	48	11	1/4	0.024	0.024	○	○
1882236	11 IL 40 W	40	11	1/4	0.024	0.024	○	○
1883766	11 IL 36 W	36	11	1/4	0.024	0.024	○	○
1882238	11 IL 32 W	32	11	1/4	0.024	0.024	○	○
1880994	11 IL 28 W	28	11	1/4	0.024	0.028	○	○
1882240	11 IL 26 W	26	11	1/4	0.028	0.028	○	○
1880993	11 IL 24 W	24	11	1/4	0.028	0.031	○	○
1883767	11 IL 22 W	22	11	1/4	0.031	0.035	○	○
1880992	11 IL 20 W	20	11	1/4	0.031	0.035	○	○
1880991	11 IL 19 W	19	11	1/4	0.031	0.039	○	○
1880990	11 IL 18 W	18	11	1/4	0.031	0.039	○	○
1880989	11 IL 16 W	16	11	1/4	0.035	0.043	○	○
1880988	11 IL 14 W	14	11	1/4	0.035	0.043	○	○
1883768	11 IL 12 W	12	11	1/4	0.039	0.043	○	○
1883769	11 IL 11 W	11	11	1/4	0.035	0.047	○	○
1882242	16 IL 72 W	72	16	3/8	0.028	0.016	○	○
1882243	16 IL 60 W	60	16	3/8	0.028	0.016	○	○
1882245	16 IL 56 W	56	16	3/8	0.028	0.016	○	○
1882247	16 IL 48 W	48	16	3/8	0.024	0.024	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1882249	16 IL 40 W	40	16	3/8	0.024	0.024	○	○
1882251	16 IL 36 W	36	16	3/8	0.024	0.024	○	○
1882253	16 IL 32 W	32	16	3/8	0.024	0.024	○	○
1880987	16 IL 28 W	28	16	3/8	0.024	0.028	○	○
1882255	16 IL 26 W	26	16	3/8	0.024	0.028	○	○
1880986	16 IL 24 W	24	16	3/8	0.028	0.031	○	○
1882257	16 IL 22 W	22	16	3/8	0.031	0.035	○	○
1880985	16 IL 20 W	20	16	3/8	0.031	0.035	○	○
1880984	16 IL 19 W	19	16	3/8	0.031	0.039	○	○
1880983	16 IL 18 W	18	16	3/8	0.031	0.039	○	○
1880982	16 IL 16 W	16	16	3/8	0.035	0.043	○	○
1880981	16 IL 14 W	14	16	3/8	0.039	0.047	○	○
1880980	16 IL 12 W	12	16	3/8	0.043	0.055	○	○
1880979	16 IL 11 W	11	16	3/8	0.043	0.059	◎	○
1880978	16 IL 10 W	10	16	3/8	0.043	0.059	○	○
1880977	16 IL 9 W	9	16	3/8	0.047	0.067	○	○
1880976	16 IL 8 W	8	16	3/8	0.047	0.059	○	○
1880975	22 IL 7 W	7	22	1/2	0.063	0.091	○	○
1880974	22 IL 6 W	6	22	1/2	0.063	0.091	○	○
1880973	22 IL 5 W	5	22	1/2	0.067	0.094	○	○
1882260	27 IL 4.5 W	4.5	27	5/8	0.071	0.102	○	○
1882262	27 IL 4 W	4	27	5/8	0.079	0.114	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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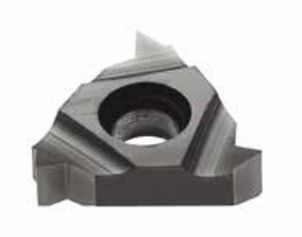
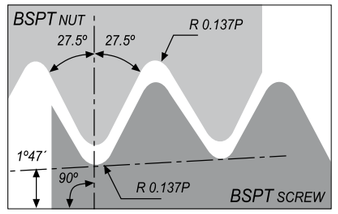
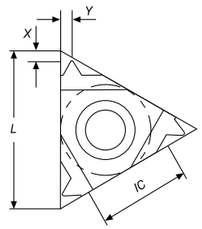
BSPT | B.S.21: 1985







External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1880998	16 ER 28 BSPT	28	16	3/8	0.024	0.024	○	○
1880997	16 ER 19 BSPT	19	16	3/8	0.031	0.035	○	○
1880996	16 ER 14 BSPT	14	16	3/8	0.039	0.047	○	○
1880995	16 ER 11 BSPT	11	16	3/8	0.043	0.059	✪	○
1882008	16 EL 28 BSPT	28	16	3/8	0.024	0.024	○	○
1882001	16 EL 19 BSPT	19	16	3/8	0.031	0.035	○	○
1881993	16 EL 14 BSPT	14	16	3/8	0.039	0.047	○	○
1881989	16 EL 11 BSPT	11	16	3/8	0.043	0.059	○	○

✪ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

Internal

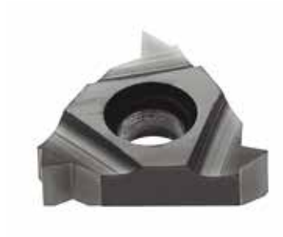
Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881724	06 IR 28 BSPT	28	06	5/32	0.028	0.024	○	○
1881767	08 IR 28 BSPT	28	08	3/16	0.024	0.024	○	○
1881763	08 IR 19 BSPT	19	08	3/16	0.024	0.024	○	○
1881949	11 IR 28 BSPT	28	11	1/4	0.024	0.024	○	○
1881004	11 IR 19 BSPT	19	11	1/4	0.031	0.035	○	○
1881003	11 IR 14 BSPT	14	11	1/4	0.035	0.039	○	○
1883770	11 IR 11 BSPT	11	11	1/4	0.035	0.047	○	○
1881002	16 IR 28 BSPT	28	16	3/8	0.024	0.024	○	○
1881001	16 IR 19 BSPT	19	16	3/8	0.031	0.035	○	○
1881000	16 IR 14 BSPT	14	16	3/8	0.039	0.047	○	○
1880999	16 IR 11 BSPT	11	16	3/8	0.043	0.059	○	○
1881710	06 IL 28 BSPT	28	06	5/32	0.028	0.024	○	○
1881746	08 IL 28 BSPT	28	08	3/16	0.024	0.024	○	○
1881742	08 IL 19 BSPT	19	08	3/16	0.024	0.024	○	○
1881929	11 IL 28 BSPT	28	11	1/4	0.024	0.024	○	○
1881925	11 IL 19 BSPT	19	11	1/4	0.031	0.035	○	○
1881918	11 IL 14 BSPT	14	11	1/4	0.035	0.039	○	○
1883771	11 IL 11 BSPT	11	11	1/4	0.035	0.047	○	○
1882090	16 IL 28 BSPT	28	16	3/8	0.024	0.024	○	○
1882084	16 IL 19 BSPT	19	16	3/8	0.031	0.035	○	○
1882076	16 IL 14 BSPT	14	16	3/8	0.039	0.047	○	○
1882071	16 IL 11 BSPT	11	16	3/8	0.043	0.059	○	○

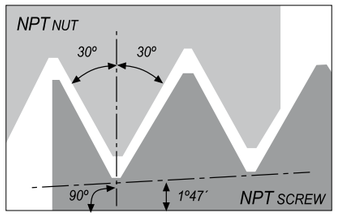
✪ Stock item | Produto de stock | Itens de stock

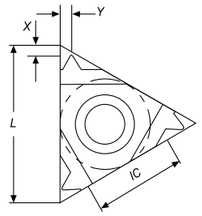
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

NPT | ANSI/ASME B 1.20.1-1983







External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881888	11 ER 27 NPT	27	11	1/4	0.028	0.031	○	○
1881875	11 ER 18 NPT	18	11	1/4	0.031	0.039	○	○
1881867	11 ER 14 NPT	14	11	1/4	0.031	0.039	○	○
1881017	16 ER 27 NPT	27	16	3/8	0.028	0.031	✪	○
1881016	16 ER 18 NPT	18	16	3/8	0.031	0.039	✪	○
1880013	16 ER 14 NPT	14	16	3/8	0.035	0.047	✪	○
1880009	16 ER 11.5 NPT	11.5	16	3/8	0.043	0.059	✪	○
1880023	16 ER 8 NPT	8	16	3/8	0.051	0.071	○	○
1881830	11 EL 27 NPT	27	11	1/4	0.028	0.031	○	○
1881817	11 EL 18 NPT	18	11	1/4	0.031	0.039	○	○
1881809	11 EL 14 NPT	14	11	1/4	0.031	0.039	○	○
1882005	16 EL 27 NPT	27	16	3/8	0.028	0.031	○	○
1881999	16 EL 18 NPT	18	16	3/8	0.031	0.039	○	○
1881994	16 EL 14 NPT	14	16	3/8	0.035	0.047	○	○
1881987	16 EL 11.5 NPT	11.5	16	3/8	0.043	0.059	○	○
1882025	16 EL 8 NPT	8	16	3/8	0.051	0.071	○	○

✪ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

NPT | ANSI/ASME B 1.20.1-1983

Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881723	06 IR 27 NPT	27	06	5/32	0.024	0.024	○	○
1881766	08 IR 27 NPT	27	08	3/16	0.024	0.024	○	○
1881761	08 IR 18 NPT	18	08	3/16	0.024	0.024	○	○
1881946	11 IR 27 NPT	27	11	1/4	0.028	0.031	○	○
1881020	11 IR 18 NPT	18	11	1/4	0.031	0.039	◎	○
1880003	11 IR 14 NPT	14	11	1/4	0.031	0.039	◎	○
1881019	16 IR 27 NPT	27	16	3/8	0.028	0.031	○	○
1881018	16 IR 18 NPT	18	16	3/8	0.031	0.039	◎	○
1880033	16 IR 14 NPT	14	16	3/8	0.035	0.047	◎	○
1880029	16 IR 11.5 NPT	11.5	16	3/8	0.043	0.059	○	○
1880043	16 IR 8 NPT	8	16	3/8	0.051	0.071	○	○
1881709	06 IL 27 NPT	27	06	5/32	0.024	0.024	○	○
1881745	08 IL 27 NPT	27	08	3/16	0.024	0.024	○	○
1881740	08 IL 18 NPT	18	08	3/16	0.024	0.024	○	○
1881926	11 IL 27 NPT	27	11	1/4	0.028	0.031	○	○
1881923	11 IL 18 NPT	18	11	1/4	0.031	0.039	○	○
1881919	11 IL 14 NPT	14	11	1/4	0.031	0.039	○	○
1882087	16 IL 27 NPT	27	16	3/8	0.028	0.031	○	○
1882082	16 IL 18 NPT	18	16	3/8	0.031	0.039	○	○
1882077	16 IL 14 NPT	14	16	3/8	0.035	0.047	○	○
1882069	16 IL 11.5 NPT	11.5	16	3/8	0.043	0.059	○	○
1882103	16 IL 8 NPT	8	16	3/8	0.051	0.071	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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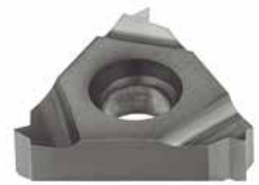
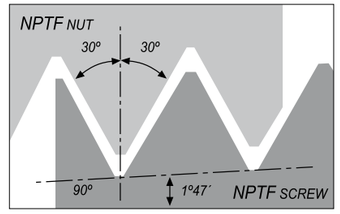
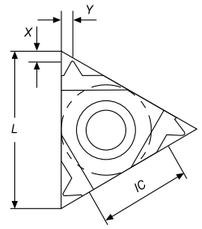
NPTF | ANSI B 1.20.3-1976







External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881889	11 ER 27 NPTF	27	11	1/4	0.028	0.028	○	○
1881876	11 ER 18 NPTF	18	11	1/4	0.031	0.039	○	○
1881868	11 ER 14 NPTF	14	11	1/4	0.031	0.039	○	○
1881030	16 ER 27 NPTF	27	16	3/8	0.028	0.028	◎	○
1881029	16 ER 18 NPTF	18	16	3/8	0.031	0.039	◎	○
1881028	16 ER 14 NPTF	14	16	3/8	0.035	0.047	○	○
1881027	16 ER 11.5 NPTF	11.5	16	3/8	0.043	0.059	○	○
1882057	16 ER 8 NPTF	8	16	3/8	0.051	0.071	○	○
1881831	11 EL 27 NPTF	27	11	1/4	0.028	0.028	○	○
1881818	11 EL 18 NPTF	18	11	1/4	0.031	0.039	○	○
1881810	11 EL 14 NPTF	14	11	1/4	0.031	0.039	○	○
1882006	16 EL 27 NPTF	27	16	3/8	0.028	0.031	○	○
1882000	16 EL 18 NPTF	18	16	3/8	0.031	0.039	○	○
1881995	16 EL 14 NPTF	14	16	3/8	0.035	0.047	○	○
1881988	16 EL 11.5 NPTF	11.5	16	3/8	0.043	0.059	○	○
1882026	16 EL 8 NPTF	8	16	3/8	0.051	0.071	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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NPTF | ANSI B 1.20.3-1976

Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1883772	06 IR 27 NPTF	27	06	5/32	0.028	0.024	○	○
1883773	08 IR 18 NPTF	18	08	3/16	0.024	0.024	○	○
1883774	08 IR 14 NPTF	14	08	3/16	0.024	0.024	○	○
1881947	11 IR 27 NPTF	27	11	1/4	0.028	0.028	○	○
1881026	11 IR 18 NPTF	18	11	1/4	0.031	0.039	○	○
1881025	11 IR 14 NPTF	14	11	1/4	0.031	0.039	○	○
1881024	16 IR 27 NPTF	27	16	3/8	0.028	0.028	○	○
1881023	16 IR 18 NPTF	18	16	3/8	0.031	0.039	○	○
1881022	16 IR 14 NPTF	14	16	3/8	0.035	0.047	○	○
1881021	16 IR 11.5 NPTF	11.5	16	3/8	0.043	0.059	○	○
1882127	16 IR 8 NPTF	8	16	3/8	0.051	0.071	○	○
1883775	06 IL 27 NPTF	27	06	5/32	0.028	0.024	○	○
1883776	08 IL 18 NPTF	18	08	3/16	0.024	0.024	○	○
1883777	08 IL 14 NPTF	14	08	3/16	0.024	0.024	○	○
1881927	11 IL 27 NPTF	27	11	1/4	0.028	0.028	○	○
1881924	11 IL 18 NPTF	18	11	1/4	0.031	0.039	○	○
1881920	11 IL 14 NPTF	14	11	1/4	0.031	0.039	○	○
1882088	16 IL 27 NPTF	27	16	3/8	0.028	0.028	○	○
1882083	16 IL 18 NPTF	18	16	3/8	0.031	0.039	○	○
1882078	16 IL 14 NPTF	14	16	3/8	0.035	0.047	○	○
1882070	16 IL 11.5 NPTF	11.5	16	3/8	0.043	0.059	○	○
1882104	16 IL 8 NPTF	8	16	3/8	0.051	0.071	○	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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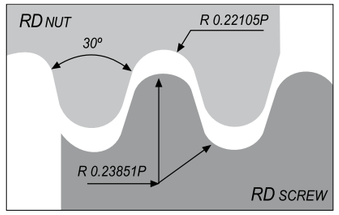
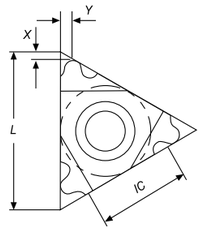
ROUND (DIN 405) | DIN 405:1997





External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881031	16 ER 10 RD	10	16	3/8	0.043	0.047	○	○
1881032	16 ER 8 RD	8	16	3/8	0.055	0.055	○	○
1881033	16 ER 6 RD	6	16	3/8	0.055	0.059	○	○
1881034	22 ER 6 RD	6	22	1/2	0.059	0.067	○	○
1881035	22 ER 4 RD	4	22	1/2	0.087	0.091	○	○
1882332	27 ER 4 RD	4	27	5/8	0.087	0.091	○	○
1882333	16 EL 10 RD	10	16	3/8	0.043	0.047	○	○
1882334	16 EL 8 RD	8	16	3/8	0.055	0.055	○	○
1882335	16 EL 6 RD	6	16	3/8	0.055	0.059	○	○
1882336	22 EL 6 RD	6	22	1/2	0.059	0.067	○	○
1882337	22 EL 4 RD	4	22	1/2	0.087	0.091	○	○
1882338	27 EL 4 RD	4	27	5/8	0.087	0.091	○	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881039	16 IR 10 RD	10	16	3/8	0.043	0.047	◎	○
1881040	16 IR 8 RD	8	16	3/8	0.055	0.055	◎	○
1881041	16 IR 6 RD	6	16	3/8	0.055	0.059	○	○
1881042	22 IR 6 RD	6	22	1/2	0.059	0.067	○	○
1881043	22 IR 4 RD	4	22	1/2	0.087	0.091	○	○
1882339	27 IR 4 RD	4	27	5/8	0.087	0.091	○	○
1882340	16 IL 10 RD	10	16	3/8	0.043	0.047	○	○
1882341	16 IL 8 RD	8	16	3/8	0.055	0.055	○	○
1882342	16 IL 6 RD	6	16	3/8	0.055	0.059	○	○
1882343	22 IL 6 RD	6	22	1/2	0.059	0.067	○	○
1882344	22 IL 4 RD	4	22	1/2	0.087	0.091	○	○
1882345	27 IL 4 RD	4	27	5/8	0.087	0.091	○	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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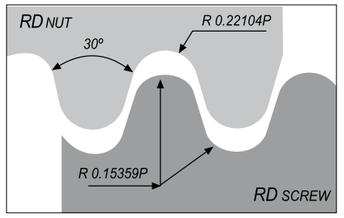
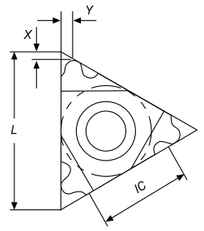
ROUND (DIN 20400) | DIN 20400:1990





External

Geometry code (1) Código	Reference Referência Referencia	Pitch	L (mm)	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)	
		MM		IC	X	Y	(68) PH6920	(D0) PH8920
1882347	22 ER 4.0 RD20400	4.0	22	1/2	0.055	0.055	●	○
1882348	22 ER 5.0 RD20400	5.0	22	1/2	0.067	0.071	○	○
1882349	22 ER 6.0 RD20400	6.0	22	1/2	0.067	0.079	○	○
1882351	22 EL 4.0 RD20400	4.0	22	1/2	0.055	0.055	○	○
1882352	22 EL 5.0 RD20400	5.0	22	1/2	0.067	0.071	○	○
1882353	22 EL 6.0 RD20400	6.0	22	1/2	0.067	0.079	○	○

● Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

Internal

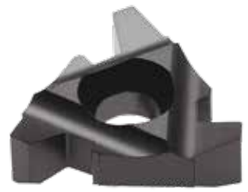
Geometry code (1) Código	Reference Referência Referencia	Pitch	L (mm)	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)	
		MM		IC	X	Y	(68) PH6920	(D0) PH8920
1882355	22 IR 4.0 RD20400	4.0	22	1/2	0.055	0.055	○	○
1882356	22 IR 5.0 RD20400	5.0	22	1/2	0.067	0.071	○	○
1882357	22 IR 6.0 RD20400	6.0	22	1/2	0.067	0.079	○	○
1882359	22 IL 4.0 RD20400	4.0	22	1/2	0.055	0.055	○	○
1882360	22 IL 5.0 RD20400	5.0	22	1/2	0.067	0.071	○	○
1882361	22 IL 6.0 RD20400	6.0	22	1/2	0.067	0.079	○	○

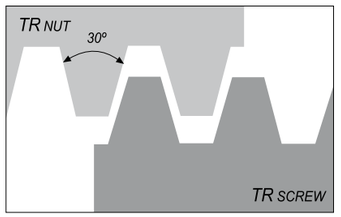
● Stock item | Produto de stock | Itens de stock

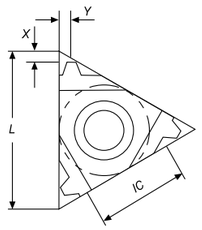
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

TRAPEZ | DIN 103:1977 | ISO 2901:1993







External

Geometry code (1) Código	Reference Referência Referencia	Pitch	L (mm)	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)	
		MM		IC	X	Y	(68) PH6920	(D0) PH8920
1881044	16 ER 1.5 TR	1.5	16	3/8	0.039	0.043	○	○
1881045	16 ER 2.0 TR	2.0	16	3/8	0.039	0.051	●	○
1881046	16 ER 3.0 TR	3.0	16	3/8	0.051	0.059	●	○
1883778	16 ER 4.0 TR	4.0	16	3/8	0.051	0.059	○	○
1881047	22 ER 4.0 TR	4.0	22	1/2	0.071	0.075	○	○
1881049	22 ER 5.0 TR	5.0	22	1/2	0.079	0.094	●	○
1883779	22 ER 6.0 TR	6.0	22	1/2	0.079	0.094	○	○
1882165	27 ER 6.0 TR	6.0	27	5/8	0.091	0.106	○	○
1882166	27 ER 7.0 TR	7.0	27	5/8	0.087	0.102	○	○
1881050	16 EL 1.5 TR	1.5	16	3/8	0.039	0.043	○	○
1881051	16 EL 2.0 TR	2.0	16	3/8	0.043	0.051	○	○
1881052	16 EL 3.0 TR	3.0	16	3/8	0.051	0.059	○	○
1883780	16 EL 4.0 TR	4.0	16	3/8	0.051	0.059	○	○
1881053	22 EL 4.0 TR	4.0	22	1/2	0.071	0.075	○	○
1882130	22 EL 5.0 TR	5.0	22	1/2	0.079	0.094	○	○
1883781	22 EL 6.0 TR	6.0	22	1/2	0.079	0.094	○	○
1882152	27 EL 6.0 TR	6.0	27	5/8	0.091	0.106	○	○
1882153	27 EL 7.0 TR	7.0	27	5/8	0.087	0.102	○	○

● Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

TRAPEZ | DIN 103:1977 | ISO 2901:1993

Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch MM	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1883782	08 IR 1.5 TR	1.5	08	3/16	0.024	0.024	○	○
1881055	16 IR 1.5 TR	1.5	16	3/8	0.039	0.043	○	○
1881056	16 IR 2.0 TR	2.0	16	3/8	0.039	0.051	○	○
1881057	16 IR 3.0 TR	3.0	16	3/8	0.051	0.059	○	○
1882119	16 IR 4.0 TR	4.0	16	3/8	0.051	0.059	○	○
1881058	22 IR 4.0 TR	4.0	22	1/2	0.071	0.075	○	○
1881059	22 IR 5.0 TR	5.0	22	1/2	0.079	0.094	○	○
1881060	22 IR 6.0 TR	6.0	22	1/2	0.079	0.094	◎	○
1882187	27 IR 6.0 TR	6.0	27	5/8	0.091	0.106	○	○
1882188	27 IR 7.0 TR	7.0	27	5/8	0.087	0.102	○	○
1883783	08 IL 1.5 TR	1.5	08	3/16	0.024	0.024	○	○
1881062	16 IL 2.0 TR	2.0	16	3/8	0.039	0.051	○	○
1881063	16 IL 3.0 TR	3.0	16	3/8	0.051	0.059	○	○
1882093	16 IL 4.0 TR	4.0	16	3/8	0.051	0.059	○	○
1881064	22 IL 4.0 TR	4.0	22	1/2	0.071	0.075	○	○
1881065	22 IL 5.0 TR	5.0	22	1/2	0.079	0.094	○	○
1881066	22 IL 6.0 TR	6.0	22	1/2	0.079	0.094	○	○
1882176	27 IL 6.0 TR	6.0	27	5/8	0.091	0.106	○	○
1882177	27 IL 7.0 TR	7.0	27	5/8	0.087	0.102	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
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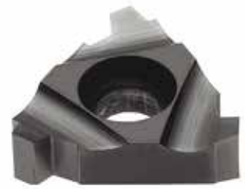

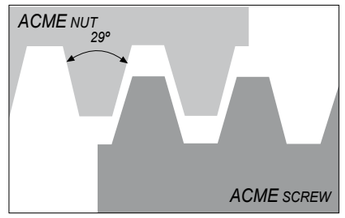

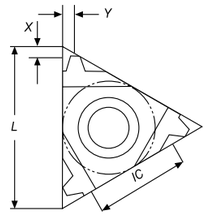

External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881871	11 ER 16 ACME	16	11	1/4	0.035	0.039	○	○
1881078	16 ER 16 ACME	16	16	3/8	0.035	0.039	◎	○
1881077	16 ER 14 ACME	14	16	3/8	0.039	0.047	○	○
1881076	16 ER 12 ACME	12	16	3/8	0.043	0.047	○	○
1881075	16 ER 10 ACME	10	16	3/8	0.051	0.051	◎	○
1881079	16 ER 8 ACME	8	16	3/8	0.059	0.059	○	○
1883784	16 ER 6 ACME	6	16	3/8	0.067	0.071	○	○
1881080	22 ER 6 ACME	6	22	1/2	0.071	0.083	◎	○
1881081	22 ER 5 ACME	5	22	1/2	0.079	0.091	○	○
1883826	22 ER 4 ACME	4	22	1/2	0.083	0.087	○	○
1882159	27 ER 4 ACME	4	27	5/8	0.091	0.106	○	○
1881813	11 EL 16 ACME	16	11	1/4	0.035	0.039	○	○
1881997	16 EL 16 ACME	16	16	3/8	0.035	0.039	○	○
1881992	16 EL 14 ACME	14	16	3/8	0.039	0.047	○	○
1881990	16 EL 12 ACME	12	16	3/8	0.043	0.047	○	○
1881985	16 EL 10 ACME	10	16	3/8	0.051	0.051	○	○
1882024	16 EL 8 ACME	8	16	3/8	0.059	0.059	○	○
1883827	16 EL 6 ACME	6	16	3/8	0.067	0.071	○	○
1882133	22 EL 6 ACME	6	22	1/2	0.071	0.083	○	○
1882131	22 EL 5 ACME	5	22	1/2	0.079	0.091	○	○
1883785	22 EL 4 ACME	4	22	1/2	0.083	0.087	○	○
1882146	27 EL 4 ACME	4	27	5/8	0.091	0.106	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1883786	08 IR 16 ACME	16	08	3/16	0.024	0.024	○	○
1881944	11 IR 16 ACME	16	11	1/4	0.035	0.039	○	○
1881107	16 IR 16 ACME	16	0.9	3/8	0.039	0.043	◎	○
1881106	16 IR 14 ACME	14	1.0	3/8	0.047	0.047	○	○
1881105	16 IR 12 ACME	12	1.1	3/8	0.047	0.047	○	○
1881104	16 IR 10 ACME	10	1.3	3/8	0.051	0.055	○	○
1881103	16 IR 8 ACME	8	1.5	3/8	0.059	0.059	○	○
1881885	16 IR 6 ACME	6	1.7	3/8	0.071	0.059	○	○
1881083	22 IR 6 ACME	6	22	1/2	0.071	0.083	◎	○
1881082	22 IR 5 ACME	5	22	1/2	0.079	0.091	○	○
1881102	22 IR 4 ACME	4	22	1/2	0.083	0.087	◎	○
1882182	27 IR 4 ACME	4	27	5/8	0.091	0.106	○	○
1883787	08 IL 16 ACME	16	08	3/16	0.024	0.024	○	○
1881921	11 IL 16 ACME	16	11	1/4	0.035	0.039	○	○
1882080	16 IL 16 ACME	16	0.9	3/8	0.039	0.043	○	○
1882075	16 IL 14 ACME	14	1.0	3/8	0.047	0.047	○	○
1882072	16 IL 12 ACME	12	1.1	3/8	0.047	0.047	○	○
1882067	16 IL 10 ACME	10	1.3	3/8	0.051	0.055	○	○
1882102	16 IL 8 ACME	8	1.5	3/8	0.059	0.059	○	○
1882099	16 IL 6 ACME	6	1.7	3/8	0.071	0.059	○	○
1882140	22 IL 6 ACME	6	22	1/2	0.071	0.083	○	○
1882138	22 IL 5 ACME	5	22	1/2	0.079	0.091	○	○
1882136	22 IL 4 ACME	4	22	1/2	0.083	0.087	○	○
1882171	27 IL 4 ACME	4	27	5/8	0.091	0.106	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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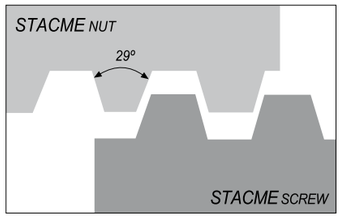

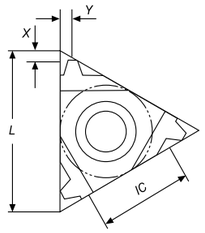

External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881872	11 ER 16 STACME	16	11	3/16	0.039	0.039	○	○
1881116	16 ER 16 STACME	16	16	1/4	0.039	0.039	○	○
1881117	16 ER 14 STACME	14	16	3/8	0.043	0.043	○	○
1881118	16 ER 12 STACME	12	16	3/8	0.047	0.047	○	○
1881119	16 ER 10 STACME	10	16	3/8	0.051	0.051	○	○
1881120	16 ER 8 STACME	8	16	3/8	0.059	0.059	○	○
1881121	16 ER 6 STACME	6	16	3/8	0.071	0.071	◎	○
1882135	22 ER 6 STACME	6	22	3/8	0.071	0.083	○	○
1881122	22 ER 5 STACME	5	22	1/2	0.079	0.091	○	○
1881123	22 ER 4 STACME	4	22	1/2	0.091	0.094	○	○
1882160	27 ER 4 STACME	4	27	1/2	0.091	0.094	◎	○
1882156	27 ER 3 STACME	3	27	5/8	0.110	0.114	○	○
1881814	11 EL 16 STACME	16	11	3/16	0.039	0.039	○	○
1881998	16 EL 16 STACME	16	16	1/4	0.039	0.039	○	○
1881996	16 EL 14 STACME	14	16	3/8	0.043	0.043	○	○
1881991	16 EL 12 STACME	12	16	3/8	0.047	0.047	○	○
1881986	16 EL 10 STACME	10	16	3/8	0.051	0.051	○	○
1882027	16 EL 8 STACME	8	16	3/8	0.059	0.059	○	○
1882021	16 EL 6 STACME	6	16	3/8	0.071	0.071	○	○
1882134	22 EL 6 STACME	6	22	3/8	0.071	0.083	○	○
1882132	22 EL 5 STACME	5	22	1/2	0.079	0.091	○	○
1881889	22 EL 4 STACME	4	22	1/2	0.091	0.094	○	○
1882147	27 EL 4 STACME	4	27	1/2	0.091	0.094	○	○
1882143	27 EL 3 STACME	3	27	5/8	0.110	0.114	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1883788	08 IR 16 STACME	16	08	3/16	0.024	0.024	○	○
1881108	16 IR 16 STACME	16	16	3/8	0.039	0.039	○	○
1881109	16 IR 14 STACME	14	16	3/8	0.043	0.043	○	○
1881110	16 IR 12 STACME	12	16	3/8	0.047	0.047	○	○
1881111	16 IR 10 STACME	10	16	3/8	0.051	0.051	○	○
1881112	16 IR 8 STACME	8	16	3/8	0.059	0.059	○	○
1881113	16 IR 6 STACME	6	16	3/8	0.071	0.071	○	○
1882142	22 IR 6 STACME	6	22	1/2	0.071	0.083	○	○
1881114	22 IR 5 STACME	5	22	1/2	0.079	0.091	○	○
1881115	22 IR 4 STACME	4	22	1/2	0.091	0.094	○	○
1882183	27 IR 4 STACME	4	27	5/8	0.091	0.094	◎	○
1882180	27 IR 3 STACME	3	27	5/8	0.110	0.114	○	○
1883789	08 IL 16 STACME	16	08	3/16	0.024	0.024	○	○
1882081	16 IL 16 STACME	16	16	3/8	0.039	0.039	○	○
1882079	16 IL 14 STACME	14	16	3/8	0.043	0.043	○	○
1882073	16 IL 12 STACME	12	16	3/8	0.047	0.047	○	○
1882068	16 IL 10 STACME	10	16	3/8	0.051	0.051	○	○
1882105	16 IL 8 STACME	8	16	3/8	0.059	0.059	○	○
1882100	16 IL 6 STACME	6	16	3/8	0.071	0.071	○	○
1882141	22 IL 6 STACME	6	22	1/2	0.071	0.083	○	○
1882139	22 IL 5 STACME	5	22	1/2	0.079	0.091	○	○
1882137	22 IL 4 STACME	4	22	1/2	0.091	0.094	○	○
1882172	27 IL 4 STACME	4	27	5/8	0.091	0.094	○	○
1882169	27 IL 3 STACME	3	27	5/8	0.110	0.114	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
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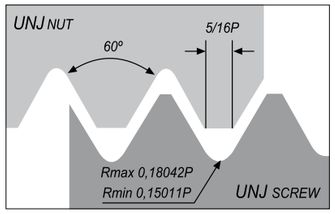
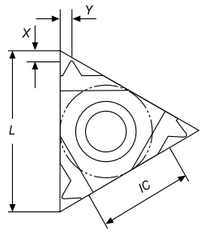
UNJ | MIL-S-8879A





External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1883790	11 ER 48 UNJ	48	11	1/4	0.024	0.024	○	○
1883791	11 ER 44 UNJ	44	11	1/4	0.024	0.024	○	○
1883792	11 ER 40 UNJ	40	11	1/4	0.024	0.024	○	○
1883793	11 ER 36 UNJ	36	11	1/4	0.024	0.024	○	○
1882318	11 ER 32 UNJ	32	11	1/4	0.024	0.024	○	○
1882319	11 ER 28 UNJ	28	11	1/4	0.024	0.024	○	○
1882320	11 ER 24 UNJ	24	11	1/4	0.028	0.031	○	○
1882321	11 ER 20 UNJ	20	11	1/4	0.031	0.035	○	○
1882322	11 ER 18 UNJ	18	11	1/4	0.031	0.039	○	○
1882323	11 ER 16 UNJ	16	11	1/4	0.031	0.039	○	○
1882324	11 ER 14 UNJ	14	11	1/4	0.035	0.039	○	○
1883794	16 ER 48 UNJ	48	16	3/8	0.024	0.024	○	○
1883795	16 ER 44 UNJ	44	16	3/8	0.024	0.024	○	○
1883796	16 ER 40 UNJ	40	16	3/8	0.024	0.024	○	○
1883797	16 ER 36 UNJ	36	16	3/8	0.024	0.024	○	○
1881165	16 ER 32 UNJ	32	16	3/8	0.024	0.024	○	○
1881164	16 ER 28 UNJ	28	16	3/8	0.024	0.024	○	○
1881163	16 ER 24 UNJ	24	16	3/8	0.028	0.031	○	○
1881162	16 ER 20 UNJ	20	16	3/8	0.031	0.035	○	○
1881161	16 ER 18 UNJ	18	16	3/8	0.031	0.039	○	○
1881160	16 ER 16 UNJ	16	16	3/8	0.031	0.039	○	○
1881159	16 ER 14 UNJ	14	16	3/8	0.039	0.047	○	○
1881158	16 ER 13 UNJ	13	16	3/8	0.039	0.051	○	○
1881157	16 ER 12 UNJ	12	16	3/8	0.043	0.055	○	○
1881156	16 ER 11 UNJ	11	16	3/8	0.043	0.059	○	○
1881155	16 ER 10 UNJ	10	16	3/8	0.043	0.059	○	○
1881154	16 ER 9 UNJ	9	16	3/8	0.047	0.063	○	○
1881153	16 ER 8 UNJ	8	16	3/8	0.047	0.063	○	○
1883798	11 EL 48 UNJ	48	11	1/4	0.024	0.024	○	○
1883799	11 EL 44 UNJ	44	11	1/4	0.024	0.024	○	○
1883800	11 EL 40 UNJ	40	11	1/4	0.024	0.024	○	○
1883801	11 EL 36 UNJ	36	11	1/4	0.024	0.024	○	○
1882325	11 EL 32 UNJ	32	11	1/4	0.024	0.024	○	○
1882326	11 EL 28 UNJ	28	11	1/4	0.024	0.024	○	○
1882327	11 EL 24 UNJ	24	11	1/4	0.028	0.031	○	○
1882328	11 EL 20 UNJ	20	11	1/4	0.031	0.035	○	○

◎ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1882329	11 EL 18 UNJ	18	11	1/4	0.031	0.039	○	○
1882330	11 EL 16 UNJ	16	11	1/4	0.031	0.039	○	○
1882331	11 EL 14 UNJ	14	11	1/4	0.035	0.039	○	○
1883802	16 ER 48 UNJ	48	16	3/8	0.024	0.024	○	○
1883803	16 ER 44 UNJ	44	16	3/8	0.024	0.024	○	○
1883804	16 ER 40 UNJ	40	16	3/8	0.024	0.024	○	○
1883805	16 ER 36 UNJ	36	16	3/8	0.024	0.024	○	○
1881179	16 EL 32 UNJ	32	16	3/8	0.024	0.024	○	○
1881178	16 EL 28 UNJ	28	16	3/8	0.024	0.024	○	○
1881177	16 EL 24 UNJ	24	16	3/8	0.028	0.031	○	○
1881176	16 EL 20 UNJ	20	16	3/8	0.031	0.035	○	○
1881175	16 EL 18 UNJ	18	16	3/8	0.031	0.039	○	○
1881174	16 EL 16 UNJ	16	16	3/8	0.031	0.039	○	○
1881173	16 EL 14 UNJ	14	16	3/8	0.039	0.047	○	○
1881172	16 EL 13 UNJ	13	16	3/8	0.039	0.051	○	○
1881170	16 EL 12 UNJ	12	16	3/8	0.043	0.055	○	○
1881169	16 EL 11 UNJ	11	16	3/8	0.043	0.059	○	○
1881168	16 EL 10 UNJ	10	16	3/8	0.043	0.059	○	○
1881167	16 EL 9 UNJ	9	16	3/8	0.047	0.063	○	○
1881166	16 EL 8 UNJ	8	16	3/8	0.047	0.063	○	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)

See page E - 385 for more detail information

Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1883806	11 IR 48 UNJ	48	11	1/4	0.024	0.024	○	○
1883807	11 IR 44 UNJ	44	11	1/4	0.024	0.024	○	○
1883808	11 IR 40 UNJ	40	11	1/4	0.024	0.024	○	○
1883809	11 IR 36 UNJ	36	11	1/4	0.024	0.024	○	○
1881198	11 IR 32 UNJ	32	11	1/4	0.024	0.024	○	○
1881197	11 IR 28 UNJ	28	11	1/4	0.024	0.024	○	○
1881196	11 IR 24 UNJ	24	11	1/4	0.028	0.031	○	○
1881195	11 IR 20 UNJ	20	11	1/4	0.031	0.035	○	○
1881194	11 IR 18 UNJ	18	11	1/4	0.031	0.039	○	○
1881193	11 IR 16 UNJ	16	11	1/4	0.031	0.039	○	○
1881192	11 IR 14 UNJ	14	11	1/4	0.035	0.039	○	○
1883810	16 IR 48 UNJ	48	16	3/8	0.024	0.024	○	○
1883811	16 IR 44 UNJ	44	16	3/8	0.024	0.024	○	○
1883812	16 IR 40 UNJ	40	16	3/8	0.024	0.024	○	○
1883813	16 IR 36 UNJ	36	16	3/8	0.024	0.024	○	○
1881191	16 IR 32 UNJ	32	16	3/8	0.024	0.024	○	○
1881190	16 IR 28 UNJ	28	16	3/8	0.024	0.024	○	○
1881189	16 IR 24 UNJ	24	16	3/8	0.028	0.031	○	○
1881188	16 IR 20 UNJ	20	16	3/8	0.031	0.035	○	○
1881187	16 IR 18 UNJ	18	16	3/8	0.031	0.039	○	○
1881186	16 IR 16 UNJ	16	16	3/8	0.031	0.039	○	○
1881185	16 IR 14 UNJ	14	16	3/8	0.039	0.047	○	○
1883814	16 IR 13 UNJ	13	16	3/8	0.039	0.051	○	○
1881184	16 IR 12 UNJ	12	16	3/8	0.043	0.055	◎	○
1881183	16 IR 11 UNJ	11	16	3/8	0.043	0.059	○	○
1881182	16 IR 10 UNJ	10	16	3/8	0.043	0.059	◎	○
1881181	16 IR 9 UNJ	9	16	3/8	0.047	0.063	○	○
1881180	16 IR 8 UNJ	8	16	3/8	0.047	0.063	○	○
1883815	11 IL 48 UNJ	48	11	1/4	0.024	0.024	○	○
1883816	11 IL 44 UNJ	44	11	1/4	0.024	0.024	○	○
1883817	11 IL 40 UNJ	40	11	1/4	0.024	0.024	○	○
1883818	11 IL 36 UNJ	36	11	1/4	0.024	0.024	○	○
1881217	11 IL 32 UNJ	32	11	1/4	0.024	0.024	○	○
1881216	11 IL 28 UNJ	28	11	1/4	0.024	0.024	○	○
1881215	11 IL 24 UNJ	24	11	1/4	0.028	0.031	○	○
1881214	11 IL 20 UNJ	20	11	1/4	0.031	0.035	○	○
1881213	11 IL 18 UNJ	18	11	1/4	0.031	0.039	○	○
1881188	11 IL 16 UNJ	16	11	1/4	0.031	0.039	○	○
1881211	11 IL 14 UNJ	14	11	1/4	0.035	0.039	○	○
1883819	16 IL 48 UNJ	48	16	3/8	0.024	0.024	◎	○
1883820	16 IL 44 UNJ	44	16	3/8	0.024	0.024	◎	○
1883821	16 IL 40 UNJ	40	16	3/8	0.024	0.024	○	○
1883822	16 IL 36 UNJ	36	16	3/8	0.024	0.024	○	○
1881210	16 IL 32 UNJ	32	16	3/8	0.024	0.024	◎	○
1881209	16 IL 28 UNJ	28	16	3/8	0.024	0.024	○	○
1881208	16 IL 24 UNJ	24	16	3/8	0.028	0.031	◎	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)

See page E - 385 for more detail information

UNJ | MIL-S-8879A

Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881207	16 IL 20 UNJ	20	16	3/8	0.031	0.035	○	○
1881206	16 IL 18 UNJ	18	16	3/8	0.031	0.039	○	○
1881205	16 IL 16 UNJ	16	16	3/8	0.031	0.039	○	○
1881204	16 IL 14 UNJ	14	16	3/8	0.039	0.047	○	○
1883823	16 IR 13 UNJ	13	16	3/8	0.039	0.051	○	○
1881203	16 IL 12 UNJ	12	16	3/8	0.043	0.055	○	○
1881202	16 IL 11 UNJ	11	16	3/8	0.043	0.059	○	○
1881201	16 IL 10 UNJ	10	16	3/8	0.043	0.059	○	○
1881200	16 IL 9 UNJ	9	16	3/8	0.047	0.063	○	○
1881199	16 IL 8 UNJ	8	16	3/8	0.047	0.063	○	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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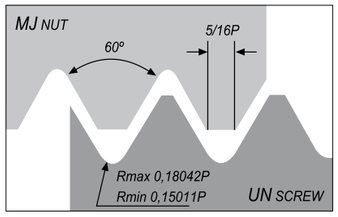
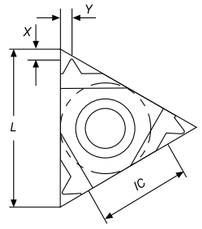
MJ | ISO 5855-1:1989





External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881067	16 ER 1.0 MJ	1.0	16	3/8	0.028	0.031	○	○
1881068	16 ER 1.25 MJ	1.25	16	3/8	0.031	0.035	○	○
1881069	16 ER 1.5 MJ	1.5	16	3/8	0.031	0.039	○	○
1881070	16 ER 2.0 MJ	2.0	16	3/8	0.039	0.051	◎	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

Internal

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1882370	11 IR 1.0 MJ	1.0	11	1/4	0.028	0.031	○	○
1882371	11 IR 1.25 MJ	1.25	11	1/4	0.031	0.035	○	○
1882372	11 IR 1.5 MJ	1.5	11	1/4	0.031	0.039	○	○
1883824	11 IR 2.0 MJ	2.0	11	1/4	0.035	0.039	○	○
1881071	16 IR 1.0 MJ	1.0	16	3/8	0.028	0.031	○	○
1881072	16 IR 1.25 MJ	1.25	16	3/8	0.031	0.035	○	○
1881073	16 IR 1.5 MJ	1.5	16	3/8	0.031	0.039	○	○
1881074	16 IR 2.0 MJ	2.0	16	3/8	0.039	0.051	○	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

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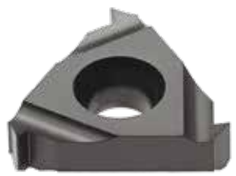
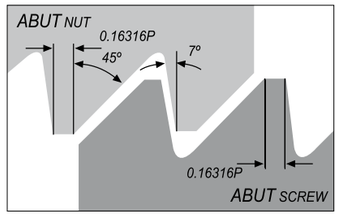
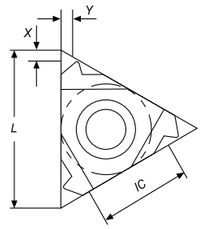
AMERICAN BUTTRESS | ANSI B1.9-1973







External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1882298	11 ER 20 ABUT	20	11	1/4	0.039	0.051	○	○
1882299	11 ER 16 ABUT	16	11	1/4	0.039	0.059	○	○
1881007	16 ER 20 ABUT	20	16	3/8	0.039	0.051	○	○
1880754	16 ER 16 ABUT	16	16	3/8	0.039	0.059	○	○
1881006	16 ER 12 ABUT	12	16	3/8	0.055	0.079	○	○
1881005	16 ER 10 ABUT	10	16	3/8	0.059	0.091	○	○
1881008	22 ER 8 ABUT	8	22	1/2	0.083	0.130	○	○
1881009	22 ER 6 ABUT	6	22	1/2	0.083	0.134	○	○
1882300	11 EL 20 ABUT	20	11	1/4	0.039	0.055	○	○
1882301	11 EL 16 ABUT	16	11	1/4	0.043	0.063	○	○
1882302	16 EL 20 ABUT	20	16	3/8	0.039	0.051	○	○
1882303	16 EL 16 ABUT	16	16	3/8	0.039	0.059	○	○
1882304	16 EL 12 ABUT	12	16	3/8	0.055	0.079	○	○
1882305	16 EL 10 ABUT	10	16	3/8	0.059	0.091	○	○
1882306	22 EL 8 ABUT	8	22	1/2	0.083	0.130	○	○
1882307	22 EL 6 ABUT	6	22	1/2	0.083	0.134	○	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

Internal

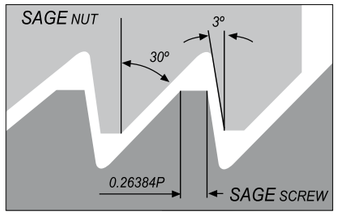
Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1882308	11 IR 20 ABUT	20	11	1/4	0.039	0.055	○	○
1882309	11 IR 16 ABUT	16	11	1/4	0.043	0.063	○	○
1881015	16 IR 20 ABUT	20	16	3/8	0.039	0.051	○	○
1881014	16 IR 16 ABUT	16	16	3/8	0.039	0.059	⊛	○
1881013	16 IR 12 ABUT	12	16	3/8	0.055	0.079	○	○
1881012	16 IR 10 ABUT	10	16	3/8	0.059	0.091	○	○
1881011	22 IR 8 ABUT	8	22	1/2	0.083	0.130	○	○
1881010	22 IR 6 ABUT	6	22	1/2	0.083	0.134	○	○
1882310	11 IL 20 ABUT	20	11	1/4	0.039	0.055	○	○
1882311	11 IL 16 ABUT	16	11	1/4	0.043	0.063	○	○
1882312	16 IL 20 ABUT	20	16	3/8	0.039	0.051	○	○
1882313	16 IL 16 ABUT	16	16	3/8	0.039	0.059	○	○
1882314	16 IL 12 ABUT	12	16	3/8	0.055	0.079	○	○
1882315	16 IL 10 ABUT	10	16	3/8	0.059	0.091	○	○
1882316	22 IL 8 ABUT	8	22	1/2	0.083	0.130	○	○
1882317	22 IL 6 ABUT	6	22	1/2	0.083	0.134	○	○

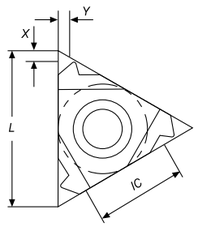
Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

METRIC BUTTRESS SAGENGEWINDE (DIN 513:1985) SAW THREAD





External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1882384	16 ER 2.0 SAGE	2.0	16	3/8	0.043	0.063	○	○
1882385	22 ER 3.0 SAGE	3.0	22	1/2	0.059	0.094	○	○
1882386	22 ER 4.0 SAGE	4.0	22	1/2	0.075	0.122	⊛	○
1882387	16 EL 2.0 SAGE	2.0	16	3/8	0.043	0.063	○	○
1882388	22 EL 3.0 SAGE	3.0	22	1/2	0.059	0.094	○	○
1882389	22 EL 4.0 SAGE	4.0	22	1/2	0.075	0.122	○	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

Internal

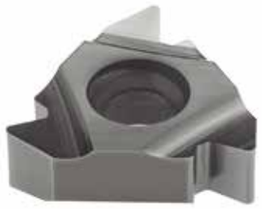
Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1882390	16 IR 2.0 SAGE	2.0	16	3/8	0.047	0.067	○	○
1882391	22 IR 3.0 SAGE	3.0	22	1/2	0.075	0.114	○	○
1882392	22 IR 4.0 SAGE	4.0	22	1/2	0.091	0.138	○	○
1882393	16 IL 2.0 SAGE	2.0	16	3/8	0.047	0.067	○	○
1882394	22 IL 3.0 SAGE	3.0	22	1/2	0.075	0.114	○	○
1882395	22 IL 4.0 SAGE	4.0	22	1/2	0.091	0.138	○	○

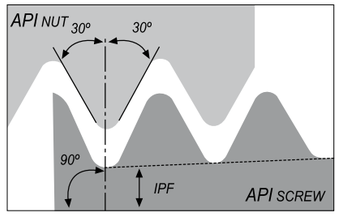
Stock item | Produto de stock | Itens de stock

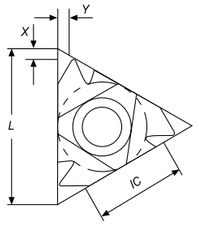
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

API | API SPEC 7:2001 (0.040 | 0.038R | 0.050)







External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	Thread	Taper IPF	Size	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881326	22 ER 5.00 API 403	5	V-0.040	3	2 3/8" - 4 1/2" REG	22	1/2	0.071	0.098	◎	○
1881322	22 ER 4.00 API 382	4	V-0.038R	2	NC23-NC50	22	1/2	0.079	0.102	○	○
1881324	22 ER 4.00 API 502	4	V-0.050	2	6 5/8" REG	22	1/2	0.075	0.110	○	○
1882396	27 ER 5.00 API 403	5	V-0.040	3	2 3/8" - 4 1/2" REG	27	5/8	0.075	0.106	○	○
1882397	27 ER 4.00 API 382	4	V-0.038R	2	NC23-NC50	27	5/8	0.083	0.110	○	○
1882398	27 ER 4.00 API 383	4	V-0.038R	3	NC56-NC77	27	5/8	0.083	0.110	○	○
1882399	27 ER 4.00 API 502	4	V-0.050	2	6 5/8" REG	27	5/8	0.079	0.118	◎	○
1882400	27 ER 4.00 API 503	4	V-0.050	3	5 1/2" . 7 5/8" . 8 5/8" REG	27	5/8	0.079	0.118	○	○

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

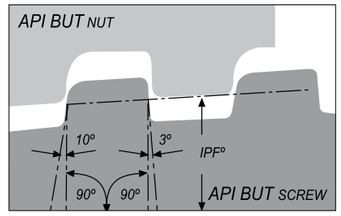
Internal

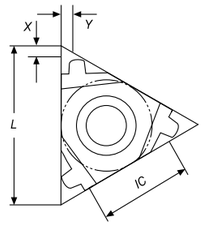
Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	Thread	Taper IPF	Size	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881335	22 IR 5.00 API 403	5	V-0.040	3	2 3/8" - 4 1/2" REG	22	1/2	0.071	0.098	◎	○
1881331	22 IR 4.00 API 382	4	V-0.038R	2	NC23-NC50	22	1/2	0.079	0.102	○	○
1881333	22 IR 4.00 API 502	4	V-0.050	2	6 5/8" REG	22	1/2	0.075	0.110	○	○
1882401	27 IR 5.00 API 403	5	V-0.040	3	2 3/8" - 4 1/2" REG	27	5/8	0.075	0.106	○	○
1882402	27 IR 4.00 API 382	4	V-0.038R	2	NC23-NC50	27	5/8	0.083	0.110	○	○
1882403	27 IR 4.00 API 383	4	V-0.038R	3	NC56-NC77	27	5/8	0.083	0.110	○	○
1882404	27 IR 4.00 API 502	4	V-0.050	2	6 5/8" REG	27	5/8	0.079	0.118	○	○
1882405	27 IR 4.00 API 503	4	V-0.050	3	5 1/2" . 7 5/8" . 8 5/8" REG	27	5/8	0.079	0.118	○	○

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

API | BUTTRESS CASING | API SPEC 5B:2008 | OIL THREADS





External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	Taper IPF	Size	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881327	22 ER 5 BUT 0.75	5	0.75	4 1/2" - 13 3/8"	22	1/2	0.087	0.094	◎	○
1881328	22 ER 5 BUT 1.00	5	1.00	16" - 20"	22	1/2	0.091	0.094	○	○

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

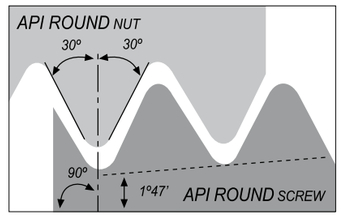
Internal

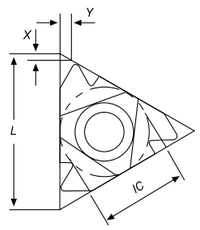
Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	Taper IPF	Size	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881336	22 IR 5 BUT 0.75	5	0.75	4 1/2" - 13 3/8"	22	1/2	0.087	0.094	◎	○
1881337	22 IR 5 BUT 1.00	5	1.00	16" - 20"	22	1/2	0.091	0.094	○	○

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

API ROUND CASING & TUBING | API SPEC 5B:2008





External

Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	Taper IPF	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881318	16 ER 10 API RD	10	0.75	16	3/8	0.059	0.055	○	○
1881320	16 ER 8 API RD	8	0.75	16	3/8	0.051	0.063	◎	○

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

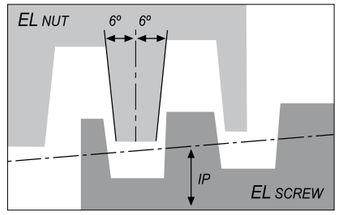
Internal

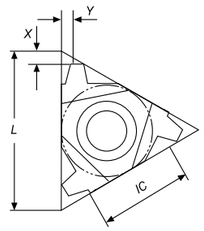
Geometry code (1) Código	Reference Referência Referencia	Pitch TPI	Taper IPF	L (mm)	Dimensions | Dimensões | Dimensiones (in) IC	X	Y	Stock - Grade Code (2) (68) PH6920	(D0) PH8920
1881319	16 IR 10 API RD	10	0.75	16	3/8	0.059	0.055	○	○
1881321	16 IR 8 API RD	8	0.75	16	3/8	0.051	0.063	○	○

◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

EXTREME LINE CASING | API SPEC 5B:2008 - OIL THREADS





External

Geometry code (1) Código	Reference Referência Referencia	Pitch	Taper	Size	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)	
		TPI	IPF		(mm)	IC	X	Y	(68) PH6920	(D0) PH8920
1881329	22 ER 6 EL 1.5	6	1.5	5" - 7 5/8"	22	1/2	0.075	0.075	○	○
1881330	22 ER 5 EL 1.25	5	1.25	8 5/8" - 10 3/4"	22	1/2	0.094	0.091	○	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

Internal

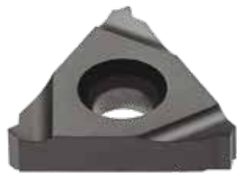
Geometry code (1) Código	Reference Referência Referencia	Pitch	Taper	Size	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)	
		TPI	IPF		(mm)	IC	X	Y	(68) PH6920	(D0) PH8920
1881339	22 IR 6 EL 1.5	6	1.5	5" - 7 5/8"	22	1/2	0.075	0.075	○	○
1881338	22 IR 5 EL 1.25	5	1.25	8 5/8" - 10 3/4"	22	1/2	0.094	0.091	○	○

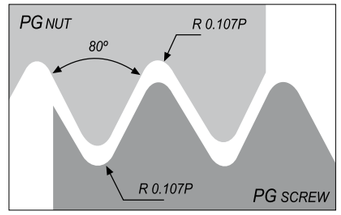
Stock item | Produto de stock | Itens de stock

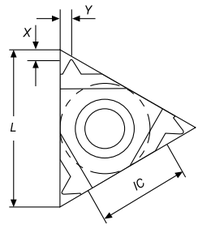
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

PG | DIN 40430; 1971







External

Geometry code (1) Código	Reference Referência Referencia	Pitch	Size	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)	
		TPI		(mm)	IC	X	Y	(68) PH6920	(D0) PH8920
1882290	16 ER 20 PG	20	PG7	16	3/8	0.028	0.031	○	○
1882291	16 ER 18 PG	18	PG9, PG11, PG13.5, PG16	16	3/8	0.031	0.035	◎	○
1882292	16 ER 16 PG	16	PG21, PG29, PG36, PG42, PG48	16	3/8	0.031	0.039	○	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

Internal

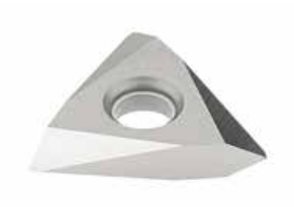
Geometry code (1) Código	Reference Referência Referencia	Pitch	Size	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)	
		TPI		(mm)	IC	X	Y	(68) PH6920	(D0) PH8920
1883825	08 IR 20 PG	20	PG7	8	3/16	0.024	0.028	○	○
1882294	11 IR 18 PG	18	PG9, PG11, PG13.5, PG16	11	1/4	0.031	0.035	○	○
1882296	16 IR 18 PG	18	PG9, PG11, PG13.5, PG16	16	3/8	0.031	0.035	○	○
1882297	16 IR 16 PG	16	PG21, PG29, PG36, PG42, PG48	16	3/8	0.031	0.039	○	○

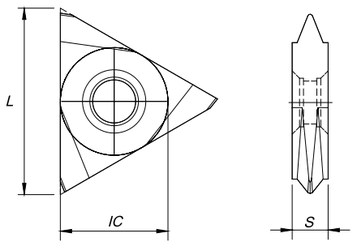
Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Order Code = (1) + (2)
See page E - 385 for more detail information

TNMC (TANGENCIAL INSERTS)



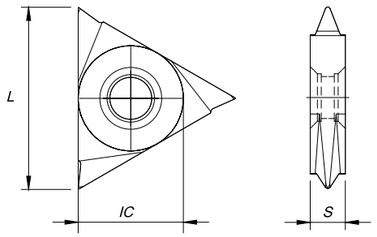


Geometry code (1) Código	Reference Referência Referencia	L (mm)	Dimensions | Dimensões | Dimensiones (in)		Stock - Grade Code (2)	
			IC	S	(68) PH6920	(D0) PH8920
1110401	TNMC 1603 55	16.50	3/8	0.125	○	○
1110402	TNMC 1603 60	16.50	3/8	0.125	○	○
1110530	TNMC 2204 55	22.00	1/2	0.187	○	○
1110404	TNMC 2204 60	22.00	1/2	0.187	○	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

TPMC (TANGENCIAL INSERTS)



Geometry code (1) Código	Reference Referência Referencia	L (mm)	Dimensions | Dimensões | Dimensiones (in)		Stock - Grade Code (2)	
			IC	S	(68) PH6920	(D0) PH8920
1110481	TPMC 1603 55	16.50	3/8	0.125	○	○
1110480	TPMC 1603 60	16.50	3/8	0.125	○	○
1110541	TPMC 2204 55	22.00	1/2	0.187	○	○
1110542	TPMC 2204 60	22.00	1/2	0.187	○	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

SPARE PARTS

Screws

Order Code Código	Reference Referência Referencia	Stock
290025000	P0200600	○
290044800	P0260700	
290027200	P0351375	
290027500	P0500990	○
290027800	P0501975	
290055000	P0502200	○
290045100	P5000790	
290044600	P5401390	
290044900	P5401391	
290045200	P8000990	
290044700	P8001590	
290045000	P8001591	

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Keys

Order Code Código	Reference Referência Referencia	Stock
290011400	XT06	
290011700	XT08	
290013100	XT10	
290013200	XT20	
290017400	XT25	
290020300	SS20	○
290019800	SS25	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

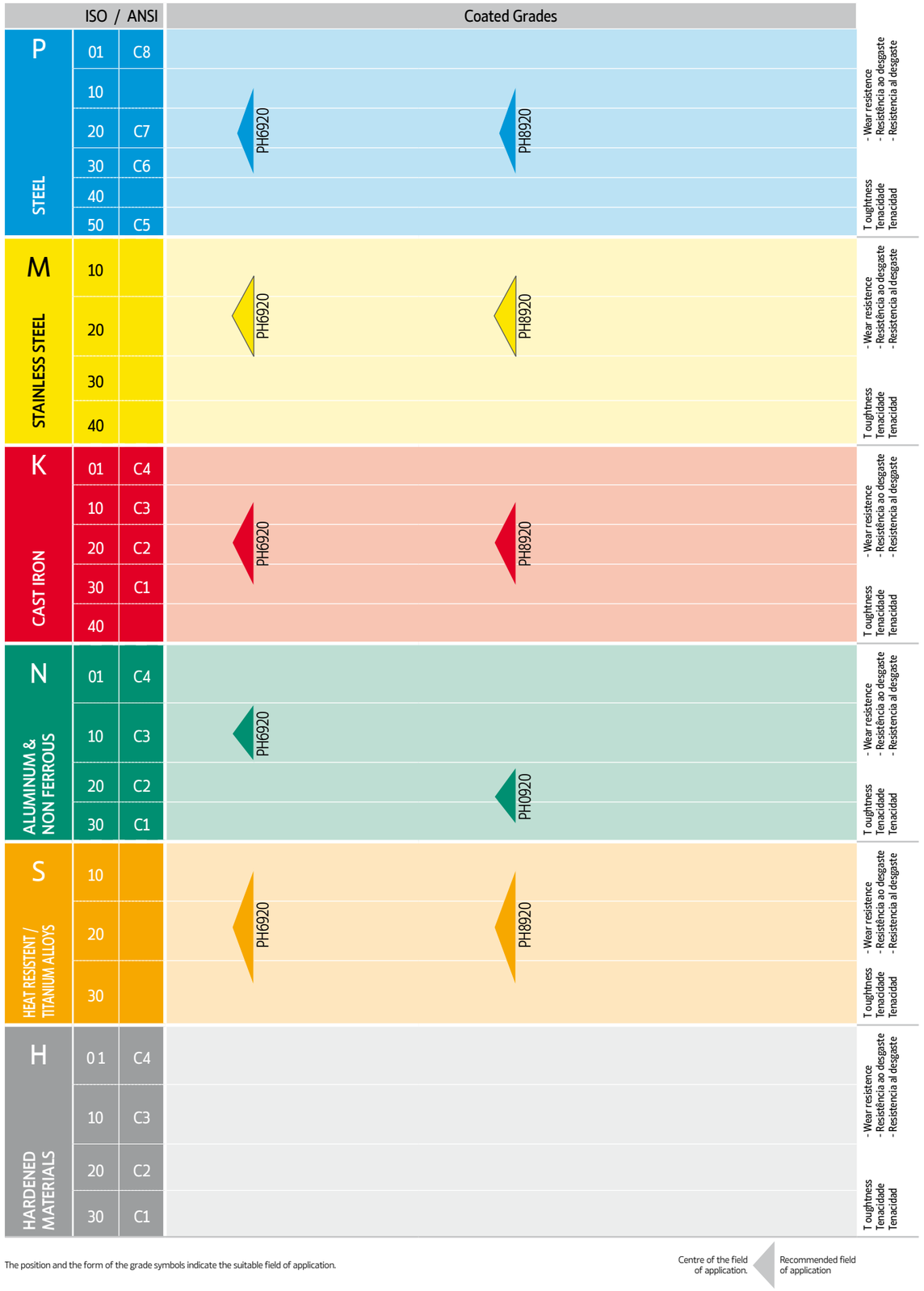
Shims

Order Code Código	Reference Referência Referencia	Stock
212134400	EA16	○
212134500	EA16 1,5N	○
212134600	EA16 1N	○
212134700	EA16 1P	○
212134800	EA16 2N	○
212134900	EA16 2P	○
212135000	EA16 3N	○
212135100	EA16 3P	○
212135200	EA22	○
212135300	EA22 1,5N	○
212135400	EA22 1N	○
212135500	EA22 1P	○
212135600	EA22 2N	○
212135700	EA22 2P	○
212135800	EA22 3N	○
212135900	EA22 3P	○
212136000	IA16	○
212136100	IA16 1,5N	○
212136200	IA16 1N	○
212136300	IA16 1P	○
212136400	IA16 2N	○
212136500	IA16 2P	○
212136600	IA16 3N	○
212136700	IA16 3P	○
212136800	IA22	○
212136900	IA22 1,5N	○
212137000	IA22 1N	○
212137100	IA22 1P	○
212137200	IA22 2N	○
212137300	IA22 2P	○
212137400	IA22 3N	○
212137500	IA22 3P	○

Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

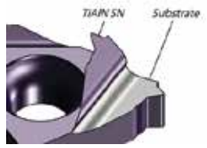
THREADING GRADES



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

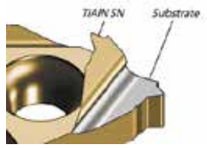
GRADES DESCRIPTION

PH6920
(P10-P35)
(M10-M25)
(K10-K30)
(N05-N15)
(S10-S30)



An advance PVD TiAlN coated grade over a tough wear-resistant submicron sbstrate for general purpose machiningof steel, stainless steel, superalloys.

PH8920
(P10-P35)
(M10-M25)
(K10-K30)
(N05-N15)
(S10-S30)



An advance PVD TiAlN+TiN coated grade over a tough wear-resistant submicron sbstrate for general purpose machiningof steel, stainless steel, superalloys.

ORDER CODE INFORMATION

The order code it's the combination between the geometry code of the insert plus the code of the grade.
- E.g. 2120035 (16IR 14W) + 68 (PH6920) = 212003568
  Geometry Code + Grade Code = Order Code

RECOMMENDED GRADES AND CUTTING SPEEDS (sfm)

ISO	Material	Hardness HB	Coated PH6920	Coated PH8920
			Cutting Speed sfm	
P	UNALLOYED STEEL	130	394-656	394-656
	LOW-ALLOYED STEEL	200	361-591	361-591
	HIGH-ALLOY STEEL	240	328-558	328-558
	STEEL CASTINGS	270	230-394	230-394
	HEAT TREATED STEEL	400	164-296	164-296
M	300 STAINLESS STEEL: (303,304,316)	200	230-460	230-460
	400 STAINLESS STEEL: (420,440)	240	263-394	263-394
	17-4 PH, 15-5 PH, 13-8MO PH	400	164-361	164-361
K	GREY CAST IRON	190	230-492	230-492
	NODULAR CAST IRON	180	328-460	328-460
	MALLEABLE CAST IRON	240	296-492	296-492
N	WROUGHT ALUMINUM: (2024, 6061, 7075...)	80	328-1312	328-1312
	CAST ALUMINUM:	90	492-1312	492-1312
	COPPER & COPPER:BRASS, BRONZE, COPPER SILICON	100	263-591	263-591
	NON METALIC:Rubber, polypropylene, Thermoplastics (PVC),Thermoplastics Plastics (FIBERGLASS),Polyamides		656-1640	656-1640
S	TITANIUM:			
	PURE TITANIUM: 99,0Ti		328-492	328-492
	ALPHA ALLOYS: Ti5A12.5Sn		132-197	132-197
	BETA ALLOYS: Ti 13V11Cr3A1		99-164	99-164
	ALPHA - BETA ALLOYS: Ti 6A14V		99-164	99-164
	COBALT BASE ALLOYS: STELLITE		66-132	66-132
	NIKEL BASE ALLOYS:INCONEL, HASTELLOY,WASPALLOY, KOVAR		66-132	66-132
	HIGH TEMPERATURE ALLOYS:IRON BASED: INCOLOY		99-197	99-197
H	HARDENED STEEL	56 HRc	99-164	99-164
	HARDENED CAST IRON	50 HRc	82-115	82-115

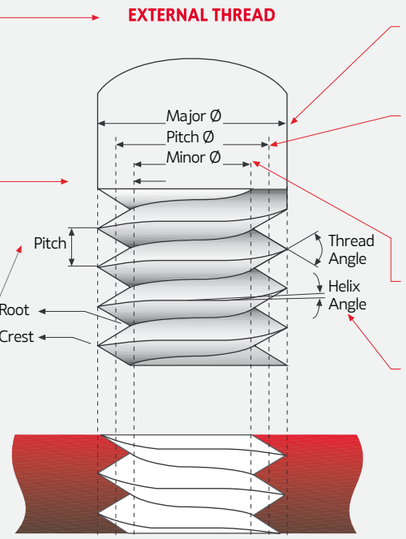
THREAD TERMINOLOGY

External Thread
A thread on the external surface of a cylinder screw or cone.

Depth of Thread
The distance between crest and root measured normal to the axis.

Pitch
The distance between corresponding points on adjacent thread forms measured parallel to the axis. This distance can be defined in millimeters or by the tpi (threads per inch), which is he reciprocal of the pitch

Nominal Diameter
The diameter from which the diameter limits are derived by the application of deviation allowances and tolerances.



Internal Thread
A thread on the internal surface of a cylinder or cone.

Major Diameter
The largest diameter of a screw thread.

Pitch Diameter
On a straight thread, the diameter of an imaginary cylinder, the surface of which cuts the thread forms where the width of the thread and groove are equal.

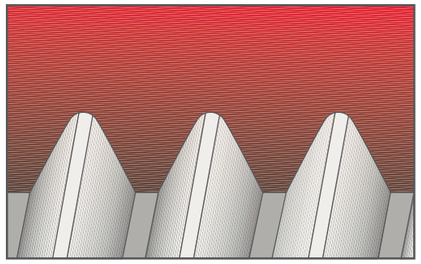
Minor Diameter
The smallest diameter of a screw thread.

Helix Angle
For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite the lead.

Straight Thread
A thread formed on a cylinder.

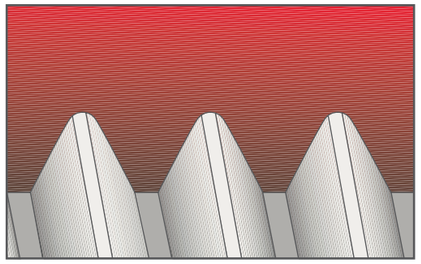
Taper Thread
A thread formed on a cone.

LEFT-HAND THREAD



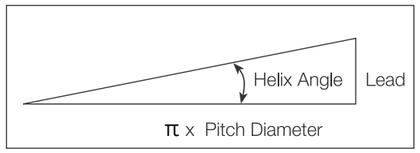
A thread which, when viewed axially, winds in a counter-clockwise and receding direction. All left-hand threads are designated LH.

RIGHT-HAND THREAD



A thread which, when viewed axially, winds in a clockwise and receding direction. Threads are always right hand unless otherwise specified.

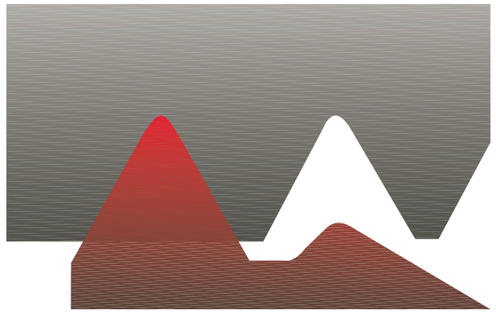
THE HELIX ANGLE



Lead
The distance a threaded part moves axially, with respect to a fixed mating part, in one complete revolution.
The lead is equal to the pitch multiplied by the number of thread starts.

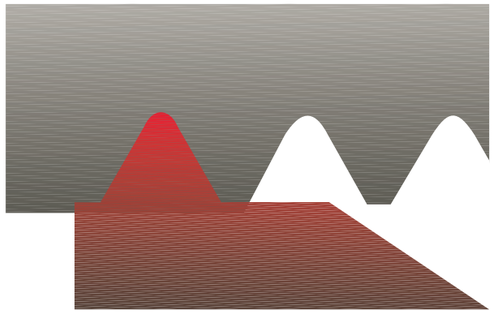
INSERT PROFILE STYLES

PARTIAL PROFILE



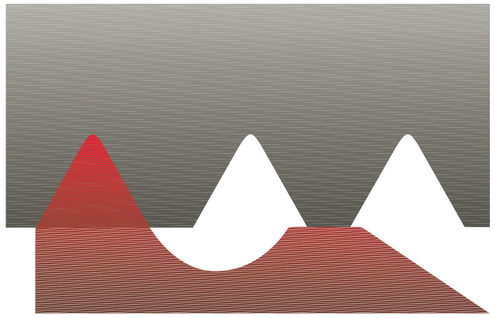
The V partial profile insert cuts without topping the outer diameter of the thread. The same insert can be used for a range of different thread pitches which have a common thread angle.

FULL PROFILE



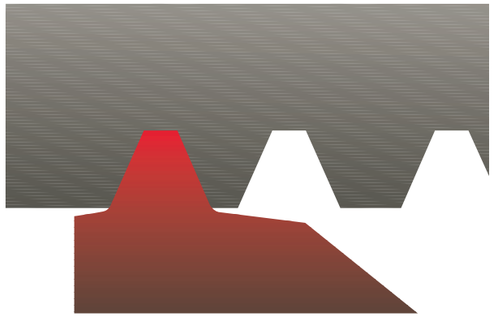
The full profile insert will form a complete thread profile including the crest. For every thread pitch and standard, a separate insert is required.

FULL PROFILE FOR FINE PITCHES



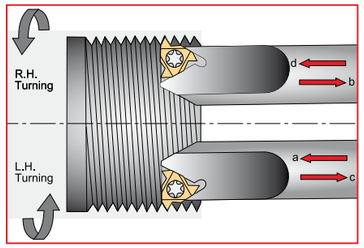
The full profile for Fine Pitches will form a complete thread.
The topping of the outer diameter is generated by second tooth.

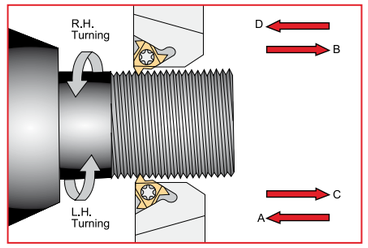
SEMI FULL



The Semi profile insert will form a complete thread including crest radius but without topping the outer diameter.
Mainly used for trapezoidal profiles.

THREAD WORK METHODS

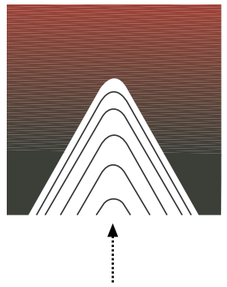




Thread	Inserts & Toolholders	Rotation	Feed Direction	Helix Method	Method
Right Hand external	EX RH	Anticlockwise	Towards chuck	Regular	A
	EX LH	Clockwise	From chuck	Reversed	B
Right Hand Internal	IN RH	Anticlockwise	Towards chuck	Regular	a
	IN LH	Clockwise	From chuck	Reversed	b
Left Hand External	EX LH	Clockwise	Towards chuck	Regular	D
	EX RH	Anticlockwise	From chuck	Reversed	C
Left Hand Internal	IN LH	Clockwise	Towards chuck	Regular	d
	IN RH	Anticlockwise	From chuck	Reversed	c

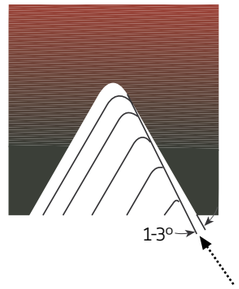
THREAD INFEAD METHODS

RADIAL INFEED



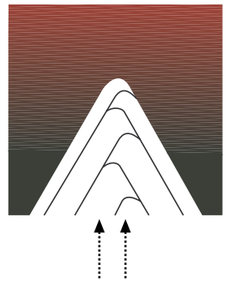
Radial infeed is the simplest and quickest method.
The feed is perpendicular to the turning axis, and both flanks of the insert perform the cutting operation.
Radial infeed is recommended in 3 cases:
• when the pitch is smaller than 16 tpi
• for material with short chips
• for work with hardened material

FLANK INFEED (modified)



Flank infeed is recommended in the following cases:
• when the thread pitch is greater than 16 tpi., using the radial method, the effective cutting edge length is too large, resulting in chatter.
• for TRAPEZ and ACME. The radial method result in three cutting edges, making chip flow very difficult.

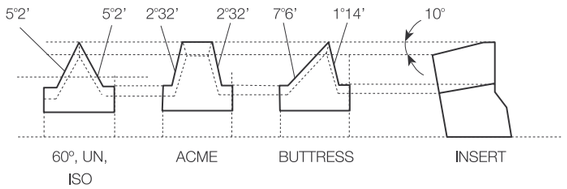
ALTERNATE FLANK INFEED



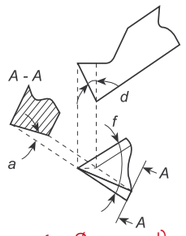
Use of the alternate flank method is recommended especially in large pitches and for materials with long cihps.
This method divides the load equally on both flanks, resulting in equal wear along the cutting edges. Alternate flank infeed requires more complicated programming, and is not available on all lathes.

CALCULATING THE HELIX ANGLE AND CHOOSING THE RIGHT ANVIL

FLANK CLEARANCE ANGLE a



Palbit toolholders are designed to tilt the insert when seated in the toolholder (10° for external, 15° for internal tooling). This results in the differing flank clearance angles, based on the geometry of insert. To ensure that the side of the insert cutting edge will not rub on the workpiece, it is most important that the insert helix angle be correct - especially in profiles with small enclosed flank angles. This correction is provided by Palbit anvils.

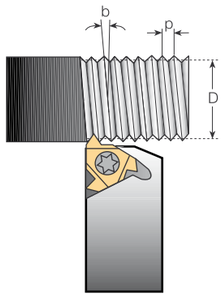


$a = \arctan(\tan Ø / 2 \times \tan d)$

Where: a - flank clearance angle
d - Tilt angle
Ø - Enclosed flank angle

CALCULATING THE HELIX ANGLE b

FORMULA



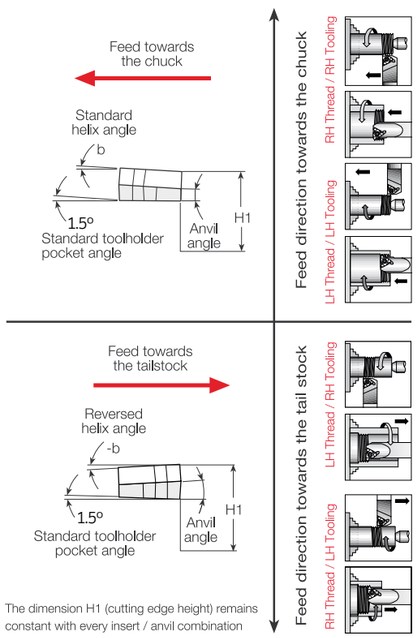
The helix angle is calculated by the following formula:

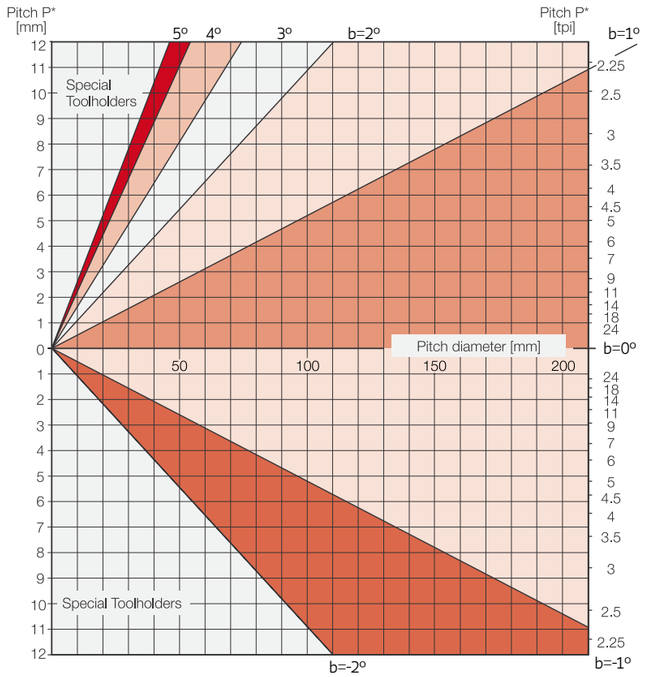
$$b = \arctan \frac{P \times N}{\pi \times D}$$

b - Helix angle (°)
P - Pitch (1/TPI)
N - No. of starts
D - Pitch diameter (mm)
Lead = P x N
TPI=Threads per inches

The helix angle can also be found using the diagram below

HELIX ANGLE DIAGRAM





*For Multi-start threads, use the lead value instead of the pitch

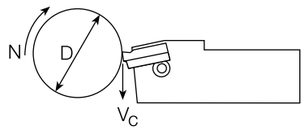
NUMBER OF CUTTING PASSES

Pitch MM	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	8.00
Pitch TPI	48	32	24	20	16	14	12	10	8	7	6	5.5	5	4.5	4	3
No. of Passes	4 - 6	4 - 7	4 - 8	5 - 9	6 - 10	7 - 12	7 - 12	8 - 14	9 - 16	10 - 18	11 - 18	11 - 19	12 - 20	12 - 20	12 - 20	15 - 24

CALCULATION OF N (RPM)

$$N = \frac{12'' \times V_C}{\pi \times D}$$

$$V_C = \frac{N \times \pi \times D}{12}$$



N - Revolution Per Minute [RPM]
V_C - Cutting Speed [sfm]
D - Workpiece Diameter [in]

SHIMS

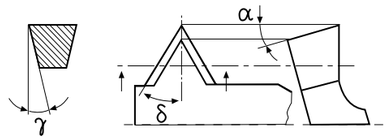
Insert Size IC	Insert Size L (mm)	Holder Type	Resultant Helix Angle 4.5	3.5	2.5	1.5 standard	0.5	0	-0.5	-1.5
3,8"	16	ER/IL	EA16 3P	EA16 2P	EA16 1P	EA16	EA16 1N	EA16 1,5N	EA16 2N	EA16 3N
		EL/IR	IA16 3P	IA16 2P	IA16 1P	IA16	IA16 1N	IA16 1,5N	IA16 2N	IA16 3N
1/2"	22	ER/IL	EA22 3P	EA22 2P	EA22 1P	EA22	EA22 1N	EA22 1,5N	EA22 2N	EA22 3N
		EL/IR	IA22 3P	IA22 2P	IA22 1P	IA22	IA22 1N	IA22 1,5N	IA22 2N	IA22 3N
5/8"	27	ER/IL	EA27 3P	EA27 2P	EA27 1P	EA27	EA27 1N	EA27 1,5N	EA27 2N	EA27 3N
		EL/IR	IA27 3P	IA27 2P	IA27 1P	IA27	IA27 1N	IA27 1,5N	IA27 2N	IA27 3N

FLANK CLEARANCE ANGLE - γ

$\gamma = tg^{-1}[tg\alpha \times tg\delta]$

α = 10° for external

α = 15° for internal



ISO METRIC EXTERNAL THREAD - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch (MM)															
	6	5.5	5	4.5	4	3.5	3	2.5	2	1.75	1.5	1.25	1	0.75	0.5	0.35
1	0.018	0.017	0.017	0.015	0.013	0.013	0.011	0.010	0.009	0.009	0.009	0.008	0.007	0.007	0.004	0.004
2	0.015	0.014	0.015	0.013	0.012	0.012	0.009	0.009	0.009	0.008	0.008	0.007	0.006	0.006	0.004	0.003
3	0.013	0.012	0.012	0.011	0.010	0.009	0.008	0.008	0.007	0.006	0.007	0.006	0.005	0.004	0.003	0.002
4	0.011	0.011	0.011	0.010	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.005	0.004	0.002	0.002	
5	0.010	0.010	0.010	0.009	0.007	0.007	0.007	0.006	0.006	0.005	0.004	0.004	0.002			
6	0.009	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.005	0.004	0.002	0.002				
7	0.009	0.009	0.008	0.007	0.006	0.006	0.006	0.005	0.004	0.003						
8	0.009	0.008	0.008	0.007	0.006	0.006	0.005	0.005	0.002	0.002						
9	0.008	0.007	0.007	0.006	0.006	0.006	0.005	0.004								
10	0.007	0.007	0.007	0.006	0.006	0.005	0.004	0.002								
11	0.007	0.007	0.006	0.006	0.005	0.004	0.004									
12	0.007	0.006	0.006	0.005	0.005	0.002	0.002									
13	0.006	0.006	0.004	0.004	0.004											
14	0.006	0.005	0.002	0.002	0.002											
15	0.005	0.004														
16	0.004	0.002														
17	0.002															
18																
Total	0.146	0.134	0.122	0.110	0.098	0.086	0.074	0.061	0.050	0.043	0.037	0.031	0.025	0.019	0.013	0.009

UN EXTERNAL THREAD - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch TPI																		
	4	4.5	5	6	7	8	9	10	11	12	13	14	16	18	20	24	28	32	48
1	0.017	0.017	0.017	0.015	0.013	0.011	0.011	0.010	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.005
2	0.015	0.014	0.015	0.013	0.011	0.009	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.007	0.006	0.007	0.006	0.006	0.004
3	0.013	0.012	0.013	0.011	0.009	0.008	0.009	0.008	0.007	0.008	0.007	0.007	0.007	0.007	0.006	0.006	0.004	0.005	0.003
4	0.011	0.011	0.011	0.010	0.009	0.007	0.009	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.005	0.004	0.004	0.002	0.002
5	0.011	0.010	0.010	0.009	0.008	0.007	0.007	0.006	0.006	0.006	0.006	0.005	0.004	0.004	0.004	0.002	0.002		
6	0.010	0.009	0.009	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.005	0.004	0.004	0.002	0.002				
7	0.009	0.009	0.009	0.007	0.007	0.006	0.006	0.006	0.005	0.004	0.004	0.004	0.002						
8	0.009	0.008	0.008	0.006	0.006	0.006	0.005	0.005	0.005	0.002	0.002	0.002							
9	0.008	0.008	0.007	0.006	0.006	0.006	0.004	0.004	0.002										
10	0.008	0.007	0.007	0.005	0.006	0.006	0.002	0.002											
11	0.007	0.007	0.007	0.005	0.005	0.004													
12	0.007	0.007	0.006	0.004	0.002	0.002													
13	0.007	0.006	0.004	0.004															
14	0.007	0.006	0.002	0.002															
15	0.006	0.005																	
16	0.005	0.002																	
17	0.002																		
Total	0.154	0.137	0.124	0.104	0.089	0.078	0.069	0.063	0.057	0.052	0.048	0.045	0.039	0.035	0.032	0.027	0.023	0.020	0.014

ISO METRIC INTERNAL THREAD - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch (MM)															
	6	5.5	5	4.5	4	3.5	3	2.5	2	1.75	1.5	1.25	1	0.75	0.5	0.35
1	0.017	0.017	0.017	0.014	0.013	0.013	0.010	0.010	0.009	0.009	0.009	0.007	0.007	0.006	0.004	0.004
2	0.014	0.013	0.015	0.013	0.011	0.011	0.009	0.008	0.008	0.008	0.008	0.006	0.006	0.006	0.004	0.003
3	0.013	0.011	0.011	0.011	0.009	0.009	0.007	0.007	0.007	0.006	0.007	0.005	0.005	0.004	0.003	0.002
4	0.011	0.009	0.010	0.010	0.008	0.007	0.007	0.006	0.006	0.005	0.006	0.004	0.004	0.002	0.002	
5	0.010	0.009	0.009	0.009	0.007	0.007	0.006	0.006	0.006	0.004	0.004	0.004	0.002			
6	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.005	0.004	0.004	0.002	0.002				
7	0.009	0.008	0.008	0.007	0.006	0.006	0.006	0.005	0.004	0.003						
8	0.008	0.008	0.007	0.007	0.006	0.006	0.005	0.004	0.002	0.002						
9	0.007	0.007	0.007	0.006	0.006	0.005	0.004	0.004								
10	0.007	0.006	0.006	0.006	0.006	0.004	0.004	0.002								
11	0.006	0.006	0.006	0.005	0.005	0.004	0.003									
12	0.006	0.006	0.005	0.004	0.004	0.002	0.002									
13	0.006	0.006	0.004	0.004	0.004											
14	0.005	0.004	0.002	0.002	0.002											
15	0.004	0.004														
16	0.004	0.002														
17	0.002															
18																
Total	0.138	0.126	0.115	0.104	0.092	0.081	0.069	0.058	0.046	0.041	0.035	0.030	0.024	0.018	0.013	0.009

UN INTERNAL THREAD - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch TPI																		
	4	4.5	5	6	7	8	9	10	11	12	13	14	16	18	20	24	28	32	48
1	0.017	0.017	0.017	0.013	0.012	0.011	0.011	0.010	0.009	0.009	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.007	0.005
2	0.013	0.014	0.015	0.011	0.011	0.009	0.009	0.008	0.008	0.008	0.008	0.008	0.007	0.007	0.006	0.006	0.006	0.006	0.004
3	0.013	0.011	0.011	0.010	0.009	0.007	0.008	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.004	0.004	0.003
4	0.011	0.009	0.010	0.009	0.008	0.007	0.008	0.006	0.006	0.007	0.006	0.005	0.005	0.006	0.004	0.004	0.003	0.002	0.002
5	0.010	0.009	0.009	0.008	0.007	0.006	0.006	0.006	0.006	0.006	0.005	0.004	0.004	0.004	0.004	0.002	0.002		
6	0.010	0.009	0.008	0.007	0.007	0.006	0.006	0.005	0.006	0.005	0.005	0.004	0.004	0.002	0.002				
7	0.009	0.008	0.008	0.007	0.006	0.006	0.006	0.005	0.005	0.004	0.004	0.004	0.002						
8	0.008	0.008	0.007	0.006	0.006	0.006	0.005	0.005	0.004	0.002	0.002	0.002							
9	0.008	0.007	0.007	0.006	0.006	0.005	0.004	0.004	0.002										
10	0.007	0.007	0.006	0.005	0.006	0.005	0.002	0.002											
11	0.007	0.007	0.006	0.005	0.004	0.003													
12	0.007	0.006	0.005	0.004	0.002	0.002													
13	0.006	0.006	0.004	0.004															
14	0.006	0.005	0.002	0.002															
15	0.006	0.004																	
16	0.005	0.002																	
17	0.002																		
Total	0.146	0.130	0.117	0.097	0.083	0.073	0.066	0.059	0.053	0.049	0.046	0.043	0.037	0.033	0.030	0.025	0.022	0.019	0.013

W. EXTERNAL THREAD - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch TPI																		
	4	4.5	5	6	7	8	9	10	11	12	14	16	18	19	20	24	28	32	48
1	0.018	0.017	0.017	0.015	0.013	0.012	0.011	0.011	0.010	0.010	0.009	0.009	0.009	0.009	0.008	0.008	0.007	0.007	0.006
2	0.016	0.014	0.015	0.013	0.011	0.009	0.010	0.009	0.009	0.009	0.008	0.007	0.008	0.007	0.007	0.007	0.006	0.006	0.006
3	0.014	0.012	0.013	0.011	0.009	0.008	0.009	0.008	0.008	0.008	0.007	0.006	0.006	0.007	0.006	0.006	0.005	0.005	0.002
4	0.012	0.011	0.011	0.011	0.009	0.007	0.008	0.007	0.007	0.007	0.006	0.005	0.006	0.006	0.005	0.004	0.004	0.002	
5	0.011	0.011	0.011	0.010	0.009	0.007	0.008	0.007	0.007	0.007	0.006	0.005	0.004	0.004	0.004	0.002	0.002		
6	0.011	0.009	0.010	0.007	0.008	0.007	0.007	0.006	0.006	0.006	0.005	0.004	0.002	0.002	0.002				
7	0.010	0.009	0.009	0.007	0.007	0.007	0.007	0.006	0.005	0.005	0.004	0.004							
8	0.009	0.009	0.008	0.007	0.006	0.006	0.006	0.005	0.005	0.002	0.002	0.002							
9	0.009	0.008	0.008	0.006	0.006	0.006	0.005	0.004	0.002										
10	0.008	0.008	0.007	0.006	0.006	0.005	0.002	0.002											
11	0.008	0.007	0.007	0.005	0.005	0.004													
12	0.007	0.007	0.006	0.004	0.002	0.002													
13	0.007	0.006	0.005	0.004															
14	0.007	0.006	0.002	0.002															
15	0.007	0.005																	
16	0.005	0.002																	
17	0.002																		
Total	0.161	0.143	0.129	0.108	0.093	0.081	0.072	0.065	0.059	0.055	0.047	0.041	0.037	0.035	0.033	0.028	0.024	0.021	0.014

W. INTERNAL THREAD - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch TPI																		
	4	4.5	5	6	7	8	9	10	11	12	14	16	18	19	20	24	28	32	48
1	0.018	0.017	0.017	0.015	0.013	0.012	0.011	0.011	0.010	0.010	0.009	0.009	0.009	0.009	0.008	0.008	0.007	0.007	0.006
2	0.016	0.014	0.015	0.013	0.011	0.009	0.010	0.009	0.009	0.009	0.008	0.007	0.008	0.007	0.007	0.007	0.006	0.006	0.006
3	0.014	0.012	0.013	0.011	0.009	0.008	0.009	0.008	0.008	0.008	0.007	0.006	0.006	0.007	0.006	0.006	0.005	0.005	0.002
4	0.012	0.011	0.011	0.011	0.009	0.007	0.008	0.007	0.007	0.007	0.006	0.005	0.006	0.006	0.005	0.004	0.004	0.002	
5	0.011	0.011	0.011	0.010	0.009	0.007	0.008	0.007	0.007	0.007	0.006	0.005	0.004	0.004	0.004	0.002	0.002		
6	0.011	0.009	0.010	0.007	0.008	0.007	0.007	0.006	0.006	0.006	0.005	0.004	0.002	0.002	0.002				
7	0.010	0.009	0.009	0.007	0.007	0.007	0.007	0.006	0.005	0.005	0.004	0.004							
8	0.009	0.009	0.008	0.007	0.006	0.006	0.006	0.005	0.005	0.002	0.002	0.002							
9	0.009	0.008	0.008	0.006	0.006	0.006	0.005	0.004	0.002										
10	0.008	0.008	0.007	0.006	0.006	0.005	0.002	0.002											
11	0.008	0.007	0.007	0.005	0.005	0.004													
12	0.007	0.007	0.006	0.004	0.002	0.002													
13	0.007	0.006	0.005	0.004															
14	0.007	0.006	0.002	0.002															
15	0.007	0.005																	
16	0.005	0.002																	
17	0.002																		
Total	0.161	0.143	0.129	0.108	0.093	0.081	0.072	0.065	0.059	0.055	0.047	0.041	0.037	0.035	0.033	0.028	0.024	0.021	0.014

NPT EXTERNAL & INTERNAL
RECOMMENDED NO. OF PASSES

No. of Passes	Pitch TPI				
	4	11.5	14	18	27
1	0.013	0.009	0.009	0.007	0.006
2	0.010	0.007	0.007	0.006	0.004
3	0.008	0.007	0.006	0.005	0.004
4	0.007	0.006	0.006	0.005	0.004
5	0.006	0.006	0.005	0.005	0.004
6	0.006	0.005	0.005	0.004	0.003
7	0.006	0.005	0.004	0.004	0.002
8	0.006	0.004	0.004	0.003	
9	0.006	0.004	0.004	0.002	
10	0.005	0.004	0.003		
11	0.005	0.004	0.002		
12	0.005	0.003			
13	0.005	0.002			
14	0.004				
15	0.003				
16	0.002				
Total	0.096	0.066	0.054	0.041	0.027

NPTF EXTERNAL & INTERNAL
RECOMMENDED NO. OF PASSES

No. of Passes	Pitch TPI				
	8	11.5	14	18	27
1	0.012	0.009	0.008	0.007	0.006
2	0.009	0.007	0.007	0.006	0.004
3	0.008	0.006	0.006	0.005	0.004
4	0.006	0.006	0.006	0.005	0.004
5	0.006	0.006	0.006	0.004	0.003
6	0.006	0.005	0.005	0.004	0.003
7	0.006	0.005	0.004	0.004	0.002
8	0.006	0.004	0.004	0.003	
9	0.006	0.004	0.004	0.002	
10	0.005	0.004	0.003		
11	0.005	0.004	0.002		
12	0.005	0.003			
13	0.005	0.002			
14	0.004				
15	0.003				
16	0.002				
Total	0.094	0.065	0.053	0.039	0.025

TR EXTERNAL & INTERNAL - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch (MM)						
	7.0	6.0	5.0	4.0	3.0	2.0	1.5
1	0.015	0.014	0.013	0.013	0.012	0.012	0.009
2	0.013	0.013	0.012	0.011	0.010	0.010	0.009
3	0.011	0.011	0.010	0.009	0.009	0.009	0.007
4	0.010	0.010	0.009	0.008	0.007	0.007	0.006
5	0.010	0.009	0.009	0.007	0.007	0.006	0.005
6	0.009	0.009	0.008	0.007	0.007	0.005	0.002
7	0.009	0.009	0.007	0.007	0.006	0.002	
8	0.008	0.008	0.007	0.006	0.005		
9	0.008	0.007	0.007	0.006	0.004		
10	0.007	0.007	0.006	0.006	0.002		
11	0.007	0.006	0.006	0.005			
12	0.007	0.006	0.005	0.004			
13	0.007	0.005	0.005	0.002			
14	0.006	0.005	0.004				
15	0.006	0.005	0.002				
16	0.006	0.005					
17	0.006	0.004					
18	0.006	0.004					
19	0.005	0.002					
20	0.002						
Total	0.159	0.140	0.110	0.091	0.071	0.051	0.037

ACME EXTERNAL & INTERNAL - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch TPI							
	4	5	6	8	10	12	14	16
1	0.014	0.013	0.012	0.011	0.010	0.010	0.010	0.009
2	0.013	0.012	0.011	0.009	0.009	0.009	0.008	0.009
3	0.011	0.010	0.010	0.007	0.008	0.007	0.007	0.007
4	0.010	0.009	0.008	0.007	0.007	0.006	0.006	0.006
5	0.009	0.009	0.007	0.007	0.006	0.006	0.005	0.005
6	0.009	0.008	0.007	0.006	0.006	0.005	0.004	0.002
7	0.009	0.007	0.006	0.006	0.005	0.004	0.002	
8	0.008	0.007	0.006	0.006	0.004	0.002		
9	0.007	0.007	0.006	0.005	0.004			
10	0.007	0.007	0.006	0.005	0.002			
11	0.006	0.006	0.005	0.004				
12	0.006	0.005	0.005	0.002				
13	0.005	0.005	0.004					
14	0.005	0.004	0.002					
15	0.004	0.002						
16	0.004							
17	0.004							
18	0.004							
19	0.002							
Total	0.137	0.112	0.095	0.074	0.062	0.049	0.043	0.038

STUB ACME EXTERNAL & INTERNAL - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch TPI							
	4	5	6	8	10	12	14	16
1	0.012	0.012	0.011	0.009	0.009	0.009	0.008	0.007
2	0.010	0.010	0.009	0.007	0.007	0.007	0.007	0.006
3	0.008	0.008	0.008	0.006	0.006	0.006	0.006	0.005
4	0.007	0.007	0.006	0.006	0.005	0.005	0.005	0.005
5	0.007	0.006	0.006	0.005	0.005	0.004	0.002	0.002
6	0.007	0.006	0.006	0.005	0.004	0.002		
7	0.006	0.006	0.005	0.004	0.004			
8	0.006	0.005	0.005	0.004	0.002			
9	0.006	0.005	0.004	0.002				
10	0.006	0.004	0.002					
11	0.005	0.002						
12	0.004							
13	0.002							
Total	0.087	0.072	0.061	0.049	0.042	0.032	0.028	0.026

UNJ EXTERNAL THREAD - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch TPI												
	8	9	10	11	12	13	14	16	18	20	24	28	32
1	0.011	0.011	0.010	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.007
2	0.009	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.007	0.006	0.007	0.006	0.006
3	0.008	0.009	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.004	0.004
4	0.007	0.008	0.007	0.006	0.007	0.006	0.006	0.005	0.006	0.005	0.004	0.004	0.002
5	0.006	0.007	0.006	0.006	0.006	0.005	0.004	0.004	0.004	0.004	0.002	0.002	
6	0.006	0.006	0.006	0.006	0.005	0.005	0.004	0.004	0.002	0.002			
7	0.006	0.006	0.005	0.005	0.004	0.004	0.004	0.002					
8	0.006	0.005	0.004	0.004	0.002	0.002	0.002						
9	0.005	0.004	0.004	0.002									
10	0.005	0.002	0.002										
11	0.004												
12	0.002												
Total	0.075	0.067	0.060	0.055	0.050	0.047	0.043	0.038	0.034	0.031	0.026	0.022	0.020

UNJ INTERNAL THREAD - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch TPI												
	8	9	10	11	12	13	14	16	18	20	24	28	32
1	0.011	0.011	0.010	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.007
2	0.009	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.007	0.006	0.007	0.006	0.006
3	0.008	0.009	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.004	0.004
4	0.007	0.008	0.007	0.006	0.007	0.006	0.006	0.005	0.006	0.005	0.004	0.004	0.002
5	0.006	0.007	0.006	0.006	0.006	0.005	0.004	0.004	0.004	0.004	0.002	0.002	
6	0.006	0.006	0.006	0.006	0.005	0.005	0.004	0.004	0.002	0.002			
7	0.006	0.006	0.005	0.005	0.004	0.004	0.004	0.002					
8	0.006	0.005	0.004	0.004	0.002	0.002	0.002						
9	0.005	0.004	0.004	0.002									
10	0.005	0.002	0.002										
11	0.004												
12	0.002												
Total	0.075	0.067	0.060	0.055	0.050	0.047	0.043	0.038	0.034	0.031	0.026	0.022	0.020

MJ INTERNAL THREAD
RECOMMENDED NO. OF PASSES

No. of Passes	Pitch (MM)					
	1.0	1.25	1.5	2.0	2.5	3.0
1	0.006	0.007	0.009	0.009	0.009	0.009
2	0.005	0.006	0.007	0.008	0.008	0.008
3	0.004	0.005	0.006	0.007	0.007	0.007
4	0.004	0.004	0.004	0.006	0.006	0.007
5	0.002	0.004	0.004	0.006	0.006	0.006
6		0.002	0.002	0.004	0.005	0.006
7				0.002	0.005	0.005
8					0.004	0.005
9					0.002	0.004
10						0.004
11						0.002
12						
Total	0.022	0.027	0.032	0.043	0.053	0.063

MJ EXTERNAL THREAD
RECOMMENDED NO. OF PASSES

No. of Passes	Pitch (MM)					
	1.0	1.25	1.5	2.0	2.5	3.0
1	0.007	0.007	0.009	0.009	0.010	0.010
2	0.006	0.006	0.008	0.009	0.008	0.009
3	0.005	0.006	0.007	0.007	0.007	0.007
4	0.004	0.005	0.006	0.006	0.006	0.007
5	0.002	0.004	0.004	0.006	0.006	0.006
6		0.002	0.002	0.005	0.006	0.006
7				0.004	0.005	0.006
8				0.002	0.005	0.005
9					0.004	0.005
10					0.002	0.004
11						0.004
12						0.002
Total	0.024	0.030	0.036	0.048	0.059	0.071

RD (DIN 20400) EXTERNAL & INTERNAL THREAD
RECOMMENDED NO. OF PASSES

No. of Passes	Pitch (MM)			
	6.0	5.0	4.0	3.0
1	0.014	0.013	0.010	0.009
2	0.013	0.011	0.009	0.009
3	0.013	0.011	0.009	0.008
4	0.012	0.010	0.009	0.008
5	0.012	0.010	0.008	0.007
6	0.011	0.009	0.008	0.007
7	0.010	0.009	0.007	0.006
8	0.009	0.008	0.007	0.004
9	0.009	0.007	0.006	0.004
10	0.007	0.006	0.006	0.004
11	0.007	0.006	0.005	0.002
12	0.006	0.005	0.004	
13	0.005	0.005	0.002	
14	0.004	0.002		
15	0.002			
Total	0.134	0.112	0.091	0.069

RD (DIN 405) EXTERNAL & INTERNAL THREAD
RECOMMENDED NO. OF PASSES

No. of Passes	Pitch TPI			
	4	6	8	10
1	0.014	0.010	0.009	0.009
2	0.013	0.009	0.009	0.008
3	0.012	0.009	0.008	0.007
4	0.012	0.008	0.007	0.007
5	0.011	0.008	0.007	0.006
6	0.011	0.007	0.006	0.006
7	0.010	0.007	0.006	0.004
8	0.009	0.006	0.004	0.004
9	0.008	0.006	0.004	0.002
10	0.007	0.005	0.004	
11	0.006	0.005	0.002	
12	0.005	0.004		
13	0.005	0.002		
14	0.004			
15	0.002			
Total	0.129	0.087	0.067	0.054

PG INTERNAL & EXTERNAL - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch TPI		
	20	18	16
1	0.007	0.007	0.007
2	0.006	0.006	0.006
3	0.006	0.005	0.005
4	0.004	0.004	0.004
5	0.002	0.004	0.004
6		0.002	0.004
7			0.002
Total	0.024	0.027	0.031

AMERICAN BUTTRESS EXTERNAL & INTERNAL
RECOMMENDED NO. OF PASSES

No. of Passes	Pitch TPI					
	6	8	10	12	16	20
1	0.011	0.010	0.009	0.008	0.008	0.007
2	0.009	0.009	0.008	0.007	0.007	0.006
3	0.008	0.007	0.007	0.007	0.007	0.006
4	0.008	0.007	0.007	0.006	0.006	0.005
5	0.008	0.007	0.006	0.006	0.005	0.005
6	0.007	0.006	0.006	0.006	0.005	0.004
7	0.007	0.006	0.005	0.005	0.004	0.002
8	0.007	0.006	0.005	0.005	0.002	
9	0.007	0.006	0.005	0.004		
10	0.006	0.005	0.004	0.002		
11	0.006	0.005	0.004			
12	0.006	0.004	0.002			
13	0.006	0.004				
14	0.005	0.002				
15	0.005					
16	0.004					
17	0.002					
Total	0.113	0.085	0.068	0.057	0.043	0.035

SAGENGEWINDE (DIN 513) EXTERNAL - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch (MM)		
	4.0	3.0	2.0
1	0.013	0.012	0.011
2	0.012	0.011	0.010
3	0.011	0.010	0.009
4	0.010	0.009	0.007
5	0.009	0.009	0.007
6	0.008	0.008	0.007
7	0.008	0.008	0.006
8	0.007	0.007	0.006
9	0.007	0.007	0.004
10	0.007	0.006	0.002
11	0.006	0.006	
12	0.006	0.005	
13	0.006	0.004	
14	0.006	0.002	
15	0.006		
16	0.006		
17	0.005		
18	0.005		
19	0.002		
Total	0.139	0.104	0.070

SAGENGEWINDE (DIN 513) INTERNAL - RECOMMENDED NO. OF PASSES

No. of Passes	Pitch (MM)		
	4.0	3.0	2.0
1	0.013	0.012	0.011
2	0.012	0.011	0.011
3	0.011	0.011	0.010
4	0.009	0.009	0.008
5	0.009	0.009	0.007
6	0.008	0.009	0.006
7	0.008	0.008	0.005
8	0.007	0.007	0.002
9	0.007	0.006	
10	0.007	0.005	
11	0.006	0.002	
12	0.006		
13	0.006		
14	0.005		
15	0.004		
16	0.002		
Total	0.120	0.091	0.061

API EXTERNAL & INTERNAL - RECOMMENDED NO. OF PASSES

No. of Passes	VO.038R 4 TPI		VO.050 4 TPI		VO.040 5 TPI	Buttress casing 5 TPI	
	2 IPF	3 IPF	2 IPF	3 IPF	3 IPF	0.75 IPF	1.0 IPF
1	0.018	0.018	0.017	0.017	0.016	0.009	0.009
2	0.015	0.015	0.015	0.015	0.014	0.009	0.009
3	0.013	0.013	0.013	0.013	0.013	0.007	0.007
4	0.012	0.012	0.012	0.012	0.011	0.006	0.006
5	0.011	0.011	0.011	0.011	0.010	0.005	0.005
6	0.009	0.009	0.010	0.010	0.009	0.005	0.005
7	0.009	0.009	0.009	0.009	0.009	0.005	0.005
8	0.008	0.008	0.009	0.009	0.008	0.004	0.004
9	0.007	0.007	0.008	0.008	0.007	0.004	0.004
10	0.006	0.006	0.007	0.007	0.006	0.004	0.004
11	0.005	0.005	0.007	0.007	0.005	0.004	0.004
12	0.005	0.005	0.006	0.006	0.005	0.002	0.002
13	0.004	0.004	0.006	0.006	0.004		
14	0.002	0.002	0.005	0.005	0.002		
15			0.005	0.005			
16			0.004	0.004			
17			0.002	0.002			
Total	0.124	0.123	0.149	0.149	0.119	0.063	0.063

API EXTERNAL & INTERNAL - RECOMMENDED NO. OF PASSES

No. of Passes	Extreme Line Casing 6 TPI 1.5 IPF		Extreme Line Casing 5 TPI 1.5 IPF		Round API 0.75 IPF 8 TPI		Round API 0.75 IPF 10 TPI	
	External	Internal	External	Internal	External	Internal	External	Internal
1	0.009	0.010	0.010	0.010	0.010	0.010	0.010	0.010
2	0.008	0.008	0.009	0.009	0.009	0.009	0.008	0.008
3	0.006	0.007	0.008	0.008	0.008	0.008	0.007	0.007
4	0.006	0.006	0.007	0.007	0.007	0.007	0.006	0.006
5	0.005	0.006	0.006	0.006	0.006	0.006	0.006	0.006
6	0.005	0.005	0.006	0.006	0.006	0.006	0.005	0.005
7	0.004	0.005	0.005	0.006	0.006	0.006	0.005	0.005
8	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.005
9	0.002	0.004	0.004	0.005	0.005	0.005	0.004	0.004
10		0.002	0.004	0.004	0.004	0.004	0.002	0.002
11			0.004	0.004	0.004	0.004		
12			0.002	0.004	0.002	0.002		
13				0.002				
Total	0.050	0.057	0.069	0.077	0.072	0.072	0.057	0.057

TAPER PIPE THREAD: NPT / ANSI/ASME B 1.20.1-1983 - INTERNAL THREAD

AMERICAN NATIONAL STANDARD TAPER PIPE THREADS

Thread Size				Recommended Tools
	Pitch TPI	Pitch MM	Profile Depth	Insert
NPT 1/16	27	0.037	0.027	06IR 27NPT
NPT 1/8	27	0.037	0.027	08IR 27NPT
NPT 1/4	18	0.056	0.041	08IR 18NPT
NPT 3/8	18	0.056	0.041	11IR 18NPT
NPT 1/2	14	0.071	0.054	16IR 14NPT
NPT 3/4	14	0.071	0.054	16IR 14NPT
NPT 1	11.5	0.087	0.066	16IR 11.5NPT
NPT 1 1/4	11.5	0.087	0.066	16IR 11.5NPT
NPT 1 1/2	11.5	0.087	0.066	16IR 11.5NPT
NPT 2	11.5	0.087	0.066	16IR 11.5NPT
NPT 2 1/2	8	0.125	0.096	16IR 8NPT
NPT 3	8	0.125	0.096	16IR 8NPT
NPT 3 1/2	8	0.125	0.096	16IR 8NPT
NPT 4	8	0.125	0.096	16IR 8NPT
NPT 5	8	0.125	0.096	16IR 8NPT

TAPER PIPE THREAD: NPTF / ANSI B 1.20.3-1976 - INTERNAL THREAD

AMERICAN NATIONAL STANDARD DRYSEAL PIPE THREADS

Thread Size				Recommended Tools
	Pitch TPI	Pitch MM	Profile Depth	Insert
NPTF 1/16	27	0.037	0.025	06IR 27NPTF
NPTF 1/8	27	0.037	0.025	08IR 27NPTF
NPTF 1/4	18	0.056	0.039	08IR 18NPTF
NPTF 3/8	18	0.056	0.039	11IR 18NPTF
NPTF 1/2	14	0.071	0.053	16IR 14NPTF
NPTF 3/4	14	0.071	0.053	16IR 14NPTF
NPTF 1	11.5	0.087	0.065	16IR 11.5NPTF
NPTF 1 1/4	11.5	0.087	0.065	16IR 11.5NPTF
NPTF 1 1/2	11.5	0.087	0.065	16IR 11.5NPTF
NPTF 2	11.5	0.087	0.065	16IR 11.5NPTF
NPTF 2 1/2	8	0.125	0.094	16IR 08NPTF
NPTF 3	8	0.125	0.094	16IR 08NPTF

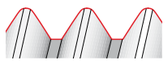
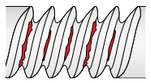
PARALLEL PIPE THREAD / BSP (G) - INTERNAL THREAD

Thread Size					Recommended Tools
	Pitch TPI	Pitch MM	Profile Depth	Bore Diameter	Insert
G1/16	28	0.036	0.023	0.258	06IR 28W
G1/8	28	0.036	0.023	0.337	08IR 28W
G1/4	19	0.053	0.034	0.451	08IR 19W
G3/8	19	0.053	0.034	0.589	11IR 19W
G1/2	14	0.071	0.046	0.734	16IR 14W
G5/8	14	0.071	0.046	0.811	16IR 14W
G3/4	14	0.071	0.046	0.949	16IR 14W
G7/8	11	0.071	0.046	1.098	16IR 14W
G1	11	0.091	0.058	1.193	16IR 11W
G1 1/8	11	0.091	0.058	1.376	16IR 11W
G1 1/4	11	0.091	0.058	1.534	16IR 11W
G1 1/2	11	0.091	0.058	1.766	16IR 11W
G1 3/4	11	0.091	0.058	2.000	16IR 11W
G2	11	0.091	0.058	2.231	16IR 11W

TAPER PIPE THREAD / B SPT (RC) - INTERNAL THREAD

Thread Size					Recommended Tools
	Pitch TPI	Pitch MM	Profile Depth	Bore Diameter	Insert
Rc 1/16	28	0.036	0.023	0.258	06IR 28BSPT
Rc 1/8	28	0.036	0.023	0.337	08IR 28BSPT
Rc 1/4	19	0.053	0.034	0.451	08IR 19BSPT
Rc 3/8	19	0.053	0.034	0.589	11IR 19BSPT
Rc 1/2	14	0.071	0.046	0.734	16IR 14BSPT
Rc 5/8	14	0.071	0.046	0.811	16IR 14BSPT
Rc 3/4	14	0.071	0.046	0.949	16IR 14BSPT
Rc 7/8	14	0.071	0.046	1.098	16IR 14BSPT
Rc 1	11	0.091	0.058	1.193	16IR 11BSPT
Rc 1 1/8	11	0.091	0.058	1.376	16IR 11BSPT
Rc 1 1/4	11	0.091	0.058	1.534	16IR 11BSPT
Rc 1 1/2	11	0.091	0.058	1.766	16IR 11BSPT
Rc 1 3/4	11	0.091	0.058	2.000	16IR 11BSPT
Rc 2	11	0.091	0.058	2.231	16IR 11BSPT

TROUBLESHOOTING

Problem | Problema	Possible Cause | Causa Possível | Causa Possible	Solution | Solução | Solucion
Increased flank wear Desgaste da aresta Desgaste del flanco 	• Cutting speed too high • Velocidade de corte alta • Alta velocidad de corte • Depth of cut too low/ too many passes • Profundidade de corte demasiado baixa / demasiados passos • Profundidad de corte demasiado baja / demasiados pasos • Unsuitable carbide grade • Grau desajustado • Grado desajustado • Insufficient cooling • Refrigeração insuficiente • Insuficiente refrigeración	• Reduce cutting speed / Use coated insert • Reduza a velocidade de corte / Use uma pastilha revestida • Reducir la velocidad de corte / Utilice un inserto recubierto • Increase the depth of cut per pass • Aumente a profundidade de corte por passo • Aumento de la profundidad de corte por paso • Use a coated carbide grade • Use um grau revestido • Utilice un grado recubierto • Increase coolant flow rate • Aumente o fluxo de refrigeração • Aumentar el flujo de refrigeración
Uneven cutting edge wear Deformação da aresta de corte Deformación del flanco de corte 	• Incorrect helix angle • Ângulo da helice incorrecto • Ángulo de hélice incorrecta • Wrong infeed method • Método de avanço incorrecto • Método incorrecto de avance	• Choose the correct anvil • Escolha o ângulo correcto • Elija el ángulo correcto • Use the Alternating Flank Infeed method • Use um método alternativo de avanço • Utilizar un método alternativo de avance
Extreme plastic deformation Deformação plástica extrema Deformación plástica extrema 	• Depth of cut too large • Profundidade de corte demasiado larga • Profundidad de corte demasiado grande • Insufficient cooling • Refrigeração insuficiente • Insuficiente refrigeración • Cutting speed too high • Velocidade de corte alta • Alta velocidad de corte • Unsuitable carbide grade • Grau não aconselhável • Grado no es aconsejable • Nose radius too small • Raio demasiado pequeno • Radio demasiado pequeño	• Decrease depth of cut / Increase number of passes • Diminua a profundidade de corte / Aumente o número de passos • Reducir la profundidad de corte / Aumentar el número de pasos • Increase coolant flow rate • Aumente o fluxo de refrigeração • Aumentar el flujo de refrigeración • Reduce cutting speed • Reduza a velocidade de corte • Reducir la velocidad de corte • Use a tougher carbide • Use um grau mais macio • Usar un grado más suave • Use an insert with a larger radius, if possible • Use uma pastilha com um raio mais largo, se possível • Utilice un inserto con un radio más amplio, si es posible
Cutting edge breakage Quebra da aresta de cortex Rotura del flanco de corte 	• Depth of cut too large • Profundidade de corte demasiado larga • Profundidad de corte demasiado grande • Extreme plastic deformation • Deformação plástica extrema • Deformacíon plastica extrema • Insufficient cooling • Refrigeração insuficiente • Insuficiente refrigeración • Unsuitable carbide grade • Grau não aconselhável • Grado no es aconsejable • Instability • Instabilidade • Inestabilidad	• Decrease depth of cut / Increase number of passes • Diminua a profundidade de corte / Aumente o numero de passos • Reducir la profundidad de corte / Aumentar el número de pasos • Use a tougher carbide • Use um grau mais macio • Usar un grado más suave • Increase flow rate and/ or correct flow direction • Aumento o fluxo ou melhore o direcionamento da refrigeração • Aumentar o mejorar la dirección del flujo de la refrigeración • Use a tougher carbide • Use um grau mais macio • Usar un grado más suave • Check stability of the system • Verifique a estabilidade do sistema • Compruebe la estabilidad del sistema
Built-up edge Aresta postiça Filos recrescidos 	• Incorrect cutting speed • Velocidade de corte incorrecta • Velocidad de corte incorrecta • Unsuitable carbide grade • Grau não aconselhável • Grado no es aconsejable	• Change the cutting speed • Altere a velocidade de corte • Cambiar la velocidad de corte • Use a coated carbide • Utilize um grau revestido • Utilice un grado recubierto
Thread profile is too shallow Perfil da rosca muito irregular Perfil de la rosca muy irregular 	• The tool is not at the workpiece axis height • A pastilha não está a maquinar a crista da rosca • El inserto no está mecanizando • Insert is not machining the thread crest • A ferramenta não está posicionada correctamente • La herramienta no está colocada correctamente a cresta de la rosca • Worn insert • Pastilha gasta • Inserto pasado	• Change tool height • Altere o posicionamento em altura da ferramenta • Cambiar la posición en la altura de la herramienta • Measure the workpiece diameter • Medir o diâmetro correcto da peça de trabalho • Medir el diámetro de la pieza de trabajo • Change the cutting edge sooner • Mudar antecipadamente a aresta de corte • Cambiar el flanco de corte en antecipo
Thread profile is too shallow Má qualidade superfície Acabado de superficie malo 	• Cutting speed too low • Velocidade de corte baixa • Velocidad de corte baja • Wrong anvil • Colchão errado • Colchón cambiado • Flank infeed method is not appropriate • Posição de avanço inapropriada • Posición de avance inadecuada	• Increase cutting speed • Aumente a velocidade de corte • Aumentar la velocidad de corte • Choose correct anvil • Escolha um colchão mais apropriado • Elija un colchón más apropiado • Use the alternate flank or radial infeed method • Use um método de flanqueamento ou radial alternativo • Utilice un método flanqueamento o radial alternativo

WORKPIECE MATERIALS - PALBIT SELECTION MATERIALS, PSM

Material da peça - seleção de materiais palbit, PSM | Material de la pieza - selección materiales palbit, PSM

Steel, Ferritic and Martensitic Stainless Steel

ISO	PSM	Material Example	Description	R_m(N/mm²)	kcX (N/mm²)	m_c
P	1	Ck50	Structural steels; ordinary carbon steels with low to medium carbon content(<0,5%C); soft carbon steel; free cutting steel.	<500	1500	0.25
	2	42CrMnNiMo 4	Normal tool steels; harder steels for toughening; Martensitic stainless steels; Carbon steels with high carbon content (>0,5%C); Ferritic and martensitic stainless steels.	550<900	1900	0.24
	3	X40CrMoV51	Normal tool steels; Harder steels for toughening; Martensitic stainless steels; Difficult tool steels; High-alloy steels with high hardness; Martensitic stainless steels.	900<1200	2000	0.24

Easy-cutting, Austenitic and Duplex Stainless Steel

ISO	PSM	Material Example	Description	R_m(N/mm²)	kcX (N/mm²)	m_c
M	4	X8CrNiS189	Easy-cutting stainless steels; Free-cutting stainless steels; Calcium-treated stainless steels.		1750	0.22
	5	X2CrNiMo17122	Moderately to difficult stainless steels: Austenitic and duplex.		2050	0.20
	6	X2CrNiMoN2253	Very difficult stainless steels: Austenitic and duplex.		2150	0.20

Cast Iron

ISO	PSM	Material Example	Description	R_m(N/mm²)	kcX (N/mm²)	m_c
K	7	GJL-150	Medium / hard cast iron; Grey cast iron.		1150	0.22
	8	GJL-250	Low-alloy cast iron; Malleable cast iron; Nodular cast iron.		1225	0.25
	9	GJL-350	Difficult high-alloy cast iron; Difficult malleable cast iron; Nodular cast iron		1470	0.30

Aluminum and Non-Ferrouses

ISO	PSM	Material Example	Description	R_m(N/mm²)	kcX (N/mm²)	m_c
N	10	AW7075 AlSi12 CuZn37	Aluminum alloys: Low Si Aluminum alloys: High Si Copper alloys			

Heat Resistent Super Alloys

ISO	PSM	Material Example	Description	R_m(N/mm²)	kcX (N/mm²)	m_c
S	11	Inconel 718	Ni-based super-alloys Titanium alloys		3300 1450	0.24 0.23

Please note that the R_m value is only for selection of the material group and when the material has been heat treatment or other methods that increase the strength of the material.

ISO	DIN	W.-Nr	EN	EN-Nr	AFNOR	BS	UNI
1	20Mn5	1.1133			20M5	120M19	G22Mn3
	30Mn5	1.1165	G28Mn6	1.1165		120M36	
	C10	1.0301	C10	1.0301	AF34C 10;XC10	045M10	C10
	C15	1.0401			AF37C 12;XC18	080M15	C15;C16
	C22	1.0402	C22+N	1.0402	C20	050A20	C20;C21
	C25	1.0406	C25+N	1.0406	AF50C30	070M26	C25
	Ck10	1.1121	C10E	1.1121	XC10	040A10	C10
	Ck15	1.1141	C15R	1.1141	XC15;XC18	080M15	15;C16
	Ck22	1.1151	C22E	1.1151	XC25;XC18	040A22	C20
	Ck25	1.1158			XC25	060A25	C25
	St37-2	1.0037	S235JR	1.0037	E24-2		Fe360B
	St37-3	1.0116	S235JRG2	1.0038	E24-3;E24-4	4360-40C	Fe360DFF
	St44-2	1.0044	S275J0H	1.0149	E28-2	4360-43B	Fe430BFN
	St44-3N	1.0144	S275J2G3	1.0144	E28-3;E28-4	4360-43C	Fe430DFF
	10S20	1.0721	10S20	1.0721	10F1	210M15	CF10S20
	10SPb20	1.0722			10PbF2		CF10SPb20
	15S20	1.0723	15SMn13	1.0725		210A15	
	35S20	1.0726	35S20	1.0726	35MF4	212M36	
	46S20	1.0727	46S20	1.0727	45MF4	212M44	
	60S20	1.0728	60S20	1.0728	60MF4		
	9S20	1.0711				220M07	CF9S22
	9SMn28	1.0715	11SMn30	1.0715	S250	230M07	CF9SMn28
	9SMn36	1.0736	11SMn37	1.0736	S300	240M07	CF9SMn36
	9SMnPb28	1.0718	11SMnPb30	1.0718	S250Pb		CF9SMnPb28
	9SMnPb36	1.0737	11SMnPb37	1.0737	S300Pb		CF9SMnPb36
	14Ni6	1.5622			16N6		14Ni6
	16Mo5	1.5423				1503-245-420	16Mo5
	36Mn5	1.1167	G28Mn6+QT	1.1165	40M5	150M36	
	40Mn4	1.1157			35M5	150M36	
	C30	1.0528			C30	080A30	
	C35	1.0501	C35+N		AF55C35	060A35	C35
	C40	1.0511	C40+N		AF60C40	080M40	C40
	C45	1.0503	E335	1.0503	AF65C45	80M46	C45
	C50	1.0540	C50+N		C50	080M50	
	Ck30	1.1178	C30E	1.1178		060A30	
	Ck35	1.1181	C35E	1.1181	XC38H1:XC32	080M36	C35
	Ck40	1.1186	C40E	1.1186	XC42H1	080M40	C40
	Ck50	1.1206	C50E	1.1206	XC48H1	080M50	
	Ck55	1.1203	C55E	1.1203	XC55	070M55	C50
	St52-3	1.0570	S355JR	1.0570	E36-3;E36-4	4360-50C	Fe510B;C;D
	St70-2	1.0535	E360	1.0070	A70-2		Fe690
2	12Ni19	1.5680			Z18N5		
	13Cr2	1.7012					
	13CrMo44	1.7335	13CrMo45	1.7335	15CD3.5	1501-620Gr.27	14CrMo45
	14MoV63	1.7715				1503-660-440	
	14NiCr10	1.5732			14NC11		16NiCr11
	14NiCr14	1.5752	14NiCr14	1.5752	12NC15	655M13	
	15Cr3	1.7015			12C3	523M15	
	15CrMo5	1.7262			12CD4		12CrMo4
	15CrMoV59	1.8521					
	15CrNi6	1.5919			16NC6	S107	16CrNi4
	15Mo3	1.5415	16Mo3	1.5415	15D3	1501-240	16Mo3
	15NiCr14	1.2735			10NC12		
	16CrMo44	1.7337			15CD4.5	1501-620Gr.27	14CrMo45
	16MnCr5	1.7131	16MnCr5	1.5715	16MC5	527M17	16MnCr5
	16MnCrS5	1.7139	16MnCrS5	1.7139			
	18CrNi8	1.5920			20NC6		
	18CrNiMo6	1.6587	17CrNiMo6	1.6587	18NCD6	820A16	18NiCrMo7
	20CrMo2	1.7311					
	20CrMo5	1.7264	20CrMo5	1.7264	18CD4		
	20MnCr5	1.7147	20MnCr5	1.7147	20MC5		20MnCr5
	20MnCrS5	1.7149	20MnCrS5	1.7149	20MnCrS5		
	20MoCr4	1.7321					
	20MoCrS4	1.7323					
	21MnCr5	1.2162			20NC5		

JIS	SS	UNS	AISI/ASTM	Misc. Brand	Condition	Form	Structure
SMnC420		G10220	1022;1518				
SMn1H;SCMn2		G13300	1330				
S10C		G10100	1010				
	1350	G10170	1015				
	1450	G10200	1023				
S25C			1025				
S10C;S9CK	1265	G10100	1010				
S15C;S15CK	1370	G10170	1015				
S22C;S20CK			1022				
S25C		G10250	1025				
STKM12C	1311						
	1312;1313		A573Gr.58				
SM41B	1412		A570Gr.40				
SM41C	1412;1414		A573Gr.70				
			1108				
			11L08				
SUM32	1922						
	1957	G11400	1140				
	1973	G11460	1146				
SUM21		G12120	1212				
SUM22	1912	G12130	1213				
		G12150	1215				
SUM22L	1914	G12134	12L13				
	1926	G12144	12L14				
			A350-LF5				
SB450M		G45200	4520				
SMn438(H);SCMn3	2120	G13350	1335				
		G10390	1039				
S30C							
	1550	G10350	1035				
S40C			1040				
S45C	1650	G10430	1045				
S50C			1049				
S30C			1030				
S35C	1572	G10340	1035				
S40C			1040				
			1050				
S55C			1055				
SM50YA	2172;2132						
	1655		1055				
			2515				
	2216		A182-F11;F12				
SNC415(H)			3415				
SNC815(H)		G33106	3310;9314				
SCr415(H)		G50150	5015				
SCM415(H)							
			4320				
	2912		A204Gr.A				
SNC22		T51606	P6				
	2216		A387Gr.12Cl.2				
SCR415	2511	G51170	5115				
SCM421							
SMnC420(H)		G51200	5120				
SMnC21H			5120H				
SCR420H							

ISO	DIN	W.-Nr	EN	EN-Nr	AFNOR	BS	UNI
2	21NiCrMo2	1.6523	20NiCrMoS22	1.6526	20NCD2	805M20	20NiCrMo2
	23CrMoB33	1.7271					
	25CrMo4	1.7218	25CrMo4	1.7218	25CD4S	1717CDS110	25CrMo4(KB)
	25MoCr4	1.7325					
	25MoCrS4	1.7326					
	28Cr4	1.7030	28Cr4	1.7030		530A30	
	28NiCrMo4	1.6513					
	30CrMoV9	1.7707					
	30CrNiMo8	1.6580			30CND8	823M30	30NiCrMo8
	31CrMoV9	1.8519	31CrMoV9	1.8519	32CDV12		
	31NiCr14	1.5755			30NC11	653M31	
	32Cr2	1.7020					
	32CrMo12	1.7361			30CD12	722M24	32CrMo12
	34Cr4	1.7033	34Cr4	1.7033	32C4	530A32	34Cr4(KB)
	34CrMo4	1.7220	34CrMo4	1.7220	35CD4	708A37	35CrMo4
	35CrMo4	1.2330			34CD4	708A37	35CrMo4
	35NiCr18	1.5864					
	36CrNiMo4	1.6511	36CrNiMo4+TA		40NCD3	816M40	38NiCrMo4(KB)
	36NiCr10	1.5736			35NC11		35NiCr9
	36NiCr6	1.5710			35NC6	640A35	
	37Cr4	1.7034			38C4	530A36	38Cr4
	37MnSi4	1.5122					
	38Cr2	1.7003	38Cr2	1.7003	38C2		38Cr2
	38MnSi4	1.5120					
	39CrMoV139	1.8523				897M39	36CrMoV139
	40CrMnMo7	1.2311					
	40CrMnMoS86	1.2312			40CMD8S		
	40CrMnNiMo8	1.2738			40CND8		
	41Cr4	1.7035	41Cr4	1.7035	42C4	530M40	41Cr4
	41CrMo4	1.7223			42CD4TS	708M40	41CrMo4
	42Cr4	1.7045			42C4TS	530A40	41Cr4
	42CrMo4	1.7225	42CrMo4	1.7225	42CD4	708M40	42CrMo4
	42CrV6	1.7561					
	42MnV7	1.5223					
	43CrMo4	1.3563					
	44Cr2	1.3561					
	46Cr2	1.7006			42C2		45Cr2
	46MnSi4	1.5121					
	48CrMo4	1.3565					
	50CrMo4	1.7228				708A47	
	50CrV4	1.8159	50CrV4	1.8159	50CV4	735A50	51CrV4
	50MnSi4	1.5131	50MnSi4	1.5131			
	53MnSi4	1.5141					
	55Cr3	1.7176	55Cr3	1.7176	55C3	527A60	55Cr3
	55Si7	1.0904	55SiCr7	1.7100	55S7	250A53	55Si8
	58SiCr8	1.2103					
	60SiCr7	1.0961			60SC7		60SiCr8
	62SiMnCr4	1.2101					
	C45W	1.1730			Y342		
	C55W	1.1820					
	C60	1.0601	C60+N	1.0601	CC55	080A62	C60
	C60W	1.1740			Y355		
	C67W	1.1744					
	C70W1	1.1520					
	C70W2	1.1620					
	C75W	1.1750	C75W	1.1750		BW1A	
	C80W1	1.1525			Y190;Y180		C80KU
	C80W2	1.1625			Y180	BW1B	C80KU
	C85W	1.1830			Y390		
	Ck45	1.1191	C45E	1.1191	XC42	080M46	C45
	Ck60	1.1221	C60E	1.1221	XC60	080A62	C60
	Ck67	1.1231	C67S	1.1231	XC68	060A67	C70
	Ck75	1.1248	C75S	1.1248	XC75	060A78	C75
	GS-50CrV4	1.8159					
	St60-2	1.0060	E335	1.0060	A60-2	4360-SSE;SSC	Fe590;Fe60-2

JIS	SS	UNS	AISI/ASTM	Misc. Brand	Condition	Form	Structure
SUS410	2506	G86170	8620				
SUS405							
SUH442	2225	G41300	4130				
SUS410							
SUS430F							
SUS416			5130				
SUS410J1							
SCS5							
SUH409							
SUS403	2240						
SUS430		G51320	5132				
SUS405	2234	G41350	4135;4137				
	2234	T51620	4135				
SUS430LX							
SUS430LX		G98400	9840				
			3435				
SUJ2			3135				
SKS3			5135				
SKS43							
SKS31							
			P20				
			P20+S				
			P20+Ni				
		G51400	5140				
	2244	G41420	4142;4140				
	2245*)		5140				
	2244	G41400	4142;4140				
SNCM447							
SNCM240							
SNCM439							
SACM645			5045				
			5045				
		G41470	4150				
	2230	H61500	6150				
	2253	G51550	5155				
	2085;2090		9255				
			9262				
SK3							
SK2							
SK1		G10600	1060				
SUP4							
		T72301	W1				
			W108				
SUS420J1							
SUS431	1672	G10420					
	1665;1678	G10640	1064				
SUS420J2	1770	G10700	1070				
	1774;1778	G10780	1078;1080				
			6150H				
SUS420							

ISO	DIN	W.-Nr	EN	EN-Nr	AFNOR	BS	UNI
2	X10Cr13	1.4006	X12Cr13	1.4006	Z12C13	410S21	X12Cr13
	X10CrAl13	1.4724	X10CrAl13	1.4724	Z10C13	BH12	X10CrAl12
	X10CrAl24	1.4762	X10CrAl24	1.4762	Z10CAS24		X16Cr26
	X12Cr13	1.4006	X12Cr13	1.4006		410S21	
	X12CrMoS17	1.4104	X14CrMoS17	1.4104	Z10CF17	441S29	X10CrS17
	X12CrS 13	1.4005	X12CrS 13	1.4005	Z12CF13	416S21	X12CrS13
	X15Cr13	1.4024	X12Cr13	1.4024	Z12C13	420S29	
	X2CrMoTi182	1.4521	X2CrMoTi182	1.4521			
	X2CrMoTi182	1.4521	X2CrMoTi182	1.4521			
	X2CrNi12	1.4003	X2CrNi13	1.4003			
	X5CrNi134	1.4313	X3CrNIMo133	1.4313	Z5CN13.4	425C11	X6CrNi1304
	X5CrTi12	1.4512	X5CrTi12	1.4512	Z6CT12	409S19	X6CrTi12
	X6Cr13	1.4000	X6Cr13	1.4000	Z6C12	403S17	X6 Cr13
	X6Cr17	1.4016	X6Cr17	1.4016	Z8C17	430S15	X8 Cr17
	X6CrAl13	1.4002	X6CrAl13	1.4002	Z6CA13	405S17	X6CrAl13
	X6CrMo4	1.2341	X6CrMo4	1.2341			
	X6CrTi17	1.4510	X6CrTi17	1.4510	Z8CT17		X6CrTi17
	X8CrNb 17	1.4511	X3CrNb 17	1.4511	Z8CNb17		X6CrNb17
	10CrMo910	1.7380	10CrMo910	1.7380	10CD9.10	1501-622Gr.31;45	12CrMo910
	100Cr6	1.3505	100Cr6	1.3505	100C6	534A99	100Cr6
	100MnCrW4	1.2510			90MWCV5	BO1	95MnWCr5KU
	100V1	1.2833			Y1105V	BW2	102V2KU
	105WCr6	1.2419	105WCr6	1.2419	105WC13		107WCr5KU
	115CrV3	1.2210	107CrV3	1.2210	100C3		107CrV3KU
	120WV4	1.2516			110WC20	BF1	110W4KU
	14CrMoV69	1.7735	14CrMoV69	1.7735	20CDV5.07		
	14NiCr18	1.5860					
	21CrMoV57	1.7709					
	32NiCrMo145	1.6746			35NCD14	830M31	
	34CrAl6	1.8504	34CrAl6	1.8504			
	34CrAlMo5	1.8507			30CAD6.12	905M31	34CrAlMo7
	34CrAlNi7	1.8550	34CrAlNi7	1.8550	34CAND7		
	34CrAlS5	1.8506					
	34CrNiMo6	1.6582	34CrNiMo6	1.6582	35NCD6	817M40	35NiCrMo6(KW)
	40NiCrMo22	1.6546			40NCD2	311-Type7	40NiCrMo2(KB)
	40NiCrMo6	1.6565				311-Type6	
3	41CrAlMo7	1.8509	41CrAlMo710	1.8509	40CAD6.12	905M39	41CrAlMo7
	45WCrV7	1.2542				BS1	45WCrV8KU
	50NiCr13	1.2721					
	58CrV4	1.8161					
	60MnSiCr4	1.2826					
	60WCrV7	1.2550			55WC20		55WCrV8KU
	67SiCr5	1.7103					
	90CrSi5	1.2108					
	90Mn4	1.1273					
	90MnCrV8	1.2842	90MnCrV8	1.2842	90MV8	BO2	90MnVCr8KU
	C105W1	1.1545	C105U	1.1545	Y1105		C100KU
	C105W2	1.1645			Y1105		C100KU
	C110W	1.1654					
	C125W	1.1663			Y2120		C120KU
	C135W	1.1673			Y2140		C140KU
	Ck101	1.1274	C100S	1.1274		060A96	
	GS-34CoCrMoV1912	1.2887					
	G-X28CrMoV51	1.2392					
	G-X37CrMoW51	1.2606					
	X18CrN28	1.4749	X18CrN28	1.4749	Z18C25		
	X19NiCrMo4	1.2764					
	X20Cr13	1.4021	X20Cr13	1.4021	Z20C13	420S37	X20Cr13
	X20CrMoWV121	1.4935	X20CrMoWV121	1.4935			
	X20CrNi172	1.4057	X20CrNi172	1.4057	Z15CN16.02	431S29	X16CrNi16
	X22CrMoV121	1.4923	X22CrMoV121	1.4923	Z21CDV12	762	X22CrMoV121
	X30Cr13	1.4028	X30Cr13	1.4028	Z30C13	420S45	X30Cr13
	X36CrMo17	1.2316	X38CrMo16	1.2316	Z35CD17		X38CrMo 161KU
	X4CrNiMo165	1.4418	X4CrNiMo165	1.4418	Z6CND16.05.01		
	X40Cr13	1.4031	X39Cr13	1.4031	Z40C14	(420S45)	X40Cr14

JIS	SS	UNS	AISI/ASTM	Misc. Brand	Condition	Form	Structure
SUS410	2302	S41000	410;CA-15				Martensite
SUS405		S40500	405				Ferrite
SUH442		S44600	446				Ferrite
SUS410	2302	S41000	410S				Martensite
SUS430F	2383	S43020	430F				Ferrite
SUS416	2380	S41600	416				Martensite
SUS410J1		J91201					Martensite
	2326		444				Ferrite
	2326		444				Ferrite
		S40977	309				Ferrite
SCS5	2385	S41500		F6NM			Martensite
SUH409		S40900	409L				Ferrite
SUS403	2301	S41008	403				Ferrite
SUS430	2320	S43000	430				Ferrite
SUS405		S40500	405				Ferrite
SUS430LX		S43036	430Ti				Ferrite
SUS430LX			430Nb				Ferrite
	2218	J21890	A182-F22				
SUJ2	2258	G51986	52100				
SKS3	2140	T31501	O1				
SKS43		T72302	W210				
SKS31							
		T61202	L2				
		K23545	A355Cl.D				
		K52440					
		K23745					
SNCM447	2541		4340				
SNCM240		G87400	8740				
SNCM439			4340				
SACM645	2940	K24065	A355Cl.A				
	2710	T41901	S1				
		T31502	O2				
	1880		W110				
SK3							
SK2			W112				
SK1							
SUP4	1870	G10950	1095				
	2322	S44600	446				Ferrite
SUS420J1	2303	S42000	420				Martensite
		S42200					Martensite
SUS431	2321-03	S43100	431				Martensite
	2317						Martensite
SUS420J2	2304	J91153	420				Martensite
			422				
	2387	–					Martensite
SUS420	2304,2314	S40280	420				Martensite

ISO	DIN	W.-Nr	EN	EN-Nr	AFNOR	BS	UNI
3	X45Cr13	1.4034	X45Cr13	1.4034	Z40C14	(420S45)	
	X45CrNiW189	1.4873	X45CrNiW189	1.4873	Z35CNWS18.09	331S40	X45CrNiW189
	X45NiCrMo4	1.2767	X45NiCrMo4	1.2767	45NCD17	EN20B	42NiCrMo157
	X65CrMo14	1.4109	X70CrMo15	1.4109	Z70D14		
	X80CrNiSi20	1.4747	X80CrNiSi20	1.4747	Z80CSN20.02	443S65	X80CrSiNi20
	X90CrMoV18	1.4112	X90CrMoV18	1.4112	Z2CND1805	409S19	XCrTi12
	54NiCrMoV6	1.2711	54NiCrMoV6	1.2711	55NCDV6	BH224	
	55NiCrMoV6	1.2713			55NCDV7		
	57NiCrMoV77	1.2744					
	75CrMoNiW67	1.2762					
	81CrMov4216	1.2369					
	G-X165CrCoMo12	1.2880					
	G-X165CrMoV12	1.2601					
	G-X165CrV12	1.2201					
	S10-4-3-10	1.3207	HS10-4-3-10	1.3207	Z130WKCDV10-4-3-10	BT42	HS10-4-3-10
	S12-1-2	1.3318	HS12-1-2	1.3318			
	S12-1-4	1.3302	HS12-1-4	1.3302			
	S12-1-4-5	1.3202	HS12-1-4-5	1.3202			
	S18-0-1	1.3355	HS18-0-1	1.3355	Z80WCV18-04-01	BT1	HS18-0-1
	S18-1-2-10	1.3265	HS18-1-2-10	1.3265		BT5	HS18-0-1-10
	S18-1-2-15	1.3257	HS18-1-2-15	1.3257			
	S18-1-2-5	1.3255	HS18-1-2-5	1.3255	Z80WKCV18-05-04-0	BT4	HS18-1-1-5
	S2-10-1-8	1.3247	HS2-10-1-8	1.3247	Z110DKCWV09-08-04	BM42	HS2-9-1-8
	S2-9-1	1.3346	HS2-9-1	1.3346	Z85DCWV08-04-02-0	BM1	HS1-8-1
	S2-9-2	1.3348	HS2-9-2	1.3348	Z100DCWV09-04-02-		HS2-9-2
	S2-9-2-8	1.3249				BM34	
	S3-3-2	1.3333	HS3-3-2	1.3333			HS3-3-2
	S6-5-2	1.3343	HS6-5-2	1.3343	Z85WDCV06-05-04-0	BM2	HS6-5-2
	S6-5-2-5	1.3243	HS6-5-2-5	1.3243	Z85WDKCV06-05-05-04-02		HS6-5-2-5
	S6-5-3	1.3344	HS6-5-3	1.3344	Z120WDCV06-05-04-	BM4	HS6-5-3
	S6-5-3C	1.3345	S-6-5-3C	1.3345			
	S7-4-2-5	1.3246	HS7-4-2-5	1.3246	Z110WKCDV07-05-04		HS7-4-2-5
	X100CrMoV51	1.2363	X100CrMoV5	1.2363	Z100CDV5	BA2	X100CrMoV51KU
	X105CrMo17	1.4125	X105CrMo17	1.4125	Z100CD17		X105CrMo17
	X155CrVMo121	1.2379	X155CrVMo121		Z160CDV12	BD2	X155CrVMo121KU
	X165CrMoV12	1.2601					X165CrMoW12KU
	X2NiCoMoTi1895	1.2709			Z2NKD19-09		
	X210Cr12	1.2080	X210Cr12	1.2080	Z200C12	BD3	X210Cr13KU
	X210CrW12	1.2436					X215CrW121KU
	X3NiCrMo1885	1.2706			E-Z2NKD18		
	X30WCrV53	1.2567			Z32WCV5		X30WCrV53KU
	X30WCrV93	1.2581			Z30WCV9	BH21	X30WCrV93KU
	X32CrMoCoV333	1.2885					
	X32CrMoV33	1.2365			32DCV28	BH10	30CrMoV1227KU
	X38CrMoV51	1.2343			Z38CDV5	BH11	X37CrMoV51KU
	X38CrMoV53	1.2367					
	X40CrMoV51	1.2344	X40CrMoV51	1.2344	Z40CDV5	BH13	X40CrMo511KU
4	X10CrNiS189	1.4305	X8CrNiS189	1.4305	Z10CNF18.09	303S31	X10CrNi1809
	X12CrNi177	1.4310	X9CrNi188	1.4310	Z12CN17.07	301S21	X12CrNi1707
	X12CrNi188	1.4300	X12CrNi188	1.4300	Z12CN18	302S25	
	X5CrNiNb1810	1.4546	X5CrNiNb1810	1.4546		347S31	X6CrNiNb1811
	X6CrNi1810	1.4301	X5CrNi189	1.4301	Z6CN18.09	304S31	X5CrNi1811
	X6CrNi1811	1.4948	X6CrNi18 11	1.4948	Z6CN18.09	304S51	X5CrNi1810KW
	X6CrNi1812	1.4303	X4CrNi18 11	1.4303	Z8CN18.11FF	305S19	X7CrNi1810
	X6CrNiNb1810	1.4550	X6CrNiNb1810	1.4550	Z6CNNb18.10	347S31	X6CrNiNb1811
5	X10CrNiMoNb1812	1.4583	X5CrNiMoNb19112	1.4583	Z6CNDNb17.13	318C17	X6CrNiMoNb1713
	X12CrNi2521	1.4335	X12CrNi2521	1.4335	Z12CN25.20	310S24	X6CrNi2620
	X12CrNiTi189	1.4541	X6CrNiTi1810	1.4878	Z6CNT18.12	321S51	X6CrNiTi1811
	X12CrNiWTi163	1.4962	X12CrNiWTi163	1.4962	Z6CNNb18.10		
	X15CrNiSi2012	1.4828	X15CrNiSi2012	1.4828	Z17CNS20.12	309S24	
	X2CrNi1911	1.4306	X2CrNi19 11	1.4306	Z2CN18.10	304S12	X3CrNi1811
	X2CrNiMo17132	1.4404	X2CrNiMo17122	1.4404	Z2CND17.12.02	316S11	X2CrNiMo17122
	X2CrNiMo18143	1.4435	X3CrNiMo18143	1.4435	Z2CND17.13	316S12	X2CrNiMo17132
	X2CrNiMo18164	1.4438	X2CrNiMo18154	1.4438	Z2CND19.15.4	317S12	X2CrNiMo1816

JIS	SS	UNS	AISI/ASTM	Misc. Brand	Condition	Form	Structure
	[2304]						Martensite
SUH31			SAEHNV3				Martensite
			6F7				
SUS440A		S44002	440A				Martensite
SUH4		S65006	SAEHNV6	sol.treated			PH
SUS440B	2327	S44003	440B				Martensite
			6F2				
SKT4		T61206	L6				
SKH57							
		T12015	T15				
SKH2		T12001	T1				
SKH4A		T12005	T5				
SKH3		T12004	T4				
SKH51		T11342	M42				
		T11301	H41;M1				
	2782	T11307	M7				
		T11333	M33;M34				
SKH9;SKH51	2722	T11302	M2				
SKH53	2723		M35				
SKH52;SKH53		T11323	M3Cl.2				
SKH55		T11323	M3				
		T11341	M41				
SKD12	2260	T30102	A2				
SUS440C		S44004	440C				Martensite
SKD11		T30402	D2				
	2310						
			18MAR300				
SKD1		T30403	D3				
SKD2	2312						
		K93120					
SKD4							
SKD5		T20821	H21				
SKD7		T20810	H10				
SKD6		T20811	H11				
SKD61	2242	T20813	H13				
SUS303	2346	S30300	303				Austenite
SUS301	(2331)	S30100	301				Austenite
SUS302	2331	S30200	302				Austenite
		S34800	348				Austenite
SUS304	2333	S30400	304;304H				Austenite
SUS304H	2333	S30480	304H				Austenite
SUS305	2333	S30500	308;305				Austenite
SUS347	2338	S34700	347				Austenite
SCS22			318				Austenite
SUH310;SUS310S	2361	S31008	310S				Austenite
SUS321	2337	S32100	321;321H				Austenite
		S34700	347H				Austenite
SUH309		S30900	309				Austenite
SUS304L	2352	S30403	304L				Austenite
SUS316L	2348	S31603	316L				Austenite
SCS16;SUS316L	2353	S31603	316L				Austenite
SUS317L	2367	S31703	317L				Austenite

ISO	DIN	W.-Nr	EN	EN-Nr	AFNOR	BS	UNI
5	X2CrNiN1911	1.4311	X2CrNiN1810	1.4311	Z2CN18.10Az	304S62	X2CrNiN1811
	X5CrNiMo17133	1.4436	X5CrNiMo17133	1.4436	Z6CND18.12.03	316S33	X5CrNiMo17132
	X6CrNi189	1.4308	X5CrNi19 10	1.4308	Z6CN18.10M	304C15	
	X6CrNiMoNb17122	1.4580	X6CrNiMoNb17122	1.4580	Z6CNDNb17.12	318S17	X6CrNiMoNb1712
	X6CrNiMoTi17122	1.4571	X6CrNiMoTi17122	1.4571	Z6CNDT17.12	320S31	X6CrNiMoTi1712
	X15CrNiSi2520	1.4841	X15CrNiSi2520	1.4841	Z15CNS25.20	314S25	X16CrNiSi2520
	X5CrNiMo1810	1.4401	X5CrNiMo17122	1.4401	Z3CND17.11.1	316S31	X5CrNiMo1712
6	X1CrNiMoN20187	1.4547	X1CrNiMoN20187	1.4547		X1CrNiMoN20187	X1CrNiMoN20187
	X1NiCrMoCuN31274	1.4563	X1NiCrMoCuN31274	1.4563			
	X10NiCrAlTi3220	1.4876	X10NiCrAlTi3220	1.4876	Incoloy800	Z10NC32.21	
	X12NiCrSi3616	1.4864	X12NiCrSi3516	1.4864	Z20NCS33.16	NA17	
	X2CrNiMoN2574	1.4410	X2CrNiMoN 2574	1.4410	Z3CND25.07Az		X2CrNiMoN2574
	X2CrMoNiCuN2563	1.4507	X2CrMoNiCuN2563	1.4507			
	X2CrNiMoCuWN2574	1.4501	X2CrNiMoCuWN2574	1.4501	Z3CND25.06Az		
	X2CrNiMoN17122	1.4406	X2CrNiMoN17112	1.4406	Z2CND17.12Az	316S61	X2CrNiMoN1712
	X2CrNiMoN17133	1.4429	X2CrNiMoN17133	1.4429	Z2CND17.13Az	316S62	X2CrNiMoN17133
	X2CrNiMoN17133	1.4439	X2CrNiMoN17135	1.4439	Z3CND18.14.05Az	(316S63)	
	X2CrNiMoN225	1.4462	X2CrNiMoN 2253	1.4462	Z2CND22.05Az	332S15	X2CrNiMoN225
	X2CrNiMoN225	1.4462	X2CrNiMoN225	1.4462	Z2CND22.05Az	318S13	X2CrNiMoN225
	X2CrNiMoN25227	1.4652	X1CrNiMoN25228	1.4652			
	X2CrNiN234	1.4362	X2CrNiN234	1.4362			
	X2NiCrMoCu25205	1.4539	X2NiCrMoCu25205	1.4539	Z2NCDU2520	904S13	
	X2NiCrMoCu25205	1.4539	X1NiCrMoCu25205	1.4539			
	X4CrNiCuNb164	1.4540	X4CrNiCuNb164	1.4540	Z4CNUNb16.4M		
	X4CrNiMo2752	1.4460	X3CrNiMo2752	1.4460	Z3CND25.7Az		X3CrNiMo2752
	X5CrNiCuNb174	1.4542	X5CrNiCuNb164	1.4548	Z6CNU17.4		
7	GG-10	0.6100	EN-GJL-100	0.6100	Ft10D	Grade100	G10
	GG-15	0.6150	EN-GJL-150	0.6150	Ft15D	Grade150	G15
	GGG-35.3	0.7033	EN-GJS-350-22	0.7033	FGS370-17	Grade350/22	
	GGG-40	0.7040	EN-GJS-400-15	0.7040	FGS400-12	Grade420/12	GS400-12
	GGG-40.3	0.7043	EN-GJS-400-18	0.7043	FGS-370-17	Grade370/17	GSO42/17
	GTS-35-10		EN-GJMB-350-10	0.8135	B340/12	B340/12	B35-12
	GTS-45-06		EN-GJMB-450-6	0.8145	P440/7	P440/7	P45-06
	GTS-55-04		EN-GJMB-550-4	0.8155	P540/5	P540/5	P55-04
8	GG-20	0.6200	EN-GJL-200	0.6200	Ft20D	Grade220	G20
	GG-25	0.6250	EN-GJL-250	0.6250	Ft25D	Grade260	G25
	GGG-50	0.7050	EN-GJS-500-7	0.7050	FGS500-7	Grade500/7	GS500-7
	GGG-60	0.7060	EN-GJS-600-3	0.7060	FGS600-3	Grade600/3	GS600-3
	GGG-NiCr202	0.7660	EN-GJSA-XNiCr20-2	0.7660	FGSNi20Cr2	GradeS2	
	GGG-NiCr203	0.7661	EN-GJSA-XNiCr20-3	0.7661	FGSNi20Cr3	GradeS2B	
	GGG-NiMn137	0.7652	EN-GJSA-XNiMn13-7	0.7652	FGSNi13Mn7	GradeS6	
	GGL-NiCr202	0.6660	EN-GJLA-XNiCr20-2	0.6660	FGLNi20Cr2	GradeF2	
	GGL-NiCr203	0.6661	EN-GJLA-XNiCr20-3	0.6661	FGLNi20Cr3		
	GTS-65-02		EN-GJMB-600-3	0.8165	P570/3	P570/3	P65-02
9	GG-30	0.6300	EN-GJL-300	0.6300	Ft30D	Grade300	G30
	GGG-70	0.7070	EN-GJS-700-2	0.7070	FGS700-2	Grade700/2	GS700-2
	GGL-NiCuCr1562	0.6655	EN-GJLA-XNiCuCr15-6-2	0.6655	FGLNi15Cu6Cr2	GradeF1	
	GGL-NiCuCr1563	0.6656	EN-GJLA-XNiCuCr15-6-3	0.6656	FGLNi15Cu6Cr3		
	GTS-70-02		EN-GJMB-700-2	0.8170	P690/2	P690/2	P70-02
	GG-35	0.6350	EN-GJL-350	0.6350	Ft35D	Grade350	G35
	GG-40	0.6040	–	0.6040	Fgl400	Grade400	
	GGG-80	0.7080	EN-GJS-800-2	0.7080	FGS800-2		GS800-2
	GGG-Ni22	0.7670	EN-GJSA-XNi22	0.7670	FGSNi22		
	GGG-Ni35	0.7683	EN-GJSA-XNi35	0.7683	FGSNi35		
	GGG-NiCr301	0.7677	–	0.7677	FGSNi30Cr1		
	GGG-NiCr303	0.7676	EN-GJSA-XNiCr30-3	0.7676	FGSNi30Cr3	GradeS3	
	GGG-NiCr353	0.7683	EN-GJSA-XNiCr35-3	0.7683	FGSNi35Cr3		
	GGG-NiMn234	0.7673	EN-GJSA-XNiMn23-4	0.7673	FGSNi23Mn4	GradeS2M	
	GGG-NiSiCr2052	0.7665	EN-GJSA-XNiSiCr20-5-2	0.7665	FGSNi20Si5Cr2		
	GGG-NiSiCr3055	0.7680	EN-GJSA-XNiSiCr30-5-5	0.7680	FGSNi30Si5Cr5		
	GGL-NiCr303	0.6676	EN-GJLA-XNiCr30-3	0.6676	FGLNi30Cr3	GradeF3	
	GGL-NiSiCr2053	0.6667	EN-GJLA-XNiSiCr20-5-3	0.6667	FGLNi20Si5Cr3		
	GGL-NiSiCr3055	0.6680	–	0.6680	FGLNi30Si5Cr5		

JIS	SS	UNS	AISI/ASTM	Misc. Brand	Condition	Form	Structure
SUS304LN	2371	S30453	304LN				Austenite
SUS316	2343	S31600	316				Austenite
SCS13	2333		CF8				Austenite
		S31640	316Cb				Austenite
SUS316Ti	2350		316Ti				Austenite
SUH310		S31000	314;310				Austenite
SUS316	2347	S31600	316				Austenite
	2778	S31254		254SMO			Superaustenite
		N08028		Sanicro28			Superaustenite
NCF800		N08800		Alloy800	sol.treated		PH
SUH330		N08330	330	IncoloyDS			Austenite
	2328	S32750	F53	SAF2507			Superduplex
		S32550	255	Ferralium			Superduplex
		S32760	F55	Zeron100			Superduplex
SUS316LN		S31653	316LN				Austenite
SUS316LN	2375	S31653	316LN				Austenite
(SUS316LN)		(S31653)	(316LN)				Austenite
	2377	S31803	329LN	SAF2205			Duplex
SUS329J3L	2377	S32205	318	SAF2205			Duplex
		S32654		654SMO			Superaustenite
	2327	S32304	–	SAF2304			Duplex
	2562	N08904	904L				Superaustenite
	2564		CN7M				Superaustenite
		S15500	XM-12	15-5-PH	sol.treated		PH
SUS329J1	2324	S32900	329				Duplex
SCS24;SUS630		S17400	630	17-4-PH	sol.treated		Superaustenite
FC100	0110-00	F11401	A1820B				GCI
FC150	0115-00	F11601	A4825B				GCI
FCD350-22L	0717-15						DCI
FCD400-18L	0717-02	F32800	60-40-18				DCI
	0717-12	F32800	60-40-18				DCI
FCMB35-10	0815-00	F22200	A4732510				Martensite
PCMP45-06	0852-00	F23130	A22045008				Martensite
PCMP55-04	0854-00	F24130	A22060004				Martensite
FC200	0120-00	F12101	A4830B				GCI
FC250	0125-00	F12401	A4835B				GCI
FCD500-7	0727-02	F33800	A53680-55-6				DCI
FCD600-3	0732-03	F34100	A47680-60-03				DCI
		F43000	A436TypeD-2				Austenite
		F43001	A436TypeD-2B				Austenite
	0772-00	–	–				Austenite
	0523-00	F41002	A436 Type2				Austenite
		F41003	A436Type2b				Austenite
PCMP60-03	0856-00	F24830	A22070003				Martensite
FC300	0130-00	F13101	A4845B				GCI
FCD700-2	0737-01	F34800	A536100-70-03				DCI
		F41000	A436 Type1				Austenite
		F41001	A436 Type1b				Austenite
PCMP70-02	0862-00	F26230	A22090001				Martensite
FC350	0135-00	F13502	A4850B				GCI
	0140-00	F14102	A27860B				GCI
FCD800-2		F36200	A536120-90-02				Martensite
			A439TypeD-2B				Austenite
		F43006	A439TypeD-5				Austenite
		F43004	A436TypeD-3A				Austenite
		F43003	A436TypeD-3				Austenite
		F43007	A436TypeD-5B				Austenite
		F43010	A439TypeD-2M				Austenite
		–	NicrosilalSpheronic				Austenite
		F43005	A439TypeD-4				Austenite
		F41004	A436 Type3				Austenite
			Nicrosilal				Austenite
			A436TypeD-4				Austenite

ISO	DIN	W.-Nr	EN	EN-Nr	AFNOR	BS	UNI
10	Al99	3.0205	AW-1200	Al99	A-4/1200	1C/1200	
	Al99.5	3.0255	AW-105 0A	Al99.5	A-5/1050A	1B/1050A	
	Al99.7	3.0275	AW-1070	Al99.7	A-7/1070		
	Al99.8	3.0285	AW-1080	Al99.8	A-8/1080	1A	
	AlCu2.5Mg0.5	3.1305			A-U2G	2L69	
	AlCuBiPb	3.1655	AW-2011	AlCuBiPb	A-U5PbBi/2011	FC1/2011	
	AlCuMg1	3.1325	AW-2024	AlCuMg1	A-U4G/2024	H14	
	AlCuMg2	3.1355			A-U4G1	2L97/98	
	AlCuSiMn	3.1255	AW-2014	AlCuSiMn	A-U4SG/2014	H15/2014	
	AlMg1	3.3315	AW-5005A	AlMg1	A-G0.6	N41/5005	
	AlMg1.5	3.3316			A-G1.5		
	AlMg1SiCu	3.3211	AW-6061	AlMg1SiCu	(6061)	H20	
	AlMg2.5	3.3523	AW-5052	AlMg2.5	A-G2.5C/5052	(N4)	
	AlMg2.7Mn	3.3537	AW-5454	AlMg2.7Mn	A-G2.5MC/5454	N51/5454	
	AlMg2Mn0.3	3.3525	AW-5251	AlMg2Mn0.3	A-G2M	N4/5251	
	AlMg2Mn0.8	3.3527	AW-5049	AlMg2Mn0.8	A-G2Mn0.8		
	AlMg3	3.3535	AW-5754	AlMg3	A-G3M		
	AlMg4.5	3.3345					
	AlMg4.5Mn	3.3547	AW-5083	AlMg4.5Mn	A-G4.5MC	N8/5083	
	AlMg4Mn	3.3545	AW-5086	AlMg4Mn	A-G4MC/5086	(N5/6)	
	AlMgSi0.5	3.3206	AW-6060	AlMgSi0.5	A-GS/6060	(H9)/(6060)	
	AlMgSi0.7	3.3210	AW-6063	AlMgSi0.7	A-GSUC/6061	(H10)	
	AlMgSi1	3.2315	AW-6082	AlMgSi1	A-SGM0.7/6082	H30/6082	
	AlMgSiPb	3.0615			A-SGPb		
	AlMn0.5Mg0.5	3.0505	AW-3105	AlMn0.5Mg0.5		N31	
	AlMn0.5Mg0.5	3.0525	AW-3005	AlMn0.5Mg0.5	A-MG0.5/3005		
	AlMn1	3.0515	AW-3103	AlMn1		N3/3103	
	AlMn1Cu	3.0517	AW-3003	AlMn1Cu	A-M1/3003		
	AlMn1Mg1	3.0526	AW-3004	AlMn1Mg1	A-M1G/3004		
	AlZn4.5Mg1	3.4335	AW-7020	AlZn4.5Mg1	A-Z5G/7020	H17/7020	
	AlZnMgCu0.5	3.4345			A-Z4GU		
	AlZnMgCu1.5	3.4365	AW-7075		A-Z5GU/7075	2L95/96	
	G-AlCu4Ti	3.1841	AC-21100	AlCu4Ti			
	G-AlCu4TiMg	3.1371	AC-21000	AlCu4TiMg	A-U5GT	2L91/92	
	G-AlMg3	3.3541	AC-51100	AlMg3	A-G3T		
	G-AlMg3Si	3.3241					
	G-AlMg5	3.3261	AC-51400	AlMg5(Si)			
	G-AlMg5	3.3555	AC-51400	AlMg5		LM5	
	G-AlMg9	3.3292	AC-51200	AlMg9			
	G-AlSi10Mg	3.2381	AC-43400	AlSi10Mg(Fe)	A-S10G	LM9	
	G-AlSi5Mg	3.2341	AC-42000		A-S7G	LM25	
	G-AlSi6Cu4	3.2151	AC-45000	AlSi6Cu4			
	G-AlSi7Mg	3.2371	AC-42100	AlSi7Mg	A-S7GO3	2L99	
	G-AlSi8Cu3	3.2161	AC-46200	AlSi8Cu3(Si)			
	G-AlSi9Mg	3.2373	AC-43200	AlSi9Mg	A-S10G		
	G-MgAg3Se2Zr1	3.5106					
	G-MgAl3Zn	3.5314	MG-P-62	MgAl3Zn	G-A3-Z1	MAG-E-111	
	G-MgAl6Mn	3.5662	MC21230	MgAl6Mn			
	G-MgAl6Zn	3.5612	MG-P-63	MgAl6Zn	G-A6-Z1	MAG-E-121	
	G-MgAl8Zn	3.5812	MG-P-61	MgAl8Zn	G-A9	MAG1-M	
	G-MgAl8Zn1	3.5812	MC21110	MgAl8Zn1	G-A92	A82	
	G-MgAl9Zn1	3.5912	MC21120	MgAl9Zn1	G-A92	MAG3	
	G-MgMn2	3.5200			G-M2	MAG-E-101	
	G-MgSe3Zn2Zr1	3.5103	MB65110	MgSe3Zn2Zr1	ZRE1	MAG6-TE	
	G-MgTh3Zn2Zr1	3.5105					
	G-AlSi10Mg(Cu)	3.2383	AC-43200	AlSi10Mg(Cu)			
	GD-AlSi12	3.2382	AC-44200	AlSi12			
			AC-46100	AlSi11Cu2(Fe)		LM9	
			AC-47100	AlSi12Cu1(Fe)			
				AlSi17Cu5			
	Cu		CW004A				
	CuAg0.1	2.1203	CW013A	CuAg0.1		Cu-Ag-4	
	CuAl10Fe	2.0940.01	CC331G		CuAl10Fe	AB1	
	CuAl10Fe5Ni5		CC333G-GZ				
	CuAl10Ni	2.0975.01	CC333G		CuAl10Ni5Fe5	AB2	
	CuAl10Ni5Fe4	2.0966	CW307G	CuAl10Ni5Fe4	CuAl10Ni	CA104	

JIS	SS	UNS	AISI/ASTM	Misc. Brand	Condition	Form	Structure
A1200	4010	AA1200					
(A1050)	4007	AA1050A					
	4005	AA1070A					
	4004	AA1080A					
		AA2117					
A2011	4355	AA2011					
A2017		AA2017A					
		AA2024					
	4338	AA2014					
	4106	AA5005A					
		AA5050B					
A6061		AA6061					
A5052	4120	AA5052					
A5454		AA5454					
		AA5251					
	4115	AA5049					
	4125	AA5754					
A5082		AA5082					
	4140	AA5083					
		AA5086					
	4103	AA6060					
(A6063	4104,4107	AA6005					
	4212	AA6082					
		AA6012					
		AA3105					
–		AA3005					
	4054	AA3103					
A3003		AA3003					
–		AA3004					
	4425	AA7020					
		AA7022					
A7075		AA7075					
	4337	A02040	204				
		A05140	5140				
			5056A				
	4163						
	4253	A13600	B85				
	4244		B26				
	4245	A13560					
	4251		A380				
			359,2				
			4418				
		AZ31B					
	4633	AM60A					
		AZ61A					
		AZ80A					
	4637	AZ81A					
	4635	AZ91A/B	4437				
		M1A					
		B80	4442				
		B80					
			A413.2				
ADC12			A384.0				
		AA384					
ADC14			B390.0				
	5015						
	5030	C11600					
	5710	C95200	CA952				
	5716	C95500	CA955				
C6301		C62730					

ISO	DIN	W.-Nr	EN	EN-Nr	AFNOR	BS	UNI
	CuAl5	2.0916					
	CuAl5As	2.0918	CW300G	CuAl5As			
	CuAl8Fe3	2.0932					
	CuCr	2.1291					
	CuFe2P	2.1310	CW107C	CuFe2P			
	CuNi1.5Si	2.0853	CW109C	CuNi1Si			
	CuNi10Fe1Mn	2.0872		CuNi10Fe1Mn	CuNi10Fe1Mn	CN102	
	CuNi10Zn45						
	CuNi12Zn30Pb1	2.0780	CW406J	CuNi12Zn30Pb1			
	CuNi18Zn19Pb	2.0790		CW408J	CuNi18Zn19Pb1		
	CuNi18Zn19Pb1	2.0790	CW408J	CuNi18Zn19Pb1	CuNi18Zn19Pb1		
	CuNi18Zn20	2.0740	CW409J	CuNi18Zn20	CuNi18Zn20	NS106	
	CuNi18Zn27	2.0742	CW410J	CuNi18Zn27		NS107	
	CuNi20	2.0822					
	CuNi25	2.0830			CuNi25	CN105	
	CuNi30	2.0835					CuNi30
	CuNi30Fe2Mn2	2.0883					
	CuNi30FeMn						
	CuNi30Mn1Fe	2.0882	CW354H	CuNi30Mn1Fe	CuNi30Mn1Fe	CN107	
	CuNi3Si	2.0857	CW112C	CuNi3Si			
	CuNi44Mn1	2.0842			CuNi44Mn		
	CuNi5Fe1Mn				CuNi5Fe1Mn		
	CuNi9Sn2	2.0875	CW351H	CuNi9Sn2			
	CuPb10Sn	2.1176	CW352H		CuSn10Pb10	LB2	
	CuPb15Sn	2.1183	CC496K-GZ				
	CuPb1P	2.1160	CW113C	CuPb1P			
	CuPb20Sn	2.1189					
	CuSn10	2.1050.01	CC480K		CuSn10	CT1	
	CuSn10Zn	2.1087					
	CuSn12	2.1051.01	CC483K		CuSn12	PB2	
	CuSn14				CuSn14		
10	CuSn4	2.1016	CW450K	CuSn4	CuSn4P	PB101	
	CuSn5			CW451K			
	CuSn6	2.1020	CW452K	CuSn6	CuSn6	PB103	
	CuSn6Zn6	2.1080					
	CuSn7						CuSn7
	CuSn7ZnPb	2.1090.03	CC493K-GZ				
	CuSn8	2.1030	CW453K	CuSn8	CuSn8P	PB104	
	CuZn10	2.0230	CW501L	CuZn10	CuZn10	CZ101	
	CuZn15	2.0240	CW502L	CuZn15	CuZn15	CZ102	
	CuZn20	2.0250	CW503L	CuZn20		CZ103	
	CuZn20Al2	2.0460	CW702R	CuZn20Al2	CuZn22Al2	CZ110	
	CuZn25Al15						
	CuZn28	2.0261	CW504L	CuZn28		CZ105	
	CuZn28Sn1	2.0470	CW706R	CuZn28Sn1	CuZn29Sn1		
	CuZn30	2.0265	CW505L	CuZn30	CuZn30	CZ106	
	CuZn30AlFeMn				CuZn30AlFeMn		
	CuZn31Si1	2.0490	CW708R	CuZn31Si1			
	CuZn33	2.0280	CW506L	CuZn33		CZ107	
	CuZn35Al1	2.0592.01	CC765S		CuZn30AlFeMn	HTB1	
	CuZn35Ni2	2.0540	CW710R	CuZn35Ni2			
	CuZn36	2.0335	CW507L	CuZn36	CuZn36	CZ108	
	CuZn36Pb1.5	2.0331	CW601N	CuZn35Pb2	CuZn35Pb2	CZ131	
	CuZn36Pb3	2.0375	CW602N	CuZn36Pb3	CuZn36Pb3	CZ124	
	CuZn37	2.0321	CW508L	CuZn37	CuZn37	CZ108	
	CuZn37Pb0.5	2.0332	CW604N	CuZn37Pb0.5		CZ118	
	CuZn38Pb1.5	2.0371	CW607N	CuZn38Pb1.5	(CuZn38Pb2)	CZ119	
	CuZn38Sn1	2.0530	CW717R	CuZn38Sn1			
	CuZn38SnAl	2.0525	CW715R	CuZn38SnAl			
	CuZn39AlFeMn						
	CuZn39Pb0.5	2.0372	CW610N	CuZn39Pb0.5	CuZn39Pb0.8	CZ123	
	CuZn39Pb2	2.0380	CW612N	CuZn39Pb2		CZ128	
	CuZn39Pb3	2.0401	CW614N	CuZn39Pb3	CuZn39Pb3	CZ121	
	CuZn40	2.0360	CW509	CuZn40	CuZn40	CZ109	
	CuZn40Al2	2.0550	CW713R				

JIS	SS	UNS	AISI/ASTM	Misc. Brand	Condition	Form	Structure
		C60800					
C6140							
		C18400					
		C19400					
	5667	C70600					
		C79300					
		C76300					
		C76300					
C7451		C75200					
		C77000					
		C71300					
		C71580					
	5682	C70600					
		C70250					
		C72150					
		C72500					
	5640	C93700	CA937				
		C93800					
		C19000					
		C94100					
	5443	C90700					
	5458	C90500					
	5465		CA907				
	5475	C91000					
C5111		C51100					
		C51000					
C5191	5428	C51900					
		C93200					
		C83600					
C5210		C52100					
C2200		C22000					
C2300	5112	C23000					
C2400		C24000					
	5217	C68700					
		C86300					
C4430		C25600					
	5220	C44300					
C2600	5122	C26000					
C2680		C26800					
	5256	C96500	CA865				
C2720		C27200					
		C34200					
		C36000					
	5150	C27200					
		C33500					
	5165	C35300					
		C46400					
		C47000					
		C36500					
		C37700					
	5170	C38500					
C2800		C28000					
		C67410					

ISO	DIN	W.-Nr	EN	EN-Nr	AFNOR	BS	UNI	JIS	SS	UNS	AISI/ASTM	Misc. Brand	Condition	Form	Structure
10	CuZn40Mn1	2.0572	CW723R	CuZn40Mn1											
	CuZn40Mn1Pb	2.0580	CW720R	CuZn40Mn1Pb											
	CuZn40Pb2	2.0402	CW612N	CuZn40Pb2	CuZn39Pb2				5168	C37800					
	CuZn44Pb2	2.0410	CW622N	CuZn44Pb2					5272	C68700					
	CuZn5	2.0220	CW500L	CuZn5		CZ136		C2100		C21000					
						CZ120						AMPCO15			
						CZ104						AMPCO18			
						CZ125						AMPCO18.136			
												AMPCO18.22			
												AMPCO18.23			
												AMPCO21			
												AMPCO22			
												AMPCO25			
												AMPCO26			
												AMPCO45			
												AMPCO483			
												AMPCO642			
												AMPCO673			
												AMPCO674			
												AMPCO8			
												AMPCO863			
												AMPCOM4			
11										S66286		A286	precip.hardened		
										S35000		AM350		cast	
										S35000		AM350	heattreated		
										S35500		AM355			
										S45500		Custom455			
												Discalloy			
		1.4876	X2NiCrAlTi3220							N08800		Incoloy800			
												Incoloy801			
										N19909		Incoloy909			
												Lapelloy			
												M-308			
										R30155		N-155		bar,forge,ring	
										R30155		N-155			
												Air Resist13			
												FSX-414			
												H531			
												Haynes188		bar,forge,ring	
												Haynes188		tube	
												Haynes25			
												Mar-M-302			
												Mar-M-509			
										R30195		MP159			
												MP35N			
												Stellite21			
												Stellite30			
												Stellite31			
												W152			
												W162			
												Astroloy		allforms	
												GTD222			
										N10665		HastelloyB-2			
		2.4810	NiMo30							N10002		HastelloyC		plate	
		2.4810	NiMo30							N10002		HastelloyC		cast	
		2.4602										HastelloyC-22			
		2.4819	NiMo16Cr15W							N10276		HastelloyC-276			
		2.4610	NiMo16Cr16Ti							N06455		HastelloyC-4			
										N06007		HastelloyG			
		2.4619								N06985		HastelloyG-3			
										N10003		HastelloyN		bar,forge,ring	
										N10003		HastelloyN		cast	
										N06635		HastelloyS		allforms	
			NiCr21Fe18Mo9							N10004		HastelloyW			
		2.4665								N06002		HastelloyX		allforms	

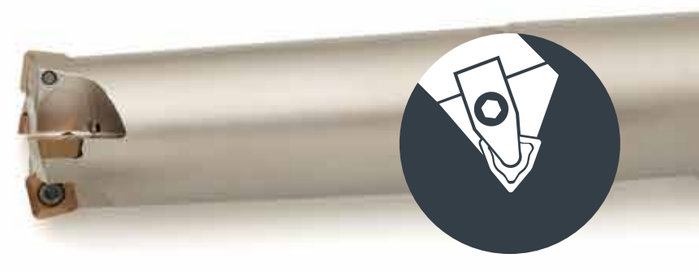
ISO	DIN	W.-Nr	EN	EN-Nr	AFNOR	BS	UNI	JIS	SS	UNS	AISI/ASTM	Misc. Brand	Condition	Form	Structure
												IN100			
		2.4816	NiCr15Fe							N06600		Inconel600		allforms	
		2.4851								N06601		Inconel601		allforms	
		2.4856	NiCr22Mo9Nb							N06625		Inconel625		bar,forge,ring	
		2.4856	NiCr22Mo9Nb							N06625		Inconel625		tube	
		2.4856	NiCr22Mo9Nb							N06625		Inconel625		cast	
			NiFe38Cr16Nb							N09706		Inconel706			
												Inconel708		bar,forge,ring	
										N07713		Inconel713			
												Inconel713LC			
		2.4668	NiCr19Fe19Nb5Mo3							N07718		Inconel718		bar,forge,ring	
		2.4668	NiCr19Fe19Nb5Mo3							N07718		Inconel718		tube	
		2.4668	NiCr19Fe19Nb5Mo3							N07718		Inconel718		cast	
												Inconel901			
		2.4669								N07750		InconelX-750	sol.treated		
		2.4669								N07750		InconelX-750	precip.hardened		
												Mar-M-200			
												Mar-M-247		allforms	
												Mod.IN100			
												Mod.IN792			
		2.4061	Ni99.6							N02205		Nickel201			
												Nimonic101			
		2.4634										Nimonic105			
		2.4636										Nimonic115			
		2.4650								N07263		Nimonic263			
		2.4631	NiCr20TiAl							N07080		Nimonic80A			
												Nimonic81			
												Nimonic86			
		2.4632								N07090		Nimonic90			
11		2.4662								N09901		Nimonic901			
												Nimonic91			
												René95			
		ppm								N03260		TDNickel			
			NiCr19Co18Mo4Ti3Al3							N07500		Udimet500			
												Udimet520			
												Udimet700			
												Udimet720			
		2.4654	NiCr20Co13Mo4Ti3Al							N07001		Waspalloy		bar,forge	
		2.4654	NiCr20Co13Mo4Ti3Al							N07001		Waspalloy		cast	
		3.7024										Ti(pure)		pure-tube	Ti(?)
		3.7024									AMS4900,-01,-21	Ti(pure)(grd1-4)		pure-plate,bar,forge	Ti(?)
	TiV10Fe2Al3										AMS4986	Ti10V-2Fe-3Al			Ti(?)
										R58210	ASTMGrade21	Ti15Mo-3Nb-3Al-0.2Si			Ti(?)
										R58650	AMS4995	Ti17			Ti(a+b)
		3.7124	TiCu2									Ti2Cu			Ti(?)
										R56320	AMS4943	Ti3Al-2.5V	annealed	tube	Ti(?+?)
										R56320	AMS4943	Ti3Al-2.5V		bar,forge	Ti(?+?)
			TiAl5Sn2.5							R54520	AMS4910	Ti5Al-2.5Sn	ELI		Ti(?)
			TiAl5Sn2.5							R54521	AMS4909	Ti5Al-2.5Sn			Ti(?)
			TiAl5Sn2.5							R54520	AMS4910	Ti5Al-2.5Sn	annealed		Ti(?)
										R54620	AMS4919	Ti6-2-4-2	annealed		Ti(?)
										R54621	AMS4919	Ti6-2-4-2	precip.hardened		Ti(?)
										R56260	AMS4981	Ti6-2-4-6	annealied		Ti(?+?)
										R56260	AMS4981	Ti6-2-4-6	precip.hardened		Ti(?+?)
		3.7164	TiAl6V4							R56400	AMS4920	Ti6Al-4V	annealed		Ti(?+?)
		3.7164	TiAl6V4							R56400	AMS4920,Grd5	Ti6Al-4V	annealed		Ti(?+?)
			TiAl6V4							R56401	AMS4981	Ti6Al-4V	ELI	ELI	Ti(?+?)
		3.7164	TiAl6V4							R56400	AMS4920	Ti6Al-4V		extrusion	Ti(?+?)
		3.7164	TiAl6V4							R56400	AMS4920	Ti6Al-4V	precip.hardened		Ti(?+?)

A - MILLING

MILLING

DRILLING

B - DRILLING



TURNING

C - TURNING

GROOVING & PARTING OFF

D - GROOVING & PARTING OFF

THREADING

E - THREADING

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SN45-12 | SN45-16

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SO10-08 | SO10-13 | SO15-16

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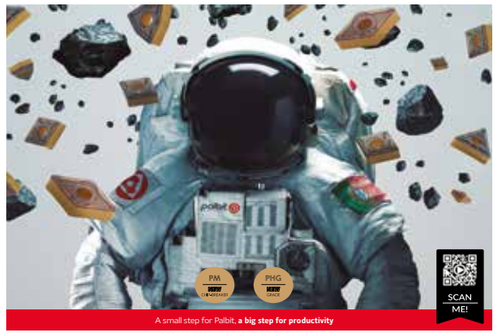
ALUPRO
XD90-15 | XD90-22

PDF

PM + PHG
(new chipbreaker + new grade)



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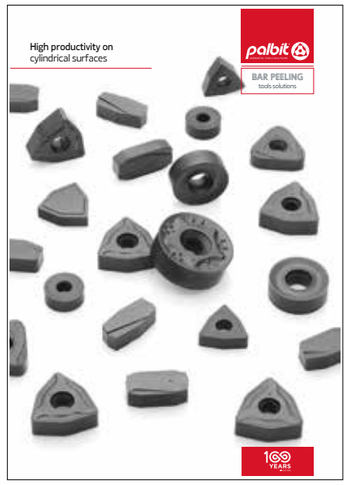

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